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# **Asian Journal of Organic & Medicinal Chemistry**

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## **Oxidative Conversion of Nickel Assisted N-Methyl-2,6-Diphenylpiperidin-4-One Oxime by Trimethylammonium Fluorochromate in Aqueous Acetic Acid Medium: A Kinetic and Mechanistic Study**

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### **ABSTRACT**

Present investigation deals with oxidative conversion of N-methyl-2,6-diphenylpiperidin-4-one oxime (NMPO) by trimethylammonium fluorochromate (TriMAFC) has been carried out in 50% (v/v) aqueous acetic acid medium at 308 K. Reaction products has been recognized as analogous ketone group. Experimental studies shows first order dependence with respect to [oxidant] and [substrate] has been observed. It is determined that introduction of sodium perchlorate results in decrement of the reaction rate substantially. The rate constant increased with increase in the concentration of perchloric acid. The reaction has been found to be catalyzed by hydrogen ions. For acrylonitrile no polymerization is occurred. The reaction has been conducted at four different temperature and the activation parameters were calculated. From the observed kinetic results a suitable mechanism was proposed.

**Keywords:** [NMPO], [TriMAFC], Oxidative Conversion, Kinetic and mechanism.

### **I. INTRODUCTION**

Oxidation reactions are very important in nature and in organic synthesis. It also much more interest in the chemical research and the industrial applications. In recent years, oxidation process has received much attention, especially in the search for selective and environmentally friendly oxidants [1-2]. Chromium compounds especially Cr (VI) reagents have been proved to be versatile reagents and capable of oxidizing almost all the oxidizable organic functional groups [3-5]. In this paper, efforts have been made to determine the kinetic orders with respect to each reactant and to propose a suitable reaction mechanism for the oxidation of NMPO.

#### **1.1 Oxidation Of NMPO**

Oxime plays an important role in various fields such as crystal engineering, pharmaceuticals, polymer science etc. Since oximes have been employed as ketone or aldehyde functional group equivalents in organic synthesis [6-9], the conversion of oximes into their parent carbonyl compounds has received considerable attention [10]. Selective oxidation of oximes to their corresponding carbonyl compounds is an important transformation in organic chemistry. Kinetics and mechanism of oxidation of NMPO by various oxidizing reagents have been well documented [11]. From the literature survey, the kinetics and oxidation of NMPO by TriMAFC has not been reported. Therefore, in current investigation, we have carried out the oxidation of NMPO by TriMAFC in presence of aqueous acetic acid, and the corresponding mechanism is explained in the research article.

#### **1.2 Trimethylammonium Fluorochromate As An Oxidant**

For the oxidation of oxime to corresponding carbonyl compounds, chromium compounds have been used in both aqueous and non-aqueous media. Since Cr (VI) is a versatile oxidant for the oxidation of different organic compounds, the production of new Cr (VI) reagents for the efficient and specific oxidation of organic substrate under mild conditions has been investigated in recent years [12]. A variety of compounds containing chromium(VI) have proved to be versatile reagents capable of oxidizing almost every oxidisable functional group. Chromium compounds have been used in aqueous and non-aqueous medium for the oxidation of oximes to carbonyl compounds. Halochromates have been used as mild and selective oxidizing reagents in synthetic organic chemistry [13-25]. TriMAFC is also one such reagent. Trimethylammonium fluorochromates has been used as on mild selective oxidant in synthetic organic chemistry [26-28]

### **II. EXPERIMENTAL**

#### **2.1 Oxime preparation and other reagents**

The corresponding oxime [NMPO] was prepared by the method described in the literature [11]. TriMAFC was also prepared by the method described in the literature [29]. All other chemicals without further purification used in this experiment are all of AnalAR grade (AR) samples.

## 2.2 Kinetic Procedure and Measurements

All the kinetic reactions were carried out under *pseudo*-first order conditions, in aqueous acetic acid medium by maintaining [substrate]  $\gg$  [TriMAFC]. Homogeneous medium of reaction mixture was maintained throughout the reaction. The progress of the reaction carried out in a solvent system of 50% (v/v) acetic acid-water medium at 308 K unless otherwise mentioned and the course of the reaction were followed by iodometric method. From the slope of linear plots of log titre *versus* time the first order rate constant were calculated.

## 2.3 Product Analysis and Stoichiometric Studies

For the completion of the reaction, the reaction mixture was allowed to stand for 48 hrs. The product was extracted with chloroform and the organic layer was washed with water, dried over anhydrous sodium sulfate. The chloroform layer was evaporated. The corresponding ketone as a product which is confirmed by the formation of 2,4-dinitrophenylhydrazone derivative (m.p. 196 °C, lit. 200 °C). The stoichiometric studies of the reaction required 0.1 mol of [NMPO] and 0.1 mol of [TriMAFC], which were mixed with one another in perchloric acid medium and 50% (v/v) aqueous acetic acid medium (total volume 100 mL).

## III. RESULTS AND DISCUSSION

Under the *pseudo*-first order conditions, the oxidation of NMPO by TriMAFC has been conducted in 50% (v/v) acetic acid-water medium at 308 K and the observed results were discussed in the following pages.

### 3.1 Influence of Changing [TriMAFC]

The concentration of TriMAFC was varied in the range 0.50 to  $2.25 \times 10^{-3}$  mol dm<sup>-3</sup> and keeping all other reactant concentration as constant and the rate were measured (Table 1). The non-variation in the first order rate constant at various concentration of TriMAFC indicates that the order with respect to [TriMAFC] is unity. These were also confirmed from the linearity of plot of log titre *versus* time ( $r = 0.999$ ) (Fig. 1) up to 80% completion of the reaction.

### 3.2 1 Influence of Changing [NMPO]

The substrate [NMPO] was varied in the range of 0.50 to  $3.00 \times 10^{-2}$  mol dm<sup>-3</sup> at 308 K and keeping all other reactant concentrations as constant and the corresponding rate constant were measured (Table 1). The oxidation of NMPO reaction was first order with respect to [NMPO], which is indicated by the plots of log  $k_{obs}$  *versus* log [NMPO] gave the slope ( $B = 0.9$ ) (Fig. 2).

### 3.3. 1 Influence of Changing [H<sup>+</sup>]

The perchloric acid concentration was varied in the range of 5.00 to  $15.00 \times 10^{-4}$  mol dm<sup>-3</sup> and keeping the constant concentration of all other reactant, the rates were measured (Table 1). The concentration of perchloric acid increases and the rate of oxidation reaction also increases. The plots of log  $k_{obs}$  *versus* log [H<sup>+</sup>] straight line with a slope of 0.79 indicate first order with respect to [H<sup>+</sup>].

### 3.4. 1 Influence of Changing Solvent Composition

The kinetic reaction was carried out with different solvent composition of AcOH-H<sub>2</sub>O mixtures and keeping constant concentrations of all other reactants, the corresponding rate constant values were measured (Table 1). The kinetic results show that as the percentage of acetic acid in the reaction mixture increases, the rate constant was decreased. This indicates that an ion-dipole interaction may be involved in the reaction pathway.

### 3.5. 1 Influence of Ionic Strength, MnSO<sub>4</sub> and Polymerization Study

From the various concentration of NaClO<sub>4</sub> in the reaction medium, the effects of ionic strength were studied. Keeping all other reactant concentration as constant, the ionic strength of the reaction was varied from 5.00 to  $20.00 \times 10^{-4}$  mol dm<sup>-3</sup>. The rate constant decreases with increasing the concentration of NaClO<sub>4</sub>, suggest that the reaction may be between an ion and neutral molecule (Table 2). Slightly increase the rate of reaction by the addition of manganous sulfate.

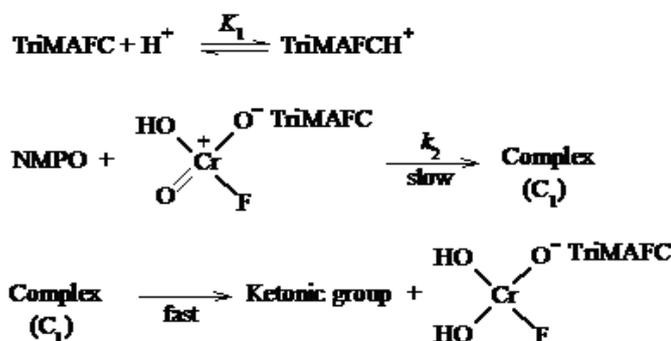
The possibility of radical formation and its involvement in the reaction has been ruled out as the addition of acrylonitrile in the reaction mixture developed no turbidity and hence the reaction rates were not affected even the [acrylonitrile] was at 5.00 to  $20.00 \times 10^{-4}$  mol dm<sup>-3</sup> (Table 2).

### 3.6. 1 Influence of Temperature

This oxidation reaction was conducted at five different temperatures *viz.*, 298, 303, 308, 313 and 318 and keeping all other reactant concentration constant, the rate constant were calculated (Table 1). From the Eyring's plots of  $\ln k_{obs}/T$  *versus*  $1/T$  were linear ( $r = 0.995$ ) (Fig. 3) and the activation parameters  $\Delta H^\ddagger = 70.19$  kJ mol<sup>-1</sup> and  $\Delta S^\ddagger = -80.12$  J K<sup>-1</sup> mol<sup>-1</sup> were obtained from the slope and intercept of the Eyring's plot.

### Mechanism and Rate Law

From the observed kinetic results the following suitable mechanism has been proposed. Effective Oxidizing species  $\text{HCrO}_4^-$  (TriMFC) protonates to give  $\text{TriMAFCH}^+$  in the equilibrium step. Further  $\text{TriMAFCH}^+$  react with NMPO to give complex ( $\text{C}_1$ ), then the  $\text{C}_1$  yield a product.



The proposed mechanism has been substantiated by the following rate law [30].

$$\text{Rate law} = \frac{-d[\text{Cr(VI)}]}{dt} = K_1 k_2 [\text{NMPO}] [\text{Cr(VI)}] [\text{H}^+]$$

### IV. CONCLUSION

From the foregoing results, the following conclusion is given:

NMPO oxidized by TriMAFC is acid catalyzed reaction. The oxidation of NMPO gives corresponding ketone as the product. Participation of an ion and a neutral molecule formed in the reaction steps indicates the effect of ionic strength and solvent polarity.

- First order with respect to [NMPO] and [TriMAFC]
- The reaction enhanced by  $\text{H}^+$  ions
- The activation parameters were calculated from the Eyring plots ( $\Delta H^\ddagger = 70.19 \text{ kJ mol}^{-1}$  and  $\Delta S^\ddagger = -80.12 \text{ J K}^{-1} \text{ mol}^{-1}$ ).

### V. ACKNOWLEDGMENTS

Thanks are due to Department of chemistry UG & PG Arignar Anna Govt.Arts College Vadachennimalai Attur, Periyar University Salem Tamil Nadu India for critical suggestions and helpful discussions.

### VI. APPLICATIONS

- Kinetic methods involved in chemical reactions such as decomposition of medicinal compounds and processes of drug absorption, distribution and elimination from the body.
- Kinetics involved in pharmacy like stability of pharmaceutical preparations, dilution methods and also drug release.
- Kinetic of oxidation reaction is much more interest in the chemical research and industrial application.
- The study of chemical kinetics has been highly useful in determining the factors that influence the rate, maximum yield and conversion in industrial process.
- Rt is also useful in selecting the optimum condition for maximum rate and yield of the chemical process.

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Table 1 – Effect of variation of [TriMAFC], [NMPO], [HClO <sub>4</sub> ], solvent composition and temperature on the reaction rates					
[TriMAFC]×10 <sup>-3</sup> (mol dm <sup>-3</sup> )	[NMPO]×10 <sup>-2</sup> (mol dm <sup>-3</sup> )	Solvent AcOH- H <sub>2</sub> O (% v/v)	[HClO <sub>4</sub> ]×10 <sup>-4</sup> (mol dm <sup>-3</sup> )	Temp. (K)	k <sub>obs</sub> ×10 <sup>-4</sup> (s <sup>-1</sup> )
0.50	1.50	50:50	10.00	308	3.18
1.00	1.50	50:50	10.00	308	3.31
1.25	1.50	50:50	10.00	308	3.46
1.50	1.50	50:50	10.00	308	3.47
1.75	1.50	50:50	10.00	308	3.48
2.00	1.50	50:50	10.00	308	3.50

2.25	1.50	50:50	10.00	308	3.55
1.25	0.50	50:50	10.00	308	1.44
1.25	1.00	50:50	10.00	308	2.53
1.25	1.50	50:50	10.00	308	3.46
1.25	2.00	50:50	10.00	308	4.50
1.25	2.50	50:50	10.00	308	5.32
1.25	3.00	50:50	10.00	308	6.18
1.25	1.50	50:50	5.00	308	1.98
1.25	1.50	50:50	7.50	308	2.75
1.25	1.50	50:50	10.00	308	3.46
1.25	1.50	50:50	12.50	308	4.19
1.25	1.50	50:50	15.00	308	4.78
1.25	1.50	30:70	10.00	308	9.24
1.25	1.50	40:60	10.00	308	5.11
1.25	1.50	50:50	10.00	308	3.46
1.25	1.50	60:40	10.00	308	2.75
1.25	1.50	70:30	10.00	308	2.28
1.25	1.50	50:50	10.00	298	0.93
1.25	1.50	50:50	10.00	303	1.98
1.25	1.50	50:50	10.00	308	3.46
1.25	1.50	50:50	10.00	313	4.43
1.25	1.50	50:50	10.00	318	6.65

Table 2 – Effect of variation of [MnSO<sub>4</sub>], [NaClO<sub>4</sub>], [Acrylonitrile] on the reaction rates

[MnSO <sub>4</sub> ] $\times 10^{-3}$ (mol dm <sup>-3</sup> )	[NaClO <sub>4</sub> ] $\times 10^{-4}$ (mol dm <sup>-3</sup> )	[Acrylonitrile] $\times 10^{-4}$ (mol dm <sup>-3</sup> )	$k_{obs} \times 10^{-4}$ (s <sup>-1</sup> )
0.00	–	–	3.46
5.00	–	–	3.47
10.00	–	–	3.51
15.00	–	–	3.68
20.00	–	–	3.70
–	5.00	–	3.11
–	10.00	–	2.32
–	15.00	–	1.64
–	20.00	–	1.06
–	–	5.00	3.42
–	–	10.00	3.47
–	–	15.00	3.51
–	–	20.00	3.68

[TriMAFC] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [NMPO] =  $1.50 \times 10^{-2}$  mol dm<sup>-3</sup>, 50-50 (% v/v) AcOH-H<sub>2</sub>O, temperature = 308 K.

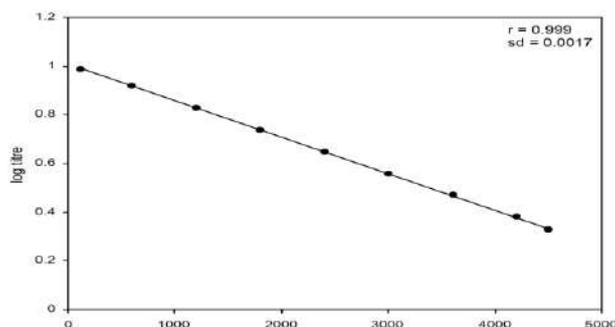


Fig. 1 – Plot of log titre versus time (s)

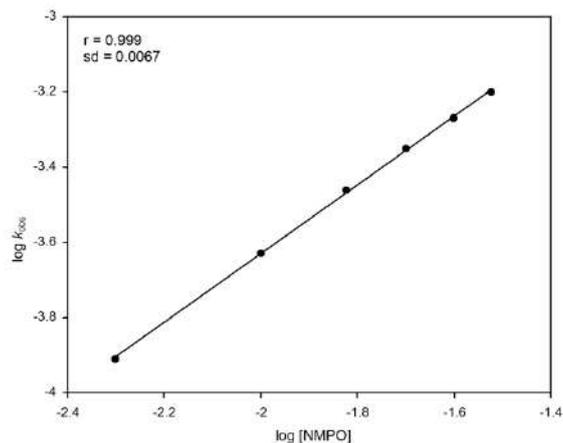


Fig. 2 – Plot of  $\log k_{obs}$  versus  $\log [NMPO]$

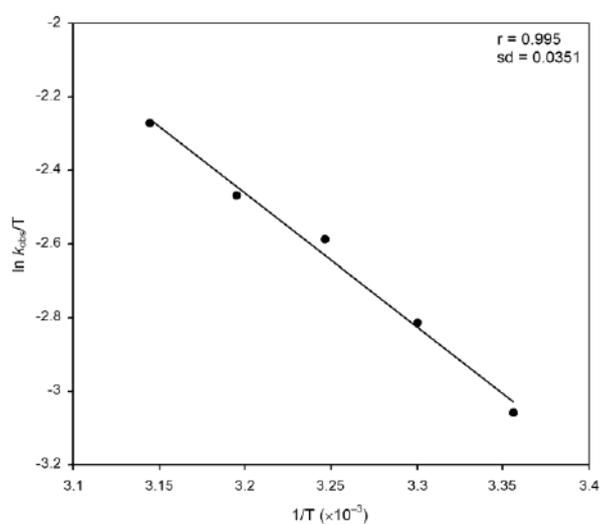


Fig. 3 – Plot of  $\ln k_{obs}/T$  versus  $1/T$

## 2-(Pyridin-2-yl) Pyridine Catalyzed Oxidative Conversion of Copper Supported N-Methyl-2,6-Diphenylpiperidin-4-One Oxime by 2,6 – Dicarboxypyridinium Fluoro Chromate-A Kinetic and Mechanistic Study

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### ABSTRACT

2-(Pyridin-2-yl)pyridine (bipy) catalyzed oxidative conversion of N-methyl-2,6-diphenylpiperidin-4-one oxime (NMPO) by 2,6-Dicarboxypyridinium Fluoro Chromate (DCPFC) has been investigated in aqueous methane carboxylic acid medium at 308 K. As-performed oxidation results in the generation of equivalent ketones. This catalysed reaction exhibits a first order oxidant [DCPFC] dependency and fractional order dependency with substrate [NMPO], catalyst 2-(Pyridin-2-yl) pyridine, and [H<sup>+</sup>]. The inclusion of acrylonitrile did not initiate the polymerization process, confirming that a free radical pathway was not accessible. The reaction rate rises as the concentration of catalyst increased and also rate influenced by changing the percentage of methane carboxylic acid medium. The reaction described above was conducted at four different experimental temperatures. Thermodynamic parameters such as activation enthalpy and entropy were determined. The appropriate mechanism has been suggested based on the observed data.

**Keywords:** Oxidation, Catalyst, Kinetic studies, Mechanism, DCPFC, NMPO, 2-(Pyridin-2-yl) pyridine

### 1. INTRODUCTION

Many oxidation reactions are accompanied by release of energy which forms the source of work in biological systems including the human system and also in manmade machines. Hence, the knowledge of oxidation pathway may be very useful in understanding the phenomena in nature and synthetic situations.

Oxidation of organic compound is immense importance both synthetic and mechanistic point of view [1–3]. It is very useful in the pharmaceutical industry for the manufacture of a variety of commercial materials.

In recent years, there has been a growing interest pertaining to the synthesis of bioactive compounds in the field of organic chemistry. Nitrogen containing heterocyclic compounds, specially piperidin-4-one presumably gaining considerable importance owing to their varied biological properties such as antiviral, antifungal, anti tumour, analgesic activities [4,5].

Many industrially essential organic compounds, such as ketones, aldehydes, and carboxylic acids, can be generated by oxidising similar substrates with different oxidising agents. [6, 7].

Currently, oxidation process have fascinated a lot of researchers, especially in the search for mild and selective oxidizing agents, catalysts for the oxidation reactions [8].

#### 1.1. Oxidation Of Organic Substrates by Chromium (VI) Oxidizing Agents

Chromium (VI) based reagents have been extensively used as oxidizing agents [9–17] in synthetic organic chemistry. Because of its high reactivity it has more advantages in various research field.

Chromium (VI) is utilized for the oxidative conversion of organic compounds, during oxidation it gets reduced to lower oxidation state. Enormous research attention has been focus on the chemistry of Cr (V) and Cr (IV) intermediate species which are produced during the reduction reaction of Cr (VI), because they play a significant role in the oxidative mechanism. In this line, many researchers continuously emphasis on developing a variety of new Cr (VI) reagents and reaction conditions have been established.

#### 1.2. 2,6 – Dicarboxypyridinium Fluoro Chromate (Dcpfc)

A variety of oxidants have been designed to enhance the selectivity of organic chemical oxidation. Of late, we have perceived that 2, 6-Dicarboxypyridinium moiety in chromium (VI) reagent is central in the oxidation of organic substrates [18]. 2, 6 – Dicarboxypyridinium Fluoro Chromate (DCPFC) is another such gentle and specific oxidising agent used for the oxidative transformation of oximes in to equivalent carbonyl compounds [19].

Besides, numerous oxidative deoxygenation methods have been developed by using Cr (VI) species [20–25].

### 1.3. N-Methyl-2, 6-Diphenylpiperidin-4-One Oxime (NMPO)

Oximes are significant in many domains, including crystal engineering, pharmaceuticals, polymer sciences, and so on. Oximes have been used to preserve and purify carbonyl molecules in organic synthesis. Also, these compounds have antimicrobial, antioxidant, antitumor, anti-depressive and antiviral properties

N-methyl-2, 6-diphenylpiperidin-4-one oxime and related metal complexes have a wide range of uses in a research fields. By displaying a diverse spectrum of pharmacological actions [26–32].

### 1.4. 2-(Pyridin-2-Yl) Pyridine

The preparation of novel series of pyridine derivatives maintains to stimulate the attention of researchers in the biological sector, supramolecular chemistry, simulated photosynthesis systems, and other fields [33–40].

2-(Pyridin-2-yl) pyridine (bipy) is a chelating bidentate ligand forming complexes with many transition metals that are of broad academic interest [41, 42].

In our present investigation, we are using DCPFC is an oxidizing agent, NMPO is a substrate and bipy is a catalyst for oxidation reaction [43] substantially very less number of kinetic work has been done so far. An aforementioned facts provoked us to pursue the current investigation.

## 2. EXPERIMENTAL

### 2.1. MATERIALS AND METHODS

NMPO was synthesized and described by Krishnasamy and Kalpana Devi [44]. DCPFC was synthesized by reported methods [45] and synthetic methods of 2-(pyridin-2-yl) pyridine was reported by described methods [46, 47]. All chemicals used were Analar grade.

### 2.2. Deionisation of Water

Water was purified by using corning vessel. Potassium permanganate was used for the second distillation. This water is used for the preparation of DCPFC, NaClO<sub>4</sub>, perchloric acid and MnSO<sub>4</sub> solutions. NMPO solution was prepared by methane carboxylic acid medium.

### 2.3. Kinetic Measurements

All kinetic runs were done in aqueous methane carboxylic acid-H<sub>2</sub>O medium 50% (v/v). By keeping a significant excess of NMPO over DCPFC, we were able to achieve pseudo-first order conditions. The least square method yields rate constants from a linear plot of log k<sub>obs</sub> against time.

### 2.4. Product Analysis and Stoichiometric Catalyzed Oxidation of NMPO By DCPFC

In 50 percent (v/v) aqueous methane carboxylic acid, an equimolar (0.01 mol) combination of NMPO and DCPFC was combined with perchloric acid. The above oxidation is catalyzed by 2-(pyridin-2-yl) pyridine. In order to confirm the completion of the reaction, the reaction mixture was kept apart for about 24 hours. The resulting material was chloroform extracted and rinsed with water. It was evaporated in order to be extracted further. The recovered residue was verified to be the matching ketone (m.p. 198 C) and passed the 2, 4-dinitrophenylhydrazine derivative test.

## 3. RESULTS AND DISCUSSION

### 3.1. Influence Of Difference of [DCPFC] Upon Reaction Rate

DCPFC concentration was ranged from 0.50 to 2.25x10<sup>-3</sup> mol dm<sup>-3</sup>, although all other reactant concentrations remained stable. The rate was calculated (Table 1). log titre versus time plot is linear (r = 0.999). It shows that the order is unity with respect to [DCPFC].

### 3.2. Influence Of Difference of [NMPO] Upon Reaction Rate

The effect of NMPO on the rate of oxidation was studied using varied beginning NMPO concentrations, and the measured rate constant raised dramatically as the NMPO concentration increased (Table 1). A graph of log k<sub>obs</sub> vs log [NMPO] (Fig. 1) shows a linear slope of 0.43, suggesting fractional order with regard to [NMPO].

### 3.3. Influence Of Difference of [H<sup>+</sup>] Upon Reaction Rate

The rate constant values for this oxidation reaction were determined by varying the [H<sup>+</sup>] concentration from 5.00 to 15.00x10<sup>-3</sup> mol dm<sup>-3</sup> while keeping all other reactant concentrations unchanged. If the concentration of [H<sup>+</sup>] increases, so does the rate constant value (Table 1). This shows that added H<sup>+</sup> ion had very significant effect on the protonation of oxidant. The graph of log k<sub>obs</sub> vs log [H<sup>+</sup>] provides a straight line with a slope of B = 0.46 (r = 0.999), indicating that the order of the reaction is fractional proportionate with regard to [H<sup>+</sup>].

### 3.4. Influence Of Difference of [NaClO<sub>4</sub>], [Acrylonitrile] And [Mnso<sub>4</sub>]

The reactions were carried out with the concentration of NaClO<sub>4</sub> varying while the concentrations of the other chemical components remained fixed to assess the effect of ionic strength on reaction speed. The rate constant values decrease as [NaClO<sub>4</sub>] increases, demonstrating that the reaction may be between an ion and a neutral molecule.

The addition of Acrylonitrile to the reaction mixture removed the risk of radical formation and its presence, even if the concentrations of Acrylonitrile varied from 5 to 20 x10<sup>-3</sup> mol dm<sup>-3</sup>. The addition of Mn<sup>2+</sup> has little effect on the reaction rate (Table 2).

### 3.5. Influence of Catalyst 2-(Pyridin-2-Yl) Pyridine Upon Reaction Rate

By altering the concentration of a catalyst 2-(pyridin-2-yl) pyridine from 0.50 to 1.75x10<sup>-3</sup> mol dm<sup>-3</sup>, the rate constant values is determined. If the concentration of the catalyst rises, so does the rate constant value (Table 3)

A perfect line with a gradient of 0.4144 and r = 0.996 is generated when log k<sub>obs</sub> is plotted against log 2-(pyridin-2-yl) pyridine. These results suggest that the fractional order reliance of 2-(pyridin-2-yl) pyridine concentration upon oxidative conversion.

### 3.6. Influence of Solvent Upon Rate of Reaction

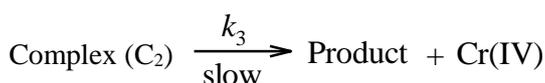
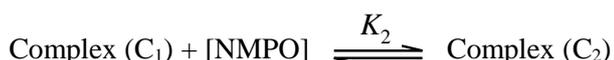
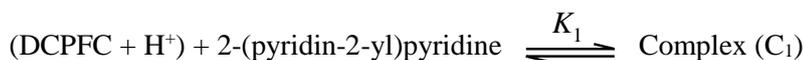
The role of medium polarity was determined by varying the amount of AcOH-H<sub>2</sub>O ratio in the reaction medium. It has been observed that the reaction rate is also influenced by the percentage of methane carboxylic acid (Table 4). The plot of log k<sub>obs</sub> versus 1/D gives a linear slope (r = 0.999). This illustrates the presence of an association between a positive ion and a dipole (ion-dipole), suggesting the presence of anionic Cr (VI) species in the reaction.

### 3.7. Influence of Experimental Temperature Upon Rate of Reaction

Temperatures ranging from 298 K to 313 K were used to study the oxidation process. The adsorption kinetics (Table 5) as well as many thermodynamic parameters were calculated using the ln k<sub>obs</sub>/T vs 1/T plot. (See Fig. 2)

The activation parameters H<sup>#</sup> = 92.39 kJ mol<sup>-1</sup> and S<sup>#</sup> = -120.15 J K<sup>-1</sup> mol<sup>-1</sup> are obtained from the slope and intercept of Eyring's graph.

### 3.8. Mechanism of Reaction and Rate Law



The rate law for the above mechanism for

$$\text{Rate law} = \frac{-d[\text{Cr(VI)}]}{dt} = \frac{K_1 K_2 k_3 [\text{NMPO}][\text{Bipy}][\text{DCPFC}][\text{H}^+]}{\{1 + K_1[\text{H}^+]\} \{1 + K_1[\text{Bipy}]\} \{1 + K_2[\text{NMPO}]\}}$$

## 4. CONCLUSION

In this paper, mechanism of 2-(pyridin-2-yl) pyridine catalyzed oxidation of NMPO by DCPFC was reported and the following conclusion is driven.

- Catalytic 2-(pyridin-2-yl) pyridine oxidation of NMPO by DCPFC at 308 K in aqueous methane carboxylic acid medium gives corresponding ketone.
- The oxidation reaction mentioned here is of first order with respect to [DCPFC].
- Fractional order with respect to [NMPO], [H<sup>+</sup>] and 2-(pyridin-2-yl)pyridine
- The rate constant value increases linearly H<sup>+</sup> concentration, indicating the role of H<sup>+</sup> ion in oxidant protonation.

- The rate of the reaction also influenced with increasing the percentage of methane carboxylic acid suggests that, the mechanistic pathway may be ion-dipole interaction.
- Acrylonitrile participation has negligible influence on the reaction rate, excluding the free radical pathway.
- From the Eyring's diagram, the number of attributes ( $H^\ddagger = 92.39 \text{ kJ mol}^{-1}$  and  $S^\ddagger = -120.15 \text{ J K}^{-1} \text{ mol}^{-1}$ ) were determined. This reaction has quite a low activation enthalpy and a negative activation entropy.
- The resultant pharmaceutically active ketone having wide range of potential applications. It is further used in pharmaceutical research even in the future.

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**Table 1** – Effect of variation of [DCPFC], [NMPO] and [H<sup>+</sup>] on reaction rate

<sup>a</sup> [DCPFC] × 10 <sup>-3</sup> (mol dm <sup>-3</sup> )	<sup>b</sup> [NMPO] × 10 <sup>-2</sup> (mol dm <sup>-3</sup> )	<sup>c</sup> [H <sup>+</sup> ] × 10 <sup>-3</sup> (mol dm <sup>-3</sup> )	k <sub>obs</sub> × 10 <sup>-4</sup> (s <sup>-1</sup> )
0.50	1.50	10.00	10.06
1.00	1.50	10.00	10.09
1.25	1.50	10.00	10.35
1.50	1.50	10.00	10.46

1.75	1.50	10.00	10.52
2.00	1.50	10.00	10.65
1.25	1.50	10.00	10.79
1.25	0.50	10.00	5.81
1.25	1.00	10.00	8.34
1.25	1.50	10.00	10.35
1.25	2.00	10.00	12.50
1.25	2.50	10.00	13.58
1.25	3.00	10.00	15.00
1.25	1.50	5.00	6.91
1.25	1.50	7.50	8.89
1.25	1.50	10.00	10.35
1.25	1.50	12.50	11.74
1.25	1.50	15.00	13.15

<sup>a</sup>[NMPO] =  $1.50 \times 10^{-2}$  mol dm<sup>-3</sup>, [Bipy] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [H<sup>+</sup>] =  $10.0 \times 10^{-3}$  mol dm<sup>-3</sup>, Solvent = 50:50 (% v/v) AcOH-H<sub>2</sub>O, Temperature = 308 K.

<sup>b</sup>[DCPFC] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [Bipy] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [H<sup>+</sup>] =  $10.0 \times 10^{-3}$  mol dm<sup>-3</sup>, Solvent = 50:50 (% v/v) AcOH-H<sub>2</sub>O, Temperature = 308 K.

<sup>c</sup>[NMPO] =  $1.50 \times 10^{-2}$  mol dm<sup>-3</sup>, [Bipy] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [DCPFC] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, Solvent = 50:50 (% v/v) AcOH-H<sub>2</sub>O, Temperature = 308 K.

**Table 2** illustrating the effect of altering [NaClO<sub>4</sub>], [Acrylonitrile], and [MnSO<sub>4</sub>].

[NaClO <sub>4</sub> ] × 10 <sup>-3</sup> (mol dm <sup>-3</sup> )	<i>k</i> <sub>obs</sub> × 10 <sup>-4</sup> (s <sup>-1</sup> )
0.00	10.35
5.00	9.25
10.00	8.05
15.00	6.54
20.00	5.35
[Acrylonitrile] × 10 <sup>-3</sup> (mol dm <sup>-3</sup> )	<i>k</i> <sub>obs</sub> × 10 <sup>-4</sup> (s <sup>-1</sup> )
0.00	10.35
5.00	10.58
10.00	10.58
15.00	10.59
20.00	10.70
[MnSO <sub>4</sub> ] × 10 <sup>-3</sup> (mol dm <sup>-3</sup> )	<i>k</i> <sub>obs</sub> × 10 <sup>-4</sup> (s <sup>-1</sup> )
0.00	10.35
5.00	10.55
10.00	10.57
15.00	10.64
20.00	10.89

[NMPO] =  $1.50 \times 10^{-2}$  mol dm<sup>-3</sup>, [Bipy] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [DCPFC] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [H<sup>+</sup>] =  $10.0 \times 10^{-3}$  mol dm<sup>-3</sup>, Solvent = 50:50 (% v/v) AcOH-H<sub>2</sub>O, Temperature = 308 K.

**Table 3** – Influence of variation of [2-(pyridin-2-yl)pyridine]

[Bipy] × 10 <sup>-3</sup> (mol dm <sup>-3</sup> )	<i>k</i> <sub>obs</sub> × 10 <sup>-4</sup> (s <sup>-1</sup> )
0.50	7.15
1.00	9.20
1.25	10.35
1.50	11.05
1.75	12.10

[NMPO] =  $1.50 \times 10^{-2}$  mol dm<sup>-3</sup>, [DCPFC] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [H<sup>+</sup>] =  $10.0 \times 10^{-3}$  mol dm<sup>-3</sup>, Solvent = 50:50 (% v/v) AcOH-H<sub>2</sub>O, Temperature = 308 K.

**Table 4** – The influence of variation of solvent composition

AcOH-H <sub>2</sub> O (% v/v)	30:70	40:60	50:50	60:40	70:30
$k_{\text{obs}} \times 10^{-4}$ (s <sup>-1</sup> )	38.90	18.18	10.35	7.92	6.30

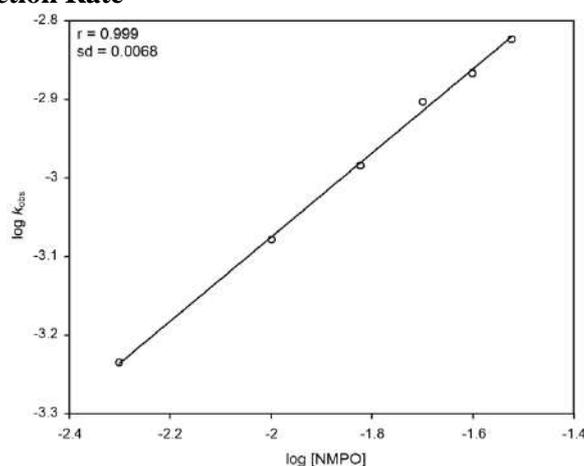
[NMPO] =  $1.50 \times 10^{-2}$  mol dm<sup>-3</sup>, [Bipy] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [DCPFC] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [H<sup>+</sup>] =  $10.0 \times 10^{-3}$  mol dm<sup>-3</sup>, Temperature = 308 K.

**Table 5** – The influence of temperature on reaction rate

Temperature (K)	$k_{\text{obs}} \times 10^{-4}$ (s <sup>-1</sup> )
298	4.93
303	8.24
308	10.35
313	14.42

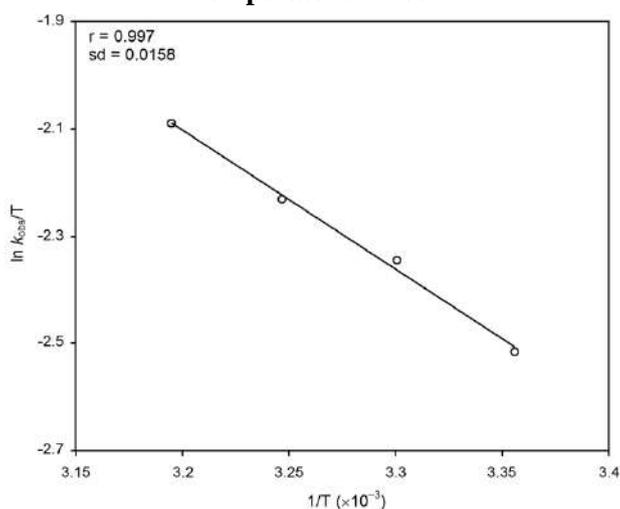
[NMPO] =  $1.50 \times 10^{-2}$  mol dm<sup>-3</sup>, [Bipy] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [DCPFC] =  $1.25 \times 10^{-3}$  mol dm<sup>-3</sup>, [H<sup>+</sup>] =  $10.0 \times 10^{-3}$  mol dm<sup>-3</sup>, Solvent = 50:50 (% v/v) AcOH-H<sub>2</sub>O.

#### Influence of [NMPO] on Reaction Rate



**Figure 1** shows the graphical representation of log  $k_{\text{obs}}$  vs log [NMPO].

#### Temperature Effect



**Fig. 2** – Representative graph of  $\ln k_{\text{obs}}/T$  versus  $1/T$

## Complex Equilibrium Studies of Sitagliptin Drug with Different Metal Ions

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### ABSTRACT

In this paper, the determination of stability constants of Sitagliptin drug with the transition metal ions such as Cu(II) & Ni(II) employing  $P^H$  metric measurement technique in 20%(v/v) water-ethanol mixture at various temperature conditions and specific ionic strength of 0.1M Sodium perchlorate have been carried out. The  $P^H$  metry is a useful and successful system utilized for metal complex estimations. The Calvin and Bjerrum method, which Irving and Rossotti further modified, was used to determine the metal-ligand stability constant values (logK). It was practical to find that a transition metal ion forms 1:1 and 1:2 complexes. The thermodynamical parameters Free energy (G), Enthalpy (H) and Entropy (S) were calculated from values of stability constant at various temperatures. The synthetic methodology of metal complexes was found to be spontaneous in nature. Sitagliptin is a drug used to cure diabetic patients of type 2 and it belongs to the class of new therapeutic called dipeptidyl peptidase inhibitors.

**Keywords:** Stability Constant,  $P^H$ metry, Sitagliptin Drug, Thermodynamic Parameter, DPP.

### 1. INTRODUCTION

Drugs contain a variety of functional groups that which is having capacity to bind with metal ions which are already in the human body <sup>1</sup>. Metal-drug interactions result in complexes that are more powerful than the parent medicines <sup>2</sup>. Many academics are interested in drug chemistry because of its wide range of applications in medical research. The biochemical function in the body is influenced by the persistence of metal complexes with medical medications. Metal complexes are widely employed in a variety of applications, including biological processes, medicines, separation techniques, and analytical processes, among others <sup>3,4</sup>. Most d-block elements forms metal complexes with important drugs that have various active binding sites for proper complex formation<sup>5</sup>. For the complexation analysis, various types of ligands are used. Because of this, we have chosen Sitagliptin<sup>6</sup>, which is the oral antihyperglycemic means antidiabetic drug belonging to dipeptidyl peptidase - 4 (DPP-4) inhibitor class with the chemical formula  $C_{16}H_{15}F_6N_5O$  and it is shown in following figure number 1. The physical properties of medicinal drug Sitagliptin is as below. Molecular weight = 407.314g/mol, Phase = solid (at STP), White to off-powder, M.P. 217-215°C, Refractivity = 87.49, Polarizability = 33.768, Solubility = freely soluble in water, solubility = 3.40-02gm/lit

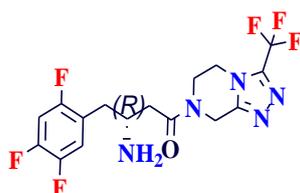


Fig 1: Sitagliptin ( $C_{16}H_{15}F_6N_5O$ )

As mentioned above this sitagliptin drug belonging to the class of antidiabetic <sup>7,8</sup> medicines and is an excellent hypoglycemic anti-diabetic medicine. This drug molecules is having very good tendency to inhibits dipeptidyl peptidase 4, a protein/enzyme which is responsible for an increase in active incretins, which reduces glucagon release while increasing insulin release. The advantage of this treatment is that it has fewer hypoglycemic adverse effects when it comes to blood glucose regulation. The working of this drug by inhibiting an enzyme which is present in the pancreas. As the enzyme inhibitor becomes less efficient, the amount of insulin released decreases, lowering the risk of hypoglycemia overshoot. The function of endogenous glucoregulatory peptides known as incretins is enhanced by this type of drug, which suppresses dipeptidyl peptidase-4's proteolytic activity. It helps to control glycemic index by lowering glucose in the liver for synthesis, lowering glucose and enhancing glucose absorption by insulin simultaneously <sup>9-11</sup>. Sitagliptin is the only oral appetite suppressant that does not cause weight gain. Many researchers have reported the use of medical drugs/Schiff bases as ligands in the literature, but very few have reported various thermodynamic characteristics<sup>12-15</sup> such as Free Entropy (S), Enthalpy (H) and Energy (G) of diverse complexes at various temperature ranges. The complex has yet to be thoroughly studied under a common set of experimental circumstances. As a result, we've decided

to investigate how temperature affects thermodynamical parameters of complexes of sitagliptin drug with transition metal ions Cu (II) & Ni (II) by using P<sup>H</sup> metrical method of analysis in water-ethanol mixture at constant ionic strength of 0.1 Molar Sodium perchlorate<sup>16</sup>.

## 2. MATERIALS AND METHODS

The Sitagliptin drug, which is being used as the ligand, which is soluble in distilled water<sup>17,18</sup>. All reagents used were AR grade metal salts and NaOH, NaClO<sub>4</sub>, HClO<sub>4</sub>. In distilled water all the solutions prepared which are used in the potentiometric titration. The solution of sodium hydroxide was standardized versus a 0.1M oxalic acid solution and the standard alkali solution, which was employed to standard the HClO<sub>4</sub> solution, as well as metal salt solutions using EDTA titration<sup>19,20</sup>. The measurements in this experiment were conducted with a water-ethanol mixture at a constant ionic strength of 0.1 M NaClO<sub>4</sub> under various temperature conditions for all set of experiments. To keep the temperature steady, a high-quality thermostat was employed during this study. Elico a digital pH meter type was used to measure the pH<sup>21-24</sup>. At the pH 3.00, 7.00 and 9.00 using standard buffer solutions an instrument was calibrated in combination with a glass and reference calomel electrode<sup>25,26</sup>.

### 2.1. Potentiometric procedure

We have prepared the following solutions to calculate the formation constants of the complexes and the protonation constants of the ligand in a 20 percent (v/v) water-ethanol mixture with various Cu (II) and Ni (II) metal ions.

A.	Free Sodium Perchlorate (A)
B.	Sodium Perchlorate + Sitagliptin (A+ L)
C.	Sodium Perchlorate + Sitagliptin + Metal (A+ L+ M)

The above-mentioned sets were made by keeping the Metal: Ligand (M:L) ratio, the concentration of perchloric acid, and sodium perchlorate (0.1M) constant throughout the experiment. The reaction solution was potentiometrically titrated against the standard base at different temperatures, and the volume of each mixture was brought up to 50 ml with distilled water.

### 2.2. Determination of the thermodynamic parameters

The thermodynamic parameters such as enthalpy (H), Gibb's free energy (G) and entropy (S) change for the formation of complexes were calculated. The change in free energy ( $\Delta G$ ) of the ligands was calculated by using the following given equation<sup>27</sup>.

$$\Delta G = -2.303 RT \log K \quad (1)$$

The enthalpy ( $\Delta H$ ) change is calculated by plotting  $1/T$  Vs  $\log K$ . This equation is also used for the calculation of changes in enthalpy ( $\Delta H$ ) is as follows<sup>[18]</sup>

$$\text{Slope} = -\Delta H / 2.303 R \quad (2)$$

$$\Delta S = (\Delta H - \Delta G) / T \quad (3)$$

### 2.3 Table 1

At 0.1 Molar ionic strength P-L & M-L stability constant of Sitagliptin drug

Temperature	logK	Ni(II)	Cu(II)	pK
303.15 K	logK <sub>1</sub>	5.211	8.500	pK <sub>1</sub> =5.75887
	logK <sub>2</sub>	4.700	6.000	pK <sub>2</sub> =11.01546
308.15 K	logK <sub>1</sub>	5.400	8.521	pK <sub>1</sub> =5.21641
	logK <sub>2</sub>	4.414	6.785	pK <sub>2</sub> =10.88144
318.15 K	logK <sub>1</sub>	5.432	8.565	pK <sub>1</sub> =5.10571
	logK <sub>2</sub>	4.311	5.900	pK <sub>2</sub> =10.05579

### 2.4 Table 2

At 0.1 molar ionic strength, thermodynamic characteristics of Sitagliptin complex formation with transition metal ions.

Metal Ions	$\Delta G$ (KJ/mol)			$\Delta H$ (KJ/mol)	$\Delta S$ (J/mol)					
	Temp	303.15 K	308.15 K		318.15 K	303.15 K	308.15 K	318.15 K		
Ni <sup>+2</sup>	G <sub>1</sub>	=31.00	31.70	31.77	-H <sub>1</sub>	= 28.540	S <sub>1</sub>	= 10.12	10.50	10.13
	G <sub>2</sub>	=26.30	26.35	26.42	-H <sub>2</sub>	= 24.525	S <sub>2</sub>	= 6.452	6.322	6.450

Cu <sup>2+</sup>	G <sub>1</sub> = 49.44	49.85	50.55	-H <sub>1</sub> = 24.855	S <sub>1</sub> = 81.44	81.37	81.44
	G <sub>2</sub> = 36.26	36.55	36.55	-H <sub>2</sub> = 34.555	S <sub>2</sub> = 5.555	4.520	5.420

### 3. RESULT AND DISCUSSIONS

By using the method of Irving & Rossotti the proton ligand stability constants (pK) of Sitagliptin drug were calculated with help of pointwise calculation<sup>24,28-30</sup>. The pointwise and half-integral approach of Calvin and Bjerrum, as improved by Irving and Rossotti<sup>31-33</sup>, was used to compute the metal ligand stability constant which is nothing but logK value of transition metal ions with Sitagliptin drug (ligand). Except for Iron metal ion, which is in the trivalent state, we explored the stability constants of bivalent transition metal ions in this study. We n-A had values ranging from 0.3 to 0.9 and 1.3 to 1.9 this both which indicates that the 1:1 and 1:2 complex formation respectively. In all systems, the values of the proton-ligand stability constants decrease as the temperature rises. This demonstrates that at higher temperatures, protons are more easily freed. As the temperature rises, the values of the metal-ligand stability constants drop. This suggests that complex formation is a heat-evolving (exothermic) process. The negative values of enthalpy change ( $\Delta H$ ) and free energy change ( $\Delta G$ ) of complex formation indicate the complex formation process is spontaneous process. Negative enthalpy change ( $\Delta H$ ) accompanied by the formation of metal complexes, indicating that the metal-ligand interactions are strong.

### 4. CONCLUSION

From the above studies it has been observed that the positive entropy changes were relate with the liberation of bound water molecules from metal chelates. During the formation of metal chelates, water molecules from the metal ion's primary hydration sphere are displaced by the chelating ligand. As a result, as the number of particles in the system increases, the system's randomness increases. The order of stability constants of various metal complexes weakens.

### 5. ACKNOWLEDGEMENT

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## Mixed Ligand Complex Formation of Copper (II) with Some Amino Acids and Metoprolol

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### ABSTRACT

The pH metric stability constant of ternary metal complexes of Cu (II) ion has been determined in an 80% (V/V) ethanol water medium at 27 °C with medicinal drug Metoprolol as primary ligand and various biologically relevant ligands such as amino acids. The distributions of concentrations of different species produced in solution were investigated. The stability of ternary complexes follows the Irving–William’s order of metal ions, which was quantitatively (log K, log X, and % RS) contrasted to their binary complexes. The stability of the complexes and electronic spectra at various pH intervals were used to determine the molecular geometry of the complexes produced in solution between the ligands and Cu (II). Cyclic voltammetry was used to examine the production of complexes as well as their electrochemical characteristics. The ternary complexes' biological activity was examined in vitro against bacteria, fungus, and yeast.

**Keywords :** Stability constant,  $\Delta \log K$ ,  $\log K$ , Mixed ligand complex.

### 1. INTRODUCTION

Metoprolol is effective, it takes actions by preserving certain natural chemicals such as epinephrine from acting on the heart and blood vessels. It is an antimicrobial and antifungal agent which is most important preservative agent belongs to a category of drugs recognized as beta blockers.<sup>1</sup> Metoprolol commonly used in, sold under the brand name Lopressor, among others, is a selective  $\beta$ -1 receptor blocker medication. This drug is used to cure high blood pressure (hypertension), angina (heart-related chest pain), irregular heart rhythms (arrhythmia). It also helps to prevent future heart attacks and stroke and to prevent migraine.<sup>2</sup> From the literature survey it can be say that no work has been reported and found anywhere till date on complex formation tendency of transition metal ion Cu (II) and Metoprolol drug with in ethanol water solution. So therefore, it is very important to understand that the complex formation tendencies of copper (II) in the presence of amino acids in 80 % ethanol - water mixture with metoprolol.

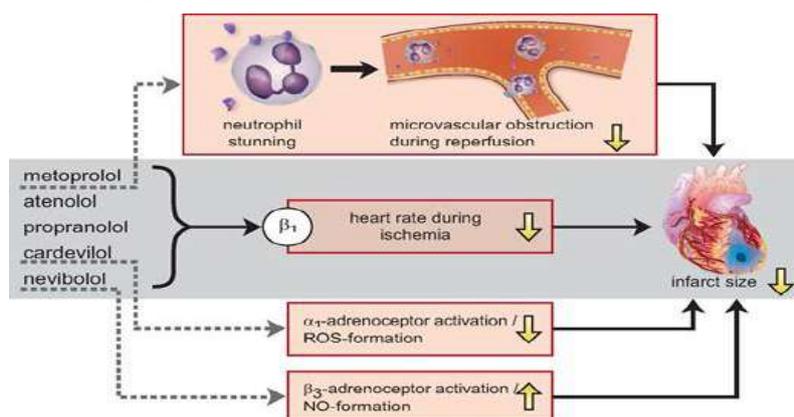
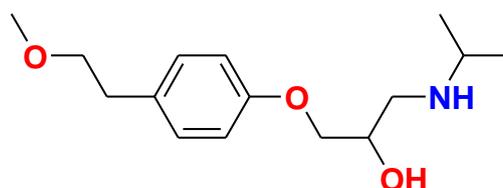


Figure (1) - Mechanism of Action of drug



Metoprolol

Figure (2) - Structure of Metoprolol drug Molecule

## 2. MATERIALS AND METHODS

All the solutions were prepared in 80 % (v/v) ethanol - water mixture solution and the reagents used were of A.R. grade and standardized has been done by known existing procedures.<sup>3</sup> By using a digital pH meter (Elico LI-127 Model) in combination with combined electrode all titrations were carried out. These all titrations were carried out at condition of  $27^{\circ}\text{C} \pm 0.1^{\circ}\text{C}$  temperature. Against 0.2 N sodium hydroxide solutions all sets of solutions were titrated. By using the experimental data all the titration curves were plotted. Proton ligand and metal ligand formation constants were evaluated based on these plots. By using SCOGS computer program concentrations of total metal, total ligands, free metal, free ligands and various possible species that are formed in the course of complexation process are determined.<sup>4,5</sup>

## 3. PROCEDURE OF TITRATION

The Calvin Bjerrum pH metric titration techniques which was modified by Irving Rossotti were applied for the determination of the equilibrium constants of 1:1:1 ternary complexes<sup>6,7</sup>. Titration procedure involves following steps:

I	Free $\text{HClO}_4$ (A)
II	Free $\text{HClO}_4$ (A) + Metoprolol (D)
III	Free $\text{HClO}_4$ (A) + Metoprolol (D) + Copper ion (M)
IV	Free $\text{HClO}_4$ (A) + Amino acids (R)
V	Free $\text{HClO}_4$ (A) + Amino acids (R) + Copper ion (M)
VI	Free $\text{HClO}_4$ + Metoprolol (D) + Amino acids (R) + Copper ion (M)

## 4. RESULT AND DISCUSSION

There are numerous parameters must be considered while determining formation constants or stability constants in solution for various types of chelating agents. Refractive index, conductance, temperature, distribution coefficients, refractive index, nuclear magnetic resonance volume changes, and optical activity are among the several characteristics or approaches. With the copper (II) 80 % (v/v) ethanol - water mixture at  $27^{\circ}\text{C}$  and ionic strength  $\mu = 0.1$  M proton ligand constant and metal ligand stability constant of Metoprolol and amino acids proton ligand constant and metal ligand stability constant of Metoprolol and amino acids are given in following table number (1). Medium = 80 % (v/v) Ethanol – Water Mixture and Temp -  $27^{\circ}\text{C}$

Ligand	$\text{pK}_1$	$\text{pK}_2$	$\log K_1$	$\log K_2$
Metoprolol	5.14525	11.01244	10.1413	9.1242
Glycine	2.7985	9.9478	9.7087	8.9914
Leucine	3.8611	10.3578	8.0854	-
Glutamic acid	3.1457	5.8987	10.9978	8.6544
Glutamine	3.0100	9.2910	9.5570	7.9577
Valine	3.2587	9.8125	10.0245	8.4921
Methionine	3.1322	9.6154	9.6514	8.6847
Phenylalanine	3.1458	9.3001	8.9912	7.6851

**Table 1 :  $\text{pK}$  and  $\log K$  values of Cu (II) chelates of various amino acids and Drug Metoprolol**

These Parameters based on some relationship between the formation of ternary complexes of Copper (II) metal ion with Metoprolol in the presence of amino acids (1:1:1) system.

Temp =  $27^{\circ}\text{C}$   $\mu = 0.1$  M  $\text{NaClO}_4$  Medium = 80 % (v/v) Ethanol - Water mixture

AMINO ACIDS	$\beta_{11}$	$\beta_{20}$	$\beta_{02}$	$K_D$	$K_R$	$K_r$	$\Delta \log K$
Glycine	21.324	25.4145	18.6877	8.6875	12.1147	1.005578	-1.0014
Leucine	20.4521	25.4145	18.7421	7.3245	9.78977	0.888587	-3.354413
Glutamine	21.7815	25.4145	17.3011	8.6600	12.3787	1.078454	-0.076801
Valine	21.6457	25.4145	18.4902	8.5200	11.6478	0.992454	-1.50001
Methionine	21.7814	25.4145	18.3102	8.6415	12.1457	1.019877	-1.0021
Phenyl alanine	19.7685	25.4145	16.6100	6.6012	10.7577	0.924577	-2.398771
Glutamic acid	23.6257	25.4145	19.6300	10.4854	12.6457	1.112477	-0.50001

**Table 2 : formation of ternary complexes of Copper (II) metal ion with Metoprolol Drug**

## 5. BINARY METAL COMPLEXES

The basicities measurements of the ligand metoprolol have been recorded in terms of their proton ligand stability constant. For the determination of metal ligand stability constant proton ligand stability constant of the ligand Metoprolol is taken into consideration. Since by using Irving - Rossotti's pH metric titration technique, proton ligand stability constant of the ligand has been determined.<sup>8</sup>

From the metoprolol titration curve, it can be seen that buffer region is in the range of  $\text{pH} < 3$ . The dissociation of proton from protonated  $\text{H}^+$  atom indicates the release of proton from respective molecule. Using Irving Rossotti method of calculation for acid and ligand curve the value of  $nA$  have been analysed.<sup>9</sup> and further determined by using computational programme named as SCOGS.

The  $nA$  values ranged between 0.1 and 1 for Metoprolol indicating liberation of proton. The  $\text{pK}$  value for Metoprolol was determined pH metrically. The  $\text{pK}$  value of Metoprolol is found to be acidic because in Metoprolol -O- group is directly attached to benzene ring and -OH is attached to alkyl group. After donation of  $\text{H}^+$  resonance stabilization taken place. Ester group stabilizes the structure it can be observed in above figure (2).

## 6. MIXED LIGAND COMPLEXES

The most important primary ligand Metoprolol for 1 : 1 and amino acids which are secondary ligands which are in the form 1: 2 complexes with copper. From the above figure it is evident that the percentage of the concentration of species Cu (II) metoprolol amino acids system and the percentage distribution curve of free metal decreases sharply with increasing pH. From this it was observed that involvement of metal ion in the complex formation process. Percentage concentration of free ligand metoprolol and amino acids increases, and this increase may be due to the dissociation of ligand present in the system as a function of pH.

## 7. CONCLUSION

Result of present investigation shows that, the less stable stability constant of ternary complexes which are formed. The negative  $\Delta \log K$  value of this system indicates that the ternary complex are less stable than that of the binary complex system. The complex is not formed it had been confirmed from the negative value of  $\Delta \log K$ . The negative value may be due to the higher stability of its binary complex.

When the titration curve run beneath the Cu (II) - Metoprolol curve then in solution ternary complex forms. Therefore, it is obvious that the entrance of secondary ligand amino acid faces steric hindrance due to larger size of the Cu (II) Metoprolol complex when compared to the aquo ion which tried to restrict the entry of the secondary ligand in the co-ordination sphere of Cu (II) metal ion and thus therefore it reduces the stability of ternary complexes.

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## Occupational Health Hazards Faced by the Workers of Knitting Units

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### ABSTRACT

Occupational health is a very important aspect for any working individual. The main aim of an occupational health service is to keep the workers physically, mentally and psychologically healthy. Workers in the knitting industry face various health risks because of exposure to chemicals and cotton dust throughout the entire process. Knitting workers are exposed to a wide variety of health hazards at work that differ from job to job. These health hazards are classified as physical, biological, chemical, mechanical, ergonomic and psycho-social hazards. As cotton is an important material in knitting cloth, it can lead to several health problems. Exposure to dust produced during yarn preparation is known to cause chronic respiratory ailments in the form of cough, sputum, wheezing, shortness of breath, chronic bronchitis and adversely alter the pulmonary function. Exposure to dust may even cause irritation of the eyes, nose and skin. The prolonged exposure to fiber lint makes the changes in the lung sizes and increased amount of wheezing and cough with sputum. The present study, therefore, is designed with a basic objective to understand various occupational health challenges faced by the worker in knitting units.

**Keywords:** health, knitting, occupational health hazards, workers

### 1. INTRODUCTION

Health has been defined as a state of complete physical, mental and social well being. Health care is the right of every individual and has been recognized in many countries attainment of the highest possible level of health is the important world wide social goal. Health is not only the start point of all welfare but also a significant yardstick to measure the progress of a country. Health at work is a consideration to deal with the health problems related to employment (Babel, et al., 2014).

Occupational health is concerned with the health safety issue of work. The hazards exposure in setting can adversely affect human health. Occupational health and safety (OHS) is a branch of public health aimed at improving workplace health and safety standards. It studies injury and illness trends in the worker population and offers suggestions for mitigating the risks and hazards they encounter on the job. Every occupation has health or safety risks associated with it, and it is every employer's responsibility to ensure that their employees can carry out their work as safely as possible (<https://www.safeopedia.com/definition/439/occupational-health-and-safety-ohs>).

The occupational health and safety conditions of the workers belonging to the knitting industry are getting more critical and complicated. The workers engaged in cotton yarn making for knit manufacturing are exposed to significant amounts of cotton dust. They are also exposed to particles of pesticides and soil. Exposure to cotton dust and other particles leads to respiratory disorders among workers. The symptoms may include tightening of the chest, coughing, wheezing and shortness of breath. Workers typically suffer from various ailments, such as respiratory illnesses, ergonomic issues like back pain, mental health problems. Musculoskeletal problems like back aches, body, hand and leg pain are reported by the majority of workers as a result of repetitive work. Time and pressure play a major role in leading to psychological issues. The working conditions largely affect the health and also the efficiency of the workers. It was reported that industry is labour oriented and due to following reasons like accidents, improper material handling, improper knowledge of the machine due to lack of training, improper mental condition of the workers and unsafe conditions can take place frequently in this industry (Babel, et al., 2014).

Babel, et al., (2014) reported that noise can be a problem in some processes in yarn manufacturing. Noise emission rises non-linearly because of higher rotary and travelling speeds in machine parts. In the long run, exposure to high noise levels has been known to damage the eardrum and cause hearing loss. Other problems like fatigue, absenteeism, annoyance, anxiety, reduction in efficiency, changes in pulse rate and blood pressure as well as sleep disorders have also been noted on account of continuous exposure to noise. Lack of efficient maintenance of machinery is one of the major reasons behind the noise pollution in a majority of the units. Though it causes serious health effects, exposure to noise is often ignored by textile units because its effects are not immediately visible and there is an absence of pain.

A study done on the textile units of the surat between the year 2014 to 2016 showed that about 85 accidents in which about 114 died and about 375 were fatality injured. The major causes of these accidental deaths were the reasons like fall from heights, as physciation, injuries of mechanical nature, injuries caused due to the material handling and inhalations of the fiber or the cotton dust these fatalities are caused due to the ill- management and careless attitude towards the health safety of the workers. There are various units in the textile industries the injuries units in the textile industry the injuries related to the production and ginning units includes the injuries of the eyes, back, fingers, arms, leg and head injuries the yarn manufacture unit includes machineries of very high rotary and travelling speeds they cause noise pollution which results in headache or 'dizziness'. The areas of the industry workplaces should be regularly cleaned in order to get rid of the hazardous chemicals and cotton dust, the system for ventilation should be put on in order to prevent any leakage of gas etc. All the precautionary methods should be taken in order to stop the fatal accident and injury occurrences among the workers (Shukla, et al., 2012).

Therefore, keeping in mind the above scenario, the study was formulated with an objective to identify the nature work processes involved in knitting units and various occupational health hazards faced by the workers of knitting units.

## 2. METHODOLOGY

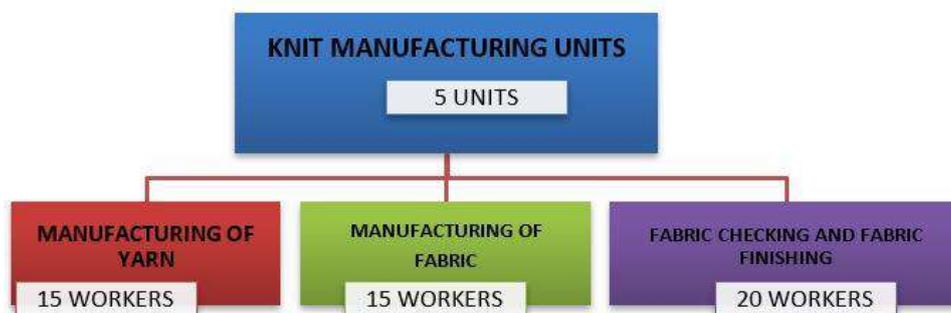
This deals with the methodological steps and procedures followed to carry out the present investigation.

### 2.1 Locale of The Research

The research aims to study occupational health, safety and workers of knitting units in and around Delhi NCR. The observation and interview was conducted in five knitting units. From each unit, 50 workers were interviewed from 3 major departments i.e manufacturing of yarn, manufacturing fabric and fabric checking & finishing.

### 2.2 Sampling Procedure and Data Collection

Sample size 5 knitting units were visited and a total of 250 workers were studied under this study. The departments to be covered under this study are: manufacturing of yarn, manufacturing of fabric, fabric checking and fabric finishing (Fig. 1). In order to obtain the required information from the respondents, an interview schedule was formulated and data was collected. 50 workers from each unit, in total 250 workers were interviewed.



**Figure 1** Departments in knitting unit  
(50 workers from each unit, in total 250 workers)

## 3. Results and Discussion

### 3.1 Personal Profile of the knitting workers

Personal profile of the knitting workers included their age, sex, religion, and educational background. Out of the total sample of 250 knitting unit workers, maximum respondents (83%) were male members and belonged to Hindu community. As far as their educational qualification is concerned, (14.4%) were illiterate, (32.4%) attained primary education, (37.6%) got secondary education, while (15.6%) were educated at the secondary level. The study also revealed that (24%) of workers had been working for the past 10 years in a knitting unit. About (84%) knitting workers were working on daily wages and maximum workers were working in 8 hours shifts.

### 3.2 Occupational Health Hazards Faced by The Workers Of Knitting Units

In the present research, an attempt was made to study the health problems of the workers, working in knitting units and it was studied under following heads:

- Health problems faced by the knitting workers in manufacturing of yarn
- Health problems faced by the knitting workers in manufacturing of fabric
- Health problems faced by the knitting workers in fabric checking and finishing

### 3.3 Health problems faced by the knitting workers in manufacturing of yarn

The workers engaged in the process of yarn making are exposed to significant amounts of cotton dust and fibre lint. An attempt was made to study the health problems (respiratory, skin, eye, ear and other problems) of the workers involved in manufacturing of yarn.

- **Respiratory problems**

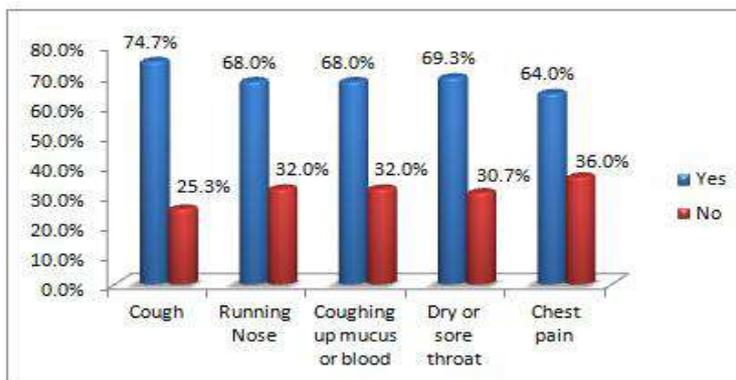


Figure 2 Respiratory problems in yarn manufacturing

The respiratory related problems faced by the knitting unit's workers included cough, dry/sore throat, running nose, chest pain, coughing blood, wheezing, running nose. The analysis indicated in (Fig.2) that chest pain (64%) and cough (74.67%) were found more among knitting workers. Further, about seventy percent of workers were facing problems with dry sore throats. Workers were having health problems like running noses and coughing with blood. It may be due to inhalation of cotton dust and fibre lint during work in knitting units.

A study conducted by researchers regarding textile units in India revealed that pulmonary function in textile workers decreased significantly with exposure to cotton dust over a long period of time. It was reported that textile units in Mumbai, India indicated an 11-33% incidence of chronic bronchitis in textile workers. Further, there was an occurrence due to increase of exposure to cotton dust while yarn manufacturing (<http://www.fibre2fashion.com/industry-article/2554/safety-and-health-issues-in-the-textile-industry?page=1>).

- **SKIN PROBLEMS**

The skin barrier is an important part of the body's immune system and acts as a natural barrier to a wide variety of substances that can cause irritation, allergic reactions and infections. The risk of skin disorders increases when the skin barrier is compromised by injury or disease. Textile workers are at high risk for skin disease due to the nature of their work. The main occupational risk for textile workers is contact dermatitis. (<https://www.dermnetnz.org/topics/skin-problems-among-textile-workers>). It was found in a present study that (21%) knitting workers were having problems of rashes, (8%) itching, infection (28%) and redness in (21%) (Fig. 3).

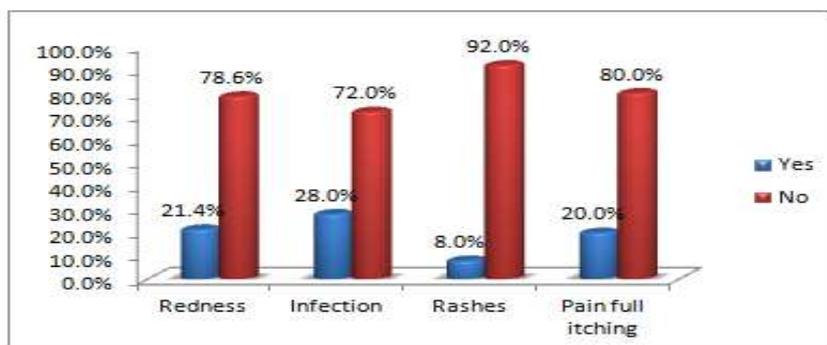


Figure 3 Skin problems in yarn manufacturing

● **EYE PROBLEM**

Knitting dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of cotton dust can cause moderate eye irritation, burning, and blindness. Eye exposure requires immediate first aid and medical attention to prevent significant damage to the eye. 61.33% of workers reported a problem of itching in the eye and 68% mentioned swelling of eyes. Some of them were having problems with redness, watering, pain and change in vision (Fig. 4).

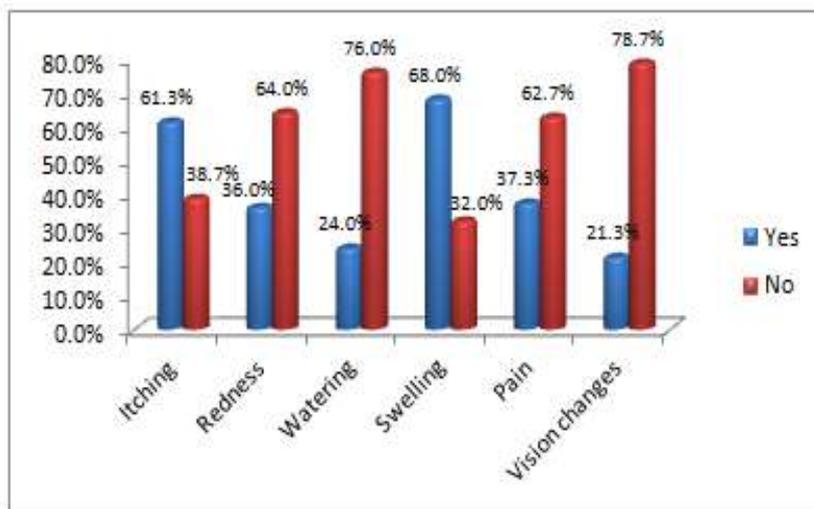


Figure 4 Eye problems in yarn manufacturing

● **EAR PROBLEMS**

In the long run, exposure to high noise levels has been known to damage the eardrum and cause hearing loss. Other problems like fatigue, absenteeism, annoyance, anxiety, reduction in efficiency, changes in pulse rate and blood pressure as well as sleep disorders have also been noted on account of continuous exposure to noise. Lack of efficient maintenance of machinery is one of the major reasons behind the noise pollution in a majority of the units. Though it causes serious health effects, exposure to noise is often ignored by textile units because its effects are not immediately visible and there is an absence of pain. From Fig. 5 it is noticed that workers were having problems, like hearing problems(65.33%), ear infection (30.67%) and ear ringing (24%) <http://www.fibre2fashion.com/industry-article/2554/safety-and-health-issues-in-the-textile-industry?page=2>.

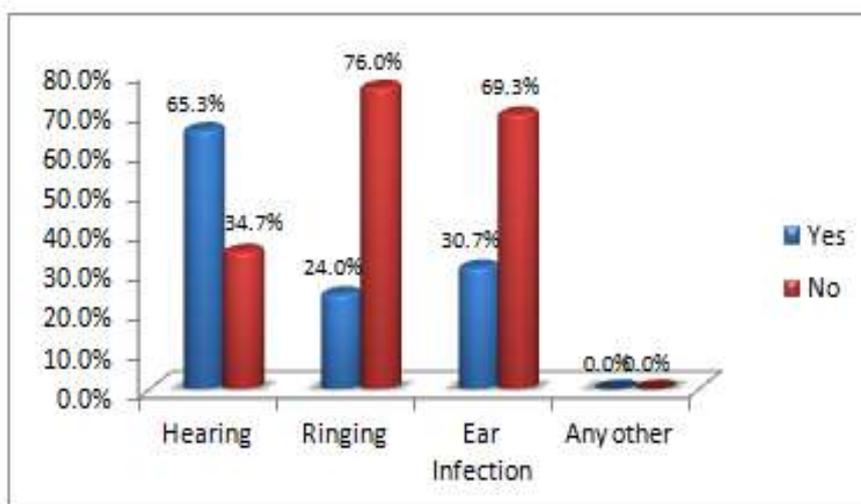


Figure 5 Ear problem in yarn manufacturing

● **OTHER PROBLEMS**

In the present study, workers involved in manufacturing of yarn were having problems like headache (56%), stomach aches (72%), loss of appetite (21.33%), nausea (64%), irritability (24%), backache (57.33%), pain or stiffness in arms, legs and joints (41.33%) , nervousness (72%) and weakness (42.67%). It may be due to long working hours, wrong body posture, heat stress and improper ventilation (Fig. 6).

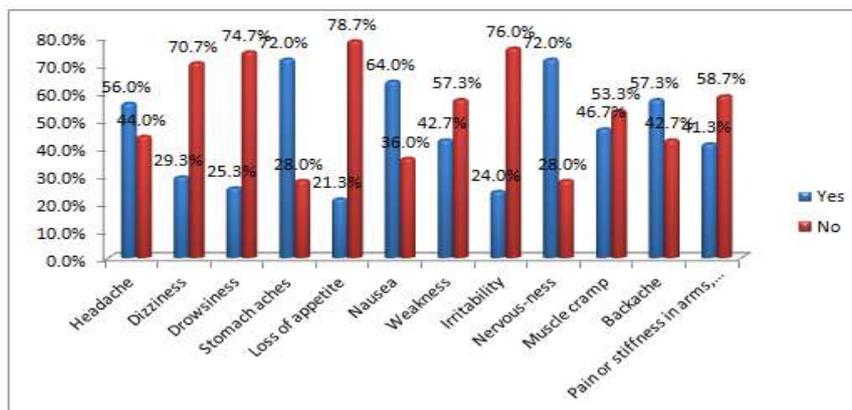


Figure 6 Other problems in manufacturing of yarn

### 3.4 Health problems faced by the knitting workers in manufacturing of fabric

In the present study, an attempt was made to study the health problems of the workers involved in manufacturing of fabric.

#### ● RESPIRATORY PROBLEMS

The manufacture of textiles from raw materials or its blends involves a wide variety of physical and chemical processes, depending on the fibre type and the specifications of the fabric produced for use in clothing, furnishings or for industrial applications. Key processes include the conversion of fibre into yarn by spinning and twisting and the conversion of yarn into fabric by weaving or knitting. The principal raw materials used in textile manufacture are the natural fibres wool, cotton and silk and man-made fibres. During conversion of cotton fibres into fabrics, a significant amount of fibre fly along with cotton dust particles are released into the working atmosphere. However, persons exposed to cotton dust particles during processing of textile fibres may develop a series of acute and chronic symptoms, commonly referred to as Byssinosis. The problem of Byssinosis has plagued cotton textile mills for hundreds of years, and cotton fibre fly and its dust are undoubtedly the most serious problem facing the textile industries today. The problem associated with fibre fly generation along with cotton dust is severe when ring spun cotton yarn is converted into knitted fabric on a high speed knitting machine. The environmental risks associated with the manufacture of cotton knitted fabrics not only create problems of health hazards to the working personnel but also affect the machine performance as well as the quality of the product (Bhowmick, et al., 2008). Analysis of present study indicated (Fig.7) that cough (72%), running nose (65.33%), chest pain (64%) were found more among knitting workers. Workers were also facing health problems of dry sore throats and coughing with blood. It may be due to inhalation of cotton dust and fibre lint while manufacturing fabric.

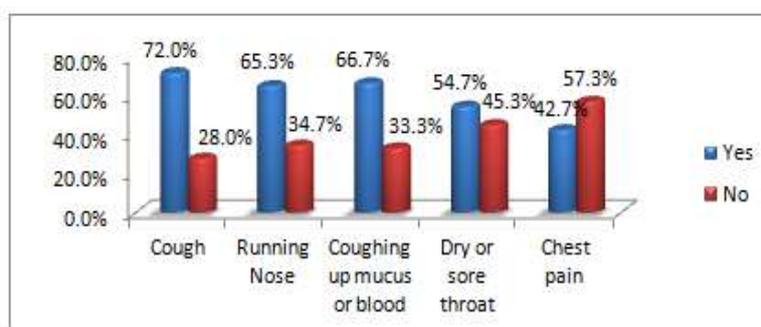


Figure 7 Respiratory problems in fabric manufacturing

#### ● Skin Problems And Eye Problems

It was found in the present research that only 18.6% knit manufacturing workers were having skin redness. About 24% of workers mentioned the problem of skin infection, 26.6% the problem of rashes, and 30.66% about itching (Fig. 8). Further, an attempt was made to collect information about eye problems in knit manufacturing. From Fig. 9 it is noticed that workers have major problems with watering (73.33%) and vision changes (73.33%). Some of them were having problems with redness (43.33%), itching (42.66%) and pain (40%).

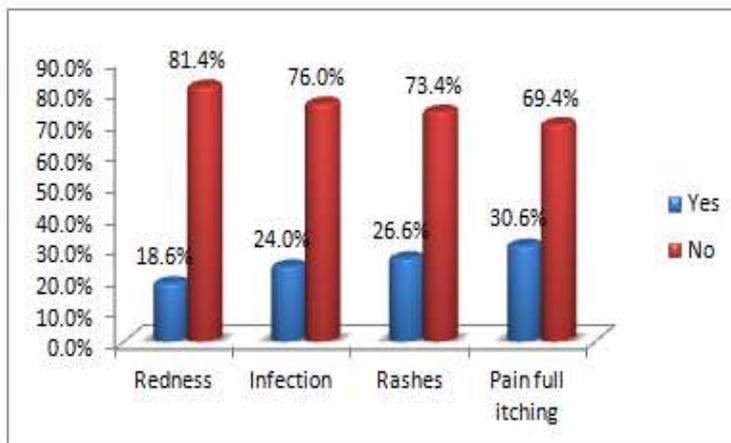


Figure 8 Skin problems in fabric manufacturing

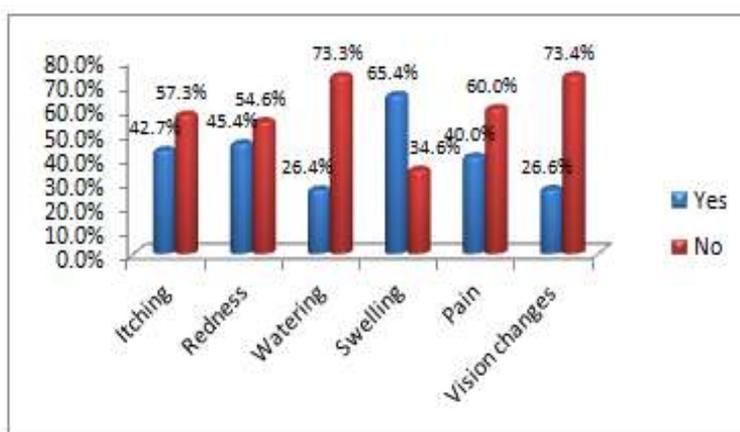


Figure 9 Eye problems in fabric manufacturing

#### • EAR PROBLEMS

Most of the common impacts of noise pollution were headache, heart diseases and hearing problems. In present research, workers were having problems, like hearing problems (68%), ear infection (38.66%) and ear ringing (28%) (Fig. 10). Workers who operate the circular knitting machines and other high noise producing machines can be encouraged to use ear muffs or head phones during working (Islam, 2015).

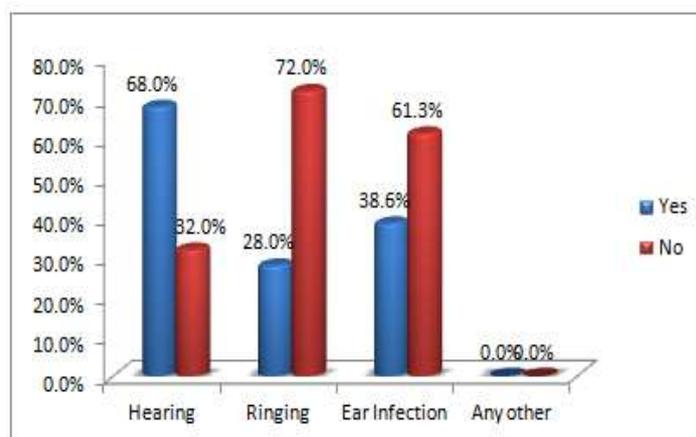


Figure 10 Ear problems in fabric manufacturing

#### • OTHER PROBLEMS

In a recent study, workers involved in manufacturing of fabric were having problems like headache, stomach aches, loss of appetite, nausea, irritability, backache, pain or stiffness in arms, legs and joints, nervousness and weakness. It may be due to long working hours, wrong body posture, heat stress and improper ventilation (Fig.11).

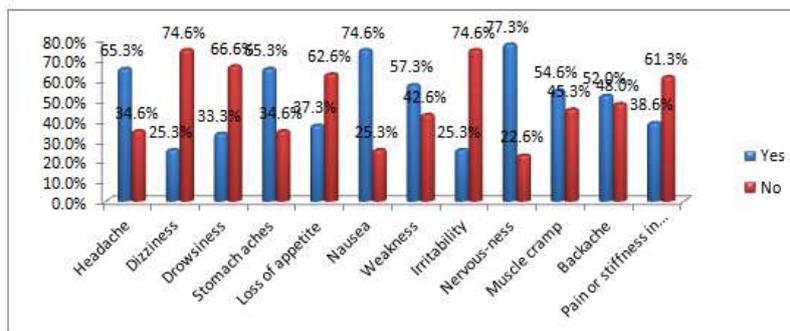


Figure 11 other problems in fabric manufacturing

#### 4.5 Health Problems Faced By The Knitting Workers In Fabric Checking And Finishing

In present study, an attempt was made to study the health problems of the workers involved in fabric checking and finishing. In the present study, the respiratory related problems studied, faced by the workers, involved in fabric inspection and finishing. Problems included cough, dry/sore throat, running nose, chest pain, coughing blood, wheezing, running nose. The analysis indicated in (Fig.12-16) shows that chest pain (65%) and cough (74%) were found more among knitting workers. Further, 69% of workers were facing problems with dry sore throat. Workers were also having health problems like running noses and coughing with blood. It may be due to inhalation of dust and fibre lint during fabric checking. It was found in the present research that skin problems were comparatively less prevalent among workers. 8% of knit finishing workers were having rashes, (15%) itching, infection (16%) and redness in (11%). In present study, 62% workers have reported problems of itching in the eye and swelling of eyes mentioned by 68% respondents. Some of them were having problems with redness, watering, pain and change in vision. Workers involved in finishing fabric were having problems like headache, stomach aches, loss of appetite, nausea, irritability, backache, pain or stiffness in arms, legs and joints, nervousness and weakness. It may be due to long working hours, wrong body posture, heat stress and improper ventilation. .

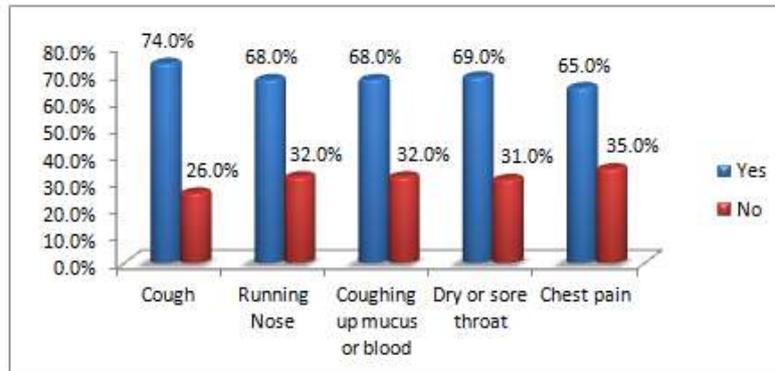


Figure 12 Respiratory problems in fabric checking and fabric finishing

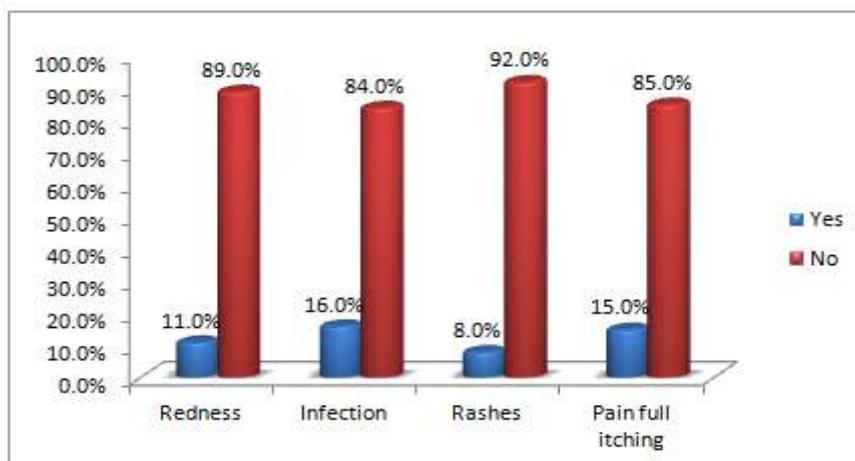


Figure 13 Skin problems in fabric checking and fabric finishing

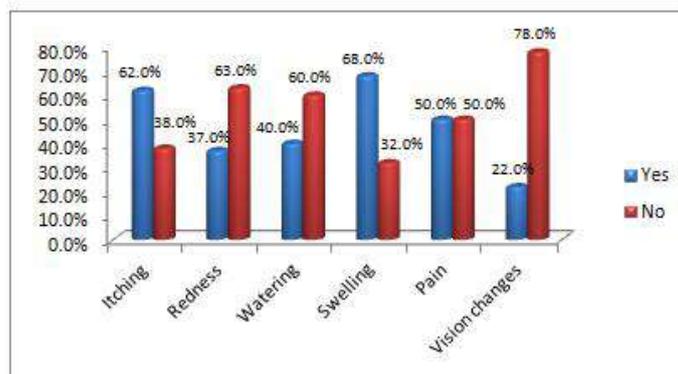


Figure 14 Eye problems in fabric checking and fabric finishing

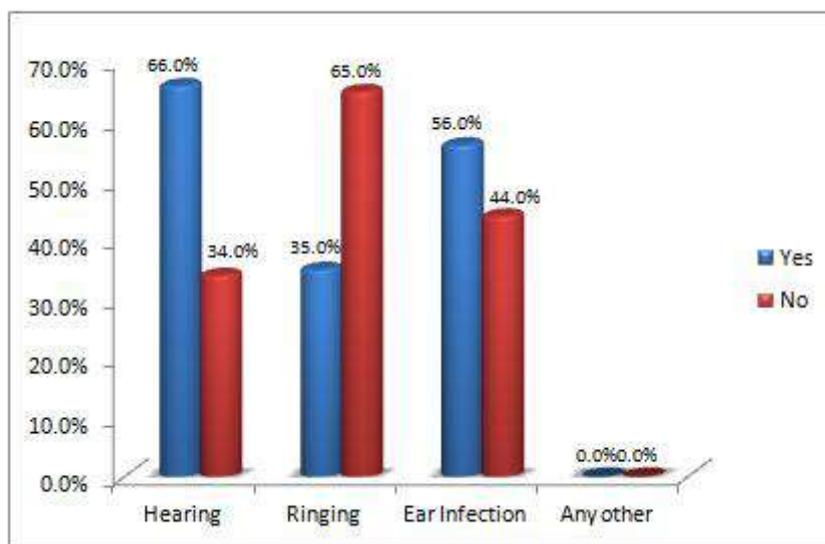


Figure 15 Ear problems in fabric checking and fabric finishing

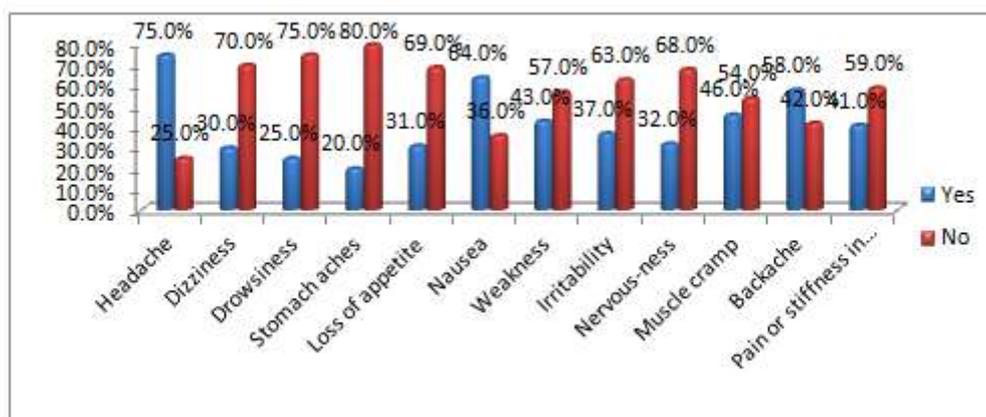


Figure 16 other problems in fabric checking and fabric finishing

#### 4. CONCLUSION

The present study was conducted in knitting units in Delhi & NCR among 250 employees from 3 major departments i.e manufacturing of yarn, manufacturing fabric and fabric checking & finishing.

It was found that respiratory problems faced by the knitting unit's workers included cough, dry/sore throat, running nose, chest pain, coughing blood, wheezing, and running nose. The analysis indicated that chest pain and cough were more among knitting workers. Most workers were facing problems with dry sore throat. Workers were having health problems like running nose and coughing with blood. It may be due to inhalation of cotton dust and fibre lint during work in knitting units. Workers who work in a knitting unit are at risk of developing skin problems. It was found in present research that workers doing work in the cotton dust area were

having problems of rashes, itching, infection, and redness. The problems related to eyes faced by the workers of the knitting unit, were covered under itching, redness, watering, swelling and vision changes. Workers were also facing various other health problems like headache, stomach-ache, loss of appetite, nausea, weakness, irritability, backache, nervousness, swelling of arms, legs joint, backache, pain or stiffness in arms, legs, joints, hair loss problem, bone related problem.

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## Mass Attenuation Coefficients and Effective Atomic Number of Yttrium Oxide (Y<sub>2</sub>O<sub>3</sub>) at Energies 122 KEV to 1330 KEV

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### ABSTRACT

In the present study, the mass attenuation coefficient ( $\mu_m$ ) of Yttrium Oxide (Y<sub>2</sub>O<sub>3</sub>) has been calculated in the energy range 122–1330 keV and compared with the obtained values from the WinXCOM program. It is found that there is a good agreement between theoretical and experimental values (03%). The linear attenuation coefficients ( $\mu_m$ ) total atomic cross section ( $\sigma_t$ ), and total electronic cross section ( $\sigma_e$ ) have also been calculated from the obtained ( $\mu_m$ ) values and their variations with photon energy have been plotted. From the present work, it is observed that the variation of obtained values of  $\mu_m$ ,  $\mu$ ,  $\sigma_t$  and  $\sigma_e$  strongly depends on the photon energy and decreases or increases due to chemical composition and density of the sample. The selected samples were thoroughly examined using the transmission method in order to determine whether the material could be used for radiation dosimeter.

**Keywords:** attenuation coefficient; total atomic cross sections

### 1. INTRODUCTION:

The current research of photon interactions with matter is extremely beneficial to modern culture. The importance of photon interaction with matter is growing in domains such as medicine, agriculture, biotechnology, radiography, space, industries, and current diagnosis such as CT scanning. In recent years, the research of photon interaction in various materials has gained importance. The proper characterization is must require for scientific study of different interaction of radiation with matter and also the penetration ability and diffusion of gamma radiation in external medium is required. The nature of the material is also important factor because from many studies it is observed that the Mass attenuation coefficient ( $\mu_m$ ) usually depends upon the energy of radiations and nature of the target material.

In Berger and Hubbell's (1987) software package XCOM, the mass attenuation coefficient values of partial photon interaction processes like photoelectric effect, Compton scattering, and pair production are all available. The effective atomic number  $Z_{\text{eff}}$  for the total and partial gamma ray interactions in oxides is equally important. A number of investigations on effective atomic numbers for total and partial photon interactions have been reported in the literature, including both theoretical and experimental studies covering energies 122 KeV to 1330 KeV.

Oxide is used in practically every industry and has a wide range of applications. Theoretical and practical research into the interaction of gamma rays with oxide materials is of tremendous interest. It is found that the values of mass attenuation coefficients, total atomic cross section of metal oxides in the energy range of 122-1330 keV are studied. These studied values are compared with theoretical values calculated using XCOM program (Berger M.J. and Hubbell J.H., 1987, 1999). Oxides, as well as organic material, have a significant impact. Understanding how photons interact with various things (i.e. alloy, plastic, soil) role in radiation biology, nuclear technology, and space research as radioactive sources such as Co<sup>57</sup> (122 keV), Ba<sup>133</sup> (356 keV), Na<sup>22</sup> (511 and 1275 keV), Cs<sup>137</sup> (662 keV), Mn<sup>54</sup> (840 keV) and Co<sup>60</sup> (1170 and 1330 keV) are more significant in biological studies, radiation sterilization, industry (Hall, 1978).

In the present work, Yttrium Oxide is subjected to mass attenuation coefficient and total photon cross sections of studies at 122 KeV to 1330 KeV photon energies to estimate the corresponding effective atomic number values for total photon interactions. The mass attenuation coefficient values are measured from experiment and compared with theoretical values by the using XCOM program and these are in good agreement with experimental values. Because photons in this energy range are widely used in medical and biological applications (Hubbell, 1999), many researchers are interested in studying mass attenuation and different values of complex molecules in the energy range 122 - 1330 keV (Murat Kurudirek, 2013, 2014a, 2014b, 2014c, 2015; Midgley, 2004, 2005; Manohara and Hanagodimath, 2007; Demir et al., 2012; Murat Kurudirek and Tayfur Onaran, 2015; Danial Salehi et al., 2015).

### 2. DATA ANALYSIS:

#### 1. Mass attenuation coefficient

In the present work we study some theoretical parameters of some oxide that have been used to determine the mass attenuation coefficient  $\mu_m$ . A parallel beam of the measured intensity  $I$  of the transmitted mono-energetic X-ray or  $\gamma$ -photons passing through matter is related to the incident intensity  $I_0$  is usually referred to as Beer-Lambert law is given by the relation.

$$I = I_0 e^{-\mu_m X} \quad (1)$$

Where,  $I_0$  and  $I$  are incident and transmitted photon intensities respectively,

$X$  is mass per unit area ( $\text{g}/\text{cm}^2$ ),  $\mu_m$  is mass attenuation coefficient ( $\text{cm}^2/\text{g}$ ) given by the following equation for a compound or mixture of elements (Jackson D. F. and Hawkes D.J., 1981; Hubbell and Seltzer, 1995). By using the Eq. (1) we obtain the following equations for linear attenuation coefficient;

$$\mu = 1/t \ln(I_0/I) \quad (2)$$

The mass attenuation coefficient of the sample is measured by using the following equation:

$$(\mu/\rho)_i = \sum_i W_i (\mu/\rho)_i \quad (3)$$

Where  $W_i$  is the weight fraction and  $(\mu/\rho)_i$  is the mass attenuation coefficient of the  $i^{\text{th}}$  constituent element. Weight fraction is given by

$$W_i = n_i A_i / \sum_j n_j A_j \quad (4)$$

Where  $A_j$  is the atomic weight of  $i^{\text{th}}$  element and  $n_i$  is the number of formula units.

## 2. Total atomic cross section

Total attenuation cross section ( $\sigma_t$ ) is a fundamental parameter to describe the photon interaction with matter. The value of mass attenuation coefficient ( $\mu_m$ ) is used to determine Total atomic cross section ( $\sigma_t$ ) by using the following relation (Hubbell, 2006; Erzeneoğlu et al., 2006).

$$\sigma_t = \frac{A}{N_A X} \ln(I_0/I) \quad (5)$$

Where,  $A$  is molecular weight and  $N_A$  is Avogadro's number ( $6.02486 \times 10^{23}$ ).

## 3. Electronic cross section:

The electronic cross section ( $\sigma_e$ ) is for an element is expressed by following relation

$$\sigma_e = \frac{\sigma_t}{Z} \quad (6)$$

Where  $\bar{Z}$  is mean atomic number.

## 4. Effective atomic number:

Effective atomic number ( $Z_{\text{eff}}$ ) is also a important parameter and it is given by the equation as,

$$Z_{\text{eff}} = \frac{\sum_i W_i f_i A_i (\mu/\rho)_i}{\sum_i f_i (A_j/Z_j) (\mu/\rho)_j} \quad (7)$$

Where  $f_i$  is the mole fraction of each constituent element (provided  $\sum_i f_i = 1$ ) and  $A_i$  is the atomic weight. In this study all the quantities are directly used (Manohara et al., 2008).

## 3. EXPERIMENTAL PROCEDURE:

The present investigation are taken up with a view to estimate total photon cross sections in the energy region 122 to 1330 KeV, in most of the Oxides by conducting transmission experiments on a good geometry setup. In the present study yttrium Oxide are chosen and the cross section were extracted at 122 KeV to 1330 KeV because very meagre experimental results are available at the energies. In the presented studies we measured incident and transmitted photon energies by using a narrow-beam good geometry set up. Fig. 1 shows the

experimental set up used in the current investigation. Co57 (122 keV), Ba133 (356 keV), Na22 (511 and 1275 keV), Cs137 (662 keV), Mn54 (840 keV), and Co60 (1170 and 1330 keV) are the six radioactive sources employed. A NaI(Tl) scintillation detector was used to detect gamma rays generated by these radioactive sources. The Signals emitted from the detector (2"x2") NaI (Tl) crystal having energy resolution of 8.2% at 0.662 MeV. Before and after each set of runs, the arrangement's stability and reproducibility were checked. The transmitted intensity was measured by setting the channels at the full-width half-maximum position of the photo-peak to minimise the effects of small-angle scattering and multiple scattering events on the measured intensity.

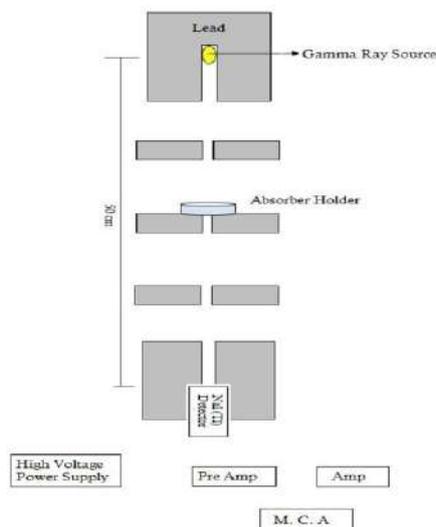


Fig.1 Narrow beam good geometry set up.

Pellet shaped uniform thickness of chosen oxides such as yttrium oxide ( $Y_2O_3$ ) under investigation was confined in a cylindrical plastic container with diameter similar to that of the sample pellet. The diameters of the sample pellets were determined using a travelling microscope. The photon attenuation in the empty containers was quite low. To obtain the average value of the mass, the sample pellet was weighted several times in a sensitive digital balance with an accuracy of 0.001 mg.

The mass per unit area were determined by using the diameter of the pellet and mean value of the mass of the pellet. The sample thickness was selected in order to satisfy the following ideal condition as far as possible (Creagh D.C., 1987):

$$2 \leq \ln\left(\frac{I_0}{I}\right) \leq 4.$$

The values of attenuation coefficients ( $\mu/\rho$ ) of Yttrium oxides ( $Y_2O_3$ ) were calculated from the measured values of incident photon intensity  $I_0$  (without sample) and transmitted photon intensity  $I$  (with sample) Eq. (2). The full experiments were performed in an air-conditioned room to avoid possible shifts of the photo-peaks. Other sources of error were evaluated and reduced. The maximum angle of scattering was maintained  $<30^\circ$  by properly adjusting the distance between the detector and source ( $30\text{cm} < d < 50\text{ cm}$ ), as the contribution of coherent and incoherent scattering at such angles in the measured cross sections at intermediate energies is negligible (Hubbell, 1999). Hence, no small-angle scattering corrections were applied to the measured data. Yttrium oxide sample used in this study were of high quality sigma Aldrich and of high purity (99.9 %) without high-Z impurities. Hence, sample impurity corrections were not applied to the measured data.

In the presented investigation, uncertainty in the mass per unit area and the error due to no uniformity of the sample are  $<0.05\%$  for all energies of interest. Optimum values of count rate and counting time were chosen to reduce the effects of photon built-up and pulse piles. The photon built-up effect, which is a consequence of the multiple scattering inside the sample, depends on the atomic number and sample thickness, as well as the incident photon energy.

#### 4. RESULTS AND DISCUSSION:

In the present work, utilizing the good geometry setup and employing the methods already discussed, the mass attenuation coefficients are measured for yttrium oxide at photon energies 122 KeV to 1330 KeV. The measured mass attenuation coefficients, total atomic cross section, molar extinction coefficient, electronic cross section, and effective atomic number of yttrium oxide are shown below.

**Table 1:** The following table gives the information about experimental and theoretical values of mass attenuation coefficient ( $\mu_m$ ), linear attenuation coefficient ( $\mu$ ), total atomic cross sections ( $\sigma_t$ ), for **Yttrium oxide** measured in the range of 122 keV to 1330 keV.

Sr. No.	Energy range keV	$\mu_m$ Expt.	$\mu_m$ Theo.	$\mu$ Expt.	$\mu$ Theo.	$\sigma_t$ Expt.	$\sigma_t$ Theo.
1.	122	0.481	0.473	2.4093	2.3692	181.44	177.30
2.	356	0.114	0.110	0.5711	0.5511	42.73	41.24
3.	511	0.088	0.086	0.4408	0.4309	32.99	32.24
4.	662	0.071	0.071	0.3507	0.3557	26.24	26.61
5.	840	0.067	0.068	0.3357	0.3407	25.11	25.49
6.	1170	0.065	0.062	0.3256	0.3106	24.36	23.24
7.	1275	0.057	0.052	0.2855	0.2605	21.36	19.49
8.	1330	0.049	0.046	0.2454	0.2305	18.37	17.24

**Table 2.** The following table gives the information about experimental and theoretical values of electronic cross sections, molar extinction coefficients, effective atomic numbers for **Yttrium oxide** measured in the range of 122 keV to 1330 keV.

Sr. No.	Energy range keV	$\sigma_e$ Expt.	$\sigma_e$ Theo.	$\epsilon$ Expt.	$\epsilon$ Theo.	Z <sub>eff</sub> Expt.	Z <sub>eff</sub> Theo.
1.	122	6.241	6.094	47.452	46.371	29.05	29.09
2.	356	1.616	1.556	11.172	10.780	26.44	26.49
3.	511	1.293	1.258	08.621	08.132	25.51	25.67
4.	662	1.048	1.124	06.86	06.961	25.03	25.09
5.	840	1.024	1.037	06.563	06.661	24.52	24.57
6.	1170	1.022	0.973	06.071	06.370	23.83	23.87
7.	1275	0.904	0.822	05.581	05.090	23.61	23.69
8.	1330	0.779	0.730	04.802	04.501	23.56	23.61

**Figure 2.** The plot of (a) mass attenuation coefficient ( $\mu_m$ ), (b) linear attenuation coefficient ( $\mu$ ), (c) total atomic cross sections ( $\sigma_t$ ), (d) electronic cross sections ( $\sigma_e$ ), (e) molar extinction coefficient ( $\epsilon$ ), (f) effective atomic numbers (Z<sub>eff</sub>) for **yttrium oxide**.

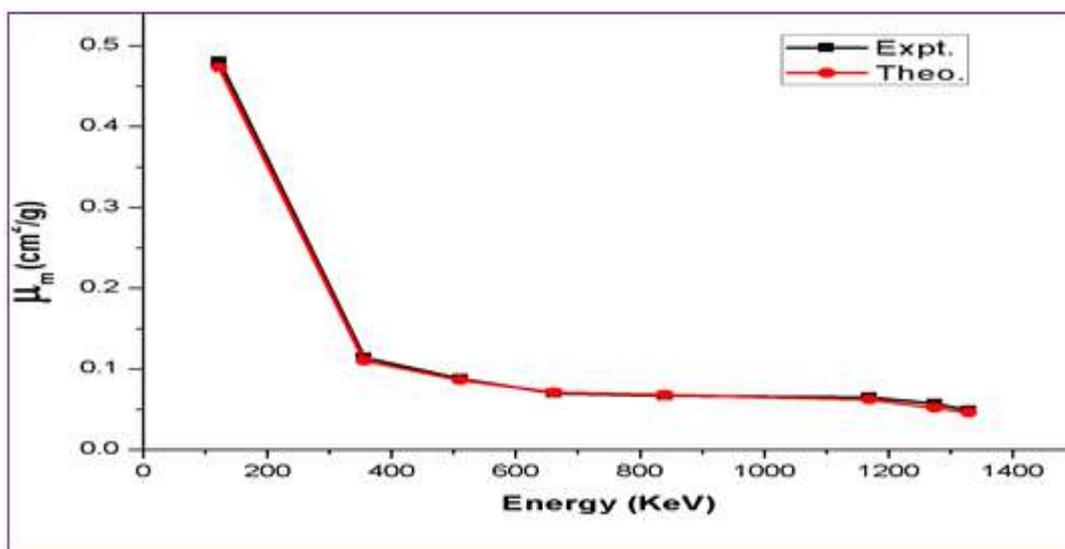


Fig. 2. The typical plot of mass attenuation coefficient ( $\mu_m$ ) versus photon energy

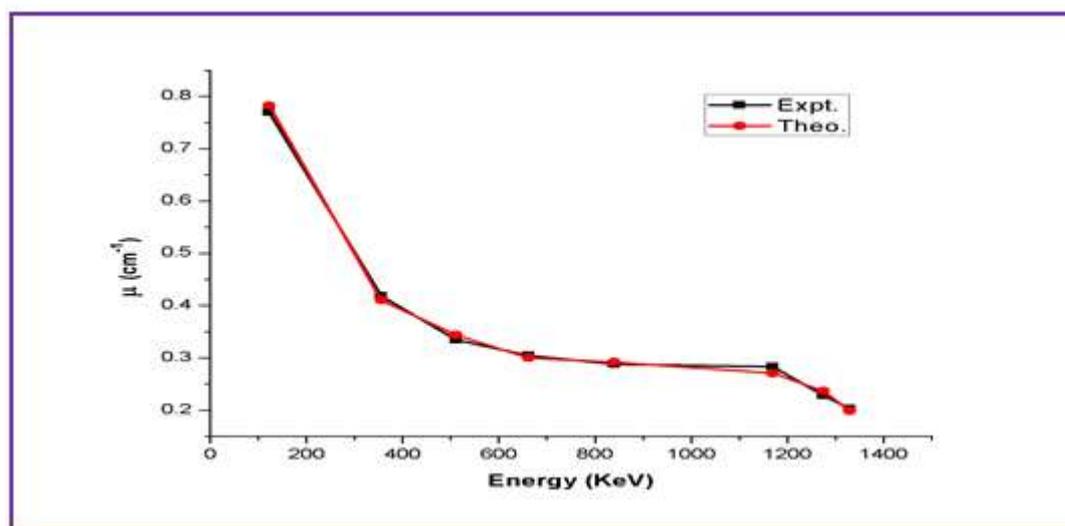


Fig. The typical plot of Linear attenuation coefficient ( $\mu$ ) versus photon energy

In the current investigation, the variation between experimental and theoretical values of  $\mu_m$  (cm<sup>2</sup>/g) for yttrium oxide studied for the energies of 122, 360, 511, 662, 840, and 1170, 1275- and 1330-keV. Photon energies are shown in Table 1, and those for yttrium oxide samples are plotted in Figure 2, and for linear attenuation coefficient in fig.3. It can be observed from the figure and table that  $\mu_m$  and other parameters such as linear attenuation, total atomic cross section etc, decreases with increasing photon energy. It is observed that the experimental values of  $\mu_m$  agree with the theoretical values calculated using the XCOM program. The total uncertainties in experimental values of the  $\mu_m$  depend on the uncertainties of  $I_0$  (without attenuation),  $I$  (after attenuation) measurements of mass thickness values, and counting statistics. The estimated total uncertainty in the measured experimental values of  $\mu_m$  was found to be in the range of 2-3%.

## 5. CONCLUSION

The present experimental study was carried out to obtain information on mass attenuation coefficient,  $\mu_m$  and related parameters  $\sigma_t$  for yttrium oxide sample. It has been found that  $\mu_m$  is an extremely useful and sensitive physical quantity for the determination of these parameters for the chosen oxide samples. The total atomic cross sections for yttrium with low and medium-Z elements are determined in the chosen energy range (122-1330 keV) which is emitted by the radioisotopes <sup>60</sup>Co, <sup>57</sup>Co, <sup>133</sup>Ba, <sup>54</sup>Mn, <sup>22</sup>Na, and <sup>137</sup>Cs. For the interaction of photons with matter the values of that  $\mu_m$  depend on the physical and chemical environments of the samples. With increasing photon energy, these values were discovered to decrease. From the study it is observed that the parameters  $\sigma_t$  changed similar to that of  $\mu_m$  and it is clear that  $\epsilon$  depends totally on the number and nature of atoms.

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## Motivational Strategies in ESL Classrooms: Teachers' Perspective

Vidhya.L, K. Anbazhagan and Sukanya Saha

### ABSTRACT

"Motivation is without question, the most complex and challenging issue facing teachers today." Scheidecker and Freeman 1999:116.

This Psychological variable is being widely spoken about by the researchers and scholars in the processes for second language learning. Dorynei in his research on "Motivational Strategies in the Language Classroom" puts forth that there are some antecedents that define motivation is the cause and origin of an action. Antecedents are human behaviour which has two dimensions: direction and magnitude. Motivation, the affective variable concentrates over both the dimensions and shows that it is responsible for the choice of a particular action, the effort spent on it, and one's perseverance with it. Motivation explains why people decide to do something, how hard they are going to pursue it and how long they are willing to sustain the activity. This study focuses on the motivational strategies that are commonly used by ESL teachers to facilitate English language learning. The researchers have borrowed the teacher interview questionnaire designed by Seham Elashhab's from his study "Motivational Teaching Strategies within Saudi University EFL Classrooms: How to Improve Students' Achievement?" to collect ESL teachers' opinions about motivational strategies used by them in their classrooms. Minor modifications have been done in the said questionnaire according to the samples chosen for this study. The questionnaire was distributed to 33 ESL teachers teaching English to ESL learners in two of the city colleges at Chennai. The findings may have implications on the effective use of motivational strategies deployed by teachers to attain the desired outcomes.

**Keywords:** Motivation, motivational strategies, ESL

### INTRODUCTION

Motivation comprises two major ingredients. These are the internal and the external factors that add flavor to a person's desire to learn and strengthen his grit to stay committed to an act and attain the outcome with optimum or more efforts. While learning a second language role of the variable, 'motivation' is crucial as theories formulated over past 60 years increasingly focus over its nature and impact. There is a persistent belief that without sufficient motivation even the cleverest learner is unlikely to attain the real proficiency in the target language, whereas the learners with strong motivation can achieve a working knowledge of it irrespective of their language aptitude or any undesirable learning conditions (Cheng & Dorynei, 2007).

Motivation is defined as the direction and magnitude of how and how much an action is performed. It is the choice of conducting an action first, sustain through it, and the effort taken to accomplish it. It has always been wondered that why does someone make good and appreciable progress compared to others despite placed into similar circumstances. The ultimate response has been that the person not only has the flair for the task but also is sufficiently motivated towards accomplishing it. Motivation drives a person to pursue a certain action diligently. In case of failure, primarily person's lack of motivation along with other circumstantial factors come under scrutiny to investigate the learning process. Motivation is thus akin to the concept of gravity, an observable phenomenon, easy to define (Martin Covington 1998: I).

In the process of second language learning, which has been varying according to the circumstances, geographies, cultures, and societies, certain key factors namely, enthusiasm, commitment, and persistence, remain constant. Regardless of the cognitive traits and language proficiency, a second language learner must possess enough motivation, without which it would be a great challenge to have sustainability in learning the second language (Dorynei "Motivational strategies in the language classroom", 2001).

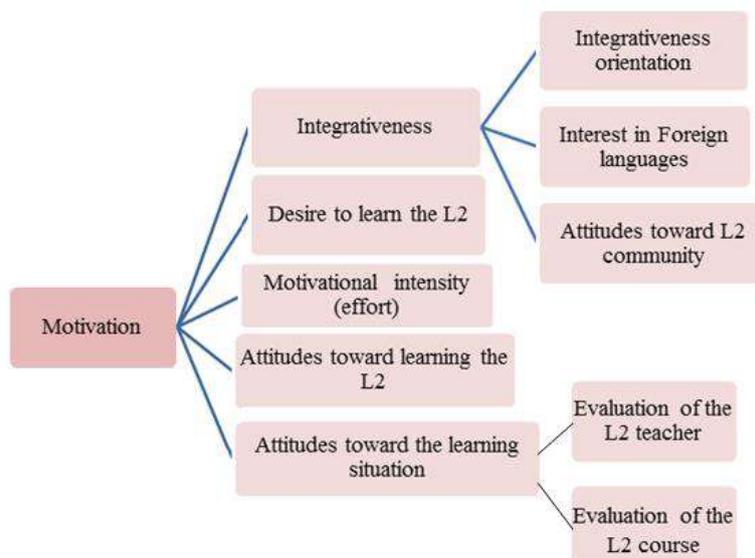
### Theories on motivational strategies

Motivational strategies are instructional interventions and self-regulating strategies. As instructional interventions, these strategies are employed by teachers to elicit and stimulate motivation in students. And as the self-regulating strategies it is systematically used by individual students to manage the levels of their own motivation. Scholars and practitioners have proposed wonderfully structured techniques on motivation to be implemented by the ESL teachers. The process to motivate a learner is a long-term goal of any teacher and one needs complete care, patience, diligent work. Dorynei, 2001 rightly says that in the process of teaching it is not common to find dramatic motivational events keep reshaping in a learners' mind moment to moment. Continuity of events leads to long-lasting effect. A teacher's strong desire to teach paves way for the student's

motivation. Further Dörnyei has expressed that the best suitable motivational practices are those that have to be clear. He also says that the three best motivators are autonomy, competence and relatedness. According to him the best of these strategies could improve good classroom relationships, clarity of instruction ultimately would promote/promotes greater enthusiasm and engagement in both the process of teaching and learning (Ruesch, Brown and Dewey, 2011). Such instructional strategies can enhance students' engagement or involvement in the learning processes. Cooperative group learning (Ghaith, 2003) shifts the focus from teacher –controlled classroom to student-centered one (Al-Jarf, 2004, Ramachandran 2004). Udvari-Solner, Villa, and Thousand (2005) stipulate corrective feedback as part of teaching strategies and design a teaching-learning process that can promote meaningful participation of all students in the classroom. Studies have also focused over building theoretical frameworks for motivation and have concentrated on establishing the effectiveness of motivation in ESL/EFL learning / teaching contexts, rather than trying to show how to motivate learners in the classrooms. Till 1990s there have not been traces of great attention being paid to the motivational strategies and there were no significant number of research devoted to them. Researchers in second language learning (e.g., Alison & Halliwell, 2002; Brown, 2001; Dörnyei, 2001b; Chambers, 1999; Williams & Burden, 1997) designed and produced the motivational techniques that can be used in the classrooms. There are three comprehensive studies till date that have been empirically conducted on the effectiveness of the motivational strategies. These are by Dörnyei & Csizer (1998) in Hungary, Cheng & Dörnyei (2007) in Taiwan, and Alrabai (2010) in Saudi Arabia.

Amongst the theories formulated to relate motivation, the Self-determination theory by Deci & Ryan (1985, 2008) expresses the intrinsic and the extrinsic motivation concerning the act performed for its own benefits to reach self-satisfaction, and on the other hand, to gain credit or reward, and/or to avoid punishment with a thought that the motive of a human is dependent on a continuum between self and controlled form of motivation. Autonomous motivation includes motivation that arises from within, controlled motivation is comprised of external factors, and it is a type of motivation where an individual acts out of the desire for rewards from outside or fears punishment. Further to differentiate between the autonomous and the controlled motivation, according to Ryan and Deci, 2008 is the motivation from partially internalized activities and values in order to avoid shame, and to protect the ego. In autonomous motivation the learner may feel self-directed but when they are driven by controlled motivation, there is a chance for them to feel being pressurized.

Dörnyei and Csizer (1998) investigated 200 English teachers in Hungary about their knowledge of motivational strategies, after the conduction of a pilot study with the obtained result they made revision which included omission and inclusion of items and they arrived at the final version of the questionnaire which had 51 motivational strategies. To name some strategies they are as follows which was categorized as scale and the strategies the scale included variables like teacher, climate, task, rapport, self-confidence, interest, autonomy, personal relevance, goal, culture, group, effort, usefulness, reward, rule, finished products, decoration and comparison and to list out the strategies they are as follows prepare for the lessons properly, show a good example by being committed and motivated, try to behave naturally and be yourself in class, be as sensitive and accepting as you can, create a pleasant atmosphere in the classroom, bring in humour, laughter and smile, have games and fun in class, have game-like competitions within class, give clear instructions, provide guidance about how to do the task, state the purpose and the utility of every task, develop a good relationship with your students, give positive feedback and appraisal, make sure that every student experience success regularly, constantly encourage your students, demystify mistakes as they are considered to be the natural part of learning, select interesting tasks, choose topics and supplementary materials, offer a variety of materials, raise learners curiosity, make tasks challenging etc. are few of the strategies and there are a few other strategies. The effectiveness and frequency of their usages of these strategies in their teaching practices was also investigated. The strategies were named as Ten Commandments, and they reflected the teachers' beliefs and perceptions in genuine classroom settings. Dörnyei and Csizer also identified the underutilization of certain strategies (Cheng & Dörnyei, 2007).



**Fig 1:** Gardner's conceptualization of the integrative motivation

The figure above represents motivation and its types with the other variable, attitude. Both are cognitive components in the process of learning of second language.

A similar study was conducted by Alrabai (2010) in Saudi Arabia where the researcher examined the importance of some motivational strategies by the EFL Saudi teachers and found that 10 strategies to top among other strategies which were in the list that would promote learner's motivation. Further the researcher investigated 119 Saudi teachers to consider the strategy which they frequently used in their classrooms to motivate the learners and the top answer to this was "Proper teacher behaviour". Alrabai divided the participants in to three group of which 77 were the BA holder, 33 were MA holders ,7 were PhD scholars, 4 had different levels of educational background as diploma, M.Phil., etc. These participants were asked to rate the motivational strategies ,the macro,micro strategies that they considered to be the strategies that gives positive effect on the learners. The strategies were itemed as teacher behaviour, pleasant classroom atmosphere, group cohesiveness and norms,L2 related values, learners' expectancy of success, learners' goals and beliefs, relevance of learning to the learners' needs, stimulating learning, motivating learning, diminishing learners' anxiety and promoting their self-confidence, promoting learners' autonomy, recognising learners' efforts and achievement of all the macro strategies "demonstrate proper teacher behaviour"strategy topped higher that other strategies .

Bernaus and Gardner (2008) and Ruesch, Brown and Dewey (2012) circulated questionnaires to find the variations in the perceptions of teachers and learners about the frequency and effectiveness of L2 motivational strategies. Sugita and Takeuchi in 2010 and 2014, too used questionnaires to explore the relationship between L2 teachers' motivational interventions and their impact on the learners. Besides questionnaires, interviews (Astuti, 2013), observations (Guilloteaux and Dörnyei 2008; Wong 2014), and reflective journals (Lee, 2017) have also been employed to gather data from learners. Jones (2009, 2018) has formulated a framework for motivation that acts as an effective motivational strategy and is called the MUSIC model: **M** expresses empowered, **U** stands for usefulness, **S** represents Succeed, **I** denotes Interest, and **C** stands for care. This model conveys that motivation is the extent to which one intends to engage in an activity (Jones, 2018, p.5) and thus it precedes engagement. These studies show that the intervention using motivational strategies have brought in or have resulted in increased achievements.

#### **Statement of the problem:**

The primary problem found with ESL students is their lack of motivation for learning English language. This problem may be consequent to many other important variables like lack of confidence, low self-esteem, and inhibitions towards English language. According to Coopersmith (1981, as cited in Liu, 2006), self-esteem is an assessment on self value or worth of himself or herself (p.33). Self-esteem becomes an essential feature in second language learning with the reason that without it no successful learning can happen (Li & Li, 2013). If a learner lacks self-confidence and possesses lower self-esteem and shows the signs like shyness, fear, and anxiety, these lead to stumbling during the learning process. These factors demand professional assistance of ESL teachers who are equipped with suitable motivational strategies that drive the learners further.

## METHODOLOGY

### Participants:

The study participants were 33 teachers teaching English to ESL learners in two city colleges at Chennai. Convenience Sampling was used to select the participants. It is a non-random sampling method and is identified as “the selection of individuals who happen to be available for the study.” (Mackey & Gass, 2005, p.122). There is no specific reason behind the choice of the samples. However, only ESL teachers teaching at tertiary level were chosen to obtain data.

## METHOD

The mixed-method design takes both qualitative and quantitative data. The study gives a descriptive statistical analysis based on the collected data. The mixed-method design in research is an approach to inquire the combination or association of both qualitative and quantitative forms. Maxwell, 2013 says that the word ‘design’ has two different meanings in the mixed methods research. One focuses on the process of the design and the other concentrating on the result of the design. Johnson et al. (2007, p.123) formulated that the mixed methods research can have three different drives 1. Qualitative driven 2. Quantitative driven, or 3) Equal-status.

Mixed method research design has various steps right from careful determination of the feasibility of the study, identifying a rationale, data collection strategy, design type, developing a quantitative and a qualitative method questions and finally analysis of the data collected. The Mixed method research uses interviews and questionnaires, performance test and observation, questionnaires and follow up focus groups, document analysis, performance tests, questionnaires and interviews. Since the present study has used both the quantitative and the qualitative inputs the chosen method is justified.

### 6.3 INSTRUMENT

A questionnaire based on a few research studies, viz. Gardner, 2006 & 2007, Cheng and Dornyei, 2007, Alnather, 2013 and Gulloteaux & Dornyei, 2008, was framed. The questionnaire for the current study is modified after obtaining permission from Seham Elashhab, the author of “Motivational teaching strategies within Saudi University EFL Classrooms: How to improve Student’s achievement?” (Seham Elashhab, 2020). It consists of 10 multiple choice questions

1. How long have you been teaching ESL students?
2. What is your general observation about students' response towards ESL?
3. How do you think motivation from a teacher would MOST impact the learning of second language?
4. How do you think positive attitude of a learner helps in learning second language the most?
5. How successful have you been in implementing the motivation strategies of yours in your classes?
6. Where do you see maximum improvements in students after having taught them using the motivational strategies?
7. How have you rewarded students for their higher motivation levels in most cases?
8. Whose motivation levels you experienced to be better?
9. Do you wish to pursue any special training to teach ESL students?
10. Have you been distressed/or fed up of teaching English to your students?

Original questions	Modified Questions
1. Do you think it is important to use motivational strategies to develop students' motivation?	1. Why do you think it is essential to use motivational strategies in ESL classrooms?
2. What do you think are the most important motivational strategies, especially in the context of EFL?	2. Name certain MOST important motivational strategies in ESL classes, according to you.
3. How can you keep your students motivated during the class or during a task?	3. How do you use feedback/assessment to motivate your students?
4. Tell me about motivated class, what do you do to keep your students motivated at the end of the lesson or task?	4. What does a motivated class look like?
5. Now, tell me about de-motivated class, what do you do to encourage students' motivation?	5. How are you going to improve your motivational strategies as an ESL teacher?
6. Do you have anything to add?	

The responses were collected from ESL teachers teaching at the tertiary level (to ESL learners of two city colleges at Chennai) after having oriented them about the purpose of conduction of interview and their role in contributing with the best choices of responses for the MCQs. The interview with individual teacher was conducted in order to get their opinion in person about the importance of motivational strategies and their effective implementation in the ESL classroom. The purpose of conducting the interview is to strengthen the study with the individual responses of the teachers handling the tertiary level ESL learners. Seham Elashhab interviewed face-to-face five EFL teachers in order to introduce the questionnaire and to get approval from them to circulate the questionnaire to the students. A thesis on A Mixed Methods Study of Motivational Teaching Strategies in the ESL Classroom in Australia submitted by Kate E. Bokan-Smith to the Faculty of Education and Social Work, The University of Sydney in 2016 also has presented similar kind of motivational strategies questions as listed below:

1. Useful Motivational Strategies
2. Most Often MS
3. Help the Unmotivated
4. Own Student Experience
5. Overall Impression
6. Spontaneous or Planned MS
7. Used new or old MS
8. Success with MS
9. How to assess MS success
10. Motivate the unmotivated
11. MS used most often
12. Why choose the MS?
13. Student perceptions of MS
14. Evidence for SS perceptions
15. Change Lesson

### DISCUSSION OF THE RESULTS

The collected data has been analysed using the SPSS software. Descriptive statistical analysis has been done as the questionnaire consisted of basic demographic variables concentrating on the respondents age, years of experience etc. The results of this investigation are presented in the following tables:

**Table 1:** 2. What is your observation about students' response towards ESL?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Afraid of learning	10	30.3	30.3	30.3
	Neutral	14	42.4	42.4	72.7
	Not responsive	1	3.0	3.0	75.8
	Reluctant to study	8	24.2	24.2	100.0
	Total	33	100.0	100.0	

According to table 1, 14 teachers have expressed that their observation on students' response towards ESL is found to be neutral with 42.4%.

**Table 3 5.** How successful have you been in implementing the motivation strategies in your classes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strategies brought wonderful changes	13	39.4	39.4	39.4
	Strategies partially motivated students	10	30.3	30.3	69.7

	Strategies worked in selected topics	10	30.3	30.3	100.0
	Total	33	100.0	100.0	

Table 3 depicts the success of the teachers in incorporating the motivational strategies in their classrooms and it has been found that 13 teachers with 39.4% have reported that the incorporation of motivational strategies have brought in wonderful changes.

Table 4 6. Where do you see maximum improvements in learners after having taught them using the motivational strategies?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	They answer questions quickly	14	42.4	42.4	42.4
	They are cheerful	11	33.3	33.3	75.8
	They come regularly to classes	7	21.2	21.2	97.0
	They complete homework	1	3.0	3.0	100.0
	Total	33	100.0	100.0	

Table 4 presents changes observed as improvements in the ESL learners after being exposed to motivational strategies, and it was found that 14 teachers (42.4%) have responded and have observed that the ESL learners (they) answer quickly.

Table 5 7. How have you rewarded them for their higher motivation levels in most cases?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	appreciating their work publically	19	57.6	57.6	57.6
	Giving immediate feedback	10	30.3	30.3	87.9
	Giving them opportunities to express	4	12.1	12.1	100.0
	Total	33	100.0	100.0	

The above presented table provides answer to the research question 1- what motivational strategies are adopted by the ESL teachers in their classroom that helped students improve their learning and the changes it brought in them?

Appreciation in any form like verbal compliment, acts of service, gift giving and sparing quality time etc. According to Chapman and White one who feels appreciated feel a greater sense of motivation and a greater sense of connectedness. They also have reported that appreciating individually and personally would boost ones confidence. The below table 5 presents the best adopted strategy, appreciating the work of the students publicly with 57.6 % as good, recognized strategy used by the teachers in raising the motivation of the learners.

Table 6 Gender \* 5. How successful have you been in implementing the motivation strategies of yours in your classes? **Cross tabulation**

		5. How successful have you been in implementing the motivation strategies of yours in your classes?				
		strategies brought wonderful changes	strategies partially motivated students	strategies worked in selected topics	Total	
Gender	Female	Count	10	5	6	21

		% within Gender	47.6%	23.8%	28.6%	100.0%
	Male	Count	3	5	4	12
		% within Gender	25.0%	41.7%	33.3%	100.0%
Total		Count	13	10	10	33
		% within Gender	39.4%	30.3%	30.3%	100.0%

All humans are not the same and the way they do things tend not to be the same. It happens with the motivational strategies and the motivational teaching practices in which there is possibility for them to carryout in varied ways to attain their target. Raacke and Raacke (2007) has reported that female teachers' explain the lesson more clearly and the above given table (table 6) depicts the gender wise response to the question, "How successful have you been in implementing the motivation strategies of yours in your classes?", Leading to an answer that 10 female teachers (47.6%) have responded that the implemented strategies have brought in wonderful changes, 5 teachers (23.8%) have responded that the strategies used partially motivated the students and 6 teachers (28.6%) have accounted for strategies worked in selected topics and none of the teachers have opted for one of the options, "never actively tried to motivate", implying that ESL teachers have been taking best efforts to motivate learners.

Table 7 Gender \* 6. Where do you see maximum improvements in them after having taught them using the motivational strategies? **Cross tabulation**

		6. Where do you see maximum improvements in them after having taught them using the motivational strategies?					
			They answer quickly	they are cheerful	they come regularly to classes	they complete homework	Total
Gender	Female	Count	8	8	4	1	21
		% within Gender	38.1%	38.1%	19.0%	4.8%	100.0%
	Male	Count	6	3	3	0	12
		% within Gender	50.0%	25.0%	25.0%	0.0%	100.0%
Total		Count	14	11	7	1	33
		% within Gender	42.4%	33.3%	21.2%	3.0%	100.0%

Table 7 interprets the gender wise observation on the factors which maximized the improvement after having taught them incorporating the motivational strategies. It can be noted that the female teachers rank high describing each choice of improvements that 8(38.1%) of teachers have opted for they answer quickly, 8 (38.1%) teachers have reported that they found learners to be cheerful, 4 (19.0%) said that their learners come regularly to class and 1 (4.8%) teacher has reported that the homework is being done.

Table 8 Gender \* 7. How have you rewarded them for their higher motivation level in most cases? **Cross tabulation**

		7. How have you rewarded them for their higher motivation level in most cases?				
			appreciating their work publically	giving immediate feedback	giving them opportunities to each	Total
Gender	Female	Count	13	8	0	21
		% within Gender	61.9%	38.1%	0.0%	100.0%
	Male	Count	6	2	4	12
		%	50.0%	16.7%	33.3%	100.0%

		within Gender				
Total		Count	19	10	4	33
		% within Gender	57.6%	30.3%	12.1%	100.0%

Table 8 focuses on and presents that what really has been done by the teachers in order to keep the ESL students motivation level higher. The factors given under this question were appreciating their work publically, giving immediate feedback and giving them opportunity. As this table presents the gender wise opinion again the female teachers have topped with responses i.e., 13 (61.9%), 8 (38.1%) representing the options appreciating their work publically and giving immediate feedback respectively.

As said earlier the study has used mixed-method approach and that the responses were collected and interpreted using the descriptive analysis. The questionnaire also comprised five interview questions:

1. Why do you think it is essential to use motivational strategies in ESL classrooms?
2. Name certain MOST important motivational strategies in ESL classes, according to you.
3. How do you use feedback/assessment to motivate your students?
4. What does a motivated class look like?
5. How are you going to improve your motivational strategies as an ESL teacher?

To further find the effect of the motivational strategies, one of the descriptive interview questions was picked since the question provides the teachers perspective on what is the MOST essential strategy/ are the MOST essential strategies they used or adopted in their classes, question 2 ,Name certain MOST important motivational strategies in ESL classes, according to you, and was analysed converting the descriptive responses of the teachers to variables and the variables as responded were 1. Appreciation and Encouragement, 2. Feedback, 3. Friendly approach, 4. Learner- centered approach (conducting activities and presentations), which were uttered as the MOST important strategies used by teachers in the classroom that has really brought in healthy learning of students.

**Table 9. Motivational strategies Cross tabulation**

Gender code	Motivational Strategies				Total
	Appreciation	Feedback	Friendly Approach	Learner- Centered Approach	
Male	7	3	4	7	21
Female	2	5	2	3	12
Total	9	8	6	10	33

The table above shows that majority of the male teachers (n=21) have given good responses with distribution towards the variables appreciation-7, feedback-3, friendly approach-4 and learner-centered approach-7, which shows that equal number of responses were given to appreciation and learner-centered approach which according to the table were the MOST important strategies that helped them get better outcome of their adopted strategies. Below given is the descriptive response given in general by all the respondents.

Q2: Name certain MOST important motivational strategies, especially in the context of ESL, according to you?

All the teachers have given the response as giving feedback, appreciate, reward, making student –centered learning atmosphere , being friendly, and showing additional concentration on the slow learners are all the most essential motivational strategies as expressed by the teachers.

### 1. LIMITATIONS

The present study is aimed to puts forth the importance of strategies that are to be adopted by the English teachers in order to bring in good enforcement among the ESL learners towards English language learning. The study restricted to only 33 teachers who were conveniently available at the time of the researchers data collection process, this limited respondents have given this current result. This research should be conducted with large group size of teacher respondents and also without learners there could not be the teachers role , so it

could be studied with the perception/ gender-wise perception of students towards learning of English through the motivational strategies adopted by the language teachers who facilitate their learning.

## CONCLUSION

Motivation one of the most essential and the most fascinating aspect of psychology, it is a determining factor in establishing an individual in a well-refined way. Dornyei (2001) has stated that motivational strategies cannot turn anyone in to a super-teacher or an excellent –motivator, the use of these strategies play a paramount role in promoting successful language learning. The aim of utilizing motivational strategies is to facilitate learning and the strategies are to be accompanied by quality instruction for the complete process of language teaching in order to have an effective accomplishment of the learning process.

The aim and purpose to conduct the present study was to understand the importance of using the motivational strategies and the perspectives of teachers' towards the use of motivational strategies in the ESL classroom. With the help of the questionnaire and the interview questions, data were collected. The findings show the role of a teacher and his/her perception towards the employability of motivational strategies in improving the learners' level of motivation towards learning of English. Teachers should value the strategies picked by them to make it relevant and appropriate to the learners. This paper strongly suggests that teachers should always think every single act of a student in the classroom is highly affected by the motivation and its level that is found in them, so, if they lack motivation and loses the sustainability to learn it affects the entire learning process. Therefore, it is strongly recommended that the teachers of ESL must build in a conducive motivated classroom atmosphere to engage the learners which would bring in a lot of improvement in the learners, which would help the learners gain confidence, autonomy and all the needed competence to establish themselves.

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## A Study to Assess Consent Practices in a Multispeciality Hospital

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### ABSTRACT

Consent is Patient's approval or agreement for healthcare professionals to provide care. Consent is a decision-making process by patients before undergoing any diagnostics and treatment. The aim of the consent process is to assist the patients or their relatives to make voluntary decision regarding their treatment and providing information related to the treatment in a language they (patients) can understand.

Patients have all the legal and fundamental right to know all the information prior to any diagnostic test, procedure or surgery and decide what should or should not happen. Hence consent should be taken prior to any procedure other than a routine physical examination.

The study was carried out at a multi-specialty hospital in Mysuru city, Karnataka. An Observational and descriptive study was carried out to the study included the collection of data from the Medical Record of the patients through a predesigned checklist for pre accreditation and during accreditation process.

**Keywords:** Consent, Patient's, healthcare, hospital

### INTRODUCTION

George Bernard Shaw has aptly stated that "The single biggest problem in communication is the illusion that it has taken place"

Ethical principles of autonomy and basic human rights have given rise to the concept of consent. Issues in obtaining the consent from the patients can be traced back to early 18th century in the US <sup>1</sup>.

The focus was on giving approval for the treatment by the patients. Further advancement to these concepts over a period of time produced the term 'informed consent' which recognizes not only the patients' autonomy in decision but also the right to complete information.<sup>2</sup>

Patients have all the legal and fundamental right to know all the information prior to any diagnostic test, procedure or surgery and decide what should or should not happen. No one has the rights to treat or touch the person without his/her approval. If any such act done would be considered as physical assault (battery) and is punishable. Hence consent should be taken prior to any procedure other than a routine physical examination.

Consent is Patient's approval or agreement for healthcare professionals to provide care. Consent is a decision-making process by patients before undergoing any diagnostics and treatment. The aim of the consent process is to assist the patients or their relatives to make voluntary decision regarding their treatment and providing information related to the treatment in a language they (patients) can understand.

Informed consent originates and also forms the responsibility of the doctor to patient. Informed consent forms a standard documented practice where the patients are provided with relevant information on diagnostic and treatment procedures, risks, complications, alternative treatment options in cases where it is not an emergency, in turn bettering the communication between the treating team and the patient. (1-10)

Informed consent is defined as the process of educating the patients and their relative about the nature of the intervention, advantages, benefits, risks, complications and alternatives of a given procedure or intervention by the health care provider. The patient must be competent to make a voluntary decision regarding the treatment. The signed consent form by the patient is the indication that it has led to the mutual understanding between the parties(11)

### MATERIALS AND METHODOLOGY

The study was carried out at a multi-specialty hospital in Mysuru city, Karnataka

#### TYPE OF STUDY

An Observational and descriptive study was carried out.

The study included the collection of data from the Medical Record of the patients through a predesigned checklist for pre accreditation and during accreditation process.

The data for post accreditation or present data was collected by a set of questionnaires which were asked to the patients or to their relatives.

#### **METHODOLOGY**

The tool that was used for the study was a structured questionnaire and a checklist.

The questionnaire was designed using review of literature from Journals, and World-Wide Website and published research studies. The questionnaire was designed to capture the data

The components of the checklist were:

- ✓ Demographic details of the patient,
- ✓ Nature and type of intervention,
- ✓ Risks and complications associated with the intervention,
- ✓ Staff name and signature who have explained the procedure,
- ✓ Name and signature of the patient/relative,
- ✓ Name and signature of the doctor/surgeon and
- ✓ The language in which the process/procedure was explained.

#### **STUDY COMPONENT:**

##### **a) Descriptive study (Prospective and Retrospective study):**

Study period: The study was carried out for a period of 4 months from February 2020 to June 2020.

- Type of study: Descriptive study
- Data collection time period: Prospective data was collected from Feb2020 and March 2020
- Data was retrospectively collected from April 2017 - June 2018
- For pre accreditation data was collected from April 2017 to June 2017 and
- From April 2018 to June 2018 for during accreditation period

#### **COLLECTION OF DATA:**

The study of records was carried out of all the departments of the hospital; The record was selected by random sampling technique, for Pre NABH and Post NABH.

#### **Total sample size for the study:**

125 sample each for pre accreditation, during accreditation and post accreditation phase was collected. Hence total sample size of the study was 375.

#### **Data Collection Process:**

- Record of the patients who had visited the hospital was analyzed.
- Random sampling technique was used to select the records.
- With the constructed checklist the records were studied to find whether all options or columns are filled in the consent form for pre accreditation data.
- Questionnaires were constructed to collect the data directly from patients or their relatives to analyze the process of consent for post and present consent process in the hospital.

#### **Data Analysis Technique:**

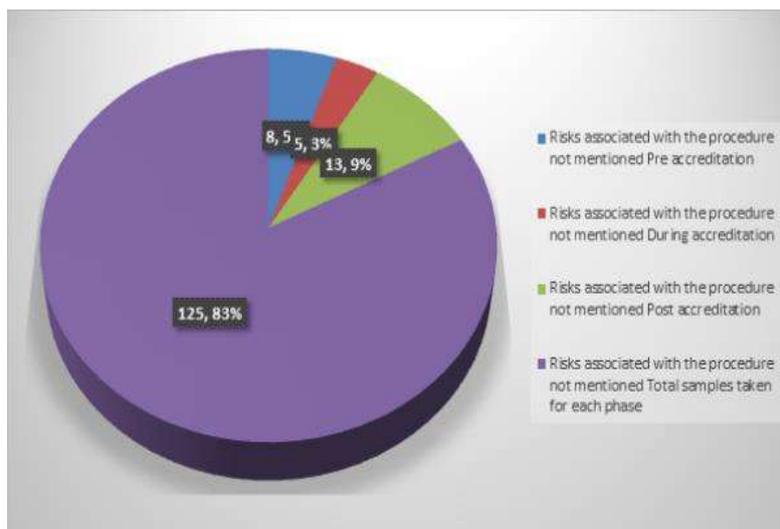
The data collected was analyzed by entry in to excel sheet and using descriptive statistics

#### **RESULTS**

##### **Before during and after accreditation study results:**

**TABLE 1:** Consent not showing risks associated with the procedure

<b>Risks associated with the procedure not mentioned</b>			
<b>Pre accreditation</b>	<b>During accreditation</b>	<b>Post accreditation</b>	<b>Total samples taken for each phase</b>
<b>8</b>	<b>5</b>	<b>13</b>	<b>125</b>

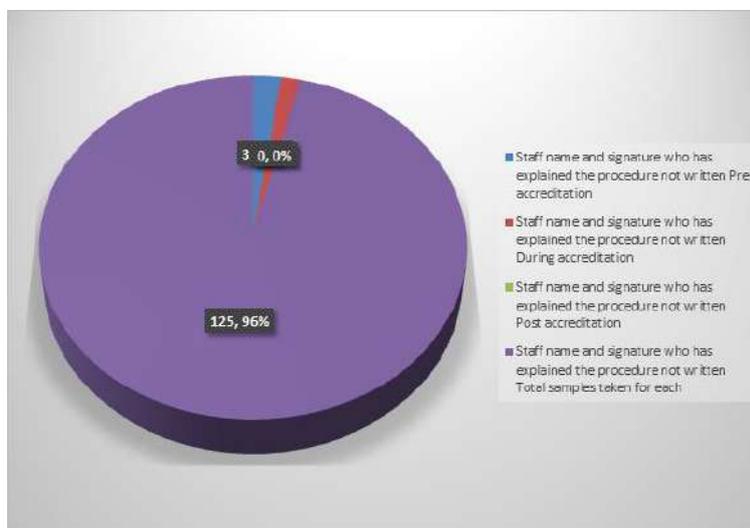


**Figure 1:** Consent not showing risks associated with the procedure

From the above table and figure it is seen that Out of 125 samples taken during pre accreditation phase 8 consent forms did not had risks and complications associated with the procedure written ,during accreditation phase 5 consent forms and after accreditation process 13 consent forms did not had risks and complications associated with the procedure mentioned.

**TABLE 2:** Consent not showing staff name and signature of the staff who has explained the procedure

Staff name and signature who has explained the procedure not mentioned			
Pre accreditation	During accreditation	Post accreditation	Total samples taken for each
3	2	0	125

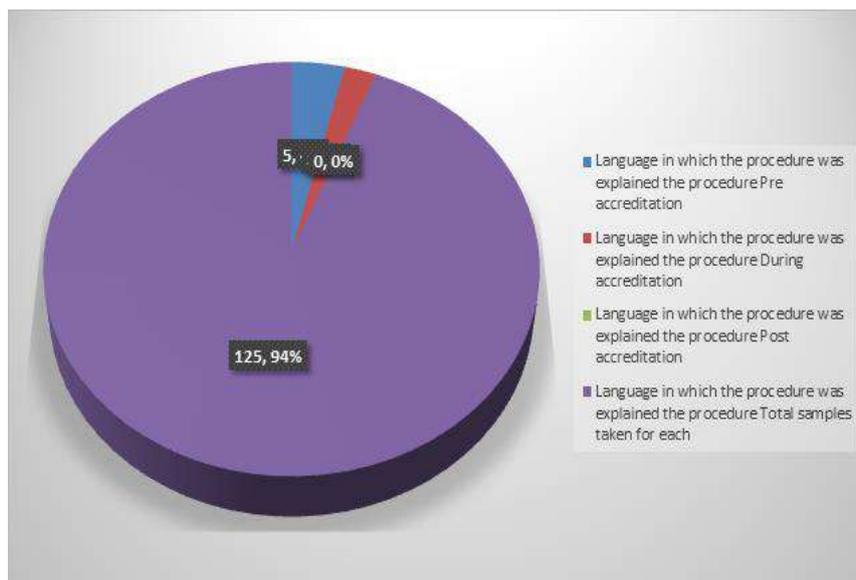


**Figure 2:** Consent not showing staff name and signature of the staff who has explained the procedure

From the above table and figure it is seen that Out of 125 samples taken during pre accreditation phase 3 consent forms did not had staff name and signature who had explained the procedure ,during accreditation phase 2 consent forms did not had staff name and signature who had explained the procedure.

**TABLE 3:** Consent not showing language in which the procedure

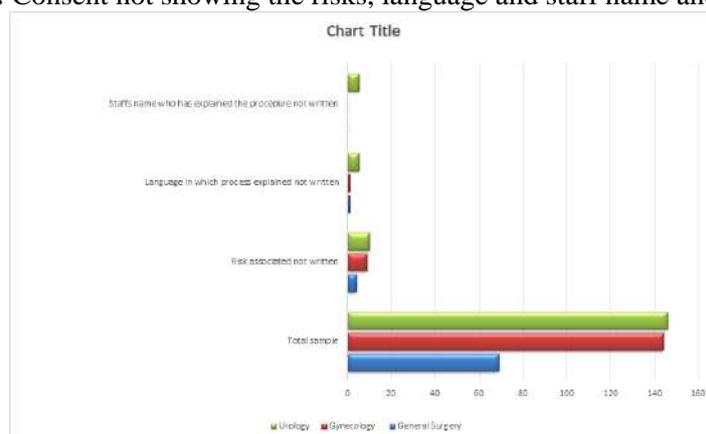
Language in which the procedure was explained the procedure			
Pre accreditation	During accreditation	Post accreditation	Total samples taken for each
5	3	0	125



**Figure 3:** Consent not showing language in which the procedure was explained

From the above table and figure it is seen that Out of 125 samples taken during pre accreditation phase 5 consent forms did not had language in which the procedure was explained written, during accreditation phase 3 consent forms did not had language in which the procedure was explained mentioned and among samples taken for after accreditation study all the samples had language in which the procedure was explained written.

**Table 4 :** Consent not showing the risks, language and staff name and signature



## DISCUSSION

- Disclosure of all the aspects related to any form treatment or any diagnostic procedure is crucial for most of all the medical procedures and for the safety of the patients and doctors as well.
- The study carried out by J Chandrasenan , MWJ Morris , J L Williams - patients views on consent for surgery, Northern General Hospital, Sheffield in 2007 found that out of 100 samples taken about 71% of the patients responded that they like to get a written information on the complications and risks of the procedure.
- The study carried out by Michael R. Johnson, Jasvinder A. Singh , Thomas Stewart , Terence J. Gioe on patient understanding and satisfaction in 2009 on informed consent in found that out of 151 samples taken by randomizing the samples into 3 groups.
- Group 1 was provided with a paper handout detailing the risks/benefits of the procedure . Group 2 was provided with a paper handout, and a video discussing the risks/benefits of the procedure and group 3 was provided with and 2 formal educating nurses .92-97% of the patients rated the consent process as good to excellent at all time points.
- In the present study it was found that most common components of the consent that were missed and incomplete in few consents are risks and complications of the treatment, language in which the procedure explained and name and signature of the staff who had explained the procedure.

- Out of 125 samples taken for pre accreditation phase and post accreditation each the compliance to the consent process has significantly increased from 87.2% to 89.6%.
- The compliance to the consent process in Urology department of the hospital from pre accreditation phase to during accreditation phase has been increased from 82.85% to 87.09% and from during accreditation phase to post accreditation phase has been significantly increased from 87.09% to 92.85%.
- The compliance to the consent process in General department of the hospital from during accreditation phase to accreditation phase has been increased from 93% to 97.05%. The compliance to the consent process in Gynecology department of the hospital from pre accreditation phase to during accreditation also has been increased from 97.36% to 97.43%.
- The only components of the consent form that has to be addressed and informed to the patients is the risks and complications of the procedure because the compliance to it has been reduced from 96% during accreditation phase to 89.6% in post accreditation phase.

Hence the present study addresses and emphasizes the disclosure of sufficient information related to risks and complication of any treatment and diagnostic procedure

### **RECOMMENDATIONS**

**Following are some of the recommendations based on the study carried out:**

- Treating doctor or doctor from the surgical team can explain all the aspects related to any form of treatment and surgery; it is doctors' opportunity to guide patients.
- More emphasis to be given to risks and complications associated with the procedure to be explained and same should be mentioned in the consent form.
- Importance of a consent forms with staff name and signature who has explained the procedure has to be emphasized.
- Language in which the procedure explained should also be mentioned in order to ensure that the patient or patient's relatives has understood all the information related to the procedure.
- Weekly, monthly audit of the medical records can be done randomly,
- Regular surprise audits should be carried out to check whether the patient records are complete or not.

### **SUMMARY**

The study aims to assess the consent practices in the multispecialty hospital. The present study is the descriptive and observational study that was carried out with the help of the checklist formulated and structured questionnaire.

In the present study it is seen that the most common variables related to consent process that were incomplete during pre during and post accreditation phase are risks and complications associated with the procedure, language in which the procedure was explained and staff name and signature who has explained the procedure.

With respect to during and post accreditation phase incomplete information related to language in which the procedure was explained and staff name and signature who has explained the procedure have been considerably reduced but risks and complications associated with the procedure were not written in few consent forms and few patients also gave the feedback that the same were not explained.

Treating doctor or healthcare providers should generally provide all the details to the patients related to the treatment or any diagnostic procedure, but it is necessary to take consent and obtain patient's permission for intelligent decisions.

Hence the present study provides the useful insight into the consent practices and in doing so helps the staff undertaking the consent.

### **CONCLUSION**

- The present study aimed to identify whether the consent practices in the hospital are in compliance with the NABH standards or not and the consent practices among various departments of the hospital.
- The present study explains the gap between the consent practices that were carried out during before during and after accreditation phase.

- In order to provide treatment for the patients' healthcare providers or treating doctors should provide adequate information to the patients and their relatives for the intelligent decision making .
- Relevant question's which are asked by the patient or patient relative about risk and benefits of the treatment and that should be fully explained by the treating doctor in the understanding language for the patient and patient relatives.
- Obtaining informed consent is very important prior to any form of treatment or any diagnostic procedure and for documentation of all cases especially for 'Medico-legal cases'.
- In any 'Medico-legal cases' consent forms helps both doctor and patients to prevent themselves from any legal liabilities.
- Informed consent is the cornerstone of the any diagnostic and surgical practice as it enshrines the respect for patient's decision.

Hence through the informed consent the patient or patients relative are provided with the awareness related to the benefits and consequence of their treatment decision

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## Child Marriage and Its Bane: Influence of Society and Family

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### ABSTRACT

Looking back child marriages wasn't considered a sin and even now in the rural parts of the country it isn't, which ends up in burnout situation to girl children's who are married around the age of 18 and also in some cases right after their puberty they get married which is even worse. Amidst the momentous development backdrop of the family, family pride and caste pride are the foremost reasons the child marriages are done and happening. Generally the demeanour of numerous social orders has been to wed them off as quickly as time permits, since many parents think once a girl child attends puberty she is due for marriage. The purpose is to explore about 'child marriage and its Bane' as a topic of forethought in child marriages, and specifically speaking out about the issues they faced and facing. The article draws on material collected with a particular attention on a focus group interview with 65 teenage girls in three batches. The findings signify that parents fear over society and caste pride plays a key role, however some of the girls voice about the problems they face in the early age marriage and how it affects them.

**Keywords:** Child Marriages, trouble, family pride, caste pride, puberty, burnout, caste

### 1. Concepts into child marriages

Child marriage, especially among those under the age of 12, fails to adequately equip or provide the individual with the opportunity to make an educated and free marriage decision. Pre-arranged weddings are what these juvenile marriages indicate. Due to poverty and a lack of options, such as the opportunity to attend school, children in rural parts of East Asia, Sub-Saharan Africa, South Asia, and Latin America have little choice but to accept early arranged marriages. Child marriages are the most common in low-income settings. Child marriages are planned by parents to protect their children's financial stability and to strengthen their social bonds. They feel it gives protection and decreases the family's financial burden because of the large cost of feeding, clothing, and (optionally) educating a female. By marrying their daughter to a well-known family and building a social tie between them, the parents boost their social standing.

According to Warner, in countries where child marriage is common, the girl's marriage is virtually usually arranged by her parents or guardians. Niger, Chad, Mali, Bangladesh, Guinea, Central African Republic, Afghanistan, Yemen, India, and Pakistan are the countries with the most arranged child marriages. In various parts of the Americas, arranged child weddings are also common.

The specific circumstance and the advancement of child marriage must be examined through the connection of a few lawful requests: conventional standard laws, State enactment, decisions of the courts, and global sources. Inside the whole broadness and range of India, various rules exist together, and State law might be in strife with customary or different sorts of rules concerning the suitable age for marriage. As indicated by insights, ladies in Rajasthan marriage at age 15. In Kerala itself, reports express that the pace of early marriage is higher in the Malabar district as contrasted and the Southern area of Kerala.

#### 1.1 Why it happens

It's tough to bring up the subject of child marriage. The problem is rooted in gender inequity, as well as the assumption that girls and women are less than boys and men. Poverty, a lack of understanding, damaging social norms and practises, and instability are all factors that contribute to the problem's growth. It serves a variety of purposes in different civilizations, and it manifests itself in various ways across and within areas and countries.

#### 1.2 Where it happens

Child marriage is a worldwide problem that affects people of various ages, nations, religions, and races. Learn more about the scope of the problem and what's being done to solve it with our interactive atlas. Find data to aid your advocacy and fundraising efforts, as well as connect with others working to eliminate child marriage in your area.

#### *Social norms and practices into Child Marriage*

Unwritten rules of conduct in a group are known as social norms. People follow them to show that they are members of the group, whether because of peer pressure or the compulsion of power holders, or simply because that is what they have always done.

The purpose of gender-based social customs is to restrict women's sexuality and sustain long-standing behaviours. Child marriage is one such practise. It's been going on for generations in a variety of places, and it's grown normal and acceptable.

In some cultures, a girl is considered a lady once she starts menstruating. Marriage may be the next step on her path to become a mother and wife.

### **1.3 Bidisha Pillai, CEO of Save The Children, said.**

"Much stays to be done to arrive at the most denied youngsters who will in general be the uttermost behind and are consistently the hardest to reach. Improvement approaches and projects detailed for kids must guarantee that there is unique spotlight on kids having a place with the helpless social gatherings, family units in destitution, and kids remaining in states performing low on advancement markers," she said

An examination of End of Childhood Index scores, that assesses 176 nations on youngsters' entrance to social insurance, training, sustenance and assurance from 'youth enders resembles kid work and kid marriage, finds the general circumstance for kids has improved in 173 nations since 2000, the report included.

### **1.4 Child marriages, an urban problem too**

According to V.Mayilvaganan (2018), a report released in September by the National Commission for the Protection of Child Rights found that 36.5 percent of child marriages occur in the state's urban districts.

According to a study, 95% of child marriages in Tamil Nadu are held to thwart love affairs.

According to a poll conducted by the Social Welfare Department and the Indian Council for Child Welfare in partnership with UNICEF, roughly 33% of child weddings in Tamil Nadu occur owing to family financial worries and 17% due to fear of children falling in love.

The study's goal was to establish the actual causes of child marriages in Tamil Nadu and develop evidence-based documentation. On Monday, the conclusions of the investigation were made public.

Approximately 1,636 underage marriages were stopped by the state government in 2017. The researchers looked at these cases to see what factors contribute to child marriages in the state. The researchers revealed that there are two types of child marriages: those chosen by the children themselves and those chosen by the family.

The motivations behind these two categories of people differ. According to the study, 95% of marriages are made on the basis of a love affair, 4% are determined on the basis of a shattered family with no one willing to care for them, and 1% are decided on the basis of pregnancy before marriage.

The family's financial issues accounted for 33% of all arranged marriages. Around 17% were related to a fear of falling in love, and 11% were due to preference marriage. In addition, 11% were due to safety concerns and illness among family members, 7% were due to family norms, 2% were due to parent migration, and 2% were due to kid education concerns.

Also, 2% were due to dowry, and 2% were due to other factors such as clandestine parent-child relationships posing a risk to the child's safety, and pre-marital pregnancy. Around 1% is attributable to the trade of a child for a debt, and 1% is related to the increased quantity of children in the family.

Throughout the field visits, the research team noticed that there were more unreported instances than reported cases. Only childline is used to report the cases. Due to fear of community condemnation, field workers such as Gram Sevika and Mukhya Sevika rarely detect child marriage situations on their own.

### **1.5 A Tamil Nadu girl who managed to avoid child marriage has an incredible storey to tell.**

Nandhini Nagaraji, who is 14 years old, has a remarkable storey to share about how her mental strength and awareness saved her from a terrible fate. The Thiruvannamalai, Tamil Nadu, young lady was just 13 years old when she got married to a guy twice her age.

Nandhini called the area authority's office the day before her wedding to inform them of the situation. Using leaflets from her textbooks, she had discovered their number. She was safeguarded and sent to a children's home a day after schooling them.

Her storey of tenacity stems from her dire circumstances. Her mother died, and her father gave her up. As a result, it was her maternal auntie who continued to try to marry Nandhini.

Nandhini, who aspires to become an IAS official one day, wants to protect a number of other young women who have had similar experiences.

## 2 Few insights in previous works

**Saraswat (2006)** in this article discussed about child marriages subsist in primitive social orders where the Nagnika idea was predominant. Guardians were made to accept that on the off chance that they didn't get their girls offered before pubescence, they would go to for hell's sake. Indian custom puts a high premium on virginity prior to marriage. This applies to girls and to a few degree men as well. In a civilization where pre-marriage purity is esteemed, perhaps the most straightforward methods for accomplishing this is to get the little youngsters wedded in their adolescence.

**Miller and Lester, (2003)**, in this study about marriage significantly improve the likelihood and weights of childbearing. The first-run through moms beneath the age 16, in expansion to the ordinary dangers and obligations of youngster bearing, face an expanded danger of motherly and newborn child mortality.

**Srivastava, (1983)** in this article conducted about child marriage cover up a bunch of social circumstances. There are assurances to be wedded of minor young men and young girls, some of them snoozing, unconscious of what's going on. At that point two families may guarantee to mastermind the marriage of their thus far unborn youngsters in the event that they happen to be of various genders. At that point, there are relationships of young people who perfect their relations two or after three years, in contrast with those relationships which are fulfilled just about 10 years and a half later.

**Verma, (2004)** in his article determine the pre-youthful and juvenile young girls who establish a sizable portion of its populace comprise a defenceless bunch by virtue of training of early relationships, potential introduction to a more serious danger of bleakness and mortality.

Pregnant girls under the age of 18 are more likely to develop difficulties, and there have been incidents of death, according to **B. Suresh Lal (2005)**. Girls under the age of 15 had a five-fold higher risk of dying following childbirth than women in their twenties. Fertility is high among young persons under the age of 18. Feelings of hopelessness, helplessness, and severe sadness are common symptoms of sexual abuse and post-traumatic stress disorder in child brides.

**Tahera Ahmed (2015)** in his research he pointed out that the effects of child marriage put girls at danger of early pregnancies with life-threatening conditions; additionally, each country should set its own mid- and long-term targets to reduce child marriages significantly.

**According to Annah V. BengesaiID, Lateef B. AmusaID, and Felix Makonye (2021)**, the average age of first marriage is 18 years, and the bulk of children are between the ages of 15 and 22. According to both logistic regression and PSM models, early marriage decreased the likelihood of completing the first cycle of high school.

Child marriage is more common among destitute Indian women than among those from higher socioeconomic status, according to **Pintu Paul's (2020)** research. Increased educational opportunities for girls and financial assistance to disadvantaged families would put an end to the practise of underage marriage among Indian women.

According to **Nawal M Nour's (2009)** research, the custom, which is fueled by poverty, is practised to protect female financial prospects and enhance social bonds. One of the most effective methods to decrease child marriage and its health consequences is to require girls to attend school.

In her research, **Anita Raj (2010)** shed light on the challenges surrounding child marriage. Child marriage (marriage before the age of 18) is an internationally recognised health and human rights violation that disproportionately impacts women. Despite the fact that the practise of girl child marriage has decreased dramatically in the last 20 years, it is still prevalent in some regions of the world, particularly in South Asia and Sub-Saharan Africa, where up to 50–70 percent of girls are married before they reach the age of 18.

Perceptions that promote aspects of child marriage were held by one out of every four parents or adolescents, according to **Heribertus Rinto Wibowoa, Muliani Ratnaningsiha, Nicholas J Goodwina, Derry Fahrizal Ulumb, Emilie Minnick (2021)**. A total of 25.8% of parents and 26.0 percent of adolescents believe that a girl is ready for marriage once she begins menstruation. According to 25.6 percent of parents and 32.6 percent of teenagers, girls over the age of 18 who are not married are a burden to their family.

Only legitimate statistics can aid in comprehending the true size of the problem and putting an end to spurious generalisations on sensitive social topics, which would otherwise ruin Pakistan's soft image, according to

Munir Ahamad Zia, Mr. Safdar Abbas, Dr. Fauzia Saleem Alvi, Mr. Noman Isaac, and Sidra Maqsood's (2018) research.

Md. Ruhul Kabir, Susmita Ghosh and Asma Shawly (2019) their research mainly resulted that Focusing on the underlying reasons of child marriage is critical, and its substantial health effects necessitate adequate legislative enactment and attention to the socioeconomic factors that encourage child marriage.

Although the repercussions of child marriage are most acute at the individual level, child marriage is also expected to have substantial and far-reaching effects at the national and global levels in the form of lost earnings and intergenerational poverty transmission, according to Jennifer Parsons, Jeffrey Edmeades, Aslihan Kes, Suzanne Petroni, Maggie Sexton, and Quentin Wodon (2015) in their research. In short, child marriage is likely to have extraordinarily significant economic costs and implications for young brides, their children, their families, their communities, and society as a whole.

### Objectives and Practices of Research Used

The Objectives of the study is to analyze the factors influencing child marriage

This article uses the primary data collected from 65 teenage girls in 3 batches. The research work was carried out during February 2021. The key intention of this research paper is to analyze the child marriage awareness reduce and bane of women children. The respondents are opted based on the "convenience sampling" and the study was carried on a sample of 65 respondents and focus group method was used for data collection.

**Table 1** Henry Garrett Ranking Factors Analysing About Child Marriage

Particulars	1	2	3	4	5		Mean Score	Rank
	85	75	68	63	59			
<b>Caste Pride</b>	21	10	12	17	5	65		<b>3</b>
	1785	750	816	1071	295	4717	72.5	
<b>Love Affair</b>	30	6	12	10	7	65		<b>1</b>
	2550	450	816	630	413	4859	74.7	
<b>Fear Over Society</b>	25	15	11	9	5	65		<b>4</b>
	2125	1125	748	567	295	4860	71.4	
<b>Economic Burden</b>	19	23	13	7	3	65		<b>2</b>
	1615	1725	884	441	177	4842	74.4	
<b>Source: Data was collected via questionnaire and computed through Microsoft Excel</b>								

Results point out love affair is ranked to the first (since many parents consider their children to elope with someone due to love affair) and economic burden is ranked second (since many parents consider their girl children as burden due to many financial commitments they face till marriage)

### FURTHER DISCUSSIONS

As a researcher when having focus group discussion with the respondents few things became clear,

- Majority of the family's financial status makes their child to get married as they say that "their neighbourhood tells them soon get your children married as you don't want your children to elope with someone", so as a researcher I asked the respondents why do you need to listen to them? And they say that "since most of their neighbourhood are their family relations and since we depend on them financially, so we have to abide by their words.
- Even others said that "keeping a girl child in home after her puberty is like "Keeping fire in stomach" they feel that once her child gets married soon "their responsibility gets fulfilled"
- One girl child (when married early) she said that, she gets fear to speak with her "mother –in law" and she gets fear when her husband raises the tone in his voice even for speaking, imagine the turbulence in the mind of the girl, this is so much cruel fearing to speak, having fear all the time, As a researcher personally, I feel that awareness need to given in the rural areas so as to make the parents understand the hazards and havoc their girl child faces after "Post Early Marriage", so after that at least there might be some awareness in child marriage among the parents

### CONCLUSION

This paper has indicated that child marriage is an acknowledged social practice in numerous nations particularly in creating countries with more predominance in India. It is still generally endorsed, even in spite of the fact that

it is an infringement of the human privileges of little youngsters because of different thought processes. Early marriage can abuse the privileges of young girls and young men, both in this age and the following yet this is an issue that effects upon young girls in far bigger numbers and with greater power. More accentuation has been given to young girls as the experience for young boy is, more averse to be exploitative or physically hurtful for what it's worth for young girls.

Still the child marriage is in practice unless parents understands and change the problems and hurdles their children face after "Post marriage", child marriages will always be in practice.

#### **Data Availability Statement**

Absence of the data due to confidentiality issues.

#### **Ethics approval statement**

I Accept that the content hasn't been plagiarised

#### **Declaration of Conflict of Interests**

The author declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article

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## Assessment of Pharmacognostic and Physicochemical Standards of *Prosopis Cineraria* (L) Druce. Leaf

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### ABSTRACT

**Objective:** To analyze the pharmacognostic characteristics and physicochemical parameters of the leaves of *Prosopis cineraria* [P. cineraria].

**Methodology:** Pharmacognostic investigation of the anatomical section of the dried leaves as well as powder microscopy was carried out to determine its morphological, anatomical and phytochemical diagnostic features. The qualitative microscopy, quantitative microscopy and other WHO suggested parameters of standardization of dried leaves and powder were carried out as per standard procedures. The physicochemical properties such as loss on drying, total ash value, acid insoluble ash value, water soluble ash value, extractive values and fluorescence of P.cineraria had been performed.

**Results:** In the present work, pharmacognostic studies of this medicinal plant were attempted which included physicochemical, phytochemical, macroscopic, microscopic studies and organoleptic evaluation. The plant powder characteristics were also elucidated. The physicochemical analyses were done by using WHO recommended parameters such as loss on drying; ash values total ash, water soluble ash, acid insoluble ash, sulphated ash and extractive values. The transverse section of leaves indicated the arrangement of various cells in epidermis, parenchyma and vascular bundles. The physicochemical parameters such as total ash, acid insoluble ash, water soluble ash and sulphated ash value, loss on drying, extractive values, fluorescence analysis of extracts and powder treated with different chemical reagents were studied under ordinary light, short and long UV light.

**Conclusion:** The current research would be useful in order to supplement the information regarding standardization, identity and in performing additional explorations in Ayurvedic system of medicine. These studies will be helpful in developing standards for quality, purity and sample identification of this plant.

**Keywords:** *Prosopis cineraria*, Pharmacognostic, Physicochemical parameters and Microscopical

### INTRODUCTION

Medicinal plants are usually playing a significant part in traditional medicines intended for therapy of various health issues. However a crucial hurdle, which has impeded the promotion in the usage of alternative medications in the developed countries, is lack of evidence of documentation and absence of stringent quality control measures. Additionally, there is a dependence on the data of all study meted out on traditional medicines by way of documentation. Keeping this issue, it is now quite necessary to generate assurance about the standardization of the plant as well as its parts to be used like a medication. During the process of standardization, we are able to take advantage of various techniques and methodology to achieve our goal in a phase wise approach e.g. pharmacognostic and phytochemical studies. These techniques and methods are helpful in recognition and standardization of the plant material. Pharmacognosy basically deals with the standardization, authentication and study of natural drugs. It is closely involved with allied fields, viz., phytochemistry and toxicological screening of natural products. Pharmacognosy has been involved in identifying controversial species of plants, authentication of commonly used traditional medicinal plants through morphological, histological, physicochemical and toxicological parameters, especially heavy metal estimation and radiobiological contamination in plants, prescribed by an authoritative source. The importance of Pharmacognosy has been widely felt in recent times [1]

Appropriate characterization and quality assurance of starting material is a crucial step to ensure reproducible quality of herbal medicine to assist people in order to justify its safety and effectiveness. Because of this reason, we have executed pharmacognostic studies of *Prosopis cineraria* belong to family Fabaceae. This sort of research is not going to help in authentication but additionally ensures reproducibility of herbal goods in promoting [2].

*P. cineraria* are small to medium size tree evergreen and thorny. It is also known as “wonder tree” and “king of desert” as all the parts of tree are useful. It is a rare medicinal tree and can grow in very harsh climatic conditions and in poor soil. It is the State tree of Rajasthan, India [3]. The importance of the medicinal value of

this tree has been highlighted in our ancient literature such as *P. cineraria* have a potential new antimicrobial activity [4]. A thorn of *P. cineraria* has been detected *in vivo* in two cases of chronic skin granulomas [5]. Stem bark shows anti-inflammatory properties [6]. The primary compounds that are thought to provide the protection afforded by fruit and vegetables are the antioxidants. The bark of the tree has abortifacient and laxative properties and is also used as a remedy for rheumatism in the central provinces. The leaves are of high nutritive value and locally called "Loong". Leaf paste of *P. cineraria* is applied on boils and blisters, including mouth ulcers in livestock [7] the smoke of the leaves is considered good for eye troubles [8]. Leaf extracts of *P. cineraria* have been reported to show antibacterial [9] anti-hyperglycemic, antihyperlipidemic and anti-oxidative activities [10]. Khejri or Shami was reported to have antimicrobial activity against *S. aureus* and *E. coli* [11]. Leaves and pods are extensively used as fodder for cattle, camels and goats. *Prosopis* species have also been extensively used in indigenous system of medicine as folk remedy for various ailments like leprosy, dysentery, bronchitis, asthma, leucoderma, pile, muscular tremors and wandering of the mind [12, 13]. It is also known to possess anthelmintic, antibacterial, antifungal, antiviral, anticancer and several other pharmacological properties.

It is also known to possess anthelmintic, antibacterial, antifungal, antiviral, anticancer and several other pharmacological properties. Leaf infusion is used on open sores on the skin [14-17]. In view of the various medicinal constituents and uses credited to *P. cineraria* endeavor is made to examine anatomical and other physicochemical parameters required for quality control of the crude drug material. Thus, this pharmacognostic research was undertaken with an aim to assess various parameters like macroscopic, microscopic, physicochemical and phytochemical properties of *P. cineraria*.

## 2. MATERIALS AND METHODS

The chemicals and all reagents mentioned in the present experimental research were of high purity (98–99%) and analytical grade. Chemicals were purchased from reliable firms and sources.

### PLANT MATERIAL

Leaves of *Prosopis cineraria* were collected from Ranthambore Tiger Reserve area located in Sawai-Madhopur district of Rajasthan, India. The collected plant was identified by Dr.D.V Singh Senior scientist and Head of Krishi Vigyan Kendra, at Banasthali Vidyapith, Rajasthan, and authenticated at Herbarium unit of Banasthali Vidyapith, Rajasthan, India (Herbarium No.-BURI-391/2021).

### Organoleptic/ Macroscopic Characterization Of Plants

The weight, colour, surfaces, venation, presence or absence of petiole, the apex, border, base, lamina, texture, aroma, and tastes of the plant sections were recorded in the Organoleptic/ Macroscopical evaluation, and the results are shown in table 1.(18)

### Microscopic Characteristics

Microscopic studies were carried out by cutting thin hand sections of the midrib and lamina region of the leaf into thin sections manually with the sharp cutting edge of the blade of *P. cineraria*, clearing them with chloral hydrate, staining them with phloroglucinol and Conc. HCl, and mounting them in glycerin for observation and confirmation of their lignifications with a light microscope (19). The results are presented in table 2.

### Physicochemical Parameters Studies

Physicochemical parameters were determined for crude drug according to the procedures given in WHO guidelines. The cold maceration method was used to obtain ash values such as acid insoluble ash, water soluble ash, total ash, and extractive values such as water and alcohol soluble extractive value. Results were recorded in table 3 (20).

### Determination of pH range

(1) **pH of 10%(w/v) Solution-** The pH of the filtrate was examined using a standardized glass electrode pH meter after an accurately weighed 10 g of *P. cineraria* leaf were dissolved in an accurately measured 100 mL of water and filtered.

(2) **pH of 1%(w/v) Solution-** 1 g of *P. cineraria* leaf were carefully weighed, diluted in 100 mL of water, filtered, and the pH of the filtrate was tested with a calibrated glass electrode pH meter.(21)

### Loss On Drying Value

After accurately weighing 10 g of plant material, it was placed in a tarred evaporating dish (without first drying it). This was weighed after drying for 5 hours at 105°C. We continued drying and weighing every 1 hour until we reached a steady weight. After drying for 30 minutes and cooling for 30 minutes in a desiccator, a constant

weight was achieved when the difference between two consecutive weights was less than 0.1 g. The loss on drying was calculated using formula (1) (22).

$$\% \text{ loss on drying} = \frac{\text{Weight loss in (g)}}{\text{Initial weight in (g)}} \times 100$$

1

#### Determination Of Total Ash Value

The total ash value was calculated using approach, with some minor adjustments. In the silica crucible, 2-3gm of powdered medication was accurately weighed. The powder medication was burnt at temperatures ranging from 500 to 6000 degrees Celsius until the sample turned white, indicating the lack of carbon. It was then weighed after cooling in a dessicator. The formula 2 was used to compute the percentage of total ash. (23)

$$\text{Ash value} = \frac{\text{Initial weight} - \text{Final Weight}}{\text{Initial weight}} \times 100$$

2

#### Acid Insoluble Ash Value

standard's procedure was used to analyse acid insoluble ash. The whole ash was heated for 5 minutes in 25ml dilute HCl, cooled, and filtered. The tarred grouch crucible was used to collect the insoluble substance, which was then washed with hot acidulated water, burned, cooled, and weighed. The % acid insoluble ash was estimated using the air dried drug as a reference.(23)

#### Water Soluble Ash Value

It was used to investigate water soluble ash, with some minor modifications. Total ash was heated for 5 minutes with 25ml water, then cooled and filtered. The insoluble debris was collected on ash-free filter paper, rinsed in hot water, and burned to a constant weight for 15 minutes at a temperature below 450°C. The weight of insoluble materials was deducted from the overall ash weight. The difference in weight represents the water soluble ash, and the percentage of water soluble ash was estimated using the air dried drug as a reference.(23)

#### Residue On Ignition /Sulphated Ash Test

A silica crucible was heated to redness for 10 minutes before being weighed after cooling in desiccators. A total of 2 g of material was weighed and placed to the crucible. It was initially slowly ignited until the substance was completely burned. The residue was then cooled and wet with 1 mL pure sulfuric acid, gently heated until no white vapours were produced, then burned at  $800^{\circ} \pm 25^{\circ}\text{C}$  until all black particles had vanished. The ignition took place in an area that was free of air currents. After allowing the crucible to cool, a few drops of pure sulfuric acid were poured to it and heated. Ignited as previously, waited for it to cool, then weighed it. The procedure was continued until the difference between two successive weighing was less than 0.5 mg. using the air dried medication as a reference, determine the percentage of sulphated ash. (21).

#### Determination Of Extractive Value

The plant pieces were ground into a coarse powder and cold macerated in a variety of solvents, including Methanol, Hydroalcohol, and water. The percentage of extractive value was computed using the formula 3 and the leftover extract was weighed. The results shows in table 4.

$$\% \text{yield} = \frac{W_1 \text{ (g)}}{W_2 \text{ (g)}} \times 100$$

Formula-3

Where W1= Weight of the crude extract residue obtained after solvent removal (g)

W2= weight of defatted ground material before maceration (g)

#### Fluorescent/Behaviour Study of Powder

Fluorescence study of obtained leaves of selected plants powder was performed as per. A little amount of plant powder was placed on a grease-free, clean microscopic slide, and 1-2 drops of freshly produced reagent solution

were added, mixed with gentle tilting of the slide, and allowed to sit for a few minutes. The slide was then placed inside the UV chamber and exposed to visible light, as well as short (254 nm) and long (365 nm) ultra violet radiations. The colours observed by using various reagents under various radiations were recorded. Obtained results were recorded and shown in the table 5. (24)

#### Fluorescent Analysis of Extracts

Plant extracts were examined in daylight, in the short and long wavelength ranges. The outcomes were recorded and displayed in table 6. (24)

### 3 Results And Discussion Standardization Of Plant Material (Pharmacognostic Study) Macroscopic Characteristics

The standardization of the herbs used determines the safety and efficacy of herbal products. (25, 26). Pharmacognostic studies were performed for the leaves of *P. cineraria* the results are in agreement to the reported literature. The Table 1 and Figure 1 show the organoleptic and macroscopic properties of the leaves of *P.cineraria*. It's a thin evergreen thorny tree with light yellowish-green foliage and slender branches equipped with conical thorns. Compound, bipinnate, stipulated, with stipules transformed into spines, alternating, and petiolate leaves.

**Table 1** Organoleptic/Macroscopic characters characterization of plants parts

Characters	leaves
Arrangement	Bipinnately compound and alternate in arrangement
Size	2.5 cm (length) and 1 cm (breadth)
Shape	oblong
color	Light green
odour	Odourless
Taste	Bitter
Appearance	Smooth
Margin	Entire
Apex	Apiculate
Base	Obtuse
Petiole	0.5-4 cm long (Present)
Texture	Glabrous
Veination	Reticulate
Outer surface	Smooth



**Figure 1:** Morphological features of leaves of *P.cineraria*

#### Microscopical Characters

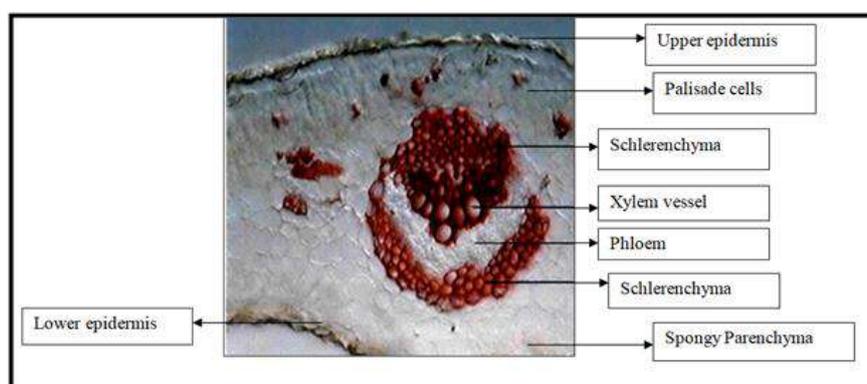
##### Transverse Section of Leaf

It is a dorsiventral type of leaf.

**Table 2** Microscopic characters of leaf

Parameters	Observation
Lower Epidermis	It consists of thin walled, rectangular, polygonal cells covered with cuticle. It consists of a few simple unicellular trichomes. Above

	lower epidermis collenchymatous cells are present.
<b>Upper Epidermis</b>	It consists of thin walled, rectangular, polygonal cells covered with cuticle. It consists of a few simple unicellular trichomes.
<b>Vascular Bundle</b>	It is collateral open type of vascular bundle. Xylem consists of xylem vessels, tracheids, and xylem parenchyma. Metaxylem is pointed towards lower epidermis. Phloem is present on the lower side of the xylem vessels.



**Figure 2** Transverse section of leaf at 10x

#### Standardization Of Crude Plant Material

Organoleptic and physicochemical characteristics were assessed in dried leaves of *P. cineraria* that had been collected and pulverized. The organoleptic and physicochemical findings were consistent with the *Ayurvedic Pharmacopoeia of India (API)* criteria, showing that the plant components were of good quality. Physicochemical characteristics such as total ash, water soluble ash, acid-insoluble ash, and sulphated ash, loss on drying, and pH content were determined to be in compliance with API criteria, showing that the raw materials were of good quality, as indicated in Table 3. The extractive values and fluorescence characteristics of extracts in visible and UV light are reported in the table 4, table 5 and table 6 .

**Table 3:** Physicochemical parameters of Bark and leaves

Parameters	leaves
pH of 1%	6.5
pH of 10%	5.9
Loss on drying	10± 0.5
Total ash value	5.5±0.3
Acid insoluble ash	1.0±0.1
Water soluble ash	4.1±0.26
Residue on ignition/Sulphated ash	2.2±0.2

Mean±SD, n=3 SD-Standard Deviation

**Table 4:** Extractive values and % Yield of *P.cineraria* Bark and leaves extracts

Extract	Yield (% w/w)	Color of extract
LME	21.6	Dark Green
HALE	12.9	Black
LAE	25.3	Dark Brown

**LME – Leaves Methanol Extracts, HALE – Hydroalcohol Leaves Extract, LAE- Leaf Aqueous Extract**

The medicinal plants hold a prominent place as one of the most important sources of drug development; maintaining efficacy requires standardization of a crude medicine and precise identification of the plant. The parameters for standardization include: physicochemical, phytochemical, fluorescence analysis, macroscopic, microscopic and powder study of the plant. All of these factors will be evaluated to assure and assist in

preserving the plant drug's quality, purity, and efficacy for its numerous applications. It will protect the plant medication from intentional or unintentional adulteration and replacement. (27).

Loss on drying, total ash, acid insoluble ash, water soluble ash, and sulphated ash were among the physicochemical parameters determined. The results were consistent with those previously published. It is important to evaluate the physical constants of plant crude drugs since they help in identifying adulterants and or improper handling of the plant material (28). The results of loss on drying for this plant were about for leaves was 11% indicating that the drying process was efficient which is not too high, thereby discouraging the growth of bacteria, fungi, or yeast. This is an essential parameter, since it measures the efficiency of plant drying process which in turn is indicative of the drug's stability during storage period (29) The ash content or ash value, which simply signifies inorganic salts naturally contained in crude medicine or sticking to it or purposely added to it as a form of adulteration, is the residue left following combustion of plant material.

Total ash, acid-insoluble ash, water-soluble ash, and sulphated ash were all used to calculate the ash value. The total ash is used to determine how much material is left after it has been ignited. This contains both 'physiological ash,' which comes from plant tissue, and 'non-physiological ash,' which is the remnant of foreign particles sticking to the plant surface. Acid-insoluble ash is a type of total ash that measures the amount of silica in a substance, such as sand or siliceous earth. The water soluble percentage of total ash is called water soluble ash (30 : 31).

Total ash of crude powder of leaves of *P. cineraria* was 5.5%, acid insoluble ash of leaves was 1.0% and water soluble ash for leaves was 4.1%. Total ash, acid insoluble ash, and water soluble ash are all high in *P. cineraria* leaves, indicating that inorganic materials and non-physiological matter like silica are present in slightly high amounts. Whereas the leaves had a slightly acidic pH. The fact that the production of the bioactive principle of the medicinal plant is impacted by a number of intrinsic and external factors is suggested by the variation in extractable matter in various solvents. As described by, high alcohol soluble and water soluble extractive values indicate the presence of polar substances such as phenols, tannins, and glycosides (32). All of these factors are important in putting together an appropriate monograph for correct identification. Total ash is made up of physiological ash, which comes from plant tissue, and non-physiological ash, which comes from pollution in the atmosphere, such as sand and dirt. Because plant materials typically contain a high degree of physiological ash, calcium oxalate in particular, total ash content alone is insufficient to evaluate the quality of herbal medicine. As a result, the acid insoluble ash content is another indicator of herbal medicine quality (33).

The purity of the crude pharmaceuticals can be determined by extractive values in a specific solvent; exhausted or contaminated drugs can be easily identified. The extractive values show the nature and quantity of chemical ingredients contained in the crude medication, as well as their solubility in a given solvent (34). In *P.cineraria* plant the extractive value was maximum in leaf aqueous solvent (25.3%).

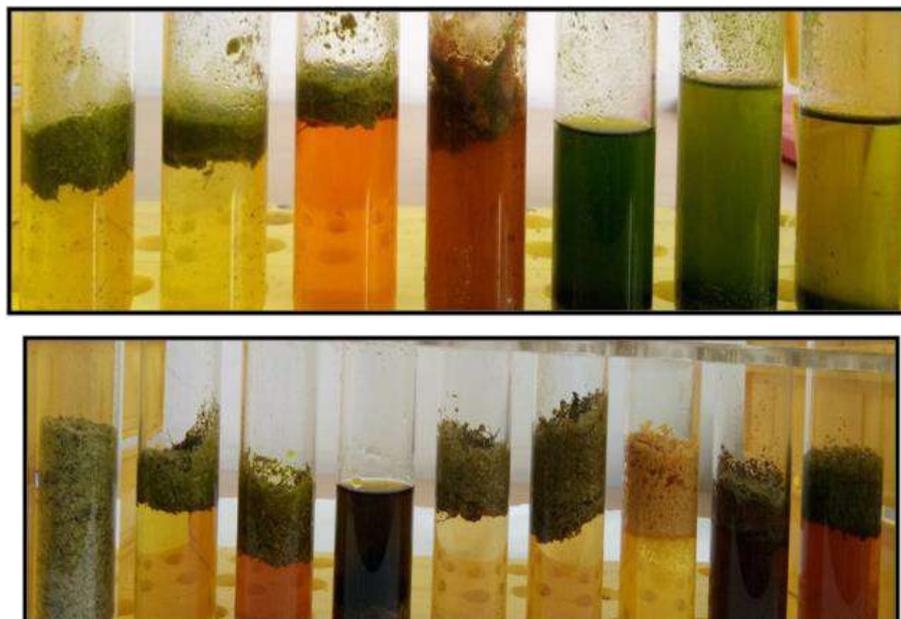
### FLUORESCENCE ANALYSIS

Fluorescence analysis is a requirement for first-line crude drug standardization. Because light with a lot of short wavelengths is particularly active in causing fluorescence, ultraviolet light causes fluorescence in many compounds that aren't visible in daylight. Fluorescence analysis is a valuable and necessary parameter for evaluating crude medicines qualitatively. The powdered drug showed divergent fluorescence characters in the presence of ultra-violet light because of quality of various constituents in the medication. It's a crucial criterion for evaluating crude medications pharmacognostically (35).

Table 5 Behaviour study of powder

Chemical treatment	Leaf
Powder as such	Light green
Powder+ Distilled water	Dark green
Powder+ picric acid	Green
Powder+ GAA	Black
Powder+1N HCl	Olive green
Powder+1N H <sub>2</sub> SO <sub>4</sub>	Grey
Powder+ conc. HNO <sub>3</sub>	Yellow
Powder+ FeCl <sub>3</sub> (5%)	Dark brown
Powder+ Iodine soln (5%)	Green
Powder+ Ammonia soln.	Dark Brown

<b>Powder +1N NaOH</b>	Red
<b>Powder+ Potassium dichromate</b>	Brown
<b>Powder+ HNO<sub>3</sub>+NH<sub>3</sub> Soln</b>	Yellowish
<b>Powder+ Methanol</b>	Green
<b>Powder+ ethanol</b>	Green
<b>Powder +Toluene</b>	Olive green



**Figure 5.5** Behaviour study of leaf powder with different chemical reagents

**Table 6** Fluorescence study of leaf

<b>Chemical Treatments</b>	<b>UV short ( 254nm)</b>	<b>UV long (366nm)</b>	<b>Visible</b>
Powder as such	Grey	Light grey	Green
Powder+ Distilled water	Light grey	Brown	Green
Powder+ picric acid	Dark green	Grey	Yellow
Powder+ GAA	Green	Grey	Light green
Powder+1N HCl	Grey	Light Brown	Light green
Powder+1N H <sub>2</sub> SO <sub>4</sub>	Light green	Grey	white
Powder+ conc. HNO <sub>3</sub>	Dark brown	Reddish brown	Light brown
Powder+ FeCl <sub>3</sub> (5%)	Grey	Brown	Light green
Powder+ Iodine soln (5%)	Dark green	Brown	Green
Powder+ Ammonia soln.	Yellow	Dark Brown	green
Powder +1N NaOH	Dark green	black	Black
Powder+ Potassium dichromate	Dark green	Light Brown	Yellow
Powder+ HNO <sub>3</sub> +NH <sub>3</sub> Soln	Yellow	Brown	Creamy white
Powder+ Methanol	Dark green	Black	Light green
Powder+ ethanol	Dark green	Dark Brown	Light green
Powder +Toluene	Dark green	Black	Green

The pharmacognostic studies are essential and have to be performed for all the medicinal plants which are being studied for any particular activity. They act as reference standard and are diagnostic features of that particular plant. Similar studies are reported for many other plants by other researchers (36-39).

### CONCLUSION

Standardization of herbal drugs is very much crucial because they are produced from heterogeneous sources which could result in variations. These kinds of variations can cause spurious results in various pharmacological and phytochemical studies. *P.cineraria* leaves is recognized for many therapeutical properties, therefore, the

current study might be beneficial to supplement the information in respective to its identification, authentication, and standardization; no such information is available for the same till date.

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#### **Authors' Contributions**

All authors' (V Pandey, P Danai, and T Agrawal) contributed equally to this work. V.Pandey conducted the actual study and wrote the manuscript. P.Danai was involved in developing the idea and designing of the study. T Agrawal supervised the work and did the proof reading of the final manuscript. All authors approved the submission of the final version of the manuscript.

#### **Conflicts Of Interest**

No conflict of interest has been reported by all the authors.

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## A Brief Study on Artificial Intelligence in Cancer Research, Diagnosis and Therapy

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### ABSTRACT

Artificial intelligence in oncology has exploded in popularity in the past few years. Artificial intelligence solutions have been created to address several cancer-related issues. Medical center's health systems are developing artificial intelligence technologies and digital businesses to assist clinical decisions, extend cancer care availability, and enhance clinical efficiency while providing safe, high-value oncology treatment. In image processing, predictive modeling, including precision oncology treatment, Artificial intelligence in cancer treatment has shown precise technical execution. However, Artificial intelligence tool use is limited, and the influence of Artificial intelligence on clinical satisfaction is unknown. Training and helping to educate the oncology workers in Artificial intelligence and machine learning are concrete actions that relevant players can take to conquer obstacles to Artificial intelligence implementation in cancer treatment. This study focuses on the application of AI in Oncology and how it is used in cancer diagnosis and treatment.

**Keywords:** Artificial intelligence (AI), AI in Oncology, Cancer Diagnosis, Cancer Therapy, Cancer Treatment

### 1. INTRODUCTION

AI is an area of computer science aimed at developing 'intelligent' computers or computer networks that can mimic different human 'cognitive' skills such as learning, thinking, and perception. The health-care industry has likewise been witnessing Artificial intelligence's rapid advancement. Physical Artificial intelligence incorporating sophisticated robots and medical gadgets is being used to give clinical outcomes and execute difficult procedures, whereas ML and algorithms have made their way into investigations<sup>[1]</sup>. A cancer diagnosis may be Artificial intelligence's most altruistic and perplexing issue in the realm of health too far. Artificial intelligence integration into many parts of cancer detection will assist in serving bigger populations, "personalise" oncologic practice, eliminating human mistakes, and saving money and time. On the other hand, Artificial intelligence has its own set of problems. This article seeks to provide a comprehensive overview of Artificial intelligence in diagnostic procedures and the problems that lay ahead, however it is not complete in breadth or depth.

The goal of AI is to give robots the capacity to think. It makes use of computer networks that are designed to look like organic neural systems. AI may be divided into two categories based on skills and functionality: Type 1 and Type 2. Artificial Narrow Intelligence (ANI) is a term that encompasses all of the AI that has been developed yet. These robots can only accomplish a single or restricted number of activities independently while demonstrating human-like talents, but they cannot duplicate our multifunctional abilities<sup>[2]</sup>. To do these tasks, AI employs a variety of algorithms, which are "sequences of procedures to be taken by computers in computations or other problem-solving activities." Whereas a standard algorithm is made up of pre-programmed, inflexible instructions that are performed each time the computer meets a trigger, AI may adapt and generate new algorithms in reaction to learned inputs without the need for human interaction. Rather than depending exclusively on the inputs, it was built to identify. The system learns to develop, adapt, and expand when new data sets become available. ML, a subset of Artificial Intelligence, is concerned with the creation of algorithms that can analyse incoming data and utilise statistical analysis to find patterns and make conclusions without having to be actively coded. When fresh data is provided, organized data sets are utilized to train the computer, which then uses the 'found patterns' to solve a problem. If the outcome is erroneous, though, they must be 'taught.' Numerous services that provide automatic suggestions to consumers, such as on-demand music streaming services, employ this method. DL is a branch of machine learning that uses a type of structure of ANNs to extract higher-level characteristics from raw data<sup>[3]</sup>. The number of layers between them maybe 1000, giving rise to the phrase DL. Unlike typical programs that evaluate information in a linear form, DL's hierarchical operating style allows computers to handle unstructured data in a non-linear manner without human

interaction. Every layer receives input from the one below it and transmits its output to the one above it, and so on. In the same way that the human brain learns to spot patterns on its own, the machine eventually learns to self-correct and make intelligent judgments<sup>[4]</sup>. Convolutional Neural Network and Recurrent Neural Network are the most prevalent Deep Learning variants RNN. Recurrent Neural Network can manage sequence information like word and voice, whereas the former is employed for picture categorization.

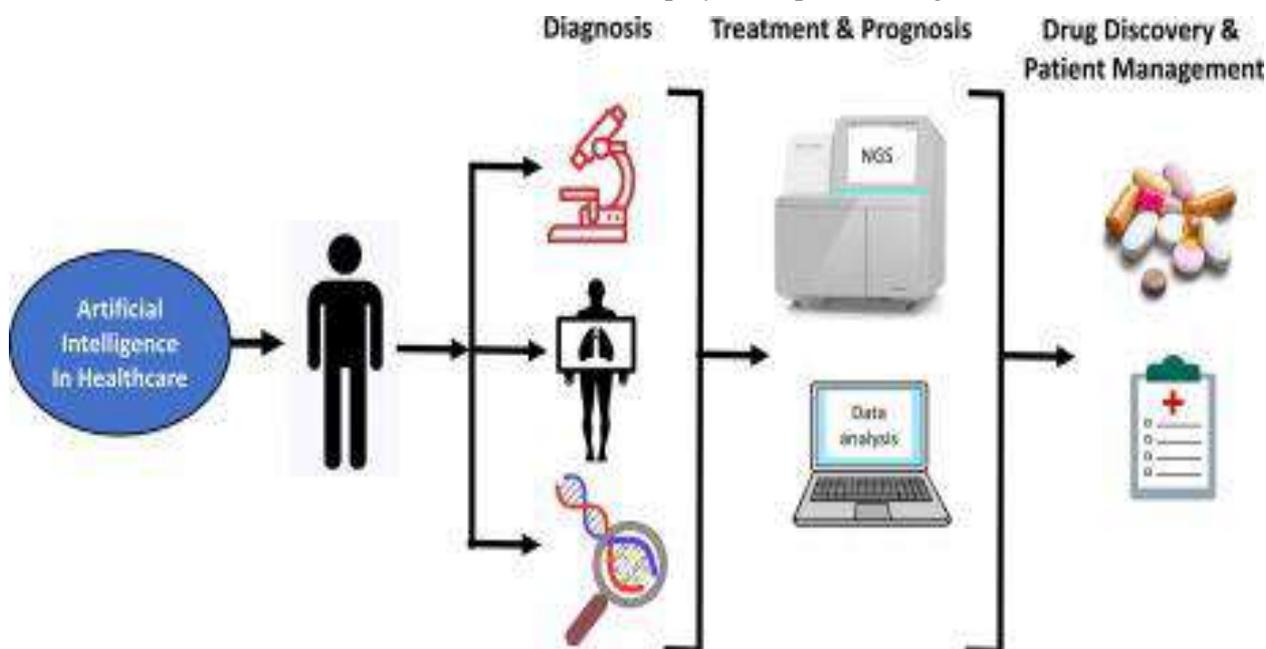


Figure 1. AI in Oncology

## 2. AI IN CANCER RESEARCH

Medical practitioners have recently increased their usage of Artificial Intelligence in cancer detection. Researchers at Tulane University revealed that Artificial Intelligence could identify and diagnose colorectal cancer and or better than pathologists by analysing tissue images. Approximately 13,000 photos of colorectal cancer were collected from 8,803 patients and 13 separate cancer facilities in Germany, China, and the US by the researchers. The investigators then created a ML software using photos chosen at random by technicians<sup>[5]</sup>. The algorithm can distinguish photos of colorectal cancer, which is among the most prevalent reasons for cancer-related fatalities in Europe and the USA, as per researchers. The group of researchers contrasted the ML method to pathologists' work after constructing a performance measuring tool. According to the research, the average pathologist got roughly 0.969 for accuracy in diagnosing colorectal cancer. In contrast, the software scored 0.98, indicating that the algorithm was somewhat more reliable than pathologists' manual information. Researchers anticipate that the findings will motivate pathologists to employ more prescreening technologies to speed up identification.

Artificial Intelligence can not only identify cancer early, but it also can improve the accuracy of diagnosis. New York University researchers constructed an Artificial intelligence technology taught to spot similarities within thousands of breast ultrasound pictures to assist clinicians in diagnosing<sup>[6]</sup>. The Artificial intelligence technique improved radiologists' ability to reliably diagnose breast cancer by 37percent when evaluated on 44,755 finished ultrasound tests. Furthermore, the technique reduced the number of clinical specimens and biopsies required to confirm malignancies by 27%. In a news release, senior study investigator Krzysztof Geras, Ph.D., said, "Our research shows how AI can help radiologists trying to read breast ultrasound tests to discover only those that show the real breast cancer in women and to avoid confirmation by biopsy in instances that transform out to be benign."

Current technologies may also benefit from Artificial intelligence advancements to enhance patient outcomes. Medical experts may utilise Artificial intelligence technology to swiftly and reliably select breast MRIs in patients with dense breast tissue to exclude those without malignancy, as per new research. Although mammography helps to reduce breast cancer-related mortality, it's much less effective in females who have extraordinarily thick breast tissue<sup>[7]</sup>. Furthermore, females with exceptionally dense breasts are three to six times more likely than females with virtually totally fatty breasts and two significantly more likely than the ordinary

female to get breast cancer. As per the researchers, they are merging mammography skills with Artificial Intelligence may drastically decrease radiologists' burden while improving patient results.

### 3. AI IN CANCER DIAGNOSIS

Whenever examining a patient's symptoms, doctors often depend on their personal and professional competence. While such medical facts and information may be assessed to identify illness, the precision of the analysis cannot be guaranteed, so this is difficult to avoid committing a fault. Such feature emphasises the human brain's inadequate capability to comprehend large range of info<sup>[8]</sup>. Artificial Intelligence models, and from the other side, excel at coping with massive amounts of information. Due to the speed and efficiency of developing teaching big data, integrated processing and extraction may allow for more accurate illness detection. They also outperform professional diagnosis in terms of usefulness and accuracy. The term "deep learning" states to a collection of digital simulations that have lately been utilised to create breakthroughs in how computers retrieve data from photographs<sup>[9-10]</sup>. Deep Learning algorithms have been used to solve problems in a variety of medical specialities, and in certain situations, they have outperformed human expertise. Deep learning might also be applied to recover data from clinical images that would otherwise be ignored by individual examination, and this data could be used to evaluate molecular condition, forecast, or therapeutic response. CNNs' diagnostic ability was superior to most other dermatologists, though not all.

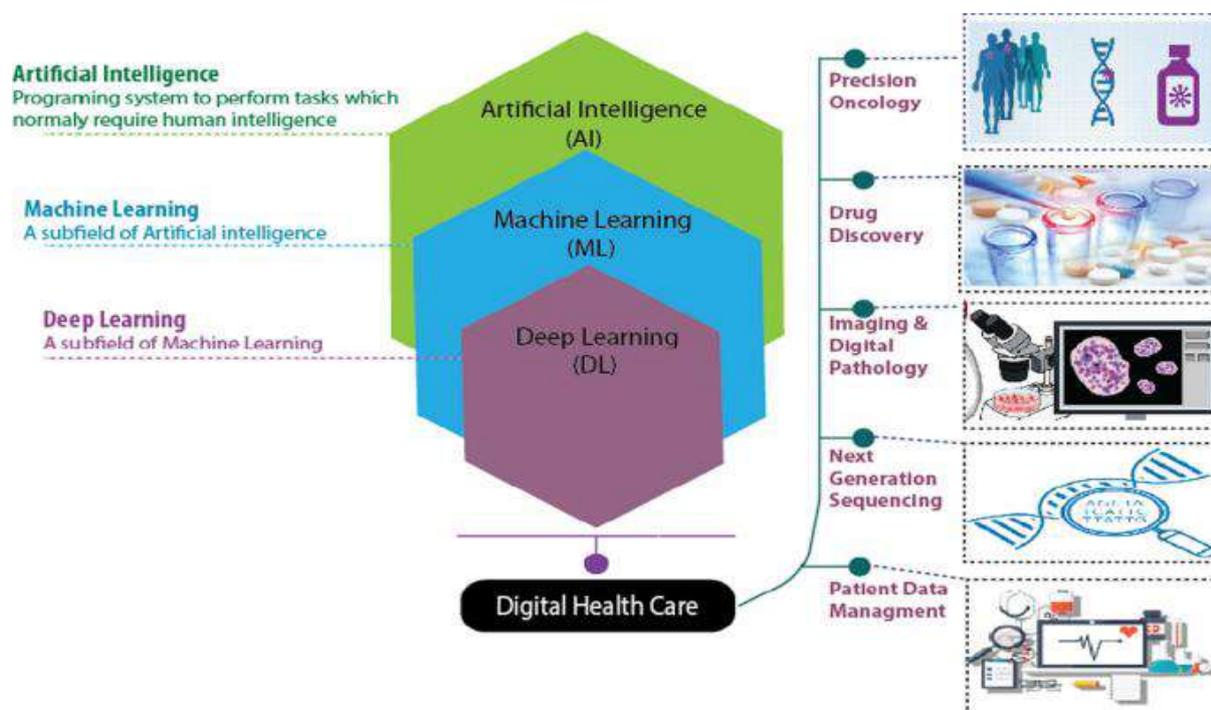


Figure 2. AI in Diagnosis of Cancer

#### 3.1 Solid tumor diagnosis

The adoption of a DCNN model to analyse sonographic imaging information from medical ultrasounds has recently been proven to increase the diagnosis accuracy of thyroid cancer. "When comparing to a group of competent radiologists, the deep convolutional neural network model had identical sensitivity and better specificity in detecting patients with thyroid cancer".

The deep convolutional neural network model's superior technical efficiency needs further examination via randomised clinical trials. Hu believes that ML algorithms can have a significant impact on clinical practice<sup>[11]</sup>. Another research used the highest number of photos to date to design and verify deep convolutional neural network algorithms. Nonetheless, the reliability in three small-scale procedures for evaluating was insufficient, ranging from 0857 to 0889. Some other research found that Artificial Intelligence models' technical efficiency should be carefully tested in a variety of geographical conditions. In the next 10 years, Mori expects tremendous advancements in AI applications for gastrointestinal endoscopy. A CNN-CAD method that relies on endoscopic images was built to evaluate invasion depth and select patients for surgical removal.

#### 3.2 Non-solid tumor diagnosis

The findings of the group besides distinct assessments for different forms of NHLs show that a mixture of proliferation-associated criteria, instead of a single measure, allows for better differentiation across lymphomas

with differential development parameters in non-solid tumours. The application of Deep Learning in the automated assessment of “hematoxylin- and eosin-stained histological” pictures led in a 5.06 percent F-measure score in the identification job and a 1.09 percent increase in the overall accuracy for the classification problem. Furthermore, a Deep Learning algorithm known as LYmph Node Assistant, or LYNA, was able to diagnose “metastatic breast cancer in sentinel lymph node biopsies”, increasing pathologist efficiency and lowering false negative rate<sup>[12]</sup>. Haenssle contrasted a CNN's diagnosis accuracy against 58 dermatologists. The majority of dermatologists outperformed the CNN, indicating the value of Artificial Intelligence in diagnostic techniques.

### **3.3 Integration of AI in medical imaging of cancer**

Artificial intelligence has been used in a variety of medical imaging domains, including “CT and magnetic resonance imaging (MRI)”, to aid in precise analysis in addition to action. “Using 3D multiparametric MRI data supplied by the PROSTATEx challenge, we created a unique DL architecture (XmasNet) based on CNNs for the categorization of prostate cancer lesions. In the PROSTATEx competition, their suggested model outperformed 69 techniques among 33 competing groups, with the second-highest AUC score (0.84)”. This research has shown that Deep Learning has a lot of promise for cancer imaging<sup>[13]</sup>. According to their results, deep Learning with the DCNN beats non-Deep Learning with the SIFT image representation and BoW in identifying entirely computerized PCa patients from BCs individuals. These findings demonstrated that Deep Learning might be used in various organ imaging modalities such as Magnetic resonance Imaging, Computed tomography, and PET scans. Wang created a new Their proposed non-invasive and preoperative technique may be able to predict HGSOc recurrence on a case-by-case basis<sup>[14]</sup>. As a result, the prognostic analysis technique may derive prognostic biomarkers from CT data without the need for follow-up. Medeiros developed a new Deep Learning method for assessing fundus pictures and calculating the degree of neuronal injury, which can subsequently be used to detect and phase glaucoma. Furthermore, the Deep Learning procedure has the potential to transcend the limits of human labelling and be used in other fields of ophthalmology.

## **4. AI IN CANCER THERAPY**

### **4.1 Artificial intelligence in medicine**

Artificial Intelligence allows computers and robots to imitate intelligent human behaviour, build medicine formulas, aid in clinical diagnostics and robotic surgical procedures, create clinical statistical datasets, and analyse the cellular construction of individual illnesses such as cancer. Artificial Intelligence has both a virtual and real influence on medicine<sup>[16]</sup>. The digital element is based on Deep Learning information management systems and, therefore can understand data for EHR and aid physicians in making precise decisions. To increase learning via experiences, Deep Learning employs a mathematical method<sup>[15]</sup>. The physical model of Artificial Intelligence, on the other hand, may aid in “robotic-assisted surgery and nano-robotic drug delivery systems”. In clinical diagnostics, the application of logistic data analysis and Deep Learning allows Machine Learning to reason and assists clinicians in making accurate treatment recommendations<sup>[17-18]</sup>. Whenever Artificial Intelligence-based “IBM Big-Blue” ultimately beat “World Chess Champion Gary Kasparov” on May 11, 1997, it received widespread acclaim from the scientific world. Artificial Intelligence can now resolve difficult problems, such as complex biological concerns, and has been employed in robotic surgery for heart valve reparation, gynaecological illnesses, including prostatectomies-related procedures, and is expected to play a big part in the future fight in contradiction of cancer.

There are 3 types of ML procedures:

1. Supervised learning;
2. Unsupervised learning; and
3. Reinforcement learning.

The significance of Artificial Intelligence in medicine has grown as a result of breakthroughs in molecular medicine and genetics made possible by computational ecology algorithms and data systems<sup>[19]</sup>. The finding of therapeutic targets has been claimed to have reached a major milestone thanks to an “unsupervised algorithm of protein–protein interaction”. An evolutionary embedding algorithm was used to identify new DNA variations as early-stage risk variables for several human illnesses, and cancer<sup>[20]</sup>. The use of advanced medical gadgets such as robots to monitor patient serious problems in real-time "care bots" especially for elderly individuals, as well as to aid surgeons in surgery is a corporeal division of Artificial Intelligence in medication. The below given figure depicts how steps are taken in cancer therapy using AI.

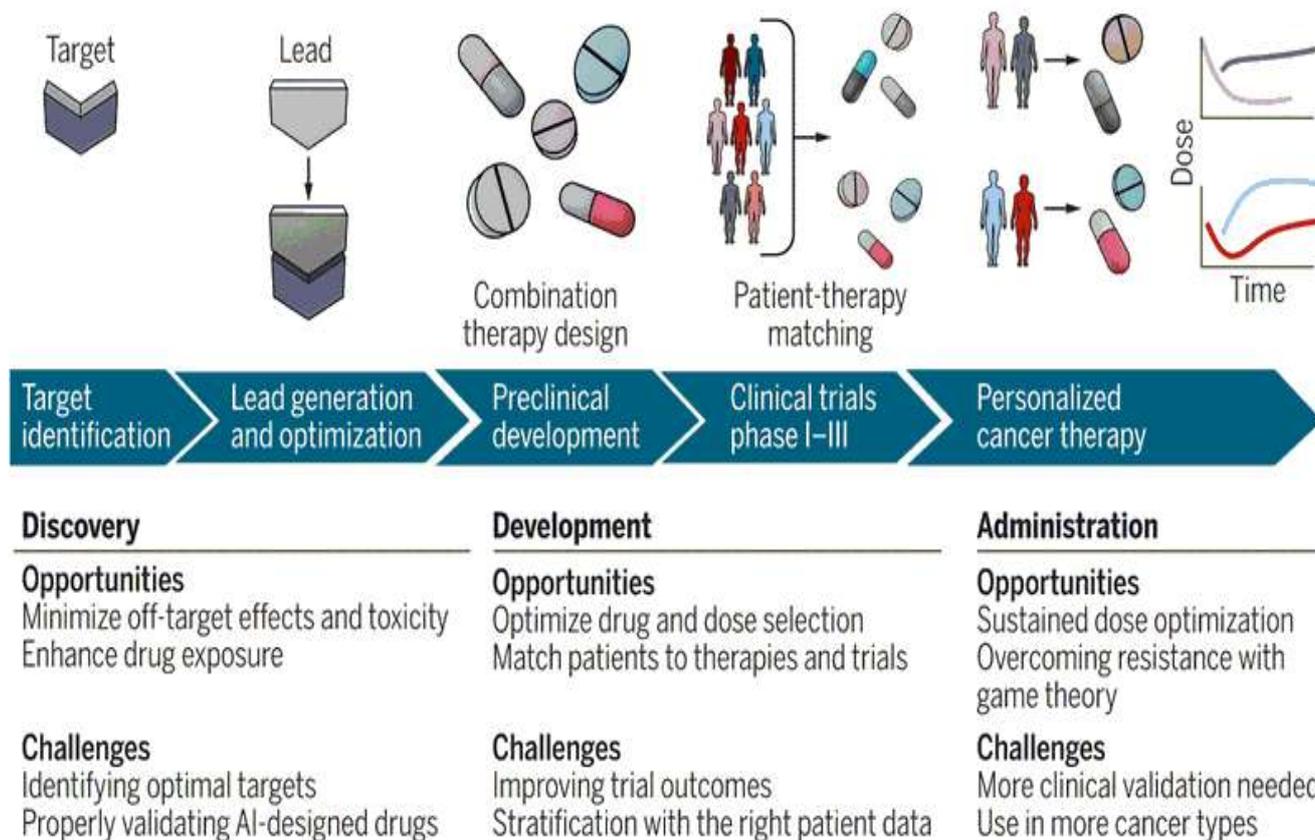


Figure 3. AI in Cancer Therapy

#### 4.2 AI in surgery

An exciting area of study is novel Artificial Intelligence-based applications and current developments in surgery. Oncologists have relied on clinical machine interaction for decades. Artificial Intelligence aid has been shown to reduce the occurrence of breast conserving surgery by 30.6 percent, while in earlier procedures, “high-risk patient tissue” samples were only proven caring later surgical procedure<sup>[21]</sup>. In today's clinical practice, machine learning algorithms to reliably forecast “high-risk cancer lesions using image guided needle biopsies” and pathology updates are critical: they may reduce the number of unnecessary surgical excisions. Different research groups have created random forest ML models to predict cancer endurance and long-term reasoning prognosis<sup>[22]</sup>. The random forest Machine Learning model was used to examine 335 high-risk cancer patients in a clinical investigation, and it was discovered that it might avert approximately one-third of unnecessary procedures. Because breast cancer is the most common malignancy among females globally, various Machine Learning supporting studies have recently been done. In these investigations, extreme boost, neural network, decision tree, and svm classifier models were employed to identify and obtain graphic cancer signatures to develop new predictive criteria for reliable survival data.

The CSC has recently been highlighted for individual and community data processing for surgical operations in the operating theatre. The computational technique is applied in some clinical contexts in which an ANN based on digital image processing was used to produce a pre-operational complete risk assessment<sup>[23-24]</sup>. Machine learning aid is also accessible during surgery. Artificial neural networks may use surveillance cameras and real-time video pictures to provide supporting therapeutic judgments and forecasts grounded on entire populace information examination from the unique hereditary pool information (see Fig. below). Furthermore, the use of Machine learning and artificial intelligence may aid oncologists in determining and forecasting morbidity and mortality<sup>[25]</sup>. Similar to Siri, AI-assisted clinical and personal care management solutions are recommended after a thorough study in real-time.

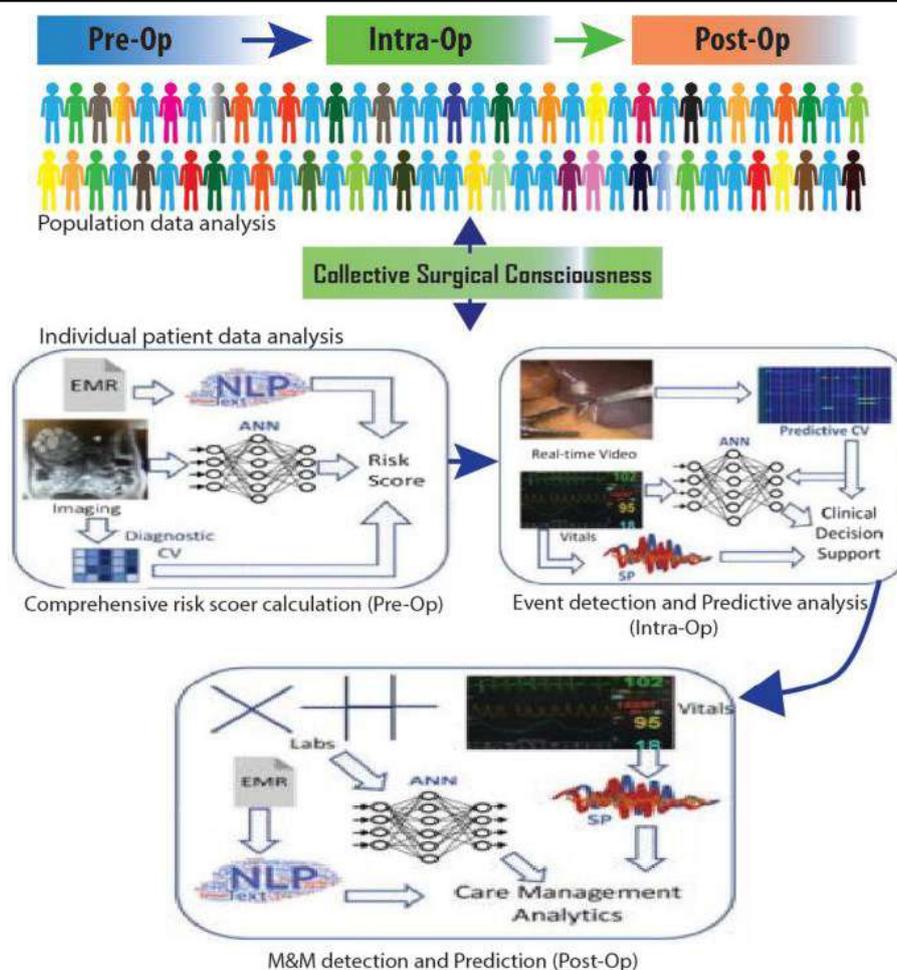


Figure 4. Figure depicting AI-based clinical analysis of data and its impact on healthcare at the individual and community level.

## 5. CONCLUSION

Oncology is a complex and difficult, yet suitable, area to design and implement Artificial Intelligence tools; due to the inherent organisational complexity of cancer healthcare provision, there is a need to interpret and synthesise huge amounts of data from various source materials, the narrow therapeutic window of diagnosis, and the heterogeneity of cancer. To present, Artificial Intelligence in oncology has shown accurate technical recognition performance processing, data modeling, and precision oncology delivery, and it might be utilised in the future to help with primary cancer prevention. However, more study is required to comprehend AI's impact on patient outcomes and costs fully. Furthermore, the hurdles to AI deployment in cancer are considerable, spanning the whole oncology care ecosystem. A massive interdisciplinary effort will be required to teach and teach the oncology profession, standardise research reporting, data sets, validation methodologies, and regulatory requirements, and finance and perform future research. As a result, in the era of big data in cancer, forming relationships across health systems, academics, businesses, and government agencies may be critical to data sets application.

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## **Education Empowerment is Manifestation to a Girl Child to remove Gender Inequality in the Society – A Study with Reference to Kadambattur Village, Thiruvallur District, Tamilnadu India**

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### **ABSTRACT**

Education is once own necessity and once own need which compensate all other need and wants of the social wellbeing. Therefore education is to be considered as the basic needs like food clothing and shelter. In this 21<sup>st</sup> century, the impact of education in the rural area is comparatively less than the urban area, especially on the girl child education. The predominant nature of the study is too embedded on the education to the girl child (Beti Padhao). The researcher adopted the Kadambattur Village in Tamilnadu in India where there are more than ten thousand people in and around that village. There are 5 government schools, among them only one school is girl's school. This study is manifested to remove gender inequality in the society and to demand the importance of girl child education. The researcher will conduct the research work on the Beti Padhao by circulating the questioner to the selected samples with help of survey and analyse the study with statistical tools. The questioner will be framed on Likert's 5 point scale pattern. The detail study will be carried out after testing the survey by Cronbach Alpha method.

**Keywords:** Beti Padhao, Child Education.

### **1. INTRODUCTION**

Education is been viewed by different perspectives, with each researcher attempting a definition to explain a process which involves the impartation of knowledge, skills, concepts, ideas and reprovng information to pupils, with the intention of making them informed and to create awareness to the society. To assume this position the study is deliberately done from the ground level of the village from Tamilnadu. The best form of education, whether formal or informal irrespective of their race, gender, and colour. It is important to note that education in all ramifications is the catalyst of development of the society, since no nation can grow beyond the quality of education delivered to her younger generation, whereas the younger generation is the future of any society and of that girl child education is the most important factor of the once society and once nation." If you educate a man you educate an individual however if you educate a woman you educate a whole family. Women Empowered means Mother India Empowered"- PT. JAWAHARLAL NEHRU the girl child education en-lights the whole world.

According to Eileen Malone Beach says that the Education, Health Care, and Income as a blessed trinity because they are so closely related, the author compare as how for the wealth and welfare is needed to the same extent the education is also required. According to the words of Napoleon Bonaparte "Give me an educated mother I will give you an educated nation." the author challenges the world that if the girl child gets educated then the whole nation will get educative.

Education is a basic right and more importantly a catalyst for economic growth and human development. Specifically, primary education is the critical enabler required to improve the economic and social scenario. We also need to ensure equal status for the girl as citizens in their own right. For any country to progress, one half of its population cannot be denied the right to education. This denial is also gross violation of many rights enshrined in the Indian Constitution, primary among them being the right to education and the right to equality.

According to Odomore, 2015 "A girl faces a lot of challenges when she gets to education" in the village and the remote areas in tamilnadu the girl's child awareness is less when compared to the urban and developed areas, the esoteric custom and patriarchal bias make these challenges more onerous and difficult. According to UNICEF, 2009, p.6 Education for women in many developing countries has been a major focus for policymakers and administration in recent years.

### **2. REVIEW OF LITERATURE**

The study enormously developed for the need for girl child education in the villages of tamilnadu, specially the research work is done in Kadambattur Village by forwarding the questioner to the selected samples. The researcher over viewed the review related to the literature and analysed the outcomes.

(Sahoo, 2016) Girl's education is a key factor in India's social and economic growth. The author states that the education to the girl child will eliminate the poverty and disqualify in the nation.

(Andres & Chavez, 2015) The author is very keen in stating that education is once own right. According to Andres & Chavez education of girls not only the benefit for herself but also of her families, society and the whole world as well. Denying girls their right to education is a detriment for many societies.

(Andres & Chavez, 2015) Education can improve an individual's abilities and bring about social change. Andres says that the ability of the social well being can be improved through the education.

(Sangeeta and Kumar, 2013) Better family planning, low mortality rates of infants and children, lower maternal mortality are some of the advantages of educating a girl.

(Ahamad and Narayana, 2015) Women are, however, denied of education in developing nations. The author states that the girl child / women education is the assets of the nation.

(Hardre and Reeve 2003) Parents treated education for a girl as insignificant. Investments in girls' education are seen as unnecessary as it is considered that a boy can only help his family financially while parents have to pay dowry marriage costs for girls. This condition is even worse in rural areas. In rural areas, the birth of girls is seen as a liability. It can be measured through the unequal gender ratio and higher dropout rates of girls that are prominent in rural areas. The root cause of the dropout of women / girl child education was less awareness among the parents community.

(Kumar et al., 2017) Parents would choose to involve their daughters in household work under such conditions rather than sending them to school.

(Upendranath, 1995) At the upper primary level, there is an increase in dropout rates, which is higher among girls than males.

(Rao et al., 2004) In all states, gender differences are predominant for school enrolment and participation.

(Singh & Rabindranath, 2019) Further access to higher education and attainment to girl's education is low among girl's students. Girls' education suffers from many factors; gender discrimination is the most prominent of them.

(Teachman et al, 1996) Some of the key obstacles to girls' education are cultural traditions, boy preference, high education prices, parental education and the financial condition and unsatisfactory school facilities.

### **3. Objective Of The Study**

The main aim and scope of the study is to retrieve the girl child education for this purpose the researcher enormously set the objective as

1. To provoke data of comparable nature of some common parameters that will give an understanding of the situation of the girl child education.
2. The researcher actively takes a series of programmes to get remedy the shortcomings on Gender Inequality in the Society.
3. To gauge the status of girl children in their family in order to predict the position of women in 21st Century.
4. The analysis followed with the feminist methodology of participant Action Research in an empirical study to test the gender equality in the education system.

### **4. METHODOLOGY**

The study is based on both primary and secondary data. The primary data is collected on structured questioner with optional type question as well as statement in likert's 5 point scale.

**4.1 Reliability:** The Researcher conducted research analysis to check the statement and variables in the present research. Cronbach alpha method is applied on the variable of Girl child education and the value obtained is 0.770 and 0.679 respectively, it show that the research instrument used in the research is highly reliable and the research instrument as be used further to verify the objective and test the hypothesis.

**4.2 Validity :** After conducted reliability test the researcher conducted the validity test in the following sets

1. Face validity

2. Content validity
3. Discernment validity
- 4.3 Face validity: Face validity is done during pre-test stage through interaction with girl child in the family and interaction with both the gender in different government schools they clearly expressed the motions about the research instrument and some sentence were modified and corrected.
- 4.4 Content validity: Content validity is done through the polite survey and the respondent expressed their opinion though questioner circulated this shows that the respondent total variance is found to be very high and content are matched for the research work.
- 4.5 Discernment validity: Discernment validity is done through the main study and application of factor analysis, factor segmentation are found to proper with high total variance therefore the research instrument passed the validity test.

## 5 DATA COLLECTION

The researcher applied convenient sampling method to collect the responses from the girl child from various part Kadambattur Village. The researchers consider government schools in Thiruvallur District for data collection purpose. The researcher circulated 40 each in all the government schools in Thiruvallur District and able to obtain 168 responses with completed responses. After scrutinising 14 of the questioner are fill with flaws hence the researcher reject those response and consider remaining 154 responses for the research. Hence the sample size of research is 154.

### 5.1 DATA ANALYSIS

After entering the coding of the questioner the researcher analysis using both univariate and multivariate statistical techniques. Factor analysis along with KMO and Bartlett test suggested exploited to measure the factor of girl child education and gender equality. Chi-squire test for sphericity is applied to test the normality of the data as well as the distribution of the sample unit.

### 5.2 Analysis And Discussion

This chapter deals with projections of result arrived at from the statistical analysis and general discussions with the regard to the result of girl child education and gender equality

**Table- 5.2** Showing the Mean, Standard Deviation of the Samples in girl child education stability

S.No	Group	Education Mean	Stability SD	Gender Mean	Stability SD
1.	Group as total	87.97	13.78	33.91	7.53
2.	Girl child above 15 years	85.13	16.51	27.88	7.85
3.	Girl child below 15 years	88.92	12.60	35.92	6.24
4.	Education below average	89.38	13.59	34.63	11.26
5.	Education above average	71.00	20.01	32.00	6.28

From the above table the mean value of education stability for the overall group shows 87.97 which we can state that the level of education stability for the overall group is average.

The mean value of the gender equality stability of the employees commitment for the overall of group show 33.91 hence we can interpret the gender equality level for the overall group is low.

**Table -5.3** showing the relationship between commitment stability and creativity

Variable	N	Mean	SD	r-value
Education stability	32	87.97	13.78	0.033*
Gender equality	32	33.91	7.53	

\*= significant at 0.05 level

From the above table the 'r' value of 0.033 indicate the positive correlation and we can infer that there is a relationship between that variable of commitment and creativity.

## 6. FINDINGS AND CONCLUSION

The research concluded that the Girl child education is the most required phenomena in the society for the successful development of the country. This study emphasis the need for the girl child education and the gender equality. It is further concluded that the awareness on girl child education is given importance now a days.

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## **A Review on Issues and Problems of Women Entrepreneurs in Micro, Small and Medium Enterprises in India**

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### **ABSTRACT**

The image of women as home makers who has very little to do with the economy is shifting in modern India. Number of women is now taking over entrepreneurial activity especially in micro, small and medium scale enterprises. But this shift from homemaker to business woman is not easy. Though the entrepreneurial path is the same for both men and women, however, in practice, several problems are faced by women, which are of different dimensions that restrict them from realizing their full potential as an entrepreneur.

**Keywords:** Micro, Small and Medium Enterprises, Women Entrepreneurs, Economic Development, Challenges, Issues and Problems

### **INTRODUCTION**

Women have always been the pillars of society and when women's are empowered, the whole world is empowered. Ministry of Micro, Small and Medium Enterprises (MSME) is empowering female entrepreneurs through its number of schemes. This helps women flash their talent and build their own place in the society. As in 2019 nearly 1.38 lakh projects have been set up by the women entrepreneurs under the Prime Minister's Employment Generation Program (PMEGP) Scheme since its launch. The projects set up by women entrepreneurs are nearly 30 percent of total projects set up under PMEGP. Under the scheme, women entrepreneurs are sheltered under Special Category and also are entitled to receive 25 percent and 35 percent subsidies for the project found out in urban and remote areas respectively. For women beneficiaries, own contribution was set to just 5 percent of the project cost. While for the other category it is 10 percent. During the fiscal year 2016 - 18, under the Khadi Program, women entrepreneurs have set up nearly 30,437 projects for which margin money of Rs. 85,305 lakh have been released.

### **REVIEW OF LITERATURE**

**V Krishnamoorthy and R Balasubramani (April 2014)**, recognized the important motivation factors and its impact on success. The study identified that aim, skills, knowledge, family support, market opportunities, independence, government subsidy and satisfaction are the important motivational factors.

**Gaidhani Shilpa (2018)** Rural Entrepreneurship is a rising entrepreneurship. Rural women are now coming out of their home to achieve their dreams. It is not easy for women to step out and walk along with men. They have to face numerous challenges to chase their goals. The research paper talks about challenges and opportunities women are facing in India.

Women entrepreneurship was a neglected domain during the past, but with the spread of education and awareness among the women the picture has been changed and the women have emerged as today's most memorable and inspirational entrepreneurs. It is said that family is a chariot with wheels which are driven by both the male and female members of the family. If one of the wheels is lagging behind, the chariot i.e. the family will not be able to grow and develop.

In the same way when we speak about a nation, the Women entrepreneurship plays a dominant role in the economic development and makes significant contributions to the economic growth of the country. This paper focuses on the problems, issues, challenges faced by women entrepreneurs, how to overcome them and to analyze problems of Indian government for and problems faced by them while pursuing their business.

The primary objective of this research is to represent the socio economic issues, motivating factors behind entrepreneurship, problems and challenges faced by women entrepreneurs in various Micro, Small and Medium enterprises. For the purpose of study the researcher has focused on secondary sources like journals, articles and government websites.

### **Selected schemes for women empowerment and safety are listed below**

- Beti Bachao, Beti Padhao
- Stand Up India

- Mission Indradhanush
- Mudra Yojana Scheme
- TREAD (Trade Related Entrepreneurship Assistance and Development) Scheme
- Mahila Udyam Nidhi Scheme
- Annapurna Scheme
- Stree Shakti Package for Women Entrepreneurs
- Bhartiya Mahila Business Bank Loan
- Dena Shakti Scheme
- Udyogini Scheme

In India, Micro, Small and Medium Enterprises are the second largest source of employment, the primary being agriculture sector. MSME accounts for nearly 42 percent of industrial production, 95 percent of the industrial units, 34 percent of the exports and manufactures more than 6000 products. This sector produces a mixture of industrial products such as beverage, tobacco, food products, cotton, textiles and wool, silk, jute and jute products, wood and wood products, furniture and fixtures, paper and goods produced from it. Other services consist of machinery, apparatus, appliances and electrical equipment.

Women Entrepreneurs are often defined as the women or may be a group of women who initiate, organize and operate business activities. Any venture which is owned and controlled by women and giving a minimum of interest of 51 percent of the capital and giving at least 51 percent of employment opportunities in the venture to women comes under the category of women entrepreneurs. Today we can see Telecom, IT, Financial and other industries are headed and guided by women pioneers. There is a change in the modern society where the women are creating new paradigms of being a daughter who takes responsibility of her parents, a wife who wishes to create a home and a family, a mother taking care of the children to make them the best and an entrepreneur who builds an enterprise and discovers her significance and meaning of life in herself. At the same time with all the dreams of togetherness she searches for mutuality, pride and respect. Today women's are also open to a life without marriage and also ready as single mother without father.

Women typically prefer to start and manage firms in different industries than men. Apart from research, policies and programs tend to be 'men streamed' and too often don't take into consideration the specific needs of women entrepreneurs. As a result, equal entrepreneurship opportunity between men and women is still not felt. Women entrepreneur has many functions such as exploring the prospects of starting new venture, undertaking risks, innovations, coordination administration and control of company and providing effective leadership in all aspects of business. Women in present society are playing a vital role in reducing poverty through fruitful work that they are engaged in outside their home. Although increasing women's participation in micro, small and medium scale enterprise is among the developmental goals and targets to cut poverty, improvement in family health and empower women's economic status. Women's entrepreneurship has to deal with both the situation of women in society and as an entrepreneur in that same society. As women constitute around 50 percent of the world population they are regarded as the better half of the society. In modern society women have to come out of the home to participate in all sorts of activities and is also enjoying the fruit of globalization marking an influence on the domestic and international market

### **Socio-Economic Issues and Problems**

#### **1. Problem of Finance:**

Finance is regarded as "life-blood" for any project, be it small or big. However, women entrepreneurs experience shortage of finance on two counts. Firstly, women do not generally have property on their names to use them as collateral security for obtaining loans. Secondly, banks also consider women less credit worthy and daunt women borrowers on the belief that they can at any time leave their project. In this situation, women entrepreneurs are bound to rely on their own savings, if any and loans from friends and relatives

#### **2. Scarcity of Raw Material:**

Most of the women entrepreneurs are plagued by the scarcity of raw material and necessary inputs. The failure of the many women co-operatives in 1971 engaged in basket making is an example how the shortage of raw material sounds the death knell of enterprises operated by women

3. High Competition:

Women entrepreneurs do not have any set up to pump in a lot of money for canvassing and advertisement activities. Thus, they have to face a high competition for marketing their products with both organized sector and their male counterparts. Such a competition eventually results in the liquidation of women enterprises.

4. Limited Mobility:

Women mobility in India is highly limited due to a variety of reasons. A single woman asking for room is still looked upon with doubt. Awkward exercise involved in starting an enterprise coupled with the officials' embarrassing attitude towards women compels them to give up idea of starting an enterprise.

5. Family Ties:

In India, it is mainly a woman's duty to take care of the children and other members of the family. In case of married women, she has to maintain balance between her business and the family. Her involvement in family few times leaves a little or no energy to devote for business.

6. Lack of Education:

In India, nearly 65 percent of women are still illiterate. Illiteracy is one of the major causes of socio-economic problems. Due to the lack of education and that too qualitative education, women are not aware of business opportunities, technology and market knowledge. Also, lack of education causes low success among women. Thus, lack of education creates troubles for women in the setting up and running of business enterprises.

7. Male-Dominated Society:

Male bias is still the order of the day in India. The Constitution of India speaks of equality between sexes. But, in practice, women are looked upon as weak in all respects. Women suffer from male reservations about a woman's role, ability and capacity and are treated accordingly. In the male-dominated society, women aren't treated equal to men. This, in turn, serves as a barrier to women entry into business.

8. Low Risk-Bearing Ability

Women in India lead a sheltered life. They are not much educated and economically not self-dependent. All these decrease their ability to bear risk involved in running a project. Risk-bearing is an essential requisite of any successful entrepreneur.

**RECOMMENDATIONS TO OVER THE PROBLEMS FACED BY WOMEN ENTREPRENEURS**

1. Focus on the policy making process with regard to women entrepreneurship
2. Awareness program, training and supportive services with more focus on gender sensitization.
3. The education system curriculum can be so designed which can help prepare future entrepreneurs with basic knowledge and required practical skills in management.
4. The Government can set some priorities for women in terms of allocation of industrial plots, sheds and other amenities.
5. Precaution should be taken to penalize any kind of misuse.
6. Self help groups should be promoted for women entrepreneurs.
7. There should be specific efforts to help women access finance.
8. There should be bank and regulatory policies which accept low collateral security, look at borrower's willingness to repay the loan and simplify business registry.
9. There should be efforts to develop innovative loan and savings products for female entrepreneurs.
10. It can be said that today we are in a better position
11. wherein women participation in the field of entrepreneurship
12. is increasing at a considerable rate, efforts are being taken
13. at the economy as well as global level to enhance woman's
14. involvement in the enterprise sector. This is mainly because

15. of attitude change, diverted conservative mindset of
16. society to modern one, daring and risk-taking abilities of
17. women, support and cooperation by society members, and
18. relaxations in government policies, granting various u

The researcher concludes that women entrepreneurship plays a crucial role for growth and development of a nation. Women entrepreneurship helps in developing the backward regions and thereby improving financial status. Government must come with more innovative schemes and these schemes must be made aware to the women's

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## A Review on Women Entrepreneurship: Evidence from India

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### ABSTRACT

Today, women play a vital role in the socio economic development of the nation. They are involved in multiple businesses thereby making very important contributions to economic progress of the nation. Women entrepreneurs also create employment opportunities. As per the Government of India, any entity which has minimum 51 percent share and is controlled by women is considered as women enterprise. As per estimated nearly 25 percent of entity are registered by women's. It is also observed that more and more females are enrolling for entrepreneurship Programs. Women's entrepreneurship has picked up force in last few years with an expansion in the variety of ventures run by women. Moreover, with more and more women pursuing skilled, technical education and with the appearance of mass media, women are now more awake of their rights to be financially independent. This paper seeks to discuss on women entrepreneurs, the challenges they come across and factors that encourage them to begin their own business.

**Keywords:** Women Entrepreneurs, financial Interest, independent.

### INTRODUCTION

In a developing nation like India, there is a focus of small and medium sized company and family businesses. Women's entrepreneurship development in the Asian countries has the potential to empower women and create a socio economic transformation of the region to which these women belong. The new generation of women owned enterprises is actively seeking money for its businesses, using upgraded technology to build a distinct segment in each the national and international market

A recent survey confirms that women's primary entrepreneurial activity is mostly focused on small and medium enterprises (MSME) sector. Among the total number of women entrepreneurs in the nation, nearly 61 percent measure are micro and small scale entrepreneurs and nearly 18 percent fall under large scale sectors. Prosperous entrepreneurs are available in various ages, financial gain levels, gender, and race. Various studies shows that most successful ventures share certain individual characteristics such as personal attributes, which includes passion, dedication, flexibility, leadership, creativity and such others.

### REVIEW OF LITERATURE

**Garg Sonu and Agarwal Parul (2017)** for any nation to grow it require entrepreneurs at the core of the economic development. Entrepreneurial activities have been dominated by males since ages. However today women have become more aware and better educational facilities have enabled them to project into this male dominated space. Globally, they have become a key player in supporting both social development and economic growth. The researcher attempts to identify the challenges faced by these women entrepreneurs, by reviewing various literatures and provide suggestion for overcoming these challenges.

**Rajvansh Anjali (2017)** Women's entrepreneurship has been recognized during the last decade. Though the number of women entrepreneurs are very less but they are still doing the best. In male dominated society, women entrepreneurs are neglected. Women are doing very well in the field of business especially in micro sectors. The researcher has focused on the challenges and opportunities for Indian women entrepreneurs of Meerut city

### Objectives and Research Methodology of the Study

The study is purely based on secondary data from articles, journals and government websites

The study throws some glimpses on the following aspects:

- Facts about Women Entrepreneurs.
- Factors responsible for the growth of women entrepreneurs.
- Challenges faced by women entrepreneurs.
- Schemes for women Entrepreneurs.

### Facts about Women Entrepreneurs around the world

- Women own nearly 30 percent of small businesses or franchises in the US.

- 17 percent of black women are in the progression of starting or running a new business.
- The female entrepreneurial activity rate in the US is 16.60 percent
- 14 percent of women owned businesses employ between 11 and 50 workers.
- Women represent nearly 50 percent of entrepreneurs in Latin America and the Caribbean.
- 36 percent of immigrant business owners in Canada are women.
- South Asia has less than 20 percent of women entrepreneurs.
- Women owned and controlled enterprises create direct employment for about 27 million people in India.

#### **Factors responsible for the growth of women entrepreneurs**

- **Opportunity**

Increased focus on multiplicity at workplace has ensured that more women have access to opportunity in the business world. Even as the 21<sup>st</sup> century business world moves to expand into a global market, women with commendable credentials are able to work not only at national market but are also able to access at international market. This allows them an equal opportunity to learn and improve their expertise in the sector of choice.

- **Education**

With expansion of business opportunities, more women are exploring STEM (Science, Technology, Engineering and Mathematics) related fields of education, which was previously considered a male domain. Apart from STEM, there has also been a steady rise in women opting for specialized management education across sectors like logistics and supply chain, finance, international business, textiles and such others, further contributing to an empowered set of women entrepreneurs in the nation.

- **Financial Freedom**

Due to business opportunity and education, more and more women, especially the millennial generation, is now experiencing a financial independence like never before. Women in India had always been active earning members for the family, the new generation of 'working' women are not only earning handsome salaries but also contribute to run the household. Today they also make their own purchase and investment decisions, planning long term savings and have complete control of their earnings. This is a critical enabling factor when starting as an entrepreneur.

#### **Challenges faced by Women Entrepreneurs**

The challenges of women's entrepreneurship development can be divided in the form of three different spheres.

- **Microsphere**

Women entrepreneurs who are operating in a microsphere are confined to the local environment and obliged to live close to the family. In most of the South Asian countries, women entrepreneurs are expected to carry out household work, take care of children, and other tasks in addition to their businesses. In such a situation, women entrepreneurs find it difficult to travel and meet customers and are often unable to grow and expand their businesses smoothly.

- **Mesosphere**

Women entrepreneurs who are operating in the mesosphere work at regional or at national level. There are large numbers of organization involved in implementing policies and programs and also support to entrepreneurs operating within the mesosphere. In some cases this can be attributed to a lack of awareness about women's issues and insensitivity towards gender related issues.

- **Macrosphere**

Women entrepreneurs operating in the macrosphere find themselves working at a international level. Women are at a disadvantage than men in connection to the opportunities. However, women who negotiate in the workplace are sometimes forced not only by gender gaps in skills and education but also by employers' assumptions regarding their abilities, work commitment, efficiency, and needs, all of which is further exacerbated by the unequal sharing of family responsibilities at the micro level. One of the major obstacle in the path of women's entrepreneurship is that women entrepreneurs often find it difficult to access funds from various financial institutions as they do not possess tangible security and credit in the market.

## **Schemes for women Entrepreneurs in India**

### **1. Annapurna Scheme:**

Under this scheme loan is provided to women who are engaged in the food catering industry. The loan permits these women entrepreneurs in buying equipment, utensils, trucks etc. Under Annapurna scheme, women entrepreneurs are allowed to sell packed food items which are one of the most general businesses that women entrepreneur's scope out. It is impressive that housewives have been managing all their lives and are familiar to. This also boosts their business since they have a chance at better capital and new products to kick start their trade than they could otherwise afford. The maximum loan amount permitted is Rs. 50,000 under the scheme.

### **2. Bharatiya Mahila Bank Business Loan:**

This scheme supports women entrepreneurs on a large scale. Women have entered into diverse fields of business and are continuously working hard for success. This bank has the vision to offer economic empowerment to women. The maximum loan amount permitted is Rs. 20 crore under the scheme.

### **3. Mudra Yojana Scheme:**

It is a Government of India initiative that aims to advance the status of women in the nation by providing loans and supporting them in all possible way. This helps them to be financially independent. Post approval of the loan, they are issued with Mudra cards that is like credit cards with the withdrawal limit being 10 percent of the loan amount. This scheme has several diverse types of plans as per the type of business, level of expansion, and loan amount. The maximum loan amount permitted is Rs. 10 Lakh under the scheme.

### **4. Orient Mahila Vikas Yojana Scheme:**

This scheme is for women who hold minimum 51 percent share capital either separately or jointly as a proprietary concern. It is an exceptionally good opportunity for these stakeholders to help in expansion of their business and add to the development of their field. This scheme does not have need of any collateral security. Loan is granted at a concession interest rate of up to 2 percent. Repayment can be done in 7 years. The maximum loan amount permitted is Rs. 25 Lakhs under the scheme.

### **.5. Dena Shakti Scheme:**

This scheme is limited only to those engaged in the fields of agriculture, retail, manufacturing, small enterprises and for micro credit organizations. As per RBI, the maximum ceiling limits to women beneficiaries also are provided based on the sector. The maximum loan amount permitted is Rs. 20 Lakh under the scheme.

### **6. Pradhan Mantri Rozgar Yojana:**

This is one among the best schemes for women entrepreneurs both socially and financially. The main focus of this scheme is creating skill based, self employment through women entrepreneurs. This scheme covers both urban and rural areas and was developed through several amendments in cost, eligibility, and also in subsidy limits. The age limit is 35 year. Loan limit for business is Rs. 2 Lakh in case of service industry and Rs. 5 lakh for other categories

### **6. Udyogini Scheme:**

This program motivates women to be independent and also help them in self-development by empowering them economically. The scheme also encourages budding women entrepreneurs by providing loans at reasonable rates of returns. This scheme is only valid for those who have a family income of less than Rs. 40,000 per year. The especially encourage loans in the trade and service sector and the maximum amount for the same is Rs. 1 Lakh.

### **7. Cent Kalyani Scheme:**

The scheme targets both the upcoming as well as existing businesses. Specific importance is on the scheme being for Women Entrepreneurs. Retail trade, education and training, as well as self help groups are not entitled for the scheme. The eligible categories are available in detail with the rules on the scheme website. This loan is a collateral-free loan with zero processing fees. Under this scheme, the loan maximum loan is Rs. 1 crore.

### **8. Mahila Udyam Nidhi Scheme:**

This scheme promotes MSMEs and small sector investments in diverse industries to grow and excel in their respective areas. The scheme also encourages the reconstruction of SSI units that are deemed incompetent but are actually competent. A period of 10 years is given to repay the loan and the maximum limit for the loan is Rs.10 Lakhs.

The researcher concludes that a proper environment with support from society, mostly from family members and government can solve many of the challenges. Government has taken several initiatives and schemes to help

women entrepreneurs to overcome these challenges. Various initiatives have been taken in five year plans by making the women entrepreneurs a target group and developing schemes around this group.

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## Artificial Intelligence: A Study on Technological Innovation towards Online Fashion Websites

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### ABSTRACT

The online fashion shopping websites is one of the growing industries among many other online markets. The fashion industries are moving towards a major technological shift due to lots of competition in the market. The new innovative tools such as Artificial Intelligence (AI), Visual Reality (VR) and Augmented Reality (AR) have developed in India to compete with global markets standards. Customer experience management is highly influenced by gaining customer satisfaction through integrated Artificial Intelligence technology for providing efficient customer service. This study emphasizes the involvement of Artificial Intelligence technology with online clothing websites such as Amazon, Flip kart, Myntra, Snap deal and Max fashion. The findings may explore the customer relationship management (CRM) services, personalization services, fit intelligent services, visual assistance are enhances from artificial intelligence tools with lead to customer satisfaction and customer preference. The research utilized non- probability judgemental sampling and snowball sampling where respondents belong to Chennai and were genuine online customers who purchase cloths from online clothing websites. The concluding observation is that there is significant relationship between age and voice assistances, intelligent searches, customer centric visual search recommendation to the customers and enhance cyber security in Influence of Artificial Intelligence towards Online Fashion Shopping Websites.

**Keywords:** Artificial Intelligence technology, Customer preference, Customer satisfaction, Online fashion shopping websites and Purchase decision making.

### INTRODUCTION

As extensive time periods the humans have started to wear clothes the craving to express their own individuality. The fashion industry is one of the biggest in the world vague at about three trillion dollars as of 2018, representing two Percent of global Gross Domestic Product (GDP). The brick and mortar long-established retail as well as online e-commerce are committed to the sale of clothing and fashion items. Artificial Intelligence technologies are transforming the fashion industry in every component of its value sequence such as designing the various products into customer needs and want, using modern logistics strategies in the marketing and sales process. . In addition to conversational systems, AI is making its approach into e-commerce and mobile apps. Additionally, Artificial Intelligence enabled shopping apps allow customers to take screenshots of cloths they see online, identify patronising apparels and accessories in that photo, and then find the same outfit and shop similar styles

### Artificial Intelligence helping to promote and sell fashion goods

Fashion brands are using Artificial Intelligence and machine learning to maximize users shopping experience, improve the efficiency of sales systems through intelligent automation, and enhance the sales processes using predictive analytics and guided sales processes. Fashion brands are also starting to leverage conversational assistants through Chat bots and voice assistants. Using relaxed border fashion brands can gather data by asking customers a set of questions, understanding the customer's desires and trends, separating deeper into their purchase patterns, and suggesting correlated products and add on items

**TABLE1: Unique features of Artificial Intelligence on the websites**

S.NO	WEBSITES	AI FEATURE
1	Amazon. in	Image search Object recognition Product recommendation Style snap
2	FlipKart.com	Solve tricky problem such as inconsistency in address systems Timely order deliveries Enhance cyber security Filtering fake reviews
3	Myntra.com	Image search Voice search

		Similar image product search
4	Snapdeal.com	Intelligence search Image search
5	Max fashion. in	Chat bots Customer centric visual search Voice assistances
<b>Source: Online sales.AI, Compiled by Authors</b>		

**Table 1 Interpretation:** Table 1 represents the unique features of Artificial Intelligence of the various online fashion shopping websites such as Amazon. In, FlipKart.com, Myntra.com, Snapdeal.com and Max fashion. in. Each website has unique feature such as Image search, Object recognition, Product recognition, and Style snap, Enhance cyber security, Intelligence search, Chat bots, which attracts the online customers to visit the website frequently and make purchase of the fashion cloths based on the individual needs and satisfaction.

### LITERATURE REVIEW

According to **Szabolcs Nagy and Noemi Hajdu (2021)** - The rapid development of digital technology has changed online shopping. Artificial intelligence is an excellent tool to meet rapidly changing consumer demand and to increase sales efficiency. Trust and perceives value was originate to be the key factors influencing consumer attitudes towards artificial intelligence.

According to **Sandhiya and Anli Suresh (2021)** - Current developments in artificial intelligence lead to obtain information's from artificial intelligence systems. Artificial intelligence allows decision support system to generate explanation. Artificial intelligence explanations fulfil a user need, explanations generated by decision support system need to be evaluated among these users. This can provide valuable insights into user requirements and effectiveness.

According to **Llias Maglogiannis, Lazaros Lliadis and Elias Pimenidis (2020)** - The fashion clothing industries is moving towards fast fashion with the enforcement in the retail markets to design products at a quicker pace by following the fashion trends and their consumer needs. Thus artificial intelligence techniques help the development of innovative methods, increase customer service quality and the designs to improve overall efficiency.

According to **Anh Tran (2019)** – Artificial Intelligence has not only played an important role in E-commerce, it also enhanced a great customer service for the company. In E- commerce services it also helped to improve their yearly profit by creating more successful online shopping strategy campaigns and fulfil client goals by understanding their needs and expectation.

According to **Marianna pupillo (2019)** - The development of new data and knowledge using digital technologies in fashion sector to be better understood and managed to reduce uncertainties and increase co-ordination. The digital transformation act as an instrument in creating the demand for the products and to ensure all the needs are identified by understanding the market opportunities. It shows the way to unbolt up fresh markets.

According to **Yuli Liang, Seung-hee lee, Jane e. workman (2019)** - Technological advancement has brought dramatic changes to consumer consumption behaviours. Consumer's self-awareness and fashion sense are being transformed by technology because new combinations of fashion and digital innovations are emerging. Positive attitudes towards technology have a positive influence towards the purchase intention.

### STATEMENT OF THE PROBLEM

The study is signified with uniqueness that examines Artificial intelligence based services, and its influence towards consumers purchase intention on fashion cloths. The features such as artificial intelligence Chat bots, personalization, visual search and fit intelligence services are aligned with AI technology. The field of AI is experiencing automated functioning of various activities such as video, image, voice assistance and other intelligent searches which have four critical aspects such as fairness, auditability, interpretability and transparency. This critical aspects should to taken seriously through correct decision making by decision support system by generating explanations for all activities based upon the requirements of the customers. The important challenge is how digital platform has influenced the customers purchase intention; it is mostly based upon best guarantee given such as transparency to redeem trust among the targeted users within e-commerce spaces. There is a research gap in the study towards artificial intelligence technology has not fully automated it exist based upon the human instructions and input data's build by the human knowledge.

### OBJECTIVES OF THE STUDY

1. To know the customers awareness level about Innovative strategies of Artificial Intelligence technology towards the online fashion websites.
2. To find out the influence of Artificial Intelligence Innovative strategies upon customer purchase decision.
3. To identify the most preferred online fashion websites and decide the best reason for choosing the particular online fashion website and their unique feature of Artificial Intelligence.
4. To know the level of boosting in online shopping business through innovative Strategies and unique features of Artificial Intelligence in the road of online shopping websites.

### Hypotheses for the study

- H<sub>01</sub> -There is no significant relationship between Age and voice assistants  
 H<sub>02</sub> -There is no significant relationship between Age and intelligent searches  
 H<sub>03</sub> -There is no significant relationship between Age and visual search  
 H<sub>04</sub> -There is no significant relationship between Age and chat bots  
 H<sub>05</sub> -There is no significant relationship between Age and recommendation to customers  
 H<sub>06</sub> -There is no significant relationship between Age and cyber security

<b>Table 2 Research methodology</b>	
<b>Research framework</b>	Descriptive, qualitative, investigative and expressive research design
<b>Sampling type</b>	Convenience Sampling
<b>Study unit</b>	Artificial Intelligence, Online Fashion Websites
<b>Samples</b>	100
<b>Study mode</b>	Digitally framed questionnaire with score value using a five-point Likert sale
<b>Collected data</b>	Primary data-Electronic approach to through E-letter and relative form of communication, Secondary data-Journals
<b>Analytical study</b>	Exploratory analysis
<b>Source: Authors compiled data</b>	

**Interpretation:** Table 2 consists about research methodology framework, type of sampling used for research, specific unit of study, sample size taken for Research analysis, mode of study to collect information, and the analysis tools and techniques used for the Research purpose.

### DATA ANALYSIS AND INTERPRETATION

#### Demographic profile

<b>Table 3 Demographic profile</b>				
<b>Gender</b>				
Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	34	34.3	34.3	34.3
Female	65	65.7	65.7	100.0
Total	99	100.0	100.0	
Source – Primary data analysis				
<b>Age</b>				
Age	Frequency	Percent	Valid Percent	Cumulative Percent
18-25	89	89.9	89.9	89.9
26-35	3	3.0	3.0	92.9
36-45	3	3.0	3.0	96.0
45 ABOVE	4	4.0	4.0	100.0
Total	99	100.0	100.0	
Source – Primary data analysis				
<b>Monthly income</b>				

Monthly income	Frequency	Percent	Valid Percent	Cumulative Percent
Rs25000-Rs30000	71	71.7	71.7	71.7
Rs31000-Rs40000	15	15.2	15.2	86.9
Rs41000-Rs45000	4	4.0	4.0	90.9
Above 50000	9	9.1	9.1	100.0
Total	99	100.0	100.0	
Source – Primary data analysis				
<b>Qualification</b>				
	Frequency	Percent	Valid Percent	Cumulative Percent
Below graduation	4	4.0	4.0	4.0
Graduation	9	9.1	9.1	13.1
Post Graduation	86	86.9	86.9	100.0
Total	99	100.0	100.0	
Source – Primary data analysis				
<b>Occupation</b>				
	Frequency	Percent	Valid Percent	Cumulative Percent
Private Sector	50	50.5	50.5	50.5
Public Sector	9	9.1	9.1	59.6
Self employed	17	17.2	17.2	76.8
Home maker	5	5.1	5.1	81.8
Others	18	18.2	18.2	100.0
Total	99	100.0	100.0	
Source – Primary data analysis				
<b>Awareness level</b>				
Awareness level	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	81	81.8	81.8	81.8
No	18	18.2	18.2	100.0
Total	99	100.0	100.0	
Source – Primary data analysis				

**Interpretation:** Table 3 shows that out of total 100 respondents in which 34.3 % are male respondents and 65.7% are female respondents the majority is female respondents. It shows that 89.9% fall under the age group of 18-25 years where as 3% fall under the age group of 26-35 years 3% of the respondents were from 36-45 years of age and 4% fall under the age group of 45 above. Out of 100 respondents, 4% belong to below graduation, 9% belong to graduation, and 86% of the respondents were from Post-graduation. Table shows that there were 50% respondents who are working in private sectors 9% of the respondents were from public sector, 17% of the respondents were from own business, 5% of the respondents are homemakers and 18% respondents are from other occupations. Out of 100 respondents, 71% of the respondents have monthly income of Rs 25000-Rs.30000, 15% of the respondents have 31000-Rs40000, 4% of the respondents have Rs.41000-Rs.45000 and 9% of the respondents have a monthly income of above Rs.50000. Out of 100 respondents 81% has awareness about artificial intelligence and 18% have no awareness about artificial intelligence technology used in fashion websites.

**Table 4 Reliability Analysis**

<b>Table 4 Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.877	13
Source – Primary data analysis	

**Interpretation:** The Cronbach's alpha value is found to be 0.877 And it is found to be highly reliable and consistent.

**Table 5 Correlation Analysis Interpretation:** Table 5 shows the analysis as follows

**Correlation Analysis Table:**

Table 5 Correlations									
		Age	Voice Assistants	Intelligent Searches	Customer Centric Visual Search	Chat Bots	Providing Recommendation to the customers	Enhance cyber security	
Age	Pearson Correlation	1	.543	.938	.836	.808	.959	.846	.548
	Sig.		.062	-.008	.021	.025	.005	.020	.061
Voice Assistants	Pearson Correlation		1	.833**	.807**	.870**	.692**	.404**	.545**
	Sig.			.000	.000	.000	.000	.000	.000
Intelligent Searches	Pearson Correlation			1	.733**	.819**	.726**	.494**	.507**
	Sig.				.000	.000	.000	.000	.000
Customer Centric Visual Search	Pearson Correlation				1	.683**	.791**	.374**	.576**
	Sig.					.000	.000	.000	.000
Chat Bots	Pearson Correlation					1	.472**	.321**	.518**
	Sig.						.000	.001	.000
Providing Recommendation to the customers	Pearson Correlation						1	.670**	.485**
	Sig.							.000	.000
Enhance cyber security	Pearson Correlation							1	.348**
	Sig.								.000
Others	Pearson Correlation								1
	Sig.								

\*\*. Correlation is significant at the 0.01 level (2-tailed).  
Source – Primary data analysis

**H<sub>01</sub> -There is no significant relationship between Age and voice assistants:** The correlation table reveals that the Pearson's coefficient value for the relationship between age and connectivity is 0.543 which shows a moderate positive correlation. The significant value for technical issues is 0.000 which is less than 0.05 and shows that there is significant relationship between age and voice assistants. Thus the H<sub>01</sub> is rejected.

**H<sub>02</sub> -There is no significant relationship between Age and intelligent searches:** The correlation table reveals that the Pearson's coefficient value for the relationship between Age and intelligent searches is 0.938 which shows a moderate positive correlation. The significant value for technical issues is 0.000 which is less than 0.05 and shows that there is significant relationship between age and intelligent searches. Thus the H<sub>02</sub> is rejected.

**H<sub>03</sub> -There is no significant relationship between Age and visual search:** The correlation table reveals that the Pearson's coefficient value for the relationship between Age and visual search is 0.836 which shows a moderate positive correlation. The significant value for technical issues is 0.000 which is less than 0.05 and shows that there is significant relationship between age and visual search. Thus the H<sub>03</sub> is rejected.

**H<sub>04</sub> -There is no significant relationship between Age and chat bots:** The correlation table reveals that the Pearson's coefficient value for the relationship between age and chat bots is 0.808 which shows a moderate positive correlation. The significant value for technical issues is 0.000 which is less than 0.05 and shows that there is significant relationship between age and chat bots. Thus the H<sub>01</sub> is rejected.

**H<sub>05</sub> -There is no significant relationship between Age and recommendation to customers:** The correlation table reveals that the Pearson's coefficient value for the relationship between Age and recommendations is 0.959 which shows a moderate positive correlation. The significant value for technical issues is 0.000 which is less than 0.05 and shows that there is significant relationship between age and recommendation. Thus the H<sub>05</sub> is rejected.

**H<sub>06</sub> -There is no significant relationship between Age and cyber security:** The correlation table reveals that the Pearson's coefficient value for the relationship between Age and cyber security is 0.546 which shows a moderate positive correlation. The significant value for technical issues is 0.000 which is less than 0.05 and shows that there is significant relationship between age and cyber security. Thus the H<sub>06</sub> is rejected.

**Table 6 ANOVA**

Table 6 ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Amazon. In	Between Groups	6.013	1	6.013	6.161	.015
	Within Groups	94.674	97	.976		
	Total	100.687	98			
Flipkart.com	Between Groups	35.655	1	35.655	25.265	.000
	Within Groups	136.891	97	1.411		
	Total	172.545	98			
Myntra.com	Between Groups	2.510	1	2.510	3.194	.077
	Within Groups	76.218	97	.786		
	Total	78.727	98			
Snapdeal.com	Between Groups	12.084	1	12.084	8.367	.005
	Within Groups	140.098	97	1.444		
	Total	152.182	98			
MaxFashion.com	Between Groups	3.523	1	3.523	3.865	.052
	Within Groups	88.436	97	.912		
	Total	91.960	98			

Source- Primary data

**Interpretation:** ANOVA study has been conducted to know the significant relationship between gender and most preferred online fashion websites. The significant value of Amazon.in is 0.15, Flip kart.in significant value is 0.000 and snapdeal.com significant value is 0.005 which is lesser than 0.05 hence the three hypothesis is rejected and Mythra.com significant value is 0.77, Maxfashion.com significant value is 0.52 which is higher than 0.05 the two hypothesis is accepted.

**Table 7 KMO and Bartlett's Test Analysis Table**

Table 7 KMO and Bartlett's test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		<b>.835</b>
Bartlett's Test of Sphericity	Approx. Chi-Square	1329.925
	Df	78
	Sig.	.000

**Interpretation:** Table shows the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is a statistic that indicates the proportion of variance in variables that might be caused by underlying factors. A KMO score of 0.835 is an acceptable score and factors with the score of 0.7 and above were selected for the study.

**Table 8: Rotated Component Matrix Analysis**

Table 8 Rotated Component Matrix			
Factors	Component		
	1	2	3
Image Search	<b>.875</b>		
Object Recognition	.866		
Product Recommendation	.860		
Style snap	.856		
Solve Tricky problem	.832		
Timely Order Delivery		<b>.797</b>	
Filtering fake products		.771	
Similar image product		.751	

Providing Recommendation to the customers		.733	
Intelligent Searches			<b>.678</b>
Customer Centric Visual Search			.646
Enhance cyber security			.626
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 7 iterations.			

**Interpretation:** Table shows that the selected 12 components were rotated in the Varimax rotation. The twelve components were Image Search, Object Recognition, Product Recommendation, Style snap, Solve Tricky problem, Timely Order Delivery, Filtering fake products, similar image product, Providing Recommendation to the customers, Intelligent searches, Customer Centric Visual Search, Enhance cyber security. Image Search has highest value .875 in 1<sup>st</sup> order, Timely Order Delivery has highest value .797 in 2<sup>nd</sup>Order and Intelligent Searches has highest value .678 in 3<sup>rd</sup> order.

**Table 9 Communalities Analysis Table**

Table 9 Communalities			
Components	Factors	Initial	Extraction
<b>Convenience</b>	Image Search	1.000	.850
	Object Recognition	1.000	.797
	Product Recommendation	1.000	.678
	<b>Style snap</b>	<b>1.000</b>	<b>.913</b>
<b>Trust</b>	Solve Tricky problem	1.000	.814
	<b>Timely Order Delivery</b>	<b>1.000</b>	<b>.832</b>
	Filtering fake products	1.000	.769
	Enhance cyber security	1.000	.798
<b>Easy Access</b>	Similar image product	1.000	.701
	Providing Recommendation to the customers	1.000	.796
	<b>Intelligent Searches</b>	<b>1.000</b>	<b>.904</b>
	Customer Centric Visual Search	1.000	.873
Extraction Method: Principal Component Analysis.			
Source: Primary Data Analysis			

**Interpretation:** Table shows that three components were extracted from the component analysis.

**First component** labelled as **Convenience** and has factors such as style snap with 91.3%,

Image search with 85.0%, Object Recognition with 79.7%, Product recommendation with 67.8%.

**Second component** labelled as **Trust** and has factors such as timely order delivery with 83.2%, solve tricky problem with 81.4%, Enhance cyber security with 79.8% and filtering fake products with 76.9%.

**Third component** labelled as **Easy Access** and has factors such as intelligent searches with 90.4% and Customer Centric Visual Search with 87.3%, providing recommendation to the customers with 79.6%, similar image product with 70.1%.

#### FINDINGS FROM THE STUDY

**Demographic profile:** Majority of the respondents were from the age group of 18-25 years who are female respondents studied Post Graduation working in the private sector and are having their monthly earning as 25000-30000.

**ANOVA Analysis:** ANOVA study has been conducted to know the significant relationship between gender and most preferred online fashion websites. The significance value of Amazon. in significant value is 0.15, Flip kart. in significant value is 0.000 and snapdeal.com significant value is 0.005 Which is lesser than 0.05 hence in three hypothesis is rejected and Mythra.com significant value is 0.77, Maxfashion.com significant value is 0.52 which is higher than 0.05 the two hypothesis is accepted.

**Correlation Analysis:** Further, the six factors extracted from the factor analysis are further tested by using the correlation analysis with Age. There is significant relationship between age and voice assistances, intelligent searches, customer centric visual search recommendation to the customers and enhance cyber security.

**Factor Analysis:** Three Components were identified during the factor loadings. The first component is named as Convenience in which style snap have a higher score of 0.913, and the second component is named as Trust in which timely order delivery have a highest score of 0.832 and the third component is Easy Access in which intelligent searches have a highest score of 0.904.

### CONCLUSION AND SUGGESTIONS

Artificial intelligence has many benefits in the fashion industries, including the use of online fashion assistants to improve customer experience, trend prediction and producing more sustainable solutions. Artificial intelligence has significant effect on the way e-commerce business attracts and retains customers. Artificial intelligence revolution in e-commerce will create plenty of new data science, machine learning and business processes. Artificial intelligence based e-commerce will also generate great platform for various fashion industries in systematic manner but the influence of artificial intelligence may impact people lacking in demand skill to face unemployment in coming years.

### SCOPE FOR FUTURE RESEARCH

The study has limited to artificial intelligence in fashion websites which can be extended to various other shopping apparels and products. The study can also concentrate on various other business processes which used artificial intelligence technology in manufacturing, warehousing and distributional operations.

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## Edge Computing Technology: An Overview

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### ABSTRACT

Now a days, with speedy deployment of IoT (Internet of Things), industries, healthcare, transportation etc. billions of sensors, storage devices produces huge amount of data to make comfort in human life. Such massive amounts of data processed by, cloud computing technology. On other hand, traditional centralized cloud computing facing several challenges, like high delay, high latency, huge utilization of bandwidth, poor efficiency, high utilization of bandwidth, less elevated security to data. To overcome all these several drawbacks, Edge comes into picture by providing irreplaceable solutions to various challenges.

In this paper, we will discuss intricacies of edge technologies. By considering each of these aspects, we will discuss in detail architecture and challenges of each paradigm. Also, this paper contains applications and role of these key technology's real time applications.

**Keywords:** IoT, cloud computing , edge computing, security, real time application

### 1. INTRODUCTION

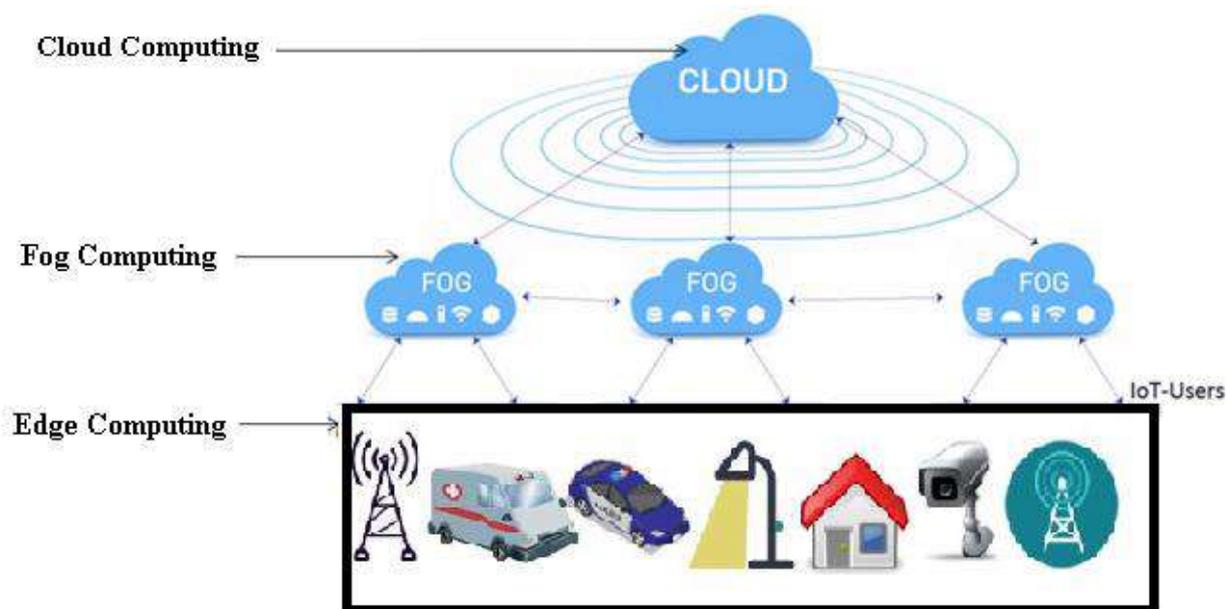
At a first glance, cloud computing, fog computing and edge computing architecture come to sight similar in but they are differ in their functionalities and characteristics. They also allowed various industries and organization to use different storage devices as well as computing devices to serve user's need. Not only centralized but also decentralized heterogeneous storage adaptable by these technologies. [1]

Edge computing is another worldview that broadens the cloud computing model by giving processing resources on the edges of an organization. Edge computing involves working with persistent data near the data source, which is considered the "edge" of the connection. This is to ensure that the application runs as close as possible to the data where it is generated, and not as a cloud storage or data storage area as shown in fig.1.

One of the reason for popularity of fog and edge computing technologies is, it is best appropriate for real time applications such as smart transport system, smart parking, gaming, healthcare etc.

Fog computing and edge computing widely used in life safety applications like healthcare domain, vehicular ad-hoc network, agriculture, manufacturing, smart cities etc.[2]

Edge computing is associate degree extension of cloud computing, that has its own characteristics with cloud computing. The most prominent feature of cloud computing is that it will grasp the total, will method an oversized quantity of knowledge, conduct in-depth analysis, and additionally performs a very important role in non-real-time processing, like business decision-making and alternative fields. Edge computing focuses on the native, and may play a higher role in small-scale, period intelligent analysis, like meeting the period wants of native businesses. Therefore, in intelligent applications, cloud computing is a lot of appropriate for centralized process of large-scale information, where as edge computing is used for small-scale intelligent analysis and native aids.[3]



**Fig.1. Fog computing and Edge computing in relation to cloud**

Fog computing also faces crucial challenges as there are no security standards and measures assigned for fog computing. Proper user authentication in fog system can able to combat, fabrication, replay and data alteration attacks. Large number of fog nodes leads to increase in energy consumption. Appropriate placement of fog servers offers potential service. To face these challenges, early life research in these computing technologies needs more contribution of many researchers.

## 2. ARCHITECTURE

The edge computing architecture can be a single network design that extends cloud services to network segments by introducing edge devices between end devices and cloud computing [4], [5]. The cloud collaboration structure is generally classified into a 1] terminal layer 2] edge/boundary layer, and 3] cloud computing layer as shown in figure 2.

The following may be a temporary introduction to the configuration and capabilities of each level in the edge computing framework.

**2.1] Terminal Layer:-** The terminal layer resides on each kind of devices connected to the edge network, together accompanying mobile terminals and IoT devices (such as sensors, smart-phones, smart cars, cameras, etc.). Inside the terminal layer, the device isn't solely a knowledge client, however additionally a knowledge supplier. So as to cut back the terminal service delay, solely the perception of the varied terminal devices is taken into account, not the computing power. As a result, many countless devices inside the terminal layer collect every kind of data and transfer it to the higher layer, wherever it's keep and calculated.

**2.2] Edge/Boundary Layer:-** The edge layer is that the core of the three-tier design. It's placed at the edge of the network and consists of edge nodes cosmopolitan between terminal devices and clouds. It always includes base stations, access points, routers, switches, gateways, etc. The edge layer supports the access of terminal devices downward, and stores and computes the information uploaded by terminal devices. Establishing connection with the cloud and transferring appropriate timely information, it is more secure and efficient solution than the cloud computing. [6]

**2.3] Cloud computing Layer:-** Among the federate services of cloud-edge computing, cloud computing remains the foremost powerful processing center. The cloud computing layer consists of variety of superior servers and storage devices, with powerful computing and storage capabilities, and may play an honest role in areas requiring giant amounts of knowledge analysis like regular maintenance and business call support. The cloud computing center will for good store the reportable information of the edge computing layer, and it may also complete the analysis tasks

that the edge computing layer cannot handle and therefore the process tasks that integrate the worldwide data. Additionally, the cloud module may also dynamically modify the readying strategy and rule of the edge computing layer in keeping with the management policy.

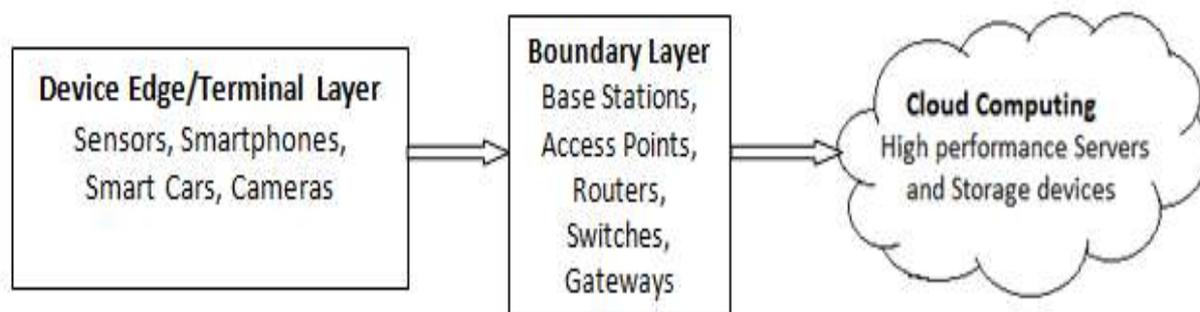


Fig. 2 Basic Architecture of edge computing

### 3. APPLICATION

- 3.1] Autonomous Transportation:** Autonomous Transportation of vehicle convoys can possible be one amongst the primary use cases for autonomous vehicles. Here, a bunch of vehicle travel shut behind each other in an exceedingly convoy, saving fuel prices and decreasing congestion. With edge computing, it'll be potential to get rid of the requirement for drivers except the front one, as a result of vehicles are going to be ready to communicate with one another with ultra-low latency.
- 3.2] Remotely Monitored Assets:** Some assets in industries like oil and gas failures are often fatal. Their assets thus ought to be rigorously monitored. Edge computing allows period analytics with process a lot of nearer to the plus, that means there's less dependence on smart quality property to a centralized cloud.
- 3.3] Smart Grid:** Edge computing are a vital technology in additional widespread adoption of sensible grids and might facilitate enable enterprises to higher manage their energy consumption. Sensors and IoT devices connected to a position platform in factories, plants and offices are getting used to observe energy use and analyze their consumption in period of time.
- 3.4] Predictive Maintenance:** Manufacturers need to be ready to analyze and find changes in their production lines before a failure happens. Edge computing helps by transfer the process and storage of information nearer to the instrumentality. This permits IoT sensors to observe machine health with low latencies and perform analytics in period of time. Predictive maintenance is simply the start, its IIoT solutions will be used for real time internal control or compliance initiatives. Deploying a prophetic maintenance answer helps organizations get crucial components of IIoT infrastructure in situation that modify later growth into broader usage models.
- 3.5] In-Hospital Patient Monitoring:** There are so many edge opportunities in healthcare sector. Currently, observation devices like aldohexose monitors, health tools and alternative sensors are either not connected or wherever there, massive amounts of unprocessed knowledge from devices would wish to be hold on a third party cloud. This presents security issues for attention suppliers. An edge on the hospital web site may method knowledge regionally to keep up knowledge privacy. Edge conjointly allows right-time notifications to practitioners of bizarre patient trends or behaviors (through analytics/AI), and creation of 360-degree read patient dashboards for full visibility.
- 3.6] Cloud Gaming:** Cloud gambling, a brand new reasonably gambling that streams a live feed of the sport on to devices, (the game itself is processed and hosted in information centers) is very captivated with latency. Cloud gambling corporation's square measure wanting to create edge servers as on the point of gamers as attainable so as to cut back latency and supply a totally responsive and immersive gambling expertise.
- 3.7] Smart Home:** Smart homes believe IoT devices aggregation and process information from round the house. Typically, this information is distributed to a centralized remote server, wherever it's processed and hold on. However, this existing design has issues around backhaul price latency, and security. By mistreatment edge work out and delivery the process and storage nearer to the good home, backhaul and roundtrip time is reduced, and sensitive info are often processed at the edge. As associate degree example, the time taken for voice-based assistant devices like Amazon's Alexa to retort would be abundant quicker.

#### 4. CHALLENGES

Moving data processing to the network's edge can assist organizations in capitalizing on the growing number of IoT edge devices, increasing network speeds, and improving customer experiences. Because of its scalability, versatility and reliability, edge computing is an excellent choice for fast-growing, agile enterprises. But, still edge computing faces some challenges as given below [7],[8]:

- 4.1] Bandwidth:** In ancient networks, enterprises would allot higher information measure at central knowledge centers and lower information measure to the endpoints. Whereas, in a grip computing server, a lot of information measure is needed across all individual ends of the server. This creates a desire for a lot of information measure when put next to the standard networks.
- 4.2] Distributed Computing:** Most of the servers, the set of modules are placed so much except one another in a very distributive manner. Whereas, edge computing tends to bring all the systems nearer to the machine areas. This creates a conflict because the business server must think about the edge server as an extra facet throughout computation.
- 4.3] Latency:** Latency is actually the delay caused by knowledge transmission. In a grip server, if the computation is going down nearer to knowledge or if the reason is merely happening at the middle, latency will be reduced. However sometimes, thanks to distributive computing and both-ways computation.
- 4.4] Operational Constraints:** Collecting massive chunks at both the edge server facts middle or the edge node poses numerous protection and accessibility problems. Also, the switch of large portions of facts goals extra modern strategies that vicinity unit though being researched inside the market.
- 4.5] Moving System Constraints:** Most of the gadgets making use of side computation like cellular gadgets, laptops, in-ear-video display units but as wi-fi earphones vicinity unit of a cellular body or are with an character in maximum cases. Implementing alternate of facts, protection, get entry to cloud/network and masses of various alternatives in transferring country can be a venture that must be overcome.

#### CONCLUSION

Edge technology has already brought many reimbursement to the Internet of Things, but it's not the only advance. Today, cloud, fog, and edge technologies offer inimitable solutions to various IoT challenges. Edge computing, as opposed to cloud computing, will provide huge data computation and storage at the network edge, which will be required by future potential applications such as smart homes, smart cities, smart automobiles, and so on. Furthermore, prospective applications and use cases are outlined, and we identify open research issues and future research areas, as well as learned lessons.

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## How Communication through Social Media Platforms Play Substantial Part in Employee Engagement

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### ABSTRACT

The main idea of this study is to antedate the use of social media platforms in employee engagement, and communication qualities in employee engagement through social media. The methodology adopted for this study is review of existing comprehensive literature review related with Social media and Employee engagement with reference to communication. The research paper determines that up adjacent and accurate communications through social media is the best side-tracks in building prevailing frankness and depiction of employee engagement in organisation. In Social media, Communication displays compact optimistic consequences in employee engagement etc.

**Keywords:** Social Media, Communication, Employee Engagement, Commitment.

### INTRODUCTION:

In technological world, organizations need to connect with their employees, at any rate so as to support illustrative commitment, engagement and efficiency. In accordance with the pattern of digitalization, an ever-increasing number of organizations are additionally building up social devices for internal and external communication. At the theme when such stages are set up in organizations, they can, in a most ideal situation, change employee engagement. Be that as it may, there is an imperative reliance: the utilization of social media cultivates more grounded employee engagement, while at least existing trust-based employee commitment is important so as to effectively set up these apparatuses. Organisations have acknowledged about its potential and at present they are available in the vast majority of the well-known informal organization destinations. The need is to have forms that support imagination, advancement and receptiveness through straightforwardness and trustworthiness, enabling this age to work together, share, learn and develop. On the off chance that young generation can share data so quickly through this mode for being a piece of an outer development, organisations can understand what suggestions this medium can have in shaping tastes about Employee marks, their actions and their professional status. It is time to organizations to understand the intensity of Social Media and really contributed towards leading etc.

### OBJECTIVE OF THE RESEARCH PAPER:

1. To find how communication through social media platforms play substantial part in employee engagement.
2. To analysis and understand how communication through social media relates with employee engagement

### LITERATURE REVIEW:

#### SOCIAL MEDIA AND EMPLOYEE ENGAGEMENT:

(Robinson, Perryman, & Hayday, 2004) resisted that employee engagement is worried about the individual commitment under sound working conditions, advance individual improvement, empower shared certainty and comprehension between the business and the representative and between the representatives themselves. (Saks,2006) characterizes employee engagement as the degree to which an individual is mindful and ingested in the execution of his/her jobs. It is the optimistic feeling that employees have towards their occupations and furthermore the inspiration and exertion they put into it. (Bakkar & Scheufeli, 2008) have characterized the term employee engagement that it is a mental state where employees feel a personal stake in the organisation's prosperity and perform to an elevated requirement that may surpass the expressed necessities of the activity. A connected with representative knows about business setting and works with partners to enhance execution inside the activity for the advantages of the organisation. (Sharma & Anupama, 2010). (Kahn, 1990) describe employee engagement is the dimension of responsibility and contribution of the employees towards their organisation and its qualities. (Perrin, 2003) characterized engagement as ability or energy that the employee holds to spend discretionary effort towards the activity. It is a stimulating frame of mind held by the employee towards the organisation and its qualities. The organisation must work to create and support commitment, which requires a two-path connection among manager and employee. (Kaplan & Haenlein,2010) characterize Web and internet comprises on a stage where all clients consistently change the substance and applications in a participating and communal way. Also, user generated content can be observed as the entirety of all manners by which individuals make utilization of Social Media. (Eun and Kyung, 2016) describes gathering of Internet-put

together applications that work with respect to the ideological and innovative establishments of web and internet that permits the creation and trade of user generated content. Perhaps the most outstanding sort of online life is the informal communication webpage like Facebook, YouTube etc. With the coming of Information and Communication advances, organisations are moving towards a brought together structure, where there is improved straightforwardness, better stream of data and joint effort. Achieving workforces has turned out to be a lot less demanding, yet captivating them on an errand is by all accounts a test for the administration. (Bernoff &Schadler,2010) have called very engaged employees who advance with innovation as extremely authorized and quick-witted operatives. (Yoshida & Tomoak 2010), interconnection is a basic idea of organisations which are made out of a system of on-screen characters acting in coordination to accomplish a particular corporate goal. An organisation makes out of various people cooperating since it is unimaginable for a solitary, segregated individual to achieve any high level of objectivity to accomplish an association's objective. A more extensive and more extravagant system of people inside or outside an association can make a shared comparability structure mitigating this limited judiciousness since one's capacity to perform consummator acts relies upon another person playing out an instrumental demonstration. Quicker data sharing and preparing realized by social networks gets proficiency an association since employees settle on the correct choices after broad counselling on Social networks with their partners and bosses and furthermore direct research online on a specific issue taking a gander at different associations in the business. To effectively adapt to quick clock speed, information rich conditions, associations need to reshape their key building obstructs into another engineering known as "data age design" which thinks about the association as an associated gathering of human data processors (Yoshida & Tomoak, 2010). Associating with collaborators was the essential help for internet-based life commitment at work many of respondents said that interfacing with colleagues was the best drive to utilize web-based social networking while at work., communication can be the way to continuing the business. The jobs of online life, for example, Facebook have been proposed as an apparatus to connect with among architects and clients in programming designing to include in their social movement (Begel, DeLine & Zimmermann, 2010). On the off chance that the online life, for example, Facebook has used legitimately, the business can build up the notoriety and brand picture utilizing internet-based life for their association (Groysberg & Slind, 2012). Representative commitment is basic to an association's prosperity. Numerous residential and global firms rely upon large amounts of commitment so as to advance ability maintenance, cultivate client reliability and enhance authoritative execution and partner esteem. What happens to compelling communication is the drive for representatives to connect with, submit and be gainful that will in this manner lead to improved business execution. This thus creates prevalent budgetary returns. Much despite what might be expected, an association that is quiet can have inconvenient outcomes as it powers employees to conjecture, devour tattle and gossip just as depending on the media for organization data (Hoover, 2005). Associations that advance compelling communications experience less turnover and opposition, higher investor returns, expanded responsibility and more elevated amounts of worker commitment. Various elements impact their choice about how and when they will utilize it and clients plan an inspirational disposition toward the innovation when they see it to be valuable and simple to utilize (Davis, 1989).

#### **RESEARCH METHODOLOGY:**

Review of existing comprehensive literature review related with Social media and Employee engagement with reference to communication.

#### **DISCUSSION:**

Feasible communication was observed to be a key driver for employee engagement and a marker of change related execution. The influx on endeavour for engagement incorporates an expansion in staff fulfilment which prompts an increment in profitability. Expanded efficiency at that point drives an incentive for the association. Engagement reviews found that employee engagement enhances the association by driving user loyalty, which thusly upgrades client steadfastness and expands gainfulness and development of an association. Investigation into the impact of inside communications on employee engagement has been done in the instructive field, police offices, open administration, and business associations (Arif et al, 2009). The majority of the investigations found were observational goings-over that were directed with the utilization of studies and some estimation device for representative commitment, work fulfilment, and communication fulfilment. Fulfilment with inner was observed to be identified with higher scores of representative commitment and communications hierarchical responsibility (Carriere and Bourque, 2009; Taylor & Elsey, 2005; Sopow, 2008; Sudhakar and Patil, 2006). Notwithstanding an expansion in representative commitment, the investigation by (White, Vance & Stafford, 2010) found that inside communication fulfilment included a feeling of network and gave employees a sentiment of more prominent obligation to advocate for the association at an individual dimension. Given these discoveries, it isn't astounding that organizations are putting more accentuation on interior communication

channels. There have been studies that interface representative fulfilment with pledge to the organisation and employee engagement, while different inspections connect communication fulfilment with representative fulfilment. There had not been past research to decide whether communication fulfilment intervenes the connections among inner communication rehearses, work fulfilment, and full of feeling hierarchical responsibility until the investigation led via (Carriere & Bourque, 2009). (Chen, 2008) states that fulfilment with internal communication was identified with occupation fulfilment. This investigation likewise recognized that partnerships with various societies will in general vary from one another in regards to communication channels. Chen found that two-route channels of communication, in spite of the fact that not run of the mill of Chinese associations, help associations achieve a more elevated amount of employee trust. (Dolphin, 2005) found comparable outcomes that two-way communication creates trust and further duty amid times of pressure or change. The two examinations bolster the idea that future communication systems need to concentrate less on scattering data and more on creating associations with representatives. (Carriere & Bourque, 2009) exhibited that inner communication fulfilment influences in general occupation fulfilment and authoritative duty. (White, Vance, and Stafford 2010) proclaimed that employees who were most happy with inward communications put a high incentive on up close and personal interchanges with their pioneers and detailed an assortment of techniques for interchanges in their association. Representatives in this investigation revealed that consultation straightforwardly from pioneers gave them a feeling of total honesty and made them feel vital, regardless of whether the data was not expected to play out their activity. (Quirke, 2005) stated that hierarchical execution can be estimated from numerous points of view contingent upon the business of intrigue. Execution results may incorporate, yet are not restricted to; benefits, maintenance of representatives, and marking and acknowledgment of organization. The organizations, perceives the requirement for compelling communication to avoid blunders and lessen costs. Building successful communication systems helps raise principles, share best practices, and create strong groups.

#### **CONCLUSION:**

Social media– communication stages' utilization, top-administrators' grasp it more keenly than representatives since they are truly preoccupied with communication and hold elevated requirements for interior communication's improvement after all staff is completely actualized with Social media– communication stages. However, even in the good days, discoveries show that communication has just been profited by utilizing Social media- communication stages and this improvement emphatically influences four out of the six precursors identified with employees' solace: job lucidity, objective clearness, peer union and the board openness. Concerning authoritative reliability, experimental discoveries lead to the end that improving organization's inward communication channels by utilizing Social media- communication stages don't contribute in changing an organization from inconsistent to solid; however, empowers an effectively dependable organization to convey its arrangements all the more productively and keep up employees' trust. organisations need to progressively prop for this change will see the coming of new age communication medium like Social Media Platforms that effectively connect with representatives. Etc.

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## Kinetic and Thermodynamic Studies of the Controlled Oxidation of Cinnamyl Alcohol by Potassium Persulphate in Acidic Medium

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### ABSTRACT

The quantitative conversion of alcohols to aldehydes/ketones has been extensively studied using a variety of oxidants. But there are few reports on the use of inorganic oxidants for oxidation of alcohols. Further, the kinetic and thermodynamic aspects of the oxidation of alcohols have been scarcely reported.

This paper reports the kinetics of the controlled oxidation of the primary unsaturated alcohol, Cinnamyl alcohol using Potassium persulphate ( $K_2S_2O_8$ ) in acidic medium. Cinnamyl alcohol is used in the preparation of perfumes. The oxidation was studied under first order kinetic conditions with respect to the inorganic oxidant and the oxidation rate was monitored by iodometric estimation of the unreacted oxidant at regular time intervals during the course of the reaction. The oxidation rate increased with [alc.] but decreased with  $[K_2S_2O_8]$ . The oxidation rate was found to be independent of ionic strength in dilute solution. A suitable reaction mechanism has been given for the oxidation process.

From the variation of oxidation rate with temperature (308-318K), the thermodynamic activation parameters were evaluated and interpreted in terms of the reaction mechanism suggested.

**Keywords:** Cinnamyl alcohol,  $K_2S_2O_8$ , oxidation, kinetics, ionic strength, entropy of activation, reaction mechanism

### INTRODUCTION

The quantitative aspects of the oxidation of alcohols to the corresponding carbonyl compounds have been reported in literature<sup>1-4</sup>. But there are few reports of the kinetic studies of the oxidation of alcohols. We have earlier reported the kinetics of the oxidation of a variety of industrially important alcohols using organic and inorganic oxidants<sup>5-8</sup>. This study deals with the first order kinetics of the oxidation of Cinnamyl alcohol to Cinnamaldehyde using  $K_2S_2O_8$  in acidic medium. The effects of alcohol and oxidant concentrations, ionic strength and temperature on the oxidation rate have been investigated in detail. From the effect of temperature on oxidation rate, the thermodynamic activation parameters have been determined. Based on the experimental data obtained, a suitable reaction mechanism has been suggested for the oxidation process.

### MATERIALS AND METHODS

Cinnamyl alcohol was procured from E. Merck, Suhuchalt, Germany and used as received. All other chemicals used in the study were of A R Analar Grade. The oxidation of alcohol was studied under first order kinetic conditions,  $[\text{oxidant}] \ll [\text{alc.}]$ . The solutions of alcohol and oxidant were allowed to equilibrate in a previously adjusted thermostat (accuracy  $\pm 0.1^\circ\text{C}$ ). After the temperature equilibrium was attained, the solutions were quickly mixed to start the reaction. Aliquots of the reaction mixture were withdrawn at regular time intervals, the reaction was quenched using ice and the unreacted oxidant was estimated iodometrically.

The first order rate constants ( $k$ ) were determined from the linear plots of  $\log(\text{unreacted oxidant})$  versus time (s). From the Arrhenius plots of  $\log k$  versus  $T^{-1}$ , the energy of activation ( $E$ ) and other thermodynamic activation parameters were determined. Analar Grade  $K_2SO_4$  was used in the range  $\mu = 5.00-20.00 \times 10^{-2} \text{ mol dm}^{-3}$  to determine the effect of ionic strength on the oxidation rate of alcohol.

### RESULTS AND DISCUSSION

Cinnamyl alcohol was oxidized to Cinnamaldehyde by  $K_2S_2O_8$  in acidic medium. The oxidation rate increased with alcohol concentration but decreased with oxidant concentration. (Table 1)

**Table-1: Rate constant data for oxidation of Cinnamyl alcohol by  $K_2S_2O_8$  in acidic medium**

$[H_2SO_4] = 1 \text{ mol dm}^{-3}$  Temperature = 308K

$[\text{alc.}] \times 10^1 \text{ mol dm}^{-3}$	$[K_2S_2O_8] \times 10^3 \text{ mol dm}^{-3}$	$k \times 10^3 \text{ mol dm}^{-3}$
0.25	5.00	5.00
0.50	5.00	5.60
0.63	5.00	6.00



- 2)  $K^*$ , the equilibrium constant for the formation of the transient activated complex from the reactant molecules increases with temperature.
- 3) The negative values of the entropy of activation,  $\Delta S^*$  indicate the formation of a rigid activated complex followed by the reorientation of solvent molecules around the complex<sup>11,12</sup>. This greatly curtails the rotational and vibrational modes of the reacting molecules leading to decrease in entropy.
- 4) The constant values of  $\Delta S^*$  at all temperatures indicates that the site of oxidation i.e. -OH remains same at all temperatures.

### CONCLUSION

The inorganic oxidant  $K_2S_2O_8$  was used in acidic medium to study the rate of oxidation of the perfumery alcohol, Cinnamyl alcohol. Ionic strength had no effect on the rate of oxidation. The oxidation was accompanied by decrease in entropy of activation.

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## The Role of Human Resources in Hospitality Sector

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### ABSTRACT

Human resource management (HRM) is considered as the most tactical and logical approach to the management of an organization's most Privileged assets – the employees who are employed there contribute to the achievement of the objectives of the business. · · Human resource management (HRM) is the application of the policy and procedures that directly involve the employees working in the task group. These policies include recruitment & Selection, maintenance, personal development, training and career development. Human Resource Management (“HRM”) is a way and means of management that links people-related behavior to the tactic of a business or organization.

The term “the hospitality industry” refers to organizations and businesses which have their core business in the provision of food, drink, leisure, business facilities and accommodation to people away from their homes. The hospitality profession is the oldest of the humane professions and they are responsible in making a guest, client, customer or resident invited and comfortable. The component sectors in the hospitality industry are Hotels & motels, Restaurants, Guest houses, cafes & snack bars, Night-clubs and Public houses

Firms in hospitality sector require highly effective personnel and HRM departments. This is mostly required by the hospitality operators who must possess the relevant and the required skills because above all, they are in the people business and the type and the level of service they deliver to their customer depend highly on the quality of the workforce they have employed, It is therefore required that people who are employed in the Hospitality Industry must have adequate knowledge, skills and qualities so that the firms can succeed and develop not only within the country but also across the Globe for maintaining the customer value. Therefore Human Resource Management is very important and the assistance it can provide to hospitality sector by attracting, training, motivating and retaining valuable workforce is eminent.

**Keywords:** Human Resources Management, Hospitality Sector, Business tactic, customer value.

### INTRODUCTION

Through the past decade, people have become more and more conscious that the competitive edge of an organisation lies in human factors. Indeed, it can be seen that the environments of the twenty-first century turn out to be highly competitive where organisation need to devote a significant amount of time, attention and energy to manage human resources. The firms also need highly effective personnel and HRM departments. This is mostly required by the hospitality operators which must possess quality human resources because above all, they are in the people business and the level of service they deliver to their customer depend highly on the people they have. It is therefore essential that people who are engaged in Hospitality Industry must have adequate knowledge, skills and qualities so that the firms can succeed and grow not only within national boundaries but also in the international arena. Based on this background that Human Resource Management finds its increasing importance and the help it can provide to hospitality operators by attracting, training, motivating good people. In fact, all organisations should adopt Human Resource Management in order to perform effectively.

When one thinks of the Hospitality Industry, we usually think of hotels and restaurants. But the term has a much broader meaning. According to the Oxford English Dictionary, hospitality means “the reception and entertainment of guests, visitors or strangers with liberality and goodwill.” The word hospitality is derived from hospice, a medieval ‘house of rest’ for travellers and pilgrims. A hospice was also an early form of what we now call a nursing home and the word is clearly related hospital. The term “the hospitality industry” refers to companies, organizations and businesses which have as their core business the provision of food, drink, leisure, business facilities and accommodation to people away from their homes. The hospitality professions are among the oldest of the humane professions and they involve making a guest, client or resident welcome and comfortable. The component sectors in the hospitality industry are Hotels & motels, Guest houses, Restaurants, cafes & snack bars, Night-clubs and Public houses.

### IMPORTANCE OF HRM IN THE HOSPITALITY INDUSTRY

The importance of HRM in the hospitality industry cannot be denied. There are two facts highlight this importance. The first fact is that the hospitality industry is a people business which is customer-driven and quality-focused. As a matter effect, the human element plays a major part in the overall success of any

organization, but especially so in a service industry such as the hotel business. Many members of the workforce (waiters, waitresses and receptionists) are in direct contact with the guests and are seen as being involved in achieving the objectives of the hotel. The quality of service offered is dependent not only upon the skills but also upon the attitudes of the staff. The latter are part of the finished product for which the customer is paying. Customer satisfaction is likely to be affected as much by the standard of food and beverage, accommodation or other facilities of the hotel as by the courtesy, helpfulness and personal qualities of the staff. Therefore both the skills and the attitudes of the workers are essential if the demands of the customer are to be met satisfactorily. This places particular importance on human resource management.

### **PROBLEM STATEMENT**

The hotel industry is one of the major pillars of a nation's economy therefore great attention must be paid to the hospitality industry. An organisation like a Hotel needs to be constantly in line with changes due to the competitive environment. Therefore, there must be a continuous reviewing of the HRM practices in order to achieve success and maintain a corporate growth. This study arises from the need to analyse to what extent the HRM practices are effectively practiced at La Plantation Hotel and how they can be enhanced to gain better results. HRM practices are the essential elements in which attention must be focused as these practices have a direct impact on the human resource of the Hotel and people are very important in order to gain competitive advantage and success. This study examines the 5 main HRM practices and how they are being performed in the Hotel. The five practices are human resource planning, recruitment and selection, training and development, performance management and effective communication. It is generally accepted that success is deemed to come from the way the human resources are being managed and trained in the organisation, for human resources are amongst the most crucial element for Service Company in the hotel industry.

Main Objective of the study

The main objective of this study is to identify, explore and evaluate the effectiveness of the present HRM practices in a hotel industry and provide recommendations where necessary in order to achieve success.

The other objectives of this project are as follows:

To analyze the effectiveness of HRP in the hotel industry.

To identify how Recruitment and Selection is carried out in the hotel industry.

To assess how performance management is performed in the hotel and its effectiveness

### **REVIEW OF LITERATURE**

To be familiarized in diversity of human resource management (HRM) and how it is managed dealt in different contexts is challenging (Boxall, Ang, & Bartram, 2011). This paper focuses on HRM in the hotel sector. The study of HRM practices in the hotel sector is of importance because of the intensity of human resource (HR) use in this industry. Reception or front line employees in the hotel sector are important for the creation and provision of excellent service quality (Chand, 2010b; Tsaur & Lin, 2004). Human interaction in Customer relationship delivery is typically seen as critical for customer satisfaction (Michel, Bowen, & Johnston, 2009; Schneider, 2004; Tsaur & Lin, 2004). While research on HRM in the hospitality industry in general includes the hotel sector, the findings of such research are not necessarily generalizable to the hotel industry (Lucas, 2002). The purpose of this review is, to explore the following questions:

Name the HR practices and strategies exist in the hotel sector, and why are they operational?. The analysis identified the most consistently studied HR practices and the most commonly adopted HR strategies in the hotel sector in order to both deepen our understanding of why such practices exist and highlight the diverse nature of hospitality operations., HOSPITALITY AND THE CONTEXT OF HOTEL WORK The term "hospitality" has not been clearly defined from a research perspective and there is a lack of clarity concerning its boundaries and separation from other service industries (Ottenbacher, Harrington, & Parsa, 2009).

An appropriate definition is hard to achieve, owing to the diverse nature of the hospitality industry (Lashley, 2000). Ottenbacher et al. (2009) argue that hospitality industries are the providers of "food, beverages, accommodation, entertainment, leisure, attraction, or some combination of those" They suggest that hospitality operations cover the sectors of lodging (hotels, motels), food service (restaurants, catering), leisure, conventions, travel, and attractions. Lodging operators are "providers of accommodation and other amenities for the travelers and other desiring customers" (p. 276). Accommodation is the main service provided by the lodging sector, which is further subdivided into resorts, luxury hotels, budget hotels, inns and motels, hostels, lodges, and other accommodations (Ottenbacher et al., 2009). The basis of this division is the nature of

accommodation provided and the level of service offered to the customer. A definition provided for large-scale hotels is “hotels with star gradings of four to five (luxury hotels) [and] possessing more than 100 rooms” (Knox & Walsh, 2005, p. 62). In the hotel industry, the star rating system (ranging from one to five) is a universally recognized standard of quality of service (Hoque, 2013). Larger hotels provide a wider range of facilities to their customers and are therefore more likely to receive a higher star rating than small-scale hotels (Hoque, 2013). In many countries, the tourism and hospitality sectors generate a large number of jobs (World Travel and Tourism Council: A career in Travel and Tourism, 2013). At the same time, however, 4 researchers have shown that labour turnover and skill shortage are critical problems in the hotel sector (e.g. Ahmad & Scott, 2013; Davidson & Wang, 2011). A hotel’s performance is said to depend to a large extent on its employees (Crick & Spencer, 2011). The career of a hotel employee is often advanced by moving from one hotel to another, which is a common practice in large and luxury hotels (Ahmad & Scott, 2013). Customer demand in the hotel industry fluctuates and therefore employing too few or too many permanent (full-time) employees for hotel operations is a significant risk (Knox & Walsh, 2005). Having inadequate staff numbers may impair service quality, whereas a large number of permanent employees increases operating costs. Thus, temporary and part-time employment and shift work are common characteristics of the hotel sector (Haynes & Fryer, 1999; Hoque, 1999b; Knox & Walsh, 2005; Luo & Milne, 2014). Fluctuating demand in the sector has led hotel managers to adopt a cost-reduction strategy by hiring more temporary and part-time casual staff (Knox and Walsh 2005).

## CONCLUSION

Firms in hospitality sector require highly effective personnel and HRM departments. This is mostly required by the hospitality operators who must possess the relevant and the required skills because above all, they are in the people business and the type and the level of service they deliver to their customer depend highly on the quality of the workforce they have employed,

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## Textile Trade between India and Bangladesh on the Backdrop of the Phase Out of MFA

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### ABSTRACT

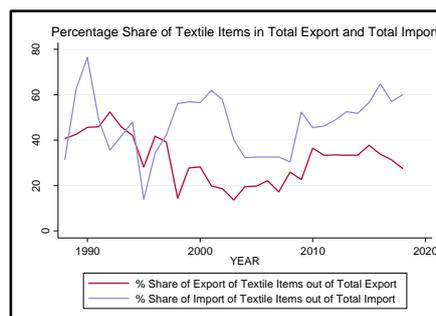
Textile industry is important for both India and Bangladesh. In the recent years India's import of textile and textile articles from Bangladesh is seen to increase. Multifibre Agreement dominated the trade in textiles. Therefore this study uses the Average Annual Growth Rates to study the textile trade between India and Bangladesh taking the backdrop of the phase out of the Multifibre Arrangement. Paired t test is used to check the robustness of the results of the AAGR. Studying the textile trade between both the countries prior to phase out of MFA quotas and post phase out of the MFA quotas reveal that textile trade between both the countries increased after the phase out of MFA quotas was completed in the year 2005.

**Keywords:** Textile Trade, MFA, India, Bangladesh.

### 1. INTRODUCTION

Textile industry is vital for both Indian and Bangladesh's economy. The Ready Made Garment industry in India is a derivative of the textile industry which contributes not only to the industrial output of the country but also generates employment and adds to the export earnings. The same is one of the main manufacturing activities in Bangladesh. These industries are contributing to the foreign exchange of both the countries. As per a report of the EXIM Bank (2015), both the countries' dominant Ready Made Garment export destination was USA followed by European Countries like the United Kingdom, Germany, France, Netherlands and Belgium. Labour costs in India are twice that of Bangladesh and Bangladesh has comparative advantage in the production of Ready Made Garments because of its low manufacturing costs. According to World Bank (2018) the top exporters of Textile were China, EU, India, U.S and Turkey and the top exporters of Clothing were China, EU, Bangladesh, Vietnam and India. India's share of textiles in total world exports was around 3.6% in 2000, 4.1 % in 2005, 5.1% in 2010 and 5.8% in 2017. India's share in clothing in total world exports was 3.0% in 2000, 3.1% in 2005, 3.2 % in 2010 and 4.1% in 2017. Similarly Bangladesh's share in clothing exports was 2.6% in 2000, 2.5 % in 2005, 4.2 % in 2010 and 6.5% in 2017. Thus the above information on the percentage shares gives an idea that India's share in textiles gradually increased, as is the case with clothing. According to Kim (2019) as of 2017 the major export partners of India's textile and clothing were US with 20.92%, UAE with 11.04% and Bangladesh with 6.04%.

According to Basher (2013) Bangladesh concentrated on a few markets excluding India and maintained growth in its exports. Readymade Garments contribute about four-fifth of the country's export earnings and India had been a competitor to Bangladesh in global apparel markets. It is also noticed that Bangladesh's export of some basic garments to the Indian market has been increasing because India is turning into an importer from being an exporter of these basic garments. Figure 1 shows textile trade as percentage share of total trade between India and Bangladesh. The figure shows percentage share of India's textile exports to and imports from Bangladesh out of its total export to and import from Bangladesh. It is clear from the figure that over the years a majority of items out of India's total imports from Bangladesh are textile items except during certain years in between. But the percentage share of India's export of textile items out of its total exports to Bangladesh is lower in comparison.



**Figure 1:** Percentage shares of Textile items in India's total export to and import from Bangladesh

According to WTO, Textile Trade was governed by the Multifibre Arrangement (MFA) from the year 1974 till the end of the Uruguay Round. At the end of the Uruguay Round MFA was replaced by WTO Agreement on Textile and Clothing (ATC) on January 1, 1995. By January 1, 2005 the ATC was integrated along the normal GATT rules or in other words it could no longer discriminate between exporters by limiting quantities with quotas. This was the start of the process of phasing out of the quotas till they were finally wiped out. The quota phase out, that is, the percentage of products to be brought under GATT (including removal of Quotas) was to be done in four stages: i) 1 January 1995 to 31 December 1997 (16%); ii) 1 January 1998 to 31 December 2001 (17%); iii) 1 January 2002 to 31 December 2004 (18%) and iv) 1 January 2005 (49%).

The multi-fibre arrangement therefore dominated the trade in textiles. Both India and Bangladesh have been impacted by it and its phase out. Its impact could even be felt in textile trade between India and Bangladesh. The present paper is a study of the textile trade between India and Bangladesh in the light of the Multifibre Arrangement (MFA) phasing out process. It studied India's trade with Bangladesh in textile and textile articles (Section XI of the HS classification including HS codes of chapters 50 to 63) with a reference period of prior and post phase out of the import quotas under Multifibre Arrangement (MFA), that is, before and after 2005 when the import quotas were completely phased out.

## 2. METHODS

Data have been collected from UNCOMTRADE. Section XI (Textile and Textile Articles) of the Harmonized System of Classification has been selected. It consists of chapters 50 to 63 of the HS 2 digit classification. The details of the Chapters are: Chapter 50 (Silk); Chapter 51 (Wool, fine or coarse animal hair; horse hair yarn and woven fabric); Chapter 52 (Cotton); Chapter 53 (Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn); Chapter 54 (Man-made filaments); Chapter 55 (Man-made staple fibres); Chapter 56 (Wadding, felt and non-wovens; special yarns; twine, cordage, ropes and cables and articles thereof); Chapter 57 (Carpets and other textile floor coverings); Chapter 58 (Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery); Chapter 59 (Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use); Chapter 60 (Knitted or crocheted fabrics); Chapter 61 (Articles of apparel and clothing accessories knitted or crocheted); Chapter 62 (Articles of apparel and clothing accessories, not knitted or crocheted) and Chapter 63 (Other made up textile articles; sets; worn clothing and worn textile articles; rags).

In order to study the textile trade between India and Bangladesh in the pre MFA phase out period and post MFA phase out period, the 2 digit and 4 digit classification of the above mentioned HS Chapters are selected for analysis.

Annual Average Growth Rates (AAGR) of India's total textile trade, India's textile export to and India's textile import from Bangladesh are calculated to make comparison of the growth rates prior to 2005 and post 2005. Along with comparison made on the basis of growth rates of the pre and post 2005 textile trade, t-test is also done to make a comparison of the items of textile and textile articles traded before and after the MFA phase out. The phase out period for the t-test has been divided into 1990 to 2004 (pre-phase out period) and 2005 to 2018 (post-phase out period).

### The formula for Annual Growth Rate (AGR):

Annual Growth Rate =  $[(\text{Present value} - \text{Initial value}) / \text{Initial Value}] \times 100$

### The formula for Average Annual Growth Rate (AAGR):

Average Annual Growth Rate (AAGR) =  $[(\text{Growth Rate})_y + (\text{Growth Rate})_{y+1} + \dots + (\text{Growth Rate})_{y+n}] / N$

Where:

$(\text{Growth Rate})_y$  = Growth rate in year 1.

$(\text{Growth Rate})_{y+1}$  = Growth rate in the next year.

$(\text{Growth Rate})_{y+n}$  = Growth rate in the year "n".

N = Total number of periods.

### The formula for paired t-test:

$$t = \frac{\bar{d}}{S/\sqrt{n}} \sim t_{n-1}$$

Where,  $d = x - y$

$$\bar{d} = \frac{\sum d}{n}$$

$$S^2 = \frac{1}{n-1} \sum (d - \bar{d})^2$$

x = average of the value of export, import and total trade of textile items before MFA phase out (1991-2004).

y = average of the value of export, import and total trade of textile items after MFA phase out (2005-2018).

n = number of observations.

### 3. RESULTS

In order to study India's textile trade with Bangladesh before and after the phase out of the Multifibre Arrangement (MFA) the Average Annual Growth Rates of India's export, import and total trade of the textile and textile articles with Bangladesh have been calculated. The AAGR was compared by dividing the time period into four divisions, that is before the phase out process started (1991-1994), during the period of first step of phase out (1995-1997), during the second step of phase out (1998-2001), during the third step of phase out (2002-2004) and finally after the complete phase out (2005-2018). The AAGR's are calculated by taking the average of the annual growth rates. Table 1 shows the findings of the calculation.

**Table 1 : AAGR of pre MFA phase out, during each phase out and after phase out**

Average Annual Growth Rate					
Period	1991-1994 (Pre phase out)	1995-1997 (First stage of phase out)	1998-2001 (Second stage of phase out)	2002-2004 (Third stage of phase out)	2005-2018 (After phase out)
Textile Export	23.94	3.75	-1.69	8.88	20.73
Textile Import	55.07	12.98	22.97	-22.86	27.22
Total Textile Trade	23.00	3.85	13.27	4.87	19.88

If the growth rates in the above periods are compared it can be noticed that the growth rates prior to the start of the phase out process were higher as compared to all the other periods in case of all the variables, that is, textile export, textile import and total textile trade. Fluctuations in the growth rates can be observed during the different stages of the phase out process. Since the growth rates differed during different periods, therefore observation of the growth rates of the items covered under textile and textile articles during the different phases was analysed and was discussed in the subsequent sections.

#### 3.1 Growth Rate of India's Textile Trade with Bangladesh During 1991-1994

Observing the AAGR of India's textile export, textile import and total textile trade with Bangladesh during 1991-1994 it was found that AAGR during this period was more than any other periods. Delving into the commodity components of India's textile exports during this period, it was found that export of cotton (HS code 52) was highest, contributing to 72% of exports amounting to US\$ 10.70 million, followed by Knitted or crocheted fabric (HS code 60) contributing to 18% amounting to US\$ 2.75 million and manmade filaments (HS code 54) contributed to 4.88% amounting to US\$ 0.72 million. Besides these three commodities, exports of all the items of HS codes from 50 to 63 contributed very less in terms of percentage share out of total textile exports during 1991-1994. In case of imports during 1991-1994, among the HS codes 50 to 63, India's imports from Bangladesh can be seen in the HS codes 52, 53, 55, 59, 60, 61. Out of which 98.98% was contributed by Vegetable textile fibres nes, paper yarn, woven fabric (HS code 53) which amounted to US\$ 0.55 million.

#### 3.2 Growth Rate of India's Textile Trade with Bangladesh During 1995-1997

The first stage of the quota phase out was during 1995-1997. During this period AAGR of India's exports of textile to Bangladesh plunged to 3.75% from 23.94% during 1991-1994. Looking into the components of India's export of textile products during this period it can be found that 88.84% out of total textile export during 1995-1997 was contributed by Cotton (HS code 52) which amounted to US\$ 14.2 million but this amount was higher as compared to 1991-1994. Drop in the AAGR therefore has resulted due to the drop in export of the other two main export items, Knitted or crocheted fabric (HS code 60) from US\$ 2.76 million during 1991-1994 to US\$ 0.82 million during 1995-97 and manmade filaments (HS code 54) from US\$ 0.72 million during 1991-1994 to US\$ 0.29 million during 1995-1997. AAGR in imports decreased to 12.98% during 1995-1997 from 55.07% during 1991-1994. To find the reason behind this decrease, the components are looked into. Observation of the values of India's imports of textile articles (HS code 52 to 63) during 1995-97 shows that in the year 1995 India imported items under all the HS codes from 50 to 63 except HS codes 51, 57, 59, 61 and 62. But the import categories were reduced further in the year 1996 and 1997. The total textile import in the year

1995 was US\$ 0.20 million. This amount however increased to US\$ 0.35 million in the year 1996 but dropped to US\$ 0.34 million in the year 1997 and the drop was mainly due to the decrease in the import of Vegetable textile fibres nes, paper yarn, woven fabric (HS code 53) which was the main import item. India's import of HS code 53 dropped from US\$ 0.31 million in 1994 to US\$ 0.19 million in 1995. This value increased to US\$ 0.33 million in the year 1996 and then fell to US\$ 0.22 million in the year 1997. Therefore, overall the decrease in AAGR of imports was caused by the negative annual growth rates of HS code 53 in 1995 and 1997. India's import of HS codes 50, 55, 56 and 63 were nil during both the years but these were imported in the year 1995. Imports of Vegetable textile fibres nes, paper yarn, woven fabric (HS code 53) in terms of percentage share during 1995-1997 was highest contributing to 82.96% and amounting to US\$ 0.75 million of total textile import from Bangladesh while Cotton (HS code 52) contributed to 16.78% amounting to US\$ 0.15 million.

### **3.3 Growth Rate of India's Textile Trade with Bangladesh During 1998-2001**

During the second stage of phase out period (1998-2001) the AAGR of India's export of textile products to Bangladesh further decreased to -1.69% from 3.75% during the period 1995-1997. Delving into the commodity composition of India's textile exports during 1998-2001 it can be seen that there was a fall in the export of two major items as compared to the previous period (1995-1997). Cotton (HS code 52) exports fell to US\$ 11.06 million during 1998-2001 from US\$ 14.20 million during 1995-1997 and Knitted or crocheted fabric (HS code 60) fell to US\$ 0.26 million from US\$ 0.82 million during 1995-1997. Therefore, decrease in the export of these two major items led to decrease in the AAGR of textile exports during 1998-2001. In case of imports during 1998-2001, the AAGR increased to 22.97% from 12.98% during 1995-1997. Looking into the composition of items imported it has been found that during this time period India imported from all the categories of HS codes from 50 to 63 except Impregnated, coated or laminated textile fabric (HS code 59). And all the categories showed increase in the values of import as compared to 1995-1997 except Knitted or crocheted fabric (HS code 60), which showed negative growth. Remarkable increase was seen in the import of other made textile articles, sets, worn clothing etc (HS code 63) from US\$ 27 during 1995-1997 to US\$ 0.91 million during 1998-2001. Increase was also seen in the import of Vegetable textile fibres nes, paper yarn, woven fabric (HS code 53) from US\$ 0.75 million during 1995-1997 to US\$ 1.65 million during 1998-2001, Cotton (HS code 52) from US\$ 0.15 million during 1995-1997 to US\$ 0.25 million during 1998-2001, Articles of apparel, accessories, not knit or crochet (HS code 62) whose import was US\$ 58116 during 1998-2001 was not imported during 1995-1997, Wadding, felt, nonwovens, yarns, twine, cordage, etc (HS code 56) was US\$ 52 during 1995-1997 which increased to US\$ 10264 during 1998-2001 and Silk (HS code 50) was US\$ 52 during 1995-1997 but increased to US\$ 2051 during 1998-2001.

### **3.4 Growth Rate of India's Textile Trade with Bangladesh During 2002-2004**

During 2002-2004 the AAGR of India's textile exports to Bangladesh increased to 8.88% from -1.69% during 1998-2001. This increase in the AAGR of exports was mainly due to increase in the exports of Articles of apparel, accessories, not knit or crochet (HS code 62) from US\$ 80939 during the year 1998-2001 to US\$ 0.38 million during the year 2002-2004, manmade filaments (HS code 54) from US\$ 0.27 million during 1998-2001 to US\$ 0.41 million during 2002-2004, Articles of apparel, accessories, knit or crochet (HS code 61) from US\$ 20287 during 1998-2001 to US\$ 0.10 million during 2002-2004, manmade staple fibres (HS code 55) from US\$ 0.98 million during the year 1998-2001 to US\$ 1 million during 2002-2004 and Wadding, felt, nonwovens, yarns, twine, cordage, etc (HS code 56) from US\$ 9544 during 1998-2001 to US\$ 34254 during 2002-2004. AAGR of imports on the other hand declined to -22.86% during 2002-2004 compared to 22.97% during 1998-2001. This decrease was a result of the decrease in the imports of Other made textile articles, sets, worn clothing etc (HS code 63) from US\$ 0.91 million during 1998-2001 to US\$ 48148 during 2002-2004, Vegetable textile fibres nes, paper yarn, woven fabri (HS code 53) from US\$ 1.66 million during 1998-2001 to US\$ 1.08 million during 2002-2004 and Cotton (HS code 52) from US\$ 0.25 million during 1998-2001 to US\$ 24764 during 2002-2004. According to a report of World Bank (2006) India introduced prohibitively high specific tariffs in addition to the ad valorem tariffs that already prevailed in the year 2000. This was done to protect the textile fabric and garment producers. These tariffs were more than 15% and were designed to stop other developing countries to compete in India. Even subsequent reductions in the ad valorem tariffs excluded the goods on which specific tariffs have been imposed.

### **3.5 Growth Rate of India's Textile Trade with Bangladesh During 2005-2018**

The AAGR increased after the phase out process was completed. The AAGR of exports increased to 20.73% during 2005-2018 from 8.88% during 2002-2004. There was positive growth of all the items exported with maximum export of cotton (HS code 52) with a percentage share of 79.90% of total textile exports during 2005-2018 amounting to US\$ 161.71 million. The next important export item was manmade staple fibres (HS code

55) with a percentage share of 9.23% which amounted to US\$ 18.69 million. The AAGR of imports increased to 27.22% during 2005-2018 from -22.86% during 2002-2004. There was positive growth in all the import items under HS codes 50 to 63 except silk (HS code 50). Vegetable textile fibres nes, paper yarn, woven fabric (HS code 53) contributed 38.47% amounting to US\$ 13.60 million, Articles of apparel, accessories, not knit or crochet (HS code 62) contributed to 25.17% amounting to US\$ 8.90 million, Other made textile articles, sets, worn clothing etc (HS code 63) contributed to US\$ 6.79 million and Articles of apparel, accessories, knit or crochet (HS code 61) contributed to 7.80% amounting to US\$ 2.75 million.

According to Balaji (2016), in the year 2011 India announced the removal of 46 textile items from sensitive list and provided zero duty access to Bangladesh in Indian markets.

#### 4. PAIRED T –TEST RESULT:

Paired t-test had been carried out in order to check the robustness of the above results of the AAGR of the pre MFA phase out period (1991-2004) and post MFA phase out period (2005-2018). The pre period (1991-2004) values were taken as the average of each commodity from 1991-2004 and the post period (2005-2018) was taken as the average of each commodity from 2005 to 2018. To test if there existed any difference in the mean values of India's export, import and total trade with Bangladesh in the pre MFA phase out period (1991-2004) and post MFA phase out period (2005-2018), null hypothesis was taken as:

$H_0$ : There is no difference between the mean values of pre-phase out (1991-2004) and post-phase out (2005-2018) values of textile export, textile import and total textile trade.

Against the above null hypothesis, the following alternative hypotheses may be considered.

$H_{A1}$ : There is difference between the mean values of pre-phase out (1991-2004) and post-phase out (2005-2018) values of textile export, textile import and total textile trade.

$H_{A2}$ : The mean values of the pre-phase out period are higher than the mean values of post-phase out values of textile export, textile import and total textile trade.

$H_{A3}$ : The mean values of the post-phase out period are higher than the mean values of pre-phase out values of textile export, textile import and total textile trade.

The results of the paired t test are obtained using STATA 13 and estimated results are summarized as follows:

**Table 2:** Result of paired t- test

Results of paired t test between pre MFA phase out (1991-2004) and post MFA phase out (2005-2018)					
	Mean Difference	t value	Df	Alternative Hypothesis	Probability
Textile Export	-7882386 (3888441)	-2.0271	133	$H_{A1}$ :mean diff $\neq$ 0 $H_{A2}$ :mean diff>0 $H_{A3}$ :mean diff<0	0.0446** 0.9777 0.0223**
Textile Import	-2990594 (900289.4)	-3.3218	66	$H_{A1}$ :mean diff $\neq$ 0 $H_{A2}$ :mean diff>0 $H_{A3}$ :mean diff<0	0.0015*** 0.9993 0.0007***
Total Textile Trade	-9363988(3871144)	-2.4189	134	$H_{A1}$ :mean diff $\neq$ 0 $H_{A2}$ :mean diff>0 $H_{A3}$ :mean diff<0	0.0169** 0.9915 0.0085***
Figures in () represents standard error difference					

From table 2 it could be observed that in case of India's export of textile to Bangladesh the first alternative hypothesis  $H_{A1}$  was significant at 5% level of significance and therefore the null hypothesis  $H_0$  was rejected in favor of  $H_{A1}$ . Thus it could be inferred that there was difference between pre and post MFA phase out mean values of India's textile export to Bangladesh. Having tested that there was difference in the mean values; second and third alternative hypotheses  $H_{A2}$  and  $H_{A3}$  were checked to see whether the mean of pre phase out export values or mean of post phase out export values was higher. Checking the p values of  $H_{A2}$  and  $H_{A3}$  it was found that  $H_{A3}$  was significant at 5% level of significance. Therefore it could be inferred that the mean of post MFA phase out export values was higher than the mean of the pre MFA phase out export values.

Similarly in case of India's import of textile from Bangladesh too the first alternative hypothesis  $H_{A1}$  was significant at 1% level of significance and therefore the null hypothesis  $H_0$  was rejected in favor of  $H_{A1}$ . Thus, it can be inferred that there was difference between pre and post MFA phase out mean values of India's textile

import from Bangladesh. Having tested that there was difference in the mean values,  $H_{A2}$  and  $H_{A3}$  had been checked to see whether the mean of pre phase out import values or mean of post phase out import values was higher. Checking the p values of  $H_{A2}$  and  $H_{A3}$  it was found that the  $H_{A3}$  was significant at 1% level of significance. Therefore it could be inferred that the mean of post MFA phase out import values was higher than the mean of the pre MFA phase out import values.

Since both textile exports and imports have increased in the post MFA phase out period therefore it must be such that the same implies for total textile trade too. However the significance of the total textile trade was also checked and it was found that in case of total textile trade too the first alternative hypothesis  $H_{A1}$  was significant at 5% level of significance and therefore the null hypothesis  $H_0$  was rejected in favor of the first alternative hypothesis  $H_{A1}$ . Thus it was inferred that there exists difference in the mean values of both the periods. The significance of the second and third alternative hypothesis was checked and found that the third alternative hypothesis  $H_{A3}$  was significant at 1% level. Thus here too it could be inferred that similar to export and import, the mean values of total textile trade too had increased after the phase out of MFA as compared to the mean values of the pre MFA period.

Therefore from the above test it was found that the mean values of post MFA phase out period of India's textile export, textile import and total textile trade have increased as compared to the pre MFA phase out period and hence are beneficial for both India and Bangladesh to strengthen their bilateral trade in textile items and products.

## 5. CONCLUSION

It can be inferred from the study that textile and textile articles consist an important part of commodity composition with respect to India's exports to and imports from Bangladesh. Since MFA dominated the textile trade for a long time therefore studying the textile trade between both the countries prior to phase out of MFA quotas and post phase out of the MFA quotas reveal that textile trade between both the countries increased after the phase out of MFA quotas was completed in the year 2005.

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## Ideologies of Swami Vivekananda for Universal Peace and Harmony and its Implications on Human Life

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### ABSTRACT

This study is undertaken to present a descriptive and prescriptive argumentation on Ideologies of Swami Vivekananda. It is descriptive because it is primarily a literature review and it is prescriptive because it reflects the author's opinion about Ideologies of Swami Vivekananda for universal love and harmony and its impact on human life.

**Keywords:** Swami Vivekananda, Universal peace and Harmony, Human life

### INTRODUCTION

Swami Vivekananda is the great visionary and spiritual leader. He visualized in bringing peace and harmony to the entire world through universal love and compassion. He always stressed that the people with humility will have qualities of the human spirit. For instance, corporate leaders like Aditya V. Birla, Bill Gates, JRD Tata, Azim Premji, Narayan Murthy had positive qualities such as love and compassion, patience, tolerance, forgiveness. They strongly believed that positive energy can bring Peace, Prosperity and Plenty to the whole organization through perfection, commitment and quality-consciousness. It is this belief helped them to carve out the goal, provide direction, and create a road map to move forward.

Swamiji in his speeches always said that Spiritual leadership guides people to attain self-realization and this kind of realization is a lifelong process of growth that transforms ordinary man into extra ordinary. For example, in Bhagavad Gita, Sri Krishna tells Arjuna about the purpose of battle i.e battle is not for his own benefit, not for satisfying his own greed and desire, but for the good of many<sup>5</sup>. It is these inspiring words, which changed Arjuna's mind from a state of inertia to a state of self-confidence and fight against evils and ultimately achieved the victory of "dharma".

There are people like the banyan tree. There are also people like the coconut tree. Banyan tree is one which gives the umbrella of protection to those coming under its shade, but it never allows a single grass to grow under it. Persons of banyan tree concept build up an empire with committed loyalties, for which the benefits are passed on. But the people who get benefit would not grow by themselves. They are always the parasites. On the other hand, Coconut tree is one which does not give shade, but offers tender coconut to the person who may be tired of day's hard work and wanting to go back to work after some relaxation. Persons of coconut tree concept allow others to independently develop themselves. They only extend the support and not the shelter. Swami Vivekananda advocated that in the situation of changing environment, we need the persons of coconut tree.

Swamiji always stressed upon one significant point i.e 'you touch somebody's body, you injure them; you touch somebody's mind, you create fear, worry, anxiety; you touch somebody's intellect, you injure his ego. You touch his soul; you may facilitate the transformation. For example, Valmiki the sage was earlier the great robber. He was transformed into a great sage, with the touch of NARADA.

Spiritual workplace is an employee-friendly work environment that recognizes, supports, and develops the spirit of its employees. Swami Vivekananda said that under such work environment, people would be willing to go to any extent to make sacrifice for the achievement of the great purpose. The most exciting example is the Dandi march launched by Gandhiji, where thousands of people willingly sacrificed their lives for the cause of freedom.

Swami Vivekananda came into this planet significantly. He is the eternal cure for all the ills of all the times. He allowed himself to be captured with the bondage of pure love. That is why he came down, perhaps to the levels of people and situations. He is like a mighty river, from which everybody can draw, may be rich or poor, idiot or scholar, beautiful or ugly, male or female and anybody. His spirit can solve all and the so-called "modern complex human problems", may be that of individual, family, office, factory, government etc.

### NEED FOR THE STUDY

It is a known fact that Emotional dishonesty creates distrust and tension among the people. This in turn may create more crimes and violence in the society. If people are emotionally dishonest, they will only think about

themselves and their personal profits. Again, If the person is emotionally dishonest, he will lose the value of natural feelings. They won't care about national development or other people's welfare<sup>4</sup>. Just to take an example, public taps that leak, street lamps that burn during day time are the common sights on which we have an active control, but we remain as passive spectators for the things that are happening around us. We hunger for wealth without work, knowledge without character, commerce without morality, politics without principle and science without humanity. We have developed an attitude of finding fault in others but not developing an attitude to do our job to the best of our ability. We have become more conscious of our rights than responsibilities. We are still in the dark. Therefore, an attempt has been made in the present study to explore the Ideologies of Swami Vivekananda for universal peace and harmony and convey to the mankind about its implications on human life.

## REVIEW OF LITERATURE

This study is undertaken to present a descriptive and prescriptive argumentation on Ideologies of Swami Vivekananda for Universal Peace and Harmony and Its Impact on human Life. It is descriptive because it is primarily a literature review and it is prescriptive because it reflects the author's opinion about Ideologies of Swami Vivekananda for universal love and harmony and its impact on human life.

## IDEOLOGIES OF SWAMI VIVEKANANDA

### 1. Purity of mind

Purity includes both external and internal purity. Purity of mind constitute internal purity, while Purity of body constitute external purity. Internal purity bestows strength, happiness, and instils love, & patience. On the other hand, external purity leads to better blood flow, and a greater ability to increase muscle tone<sup>1</sup>.

#### The tips to be considered for attaining purity

- Faith in almighty is important, faith in oneself is more important and faith in the goodness of others is most important.
- Ability of the body, stability of the mind, mobility of the intellect, debility of the ego is required to attain the nobility of the soul.
- We should Keep our body hygienically neat and clean and do exercise or Yoga regularly.
- Choose good man for emulation, bad man for correction, and no man for imitation. Create a friendly world.
- To purify the mind the first prerequisite is to consume pure food. Therefore, before eating, the food is offered to God, it becomes Prasada (a gift from God). All the impurities in the food are thereby removed. This helps the process of cleansing the mind. This practice has to be kept up continuously.
- Participate, deliberate, contemplate and meditate to know yourself, your organization, your society, your environment and your role.
- Our foremost duty is to show our gratitude to our parents. We have to take care of them in their old age. Such discharge of duty is itself a Sadhana, a form of Yoga.

### 2. Emotional Honesty

Emotional honesty is expressing the true feelings freely and spontaneously. A person who is honest with himself recognizes his weaknesses and works towards becoming a better person and also learns to share his feelings respectfully with others<sup>4</sup>. Further, if we are emotionally honest, we hear another's feelings without judging, criticizing, fixing, or defending. Emotional Honesty brings good health and happiness and if the person is known as an emotionally honest person, people believe him, honour him and respect him.

Emotional honesty allows people to be intimate and connect deeply with other persons. Honesty encourages open communication between employer and employees. It leads to effective relationships in an organization. **For instance**, Pizza Huts<sup>1</sup> adopts customer-oriented strategies to build long term relationships with the customers. Google Company<sup>2</sup> sends appreciation letters to home address of the employees, as the company strongly believes that the appreciation from the spouse improves morale of the employees and makes them to discharge their work with zeal and enthusiasm.

### 3. Virtue of Humility

Virtue of Humility is the quality of being humble. Humble means accepting our limitations and making an effort to make the world a better place without wanting to take all the credit. Such kind of people will be

satisfied with what they have and they expect good things to happen in future<sup>8</sup>. They recognize people for their achievements and patiently listens to the views of the people without interrupting them.

People with virtue of humility admit their mistakes and they don't gossip about people or put them down. They realise that knowledge is infinite, and they always ask people to share their knowledge with others.

Humble person develops the habit of spending more time with the children and makes yoga a regular part of their life. They pay attention to minute details. For instance, Employees in the Boston consultancy group<sup>1</sup> pay attention to the minute details, that helped them to create an environment for innovation and personnel development and instil in every employee a sense a pride in the work they do.

#### 4. Proactive Behaviour

Proactive person takes ownership of their performance and hold themselves accountable. They do not blame circumstances. Proactive person will anticipate an incident/event that may occur in the future and tries to prevent it from happening or lessen the impact. Proactive people don't need to be asked to do something, and they usually require less detailed instructions

Research study conveys that more proactivity equals' better productivity and better productivity usually means improved financial performance, happier shareholders, and less sleepless nights for leaders. For instance, In Coromandel cements employees improve their performance at least by 5% every year irrespective of the approaches they follow. Further, Proactive employees constantly find new and better ways of doing their work. As a consequence, organization becomes more efficient and more productive. Another example<sup>8</sup> to support this view is the Toro Company and Dixon Industries collectively recalled 62,000 faulty commercial riding mowers. These companies worked directly with their dealers, distributors and customers during the recall campaign to proactively fix or replace the affected units already in the market. When companies voluntarily take a proactive stance, it is easier to keep customers and get new business.

#### Examples of proactive behavior:

- Reducing the risk of crime by hiring additional police officers.
- A nurse who, while waiting for the doctor to arrive to see a patient, anticipates and prepares the equipment and information that the doctor might need, enabling the doctor to do job much more effectively.
- Students studying for the full semester class during their summer vacation.
- Reactive people tend to use "I can't", "If only", "I have to". Proactive people say, "I can", "I will", "I want to". A simple change in language can make a big difference.

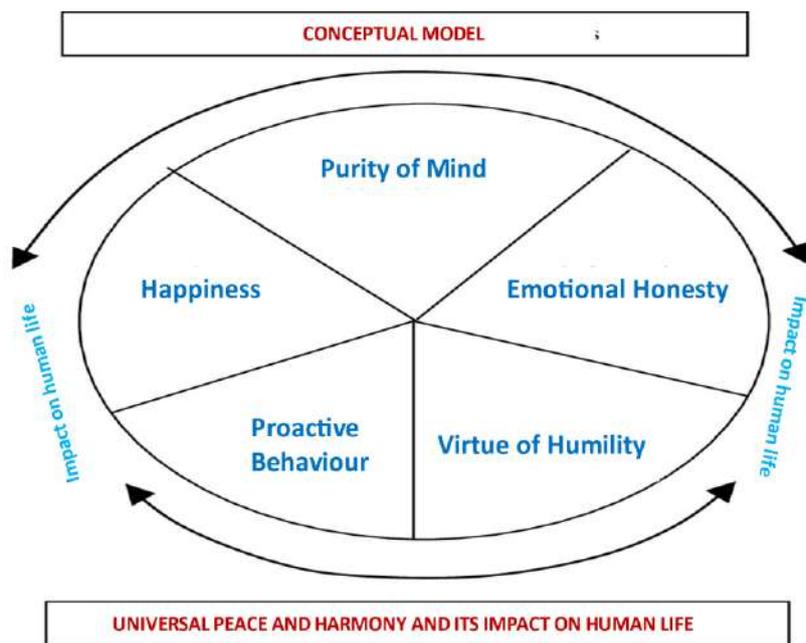
#### 5. HAPINESS

Happiness relates to life satisfaction, appreciation of life, and positive experience of emotions.

Swami Vivekananda says that every individual will have their own definition of what makes them happy. Studies shows that there is correlation between health and happiness<sup>8</sup> i.e., people who experience positive emotions frequently require fewer hospitalizations and are less prone to stroke and heart attacks. Further, there is a significant correlation between happiness and social life. Happy people will have successful friendships, happy marriage life, positive relationships, better social engagement and better interpersonal skills<sup>9</sup>. Studies show that supportive relationships contribute to greater happiness.

Swamiji says that thoughts, beliefs, expectations have a direct bearing upon the happiness and wellbeing of the people. Happier people are more optimistic and more willing to push themselves without feeling defeated or rejected<sup>5</sup>. They learn from their experiences and adapt better to situations, balancing their expectations with pragmatism. On the other hand, If the person feels he is helpless, restricted and limited by others, he will not be happy. Happiness comes if the person has freedom to make decisions, freedom to mould his life according to his dreams and desires<sup>11</sup>. Research study conveys that the people who have the freedom to make decisions for themselves are generally happier than those who have to depend upon others to make decisions for themselves. Further, if people practice forgiveness, the world becomes a better place to live. Forgiveness is essential to release fear and live in peace. In fact, forgiveness is the single most important factor, which helps person to create a life of love and happiness. Without it, people live in hurt, anger and upset. With it, all the gifts and miracles of God's love flow into the lives of people. The negative consequences of not forgiving have been documented in studies that show that it can lead to **emotional pain of anger, hate, hurt, resentment, bitterness** and so on and as a consequence can create health issues, affect relationships and stop us from experiencing the freedom that forgiveness enables.

Based on review of literature, the following conceptual model is designed



### Propositions

The following propositions are formulated, based on review of secondary literature

1. Purity of the mind is attained when the mind is free from negative emotions.
2. Emotional honesty allows people to be intimate and connect deeply with other persons.
3. Humble person doesn't waste his time in complaining about bad things that has happened to them.
4. The person with proactive behaviour anticipates problems and seeks new solutions.
5. A person will be happy when, what he thinks, what he says, and what he does are in harmony.

### Implications of the study

Swami Vivekananda is a powerful change agent and his ideologies are absolutely essential to meet the challenges of the changing environment. For instance, the ideologies of swami Vivekananda teaches us that a controlled mind acts as our friend and helps us to lead a peaceful and moral life. An uncontrolled mind, on the other hand, is our enemy and acts against our interests.

Proactive people like Swamiji strongly believed that accepting and respecting the cultural values of other parties is very important, as it will assist to produce RAMs i.e Responsibility, Accountability and Maturity. For instance, Eye contact is the form of nonverbal communication. In U.S., eye contact is a good thing and is seen as a reflection of honesty and straightforwardness. However, in some Asian and Middle Eastern cultures, prolonged eye contact can be seen as rude or aggressive in many situations. Women may need to avoid it altogether because lingering eye contact can be viewed as a sign of sexual interest:

Accepting a business card from a Japanese businessperson is more ceremonial in Japanese culture than it is in American culture. When accepting a business card, the person receiving it in Japan is expected to take it with both hands and review it to show respect. The person presenting the card will bow and present the card with both hands. This may seem strange in the United States, as cards are usually exchanged freely. Understanding this can help Japanese business people not to feel disrespected, if their American counterparts are less ceremonial about taking their business cards. Again, A golf ball manufacturing company packaged golf balls in packs of four to market their product in Japan. Unfortunately, the pronunciation of the word "four" in Japanese sounds like the word "death", and thus items which are packaged in "fours" could not be sold in Japan<sup>7</sup>. So, Swamiji conveyed to the mankind that for the growth human personality, the development of pure mind and the refinement of the heart are essential.

In this paper, authors have drawn insights from secondary literature. In view of this, it would be worthwhile to conduct empirical studies by taking a large sample, as such kind of studies may throw new light on the growth of human personality.

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## Cashless Payment Policy and Its Effects on Economic Growth of India: An Exploratory Study

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### ABSTRACT

Cashless economies are those that use mostly plastic or digital money and thus minimal cash or money in paper form. The ease of conducting financial transactions is probably the biggest motivator to go digital. The study develops a conceptual framework to understand the working of cashless economy. The paper highlights the various objective of being cashless. The benefits of making a country cashless have also been included. The study also explains the hurdles coming in the way of making an economy cashless.

The financial safety over the digital payment channel is important for pushing the cashless economy idea. A major obstacle for the quick adoption of alternate mode of payment is mobile internet penetration, which is crucial because point of sale terminal works over mobile internet connection, while banks have been charging money on card-based transaction which is seen in hurdle. India has been using electronic payment system for many year now, However the retail sector still has predominance of cash transaction and payment through cash is yet to pick up card is the one of the most secure, convenient mode of cashless payment in retail market.

Keywords: Cashless economies, financial safety, retail sector, retail market, mobile internet

### INTRODUCTION

The government has implemented a major change in economic environment by demonetizing the high value currency notes of – Rs 500 and Rs 1000 from 8th November 2016 and push India towards cashless future. What is cashless economy: A cashless economy is one in which all the transactions are done through electronic channels such as debit/credit cards, Immediate Payment Service (IMPS), National Electronic Funds Transfer (NEFT) and Real Time Gross Settlement (RTGS). The circulation of physical currency is minimum. The Indian economy continues to be driven by the use of cashless than 5% of all payments happen electronically. Electronic based transaction seeks to drive the development and modernization of India's payment system. The essence of the policy is to shift the economy from a cash based economy to a cashless one. Efficient and modern payment system is a key enabler for driving growth and development. The policy also aims at improving the effectiveness of monetary policy, managing inflation in the economy, maintaining stable pricing system. In India, the ratio of cash to gross domestic product is 12.42 %in GDP; this is one of the highest in the world. It was 9.47% in China or 4 % in Brazil. Further, the number of currency notes in circulation is also far higher than in other large economies, India had 76.47 billion currency notes in circulation in 2012-13 compared with 34.5 billion in US. The government is working at various levels to reduce the dependence on cash.PM-Narendra Modi unveiled two schemes –Lucky GrahakYojna, Digi DhanVyapaarYojna for customers and traders like to promote mobile banking and e-payments. To encourage and strengthen cashless economy it's important to inculcate the habit of making e-payments. Government encourages cashless transactions like mobile banking, Ru-pay cards, UPI, USSD these are means and methods of digital payments. Less cash economy is in the interest of everyone and it will help in creating a clearer economy in future. Government have also introduced Aadhar based payment system, this is for those people who don't have cards or mobile phones. Reducing Indian economy's dependence on cash is desirable for a variety of reasons. To control counterfeit notes that could be contributing to terrorism, It also affect the monetary policy of our country and to eliminate the —black money, hawala transfers can't be made without paper currency, Curbs illegal activities altogether. A large part of black money is generated in illegal trades like selling drugs therefore without cash or less cash illegal trade might become difficult. RBI has also issued licenses to open new-age small finance banks and payments banks which are expected to give a push to financial inclusion and bring innovative banking solutions.

### REVIEW OF LITERATURE

Keeping this view in mind, an attempt has been made to make a brief survey of the work undertaken on the field of Cashless economy. The reviews of some of the important studies are presented below. Cashless economy is not the complete absence of cash, it is an economic setting in which goods and services are bought and paid for through electronic media. According to Woodford (2003), Cashless economy is defined as one in which there are assumed to be no transactions frictions that can be reduced through the use of money balances, and that accordingly provide a reason for holding such balances even when they earn rate of return. In a cashless

economy, how much cash in your wallet is practically irrelevant. You can pay for your purchases by any one of a plethora of credit cards or bank transfer (Roth, 2010) observed that developed countries of the world, to a large extent, are moving away from paper payment instruments toward electronic ones, especially payment cards. Some aspects of the functioning of the cashless economy are enhanced by efinance, e-money, e-brokering and e-exchanges. Cashless economy is not the complete absence of cash, it is an economic setting in which goods and services are bought and paid for through electronic media

**1. Alvares, Clifford (2009)** in their reports —The problem regarding fake currency in India. It is said that the country's battle against fake currency is not getting easier and many fakes go undetected. It is also stated that counterfeiters hitherto had restricted printing facilities which made it easier to discover fakes.

**2. Jain, P.M (2006)** in the article —E-payments and e-banking opined that e- payments will be able to check black —An Analysis of Growth Pattern of Cashless Transaction System. Taking fullest advantage of technology, quick payments and remittances will ensure optimal use of available funds for banks, financial institutions, business houses and common citizen of India. He also pointed out the need for e-payments and modes of E-payments and communication networks.

**3. Srinivas, N. (2006)** in his study —An analysis of the defaults in credit card payments, has tried to analyse the socio-economic profile of the defaulters of credit cards, to identify the set of factors which contributed to such defaults and suggest relevant measures to minimize the default cases. Analysis of reasons indicated that economic hardship is the major reason identified by majority of the sample units follows by rigid payment structure and loss of job/business. The main suggestion is that the banks concerned should redesign the payment structure of credit card defaulters in a flexible and affordable instalment

#### **OBJECTIVE OF STUDY**

1. Understanding the framework to understand the working of cashless economy
2. To Discuss the benefits of making a country cashless
3. Study the financial safety over the digital payment modes
4. To find out and explains the hurdles coming in the way of making an economy cashless.

#### **RESEARCH METHODOLOGY**

To do the present research study researcher have used secondary data sources through which the qualitative data is collected from different published research literature such as research papers, financial magazines, researcher also have referred online published contents

#### **Objectives of Cashless Economy**

- 1. Modernization of Payment System:** To drive development and modernization of payment system electronic payment is first step. An efficient and modern payment system is positively correlated with economic development, and is a key enabler for economic growth.
- 2. Efficient Transaction:** To reduce the cost of banking services (including cost of credit) and drive financial inclusion by providing more efficient transaction options and greater reach.
- 3. Managing Inflation and Driving Economic Growth:** To improve the effectiveness of monetary policy in managing inflation and driving economic growth. In addition, the cash policy aims to curb some of the negative consequences associated with the high usage of physical cash in the economy.
- 4. High cost of Cash:** There is a high cost of cash along the value chain from the banks, to corporations and traders; everyone bears the high costs associated with volume cash handling.
- 5. High risk of Using Cash:** Cash encourages robbery and other cash related crimes. It can also lead to financial loss in the case of fire and flooding incidents. It can be reduced by cashless transactions.
- 6. Informal Economy:** High cash usage results in a lot of money outside the formal economy, thus limiting the effectiveness of monetary policy in managing inflation and encouraging economic growth.
- 7. Inefficiency and Corruption:** High cash usage enables corruption, leakages and money laundering, amongst other cash-related fraudulent activities can be reduced by cashless payments.

### **Modes of Cashless Payment**

Modes of cashless payment are ways of paying without cash. A cashless method is more transparent as every transaction can be traced easily as it leaves its footprints. Many smart people have adopted new cashless payment options. The alternative means of payment are as follows:

- 1. Cheques:** The cheque is one of the oldest modes of cashless payments. In this method you issue a cheque for the specific amount to someone else. The cheque gets deposited in the respective bank. The bank processes a payment through a clearing house. The entire transaction done through cheque gets recorded and there is a proof of payment. However, there are instances where cheque payments get dishonoured due to signature mismatch or insufficient fund. In order to avoid such issue, you can use other cashless payment options (Parekh, 2016).
- 2. Demand Drafts:** Another mode of cashless payments is bank drafts. Demand draft never gets defaulted as it is signed by banker, except if they are fraudulent. However, they are less popular because you need to visit a bank in order to deposit cheque and demand draft.
- 3. Automated Teller Machine (ATM):** ATM is a combined computer terminal, with cash vault and recordkeeping system in one unit, permitting customers to enter the bank's book keeping system with a plastic card containing a Personal Identification Number (PIN). It can also be accessed by punching a special code number into the computer terminal linked to the bank's computerized records. It is cash dispensing machines, deposits, funds transfer between two or more accounts and bill payments. Automated Teller Machines will be used much frequently for making variety of online payments such as utility bills, T.V subscriptions, GSM recharges, etc. Customers are advised to keep their ATM cards (Debit and Credit) safe and never to divulge their PINs.
- 4. NEFT:** It is an online platform where banks exchange value thereby enabling the performance of interbank transfers such as NEFT and NIBSS instant transferring funds between banks for single or multiple beneficiaries for individual. NEFT payments are instant and immediate.
- 5. RTGS:** Real Time Gross Settlements is used to transfer sums in favour of a single beneficiary. Online transfer using RTGS is comparatively faster than cheque or DD. Online transfer can be done from anywhere using internet facility. **Mobile Money:** This is a product that enables users to conduct funds transfers, make payments or receive balance enquiries on their mobile phones.
- 6. E- transfers:** E – transfer refers to electronic transfers which can be affected via the internet on PCs, laptops and other devices. Bank customers who have subscribed to internet banking can do basic banking transactions via the web.
- 7. POS Terminal:** Point of Sale (POS) terminals are deployed to merchant locations where users swipe their electronic cards through them in order to make payment for purchases or services instead of using raw cash. As the POS terminals are online real-time, the customers bank account is debited immediately for value of purchases made or services enjoyed.
- 8. Electronic Purses/Wallets:** E-wallets that store card numbers and cash. This is a virtual wallet that can store credit card, debit card and other information. E – Wallets customer and merchant both require a smart phone with active internet connection. The most popular example of E – Wallet is PayPal. E – Wallet is simplest cashless method.
- 9. Mobile Wallets:** The next cashless payment method is Mobile Wallet. You do not need a debit card, credit card or internet banking password for making payment using a mobile wallet. Just load money in your wallet via IMPS and use it on the move. You can download mobile wallet app from play store. For example: Paytm, PayUmoney, Oxigen, Lime etc. **Credit Cards:** This is a plastic card for payment for the goods or items delivered. The limitation of this method is an availability of swipe card facilities (POS) at merchant end. **Debit Cards:** These were a new form of value transfer, where the card holder after keying of a PIN, uses a terminal and network to authorize the transfer of value from their account to that of a merchant.
- 10. Smart Cards:** A smart card is a plastic card with a computer chip inserted into it and that store and transacts data between users. **Personal Computer Banking (Home Banking):** This term is used for a variety of related methods whereby a payer uses an electronic device in the home or workplace to initiate payment to a payee.
- 11. Electronic Cheque:** Electronic cheques are used in the same way as paper cheque – the clearing between payer and payee is based on existing and well known banking settlement system. Digitized 'E-Cash'

Systems: E-cash payment system takes the form of encoded messages and representing the encrypted equivalent of digitized money.

**12. UPI Apps:** UPI is a mobile payment system which allows you to do various financial transactions on your smart phone. UPI allows you to send or receive money using virtual payment address without entering bank information. Merchant can enrol with banks to accept payments using UPI. Example - SBI pay, ICICI pocket, PNB UPI.

### **Benefits of Cash less Economy**

Cash less economy helps in curbing generation of black money. As a result it reduces real estate prices because most of black money is invested in Real estate which inflates the prices of Real estate markets. An increased use of digital payment instead of cash would enable a more detailed record of all the transactions which take place in the society, allowing more transparency in business operations and money transfers which reduce tax avoidance and money laundering. Cashless Economy also reduces the cost of banking services. It also improves monetary policy in managing inflation and increases economic growth in our country. Another benefit of cashless economy is that it discourages cash related robberies and other cash-related crimes.

### **Cash VS Digital Money: Why Cashless is going to be tough within India?**

At the end of a panel at "Startup India Standup India", adequately named "Disruptive Power of Technology in Financial Inclusion", the panelists, which included Paytm CEO Vijay Shekhar Sharma, Eko Founder and CEO Abhishek Sinha, and Ispirt's Sharad Sharma, pledged to make India a cashless economy. That was January 16th, 2016, and nearly 10 months later, Prime Minister Narendra Modi, put disruption into the financial payments space, with the move to remove (and gradually recycle) 86% of the cash in the Indian economy.

### **Infrastructure Issues**

- 1. Number of citizens on mobile:** Not all Indians are mobile, leave alone connected. The latest figures from the Indian telecom regulator TRAI show that, as of 31st July 2016 (pdf): India had a teledensity of 83%, with Bihar, Assam, Madhya Pradesh and Uttar Pradesh with teledensity of less than 70%. While state-wise data for wireless teledensity is not available, it won't be very different, since most connections in India are wireless. Note that these are number of connections, not users, so you will have to discount this significantly, because many users have multiple SIM cards. Proof: Delhi has a teledensity of 234.77%. Urban wireless teledensity is 148%, and rural is 50.72%. Even of the 1,034.23 million connections, 88.88% are active.
- 2. Number of mobile users who are connected to the Internet:** There were 342.65 million Internet connections by the end of March 2016, of which 20.44 million were wired connections. In total, 149.75 million were on broadband (3G + 4G + wireline broadband) and 192.9 million on "Narrowband". Narrowband Internet subscriber base was 192.90 million (2G and wireline broadband). Click here for statewise broadband and narrowband data. For the top four telecom operators, the number of mobile connections that are data enabled in a manner that is more than 1mb or more than 10mb per month is around 30%.
- 3. How many people are online daily?** These are connections. How many are online monthly? According to Facebook India MD Umang Bedi, 165 million log on to Facebook on a monthly basis. How many go online daily? Only the telecom operators know
- 4. Availability of reliable connectivity:** "When we were doing Aadhaar," TRAI Chairman RS Sharma said at an event WiFi in India, around two months ago, "and we said it will be an online infrastructure and identity. People said you are creating an online identity in a situation where connectivity doesn't exist. So there was a huge amount of pressure on us to make it work offline as well. Our view was that we are creating a future-proof identity infrastructure. We don't want an infrastructure which becomes useless tomorrow. The future is online. The future is a connected world." But the future isn't now, and RS Sharma knows that: "Today with Aadhaar," he added, "I keep getting complaints that there isn't a tower in a place and therefore we weren't able to authenticate. Therefore, connectivity is a very very serious problem." If you drive from place to place, especially beyond the national highways: state highways, through pot-holed and dusty roads connecting villages and towns, to small places in the hills, you'll find connectivity sparse and fleeting.

Telecom Service Area	Narrowband (Mar-16)		Broadband (Mar-16)		Total Internet (Dec-15)		Total Internet (Mar-16)	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Andhra Pradesh	5.70	7.99	3.43	7.74	9.05	15.38	9.13	15.73
Assam	2.37	1.56	0.84	1.98	3.38	2.79	3.21	3.54
Bihar	6.92	6.89	1.95	3.87	8.43	10.00	8.86	10.76
Delhi	0.49	8.13	0.45	11.53	0.95	18.72	0.93	19.66
Gujarat	4.11	7.23	1.95	7.81	6.16	15.00	6.06	15.04
Haryana	2.08	2.27	0.89	2.32	2.96	4.50	2.97	4.59
Himachal Pradesh	1.02	0.82	0.74	0.46	1.73	1.15	1.76	1.28
Jammu & Kashmir	1.16	1.10	0.67	0.68	1.84	1.65	1.83	1.79
Karnataka	3.62	6.83	1.92	10.26	5.85	16.33	5.54	17.09
Kerala	2.70	3.76	2.87	5.27	6.14	8.25	5.57	9.02
Kolkata	0.25	4.62	0.30	4.10	0.55	8.48	0.55	8.72
Madhya Pradesh	5.18	7.39	1.07	6.78	6.37	13.08	6.24	14.17
Maharashtra	6.59	9.08	3.18	10.64	9.70	18.82	9.76	19.72
Mumbai	0.16	6.60	0.12	8.77	0.30	15.31	0.28	15.37
North East	1.35	1.11	0.62	0.99	1.96	1.74	1.97	2.10
Orissa	2.72	2.68	0.65	2.25	3.60	4.25	3.37	4.93
Punjab	3.59	4.68	1.12	4.07	4.56	8.45	4.71	8.75
Rajasthan	5.16	6.38	1.85	3.87	7.28	9.58	7.01	10.25
Tamil Nadu	3.53	9.59	3.32	11.56	6.86	20.41	6.86	21.16
Uttar Pradesh(East)	9.40	7.26	1.81	4.01	10.98	10.86	11.21	11.27
Uttar Pradesh(West)	5.15	6.04	1.32	4.00	6.15	9.48	6.48	10.04
West Bengal	5.43	2.24	2.21	3.51	7.36	5.27	7.64	5.75
<b>Total</b>	<b>78.65</b>	<b>114.25</b>	<b>33.29</b>	<b>116.47</b>	<b>112.16</b>	<b>219.50</b>	<b>111.94</b>	<b>230.71</b>

#### Breakup of Rural Urban Internet Subscriber (Subscription in Millions)

**5. Availability of user devices:** According to Idea Cellular CEO Himanshu Kapania, there are currently over a billion mobile phones in India: around 850 million feature/smart phones, and 150 million LTE enabled phones.

Airtel India MD and CEO Gopal Vittal recently said that: “What we have found is that **people with smart phones, not all of them use data.** That number of people with a smart phone using data is probably around **60% to 70%**. This is important because the most payments business don’t support feature phones (do any?), and while we will see smart phone penetration grow, and we need feature phone support for now. Mobikwik yesterday has promised it, apart from rolling out a low bandwidth application.

**6. Merchant acceptance:** India had 712.5 million debit cards, and 130.53 million transactions, as of August 2016. That’s around 18 transactions for every 100 cards. Credit Cards? Only 26.38 million in India as of August 2016, accounting for 83.95 million transactions.

Demonetization might lend itself to greater utilization of cards, but there were only 1,461,672 point of sales machines in India, as of August 2016, according to the RBI. In the entire country. In all likelihood, concentrated in major cities, with some merchants with have more than one machine, as backup. A 2015 Ernst and Young report said that India has the dubious honour of having one of the lowest POS terminal penetration, with only 693 machines per million. Brazil had 32,995 terminals per million people and China and Russia, had around 4000 terminals per million people.

**7. Payment and mobile network capacity:** What we’ve seen with Demonetization and the increase in usage of cards and online payments is that somewhere in the value chain, banks and/or payment gateways were not in a position handle the load. Transactions failed. What we were told was that Visa wasn’t able to handle the load. At present, there isn’t sufficient capacity for the escalation in usage if everyone starts transacting digitally. More importantly, do we have the network capacity to deal with this? What happens in an emergency situation, when networks are down because everyone is trying to call everyone, as we’ve seen previously in India? If you don’t have cash, and there is insufficient connectivity, how will you be able to buy anything, use public transportation etc?

## USAGE ISSUES

- 1. Time taken for a transaction:** If you've driven through a toll booth, or paid for parking, you know that operators keep exact change because they expect notes to come in with a specific denomination. The time taken isn't usually to tender change for notes, but for printing a receipt. Watch a small shop selling high frequency purchases like mobile recharge cards, candies or cigarettes, and you'll see that the pace at which they close a transaction with a customer is critical for them: they don't typically give a bill for each transaction, and that's a problem when it comes to taxation. But from a user's perspective, think of the additional time it takes:
- 2. For a card,** you need to place it in a PoS machine, get a user to input a PIN, and if there is connectivity, wait for the merchant to get a confirmation before you can leave.
- 3. For digital transactions,** you need to get a user to scan a merchant QR code, authenticate with a PIN (ideally). Or, you need the merchant to send a payment link to a customer, for the customer to receive it, open a page, type in details and complete a transaction. Then wait for the merchant to receive a confirmation of the transaction before you can leave. Can you imagine doing this while exiting a parking or at a toll booth? The quickest means of payment is an NFC machine, but most phones aren't NFC enabled in India, nor do merchants accept NFC payments.
- 4. Security issues:** The weakest security link in any transaction is not the technology system, but the user, and their lack of understanding of security issues. To get a sense of this, to withdraw money from ATM's, some people were giving others their card and PIN numbers. For example: this and this. But there are other risks too: In 2011, it was believed that payment gateway CC Avenue was hacked. HDFC Bank too. Last month, HDFC and Axis Bank were hacked too.
- 5. No privacy with cashless:** a switch to cashless means that each and every transaction is tracked and documented. This is great for governance, with taxation, but there is no protection for citizens, as to who owns that data, whom they can share it with, and how it will be utilised. If I'm using a wallet, where is the law that prevents usage of that data for advertising to me? By switching to cashless, you're not giving users a choice. India doesn't have a privacy and data protection law, and shamefully enough, the Indian government has gone to court arguing that there isn't a fundamental right to privacy in the country. To quote the Attorney General of India, representing the Union of India, in August last year: "Violation of privacy doesn't mean anything because privacy is not a guaranteed right"  
  
Cash offers that relative privacy and anonymity, that the Government of India is trying to deny its citizens. The only cashless currency that affords anonymity is bitcoin.
- 6. Language compatibility:** Paytm has recently updated their application with some features enabled in Indian languages. Mobikwik has done English and Hindi. PhonePe works in English, Hindi and Tamil. However, most mobile handsets don't have an Indian language interface, as don't most applications and services. Ola is available in Indian languages only for drivers, not passengers. Apart from Snapdeal, no ecommerce company tried going the Indian language way. There's a part of the population in India which still isn't able to read and write, leave alone being able to read and write English, while we don't have phones that are in Indian languages and apps that aren't in Indian languages. The digital divide here is massive. Physical notes are a visual medium of exchange.
- 7. Interoperability issues (between payment systems):** cash is interchangeable: you don't need a connection, an application or an account to exchange cash. Here, you have a situation where State Bank of India doesn't allow payment into a Paytm wallet via netbanking, or wallet to wallet transfer isn't allowed. There's the Unified Payments Interface, set up by the bank owned group NPCI, where the Reserve Bank of India has not allowed wallet to wallet transfers. Customers are locked-in whether it is to their bank account (because you need banking systems functional to transfer money) or to their wallets.
- 8. Cost of transaction:**
  - 8.1 Merchant costs:** Merchants need a working Internet connection to accept digital payments. They need to pay a monthly rental for a machine, or a smartphone with an application to accept payments. On Credit cards, merchants are charged a merchant discount rate (MDR), an inter-bank exchange fee, of 2.5-1.7% per transaction. On debit cards, they need to pay 0.75% per transaction below Rs 2000 and 1% for transactions above Rs 2,000. For UPI, merchants are charged 0.75% per transaction plus other costs (on par as debit cards.)

**8.2 Customer costs:** You need a smartphone, an Internet connection and/or have to pay USSD charges (Rs 0.5 per session) and data charges when applicable.

**8.3 Cost are applicable when cashless is converted into cash:** From an RBI paper on processing costs on cheques and ATMs: "The feedback received from different banks revealed the following – a total cost of Rs.1.95 per Rs.1000/- which excluded the cost of insurance and dispensing cash at ATMs; the cost of dispensing cash through ATMs alone is approximately Rs.17 per transaction; the opportunity loss for holding idle cash would be approximately 9%; the cost per transaction at ATMs ranges from Rs.6.60 to Rs.15.88 in case of fully outsourced operations depending upon the service provider and area of operation."

**Cash isn't the same as cashless (digital payments) because:**

- Not enough people have mobile connections, an Internet connection (which can survive massive usage in times of emergency), or use it regularly, on a smart phone, which supports all Indian languages, with an application that supports all Indian languages. Internet connectivity isn't reliable or available or as cheap for users as cash.
- The process of making digital payments in India is not easy, and is time consuming.
- Making digital payments is costlier either for the merchant or the customer, or both.
- Digital payments can lead to major security risks, with adequate processes not in place for easy redressal, for either merchant or customer. Above all, not enough is being done to educate the consumer, the weakest chain in the link.
- Digital payments aren't a single standard like cash: money in one type of account is not the same as in another type of account, and it is not interoperable, unlike cash.

**CONCLUSION**

The need to move towards a cashless economy in India is immense. One, it will save a huge amount of money that is spent annually in printing and maintaining currency. Most importantly it will help the Government achieve its objective of inclusive growth (through financial inclusion) and make public utilities more efficient. Currently less than 1% of all consumption expenditure is incurred through cashless instruments. However, to move towards a cashless economy, the important role of network effect and creation of a critical mass cannot be ignored. Therefore, at least in the initial stages, steps have to be taken to help build the critical network size.

However, the benefits of this move have now started trickling in with more and more people switching to digital modes of receiving and making payment. India is gradually transitioning from a cash-centric to cashless economy. Digital transactions are traceable, therefore easily taxable, leaving no room for the circulation of black money. The whole country is undergoing the process of modernization in money transactions, with e-payment services gaining unprecedented momentum. A large number of businesses, even street vendors, are now accepting electronic payments, prompting the people to learn to transact the cashless way at a faster pace than ever before. Here are two ways in which cashless can be encouraged

- Giving an indirect tax rebate for using cashless methods of payment, which brings parity between cash and cashless. Even online, merchants can be incentivised to charge less for digital payments, and more for cash on delivery.
- Digital Payments businesses have tried their hand with cashbacks, and lower rates for digital purchases have already encouraged digital payments. Incentives could be given to businesses, which they can transfer to customers.

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## Mitigating Financial Risks in the Tractor Industry -A Case Study on Post Covid-19 Recovery in Escorts Ltd

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### ABSTRACT

The unprecedented crisis of Covid-19 with unseen risks forced countries to go into lockdown over a prolonged period because of its speedy and synchronised spread. The economic contraction with stifled demand due to the pandemic was the biggest risk witnessed in almost all the sectors including automobile and tractor industry. When the lockdown was comforted, there was a phenomenal bounce back in the tractor industry, which led to easing the financial risks.

The present study is therefore taken up to understand the instantaneous growth in this industry by probing into financial performance of Escorts Ltd. This conglomerate is one of the forerunners representing the tractor industry in India, which operates through three segments; Agri- Machinery, Material Handling and Construction Equipment, and Railway Equipment.

The objective is to examine the financial performance of Escorts Ltd. that led to V-shaped recovery, when automobile sector was deeply affected by the lockdown.

The study focuses on the key financial indicators of Escorts Ltd. for the years 2019 to 2021. The data is collected from secondary sources. It is based on quantitative analysis of the financial results for the selected period of three years. The findings are depicted in the form of chart and tables.

The study concludes that Escorts Ltd. could manage to tide over the risks and re-establish the strong financials swiftly in the post lockdown period.

Keywords: Covid-19- lockdown, Recovery, Tractor Industry

### 1. INTRODUCTION

India is the largest producer of tractors in the world and a major exporter. When the consequential lockdown after the outbreak of the pandemic led fragile economy to a standstill and the effects were percolated in almost all sectors, the tractor industry exhibited a phenomenal bounce back in their financial performance. Indian tractor market witnessed the highest- ever recorded growth across the domestic and exports market in the year 2020-21. The domestic industry observed an impressive growth in volumes of 27% to 8.99 lakh tractors in the financial year 2020-21 as compared to 7.09 lakh tractors in the previous year.<sup>1</sup>

In spite of volatility of performance in almost all industries, rating agency ICRA continued to maintain a stable outlook for the tractor industry.

#### 1. Management Report of Escorts Ltd. for the year 2020-2021

Rohan Kanwar Gupta, Vice-President & Sector Head, Corporate Ratings, ICRA reported "In the midst of all this crisis, an expectation of growth in agricultural output remains a silver lining, and is expected to result in healthy cash flows for the farming community, this, in turn, will be favourable for the tractor industry. Overall, the demand drivers for the industry continue to remain favourable and are expected to support volumes over the near term." (Press Trust of India, 31<sup>st</sup> July 2020)

Escorts Ltd. is one of the largest manufacturers in the tractor industry in India. It is a leading engineering conglomerate having a brand value and diversified business in the high growth sectors such as Agri- Machinery, Material Handling and Construction Equipment, Railway Equipment and auto components.

Ever-growing food and agri- business forming global industry, demand for innovative-agriculture solutions, infrastructure play creating demand for construction technology, cutting-edge technology- driven products make Escorts Ltd. a strategic fit in the ever rising industry segments of agri-machinery, construction equipment and railway equipment, on the global platform. These aspects supported by various government initiatives and agri-focused schemes during the lockdown, helped the company to mitigate the financial risks. Rather it showed a V-shaped recovery soon after release of the lockdown and emerged stronger ever before.

The present study is therefore taken up to study and analyse the financial metrics of Escorts Ltd. and observe its quick recovery against the risk of global crisis.

## 2. OBJECTIVES

- 1) To analyse the V-shaped performance recovery in the tractor industry in the post Covid-19 lockdown period with respect to Escorts Ltd.
- 2) To compare the actual financial results of the years ending March 2019, 2020 and 2021 by calculating key financial ratios.
- 3) To examine with the help of CAGR, whether the immediate recovery of Escorts Ltd. could dilute the overall negative returns.

## 3. METHODOLOGY

The present study is analytical in nature. It is a comparative analysis of factual financial indicators and it is based on the case study approach.

### 3.1 SOURCE OF DATA

The data is collected mainly through professional Database viz. Capitaline and secondary sources like Annual Reports, Journals, Newspapers, Company websites, and other relevant links.

### 3.2 SAMPLE

An Indian multinational, engineering conglomerate, Escorts Ltd., representing a leading company in the tractors industry has been selected and analysed to see how this industry witnessed a phenomenal bounce back after lockdown last year

### 3.3 PERIOD

The period under study is March 2019 to March 2021 which represents pre (March'2019) and post (March' 2021) lockdown years.

### 3.4 ANALYSIS

Analysis of the data is done by comparing annual results of the company as well as industry available for three years under the study. Further by working out few financial ratios, CAGR, Variances (YOY) for all the relevant years. The data is presented through appropriate chart and tables.

## 4. LIMITATIONS

- The scope of the study is limited to a single sample company representing tractor industry
- This study is relevant for a specific current situation so it may not be applicable when the economy reverts to normalcy.
- There are certain inferences drawn with the simple mathematical formula and are purely based on quantitative details, the qualitative aspects and its impact on the analysis are not considered.

## 5. NEED

After a hard-hitting period of almost two years, a review and an analysis of the situation is required to overcome and get into momentum to attain normalcy. The present study is necessary as in the current situation, it is difficult for the companies to get the steady returns from their business. The enormosity of the crisis of Covid-19 is unlike and it has affected each and every sector and every individual. While this crisis has disrupted business at a large, yet it has opened up scope for newer opportunities. The organisations that grab these opportunities may arise as winners in the future. Tractor industry in India is one such sector, which could remain steady in spite of all adversities. Covid-19 failed to breakdown the demand for tractors in 2020, it was lowered compared to the previous year though. However sales reached an all-time high and beat all previous volumes in the year 2020- 2021, the best so far for the industry.

Escorts Ltd. is one of the oldest and prominent players in the segment with a significant market share and brand value. The present study is proposed to get insight into what is the current financial situation in the tractor industry by taking Escorts Ltd. as a representative sample.

The focus of the study therefore is on understanding and analysing the V-shaped recovery in the tractor industry with respect to the financial results of Escorts Ltd.

## 6. Background of the study (Literature Review)

- (Balachandar, 2021) While answering a query from Money Control, Hemant Sikka, President Farm Equipment Sector- Mahindra & Mahindra said that the growth of tractor industry is due to several positive factors especially in rural economy. Factors like improved agricultural harvests, higher Minimum Support

Price (MSP), bountiful rains, record water levels in reservoirs and governments rural development schemes pushed tractor demand in 2020.

- (Garg, 2020) reports that Covid-19 pandemic has stifled the corporate performances and changed the lifestyles, at the same time it has opened up unprecedented opportunities. This can work effectively for the sectors, where the goods are supplied to growth sectors like agriculture, construction etc. and the constant innovation is a part of business strategy.
- (Philip, 2020) believed that India's tractor industry is in for some good cheer in the year 2021. The researcher also observes that the tractor sector hardly depends on import from China. 95% of the parts are procured at the local level. And therefore this sector escaped the devastating effect of the Covid-19 pandemic.
- (Jejurikar, 2020) found that the supply of tractors has been normal without any impact and growth in tractor sales in February of over 20% provides enough proof for that. The demand is going to be increased further more because of the robust Rabi crop with favourable crop price.
- (Mukherjee, 2020) reports that the sales of tractors have increased in the post lockdown period, yet the companies should sell tractors in agri and non-agri sectors as a measure to overcome the risk of uncertainties stemming from the outbreak of Coronavirus pandemic. In non-agri sector tractors are used as a medium of transportation, for haulage and construction activities. About 35-40% of tractors in India are used for industrial purposes or non-agricultural applications.
- (Siu & Kennedy, 2012) reports, "The relationships between the relative performance of the different styles and fundamentals such as economic activity, inflation and exceptional situations are not stable. Therefore relying on the belief that it will perform better will add a significant amount of risk." Therefore analytical study is required to tackle such exceptional situation.

Reviewing the above, it is observed that tractor industry is hardly affected in the adverse circumstances and could survive one of the biggest challenges (Philip, 2020) and (Jejurikar, 2020).

Contradicting with these (Mukherjee, 2020) says that though tractor industry is not much affected, the manufacturers need to take steps to overcome the fears of the coronavirus pandemic by selling tractors both in agri and non-agri sectors,

The present study analyses the financials of Escorts Ltd. to review the above opinions further as a case study where the initial negative impact is wiped off by the strong performance of the post lockdown period.

## 7. FINDINGS AND ANALYSIS:

From the data collected through secondary sources following chart and tables are prepared and analysed as under.

**Table no. 7.1** Escorts Ltd. – Variances for the years ended March 2019 to 2021 (₹ in cr.)

Financial Indicators	Mar-21	Mar-20	Variance %	Mar-20	Mar-19	Variance %
	₹	₹	(GOLY)	₹	₹	(GOLY)
Net Sales	6,929.29	5,760.95	20.28	5,760.95	6,196.36	-7.03
Other Income	154.56	92.25	67.54	92.25	92.99	-0.8
EBITDA	1,283.79	758.85	69.18	758.85	826.28	-8.16
EBT	1,157.11	638.84	81.13	638.84	722.43	-11.57
EAT	874.06	492.24	77.57	492.24	477.59	3.07

(Prepared by the researcher) (Source – Capitaline Database)

### Observation and Interpretation:

Table No.7.1 compares the key financial indicators for the year ended March'2020 with the corresponding previous year's period, i.e. March'2019. This shows the clear negative impact of Covid-19 lockdown with respect to all parameters. Whereas the variance percentage of March'2021 compared to March'2020 shows the remarkable increase in the immediate post lockdown phase.

Escorts Ltd. witnessed the highest- ever recorded growth with respect to all financial indicators. The V- shaped recovery can be seen with respect to the variance percentage of EBITDA, EBT and EAT, which are bounced back with 69.18% , 81.13% and 77.57% respectively from -8.16%, -11.57% and 3.07 % respectively.

**Table no. 7.2** Escorts Ltd.-ROG for the years ended March '19, March' 20 and March '21

Parameters	Growth Rate Percentage		
	Years ↓ → Mar -21	Mar -20	Mar -19
Net Sales	20.28	-7.03	24.05
EBITDA	69.18	-8.16	35.48
NPBT	81.13	-11.57	41.98
NPAT	80.02	0.13	40.67
Net Worth	54.93	15.13	18.63
Capital Employed	54.78	6.67	27.13
Market Capitalisation	113.85	-16.8	-2.63

(Prepared by the researcher) (Source – Capitaline Database)

**Observation and Interpretation:**

Table No.7.2 enumerates ROG i.e. Rate of Growth for selected parameters. A phenomenal growth can be seen in the post lockdown period i.e. in the year ended March'21. Growth in Profit at each level of EBITDA, NPBT and NPAT shows extraordinary recovery with ROG of 69.18%, 81.13% and 80.02% respectively. This speedy recovery is echoed in the growth of Market Cap., which is increased from ROG of – 16.8% to 113.85% in the post lockdown period.

**Table No. 7.1 and 7.2 accomplish objective 1**, i.e. ‘To analyse the extraordinary performance recovery of tractor industry in the post Covid-19 lockdown period with respect to Escorts Ltd.’

**Table No. 7.3** Escorts Ltd. - Key Financial Ratios for the years 2019- 2021

Particulars	Years		
	Mar '21	Mar '20	Mar '19
<b>Financial Ratios</b>			
Debt-Equity Ratio	0.01	0.06	0.07
Current Ratio	1.46	1.22	1.09
<b>Turnover Ratios</b>			
Inventory	8.76	6.68	8.8
Debtors	10.1	6.99	8.22
<b>Profitability Ratios</b>			
EBITDA (%)	18.34	12.9	13.12
EBIT (%)	16.65	11.06	11.73
EAT (%)	12.43	8.12	7.63
ROCE (%)	27.76	20.61	27.64
RONW (%)	21.41	16.29	19.55
<b>Ratios from Investors' point of view</b>			
DPS (₹)	7.5	2.5	2.5
EPS	64.63	38.53	39.07
Interest Cover Ratio	87.57	37.29	37.59
Price to Earning (P/E)	20.03	17.58	20.62

(Prepared by the researcher) (Source – Capitaline Database)

**Observation and Interpretation:**

**Table No. 7.3** compares the key financial ratios for the years ended March 2019, 2020 and 2021. All key financial ratios are improved and shows swift recovery in the post lockdown period.

Company's short term as well as long term solvency position seems sound looking at the debt equity and current ratios. The current ratio is improved from 1.09 to 1.46 which is closer to the required standard. This indicates the stability of short term financial position. The lowering debt equity ratio indicates lesser borrowed funds than the own funds which is also reflected by improved Interest Coverage Ratio(ICR) from 37.59% to

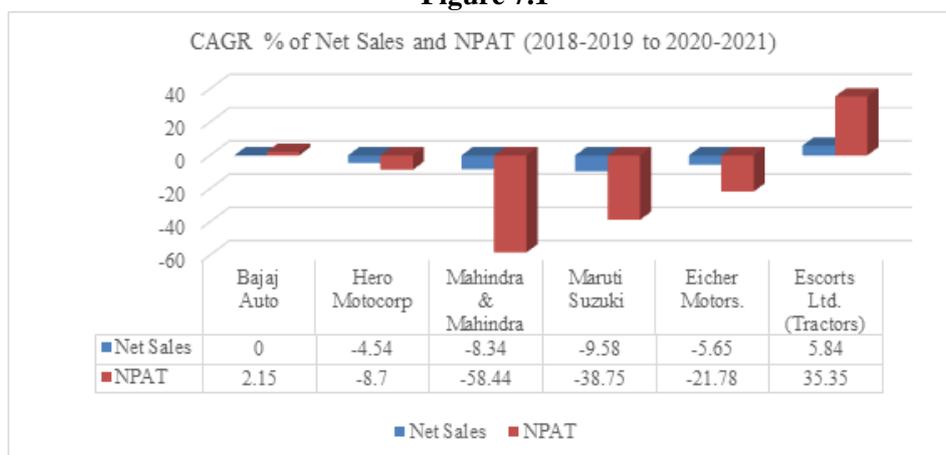
87.57%. The impressive jump in ICR is due to the dual factors of increase in EBIT and reduction in debt so as to reduce interest during the year 2020- 2021.

The Inventory Turnover ratio showed a drop in the year 2020 as compared to 2019, but the same jumped up to 8.76 times which is the highest of all the three years. The Debtors' turnover ratio is 10.01times which is quite better than the standard ratio and an improvement over the ratio of the previous years.

All profitability ratios viz. EBITDA, EBIT.EAT, ROCE, RONW have improved in 2021 as compared to 2020, indicating a clear increase and quick recovery in the post lockdown period. The repercussions of hiked earnings could be seen in the higher amount of EPS and in turn in the DPS as well. The increased Price to Earnings ratio indicates higher market price of the shares, that is high volume of market capitalisation.

**Table No. 7.3 accomplishes objective 2**, i.e. 'To compare the actual financial results of the years ending March 2019, 2020 and 2021 by calculating key financial ratios.'

**Figure 7.1**



Comparative Compound Annual Growth Rate (CAGR) w.r.t. Net Sales and NPAT of the companies belonging to automobile sector.

**Observation and Interpretation:**

Figure No. 7.1 shows interesting analysis of CAGR of several companies including Escorts Ltd. for three years under the study. CAGR is calculated for two parameters Net Sales and Net Profit after Tax for all the given companies. It is observed that all except Escorts Ltd. and NPAT of Bajaj Auto, showed negative CAGR. The rapid recovery after lockdown in Escorts could be the automobile products it deals in; they are agri- machinery, tractors, automotive components, railway equipment, and construction and material handling equipment.

**Table No. 7.4 Escorts Ltd.-CAGR for Key Parameters (2019-2021)**

Parameters	CAGR %
Net Sales	5.84
Other Income	27.16
Gross Profit	25.97
Total Expenditure	0.13
NPBT	27.08
NPAT	35.35

(Prepared by the researcher) (Source – Capitaline Database)

**Observation and Interpretation:**

Table No. 7.4 further shows the CAGR of Gross profit of Escorts Ltd., which shows the growth rate at 25.97%; Other Income at 27.16 % with a negligible increase in expenditure at 0.13% so as to give higher NPBT and NPAT growth rate. This clearly shows that the negative returns during lockdown period are wiped off with the fast track recovery performance after lockdown.

Figure No. 7.1 and Table No. 7.4 accomplish objective 3 i.e. 'To examine with the help of CAGR, whether the immediate recovery of Escorts Ltd. could dilute the overall negative returns.'

## 8. CONCLUSION

It is observed that the overall performance of Escorts Ltd. has been impacted positively in the post lockdown period. Though Covid-19 pandemic stifled performance during the year 2019-2020, the company with its strong financials, could seize back its lost market share and witnessed V-shaped recovery immediately after the lockdown. The study concludes that Escorts Ltd. could manage to tide over the financial risks and re-establish the strong financials swiftly in the post lockdown period.

## 9. RECOMMENDATIONS:

- Companies may set supply chain and network distribution meticulously so as to avoid sudden instabilities which impact the business negatively.
- The company may institute a vigorous agenda for risk governance as part of sustainability strategy.
- It may take time to regain in case of some segments. Till then the company may take leverage on the segments such as agri- business and construction equipment as the recovery momentum in these segments is higher as compared to other segments.
- The company may gain more if it works on introducing innovative products with upgraded technology like GPS based steering, AC cabins for more productive farming as suggested by (Mukherjee, 2020)
- Companies may go for strategic coalition and strengthening of product and distribution network to support entry in new markets, upcountry as well as overseas.

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## **A Report on Emerging Dimensions of Women Empowerment through Micro Finance**

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### **ABSTRACT**

Funding for women employment is growth very rapidly. Through micro finance women are empowered. The capacity building of the individuals is empowered them for social transformation, economic development, participation in development process and representation in governance. The main objective of the study is to generate some effective dimensions of women empowerment, highlight the significance of micro finance in asset creation, income generation and poverty aviation of females.

Keywords: Women employment, Micro Finance, Women Empowerment, Income Generation

### **INTRODUCTION**

The experience of the more than five decades has demonstrated that there is always a possibility to develop but it is not unbeatable to occur. It is indenting a few countries succeeding in rapid economic growth and poverty alleviation, while others not being so successful. Even measured by minimum standard of a dollar a day people living in poverty are about 1.3 billion out which 8 percent poor live in Uttar Pradesh, and the country topping the list in this respect. Many development strategies experimented so far have not yielded the desired results. For more than four decades, development was seen mainly as a measure of economics – increasing the capital stock and improving the allocation of resources. However, the Economists differed in their view of how best to improve resources and to their allocation, and the role government in this exercise. In 1980's, the development strategy shifted from micro management policies to macroeconomic policies along with adjustment of fiscal imbalances and monetary policies. The collapse of the socialist economies in the world and end the cold war demonstrated the inefficacy of a larger government role in the national economies. The new phase of development thereafter was followed by the policies of (L.P.G.) liberalization, privatization and globalization.

The Capacity building of the individuals is must to empower them for social transformation, economic development, participation in development process and representation in governance. Hence a country aspiring to develop must have institutions, entrepreneurship and leadership to catalyze, absorb and manage the process of change and the changed society.

Funding for women employment is ready to growth in addition withinside the years to come, additionally which will promote gender policies. The get admission to micro-finance services (credit, financial savings, coverage and pensions) continues to be incredibly unequal among guys and women. Considerable advances had been made withinside the Nineteen Nineties withinside the layout of NGO-controlled programmes and poverty-focused banks to growth women's get admission to small loans and financial savings facilities. Literature organized for the Microcredit Summit Campaign provides an exceedingly appealing imaginative and prescient of growing numbers of increasing micro-finance programmes which now no longer most effective supply many women get admission to micro-finance services, however additionally provoke a 'virtuous upward spiral' of empowerment<sup>1</sup>. Funding for microfinance is increasingly dependent on progress towards financial self-sustainability within a given time-frame. The cost-cutting measures in micro-finance programmes may have potentially negative implications for poverty-reach and contribution to women's empowerment (Mayoux 1998, 2000; Rahman 1999). Even those donor agencies are becoming aware that this may limit the potential of micro-finance for empowerment or poverty alleviation (Buckley 1996, DFID 1998, Rosenberg1998). This awareness has not however so far led to significant change in practice.

### **OBJECTIVES OF THE STUDY**

The main objective of the study is to generate some effective dimensions of women empowerment. Along with the above-mentioned broad objective following are other objectives:

1. To highlight the significance of micro finance in asset creation, income generation and poverty aviation of females.
2. To emphasize on Emerging dimensions of women empowerment.
3. To overview the evidence and impact of microfinance on women.

## RESEARCH METHODOLOGY OF THE STUDY

The study is basically exploratory in nature for which the researcher has depended mainly on primary data as well as secondary data. A preliminary study on various MFIs activities followed by corporate was conducted at the first stage. For this, a detailed review of the existing literature was done. Emerging dimensions of women empowerment was seen through the proactive role of MFIs. Based upon the study and the researcher's imagination, some promising suggestions have been put forwarded by the researcher.

## SCOPE OF THE STUDY

**In the process, the researcher wants to conduct study in the following areas:**

1. The study will bring in light to some successful Empowerment related examples.
2. The research will show the relationship between women empowerment and employability.
3. This effort will encourage corporate to develop a positive attitude towards MFIs.

## REVIEW OF LITERATURE

Nagayya (2000) maintains that an off-the-cuff arrangement for credit provide to the poor through SHG' is quick rising as a promising tool for promoting income-generating enterprises. He has reviewed the initiatives taken at the national level with a view of institutional arrangements to support this programme for alleviation of financial condition among the poor, with target women. He maintained that NABARD and SIDBI are enjoying a distinguished role at numerous stages of implementation of this programme. There are alternative national level bodies conjointly supporting NGO'/VA/s, videlicet Rastriya Mahila Kosh (RMK), Rashtriya Gramin Vikas Nidhi (RGVN) and so forth He caught up an imperative got to enlarge the coverage of SHG' prior to portfolio of banks as a part of their company strategy, to acknowledge perceived edges of SHG' funding in terms of reduced default risk and group action costs.

**Bhatia and Bhatia** (2000) through few case studies highlighted that recovery of SHG's is higher than other credit extended to borrowers. Moreover, involvement of SHG's had helped the bank branches in recovery of old dues. They observed that there has been perceptible changes in the living standards of the SHG's members, in terms of ownership of assets, increase in savings and borrowing capacity, income generating activities and income levels as well.

**Puhazhendhi** (1999) analyzed the functioning of SHG's, in performance, sustainability, empowerment of women, economic impact on the members, future potentials etc. He observed that SHG's in Tamil Nadu are performing well towards social change and transformation. The emerging trends are leading to positive direction of empowerment of members and promotion of micro finance.

**Dasgupta** (2000) in his paper on informal journey through Self facilitate teams determined that micro-financing through informal cluster approach has established quite an few edges viz.: (i) savings mobilized by the poor; (ii) access to the specified quantity of acceptable credit by the poor; (iii) matching the demand and provide of credit structure and gap new marketplace for FI'; (iv) reduction in dealings value for each lenders and borrowers; (v) tremendous improvement in recovery; (vi) heralding a replacement realization of subsidyless and corruptionless credit, and (vii) outstanding direction of poor women. He stressed that SHG' ought to be thought of in concert of the most effective means that to counter social Associate in Nursingingd money citizenship not as an finish in itself.

**Datta and Raman** (2000) highlighted that SHG's are characterized by heterogeneity in terms of social and economic indicators. The success of SHG's in terms of high repayment is mostly related to the exploitation of prevailing social ties and cohesion found among women members. Social cohesiveness among members spring not only from their diverse background of knowledge base, skills occupations and income levels, but also due to the dynamic incentive system of progressive lending to the groups on the successful completion of loan repayment. However, SHG's are heavily dependent on external financial agencies for their lending operations.

**Satish** (2001) in his paper raised certain issues related to the functioning of SHG's. Adequate care should be taken to ensure homogeneity of socio-economic status of the members, while forming SHG's. The process of SHG formation has to be systematic whether a Bank or an N.G.O forms it.

**Barbara and Mahanta** (2001) in their paper maintained that the SHG's have helped to set up a number of micro-enterprises for income generation. Rastriya Gramin Vikas Nidhi's credit and saving programme in Assam has been found successful as its focus is exclusively on the rural poor. It adopted a credit delivery system designed specially for them with the support of a specially trained staff and a supportive policy with no political intervention at any stage in the implementation of the programme.

### MISSION OF THE ORGANIZATION

LMST has the mission of upliftment of the poor and disadvantaged sections of the society with particular emphasis on women occupied in the informal economy.. In view of this LMST is committed to strengthening the movement of women in the informal sector / economy through highlighting their issues at the National level and by building their capacities in order to empower them. LMST believes in Gandhian thoughts and principles of Satya (truth), Ahimsa (Non-Violence), Sarva Dharma (Integration of all faiths) and Khadi (Propagation of Self-employment).

LMST endeavors to empower women workers in the informal economy/ sector by Organizing them for collective strength, bargaining power and representation in committees and boards at district, and national and international level.

### ANALYSIS OF DATA

To highlight the significance of micro finance in asset creation, income generation and poverty aviation of females.

TABLE NO:

		Mild change	Some change	No change	Total
<b>Social Security</b>	Frequency	2	42	6	50
	Percent	4.0	84.0	12.0	100.0
<b>Food Security</b>	Frequency	2	33	15	50
	Percent	4.0	66.0	30.0	100.0
<b>Education</b>	Frequency	2	43	5	50
	Percent	4.0	86.0	10.0	100.0
<b>Medical</b>	Frequency	1	41	8	50
	Percent	2.0	82.0	16.0	100.0
<b>Marriage</b>	Frequency	1	40	9	50
	Percent	2.0	80.0	18.0	100.0
<b>Festivals</b>	Frequency	1	44	5	50
	Percent	2.0	88.0	10.0	100.0
<b>Emergencies</b>	Frequency	1	41	8	50
	Percent	2.0	82.0	16.0	100.0
<b>Agriculture</b>	Frequency	1	35	14	50
	Percent	2.0	70.0	28.0	100.0
<b>Asset Building</b>	Frequency	1	42	7	50
	Percent	2.0	84.0	14.0	100.0

Source: Primary source of data collection

### Autonomy in Decision Making as an Important Indicator of Women Empowerment:

Women empowerment in society and family are closely linked to decision making influence. Autonomy in decision making has been measured in terms of participation of women in household responsibilities. To ascertain the influence of work participation of women on decision making, an important indicator of empowerment of women, we analyze the difference in participation in decision making on various issues categorized as under among workers and non-workers.

- 1. Trivial Issues (TI):** includes decision in making in what items to cook and answering freely to questions asked.
- 2. Issues Related to Own Self (IROS):** Obtaining health care for own health, decision making in going for outings, purchasing requirements for own self, visiting and staying with parents/friends/relatives.
- 3. Issues Related to Children (IRC):** Decision making in purchasing requirements for children and decision making in education of children.

4. **Critical Issues (CI):** Decision making with respect to expenditure in marriages, borrowing money to meet household demands, borrowing money to start business, paying back of debts and control over using earned or saved money.

**TABLE NO:**

	N	Mean	Median	Mode	Std. Deviation
Social Security	50	4.08	4.00	4	.396
Food Security	50	4.26	4.00	4	.527
Education	50	4.06	4.00	4	.373
Medical	50	4.14	4.00	4	.405
Marriage	50	4.16	4.00	4	.422
Festivals	50	4.08	4.00	4	.340
Emergencies	50	4.14	4.00	4	.405
Agriculture	50	4.26	4.00	4	.487
Asset Building	50	4.12	4.00	4	.385

**Source:** Primary source of data collection

To emphasize on Emerging dimensions of women empowerment Impact of such training and exposure visits

**TABLE NO:**

Sr. no.	VARIABLES		Total change	Average change	Mild change	Some change	No change	Total
1.	Confidence Building	F	1	0	0	48	1	50
		%	2.0	0	0	96.0	2.0	100.0
2.	Skill Development	F	0	0	0	50	0	50
		%	0	0	0	100.0	0	100.0
3.	Marketing Linkage	F	0	0	0	28	22	50
		%	0	0	0	56.0	44.0	100.0
4.	Bank Linkages	F	0	0	0	13	37	50
		%	0	0	0	26.0	74.0	100.0
5.	Linkages with Govt. Officials	F	0	0	0	25	25	50
		%	0	0	0	50.0	50.0	100.0
6.	Knowledge on rights, entitlements and development programmes	F	0	0	0	29	21	50
		%	0	0	0	58.0	42.0	100.0
7.	Managerial efficiency for Micro enterprise development	F	0	0	1	26	23	50
		%	0	0	2.0	52.0	46.0	100.0
8.	Enhanced Income and earnings	F	0	0	0	45	5	50
		%	0	0	0	90.0	10.0	100.0
9.	Active Participation in decision making in family	F	0	0	0	30	20	50
		%	0	0	0	60.0	40.0	100.0
10.	Active Participation in Development Programmes	F	0	0	0	27	23	50
		%	0	0	0	54.0	46.0	100.0
11.	Active Participation in Decision making outside the family	F	0	0	0	28	22	50
		%	0	0	0	56.0	44.0	100.0
12.	Others (Spe.)	F	0	0	0	32	18	50
		%	0	0	0	64.0	36.0	100.0

**Source:** Primary source of data collection

Participation in decision-making was found higher for the working women as compared to the non-working women in all aspects of household decision making. Higher the participation in decision making higher is the degree of autonomy. Still one needs to look into the nature of this participation of women. The magnitude of decision making varies across trivial issues, issues related to own self, issues related to children and critical issues.

For matters relating children autonomy were highest. All working women had autonomy in issues relating to children. Only 5% non-working women were not allowed or did not take part in decision making. In case of issues classified as trivial issues the female participation in decision making is extremely high among working women whereas 9% non-working women did not enjoy autonomy in such issues. For the issues related to own self autonomy ranged roughly between 10 to 20 percent. Autonomy in going for outing or visiting friends/relative/parents i.e., freedom of mobility was most restricted. On health issues around 66 percent non-workers made joint decisions. Independent decision making in own health related issues was almost double for workers.

Decision making was most restricted in financial matters. Around 25-50 percent women did not participate in such decisions with variations in the levels of participation with respect to their status. Around 40 percent non-working women did not participate in decision-making in financial matters relating to borrowing money for household demands, starting business and paying back debts.

**To overview the evidence and impact of microfinance on women.**

**TABLE NO:**

		Some change	No change	Total
Mobility	F	35	15	50
	%	70.0	30.0	100.0
Recognition in family	F	38	12	50
	%	76.0	24.0	100.0
Recognition in community	F	38	12	50
	%	76.0	24.0	100.0
Interaction with outsiders	F	43	7	50
	%	86.0	14.0	100.0
Literacy/ education	F	41	9	50
	%	82.0	18.0	100.0
Access to Health services	F	22	28	50
	%	44.0	56.0	100.0
Access to Immunization	F	15	35	50
	%	30.0	70.0	100.0
Access to sanitation facility	F	33	17	50
	%	66.0	34.0	100.0
Access to credit sources	F	24	26	50
	%	48.0	52.0	100.0
Asset Building	F	33	17	50
	%	66.0	34.0	100.0
Family Income	F	42	8	50
	%	84.0	16.0	100.0
Skills	F	31	19	50
	%	62.0	38.0	100.0
Voicing your concern	F	31	19	50
	%	62.0	38.0	100.0
Nutrition awareness	F	44	6	50
	%	88.0	12.0	100.0
Family Planning awareness	F	29	21	50
	%	58.0	42.0	100.0
Girl Child development awareness	F	29	21	50
	%	58.0	42.0	100.0

	%	58.0	42.0	100.0
Health awareness	F	39	11	50
	%	78.0	22.0	100.0
Decision making related to child centered	F	25	25	50
	%	50.0	50.0	100.0
Decision making related to money centered	F	16	34	50
	%	32.0	68.0	100.0
Participation in Development Programmes	F	27	23	50
	%	54.0	46.0	100.0
Individual Income	F	36	14	50
	%	72.0	28.0	100.0
Others (Spe.)	F	33	17	50
	%	66.0	34.0	100.0

**Source:** Primary source of data collection

The sub group ownership of assets shows if a woman owns land or any other property or valuable. This is measured in terms of own landownership, ownership of property and/or valuables, and independent savings. Microcredit shows to have no significant positive (or negative) impact on landownership in own name and personally own property and/or valuable. On the contrary, the positive relationship between microcredit and independent savings is significant at the 1 percent level in all the models, from the most basic without independent control variables to the most comprehensive model with all the independent control variables.

This suggests that the relationship is robust. An explanation might be that the microcredit borrowers have built up a trust and relationship with the micro credit program, and thus been able to access the other financial services offered by the micro finance institutions.

### VOICE

Voice is a variable showing the woman's freedom of expression, if she is able to express her views in the presence of her husband, family members and others. Voice is examined via two variables: comfortable giving opinion in the presence of husband or other family member and village people listen to ideas and opinions. Microcredit is a positive significant explanatory variable in the most basic model without independent control variables for both comfortable giving opinion in the presence of family member and Village people listen to ideas and opinions. However, the relationship seems not to be that strong since when independent control variables are added, the relationships are no longer significant. Furthermore, expenditure seem to be positively correlated with comfortable giving opinion in the presence of family member while number of children is negatively significant in explaining comfortable giving opinion in the presence of family members. The OLS models for comfortable giving opinion in the presence of husband or family member.

### MOBILITY

Mobility is the subgroup that defines a women's freedom of movement. Mobility is divided into two indicators: comfortable going to the local market without asking for permission and comfortable going to the neighborhood village without asking for permission.

Microcredit shows no significant relationship to either comfortable going to the local market without asking for permission or comfortable going to the neighborhood village without asking for permission. both microcredit borrowers and soon to be microcredit borrowers are highly restricted in their freedom of movement.

### DECISION MAKING POWER WITHIN THE HOUSEHOLD

Decision making power within the household is the subgroup that shows the amount of say the woman has in household decisions. Decision making power is in turn divided into the following six separate indicators: ability to make small purchases, involved in decision to make large purchases, involved in decision to work outside the home, involved in decision on how many children to have, involved in decision to buy or sell property, and involved in decision to send children to school. Microcredit seem to be significantly positive correlated with ability to make small purchases, involved in decision on how many children to have, and involved in decision to work outside the home at the 10 percent level in the simplest model without independent control variables.

### CONCLUSION

To conclude the researcher expresses that a fruitful study of 50 respondents engaged in Lucknow Mahila Sewa Trust (LMST) was done and an interesting revelation of women empowerment surfaced. The objectives of the study were achieved as described. Growths in terms of ownership of dwelling, increase in family income and acquiring gadgets have been established beyond doubt. A definite relationship between working women and empowerment has emerged. An interesting inference is that the growth and empowerment of the women can happen irrespective of literacy levels. The hypothesis has been statistically proved with the help of chi square test, as it shows that there is a significant relationship and association between women working with Lucknow Mahila Sewa Trust (LMST) and empowerment which is personal, family decision making and social. Hypothesis testing reveals that in the sample study the respondents emerged significantly empowered personally and in family decision making but a little less in the area of social empowerment. Women are a force to reckon with and with the changing winds of globalization, as the future unfolds, they will emerge 'stronger and higher.'

### RECOMMENDATIONS

- There is need to accept that women's needs are not only for self-employment. The Programmes should be designed on the basis of the needs of women at the micro level. Planning for self-employment for women needs a multipronged strategy.
- The various categories for financial institutions in rural market have exhibited different potentials in serving rural women. There is need to synchronize their efforts so that their work becomes supplementary and complementary in serving women.
- In order to ensure proper utilization of the credit, there is an urgent need to introduce availability of consumption credit from the formal channel. The need is to sensitize bank staff towards the needs, constraints and inhibitions of women.
- A proper mechanism should be evolved to prepare database on SHG's, SHP's, MFI's etc. Moreover, MIS with good management backing needs to be developed to achieve sustainability of micro-financing institutions.
- The factors responsible for poor performance of micro-finance and functioning of SHG's should be investigated, examined and analyzed scientifically and systematically to resolve the emerging problems, difficulties and challenges being faced.
- More research should be carried out to assess the impact of micro-credit through SHG's. The impact assessment should be more focused on socio-economic empowerment of members, social change, dynamics of groups, business, leadership, promotion of viable micro enterprises etc.
- Social capability building programmes should be organized from time to time to train the NGO's activists, volunteers, Panchayat representatives, members of youth clubs etc. to promote small savings and women's active and positive role in development process, ensuring their rights, entitlements and due share in developmental benefits.
- The key elements in the survival and sustainability of the SHG's should naturally be built on those elements that have brought the group together. SHG's have to evolve as sustainable village level institutions for taking active role in development and governance.

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## An Analytical Study of Investment Pattern amongst Investors

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### ABSTRACT

Investment is an act of putting assets / money in investment avenues with an intention to earn additional income or asset appreciation. Investment is putting savings in investment options with expectation of earning regular income or capital appreciation. The article studies the investment pattern among investors.

Keywords: Investment, Money, Fixed Deposit, Mutual fund

### INTRODUCTION

Investment is an act of putting assets/money in investment avenues with an intention to earn additional income or asset appreciation. Investment is putting savings in investment options with expectation of earning regular income or capital appreciation. There are various investment options such as Bank deposits, Shares, Debentures, Real estate, Gold/Silver Insurance, Mutual Funds, etc. Important feature of investment is that it involves waiting period. Investment gives rewards after certain period of time. Investment is about sacrifice of present value for increased future value.

A person who invest money is known as Investor. Investors are of different varieties. Some are risk taker, some are not. Some prefer certain categories of investment. Some invest for short period while some for longer time frame. Every investor has different investing pattern or different investment preference.

Money invested by investor is used as capital by industries. Increase in investment leads to increase in capital for industries. Increase in capital leads to increase in production which will lead to economic growth. Economic growth of any country is depends upon rate of investment in that country. Increase in investment boost economic growth. Investment play an important role in the growth of country. So investment by investor plays vital role in development of country. This study intends to understand investment pattern amongst investors.

### REVIEW OF LITERATURE

**Singh and Pathak (2017)** made a comparison of preference among three different age groups of investors and various aspects of investment behaviour. They studied perception of risk, factors affecting investment decision, choice of investment option, time horizon of investment and preferred channel of investment. They also studied differences and similarities among the selected age groups. The study concluded that there were differences in the perception of mutual funds among various age groups except that all considered returns, risk and liquidity as important factor while choosing Mutual funds.

**Abhinandan, Aiman & Ebrahim (2019)** reviewed investment pattern of working women, teachers and salaried people. Secondary data was collected from websites, research papers and journal. The study concluded that Indians prefer traditional investment avenues.

**Gugale & Vedashree (2021)** studied factors which contributes to selection of insurance policies. Structured questionnaire was filled from investor in the state of Maharashtra. The data was analysed using T-test. The study concluded that demographical factors play important role in choosing insurance policies.

**Abdullaeva (2021)** studied inflow of foreign investment in the Banks. Secondary data was collected and analysed using appropriate statistical tools. The study concluded that inflow of foreign investment will have positive impact on banking industry and it will lead to increase in domestic investment. **Tursunaliovich, Alojnovich & Ogli (2021)** examined the role of investment in economy's development in Republic of Uzbekistan. The study concluded that balanced budget helps country to overcome economic crisis. During inflationary pressures, reduce in government spending and rise in taxes will help.

### Objectives of the Study

- a) To study investment pattern among investors
- b) To study investment pattern of investors vis-à-vis demographic factors

### Research Design

Primary data has been used in the study. Primary data was collected through structured questionnaire filled up by the 435 respondents. But only 399 responses could be used for the study. The data was analysed using chi-square.

**Analysis and Interpretations**  
**Investment options preferred**

	Yes		No	
	Count	Row N %	Count	Row N %
Saving Account	204	51.1%	195	48.9%
Fixed Deposit	252	63.2%	147	36.8%
Insurance	183	45.9%	216	54.1%
Shares/ Debenture	94	23.6%	305	76.4%
Gold/Silver	76	19.0%	323	81.0%
Real Estate	67	16.8%	332	83.2%
Mutual fund	399	100.0%	0	0.0%
Others	22	5.5%	377	94.5%

Source: Compiled from Primary Data

The 399 respondents were mutual fund investors, so mutual fund investment is highest (100%) preferred investment option amongst the respondents. The second highest investment option is Fixed deposit (63.2%), followed by Saving Deposit (51.1%). The lowest preferred investment option is 'Others' (5.5%). The 'Others' category of investment option includes Personal lending, non-conventional investment options, investment in precious stone etc.

**Comparison with Demographic factors**

**(a) Investment Option preferred as per the Age**

Table 2: Investment Option preferred as per the Age		Age							
		Below 30 years		31 to 45 years		46 to 60 years		above 60 years	
		Count	Column N %						
Saving Account	Yes	97	54.8%	66	46.8%	25	43.9%	16	66.7%
	No	80	45.2%	75	53.2%	32	56.1%	8	33.3%
Fixed Deposit	Yes	98	55.4%	91	64.5%	42	73.7%	21	87.5%
	No	79	44.6%	50	35.5%	15	26.3%	3	12.5%
Insurance	Yes	70	39.5%	67	47.5%	33	57.9%	13	54.2%
	No	107	60.5%	74	52.5%	24	42.1%	11	45.8%
Shares/ Debenture	Yes	32	18.1%	33	23.4%	18	31.6%	11	45.8%
	No	145	81.9%	108	76.6%	39	68.4%	13	54.2%
Gold/ Silver	Yes	27	15.3%	31	22.0%	11	19.3%	7	29.2%
	No	150	84.7%	110	78.0%	46	80.7%	17	70.8%
Real Estate	Yes	21	11.9%	22	15.6%	14	24.6%	10	41.7%
	No	156	88.1%	119	84.4%	43	75.4%	14	58.3%
Mutual fund	Yes	177	100.0%	141	100.0%	57	100.0%	24	100.0%
	No	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Others	Yes	8	4.5%	10	7.1%	3	5.3%	1	4.2%
	No	169	95.5%	131	92.9%	54	94.7%	23	95.8%

Source: Compiled from Primary Data

It is observed that irrespective of the age group the respondents belong to, Fixed Deposit and Insurance are preferred investment options. It can be concluded that even though there are various investment options available which investors are aware about, but preferred investment options are Fixed Deposit and Insurance.

**Pearson Chi-Square Tests**

Pearson Chi-Square Tests			Interpretation
	Chi-square		
Saving Account	Chi-square	5.533	Non-Significant
	DF	3	
	P-value	.137	
Fixed Deposit	Chi-square	13.558	Significant
	DF	3	
	P-value	.004*	

Insurance	Chi-square	6.988	
	DF	3	
	P-value	.072	<b>Non-Significant</b>
Shares/ Debenture	Chi-square	11.601	
	DF	3	
	P-value	.009*	<b>Significant</b>
Gold/Silver	Chi-square	4.037	
	DF	3	
	P-value	.257	<b>Non-Significant</b>
Real Estate	Chi-square	16.309	
	DF	3	
	P-value	.001*	<b>Significant</b>
Mutual fund	Chi-square	.	<b>Not calculated as all values fall in only one category of MF</b>
	DF	.	
	P-value	.	
Others	Chi-square	1.100	
	DF	3	
	P-value	.777b	<b>Non-Significant</b>

### INTERPRETATION

It is concluded that Fixed Deposit, Shares/Debenture and Real Estate have significance of association with age of respondents as its P-value is less than equal to 0.05.

### (b) Investment option preferred as per Gender

		Gender			
		Male		Female	
		Count	Column N %	Count	Column N %
Saving Account	Yes	113	50.0%	91	52.6%
	No	113	50.0%	82	47.4%
Fixed Deposit	Yes	142	62.8%	110	63.6%
	No	84	37.2%	63	36.4%
Insurance	Yes	108	47.8%	75	43.4%
	No	118	52.2%	98	56.6%
Shares/ Debenture	Yes	70	31.0%	24	13.9%
	No	156	69.0%	149	86.1%
Gold/Silver	Yes	41	18.1%	35	20.2%
	No	185	81.9%	138	79.8%
Real Estate	Yes	47	20.8%	20	11.6%
	No	179	79.2%	153	88.4%
Mutual fund	Yes	226	100.0%	173	100.0%
	No	0	0.0%	0	0.0%
Others	Yes	14	6.2%	8	4.6%
	No	212	93.8%	165	95.4%

Source: Compiled from Primary Data

It is observed that irrespective of Gender of respondents, Fixed Deposit and Insurance are preferred investment options.

### Pearson Chi-Square Tests

Pearson Chi-Square Tests			Interpretation
	Chi-square	P-value	
Saving Account	Chi-square	.265	<b>Non-Significant</b>
	DF	1	
	P-value	.606	
Fixed Deposit	Chi-square	.024	<b>Non-Significant</b>
	DF	1	
	P-value	.877	

Insurance	Chi-square	.776	
	DF	1	
	P-value	.378	<b>Non-Significant</b>
Shares/ Debenture	Chi-square	15.912	
	DF	1	
	P-value	.000*	<b>Significant</b>
Gold/Silver	Chi-square	.277	
	DF	1	
	P-value	.598	<b>Non-Significant</b>
Real Estate	Chi-square	5.982	
	DF	1	
	P-value	.014*	<b>Non-Significant</b>
Mutual fund	Chi-square	.	<b>Not calculated as all values fall in only one category of MF</b>
	DF	.	
	P-value	.	
Others	Chi-square	.464	
	DF	1	
	P-value	.496	<b>Non-Significant</b>

**INTERPRETATION:**

P-value less than equal to 0.05 indicates association of significance. Asterisk mark (\*) in the above table indicates significance of association between respective parameters. We can conclude that Shares/Debenture has significance of association with gender of respondents as its P-value is less than equal to 0.05.

**(c) Investment option preferred and Occupation**

		Occupation							
		Business		Profession		Employment		Other	
		Count	Column N %	Count	Column N %	Count	Column N %	Count	Column N %
Saving Account	Yes	22	38.6%	56	50.0%	100	53.8%	26	59.1%
	No	35	61.4%	56	50.0%	86	46.2%	18	40.9%
Fixed Deposit	Yes	35	61.4%	70	62.5%	121	65.1%	26	59.1%
	No	22	38.6%	42	37.5%	65	34.9%	18	40.9%
Insurance	Yes	27	47.4%	55	49.1%	90	48.4%	11	25.0%
	No	30	52.6%	57	50.9%	96	51.6%	33	75.0%
Shares/ Debenture	Yes	16	28.1%	26	23.2%	46	24.7%	6	13.6%
	No	41	71.9%	86	76.8%	140	75.3%	38	86.4%
Gold/Silver	Yes	7	12.3%	22	19.6%	40	21.5%	7	15.9%
	No	50	87.7%	90	80.4%	146	78.5%	37	84.1%
Real Estate	Yes	13	22.8%	21	18.8%	30	16.1%	3	6.8%
	No	44	77.2%	91	81.3%	156	83.9%	41	93.2%
Mutual fund	Yes	57	100.0%	112	100.0%	186	100.0%	44	100.0%
	No	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Others	Yes	2	3.5%	3	2.7%	11	5.9%	6	13.6%
	No	55	96.5%	109	97.3%	175	94.1%	38	86.4%

**Source:** Compiled from Primary Data

It is observed that respondents engaged in Business prefer Fixed Deposit (61.4%) and Insurance (47.4%) as investment option. Professional and Employed respondents prefer Saving Account and Fixed Deposit as investment option, while 'Other' respondents prefer Saving Account and Insurance as an investment option.

**Pearson Chi-Square Tests**

Pearson Chi-Square Tests		Occupation	Interpretation
Saving Account	Chi-square	5.273	
	DF	3	
	P-value	.153	<b>Non-significant</b>

Fixed Deposit	Chi-square	.696	
	DF	3	
	P-value	.874	<b>Non-significant</b>
Insurance	Chi-square	8.717	
	DF	3	
	P-value	.033*	<b>Significant</b>
Shares/ Debenture	Chi-square	3.199	
	DF	3	
	P-value	.362	<b>Non-significant</b>
Gold/Silver	Chi-square	2.728	
	DF	3	
	P-value	.435	<b>Non-significant</b>
Real Estate	Chi-square	4.974	
	DF	3	
	P-value	.174	<b>Non-significant</b>
Mutual fund	Chi-square	Not calculated as all the data in yes category only	
	DF		
	P-value		
Others	Chi-square	7.797	
	DF	3	
	P-value	.050b	<b>Significant</b>
Results are based on non-empty rows and columns in each innermost sub table.			
*. The Chi-square statistic is significant at the .05 level.			
b. More than 20% of cells in this sub table have expected cell counts less than 5. Chi-square results may be invalid.			

#### INTERPRETATION

P-value less than equal to 0.05 indicates association of significance. Asterisk mark (\*) in the above table indicates significance of association between respective parameters. We can conclude that Insurance has significance of association with Occupation of respondents as its P-value is less than equal to 0.05.

#### (d) Investment Option preferred as per level of Education

		Education							
		Up to HSC		Graduation/ Diploma		Post-graduation		Other	
		Count	Column N %	Count	Column N %	Count	Column N %	Count	Column N %
Saving Account	Yes	41	57.7%	82	48.8%	76	53.9%	5	26.3%
	No	30	42.3%	86	51.2%	65	46.1%	14	73.7%
Fixed Deposit	Yes	33	46.5%	117	69.6%	92	65.2%	10	52.6%
	No	38	53.5%	51	30.4%	49	34.8%	9	47.4%
Insurance	Yes	18	25.4%	86	51.2%	70	49.6%	9	47.4%
	No	53	74.6%	82	48.8%	71	50.4%	10	52.6%
Shares/ Debenture	Yes	15	21.1%	42	25.0%	29	20.6%	8	42.1%
	No	56	78.9%	126	75.0%	112	79.4%	11	57.9%
Gold/ Silver	Yes	10	14.1%	29	17.3%	35	24.8%	2	10.5%
	No	61	85.9%	139	82.7%	106	75.2%	17	89.5%
Real Estate	Yes	8	11.3%	25	14.9%	30	21.3%	4	21.1%
	No	63	88.7%	143	85.1%	111	78.7%	15	78.9%
Mutual fund	Yes	71	100.0%	168	100.0%	141	100.0%	19	100.0%
	No	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Others	Yes	7	9.9%	12	7.1%	2	1.4%	1	5.3%
	No	64	90.1%	156	92.9%	139	98.6%	18	94.7%

Source: Compiled from Primary Data

It is observed that respondents having education qualification up to HSC and Post-graduation prefer Saving Account and Fixed Deposit as their investment option. The rest of respondents prefer Fixed Deposit and Insurance as their investment option.

### Pearson Chi-Square Tests

Pearson Chi-Square Tests			Interpretation
Saving Account	Chi-square	6.721	Non-Significant
	DF	3	
	P-value	.081	
Fixed Deposit	Chi-square	12.694	Significant
	DF	3	
	P-value	.005*	
Insurance	Chi-square	14.780	Significant
	DF	3	
	P-value	.002*	
Shares/ Debenture	Chi-square	4.757	Non-Significant
	DF	3	
	P-value	.191	
Gold/Silver	Chi-square	5.426	Non-Significant
	DF	3	
	P-value	.143	
Real Estate	Chi-square	4.266	Non-Significant
	DF	3	
	P-value	.234	
Mutual fund	Chi-square	.	Not calculated as all values fall in only one category of MF
	DF	.	
	P-value	.	
Others	Chi-square	7.971	Significant
	DF	3	
	P-value	.047*,b	

### INTERPRETATION

P-value less than equal to 0.05 indicates association of significance. Asterisk mark (\*) in the above table indicates significance of association between respective parameters. We can conclude that Fixed Deposit, Insurance and Other investment option has significance of association with level of education of respondents as its P-value is less than equal to 0.05.

### (e) Investment option preferred and Marital Status

		Marital Status			
		Married		Single	
		Count	Column N %	Count	Column N %
Saving Account	Yes	160	51.1%	44	51.2%
	No	153	48.9%	42	48.8%
Fixed Deposit	Yes	211	67.4%	41	47.7%
	No	102	32.6%	45	52.3%
Insurance	Yes	158	50.5%	25	29.1%
	No	155	49.5%	61	70.9%
Shares/ Debenture	Yes	80	25.6%	14	16.3%
	No	233	74.4%	72	83.7%
Gold/Silver	Yes	69	22.0%	7	8.1%
	No	244	78.0%	79	91.9%
Real Estate	Yes	62	19.8%	5	5.8%
	No	251	80.2%	81	94.2%
Mutual fund	Yes	313	100.0%	86	100.0%
	No	0	0.0%	0	0.0%

Others	Yes	16	5.1%	6	7.0%
	No	297	94.9%	80	93.0%

Source: Compiled from Primary Data

It is observed that irrespective of Marital Status of respondents, Saving Account and Fixed Deposit are preferred investment option.

### Pearson Chi-Square Tests

Pearson Chi-Square Tests			Marital Status	Interpretation
Saving Account	Chi-square		.000	
	DF		1	
	P-value		.994	Non-significant
Fixed Deposit	Chi-square		11.295	
	DF		1	
	P-value		.001*	Significant
Insurance	Chi-square		12.454	
	DF		1	
	P-value		.000*	Significant
Shares/ Debenture	Chi-square		3.226	
	DF		1	
	P-value		.072	Non-significant
Gold/Silver	Chi-square		8.460	
	DF		1	
	P-value		.004*	Significant
Real Estate	Chi-square		9.456	
	DF		1	
	P-value		.002*	Significant
Mutual fund	Chi-square		-	Not calculated as all the data in yes category only
	DF		-	
	P-value		-	
Others	Chi-square		.450	
	DF		1	
	P-value		.502b	Significant
Results are based on non-empty rows and columns in each innermost sub table.				
*. The Chi-square statistic is significant at the .05 level.				
b. More than 20% of cells in this sub table have expected cell counts less than 5. Chi-square results may be invalid.				

### INTERPRETATION

P-value less than equal to 0.05 indicates association of significance. Asterisk mark (\*) in the above table indicates significance of association between respective parameters. We can conclude that Fixed Deposit, Insurance, Gold/Silver and Real Estate option has significance of association with Marital Status of respondents as its P-value is less than equal to 0.05.

### (f) Investment Option preferred as per level of Annual Income

		Annual Income							
		up to Rs. 3 lakh		Rs. 3.1 to 5 lakh		Rs. 5.1 to 10 lakh		Rs. 10.1 & above	
		Count	Column N %	Count	Column N %	Count	Column N %	Count	Column N %
Saving Account	Yes	94	60.6%	58	53.7%	29	34.1%	23	45.1%
	No	61	39.4%	50	46.3%	56	65.9%	28	54.9%
Fixed Deposit	Yes	87	56.1%	62	57.4%	63	74.1%	40	78.4%
	No	68	43.9%	46	42.6%	22	25.9%	11	21.6%
Insurance	Yes	61	39.4%	43	39.8%	55	64.7%	24	47.1%

	No	94	60.6%	65	60.2%	30	35.3%	27	52.9%
Shares/ Debenture	Yes	26	16.8%	17	15.7%	35	41.2%	16	31.4%
	No	129	83.2%	91	84.3%	50	58.8%	35	68.6%
Gold/Silver	Yes	27	17.4%	14	13.0%	23	27.1%	12	23.5%
	No	128	82.6%	94	87.0%	62	72.9%	39	76.5%
Real Estate	Yes	12	7.7%	11	10.2%	28	32.9%	16	31.4%
	No	143	92.3%	97	89.8%	57	67.1%	35	68.6%
Mutual fund	Yes	155	100.0%	108	100.0%	85	100.0%	51	100.0%
	No	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Others	Yes	10	6.5%	4	3.7%	3	3.5%	5	9.8%
	No	145	93.5%	104	96.3%	82	96.5%	46	90.2%

Source: Compiled from Primary Data

It is observed that respondents belonging up to Annual Income of Rs. 5 lakh prefer Saving Account and Fixed Deposit as investment option. The rest of respondents prefer Fixed Deposit and Insurance as investment option.

### Pearson Chi-Square Tests

Pearson Chi-Square Tests			Interpretation
Saving Account	Chi-square	16.490	
	DF	3	
	P-value	.001*	<b>Significant</b>
Fixed Deposit	Chi-square	14.327	
	DF	3	
	P-value	.002*	<b>Significant</b>
Insurance	Chi-square	16.420	
	DF	3	
	P-value	.001*	<b>Significant</b>
Shares/ Debenture	Chi-square	24.006	
	DF	3	
	P-value	.000*	<b>Significant</b>
Gold/Silver	Chi-square	7.062	
	DF	3	
	P-value	.070	<b>Non-Significant</b>
Real Estate	Chi-square	36.085	
	DF	3	
	P-value	.000*	<b>Significant</b>
Mutual fund	Chi-square	.	<b>Not calculated as all values fall in only one category of MF</b>
	DF	.	
	P-value	.	
Others	Chi-square	3.385	
	DF	3	
	P-value	.336	<b>Significant</b>

### INTERPRETATION

P-value less than equal to 0.05 indicates association of significance. Asterisk mark (\*) in the above table indicates significance of association between respective parameters. We can conclude that except for Gold/Silver, all investment option has significance of association with level of income of respondents as its P-value is less than equal to 0.05.

### FINDINGS

- All the respondents prefer Fixed Deposits as investment option. They also invest in Mutual Funds but Fixed Deposit is popular form of investment.
- Age of respondents and choice of investment as far as Fixed Deposit, Shares/Debenture and Real Estate are concerned have significance of association.
- Majority of male respondents prefer to invest in Shares/Debentures.

- It is observed that respondents engaged in Business prefer Fixed Deposit and Insurance as investment option. Professional and Employed respondents prefer Saving Account and Fixed Deposit as investment option.
- Occupation of the respondents influence the choice of type of investment as far as Insurance is concerned.
- It is observed that respondents having education qualification up to HSC and Post-graduation prefer Saving Account and Fixed Deposit as their investment option. The rest of respondents prefer Fixed Deposit and Insurance as their investment option.
- Fixed Deposit, Insurance and Other investment option has significance of association with level of education of respondents.
- It is observed that irrespective of Marital Status of respondents, Saving Account and Fixed Deposit are preferred investment option.
- Fixed Deposit, Insurance, Gold/Silver and Real Estate option has significance of association with Marital Status of respondents.
- It is observed that respondents belonging up to Annual Income of Rs. 5 lakh prefer Saving Account and Fixed Deposit as investment option. The rest of respondents prefer Fixed Deposit and Insurance as investment option.

### CONCLUSIONS

It can be concluded that Fixed Deposit is still popular form of investment option. People invest in fixed deposit due to Security of Money and Liquidity. Males prefer to invest in Shares and Debentures as they have capacity to take more risk. They also invest in Shares/Debentures as they expect high returns from it.

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## A Study on Green Accounting: Concept and its Importance

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### ABSTRACT

Environmental protection has always been an important issue due to its everlasting and negative impact on human mankind. Further-the damage to the environment is in return to the humans themselves. By the actions of human, many harms are caused to the environment. Land gets infertile, water bodies and air gets polluted and excess noise causes further health issues. As the economic activities are important for human growth; similarly environmental protection is important for human survival. So this type of destruction is partly due to the establishment of an industry for economic development. This harm is highlighted by green accounting. Hence implementing green accounting principles in the organizations is very crucial. Green Accounting is a new accounting system that captures the costs and benefits of an ecosystem for your business. Green accounting is also known as environmental accounting. Green accounting, or environmental accounting, is a tool used to express the harm from business activities and the benefits from the natural environment. Therefore, we now want to shed light on the concept of green accounting and its importance in current scenarios. And this study will also try to study more and more unknowns on the subject of green accounting or environmental accounting to raise awareness. This study also seeks to emphasize the importance of green accounting in the world of modern economic development

Keywords: Green Accounting, Environmental accounting, Economic development

### INTRODUCTION

Green Accounting system can be defined as the accounting system that covers the analysis of the cost and benefit of the natural environment. It leads to sustainable development. It aims at maintaining balance between economic growth and saving the nature. Taking into account the deterioration of the environment, the economic damage caused by the constant exploitation of the environment leading to global warming, and the depletion of the natural resource base of economic global warming. Therefore, not only the government but also companies are responsible for the protection and development of the environment. Because the corporate world is the only factor that causes environmental degradation. This term was first used by economist and professor Peterwood in the 1980s. The purpose of introducing green accounting in the corporate world is to protect the environment and raise awareness of the need to protect it.

Green Accounting is a new accounting system that tracks the costs and benefits of the ecosystem. Green accounting is inevitable to protect and promote the green environment. Therefore, this study is indispensable for publicizing the concept of green accounting and raising awareness of green accounting. This study is also important for examining its history and development and its importance. This study will be useful not only to the authors working on it, but also to potential learners of green accounting.

Here are several indicators of India's economic health known as GDP or NDP, which represent India's economic condition. On the other hand, the financial accounting of the corporate sector also reflects the financial position of the company. However, in either case, there is no indication of the quality of the country's environment. Therefore, this study focuses on a new concept of green accounting, a newly developed concept in the corporate world that links the costs and benefits that the environment provides to a company with the company's financial accounting. Green accounting is one of the key areas of CSR today. Today, environmental issues are becoming more important around the world

### OBJECTIVES

- To study concept of green accounting
- To analyze the benefits of green accounting
- To study the issues in implementation of green accounting

### REVIEW OF LITERATURE

J.Ma(2019) stated in his research paper, 'A Research Review of Corporate Governance Accounting Information Disclosure', defines green accounting as environmental accounting and aims at providing environment related data of accounting theory and method. It also analysis relationship between economic development and resources on the basis of environmental laws.

Mr Shashidhara D (2019) stated in her research 'A Study on Green Accounting: Concept & Its Importance' about the importance of environmental protection and controlling degradation. The researcher also states that India still doesn't have an established green accounting framework and hence some programs should be conducted to educate corporate sector and implement green accounting in business organization.

G.Tarun(2018) mentioned in his research that when we account for natural and environmental resources, the firm gets information on its effect on environment and hence it helps in introducing policies and laws for environmental sustainability as it is also pushed by environmentalists.

### **Scope of the study**

The research paper aims to study green accounting. It aims to define the importance and its legal framework to be followed by Indian corporate organizations.

### **Research Methodology**

The research is carried on using the secondary sources like journals, articles and research papers. Many literatures are studied to build the background of the research.

### **Limitations of the study**

- The study is based on secondary source of data
- The study only covers green accounting in India

### **Need of Green Accounting**

Green Accounting is done in order to make the businesses aware that there should be a balance between environmental management and profit orientation of an organization. It is very important for a country like India to manage its natural resources. GDP should not be an ideal indicator of measuring economic development of a nation. All the countries should also keep green accounting in picture for measuring true wealth and development.

### **Green Accounting has varied benefits:**

- It helps the companies to measure and then further reduce their negative impact on environment.
- It helps the economy of the nation to develop in holistic and sustainable manner.

The main purpose of Green Accounting is to help businesses understand and manage the potential between traditional economic and environmental goals. It also increases the amount of important information available for policy analysis, especially if that important information is often overlooked. This step represents strong sustainability.

### **Importance of Green Accounting**

Green accounting shows the organization's commitment to the most important aspects of the environment, such as the planet, people and profitability. It measures the social, environmental and economic impact of a company. This accounting also includes providing many incentives to promote companies to follow green accounting principles. It also levies penalties on breaching the laws. The importance of green accounting is emphasized in the following points.

- Pollution prevention
- Sustainable development
- Assessment, auditing, and reporting of the performance of environmental activities
- Moral obligation to protect and protect the environment.
- You can reduce costs by improving environmental behavior.
- Environment-centric management system

### **Laws Related to Green Accounting**

- Environmental protection water (Prevention and control pollution) Act, 1974
- The Air (Prevention and control pollution) Act, 1981
- The environment (Protection) Act, 1986
- The Forest Conservation Act, 1980

- Hazardous Waste (Management and Handling) Rules, 1986.

#### **Limitations of Green Accounting**

- Green accounting focusses on the cost to the company but does not consider the social cost that is borne to the society
- The cost of the tools used in this accounting is fairly high
- This is an emerging concept and hence awareness level of organizations is low.

#### **CONCLUSION**

The research concludes that Indian Companies are still in the initial phases in implementing the Green Accounting principles. There are many steps that can be taken by the companies in order to ensure that holistic and sustainable development takes place in the country. Green accounting can be declared as a CSR Activity and there should be strict laws for its implementation. Many other awareness programs can be conducted to make the organizations understand its importance to teach the employees procedural aspects of green accounting.

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## **An Empirical Study on Green Accounting Practices in the Current Paradigm for Sustainable Development in India**

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### **ABSTRACT**

Green Accounting also branded as environmental accounting, is connected with the conservational (environment) services and goods. It undertakes the Cost- Benefit analysis which arise through environmental protection and exhaustion of the existing capital. It incorporates the economy, society and the environment at large. The Green accounting contemplates the accounts of the emissions, natural resource, value of non-marketed environmental services and goods, green gross domestic product and disaggregation of traditional national accounts. It has lately gained relevance because it significantly depicts the commitment that the organization has for its environment and it deals with three important aspects i.e., people, profitability and planet Integrating green accounting system in the national economic accounts could help in measuring the sustainable development. Thus, this research paper focuses on exploring the concept of Green Accounting, its practices, and its contribution towards sustainable development in India

Keywords: Green Accounting, Green accounting practices, sustainable development

**Background study:** The term *Environmental Accounting or Green Accounting* was first introduced in the year 1980 by economist Prof. Peter Wood. In the year 1994, Sciences of National Academy evaluated the process of environmental accounts designed by the Bureau of Economic Analysis termed as the Integrated Satellite of Economic and Environmental Accounts but it was not extensively spread. Recent years, have rising concern for environmental degradation which is taking place due to increasing industrial activities in the economy. The developing country like India is facing dual complications of protecting the environment and endorsing economic development. Thus, Environmental accounting plays an important role in understanding the contribution made by the business enterprises towards environmental safety and welfare. A balance between environmental protection and promotion of economic development is essential. Therefore, there is a need to scrutinise prudently the benefits and cost of environmental protection in order to set safe limit of environment degradation and the required level of development. Although the concept of green accounting is a new branch of study and practice, its need is prominently sensed as it focusses on providing the accounting for environmental impact of certain factors to the business organization

### Forms of Green Accounting

- Green Financial Accounting: This Accounting focuses upon the environmental aspect at the end of the year through the financial statements.
- Green Management Accounting: This Accounting involves the management of the Environmental as well as economic performance. It involves all types of planning with respect to the environmental management.
- Green Cost Accounting: This Accounting deals with the evaluation of the overall environmental cost. It involves the total social costs as well as private costs.
- Natural Resource Accounting: It is used while computing National Income with the inclusion of all environmental aspects which is termed as Environmental Gross National Income.

### **LITERATURE REVIEW:**

**Alka Solanki (2016)**, studied and analyse the available literature based on the green accounting and understand how it was been studied and evaluated by different authors who were working on it.

**Yousif Abdelbagi Abdalla A K Siti-Nabiha and Amirul Shah MD Shahabuddin (2014)** were of the opinion that accounting for environment as well as social is more important in developing countries to spread the economic efficiency of the organization and sensitize the issue of social and environmental consciousness

**Shukla and Vyas (2013)** felt that environmental practices do not possess the quantitative information

**Rankin et al (2011)**, experienced that process of management, financial aspects and the system of nation were strongly interrelated for evolving the frame work of environmental reporting. Hence, he focused on the environmental reporting with aggregated results of the national, management and the financial

**Schaltegger – Burritt (2010)** stated that lately companies have identified the importance of the environmental accounting and it cannot be overlooked from the part of the accounts of the firm. Further he highlighted the need to consider the financial outcomes of the social as well as the environmental accounting along with the existing traditional accounting to reflect the true and fair view of the business

**Objectives of the study:**

- I) To familiarize with the concept of Green Accounting in India
- II) To understand the legal framework of Green Accounting in India
- III) To study the importance of Green Accounting practices for the sustainable development in India

**Green Accounting in India:** Green Accounting also denoted as environmental accounting integrates environmental assets and their source and sink function into national and business accounts. It generally comprises of stipulating monetary values to valued environmental goods and services which are not traded in markets. Thus, green accounting refers to the measurement and communication of information on the environmental accountability performance of a business entity to interested parties. It is also popularly called green accounting or 'eco-accounting'. It plays a vital role in helping business segments and other sector enhance their public trust and confidence and is associated with receiving a fair valuation. Thus, Green accounting helps in discharging organizational accountability and increasing environmental transparency.

**Legal framework of Green Accounting in India:**

The success of any corporation principally relies on the critical measures of performance like profitability, quality and environmental responsibility. The Constitution of India levies the responsibility on every national to safeguard and improve the natural environment and to have empathy for living creatures. The management attitude also needs to change from time to time. Further, the Supreme Court has also observed that "Sustainable Development" requires everyone to see to the maintenance of balance between development and its sustenance in future. In addition, the Companies Act, 2013 has also laid down several provisions for the protection of the environment. The Supreme Court and the High Courts of several states have passed orders to close many polluting industries. Therefore, the corporations have to prepare accounts as well as audit reports for compliance of Laws and Acts.

Trade licensing has been obliterated for all practical purposes, and environmental consent from various government authorities has now become projecting. Growing apprehension about the protection of the environment and taking conservation measures have become major fear globally in the last twenty years. Indian government also established a Central Ministry of Environment with the object of the environmental protection and anti-pollution measures in coordination with other states and various ministries, Necessary legislation has also been passed. (1) The various laws relevant to the environmental protection are as under:

- (A)**Directly related to the environmental shield:** (1) Water (Prevention and Control of Pollution) Act,1974. (2) Water (Prevention and Control of Pollution) Cess Act,1977. (3) The Air (Prevention and Control of Pollution) Act, 1981. (4) The Forest (Conservation) Act, 1980. (5) The Environment (Protection) Act, 1986.
- (B)**Indirectly related to the environmental shield:** (1) Constitutional provision (Article 51A) (2) The Factories Act, 1948. (3) Hazardous Waste (Management and Handling) Rules, 1989. (4) Public Liability Insurance Act, 1991. (5) Motor Vehicle Act, 1991. (6) Indian Fisheries Act, 1987. (7) Merchant of shipping Act, 1958. (8) Indian Port Act. (9) Indian penal Code. (10) The National Environment Tribunal Act, 1995.
- (2) All new projects require environment clearance from both the Central Ministry of Environment and Forests and the corresponding State Governments department of environment.
- (3) The Central Pollution Control Board (CPCB) has also been set up

**Green Accounting Practices in India:**

- 1. The first declaration regarding the green accounting was made in the year 1991
- 2. The Ministry of Environment and Forests proposed that every company in the Annual Report, disclose the details of steps taken or proposed to be taken towards the adoption of appropriate technologies for prevention of pollution through various control measures, minimization and recycling of wastage, investments made for environment protection and the impact of the measures initiated by them to control pollution, waste reduction and energy conservation

3. It is obligatory for all the projects in the country to get environment clearance concerning both Union Ministry of Environment & forest and the corresponding State Government Department of Commerce
4. The companies are required to disclose the following set of information
  - I) Type of devices installed to control pollution
  - II) Steps taken for energy conservation
  - III) Optimum Utilization of resources
  - IV) Steps for decomposition of waste
  - V) Steps for improving the quality of product

**In the environment statement, the concerned industry is required to provide information on:**

- A) Water and raw materials consumption
- B) Pollution generated
- C) Impact of pollution control measures on conservation of natural resources
- D) Nature of hazardous and solid wastes produced and disposal practices adopted
- E) Measures taken for environmental protection
- F) Steps taken to popularize the benefits of green accounting and reporting amongst the corporate sector

**Importance of Green Accounting practices for sustainable development in India:** Across the globe, the economic well-being of the company is assessed with the help of Gross Domestic Products (GDP). But in reality, other factors should also be considered. The primary issue with a developing country is that they have to emphasize on both the issues i.e. GDP and conservation of resources. If GDP of the country decreases, then the reputation of the country in the international business market will be affected and it might also affect business relations with other countries. Green accounting helps in identification of cost and benefits raised by the company for its business environment. It tends to include environmental cost of doing business in financial results of a company. It is important to account for cost and benefits of the environment as a business environment consumes a lot of environmental resources. In certain business processes, a business organization has a very adverse impact on the environment and for the sustenance of human life, the environment is very important (Bertoni and De Rosa, 2012).

Green accounting provides benefits like pollution control and sustainable development. It also helps in implementation of environmental centralized product life cycle and other management systems. This help in total integration of green accounting in business. However, there is no prescribed standard, policy and procedure for implementation of green accounting in India. Majority of the business organization ignore this concept as there is no obligatory rule for its employment. Estimation on assessment of the environmental impact on the business organization is also one of the most difficult tasks as this concept is very new. Also, the initial cost of implementation of green accounting is very high and only large organizations can afford such high costs.

Minimol & Makesh (2014) have recognized some phases relating to Green Accounting Practices in India. According to them, Green Accounting Practices in India are as follows:

- (i) Identification of Environmental Accounting Parameters: Firstly, organisations categorize their individual environmental reporting strictures such as environmental policy, health safety and environment, energy conservation, corporate sustainability/environmental initiatives, sustainability reporting, waste management, water management, wind/renewable energy sources, environmental information system, environmental disclosure practices, environmental targets, environmental reporting indicators, environmental cost and benefits, environmental liabilities and environmental assets.
- (ii) Defining the Environmental Reporting Parameters: Here, the organisations clearly elucidate the effective meaning of each parameter they identified
- (iii) Specify the Environmental Targets to be achieved: In this, the organisations make effort to frame the environmental goals to be achieved both in short run and long run.
- (iv) Developing the Environmental Performance Indicators: At this stage, organisations require to develop the indicators for measuring the environmental performance such as environmental policy framework, health

and safety standards, energy conservation practices, waste management programmes, water management policies etc.

- (v) Measure the Environmental Performance Indicators: Here, the organisations need to measure the actual environmental performance in terms of the predetermined standard performance indicators. Measurement may be either qualitative or quantitative in nature. For instance, indicators such as environmental policy framework need to be qualitatively measured while waste management programmes are to be measured quantitatively.
- (vi) Report the Environmental Performance Results: Lastly organisations integrate their environmental performance with that of financial to provide the environmental impact in their financial performance.

### CONCLUSION

Green accounting has become essential for corporates to formulate devices of green sources for the contemporary age and future as well. This will help in deciding pollution limits, permitted emissions, maximum permissible use of non-renewable resources and dependency on renewable resources. It plays a big role in Corporate Social Responsibility (CSR). India is profoundly hampered with overpopulation, global warming, pollution, exhaustion of natural resources and many more environmental hazards. It is indispensable to implement green accounting to save the planet. Environmental accounting, aims at achieving sustainable development, maintaining a favourable relationship with the community, and pursuing effective and efficient environmental conservation activities. These accounting measures allow a company to identify the cost of environmental conservation during the normal course of business, identify benefits from such activities, provides the best possible means of quantitative measurement (in monetary value or physical units) and support the declaration of its results.

Implementation of green accounting by a business organization shows how committed such organization is towards the environmental protection. Adverse impact on environment has a significant impact on the overall economy which indirectly affects the environment in which business organizations are functioning. Enterprises which are environmentally sustainable need to maintain account for their environmental activities to determine the true profit. They should maintain account of its environmental activities impact and its effect to determine its profit.

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## **A Study on Human Resource Accounting: Issues and Challenges**

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### **ABSTRACT**

Human beings are the important assets of any organization. The success or failure of an organization depends upon their performance and efficiency. Valuation of human resources is being ignored in most of the organization as they believe that the salary given and amount invested on their development is an investment.

In 1980's this concept of Human Resource Accounting has been introduced as under old method of accounting proper valuation of capabilities of human being was not done. It affected the investments made by company in human assets. As cost of expenditure on selection is increasing day by day. Human resource accounting deals with the valuation of important asset of an organization that is human being.

This paper focuses to explain the concept of human resource accounting along with challenges and issues of it.

Keywords: Human Asset, Human resources, Human resource Accounting

### **INTRODUCTION**

Human resource is the most important and valuable part of any organization and they contribute the most to an organization. We know that the skillful, gave and propelled staff can change over a debilitated worry into an effective one. While clumsy and apathetic staff might waste away the current assets, driving worry to decrease stage.

The greater part of the associations and Accounting Professionals disregarded the significance of individuals in associations and as useful assets. However, the worldwide financial situation has had a change in outlook in the beyond couple of many years which has shown drastic change in the transfer of industries from manufacturing to service sector industries. For any manufacturing concern assets like machinery, plant etc. are of most extreme significance, while, in an assistance-based industry, information, abilities, skill, inspiration, comprehension of authoritative culture and mentalities of the workers accept extraordinary importance. For example, the achievement of IT businesses, scholarly foundations, counseling firms, clinics and so forth simply relies upon the nature of their human asset and consequently, people are perceived as a basic piece of a concern. Thus, it gave rise to interest and growth of accounting in Human resources.

In any case, certain predetermined strategies are needed to appraise and to extend the value of human resources. Human Resource Accounting might be characterized as, " a course of accounting which recognizes, evaluates and gauges human resources for the utilization of them so to know how much is the available resources and how much is actually being required for valuation".

### **OBJECTIVES OF THE STUDY:**

1. The research paper tries to explain about concept of Human Resource Accounting.
2. The research paper tries to study about various approaches to Human Resource Accounting.
3. To research also tries to identify problems and challenges of Human Resource Accounting.

### **METHODOLOGY OF RESEARCH:**

The main aim of this research paper is to study challenges and issues in human resource accounting. This research paper is trying to add in the existing literature on Human resource Accounting. Study is dependent on secondary data gathered from newspaper, internet, google, search engines and textbooks.

### **HUMAN RESOURCE ACCOUNTING TRENDS IN INDIA:**

The Companies Act, 1956 doesn't request outfitting of Human resource accounting data. As per latest Companies Act also there is no space given to Human resource accounting in the financial reports of an organization. Though there is not any legal requirement but still many companies give value to human resources and recognize them in their financial reports.

The concept of human resource accounting was brought into existence by BHEL (Bharat Heavy Electrical Ltd) in the year 1972. After it many private and public sector companies like EIL (Electrical India Limited), GTL (Global Tele Limited), CCI, etc. have given specific importance and had recognized the value of human being for a concern.

Though the organizations who all are recognizing human resource in their reports are not considering the same as main part of financial statements but they are treating it as an additional material. Therefore, it is to be given equal opportunity and importance in report as like other assets of an organization. We must treat them equally and should realize its importance.

#### **METHODS OF VALUATION:**

**There are two methods of valuation:**

- 1) Cost Based method
- 2) Economic Value Based method

Under Cost Based method there are three approaches as follows:

- a. Opportunity cost approach
- b. Historical cost approach
- c. Standard cost approach

Under Economic Value Based method there are basically two models as follows:

- a. Lev & Schwartz model
- b. Flam Holtz model

There are many models made to identify human resources, some depend on past cost while some depend on future profit. But Lev and Schwartz model, any remaining methodologies have a few provisos and limit due which Lev and Schwartz model has been utilized most generally.

Under Lev and Schwartz model, present value of the future earnings from workers is to be considered and human workers are valued at that value under human resource accounting. It is denoted by letter *r*. Under these human resources are classified into similar nature groups like unskilled, skilled and semiskilled workers. As per groups than average earnings are identified. Than to determine present value discounting is done at specified rate for average earnings of workers. Lastly these present values are summed up to know the earnings of the organization as a whole.

#### **ISSUES AND CHALLENGES IN HUMAN RESOURCE ACCOUNTING:**

##### **1. To ascertain the value of human asset is very difficult**

It is hard to separate expense and worth of human asset because of absence of rules.

In contrast to actual resources, human asset can't be claimed, held or used according to will and wish of the association. Human existence is unsure and subsequently esteeming human asset in such condition isn't the suitable technique.

##### **2. Supporting documents as proofs not available:**

Supporting documents are not available to say that Human resource accounting is an effective tool for management to measure human assets.

##### **3. It demotivates and discourages human workers**

As due to valuation many people get discouraged say for example if any person is valued less as compared to another person than he/she will get demotivated or discouraged, which might result in leaving of that employee from an organization. This is also one of the major issue in respect of human resource accounting.

##### **4. Difficult to measure:**

As there is not specified manner how to measure it, as not any guidelines in respect of it. What is to be considered and what not? How it is to be reflected in financial statement. The manner in which it is to be amortize, whether to go increasing, decreasing or in constant way.

##### **5. Idea of Human resource accounting is not acceptable:**

As there are many more chances of biasness. Higher authorities can value n rank their choice of employee at higher rank. Thus, it will result in discrimination and it will demotivate many workers of the organization.

#### **CONCLUSION**

It is difficult to value human being. Under accounting, there are many things which cannot be valued monetarily. Amongst them accounting for human being is one such region. Though this accounting helps the management in decision making, about the selection of employees in organization and recruitment of required number of employees.

As discussed above there are number of challenges in respect of human resource accounting. One uniform process or standard is to be there to value them so as to have uniformity in valuing and presentation of them in statements. Organization must understand the need to value them rather than considering them as an addition material. They must understand their importance. Success and failure of any organization depends upon them.

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## Comparisons of Non-Performing Assets of Bom and Hdfc Banks in Indian Economy Since 2015

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### ABSTRACT

Non-Performing Assets is an important Aid to trade. In today's world it has adopted best international practices with a vision to strengthen the banking sector. Several provisioning norms have been introduced, and these help banks to improve efficiency. In the background of these developments, the scope of the study is limited to the analysis of NPAs of the Bank of Maharashtra and HDFC banks. It studies trend of NPAs in both the banks. It is observed that both the public sector and private sector banks have equal NPA's

Keywords: Gross NPA, Net NPA, Standard assets, Sub-standard assets, Doubtful Assets Loss Assets

### INTRODUCTION

It means an asset or account of borrower, which has been classified by a bank or financial institution as sub-standard, doubtful or loss asset, in accordance with the directions or guidelines relating to asset classification issued by central bank of a country. A loan is in arrears when Principal or interest payments are late or missed. A loan is in default when the lender considers the loan agreement to be broken and debtor is not able to meet his responsibilities. It gives additional Monterey burden on banks

#### Classification of Assets:

Assets are classified into following four categories:

- 1) Standard Assets
- 2) Sub-standard Assets
- 3) Doubtful Assets
- 4) Loss Assets

#### Bank of Maharashtra:

It is a major public sector bank in India. The India Government holds 87.74% of the shares. It had the largest network of branches of any public sector bank in the state of Maharashtra. It was founded by V. G. Kale and D. K. Sathe in Pune, India.

#### HDFC Bank:

It is an Indian banking and financial services company head office in Mumbai. It has a base of 104,154 permanent employees as of 30 June 2019. HDFC Bank is India's largest private sector bank by assets. It is the largest bank in India by market capitalisation as of March 2020. As equity shares of HDFC Bank are listed on the BSE and NSE.

#### Objectives of study

To Study and compare the % NPA pattern of BOM and HDFC banks.

To Study and compare the % of NPA's with special reference to the assets and advances made by these banks

#### Hypothesis:

Both BOM and HDFC banks have equal % of NPA's

Research Methodology: Data collection: Secondary data was used to find the NPAs of the two bank ,under study and then their % of Gross NPA and % of Net NPA were calculated using standard formula for both Gross as well as Net NPA, the difference were tested for significance using T-Test.

Data compilation: Use of tables, Multiple bar Diagram

Analysis of data: % of Growth Analysis of NPA

% of Gross NPA

Year	BOM	HDFC
2015	6.33	0.90
2016	9.34	0.94

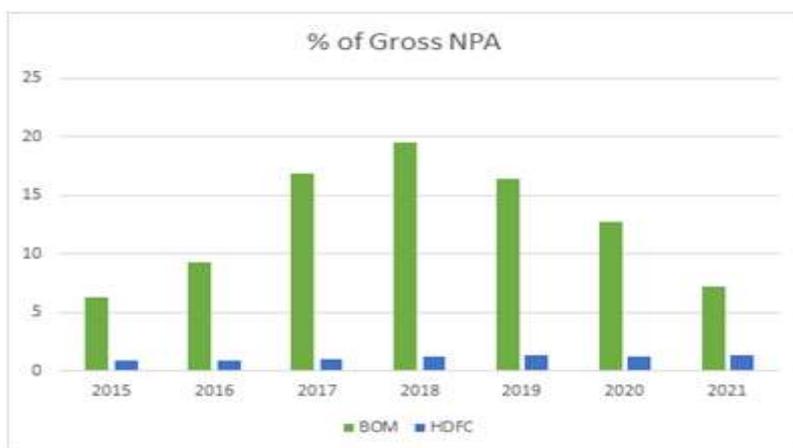
2017	16.93	1.05
2018	19.48	1.30
2019	16.40	1.36
2020	12.81	1.26
2021	7.23	1.32

t=0.000967364

(Ref: .www.moneycontrol.com)

% Gross NPA=Gross NPA/Total Assets\*100

The above table explains the % Gross NPA of BOM and HDFC Banks. In all the years % Gross NPA of BOM is higher than HDFC bank. In the Year 2021 the % Gross NPA of BOM is 7.23% whereas the % Gross NPA of HDFC bank is 1.32%. The both the banks have higher % Gross NPA is in the Year 2018.



% of Net NPA

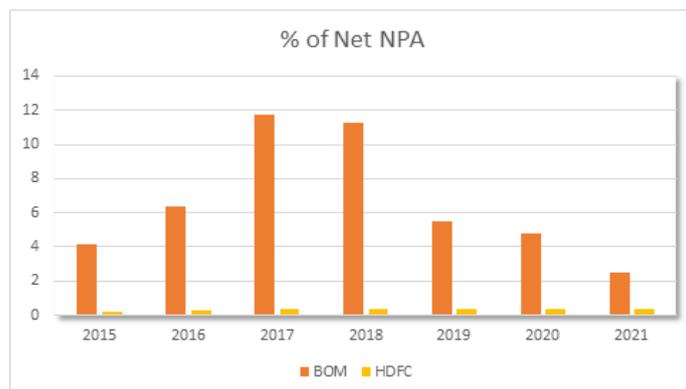
Year	BOM	HDFC
2015	4.19	0.20
2016	6.35	0.28
2017	11.76	0.33
2018	11.24	0.40
2019	5.52	0.39
2020	4.77	0.36
2021	2.48	0.40

t=0.003338395

(Ref: .www.moneycontrol.com)

% Net NPA=Net NPA/Total Assets\*100

The above table explains the % Net NPA of BOM and HDFC Banks. In all the years % Net NPA of BOM is higher than HDFC bank. In the Year 2021 the % Net NPA of BOM is 2.48% whereas the % Net NPA of HDFC bank is 0.40%. Both the banks have higher % Net NPA is in the Year 2018.



### FINDINGS AND CONCLUSIONS

- 1) The % of Gross NPA of both BOM and HDFC grew consistently over the period 2015 to 2018 and their after decrease continuously and same is the case with % net NPA which shows that % NPA's of both the banks followed the same trends abnormally high % NPA for the two banks in the year 2018 could be because of demonetization policy announced by the government as on 8th November 2016
- 2) The t value for differences in % Gross NPA between BOM and HDFC was found to be 0.000967364 which is insignificant for 18 DF and hence it can be concluded with 95% of confidence that their no difference between percent Gross NPA's of two banks.
- 3) The t value for the difference in % net NPA's of BOM and HDFC was found to be 0.003338395 which is insignificant and hence it can be concluded that BOM and HDFC have same % Net NPA
- 4) From 2 and 3 it can be seen that though the volume of NPA for BOM is much higher than of HDFC but however taking the % of NPA's with respect to total assets the two banks have same NPA's. This leads to conclusion that BOM and HDFC are having same % NPA's and the two kinds of banks are equally efficient in loan recovery.
- 5) In all the cases % NPA of BOM is higher than HDFC bank in terms % Gross NPA and % Net NPA.

The aforementioned findings leads to the conclusions that BOM banks have to be more proactive in recovery process.

### SUGGESTIONS AND RECOMMENDATIONS

- Bank should find out the main reasons of the loan required by the borrower.
- Bank should check proper identification of the guarantor including analysis of his wealth.
- Bank should frame reasonably well documented loan policy and rules.
- Bank should review weekly the Position of overdue accounts.
- Bank should take quarterly balance confirmation certificates from the borrowers.
- Bank should appoint a committee to review irregular accounts.
- Bank should ensure credibility of the borrower.
- Bank should conduct proper SWOT analysis of borrowers.
- Bank should ensure that there is no diversion of funds disbursed to the borrower.
- Bank should follow all Principles like Liquidity, safety and Profitability while giving loans.
- Bank should critically examine and analyse the reasons behind time overrun.
- Bank should ensure that latest technology is being used.
- Banks should ensure that the assets are fully insured.
- Bank should create strict competition among staff members for recovering.
- Bank should Create separate "special Recovery Department" with an Officer
- Bank officials should find out the difference between wilful and non-wilful defaulter.
- Bank should keep recovery process fast, time saving and effective.
- Bank officers should follow the ethics of doing job.
- Proper act should be passed for NPAs management.

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## Essay on History of Banking Failures in India

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### ABSTRACT

Banking Industry is the backbone of Indian Economy. The sector is known for its contribution to the success of the economy. But in the success journey of the industry, many banks have seen failures. The paper aims to study the history of the major banking industry failures and the reasons behind it. It also aims to suggest the measures that the banks should adopt in order to avoid future failures. The study was conducted by referring authentic data from journals, newspapers, online articles and websites. The study revealed that major reasons behind banking failures in India had been reckless issuing of bank loans, overdependence on a single customer, inability to earn profits, poor governance and poor auditing efforts. The study also revealed that under pressure or unrealistic deadlines faced the top management to take hasty decisions for the company. The study gives a scope to future researchers to study similar area with the perspective of top officials of the bank thus leading to holistic understanding of banking failures.

Keywords: Banking Industry, History, Failures

### INTRODUCTION

India is a fast growing economy. Due to its vast population, a major contribution to the development of the economy comes from the service industry. Amongst all the service sector entities, the major contributor to the development is the banking sector. It can be considered the backbone of the complete economy. It works as a lubricant in the smooth functioning of the country. Another reason for which this industry can be considered as the life and blood of the country is due to the dependence of the middleman and in fact every citizen of the country on this industry for securing its savings.

Since the inception of the first bank in India, today we have one of the most technically advanced banking sectors. But this industry has seen many ups and downs also. Many banks that were at their peak faced the worst deaths.

### OBJECTIVE OF THE STUDY

- The research paper tries to study major banking failures in India and the major reasons behind their failure.
- The research paper tries to study how far the failures have happened due to NPAs.
- The research also tries to suggest the measures that the banks should take to avoid failures.

### RESEARCH METHODOLOGY:

In order to perform the in-depth study of the banking industry failure stories, secondary research was performed. The data from many reputed books, journals, newspapers, online articles and websites was referred for a comprehensive analysis.

### Banking Failure: An Introduction

As per Investopedia, if the bank closes due to its insolvency and by the instructions of state regulations it is known as bank failure.

Bank failures commonly occur due to the increase in liabilities than the existing assets. It can also occur due to increase in bad debts and liquidity crunch. Due to these reasons, the bank fails to pay back its depositors and unfortunately few banks cannot revive back from the situation.

### Banking failure history in India:

Banking sector has seen many fraudulent activities and instances of mismanagement. For example, Rs. 11,400 Cr. Punjab National bank and Nirav Modi scam. Similarly, the scam that involved Videocon and ICICI Bank costing Rs 1875 Cr. Below mentioned are such instances of banking failures studied closely to know what has contributed to bank failures since inception of formal banking system in India.

1. **General Bank of India failure (1791)** : General Bank of India failure was the first bank failure that took place in India. The bank was liquidated as it could not earn profits and also further due to currency difficulties.

**2. Presidency Bank of Bombay (1867):** This bank was one of the three presidency banks established by East India Company. The other two being Presidency Bank of Calcutta and Presidency Bank of Madras. The PBB was running very efficiently till the 1860s. But the bank started recklessly issuing loans to the private cotton market players. Few of the loans were also issued on private security.

But when this Indian cotton market faced ups and downs it showed a direct impact on the bank. Other reasons associated with the bank failure were the prevalence of the concept of unlimited liability (after which this policy was changed), the practice of speculation and also not having proper risk assessment.

**3. The Banking Crisis (1913-1917) :** This phase came in banking history when the Indian Companies Act was just passed. At this stage, the banking regulations were not adequate. Hence the banks that were small and weak couldn't sustain.

The other reasons that led to the failure of even the stronger banks was the competition for attracting customers as the depositors were the only way of gaining capital base. Few banks went on promising the high interest rates that they couldn't afford. As a feather on the cap, these funds were invested in enterprises that were hazardous.

Major reason behind the reckless decisions of the bank was the lack of central bank in those days. Also the people who were managing the bank were not capable enough to take safe decisions. They invested large sums in speculative dealings. Due to the lack of central regulatory bank, the individual banks even followed dishonest and fraudulent activities. Hence the major reason behind the crisis was lack of central bank and coordinated banking policy.

**4. Travancore and Quilon bank failure (1938):** Amol Agarwal (2018), quoted in an article on livemint.com, the history and reasons behind failure of these mergers. Author states that the TNQ Bank was the merger of two banks: 'Travancore National Bank' and 'Quilon bank'. Travancore National Bank was established in 1912 in Kerala by Christian community. Quilon bank was also established by Christians in 1919. Both the banks were working very efficiently when they merged in the year 1937. It headquartered in Madras.

The merged bank emerged as the fourth largest bank of those days.

But the merger didn't prove to be lucky for both the banks as in 1938, the bank was winded up.

One reason for failure of this bank was the common reason of lending recklessly. But the main reason behind the failure was the then strained relationship between the bank and the government of Travancore.

K.G.Vijayalekshmy (1993) stated that the bank also faced closure due to Abstention Movement that was taking place in Kerala during those days. The bank was accused of supporting the State Congress and hence due to its rivalry with the Dewan, the bank faced closure. Dewan allegedly defamed the bank promoters by distributing pamphlets mentioning that the bank was run by thieves.

RBI also didn't come to rescue the bank in the crisis situation.

**5. Palai Central Bank (1960):** As stated by Amol Agarwal in an article in Blommborgquint.com, the bank was also established in Travancore in 1927 and its closure was one of the major bank failures in those days.

The reasons behind the failure were granting of loans to directors and their family members and providing dividends generously. RBI continuously advised the bank many times to caution its actions and practices but the bank kept ignoring RBI's advices. RBI also started putting indirect hurdles in its operations by asking them to stop advertising, raising fresh deposits or opening new branches. But finally bank reached a devastating state in year 1960s by accumulating total loans worth Rs.5 Cr and finally it got liquidated.

**6. Global Trust Bank failure (2004):** This was a private bank that started in year 1994. It became a leading private sector bank in India. But soon the bank witnessed its unfortunate period since year 2001 as it got associated with many scams and controversies that brought credibility of bank under doubt.

In a case study published by ICMR (2005), the major reasons behind the failure of the bank were stated. The biggest cause behind the collapse of the bank was the mistakes committed by the management. Bank's net worth got eroded due to increase in the NPAs. Also then the bank attempted to get investments from overseas which failed due to regulatory issues.

Another major factor behind the collapse of the bank was its nexus with Ketan Parekh. He was one of those whom the bank disbursed huge loans. The bank was finally merged with Oriental Bank of Commerce which gave a relief to the depositors.

- 7. Kapol Cooperative Bank (2017):** This bank was founded in the year 1939. The bank had around 20 branches across Mumbai and Gujrat and had around 2,50,000 customers. The bank faced financial troubles due to its weak capital base and large non performing assets. However, the bank didn't see a closure but came under strict purview of RBI as it was instructed to continue business with restrictions till it improved its financial position.
- 8. Yes Bank (2020):** Yes Bank was established in the year 2004 and headquartered in Mumbai. The bank was performing well and was counted amongst well trusted banks in the past years. But on March 5, 2020 the central bank took the charge of the bank to avoid the collapse of the bank which left the whole country in shock.

Anand Adhikari (2020) in his article for Business Today mentioned that Yes Bank though being set up by top notch professionals saw the bad phase when the central bank overtook the responsibility of its operations. The major reasons behind the collapse of the bank were a steady decline in its financial position since last many years. The bank was consistently making losses due to bad loans. Also it allegedly under reported its nonperforming assets hiding its true picture from public. Also when RBI questioned the bank regarding its recovery measures, it gave false assurance to the central bank. It tried attracting investors but unfortunately, investors didn't turn out to be serious. Also customer withdrawal of money from accounts increased in that phase. All this collectively led to the failure of a top performing commercial bank.

### **FINDINGS AND CONCLUSION**

The failures started with the inability to earn profits and due to currency difficulties as the banking sector in the country was in its formative stages. But further there was a commonality observed amongst bank failures. As per the research, below mentioned are few reoccurring reasons of Indian bank failures:

- **Reckless issuing of bank loans:** The research shows that since earlier years of 1860s, the most common reason had been reckless issuing of bank loans.
- **Overdependence on one big customer:** Many banks have failed due to their over dependence and issuing of giant loan amount to one big customer and hence putting risk of the future of whole bank on stake.
- **Inability to earn profits:** Banks, many a times have not been able to survive competition and earn profits that leads to their failure.
- **Poor Governance:** Often, top management takes reckless decisions, develops relationship with corrupt people due to which the reputation and future of the organization gets spoiled.
- **Hiding true financial status from RBI:** The banks in many cases, have hid the true financial status of the company and the exact revival measures from RBI.
- **Poor auditing of the financial statements:** All this can be controlled at an earlier stage if the financial auditors of the company due a fair job. Lack of ethical behavior of auditors, the banks face a tough time when the bubble bursts.
- **Late Intervention of RBI:** RBI has been found intervening and taking control at the disastrous state of the bank which in turn becomes too late and the harm is already caused to the stock market and the bank customers.

**Hearing the other side:** An important observation that deserves attention is that despite of the top management being so professional and intellectual and despite of witnessing similar failures of other banks, the top management repeats the same mistake.

It is important to hear the other side also. May be top officials witness undue pressures or receive unrealistic deadlines that force them to succumb to pressure and take hasty decisions.

### **RECOMMENDATIONS & SUGGESTIONS:**

Bank failures are not a normal organizational failure because it also hurts the sentiments of the depositors and creases distrust in their mind. Hence it is very important to understand the gravity of the situation.

**Looking into a continuous similar history of bank failures in India, following suggestions can be put forward:**

- RBI should intervene early and looking into the recurring causes of the failures, should take stringent measures when the bank appears to be a loss making entity.

- Stricter rules and regulations should be imposed on auditors for their unethical practice.
- Frequent developmental programs should be conducted for top management to remind them that greed and desire to quickly increase profits may lead to big failures.
- This suggestion that I personally believe in is actually the need of the hour. **Indian ethos in management** should be promoted in every Indian firm. The more rooted we are to our basics, the better citizens we will be. So the top management who hold the onus of running the organization profitably does not cheat and breaks the trust of the organization.

#### **Limitations of the Study**

- The research data was highly limited and scattered.
- A proper inventory of all such cases can be stored in one database to facilitate further analysis and study
- The paucity of time allowed only the major cases to be studied.

#### **Future Scope of study**

Study has opened way to know another research area of why the top management bank officials make the mistakes that they are already aware of. Delving into their angle may bring in great ideas and good solutions to the bank failures in India.

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## **Profitability Ratio Analysis of Hdfc Ltd and LIC Housing Finance Ltd.: A Comparative Study**

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### **ABSTRACT**

Housing is one of the fundamental needs of Human beings. Availability of 'Affordable housing for all' is one of the World millennium goals. There is still a gap between demand and supply factors relating to housing and one of the major reasons is affordable Housing finance. Housing finance companies are the bridge for reaching out to fulfill the housing needs of an individual. In this paper, an attempt is made to comparatively study the profitability ratios of two giants of housing finance sector i.e. HDFC Ltd. and LIC Housing Finance Ltd. of India for five years using trend analysis and Mann Whitney test.

Keywords: HDFC Ltd., LIC Housing Finance Ltd., Profitability Ratio, Housing Finance

### **INTRODUCTION**

A 'home' is a safe and secure place where every individual across the globe would like to be and having an 'own home' in the metro city like Mumbai is a great accomplishment. Rapid urbanization and changes in socio-economic circumstances have explosively boosted the demand for housing in India. In India, in the opinion of majority of the middle and low income group of people affordable housing is a dream. However, a good housing finance system can bridge the gap between demand and supply of housing. Housing credit can be availed from Banks and Non-banking Financial Companies (NBFCs). Housing Finance Companies (HFCs) are also a part of NBFCs. Housing Development Finance Corporation (HDFC) Ltd. and LIC Housing Finance Ltd. are two major Housing Finance Companies in India who are fulfilling the housing credit needs of millions of people. They offer a wide range of housing loan products suitable to all kinds of people with different financial positions.

#### **Housing Development Finance Corporation Ltd.**

In 1977, HDFC Ltd. was incorporated with the primary objective of solving the housing shortage problem in India by promoting 'home ownership' by providing housing finance to the needy. The Industrial Credit and Investment Corporation of India (ICICI) promoted HDFC Ltd. as the first specialised Mortgage Company in India. HDFC provides credit to individuals, corporate and developers for repair, purchase, construction and development of residential and commercial properties. It is a leading Housing finance provider in India with 8.6 million cumulative housing units financed.

#### **LIC Housing Finance Ltd.**

LIC Housing Finance Ltd (LICHFL) is the leading Housing Finance Companies in India. It was incorporated on 19<sup>th</sup> June, 1989 as a public limited company promoted by Life Insurance Corporation of India. The objective of LICHFL is to provide housing loans to individuals, builders and developers etc. In India, LIC HFL is one of the pioneers ensuring access to housing finance for home ownership to more than 25 lakhs home owners.

### **REVIEW OF LITERATURE**

In the view of Ashok Bardhan (2011), there are two factors that have clearly emerged as key drivers in the Indian housing market are

1. A wide group of stake holders and a multiplicity of institution and
2. Enhanced confidence in the housing finance industry.

It has been recognized that the housing sector is a critical economy sector and can potentially leverage large scale economic development at the local and national level.

According to Enekwe Chinedu Innocent, Okwo Ifeoma Mary & Ordu Monday Matthew (2013), Housing is one of the three fundamental needs of life. It is always the top priority of any person, economy, government and society at large. They analysed in their paper the disbursements of individual house loans region-wise, their amount of portfolio and the defaults of LIC Housing Finance ltd. for the ten years i.e., from 1995-96 to 2004-05 using ratio analysis tools

Duggal, Minakshi (2013) studied that the Housing sector is the 'Engine of economic growth' and the availability of housing is a determining factors of a Nation's development. They did the study of two housing finance

institutions i. e. LIC Housing Finance Limited from public sector and Housing Development Finance Corporation Limited from private sector by using exponential growth rate and ratio analysis. They concluded that the profitability and productivity are interrelated. The performance of Housing Development Finance Corporation Limited is better than LIC Housing Finance Limited in terms of the profitability and productivity.

Parishwang Piyush, Himanshu Negi and Navneet Singh (2016), analysed the level of customers` satisfaction towards housing finance banks in Meerut, India. They also studied the preference of customers towards HDFC and LIC Housing Finance Ltd. for home loans.

Mamatha Shree., Dr. Baba Gnanakumar (2021), observed that the enhanced operational efficiency is a very important pre-requisite for survival and growth of Housing Finance Companies however there is a significant difference in the operational efficiency of major HFCs in India. This difference is due to cost structure of the individual HFCs. They concluded that the HFCs in India irrespective of their sizes and track record can perform better following strategies suggested by them.

### OBJECTIVES

The present paper intends to,

1. Analyse the Profitability ratios of HDFC Ltd.
2. Analyse the Profitability ratios of LIC Housing Finance Ltd.
3. Compare the Profitability ratios of HDFC Ltd. and LIC Housing Finance Ltd.

### Scope of study

Scope of study is restricted to analyzing only the Profitability ratios of HDFC Ltd. and LIC Housing Finance Ltd. over the five accounting years.

### RESEARCH METHODOLOGY

The secondary data is collected from the annual reports of the companies, Books, Journals and other e-resources. A non-parametric Mann Whitney U-test and trend analysis are used for a comparative study.

### Profitability ratio analysis

Profitability ratios evaluate the company's ability to earn profits from its sales/operations, assets, or shareholders' equity. They indicate the efficiency of a company to generate profit and value for shareholders. Profitability ratio analysis gives better insight about performance of companies specifically when they are compared with the results of a similar companies or company's own historical performance or the industry average.

Profitability ratios can be classified as Margin ratios and return ratios. Following chart shows the list of Profitability ratios.

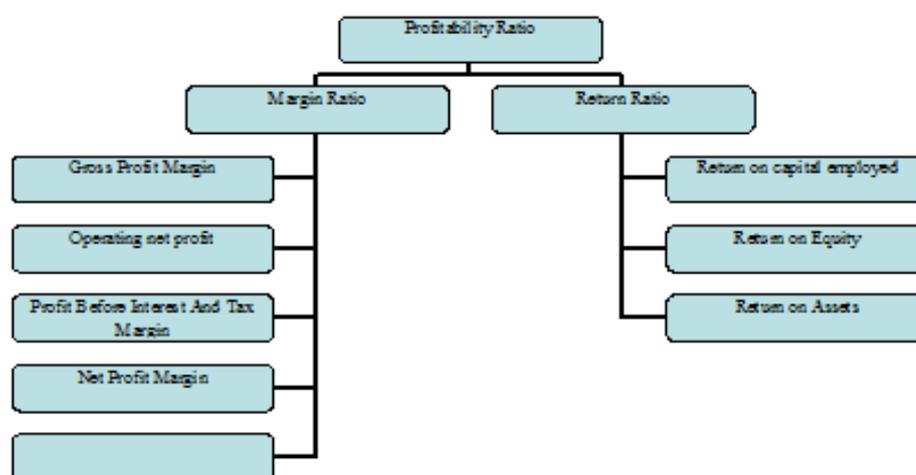


Chart 1 Profitability Ratio

### Data Interpretation and analysis

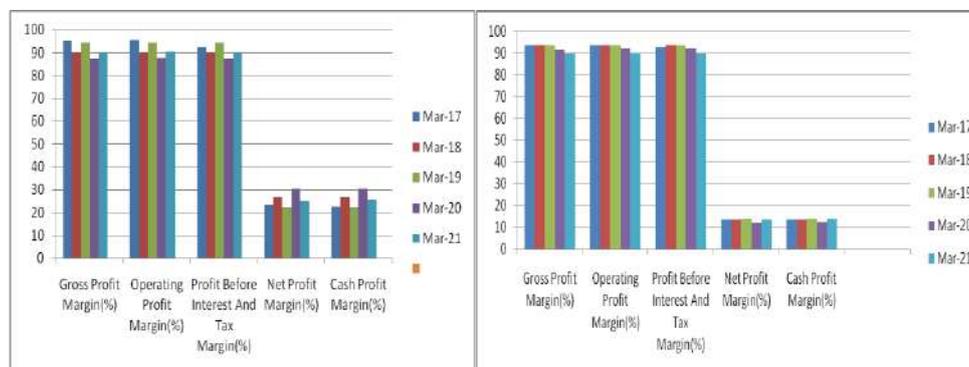
#### Margin Ratios:

Margin ratios indicates the percentage of Gross profit, Operating net profit, Profit before Interest and Tax, Net profit, , Cash profit and in relation to Sales respectively.

The following table shows trend of Margin ratios of HDFC Ltd. and LIC Housing Finance Ltd. for 5 years – As on 31<sup>st</sup> March, 2017 to 31<sup>st</sup> March, 2021.

Particulars	March 2017		March 2018		March 2019		March 2020		March 2021	
	HDFC	LIC HFL								
Gross Profit Margin (%)	95.21	93.61	90.12	93.72	94.41	93.7	87.38	91.79	90.14	89.68
Operating Profit Margin (%)	95.38	93.68	90.24	93.79	94.56	93.76	87.63	92.03	90.47	89.93
Profit Before Interest And Tax Margin (%)	92.2	92.99	90.08	93.7	94.34	93.66	87.34	91.91	90.09	89.68
Net Profit Margin (%)	23.17	13.8	26.93	13.49	22.22	14	30.25	12.19	24.97	13.77
Cash Profit Margin (%)	22.61	13.78	27.04	13.56	22.35	14.06	30.49	12.45	25.29	14.02

**Table 1** Margin Ratios of HDF Ltd. and LIC HFL



**Figure 1** - Margin Ratios - HDFC Ltd. Ltd.

**Figure 2** - Margin Ratios – LIC Housing Finance

It is observed from the above figures that Gross profit margin ratio, Operating profit margin ratio and Profit before interest and tax margin ratio of HDFC Ltd. And LIC HFL is nearly 90%. Gross profit margin ratio, Operating profit margin ratio and Profit before interest and tax margin ratio of HDFC Ltd. has fallen down in FY 2017-18 in comparison of 2016-17. It recovered in 2018-19 but again went down in 2019-20 which again went up in 2020-21. Gross profit margin ratio and Operating profit margin ratio of LIC HFL is showing decreasing trend over five years and Profit before interest and tax margin ratio has shown increasing trend during FY 2017-18 to 2019-20 but it has fallen down in 2019-20 and 2020-21.

Net profit margin ratio of HDFC Ltd. went up in 2017-18 than 2016-17, it again fall down to 22.22% in 2018-19. It went up to 30.25% in 2019-20 and again went down to 24.97% in 2020-21. Similar is the trend observed in Cash Margin ratio too.

### RETURN RATIOS

Return on capital employed and Return on Net worth ratios indicates the percentage of returns (Profits) in relation to Capital employed and Net worth respectively. Return on assets ratio is a profitability ratio helps to measure the net income earned by total assets during a period.

The following table shows trend of Return ratios of HDFC Ltd. and LIC Housing Finance Ltd. for 5 years – As on 31<sup>st</sup> March, 2017 to 31<sup>st</sup> March, 2021.

Particulars	March 2017		March 2018		March 2019		March 2020		March 2021	
	HDFC	LIC HFL	HDF C	LIC HFL						
Return On Capital Employed (%)	13.64	10.77	9.52	8.71	9.25	8.7	10.16	8.61	7.89	7.79
Return On Net Worth (%)	18.79	17.43	17.05	14.06	12.45	14.95	20.86	13.2	11.2	13.32
Return on Assets (Rs. In Crores)	249.23	219.49	383.54	282.19	449.37	322.18	491.61	360.5	594.82	406.63

Table 2 Return Ratios of HDFC Ltd. and LIC HFL

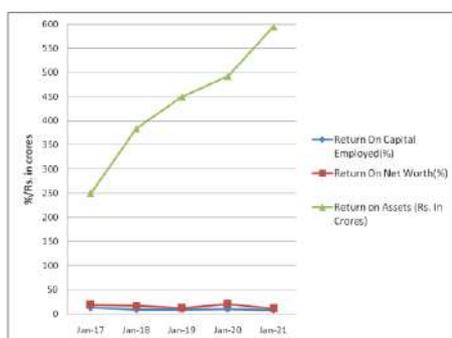


Figure 3 - Return Ratios – HDFC Ltd.

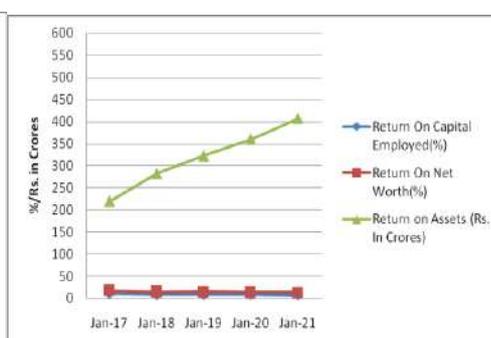


Figure 4 - Return Ratios – LIC Housing Finance Ltd.

From the above figures it is seen that Return on capital employed ratio of HDFC Ltd. went down from 13.64% in 2016-17 to 9.25 in 2018-19, it went up to 10.16% in 2019-20 and again went down to 7.89% in 2020-21. Return on capital employed ratio of LIC HFL has continuously shown decreasing trend from 10.77% in 2016-17 to 7.79% in 2020-21. Return on net worth ratio of HDFC Ltd. showed decreasing trend till 2018-19 however it went up to 20.86% in 2019-20 but again went down to 11.2% in 2020-21. Similar trend was observed with LIC HFL. Return on assets ratio of both companies shown increasing trend over a period of five years however ratio of HDFC Ltd. is a way higher in comparison of LIC HFL.

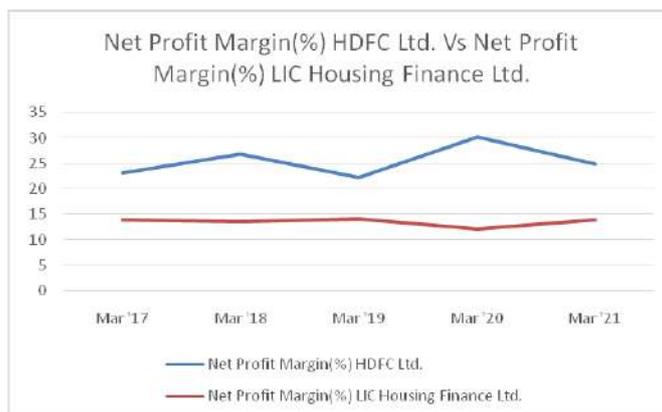
From the above trend analysis, following hypothesis are made to get better inside into the comparative profitability analysis of both companies using **Mann Whitney U test**.

**Hypothesis 1:**

**H<sub>0</sub>:** The distribution of Net Profit Margin (%) for the two groups is not significantly different

**H<sub>A</sub>:** The distribution of Net Profit Margin (%) for the two groups is significantly different

	Net Profit Margin (%) HDFC Ltd.	Net Profit Margin (%) LIC Housing Finance Ltd.
Count	5	5
Rank Sum	40	15
U	0	25
$\alpha$	0.05	
tails	2	
U Stat	0	
U critical	2	
Significant	Yes	



From this data, it can be observed that U stat (0) is less than U critical (2). At  $\alpha = 5\%$ , we have Sufficient evidence to reject null hypothesis that Net Profit Margin (%) for the two groups are not significantly different.

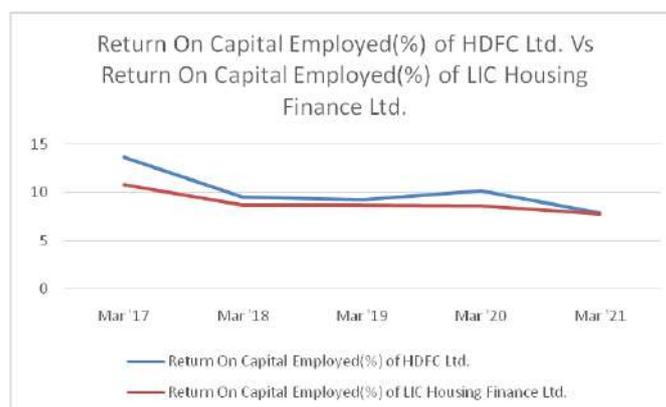
From this data, it can be concluded that Net Profit margin (%) of HDFC was significantly different (higher) than Net Profit margin (%) of LIC housing Finance.

**Hypothesis 2:**

**H<sub>0</sub>:** the distribution of Return on Capital Employed (%) for the two groups is not significantly different

**H<sub>A</sub>:** the distribution of scores Return on Capital Employed (%) for the two groups are significantly different

	Return On Capital Employed(%) of HDFC Ltd.	Return On Capital Employed(%) of LIC Housing Finance Ltd.
Count	5	5
Rank Sum	33	22
U	7	18
$\alpha$	0.05	
tails	2	
U Stat	7	
U critical	2	
Significant	NO	



From this data, it can be observed that U stat (7) is more than U critical (2). At  $\alpha = 5\%$ , we don't have sufficient evidence to reject null hypothesis that Return on capital employed (%) for the two groups are not significantly different. From this data, it can be concluded that Return on capital employed (%) of HDFC Ltd. was not significantly different than Return on capital employed (%) of LIC housing Finance.

**CONCLUSION**

From the above study, it can be concluded that performance of both companies based on trend analysis of profitability ratios is not specifically different than each other though the size of both companies are different in relation to sales and capital employed. However, Net profit margin ratio of HDFC Ltd. is significantly higher than that of LIC HFL may be due to better management of finance cost, more reachability and larger customer base.

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### **FUTURE SCOPE OF STUDY**

The study can be extended using other financial ratios and performance analysis methods.

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## NAAC Accreditation and Global Ranking of Indian Universities – Similarities and Differences

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### ABSTRACT

A growing concern over the differences in academic assessment standards is approaching the thinkers of Indian education systems. Differences in curriculum pattern and structure, marking systems, assessment criteria etc. are often pointed out as some of the disadvantages for Indian students in the global academic scenario with highly competitive environment. These criteria of curriculum, structure, assessment etc. make some basic conditions for assessing the higher education institutions by the National Assessment and Accreditation Council (NAAC) – the government-authorized agency for the purpose. Despite having high certifications and accreditations, many higher education institutes fail to make it to the global ranking lists of universities published by widely acknowledged source like the Quacquarelli Symonds (QS). In this paper, the researcher has tried to reflect on the assessment methods of these two assessment agencies for higher education institutions and find out some advantages and disadvantages in both.

Keywords: NAAC Accreditation, Global Ranking, QS Ranking, Higher Education Curriculum.

### INTRODUCTION

Many believe that education system is the foundation of a nation's future. Performance of the educational institutions reflects the ongoing socio-political events and their impact on the nation's progress, as far as progress is related to research and development. Absence of funds and resources, compromised educational facilities for general students of all economic strata, lack of transparency in recruitment process etc. indicate toward the declining standards of education in a country. However, globalization has opened up many countries' education system to privately owned markets of the traders of institutional education. The situation has given rise to the need for a common standard across borders in assessing educational institutions as well as the students. However, in this paper, the researcher has focused only on institutional assessment criteria to find the differences and similarities between global ranking systems and national accreditation system. Some attempts to offer seemingly more effective criteria of assessment have been made as well.

### LITERATURE REVIEW

Author Dawson (2017) has discussed about the impact of globalization on higher education sector in the light of innovations and extension. According to him, globalization has not only changed the parameters of performance for the institutions, it has also impacted the teaching method in many countries. New tools and equipments are being introduced for more collaborative learning environment.

Author Giroux (2015) has argued against this growing trend of introducing consumerist practices in the teaching-learning environment. He has also defied the need of validation from paid sources of ranking and assessment for global higher education institutes.

Author Fulford (2016) has been very strict to his point of determining the socio-economic background first before ranking universities under global parameters of success. His research and analysis indicate to the futility of same ranking parameters for institutions belonging to different economic systems.

Author Ikazoboh (2016) has pointed out to the importance of a balance in global policies of public education for an acceptable ranking pattern. Here again, the socio-economic context and the political mechanisms play differentiator for a common ranking system.

According to Gardner (2012), ranking of any agency, whether it is national or international, does not testify the learning environment of the institutions. Hence, the criteria of students' support and assistance in university ranking, is problematic.

### NAAC Accreditation Criteria

There are seven key considerations in NAAC's assessment guideline for higher education institutions as discussed below.

**Curricular Aspects:** NAAC puts emphasis on curriculum structure and revisions as a key condition for useful and progressive teaching-learning process. Starting from design and development, this criterion considers curriculum planning and implementation, flexibility of the plans, gradual advancements and feedback on the same. The numerical credits of the assessment vary, depending on the nature of ownership and control of each institution (Gish et. al., 2016). For instance, the performance in curriculum management for the affiliated institutions is weighed under a score of 100 and the same for the autonomous ones in 150.

**Teaching-learning & Evaluation:** This is a vast and complicated criterion of evaluation. While the curriculum pattern answers the ‘what’ in the learning environment, the teaching and evaluation process answers the ‘how’ of it. An appropriate curriculum may not deliver the desired outcome of a nation’s objectives behind its established education system (Gish et. al., 2016). Experts in these domains participate in the evaluation process of teaching-learning environment and evaluation system for students in a higher education institution. Credits for affiliated colleges in this criterion is set at 350 while for Autonomous institutions and Universities, it is 300 and 200 respectively.

**Research, Innovations & Extension:** Unlike the two criteria mentioned, which belongs to technical aspects of education system, in this criterion, the agency has considered the social perspectives of the outcome in a learning environment. Research refers to the input in the curriculum system by finding new avenue of education and learning. Innovation refers to the usefulness of the research on practical fields of operations with relevant contexts. Extension is the co-curricular presence of the institution in the forms of social development through representation or direct engagement. Research facilities, resource mobilization, publications and awards for social causes are some of the identifiers in this regard.

**Infrastructure & Learning Resources:** Good learning environment, according to the NAAC, includes physical facilities of institutions for a secure and convenient learning practice. Library system, hostels, playgrounds, modern technological solutions, emergency management systems, grievance management, building and interior infrastructure etc. are some key indicators of this assessment criterion (Fulford, 2016).

**Student Support and Progression:** This criterion reflects on support and assistance offered to each student for their complete development. Mentoring, assistance leading to more active participation of students in all curricular and co-curricular activities are considered in this regard (Fulford, 2016). This criterion also shows the degree of active engagement of the faculty members in the growth of each student according to their unique capacities.

**Governance, Leadership and Management:** In this criterion, the agency checks the institution’s leadership practices with developmental strategies and visions, employee welfare rules, management of finance and other resources, and internal cultural environment. All institutions including affiliated colleges, autonomous institutions and universities are evaluated under the same score of 100 in this criterion.

**Institutional Values & Best Practices:** In this category, some advanced practices like green campus, energy conservation, innovation and safety of socially weaker sections of students are considered.

The following table represents the credit marking system for the assessment:

Criteria	National Universities	Autonomous universities	Affiliated UG Colleges
Curricular Aspects	150	150	100
Teaching-learning & Evaluation	200	300	350
Research, Innovations & Extension	250	150	110
Infrastructure & Learning Resources	100	100	100
Student Support & Progression	100	100	140
Governance, Leadership and Management	100	100	100
Institutional Values & Best Practices	100	100	100

## CRITICISM

NAAC’s assessment criteria have often been subject to criticism from various sections of scholars and educationists. The key problem is absence of clear measurement guidelines or scores to define the requirements more precisely. For instance, there is no clear parameters to identify the strengths and weaknesses in teaching-learning outcome of an institution. Impact on society is also a subjective concept (Elshawa et. al., 2016). However, other conditions of administration, socio-economic conditions and management structure also determine the efficacy of the assessment criteria as presented in the following table.

Causes	Influences	Environmental factors
Organizational Factors	<ul style="list-style-type: none"> <li>Hierarchical Structures</li> <li>Different student backgrounds</li> <li>Resource scarcity</li> <li>Inadequate planning</li> <li>Unreal societal and administrative expectations</li> </ul>	<ul style="list-style-type: none"> <li>Unhealthy social conditioning</li> <li>Misleading parameters of success</li> <li>Administrative unwillingness</li> <li>Unfair recruitment process</li> <li>Lack of organizational interest</li> </ul>
Performance Evaluation Issues of Faculties and Students	<ul style="list-style-type: none"> <li>Absence of necessary resources</li> <li>Lack of training and service quality assurance</li> <li>Power-politics in education</li> </ul>	<ul style="list-style-type: none"> <li>Technical outcomes do not ensure practical roles</li> <li>Parameters are subjective for different kinds of institutions and students (Elshawa et. al., 2016).</li> </ul>
Student Assistance	<ul style="list-style-type: none"> <li>One-way interaction</li> <li>Master-follower environment instead of teaching-learning</li> <li>Power-play in grievance management</li> </ul>	<ul style="list-style-type: none"> <li>Undecided parameters of students' assistance</li> <li>Inability to mark progress in quantitative measures</li> <li>Socio-economic discriminations</li> </ul>

As of the recent data, NAAC credited 206 universities and 1650 colleges in both private and affiliated markets, with grade A. (Appendix A).

### Global Ranking

Most popular global university ranking agency is the QS University Ranking. The agency issues list of universities based on their various measures of performance under different domains and in different continents. Here, the researcher has taken the Asian University Ranking by QS for reference and analysis.

### Parameters of QS Ranking

QS global ranking parameters follow six key criteria as described below:

**Academic Reputation from Global Survey:** It is one of the heaviest parts in the methodology of QS global ranking. It depends on survey from reputed academicians across the nations. Mailing, application surveys, suggestions etc. are the common methods of conducting the research. Each participant can suggest names of 30 universities but cannot suggest the one he or she is affiliated with. It contributes 40% of the total weight in the evaluation system (Hall, 2016).

**Faculty-Student Ratio:** QS considers the student-faculty ratio of an institution to gauge its performance. It is a traditional measure with subjective utility. This criterion contributes 20% of the whole assessment.

**Citation per Faculty from Scopus:** The number of faculties' original work cited in globally reputed journals of both physical and digital publication contributes another 20% of the global ranking index by QS. The criterion is slightly compromised for subjects that tend to grow faster than usual. 'Publish or Perish' is the cultural concept taken up by the agency for such issues (Hall, 2016).

**Employer Reputation from Global Survey:** Employers' review of employee conditions contributes 10% of the credit system. Again, surveys are used for data collection regarding employment conditions and criteria.

**Proportion of International Students and Faculties:** International orientation refers to the presence of foreign students and faculty staff whether permanent or visiting, in an institution. This condition makes total ten percent of the assessment criteria. This condition is supposedly added for encouraging diversity.

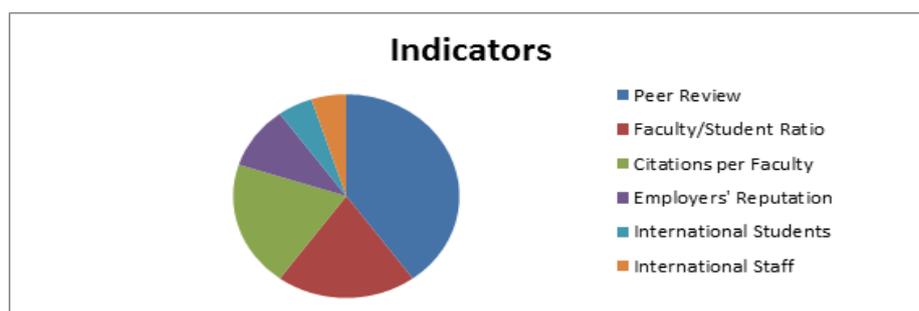


Fig. 1. A Pie Chart on the Criteria and Ratio of indicators adopted by QS Ranking

## CRITICISM

The QS Asian University Ranking Criteria also face myriad criticisms from different sections of academicians and researchers on the field. The agency itself has also expressed concerns over their evaluation criteria in some cases, but nevertheless, they could not find any suggestion for its betterment till now. The following are key concerns about the criteria.

- The criteria of credit are mostly quantitative. No consideration of social contribution and performance based on the existing socio-economic condition is there in the list. Numeric data may not suffice in depicting the true picture of success as an academic institution (Dawson, 2017).
- The whole decision depends on survey results. Surveys always come with the natural limitation of sample size and kind.
- Peer review by selected academicians often goes biased and manipulated under various conditions.
- Ratio of international students and faculties does not necessarily indicate the quality of education, especially in this age of open market for education as a commodity (Dawson, 2017).
- Employers' reputation is again, a subjective consideration based on the labour markets of different nations and the governmental policies for labour law and economic regulations.
- Faculty's citation does not ensure a rich teaching-learning environment as far as transferring their knowledge successfully to the students is concerned.

In the recent QS ranking of World Universities, India has received only 3 positions among the first 200 names. These three Universities are IIT Bombay, IIT Delhi and Indian Institute of Science. These institutions managed the 177<sup>th</sup>, 185<sup>th</sup> and 186<sup>th</sup> ranks respectively. Unfortunately, despite having hundreds of higher education institutions credited with 'A' by NAAC, only 35 institutions could make it to the global ranking list of 1300 universities. (Appendix B)

## Similarities between the Two Accreditation Method of NAAC and QS

The conditions and criteria reveal that there are the following similarities between the two ranking process.

**Management:** Both the ranking systems emphasise on management through their process of evaluating employees' feedback and assessing employers' performance.

**Innovation and Extension:** Both the agencies assess the progress in the institution's contribution to the society through research and development (Brown, & Carasso, 2013). While NAAC's criteria are more abstract, QS's criterion for this is very specific with citation per faculty as a measure.

## Differences between NAAC and QS ranking

The ranking and accreditation systems are significantly different from many aspects as discussed below.

**Quantity vs. Quality:** NAAC ranking depends more on qualitative analysis no matter how biased it can be in some cases. QS ranking is more quantitative with specific statistical reference collected from surveys (Collini, 2012). This process can also be inadequate based on the different socio-economic contexts in which the institutions operate and the number and kind of samples collected.

**Student Assistance:** QS does not consider a student's overall growth as a criterion for institutional success. It takes the provisions of physical infrastructure and environment helpful for students' growth as a default condition (Watts & Blessinger, 2017). Hence, only the international students' and faculties' ratio matter in this process.

**Resource Allocation and Utilization:** Resource plays a vital role in the performance of education sector. While NAAC has some criteria for the measurement, QS does not consider it.

## CONCLUSION

The study indicates to a common factor of disadvantage in both the ranking and accreditation system. This factor is subjectivity. The QS global ranking does not consider the socio-economic background, which questions the credibility of their assessment. The NAAC does not follow a clear statistical method in their data collection process, which again, can be highly manipulated and misguided. However, unless a basic common system of economic stability is established across the borders, thoughts of establishing common assessment criteria and evaluation methods equal to day-dreams. In the present case, a common global criterion can only be applicable for private education business.

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### Appendix A

Sr. No.	Name of College/ Institution	State	NAAC Score	NAAC Grade
1	Government Mohindra College, Patiala	Punjab	3.86	A++
2	Jyoti Nivas College, Bangalore	Karnataka	3.76	A++
3	Cotton College, Guwahati	Assam	3.76	A++
4	M. S. P. Mandal's Deogiri College, Aurangabad	Maharashtra	3.75	A+
5	S.S. Jain Suboth PG College, Jaipur	Rajasthan	3.72	A+
6	Loyola College of Social Sciences, Thiruvananthapuram	Kerala	3.72	A+
7	Stella Maris College (Autonomous), Chennai	Tamil Nadu	3.68	A+
8	Andhra Loyola College, Vijayawada	Andhra Pradesh	3.65	A+
9	St. Agnes College, Mangalore	Karnataka	3.65	A+
10	Miranda House (DU North Campus), Delhi	Delhi	3.61	A+
11	Lady Shri Ram College for Women, New Delhi	Delhi	3.61	A+
12	Midnapore College, Midnapore	West Bengal	3.58	A+
13	Patna Women's College, Patna	Bihar	3.58	A+
14	Post Graduate Government College for Girls, Sector 11, Chandigarh	Chandigarh	3.52	A+
15	St. Joseph's Degree & PG College (Autonomous), Hyderabad	Telangana	3.49	A
16	Sanatan Dharma College (Lahore), Ambala Cantt.	Haryana	3.48	A
17	Parvatibai Chowgule College of Arts and Science, Gogol-Margo	Goa	3.41	A
18	St. Xavier's College, Ahmedabad	Gujarat	3.41	A
19	Janta Vedic College, Baraut	Uttar Pradesh	3.39	A
20	Government College for Women, Jammu	Jammu & Kashmir	3.32	A
21	Government College for Women, Srinagar	Jammu & Kashmir	3.31	A
22	Gangadhar Meher College (Autonomous), Sambalpur	Odisha	3.26	A
23	Jamshedpur Women's College, Jamshedpur	Jharkhand	3.26	A
24	Kanchi Mamunivar Centre for Post Graduate Studies Puducherry,	Pondicherry	3.19	A
25	Jawaharlal Nehru College, Pasighat	Arunachal Pradesh	3.13	A
26	Lady Keane College	Meghalaya	3.09	A
27	Patkai Christian College, Patkai, Dinapur	Nagaland	3.06	A
28	Government College, Dharmashala	Himachal Pradesh	3.06	A
29	Shri Guru Ram Rai (PG) College, Dehradun	Uttarakhand	3.04	A
30	Government Bilasa Girls P.G. College (Autonomous), Bilaspur	Chhattisgarh	3.04	A

### Appendix B

**Top varsities** | JNU, featuring for the first time in the QS World Universities Ranking list, is among the top-600 in the world = indicates shared ranking

2022 global rank	Name
177=	Indian Institute of Technology, Bombay
185	Indian Institute of Technology, Delhi
186=	Indian Institute of Science, Bengaluru
255=	Indian Institute of Technology, Madras
277=	Indian Insititute of Technology, Kanpur
280	Indian Insititute of Technology, Kharagpur
395=	Indian Insititute of Technology, Guwahati
400=	Indian Institute of Technology, Roorkee
501-510 (ranking band)	University of Delhi
561-570 (ranking band)	Jawaharlal Nehru University, Delhi

## Factors Affecting the Credit Policy: An Empirical Study on the Yemeni Banks

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### ABSTRACT

This paper focuses on the factors influencing the credit facilities of Yemen banks. To achieve the objective, it used the descriptive analytical approach to analyze a dataset from the 2006 to 2018 period. Additionally, it relied on descriptive statistics, correlation coefficients, and simple regression to analyze the study data and hypotheses by SPSS 23. The ratio of credit facilities to total assets was used as a dependent variable and eight factors as independent variables. The results indicated that there was no statistically significant effect on the deposit ratios, capital ratio, interest rate on loans and deposits, liquidity ratio, and legal reserve ratio on the credit facilities ratio. Moreover, the results indicate there is a positive effect relationship for each of the interest rates on loans, inflation rate, and economic growth but not statistically significant. The recommendation was to avoid excessive liquidity and seek to employ their cash balances while expanding the granting of credit facilities.

Keywords: Credit facilities; deposit ratio; capital ratio; lending rate, deposit rate; statutory reserve ratio; liquidity ratio; inflation rate; and economic growth.

### 1. INTRODUCTION

Tallon (2010) indicated that banks as a whole are a link that interacts in various fields, and as this activity grows and expands, the banks' accounts and services multiply accordingly. Banks play their role in developing countries and developing economic and political progress. They are funding the national economy by providing loans and various funding and funding facilities based on their external resources from deposits and other internal and internal resources represented in their capital, its provisions, and profits according to Tsai, (2018). Michaelowa et al. (2019) explained in their study that the decision to lend finance would be more rational. Most of the effective credit policies should be applied to consider a range of standards and conditions taken in mind within this policy set for the management of credit portfolios. Bank credit departments tend to define credit policies and guidelines based on long-term growth objectives, according to Lee & Shen (2014).

The crediting policy of Yemeni banks is a set of rules, instructions, and methods by which to achieve the goals of banks, as explained by Khan (2017). Further, Elliott et al. (2015) indicated that banks exercise the function of credit facilities in a disciplined manner due to their superior ability to accept deposits and use them to create a group of investments that are extremely important to the economy. From which bank credit facilities are highlighted. Consequently, credit facilities represent the most attractive investment for the management of the Yemeni banks or any other financial intermediary; it occupies the largest and most important part of the investment portfolio, although it is more invested according to Golin & Delhaise (2013).

The present paper has five sections; following this introduction is the previous studies section two, the third section is a theoretical framework of the study, the fourth section the methodology, and finally, analysis of data and the conclusion make up the last two sections.

**1.1 Study Problem:** Yemen banks grant loans and advances for individuals, business organizations, and the government to enable them to initiate investment and development activities to develop their growth in particular or contribute to economic development. The problem of a study comes from finding out the factors affecting (Deposit Ratio, Capital Ratio, Lending Rate, Deposit Rate, Statutory Reserve Ratio, Liquidity Ratio, Inflation Rate, and Economic Growth) the credit facilities grant in banks of Yemen.

**1.2 Objectives of the Study:** The study aims to find out the factors that influence credit facilities in Yemen banks.

**1.3 The Study Hypotheses:** They were based on the previous studies and conceptual framework and summarized as follows:

**H0:** There is an effect of the factors (deposit ratio, capital ratio, lending rate, deposit rate, statutory reserve ratio, liquidity ratio, inflation rate, and economic growth) on the credit facilities grant in banks of Yemen.

**H1:** There is no effect of the factors (deposit ratio, capital ratio, lending rate, deposit rate, statutory reserve ratio, liquidity ratio, inflation rate, and economic growth) on the credit facilities grant in banks of Yemen.

## 2. Previous Studies

Many studies dealt with the factors affecting credit facilities in various countries. Qudah et al. (2021) concluded no statistically significant differences in the credit policy components of Jordanian Islamic banks from one bank to another. In the study conducted by Mahdi & Nikam (2019), the results indicated a moderate and significant correlation between the cash-generating capacity of the client's activities and the rationalization of the credit policies. A study by Mahdi et al., (2021) indicates that there is a strong and statistically significant between the loans and deposits, which indicates that the correlation is strong and statistically significant between the types of deposits. They also showed a statistically significant relationship between the analysis of the cash flow capacity of the client's activities and the rationalization of credit policies. Rachman et al. (2018) reached that the profitability of Indonesian banks and credit growth negatively affect the number of non-performing loans. A study conducted by Rabab'ah (2015) indicated that the credit facilities ratio is influenced by size and economic growth. Sharma and Gounder (2012) showed that credit facilities have a higher growth when the powerful economic growth. Olokoyo (2011) indicated the importance of the determinants of the lending behavior of commercial banks in Nigeria. The study results indicated that commercial bank deposits have the most significant impacts on their lending behavior. Olokoyo's (2011) study indicated that commercial bank deposits significantly influence their lending behavior. Moreover, Guo & Stepanya (2011) showed that domestic and foreign financing has positively and coherently contributed to credit growth. In addition, it indicated that strong economic growth leads to higher credit growth, higher inflation, and an increase in nominal credit. Grodzicki et al. (2010) indicated Banks are an important driver of credit growth.

After studying the problems of previous studies, the gap bridge was made. The paper tried to improve the gap by providing a more recent frame of time. The study sought humility to seek the impact of factors affecting the granting of credit facilities in Yemen.

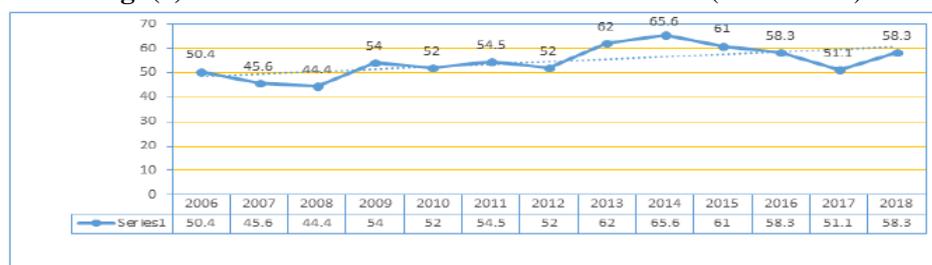
## 3. Theoretical Framework

The Yemeni banking sector continued its growth and development from 2006 to 2018 despite the current economic, security, and political challenges, thanks to the precautionary measures and monetary policies adopted by the Central Bank Yemeni, according to Biswell (2020). Qatinah (2013) clarified during the past few years, Yemeni banks have also embarked on the change and renewed development of banking services and products to meet the needs of customers and society. However, despite this, the proportion of those dealing with the Yemeni banking sector is less than 6%, indicating that the Yemeni banking sector needs more modernity and innovation in creating new banking tools. Also, Chami (2007) pointed out that effective and successful credit policies lead to the alignment between liquidity, safety, profitability, and proper management by banks of their assets. By adhering to the controls and procedures of the credit policy, especially concerning the credit granted according to Khan & Mahapatra (2009). Study of the safeguards provided as a failure to comply with the procedures and controls and approved by the bank's management. It leads to lower efficiency of banking management and inability to keep abreast of banking developments because of the problem of default bank problem resulting from the failure to study the following appropriations (Abdul, et al, 2016). This section explains the fact about credit facilities in Yemeni banks.

### 3.1 Credit Facilities in Yemen Banks

Almekhlafi et al. (2016) define credit or business loans as a pre-approved cash amount issued by a bank to a company that the borrowing company can access at any time to help fulfill various financial obligations. Trade credit is commonly used to fund common day-to-day operations and is often repaid as soon as funds are available since most of the Yemeni banks' revenues are obtained through loans.

**Fig. (1):** Yemeni Banks Growth of Credit Facilities (2008 -2017)



**Source:** Researcher preparation based on budget data of annual CBY (2006 -2018)

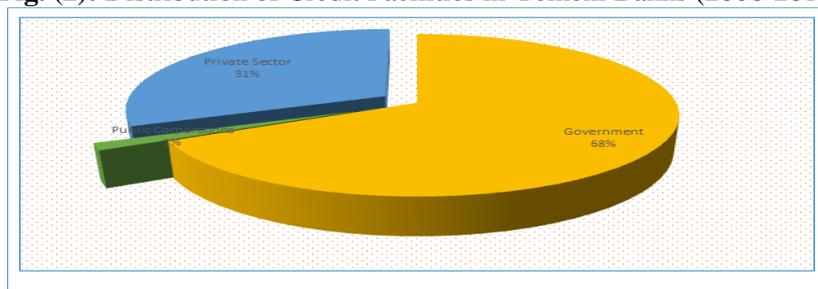
Figure (1) above shows the ratio of credit facilities to total assets. The credit facilities ratio ranged between 44.4% to 65.6 % during the period. Credit provided by the Yemeni banks is considered an important source of financing of the Yemeni economy. Credit facilities were 54.6% of total assets from 2006 to 2018. Production reached its highest level during 2014, reaching 65.6%. The increase of the facilities is attributed to the sturdy economic growth. In 2007-2008 a slight decrease in the ratio of credit to total assets because of the financial crisis that reflected in the slowdown in growth and credit facility. Therefore, banks in Yemen should improve their credit policies to serve lenders and borrowers by facilitating legal procedures, which represented in implementing the instructions of the Central Bank of Yemen, applying financial reporting standards, Basel instructions to preserve lenders, and borrowers. Loans of Yemeni banks are distributed between government loans, public corporations, and the private sector.

### 3.1.1 Types of Yemeni Banks Credit Facilities

Hazaea et al. (2020) was divided credit facilities in the operating of Yemeni banks into three types: Government loans, public corporations, and private sector loans. It can be noted that loans and advances of the government constitute the largest proportion of this facility representing 68% of the total facilities as an average for 2006-2017. The percentage of the total private sector of the total facilities amounted to 31%, while the percentage of the public corporation was 1 % of the total facilities.

Figure 2 shows the distribution of credit facilities in Yemeni banks granted by banks operating in Yemen during 2006-2018. Through the figure below, government loans are the loans that banks in Yemen depend on, and government bonds represent them because they are low risk. Loans to the private sector were moderate, in contrast to those of the public corporation sector, which were almost non-existent. Public company loans in Yemen banks are few compared to other types of loans (Al-Hattami & Kabra 2019). Moreover, the result indicates that banks are not seeking to increase public sector loans due to their substantial risks.

**Fig. (2):** Distribution of Credit Facilities in Yemeni Banks (2006-2018)

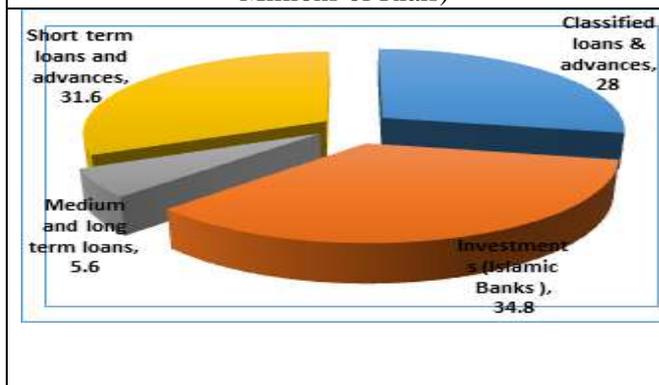


**Source:** Researcher preparation based on budget data of annual CBY (2006 -2018)

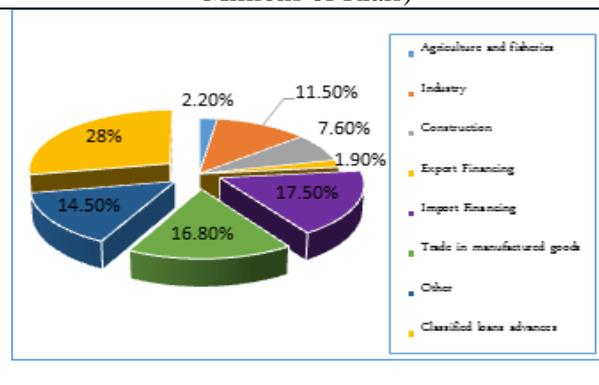
### 3.1.2 Credit Facilities of Yemeni Banks

Figure 3 illustrates the credit facilities of Yemeni banks (excluding government advances) according to the term of loans, where the investments (Islamic Banks) amounted to 34.8 % of credit facilities to the private sector granted by Yemeni banks. The short-term loans and advances were 31.6 % of the total private loan, while the classified loans and advances amounted to 28% of credit facilities to the private sector granted. It is noted that there is a decline in the medium and long-term loans from private sector facilities granted.

**Fig.(3):** Credit Facilities (excluding Facilities to Government) according to the term of loans (In Millions of Rials)



**Fig. (4):** Credit Facilities (excluding Facilities to Government) according to the term of loans (In Millions of Rials)



**Source:** Researcher preparation based on budget data of annual CBY (2006 -2018)

Figure 4 shows credit facilities in the Yemeni Banks (excluding Advances to Government) according to the sectors granted by operations Yemeni banks. Credit facilities were concentrated in eight sectors, where classified loans advances, trade in manufactured goods, and import financing amounted to 56%. Yemeni banks grant 3 % of credit facilities to the private sector. This indicates the importance of these sectors on the Yemeni economy as a whole, in terms of their high contribution to the GDP, which reaches more than 55%. As for the credit facilities classified under "others," they mostly represent the facilities granted to individuals, which amounted to 14% of the facilities of the private sector, while the facilities to the industrial sector amounted to 11.5% of the private sector granted by banks. It is noted that there is a decline in the sectors of agriculture, fisheries, construction, and export financing from private sector facilities granted by banks operating in Yemen by the economic sector for the period 2006-2017.

#### 4. Research and Methodology

The research methodology used for this research is explained in terms of research design, study society, sample, statistical analysis, data collection, and development.

##### 4.1 The Study Sample and Population

The structure of the banking system consisted of ten conventional and commercial banks, two specialized, four Islamic, and two microfinance banks. However, the study sample consists of a consolidated balance sheet of commercial and Islamic banks for the period 2006-2018.

1. United Bank Limited	9. Saba' Islamic Bank
2. Yemen Kuwait Bank	10. Coop. Agricultural Credit Bank ( <i>CAC Bank</i> )
3. Tadamon International Islamic Bank	11. International Bank of Yemen
4. Yemen Commercial Bank	12. Alkuraimi Islamic Microfinance Bank
5. Islamic Bank for Finance and Investment	13. Housing Credit Bank
6. Shamil Bank of Yemen & Bahrain	14. Arab Bank Limited
7. Yemen Bank for Reconstruction. & Development.	15. Al-Rafidayn Bank
8. Yemen Gulf Bank	16. Qatar National Bank
	17. National Bank of Yemen
	18. Al-Amal Microfinance Bank

Source: prepared by Researchers

##### 4.2 STUDY DATA

The study collected data from annual reports that covered a consolidated balance sheet of commercial and Islamic Yemeni banks from 2006 to 2018.

##### 4.3 The Study Model

The study model was formulated based on previous literature review studies and formulated as follows:

<b>Independent Variables</b>	<b>Dependent Variable</b>
<ul style="list-style-type: none"> <li>• DEP: Deposits Ratio</li> <li>• CAP: Capital Ratio (Capital / Total Assets)</li> <li>• LR: The average interest rate on loans</li> <li>• DR: Average deposit rate</li> <li>• RR: Reserve Ratio</li> <li>• LIQ: Liquidity Ratio</li> <li>• INF: The inflation rate</li> <li>• GRTH: Economic Growth</li> </ul>	<ul style="list-style-type: none"> <li>• BC / TA: Credit Facilities Ratio</li> </ul>

Source: prepared by Researchers.

## 5. RESULTS

### 5.1 Data Analysis and Interpretation of the results

The table below illustrates the results of the study; it indicates that the mean of the credit facilities to total assets was about 54.55 % of the total assets. The ratio of the credit facilities ranged from 44% to 65.6%, and the standard deviation was 6.277. This means the credit facilities in Yemen banks are enjoying relative stability. The mean ratio of deposits to total assets was 78.74% and the standard deviation was 2.42955. This indicates

that there is relative stability in the deposits of the Yemen banks during that period. While the mean of the capital to total assets ratio was 8.32%, and a standard deviation of .83681. This means the capital ratio is generally considered low for Yemeni banks.

The mean average interest rate on loans (LR) was 20.26%, with a standard deviation of 1.98552. This means that the interest rates are relatively high. While the average interest rate on deposits (DR) was 15.15% and a standard deviation was 2.82389, this means reflecting the presence of high volatility in the interest rates on deposits. The mean of the legal reserve ratio was 23.10% and the standard deviation was 6.05915%, this means reflecting the presence of a significant fluctuation in the legal reserve ratio. The liquidity ratio was approximately 14%. The ratio ranged from 9.90% to 18.20%. This means the proportion of liquidity in the Yemeni banks is medium, stable, and varied from one bank to another and from one year to another.

The inflation rate amounted to 14.6%, this means reflects the presence of fluctuation in the inflation rate.

The mean of the economic growth in Yemeni banks was (-2.02). This means the instability of the economic growth rate in Yemen was observed.

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Credit Facilities Ratio (BC / TA)	13	44.40	65.60	709.20	54.55	6.27755
Deposits Ratio (DEP)	13	73.70	81.80	1018.50	78.34	2.42955
Capital Ratio (CAP)	13	6.60	10.30	108.20	8.32	.83681
Average Interest Rate on Loans (LR)	13	17.50	22.00	263.50	20.26	1.98552
Average deposit rate (DR)	13	10.00	20.00	197.00	15.15	2.82389
Reserve Ratio (RR)	13	14.70	31.50	300.30	23.10	6.05915
Liquidity Ratio (LIQ)	13	9.90	18.20	182.10	14.00	2.50714
Inflation Rate (INF)	13	8.10	30.70	189.40	14.6	6.60118
Economic Growth (GRTH)	13	-28.00-	7.70	-26.31-	-2.02-	9.76837

Source: prepared by researchers from (SPSS) Output from Primary Data

## 5.2 The Results of the Regression Analysis

Dependent variable (Y)	Model Summary			ANOVA		Coefficient				
	R-value	R Square	Adjusted R Square	F calculated	Sig	Independent variable (x)	Beta	Std. error	T calculated	Sig
Credit Facilities	0.889	0.791	.372	1.889	.282	(Constant)	0.00	159.420	.294	.783
						DEP	-.057-	1.568	-.094-	.929
						CAP	-.023-	2.820	-.061-	.954
						LR	.847	1.113	2.408	.074
						DR	-.388-	.755	-1.143-	.317
						RR	-.147-	.368	-.413-	.701
						LIQ	-.559-	1.058	-1.323-	.256
						INF	.198	.405	.465	.666
						GRTH	.125	.201	.398	.711

Source: prepared by researchers from SPSS Output from Primary Data

The table above shows the results of the hypothesis testing of the study. The results indicate that there is a not statistically significant between deposits and credit facilities. This means the deposits did not affect the credit facilities. This result agrees with the results conducted by Rabab'ah (2015), which states that deposits do not affect credit facilities. While these results did not agree with the results that studies conducted by Olokoyo

(2011) and Sharma and Gounder (2012). The coefficient of the capital factor was negative but not statistically significant. This indicates that the capital ratio does not affect the credit facilities granted by Yemen banks. This result agrees with the studies of Rabab'ah (2015), Berrospide, and Edge (2010) that the effect of capital was minor on bank lending. The average interest rate on loans indicated, which there is no statistical significance and does not affect the credit facilities granted. In addition, the coefficient of the average interest rate on the deposits has no statistical significance and does not affect the credit facilities according to the results of the table. The result is similar to what is expected and what was found in Rababah (2015). The results indicated that the statutory reserve ratio coefficient (RR) was negative and not statistically significant. The statutory reserve ratio does not affect the percentage of credit facilities granted by banks in Yemen. This result is similar to the findings of Rabbah (2015). The result may be that a large part of the deposits is kept in the form of liquid assets in banks of Yemen, which makes the change in the reserve ratio ineffective on the credit facilities granted. The liquidity ratio finds out there is a negative and has no statistical significance. This means the high liquidity ratio does not affect the credit facilities granted. The result agrees with the study conducted by Olokoyo (2011). Moreover, the results illustrate that the inflation rate coefficient was positive but not statistically significant regarding the macroeconomic variables. This means that the inflation rate influences the ratio of credit facilities in Yemeni banks. This result agrees with studies conducted by Sharma and Gounder (2012), but this result differs from the study of Rabab'ah (2015). The result is explained by the effect of the inflation rate on the proportion of credit facilities extended by the Yemeni banks. Finally, the economic growth rate coefficient indicates that there are positive and not statistically significant; this confirms that the high economic growth rate increases the credit facilities. This result confirms the results conducted by Imran and Nishatm (2013) and Rabab'ah (2015).

## 6. CONCLUSIONS AND RECOMMENDATIONS

The study examined the factors affecting the credit facilities provided by the Yemen banks for the period 2006 - 2018. The study showed that the credit facilities provided by the banks operating in Yemen are considered one of the most important sources of funding for the Yemeni economy. The average of the credit facilities was 54.55% of the total assets of Yemen banks during the period 2006 to 2018. The deposits ratio was 78.43% of the assets, the capital ratio was 8.32%, the interest rate on loans was 20.26%, and 15.15% on deposits. While the ratio of the reserve was 23.10%, the liquidity ratio was 14%, the inflation rate was 14.6%, and the economic growth was (-2.02). The study found that there is no statistically significant effect for each of the deposits, capital ratio, the interest rate on loans, liquidity ratio, and the legal reserve ratio on the credit facilities granted in Yemen banks. Moreover, the results indicate there is a positive effect relationship for each of the interest rates on loans, inflation rate, and economic growth but not statistically significant. The researchers recommended that Yemeni banks avoid excessive liquidity and seek to employ their cash balances while expanding the granting of credit facilities. The central bank must maintain low-interest-rate levels on the deposit window in order not to constitute a profitable alternative for the banks.

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## **The Impact of the Adoption of the IFRS 9 Requirements on the Financial Stability of Yemeni Banks**

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### **ABSTRACT**

The study aimed to find out the impact of the adoption of the IFRS 9 requirements (Classification and Measurement, Impairment "ECL", and Hedge Accounting) on the financial stability in Yemeni banks. The data was collected by using the questionnaire. The number of banks that have been selected to represent the sample is 10 banks. From each bank, a random sample was selected. The sample selection stands at 250 responses. The valid sample of this study is 218 responses - yielded (87.20%) of the sample. Data analysis was performed using (SPSS 23) multiple regression techniques were used to detect factors that predict the statistical significance of the variables. The result indicates that there is a significant effect of only one variable adopting IFRS 9 requirement (Classification and Measurement) on financial stability, While the t-test showed that each of the two variables (Impairment "ECL" and Hedge Accounting) does not substantially affect the financial stability. The banks should provide feedback, workshops, and training courses to raise awareness and the capabilities of employees, financial managers, and accountants in all sectors, to absorption and understand the application of the IFRS 9.

Keywords: IFRS 9; Classification and Measurement; Impairment (ECL); Hedge Accounting, Financing Stability.

### **1. INTRODUCTION**

In the wake of the 2008 financial crisis, the International Accounting Standards Board (IASB) in cooperation with the Financial Accounting Standards Board (FASB) launched a project to address the weaknesses of the International Accounting Standard (IAS) 39 according to Stellinga, (2014). They have called on standard-setters to change loan loss accounting standards and to allow managers of the banks freehand to incorporate forward-looking information into loan-loss provisions. In response to these calls, the IASB issued the IFRS 9, whereby the impairment rules are based on the Expected Credit Losses model (ECL).

Transformation to IFRS 9 will create operational challenges across many banking systems worldwide according to Hamza, (2017). The IFRS 9 is one of the most important accounting changes that banks face. It was implemented in 2018 for most major financial markets. Banks are required to transform to recognition and presentation of ECLs on financial assets, rather than the current practice of providing only when losses are incurred (Gaffney, & McCann, 2019). IFRS 9 will also change the way banks represent a wide range of financial assets. The adoption of the new standard in Yemeni banks will increase allocations and early recognition of credit losses. It will have an impact on financial banks' data and regulatory capital according to the study by Bernhardt et al., (2014). Moving to an expected loss approach will require major operational changes, including greater integration between credit risk management and internal accounting systems. Yemeni banks will also need more data on how investment portfolios perform through the credit cycle and will need to build simple models of expected losses (EBA. 2016) consequently. IAS 39 has replaced IFRS 9. The change will materially affect the financial statements of banks, with the impairment accounts heavily affected.

The study investigates the influence of the application of the IFRS 9 requirements on the financial stability of Yemeni banks. IFRS 9 is the applicable financial reporting standard for financial instruments. Under IFRS 9, the expected future credit losses are accounted for using the ECL. This means that the loan outstanding is consistently valued based on creditworthiness. Policymakers need to investigate the implications of IFRS 9 to verify whether implementation has achieved the desired results. Especially since IFRS 9 has a big influence on the variables in financial companies because financial companies have many financial instruments in their balance sheets (Gumb et al., 2018). The IASB made promises to the financial markets.

#### **1.1 The Problem of the Study**

After the widespread use of IFRS in various parts of the world. It has become the language of joint international accounting. Because of its sensitivity and importance, the IFRS creates diversities that can lead to increased

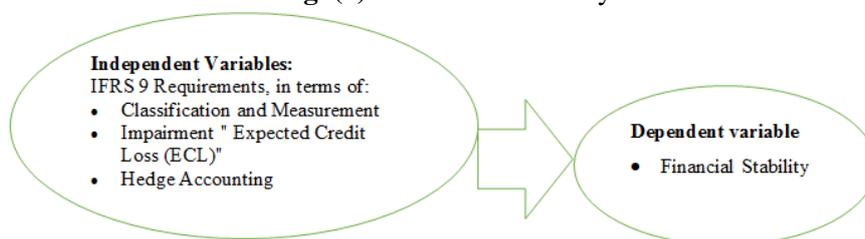
confidence in financial information. The problem statement of the paper demonstrates the extent to the impact of adopting IFRS 9 requirements on the financial stability of Yemeni banks. Therefore, the study problem revolves around the following question: Is there any statistical significance of the adoption of the IFRS 9 requirements (Classification and Measurement, Impairment, and Hedge Accounting) on the financing stability of Yemeni banks?

### 1.2 Objectives of the Study

The banking sector plays an important role as a financial intermediary and a primary source of financing for the local economy. It is considered the driving wheel for economic growth. The IFRSs are the primary guide for measuring operations and events that affect the financial position of the banks and the results of their business. There must be close relevance to financial accounting objectives that are appropriate to the environment where these standards are applied. Based on the above, this study aims at shedding light to study the statistical significance of the adoption of the IFRS 9 requirements (Classification and Measurement, Impairment, and Hedge Accounting) on the financing stability of Yemeni banks.

### 1.3 Model of the Study

Fig. (1): Model of the Study



Source: Prepared by the Researcher

### 1.4 Hypotheses of the Research

Strauss & Smith, (2009) define a hypothesis as a speculative statement of the relationship between two or more variables. The hypothesis was written in a way that can be proven or disproved by valid and reliable data. Based on the study problem, objectives as well as study questions, and in light of the research model, a hypothesis of the research has been established to answer the research problem. The hypothesis has been formulated as the following: "There is no significant impact of the adoption of the IFRS 9 requirements (Classification and Measurement, Impairment "ECL" and Hedge Accounting) on the financial stability of the Yemeni banks".

## 2. LITERATURE REVIEW

Many studies studied the impact of the IFRS 9 on the various dependent variables. The studies indicated that the effect of IFRS 9 on transition on provisioning increase depends on portfolio quality (Ntaikou, D. & Vousinas, G., 2018; Sultanoglu, 2018). Classification and Measurement processes are based on both the business model and cash flow characteristics, accordingly, and financial instruments are classified/measured either at amortized cost or at fair value either through comprehensive income or through profit or loss (Groff, & Morec, 2020). According to Gope, (2018), IFRS 9 establishes specific categories into which the financial assets and liabilities must be classified. As, the results conducted by Dib, D., & Feghali, K. (2021) found that the impact of the new ECL model is not material to the banks' equity. Çollaku, et al., (2021) discovered that the transition to IFRS 9 has a significant influence on the recognition of additional loan impairment but assets and capital regulations are not affected significantly causes instability and re-consolidation of capital. According to (Volarević, H., & Varović, M. (2018). was expected that ECL application by European banks would increase loss provisions and common equity Tier 1 and total capital ratio decreased. The study to Loew et al., IFRS 9 does not affect long-term investments by banks. The study of Mahdi & Nikam (2021) and Saeed,et al., (2021) reached that there is a positive relationship between the impact of the adoption of the IFRS9 on the suitability and reliability of the quality of financial reporting information in Yemen commercial banks. The study conducted by Novotny (2016) showed IFRS 9 might enhance financial stability. However, due to the reliance on point-in-time estimates of the main input parameters ECLs will increase the volatility of regulatory capital for some banks in the European Union. Also, Novotny, (2015) indicated the IFRS 9 expected credit loss model might enhance financial stability. However, the potential benefits of the IFRS 9 will crucially depend on its proper and consistent application. Dong, M., & Oberson, R. (2021) indicated in their study that banks that adopted the CTA under the mandatory application of IFRS 9 decrease their exposure to systematic risk during the transitional period. Moreover, Jassem, et al., (2021) indicated that the adoption of IFRS 9 has led to higher levels of perceptions of Malaysian

bank transparency and trust, and lower levels of skepticism towards such banks. The analysis results of Al-Sakini, et al., (2021) showed that the characteristics of the industry positively affect fraudulent financial reports.

### 3. STUDY METHODOLOGY

Tranfield et al., (2003) defined the research methodology as a systematic and structured process to conclude a specific problem. This section includes the research methodology used for this research that is explained in terms of research design, study society, and sample, statistical analysis, data collection, questionnaire design, and development.

The study population consisted of eleven conventional and commercial banks, two specialized, four Islamic banks, and two microfinance banks. The sample of the study was drawn from employees and supervisors who are working in the selected Yemeni banks. The targeted banks are the Yemeni banks that have incorporation date before 2005, banks that have less than seven branches, and microfinance banks were excluded. The total number of banks that have been selected to represent the sample is 10 banks (National Bank of Yemen, Tadamon International Islamic Bank, Coop. Agricultural Credit Bank (CAC Bank), Yemen Bank for Recon. & Dev., Arab Bank Limited, International Bank of Yemen, Yemen Kuwait Bank, Yemen Commercial Bank, Saba' Islamic Bank, and Shamil Bank of Yemen & Bahrain). From each bank, a random sample was selected. The targeted respondents in each bank were different levels of administration employees and supervisors (Main Administrations, Credit, Financial, Risk, Finance, and Investment Administrations, Internal and External Auditors). The total number of the sample selection stands at 250 (responses 225, no responses 25, and 7 not valid). The valid sample of this study is 218 responses - yielded (87.20%).

Data analysis was performed using (SPSS 23) technique was used to analyze questionnaires to find out the impact of the adoption of IFRS 9 requirements on the financial stability of Yemeni banks. Multiple regression techniques were used to detect factors that predict the statistical significance of the variables.

The primary data was collected by using the questionnaire. The items of the questionnaire were structured based on laws and financial regulations, accounting disclosure and policies, financial, instructions of the IFRS, IFRS 9, IAS, and modern accounting systems. Secondary data collection from a set of Arabic and English books, periodicals, annual reports of Yemeni banks.

The questionnaire consisted of 27 items distributed among the information on personality and the demographic characteristics of the study, which consisted of five items. The independent variables items included 18 items distributed among its independent variables. The dependent variable contained five

### 4. DATA ANALYSIS AND INTERPRETATION OF THE RESULT

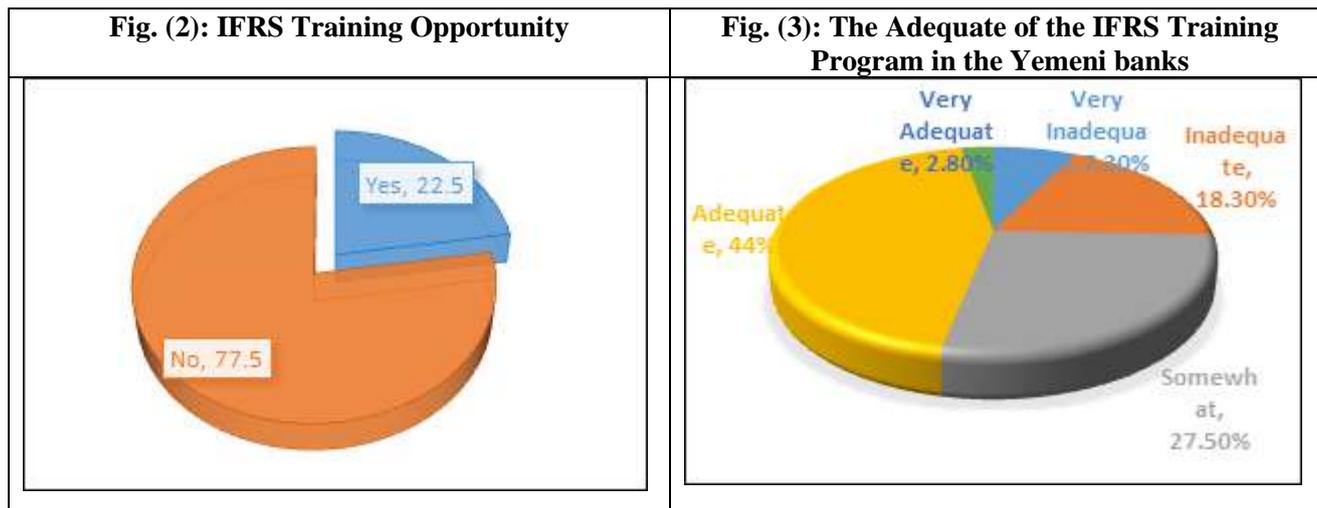
#### 4.1 The characteristics of the study sample

NO	Variable	Category	Frequency	Percentage %
1	Gender	Male	174	79.8
		Female	44	20.2
		<b>Total</b>	<b>218</b>	<b>100%</b>
2	Years of Experience	1-5	19	8.7
		6-10	47	21.6
		11- 15	78	35.8
		More Than 15 Years	74	33.9
		<b>Total</b>	<b>218</b>	<b>100%</b>
3	Academic degree	Diploma	19	8.7
		B.A	155	71.1
		M.A	37	17
		Ph.D.	7	3.2
		<b>Total</b>	<b>218</b>	<b>100%</b>
4	Specialization	Accounting	122	56.0
		Financial and Banking Sciences	43	19.7
		Economics	6	2.7
		Administration	47	21.6
		<b>Total</b>	<b>218</b>	<b>100%</b>

Source: SPSS Output from Primary Data and Field Survey

The results showed the gender of the respondents was (79.8%) of the respondents were male and (27%) were female. The years of experience was (35%) and (33.9%) from respondents were 11 – 15 years and more than 15 years. Hence, this increased the stability of the questionnaire as previously explained. That a large part of the study sample has sufficient experience and educational qualifications, the percentage of holders of the bachelor has was 71.1 % of the study sample and master's degrees was 17%. 56% of the sample study was specialization of accounting, while 19.7% was financial and banking sciences.

4.2 The result indicates the employees did not get training opportunities when the adoption of IFRSs in the Yemeni banks with a percentage of 77.5%. Due to the banks did not provide feedback to the employees to know their weaknesses and to overcome them, while 22.5% of the sample respondents have training opportunities.

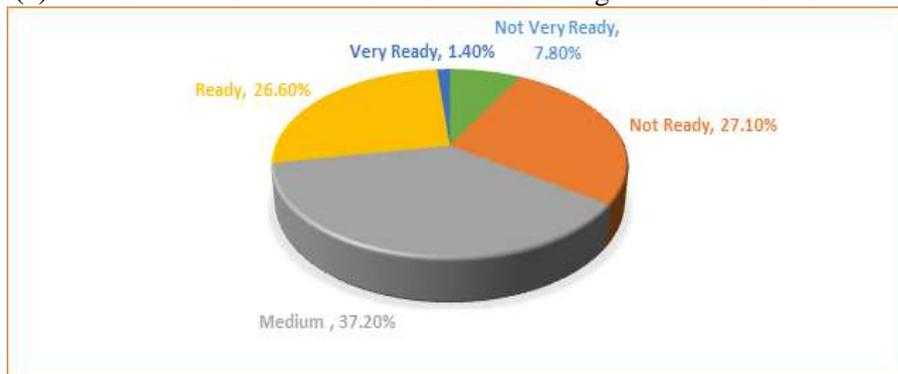


Source: SPSS Output from Primary Data and Field Survey

4.3 The result illustrated respondents' opinions regarding "How adequate of the IFRS training programs in Yemen banks". It finds out (44%) of respondents' opinions indicate that the adequate of the IFRS training program in the Yemeni banks is "Adequate". This means the employees need more training programs. The percentage (27%) of respondents' opinions indicate that the adequate of the IFRS training program in the Yemeni banks is "Somewhat or Nature", and (2.8%) of respondents' opinions show that "Very Adequate". The percentage (18.3%) shows that the adequate of the IFRS training program is "Inadequate". While (7.3%) of respondents' opinions show that "Very Inadequate".

4.4 Figure three-show respondents' opinions that regarding "How efficient are the Yemeni banks in visualizing the framework of the IFRS 9? " The results demonstrate that (37.2%) of respondents' opinions show that the efficiency of the banks in visualizing the framework of the IFRS 9 is "Medium". The percentage (26.6%) of respondents' opinions show that the efficiency is the banks in visualizing the framework of the IFRS 9 is "Ready" for the adoption of the IFRS 9, and (1.3%) shows that the is "Very Ready". While (27.1%) of respondents' opinions show that the efficiency in the banks in visualizing the framework of the IFRS 9 is "Not Ready" for the application of the IFRS 9, and (7.8%) of respondents' opinions show that the is "Not Very Ready".

Fig. (4): The Efficient of Yemeni Banks in Visualizing the Framework of the IFRS 9



Source: SPSS Output from Primary Data and Field Survey

#### 4.5 The Extent of the IFRS 9 Adoption in the Yemeni banks

IFRS 9 is one of the IFRS, which replaces IAS 39 concerned with accounting for financial instruments. IFRS 9 includes three main topics: classification and measurement, impairment (ECL), and hedge accounting. IFRS 9 was issued by IASB, which was imposed on 1 January 2018, to replace the former IAS 39 (Pereira and Chand, 2015). According to Barnoussi et al., (2020) IFRS 9 started as a common project with (FASB). It promulgates accounting standards in the United States, because of the financial crisis of 2008. Subsequently, the boards decided to amend IAS 39 to address were perceived deficiencies that believed to contribute to the scale of the financial crisis.

During the financial crisis, recognition of losses on credit and other financial instruments was delayed as a weakness of IAS 39. This is the major reason for the fact that the impairment present value requirements under IAS 39 are based on an incurred loss model, while not being recognized as credit losses until the loss occurs. Pavlović, (2015) indicated the new impairment IFRS 9 requirements are based on the ECL model and replace the IAS 39 approach.

**Table (2):** The Extent of the IFRS 9 Adoption in the Yemeni banks

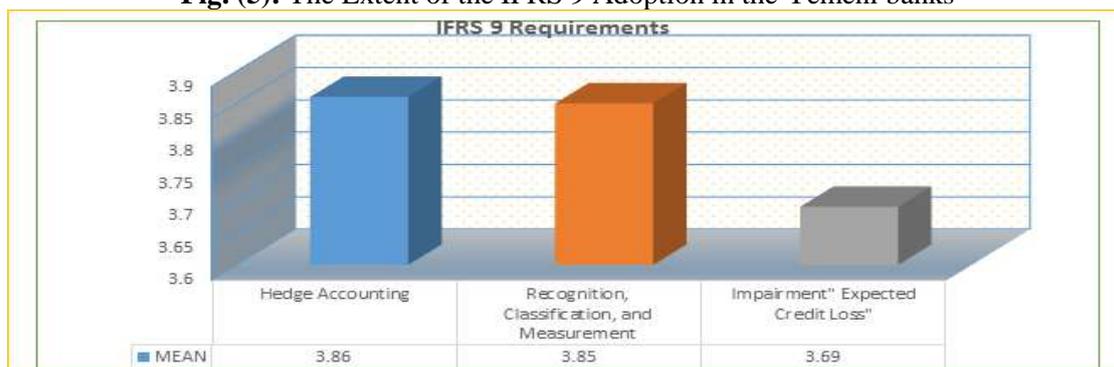
No	The Axes	Mean	Mean %	St. deviation	T-Test	Sig.	Approval Rate
1	Hedge Accounting	3.86	77.2%	0.529	23.892	0.000	High
2	Classification and Measurement	3.85	77%	0.490	25.695	0.000	High
3	Impairment" Expected Credit Loss"	3.69	73.8%	0.587	17.472	0.000	High
<b>IFRS 9 Requirements</b>		<b>3.80</b>	<b>76%</b>	<b>0.457</b>	<b>25.894</b>	<b>0.000</b>	<b>High</b>

**Source:** SPSS Output from Primary Data and Field Survey

The results are shown that the degree of the Yemeni banks' approval of adopting the IFRS 9 requirements was high approval. The overall arithmetical mean is 3.80. It has a standard deviation of 0.457, this indicates the presence of harmony and harmony among the respondents' responses about the variables, and that the dispersion was low. The T-Test confirmed this result, as the value of the T-Test, 25.894 with a significance level of 0.000, as it revealed that the difference between the arithmetic mean of IFRS 9 and the hypothetical average was significant statistical at 0.05 level of significance. The values of arithmetic mean indicated the very great convergence in the extent of the Yemeni banks' adoption of both (Hedge Accounting, Classification, and Measurement), as their arithmetic averages are 3.86 and 3.85 respectively. While the arithmetic means of (Impairment "ECL") is 3.69, which options last in the order of the IFRS 9 requirements, the results demonstrate that the IFRS 9 requirements have a high degree of adoption in the Yemeni banks is large according to T-Test confirmation.

The framework for providing IFRS 9 will make banks assess how economic and credit changes will alter their portfolios, business models, capital, and provisioning levels under various scenarios. Under IFRS 9 requires banks to make more financial stability policies for provisions for sectors or areas considered high risk. As a result, banks will need to re-evaluate their product offerings and manage risk, which is likely to lead to the tightening of credit rating and rating processes. The impact of adopting IFRS 9 will differ from one bank to another and highlight the allocation of capital more sharply. The results mentioned above are made illustration by the below figure.

**Fig. (5):** The Extent of the IFRS 9 Adoption in the Yemeni banks



**Source:** SPSS Output from Primary Data and Field Survey

#### 4.6 The Extent Reality of the Financial Stability

The insufficient development of a system of financial intermediaries reduces the rate of growth of the economy and can render savings mobilization useless. In a study conducted by Bairamli & Kostoglou, (2010) the success of the individual savings transition is determined by the degree of sophistication of financial intermediaries and the presence of attractive financial instruments. As indicated by Ozcan et al., (2003) in their study fiscal policymakers should focus on increasing the level of domestic private savings because the critical problem for developing countries is the lack of investment that restricts economic growth. The increase in savings will lead to the accumulation of capital, which will ultimately lead to economic growth. The high level of domestic savings will help solve unemployment problems, contribute to the development of entrepreneurship, and thus can positively affect the rate of economic development.

The researcher found out that there is high financial stability in the Yemeni banking sector as evidenced by the responses of the study sample. Under financial stability, mobilizing domestic savings into investments would be very beneficial and return the money that has from migrated home. Individuals' savings should be the most significant investment resource for developing the financial sector, as foreign capital is often involved in increasing savings. Mobilizing domestic savings is crucial to raising economic growth and promoting development, as it is private savings that most affect domestic investment. Most savings are realized when they have directed entirely too productive investments. As a result, it will solve the problems of employment and economic growth.

**Table (3):** The Extent Reality of the Financial Stability

The Axes	Mean	Mean%	St. deviation	T-Test	Sig.	Approval Rate
The Financial Stability	3.93	78.6%	0.542	25.410	0.000	High

Source: SPSS Output from Primary Data and Field Survey

From the above descriptive analysis of the respondents' responses about the dependent variable, the reality of financial stability in the Yemeni banks. Notices the overall arithmetic average of the variable (Financial Stability) is (3.93), it is higher than the average measurement tool adopted in the study (3). This means that most of the respondents have a high approval rate for this variable. It has a standard deviation obtained of 0.542, which indicates that there are consistency and harmony between the views of respondents on the paragraphs of the variable. T-Test was found that there is statistically significant, as the value of the T-Test 25.410, with a significance level of 0.000 was smaller than the level of significance adopted in this study 0.05. This confirms that the degree of financial stability to mobilization savings in the Yemeni banks.

#### 5. THE RESULTS OF THE HYPOTHESIS TESTING

The hypothesis of the study aims to find out the impact of the adoption of the IFRS 9 requirements (Classification and Measurement, Impairment "ECL", and Hedge Accounting) of financial transactions and operations on the financial stability of Yemen banks.

**Table (4):** The Implications of IFRS 9 on the Financing Stability

Model Summary				ANOVA		
R	R Square	Adjusted R Square	Std. An Error of the Estimate	F Calculated	Sig.	
0.491	0.241	0.231	0.476	22.697	0.000	
Coefficient						
Dependent variable	Independent Variables & the Constant	Beta	Std. Error	T calculated	Sig	Collinearity Statistic (VIF)
Financial Stability	Constant	1.707	0.277	6.172	0.000	-
	Classification and Measurement	0.441	0.101	4.374	0.000	2.345
	Impairment "ECL"	-0.011	0.076	-0.151	0.880	1.920
	Hedge Accounting	0.147	0.078	1.898	0.059	1.617
$y = 1.707 + 0.441 \times \text{Classification and Measurement} - 0.011 \times \text{Impairment "Expected Credit Loss"} + 0.147 \times \text{Hedge Accounting} \quad (* \text{ Significant at } 0.05)$						

Source: Prepared by the Researcher from SPSS Output

The value of the R Square was (0.241), which is a statistically significant value and indicates the degree of a statistically significant effect of the function between the independent variables and the dependent variable. This means that there is a positive statistical significance of adopting the IFRS 9 requirements and financial stability. The value of Adjusted R Square is 0.231; the independent variables interpreted 23.1% of the variance in the dependent variable while 76.9% of the discrepancies were due to other random variables. The value of VIF showed that there is no Multicollinearity between the independent variables, as it is noticed that its value for all independent variables is less than (3), and this is evidence that the model variables are not affected by the Multicollinearity problem.

The results were shown there is a significant effect of the regression model of only one variable in the dependent variable. That indicates a statistically significant impact at the significance level ( $\alpha \leq 0.05$ ) for adopting IFRS 9 requirements (Classification and Measurement) of financial transactions on financial stability. While the t-test showed that each of the two variables (Impairment "ECL" and Hedge Accounting) does not substantially affect the financial stability. Whereas the T-Test revealed that this effect was not substantial, as its value amounted to (-0.151) and (1.898) with a significant level of 0.880 and 0.059, respectively, which is greater than the level of significance adopted in this study ( $\alpha \leq 0.05$ ). The high statistical significance of the regression coefficients was also evident, which was indicated by the value of Fisher's test, as the calculated f value was 22.697 with a significance level of 0.000 less than 0.05.

Therefore, the results of the null hypothesis (H01) are rejected, and the alternative hypothesis (H11) is accepted. This means, "*There is a statistically significant to the adoption of the IFRS 9 requirements (Classification and Measurement) on the financial stability of the Yemeni banks*". While the null hypothesis (H01) is accepted and the alternative hypothesis (H11) is rejected. This means, "*There is no a statistically significant of the adoption of the IFRS 9 requirements (Impairment "ECL" and Hedge Accounting) on the financial stability of the Yemeni banks*".

These results did not agree with the study conducted by Novotny, (2016), it resulted that if IFRS 9 is applied consistently. It will require recognition of "ECL" in proportion to the risk of underlying sovereign exposures; therefore, the standard can contribute to IFRS 9 to improve financial stability in this area. The results of the current study are consistent with the study by Simper & Bryce (2019) that indicated the expected regulatory volatility of capital as well as the importance of the risks of key banking variables with the forward-looking information system that LLP captures, raising further concerns about the overall impact of the new accounting framework on stability banking and financial.

## 6. CONCLUSION

The result indicates the employees did not get training opportunities when the adoption of IFRS in the Yemeni banks with a percent of 77.5%. It showed that the efficiency of the banks in visualizing the framework of the IFRS 9 is ready for the application of the IFRS 9. The extent of the IFRS 9 requirements adoption in the Yemeni banks was a high approval. The adoption of the financial stability of the Yemeni banks has obtained very high approval. Moreover, The result indicates that there is a significant effect of only one variable adopting IFRS 9 requirement (Classification and Measurement) on financial stability, While the t-test showed that each of the two variables (Impairment "ECL" and Hedge Accounting) does not substantially affect the financial stability. The research recommendations the banks should provide feedback, workshops, and training courses to raise awareness and the capabilities of employees, financial managers, and accountants in all sectors, to absorption and understand the application of the IFRS 9 because of its direct impact on the financing stability. Banks must be mobilizing domestic savings is critical to increasing economic growth and promoting development.

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## Corporate Social Responsibility in India: A Study

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### ABSTRACT

CSR (Corporate Social Responsibility) was previously known as corporate philanthropy, and it has been practised in India for centuries. However, in today's globalised and modern India, philanthropy does not fix the problem in terms of quantity or quality. In order to fulfil their social responsibilities, corporations must first comprehend and reframe their roles. They must look beyond government-sponsored development programmes and take responsibility of efforts aimed at improving their community's health and level of living. CSR is defined as "the commitment of business to sustainable development," according to the World Business Council for Sustainable Development. Collaborating with employees, their families, and the local community to contribute to long-term economic growth of the country.

Keywords: CSR, Company Act 2013, India, Philanthropy, CSR Disclosure, Sustainable development.

### INTRODUCTION

A dearth of definitions, cipher of conduct, and 'CSR' principles has arisen, most intended to be voluntarily adopted by companies. In the United States and Europe, CSR is usually viewed as a set of voluntary, non-enforceable standards—principles, pledges, or programs by which companies seek to operate in a socially responsible manner. Indeed, one of the defining characteristics of CSR as it is commonly understood in the West is that it relates to voluntary and self-regulatory corporate action; that is, CSR aims to persuade "businesses to conduct business beyond conformity with the law and beyond shareholder wealth maximisation." Similarly, much academic research and some civil society initiatives have assumed that CSR is a voluntary tool for company reform. The argument about CSR in India has taken a different direction. India appears to be the first nation to demand CSR considerations as part of a company's corporate governance and to progress toward mandatory CSR spending for all publicly traded companies. India is one of the world's largest economies and a driving force in the global marketplace. At a time when many stakeholders consider CSR to be "voluntary by nature" rather than required, India's actions appear to be out of the ordinary.

### Definition of Corporate Social Responsibility

"The term "corporate social responsibility" has no universally agreed definition (CSR). The commercial sector, governments, and civil society organisations all have different perspectives on the notion of CSR. Corporate Social Responsibility (CSR) is a concept whereby companies integrate social, environmental and health concerns in their business strategy (policy) and operations and in their interactions with stakeholders on a voluntary basis. The social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time. (Carroll, 1979)

European Union (EU): It describes CSR as "the concept that an enterprise is accountable for its impact on all relevant stakeholders. It is the continuing commitment by business to behave fairly and responsibly, and contribute to economic development while improving the quality of life of the work force and their families as well as of the local community and society at large." while proposing the Corporate Social Responsibility Rules under Section 135 of the "Companies Act, 2013," the Chairman of the CSR Committee mentioned the Guiding Principle as follows: "CSR is the process by which an organization thinks about and evolves its relationships with stakeholders for the common good, and demonstrates its commitment in this regard by adoption of appropriate business processes and strategies. Thus, CSR is not charity or mere donations. CSR is a way of conducting business, by which corporate entities visibly contribute to the social good. Socially responsible companies do not limit themselves to using resources to engage in activities that increase only their profits. They use CSR to integrate economic, environmental and social objectives with the company's operations and growth."

"The Companies Act, 2013" has introduced various measures that will affect the way Indian businesses operate, one of which is spending on corporate social responsibility (CSR) activities. Corporate social responsibility, which was formerly mostly voluntary, is now codified in law. In this bulletin, we highlight the major requirements, analyses, and issues connected to the compliance of these regulations for companies to consider,

based on the CSR provisions set forth in the 2013 Act and the draught CSR rules made available for public comment.

### **India's CSR Situation**

In India, corporate social responsibility (CSR) is not a new notion. Corporations such as the Tata Group, the Aditya Birla Group, and Indian Oil Corporation, to name a few, have been involved in community service since their inception. Many other groups have contributed to society through donations and charitable events. Nowadays, the primary goal of CSR is to optimise a company's total influence on society and stakeholders. An rising number of businesses are incorporating CSR policies, practises, and initiatives into all aspects of their operations and procedures. CSR is becoming increasingly crucial for maintaining goodwill and image, resisting attacks, and enhancing company competitiveness, according to a growing number of companies. India is the first country in the world to make corporate social responsibility (CSR) mandatory. According to the new law (Firm Act 2013), any company that has a net worth of Rs.500 crore or more or revenue above Rs.1,000 crore or a net profit above Rs.5 crore needs to spend at least 2% of the average net profits for the past three years on CSR activities

### **The Study's Objectives**

The research was conducted with the following goals in mind:

- i. Acquire an understanding of the concept of corporate social responsibility.
- ii. To determine the impediments to achieving Corporate Social Responsibility.
- iii. To investigate corporate social responsibility practises and how they affect business.
- iv. To provide current information on CSR trends to those involved in policymaking, policy analysis, policy research, practitioners, and other stakeholders.
- v. To provide data for future CSR research.

CSR must be distinguished from charitable donations and "good works," such as corporate philanthropy and human rights. Globalisation, the need for comprehensive growth, and hence the imperatives of climate change have created new difficulties and opportunities in the twenty-first century. Indian business, which is now widely regarded as a critical component of India's rise, is set to assume a leadership role in the issues of our time. This approach also emphasises the idea that businesses are significant members of society, with a crucial and active role to play in preserving and maintaining healthy ecosystems, promoting social inclusion and equity, and adhering to ethical and sound governance criteria. This makes commercial sense as well, because companies that practise successful CSR have a reputation for being socially responsible and achieve sustainable growth in their operations. Indian entrepreneurs and business enterprises have an extended tradition of operating among the values that have outlined our nation's character for millennia. India's ancient knowledge, that remains relevant these days, evokes individuals to figure for the larger objective of the well-being of all stakeholders. These sound and all-encompassing values are even additional relevant in current times, as organizations grapple with the challenges of modern enterprise, the aspirations of stakeholders and of voters desirous to move participants in economic process and development. CSR is not philanthropy, and CSR activities are entirely optional for firms to engage in outside of any governmental requirement or responsibility. Following Voluntary recommendations for corporate Social Responsibility have been produced to provide companies with guidance in coping with the abovementioned demands, while working closely within the framework of national ambitions and policies. While the rules are designed for the Indian market, businesses with a global presence could profit from applying them for their international operations as well. Because the rules are voluntary and not in the form of a prescriptive road map, they are not intended for use in restrictive or written agreements. While it is expected that many more companies will make sincere efforts to comply with these guidelines, there may be legitimate reasons for a few corporations to be unable to do so. In such a case, it is expected that such corporations might inform their stakeholders regarding the guidelines that the businesses have not been able to follow either absolutely or partly. It is hoped that "India Inc." would answer these guidelines with keen interest. The Indian corporate sector has seen the present decade as an amount of high growth and the emergence of a powerful India Inc. having a major world footprint. the decade conjointly saw the money crisis that barrel the world markets, whereas the company sector is convalescent from the jolt of the worldwide money crisis, the future is looking bright. However, the company sector is additionally standing Jain and Jain / OIDA International Journal of Sustainable Development 06: 07 (2013) 25 within the midst of a sustainability crisis that poses a threat to the terribly existence of business. What we have before us could be a cross-road where one path leads us to inclusive growth and therefore the other could result in unsustainable future. We have seen the

business generating wealth and price for the shareholders within the last sixty years, however at the same time we tend to even have the issues of poverty, unemployment, illiteracy, deficiency disease etc. facing the state the company growth is typically seen as widening the gap between the Bharat and India through its financial gain – skewing capability. This gap must be bridged. Whereas the govt. undertakes in depth developmental initiatives through a series of sectoral programmes, the business conjointly must take the responsibility of exhibiting socially accountable business practices that ensures the distribution of wealth and well-being of the communities within which the business operates. The modification is obvious within the statements regarding corporate social responsibility being created by India's leading industrial teams just like the Tata, "Over the years, the nature of the company's involvement with the community has undergone a change. It has moved away from charity and dependence to empowerment and partnership and the consistent transformation in their corporate social responsibility practices in the last decade." Sudha Murthy of the Infosys Foundation, the social initiative arm of the IT major Infosys, explains the great efforts that corporation are going into ensure that the projects they are involved with are actually genuine and serve a purpose, "We get a lot of projects, so we do a round of elimination...make a shortlist, as to which are the good ones, after a lot of verification. Then we supervise the implementation part by visiting the area. But we have to work very hard, during all holidays, weekends and 18 hours every day,".

### **CSR IN INDIA**

From the very beginning CSR in India continues is characterized prominently by humanitarianism and community development activities. A study conducted in India shows that Indian companies and stakeholders are commencing to adopt some aspects of the mainstream agenda, such as the incorporation of CSR into their business. The development of CSR in India can be divided into four stages. These stages depicts how CSR practice in India has been different from time to time.

#### **STAGE 1**

The prime phase of CSR is primarily determined by culture, religion, family tradition, and industrialization. In the pre-industrial period up to the 1850s, merchants devoted themselves to society welfare for religious reasons, giving out their wealth, for instance, by building temples. Moreover, the merchants provided relief in times of crisis such as famine or epidemics. Industrialisation brought about by the invasion of Britishers in India, paved way for engagements which were supported by religious motives and business considerations. The first phase of CSR showed a lack of long term planning and charity practised outside the company affairs.

#### **STAGE 2**

The second phase of CSR development was the period during struggle for Independence .The companies and business houses during the freedom struggle supported financially Gandhi and other leaders in their reform programmes.

#### **STAGE 3**

The third phase of CSR witnessed rise of public sector undertakings after Independence. It shows a marked shift from self-regulation to strict legal and public regulation. The activities of the private sector were completely regulated in view of the requirements of the country's unfortunate population and to prevent any further exploitation. However, this supposition of efficiency of the public sector to tackle developmental challenges was limited and corruption and red-tapism forced India to look towards private sector involvement in our socioeconomic development.

#### **STAGE 4**

This phase embarks a major drift in the attitude of the companies as they started to blend CSR as a building block of their business strategy. It was no more considered an external requirement or obligation. The process of liberalisation of the Indian Economy linked the Indian market and the global market, thereby abolishing licensing and control systems. Increased profits also increased the willingness of business organisations ability and willingness to give.

### **INDIA'S CURRENT CSR STATUS**

Frequently, the topic of how CSR pertains to a country like India has been asked. Given India's current place in the globe, corporate social responsibility is linked to various concepts, given its historical relevance. When one considers CSR as a concept that encompasses a wide variety of concerns under the umbrella of sustainable development, a greater understanding of its significance in India emerges. This is critical phrase for today's developing countries. A fundamental component of this philosophy is the protection of the environment and a country's natural resources. Furthermore, it is critical to ensure that society is free of income gaps and the provision of essential amenities such as health care, education, and literacy. As a result, several big CSR efforts

have been established in India since the mid-1990s, if a company's operations are centred on the most basic. "A Code for Desirable Corporate Governance," the first voluntary corporate governance code, is one of them. The Confederation of Indian Industry (CII), India's largest trade and industry organisation, spearheaded this project. CSR has been gaining traction in India from the year 2000 as a significant aspect of company activity. A significant number of roundtables and networks devoted to CSR are being formed and are carrying out useful work. A few more great instances are shown below. Many new organisations are emerging on the Indian market that focuses on CSR issues. For example, the Business Council for Sustainable Development (Core-BCSD) of Asian country's Company Round-table Conference on Development of Methods for the Environment and Sustainable Development (Core-BCSD) could be a conglomerate of Indian businesses striving to incorporate sustainable development principles into their operations, both collaboratively and individually. The Core-BCSD Asian nation programme, which includes some of the world's most resource-rich countries, was created by the Energy and Resources Institute (TERI). A number of significant Indian corporations are currently represented at the round-table conference. TNS India and the Times Foundation conducted a poll in June 2008 with the goal of better understanding the role of corporations in CSR. Over 90% of the big Indian organisations polled were interested in CSR projects, according to the data. The corporate sector, in fact, was more concerned with CSR efforts than the general public and government sectors. Companies were most interested about promoting livelihoods, education, health, the environment, and women's empowerment. The majority of CSR initiatives were carried out as internal projects, with only a few exceptions. Only a tenth of the organizations said that they are into CSR because it is mandatory, and just about two fifths of them do it for tax exemption. Public goodwill and branding are high on the agenda in the case of private multi-national agencies, and improved perception about the company is the motivation in the case of PSUs. Various Multinational companies working in India have taken up Corporate Social Responsibility. Some of them are given below.

**Bharat Petroleum Corporation Limited, Maruti Suzuki India Limited, and Hindustan Unilever Limited,** focus holistic development in the villages they have adopted. They provide better medical and sanitation facilities, build schools and houses, and help the villagers become self-reliant by teaching them vocational and business skills.

#### **Reliance Industries**

It initiated a project named as "Project- Drishti" to bring back the eyesight of visually challenged Indians from the economically weaker sections of the society. This project has brightened up the lives of over 5000 people so far. •

#### **GlaxoSmithKline Pharmaceuticals'**

CSR programs primarily focus on health and healthy living. They work in tribal villages where they provide medical check-ups and treatment, health camps and health awareness programs.

#### **SAP India**

Sap India in partnership with Hope Foundation (an NGO that works for the betterment of India's poor and the needy) throughout India, has been working on initiatives for short and long-term rehabilitation of the tsunami victims.

#### **IBM**

As part of its Corporate Service Corps (CSC) programme, IBM has joined hands with the Tribal Development Department of Gujarat for a development project aimed at upliftment of tribal in the Sasan area of Gir forest. •

#### **HSBC**

The financial services sector is going green in a steady manner. Efforts by companies such as HSBC India, Max New York Life and Standard Chartered Bank have ensured that the green movement has kept its momentum by asking their customers to shift to e-statements and receipts. •

#### **TATA GROUP**

The Tata Steel Rural Development Society aims to improve agricultural productivity and raise farmers' standard of living.

**Birla Yamaha Ltd.** Fully aware of its social responsibilities, the Group is supporting the cottage and village industry sector by establishing centres in Bhadoi, Srinagar, Jaipur and Agra for producing handmade carpets. The support is not just financial, but for marketing and designing as well. Help is also being provided to the families of artisans so that adult members can contribute towards creating some of the most exquisite carpets.

**Apollo Tyres Ltd.** To combat the growing hazard of HIV/AIDS, Apollo Tyres, in an active collaboration with DFID (implemented through 36 NGO's, launched the Apollo Tyre Health Care Centre in October 2000 to provide general and sexual health services for truckers and the transport community at large. The Centre provides STD diagnosis and treatment, behaviour change communication and condom promotion. Through consistent counselling and educational programmes, the centre through its dedicated teams of volunteers, enlightens the truckers on the numerous risks involved and the methods of prevention. With this initiative Apollo paved the way for future endeavours to achieving holistic health care at the micro level.

#### **Hindustan Lever Ltd.**

Unilever's Corporate Purpose states to succeed require the highest standards of corporate behaviour towards its employees, consumers and the societies and the world in which we live. As with Unilever, HLL's approach to Corporate Social Responsibility (CSR) is rooted in this belief. CSR, in HLL, covers the company's interaction with and impact on society in three distinct areas. These are the company's own operations; the company's relationships with its business partners through the value chain; and the voluntary or philanthropic contributions it makes to communities. HLL supports Asha Daan run in Mumbai by the Missionaries of Charity (founded by the late Mother Teresa). Asha Daan is a home for abandoned, handicapped children, the destitute and people affected by AIDS (HIV positive). Asha Daan had been set up on a 72,500 square feet plot, in the heart of the city leased by the company. HLL also bears the capital and revenue expenses for maintenance, upkeep and security of the premises.

#### **CSR- FUTURE PROSPECTIVE**

Corporate social responsibility is one of the earliest and key conceptions within the educational study of business and society relations. The key question concerned whether or not the interests of business and society merge within the long ran. That question is assessed within the present and future contexts. There appear to be clearly anti-responsibility trends in recent academic literature and managerial views concerning best practices. These trends raise vital doubts about the future standing of corporate social responsibility theory and practice. The very important modification is that a melodic phrase of wealth creation progressively dominates the managerial conception of responsibility. Bowen's (1953) provides a developmental history of the corporate social responsibility notion from the Progressive Era forward to the company social performance framework and Carroll's pyramid of corporate social responsibilities. There are 3 emerging alternatives or competitors to responsibility: (1) an economic conception of responsibility; (2) global corporate citizenship; and (3) stakeholder management practices. The article examines and assesses every various. The article then assesses the prospects for business responsibility in a global context.

#### **COMPANIES BILL 2013:**

##### **CORPORATE SOCIAL RESPONSIBILITY**

The New Companies Bill makes it mandatory for companies to earmark at least 2 percent of their average net profits for the preceding three financial years, for implementing a corporate social responsibility (CSR) strategy. (b) The bill is applicable to companies with a net worth of Rs. 500 crore or more, a turnover of Rs 1,000 crore or more and a net profit of Rs 5 crore or more during any financial year. (c) Thus the bill makes it compulsory to not just earmark the funds but also form a CSR committee (of board members consisting 3 or more directors out of which at least one is an independent director), formulate a CSR policy, allocate the amount to different activities and monitor the implementation from time to time. Further, the CSR policy is to be disclosed on the company website. (d) With regard to implementation, only project based investments, and not mere donations, will be accepted as CSR which involve innovative social inventions/initiatives that factor in hazards, risks and vulnerabilities. Baselines surveys, social impact assessment and meticulous evaluation including documentation is mandatory along with training and re orientation of the staff. (e) The CSR amount unused/unelapsd in a particular year will be carried forward to the following year. CSR budget itself hence is non lapsable. (f) With regard to failure to spend the requisite amount, the bill states that the company shall have to provide sufficient reasons for not spending the allocated CSR budget. While no specific penalties are contemplated in the Bill with respect to CSR, sections 450 and 451, provide for general penalties for flouting the rules and repeat offences. (g) An estimated 2,500 companies fall into this "mandatory" CSR-reporting category. (h) CSR activities in the first year would be between Rs. 9,000 crore and Rs. 10,000 crore spent in social welfare.

#### **IMPLICATIONS FOR CORPORATES**

In terms of CSR, the new bill contains two key measures. The first is that the board must confirm that the corporation will invest in CSR. The second requirement is that they give proof of expenditure. So, while there is no legal requirement on the part of the corporation, the board members are held accountable. A poor proof will allow the regulator to challenge the administrators' roles and responsibilities, making it more than just a paper

provision but a duty on the board that they will not be able to avoid easy. The objective was also to make the payment transparent and simple ad hoc giving. By establishing a CSR team, consisting of three administrators and one director, a CSR strategy, assuring execution, and monitoring results, the company is moving in the right way.

### **OBSTACLES AHEAD**

The first and most important obstacle is political pressure from local legislators, especially for PSUs to pay in their districts. Appropriate and important baseline surveys, as well as social impact evaluation, will lose their relevance if efforts can't be directed to places that need them most in terms of operational risk reduction. (a) Another point of contention is that a mandatory disbursement is nothing more than a tax. As a result, mandatory CSR will imply an increase in the country's already high corporate tax rate. It now stands at 32.5 percent, higher than the global average of 24.09 percent. Increases in corporate taxes could hurt India's position as a developing country. As a result, it will be at a competitive disadvantage in the global marketplace. (b) Another concern is the commercialization of the company's projects' Returns on Investment (ROI). This is due to the fact that CSR-based programmes can have a long gestation time, making calculated returns on investments such as scholarships for underserved groups or environmental benefits from the use of cleaner fuels, among other things, long-term possibilities. (c) Companies may be pushed to restructure their organisations, which may result in the diversion of their staff away from their primary activity. Due to a shortage of experience, this might open the way for a massive increase in CSR consulting. As a result, the process of integrating qualified agencies into a company's CSR framework should be simplified. (d) Finally, because the Companies Bill is such a significant change, efforts should be made to remove the cloud surrounding the legitimate activities that may be undertaken by corporations under CSR to prevent the initiative from getting encumbered by emergence of corruption with corporations trying to 'greenwash' their profitable activities under the garb of CSR.

### **CONCLUSION**

Corporate Social Responsibility (CSR) is not a fad or a passing trend; it is a business requirement that many Indian companies are beginning to consider or are already participating in in some form. While some organisations identify some of these activities as corporate citizenship, the underlying message and objective remain the same. A good CSR strategy requires linking these activities with business objectives and corporate principles, thereby integrating corporate responsibility across business functions and improving the company's reputation. India's goal is to employ basic business concepts to make CSR sharper, smarter, and more focused on what counts most. This can be accomplished by:

- (a) Focusing on priorities;
- (b) Allocating funds to regard CSR as an investment with expected returns; and
- (c) Maximising available resources by avoiding duplication of effort and maintaining existing services. strong and enhanced
- (d) Monitoring activities and close collaboration with implementation partners such as NGOs to ensure that initiatives provide the desired results
- (e) Reporting performance in an open and transparent manner so that everyone may
- (f) The effectiveness of CSR, and thus the ability of corporations to execute on the goals of their CSR strategy, requires a long-term perspective by organisations that include their commitment to each internal and external stakeholder. The journey to corporate social responsibility has begun!

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## **An Overview of National Pension Scheme and its Awareness among Residents of Mumbai**

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### **ABSTRACT**

The National Pension Scheme was launched for all citizens of India on 1st January 2004. It has been intended to empower orderly reserve funds during working tenure of the NPS account holder. It gives solution of regular retirement income to retired or old age citizens of India to some extent. The article studies the Awareness of National Pension Scheme among Residents of Mumbai

Keywords: National Pension Scheme, NPS Trust, Retirement Income, Citizens

### **1. INTRODUCTION**

The National Pension Scheme was launched by the Government of India from 1st January 2004 for Government employees but later on this scheme was opened up for all citizens of India. Remarking the need to provide revenue security to low pay workers and to individuals from financially weak areas of society NPS is a contributory framework under which both the business houses and workers can contribute specific sum from their income so after retirement worker will get regular income. This plan is for the long term saving which can give some help in post-retirement or old age, when they don't have any source of earning to pay day to day expenses of life.

National Pension Scheme has been intended to empower orderly reserve funds during working tenure of the NPS account holder. It gives solution of regular retirement income to retired or old age citizens of India to some extent. All residents from the age of 18 years to 65 years can take up this plan.

### **Main Structure of NPS:**

NPS Trust and Trustee Bank- (NPS Trust ):These are set up by the PFRDA who handles the funds part of the exchanges between different elements in a in accordance with the guidelines issued by the Authority under NPS. Axis Bank Ltd. has been appointed as Trustee Bank under NPS by PFRDA w.e.f. 1st July, 2015. The appointment of Trustee Bank is valid for five years subject to annual review by PFRDA . It receives NPS funds from all Nodal Offices and transfers the same to the Pension Funds / Annuity Service Providers/other intermediaries as per the operational guidelines from Central Record keeping Agency

- **Points of Presence (POP) and POP-Service Provider (POP-SP)-**

These are the banks and non-banking monetary institutions enlisted with PFRDA for enrollment and give services to NPS subscribers. In NPS structure these are primarily banks who work as first point of communication to the NPS account holders. Point of Presence Service Providers (POP- SPs) are the approved branches of POP which act as collection points.

### **Some of the main functions of POP-SP are:**

- Subscriber Registration
- Initial Contribution Processing at the Time of Registration
- Regular subscriber's contribution
- Change in subscriber details
- Grievance handling
- **Annuity Service Providers**

These are named by the PFRDA to give annuity to the subscribers through their different plans. It is the wish of subscribers to select any of the Annuity Service Providers for purchasing an annuity and accordingly, try to earn month to month pension to their NPS account holders.

- **Pension Funds Managers-**

These are agents appointed to invest the funds got from different subscribers.

Following is list of Pension funds managers

- ICICI Prudential Pension fund Management Co. Ltd.
- SBI Pension Funds Pvt. Ltd.
- LIC Pension Fund.
- UTI Retirement Solutions Ltd.
- Kotak Mahindra Pension fund Ltd.
- Aditya Birla Sunlife Pension Management Ltd.
- HDFC Pension management Co. Ltd.
- Reliance Pension Fund.
- Custodian

Custodian takes care of security side of all transactions of subscribers. Stock Holding Corporation of India Ltd. (SCHIL) has been delegated by PFRDA to work as "The Custodian and Depository Participant" to NPS Trust and offer custodial types of assistance for protections in actual structure and Depository Participant administrations for protections in Demat mode.

## **2. Working of National Pension Scheme**

The plan encourages to contribute with a base sum and permits contributing as we wish. The subscribers can get to two kinds of account under this plan

### Tier I

Tier I account mainly, expected to just create some saving which can be used for the post retirement period, and it won't permit the resident to with draw, before 60 years of life. Under this option subscriber get tax exemption.

### Tier II

Tier II account is permitted only if when there is a functioning Tier I account of the subscriber. It permits the holder to pull back the sum, at whatever point required. As Tier II is willful, it doesn't give benefit of tax exemption.

A person's investment is pooled in pension fund under the National Pension Scheme. These money are invested by Pension Fund Regulatory and Development Authority (PFRDA) authorised funds managers as per given guidelines in varied portfolios involving shares of Companies, government securities, bills, corporate debentures. These investments would grow depending on returns and accumulate over the period subscriber have kept money for investment

The record keeping for every one of the NPS related activities are taken care by the National Securities Depository Limited (NSDL). After finishing of the NPS investments paying period, the Annuity Service Provider (ASP) are the person who ensure the delivery of pension for the NPS account holder. PFRDA selected eight organizations for pension fund operations list of which is already given in above paragraph.

## **3. Advantages of NPS to Subscribers**

### • **Easy Process**

All candidates just need to open a NPS account with any of the POPs or through e-NPS and get a Permanent Retirement Account Number (PRAN)

### • **Easy Transferable**

A candidate can work a record from anyplace in the nation and can pay commitments through any of the POP-SPs regardless of the POP-SP branch with whom the candidate is enlisted, regardless of whether subscriber changes his/her city, work and can likewise make contribution through e-NPS. The account can be transfer to some other sector like government sector and corporate model on the change of job by NPS account holder from private to Government .

### • **Minimum cost**

National Pension Scheme need very nominal charges for administration and management. It is lowest cost pension scheme in the india.

- **Adaptable**

A candidate can pick his/her own venture choice and Pension Fund or choose the Auto decision to improve and wanted returns.

- **Tax Benefits under NPS**

A tax exemption of Rs.1.5 lakh can be claimed on the employee's and employer's contribution towards the National Pension System (NPS). Tax benefits can be claimed under Section 80CCD (1), 80CCD (2), and 80CCD (1B) of the Income Tax Act. Under Section 80CCD (1B), individuals can claim an additional amount of Rs.50,000 for any other self-contributions as NPS tax benefit.

Therefore, individuals can claim up to Rs.2 lakh as tax benefits under NPS.

#### 4. OBJECTIVE OF THE STUDY

To study the awareness level about National Pension Scheme among Mumbai citizen

To study the advantages of NPS for the Subscribers

To Study Satisfaction level of subscribers are with NPS

#### 5. RESEARCH METHODOLOGY

Sample Size: 100

##### Data Collection

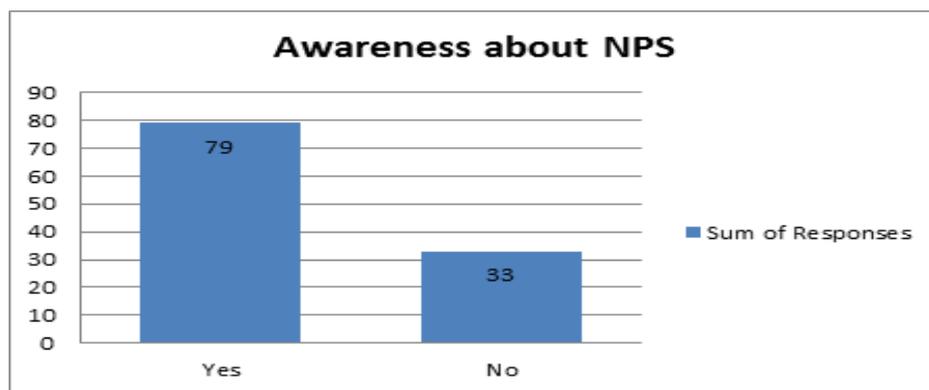
For the purpose of this study, we have chosen 100 investor participants randomly from Mumbai who have put their investment either into National Pension Scheme or any other schemes. This study is fundamentally descriptive in nature and the whole study has been led based on both primary and secondary sources.

Primary Data: Primary information is collected through Questionnaire survey method and 100 members were taken as samples from Mumbai city. For the gathering data, a questionnaire was prepared considering the objectives of research.

Secondary Data: The secondary data collected is mainly from the articles, journals, websites, research reports and already conducted survey analysis, various other sources given below as references

##### Awareness about National Pension Scheme

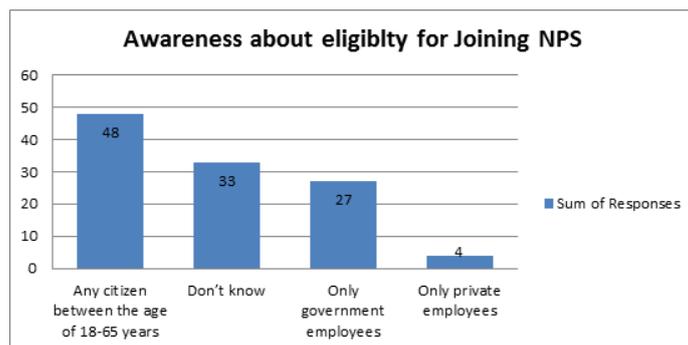
Yes	79
No	33
Total	112



Out of 112 respondents 79 have said that they are aware about National Pension Scheme and 33 respondents are not aware about this scheme. From above analysis we can say that 71% of respondents are aware about National Pension Scheme.

##### Awareness about eligibility for Joining NPS

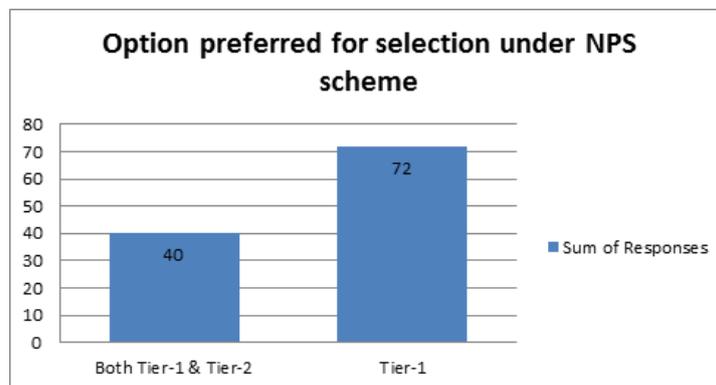
Choices	Responses
Any citizen between the age of 18-65 years	48
Don't know	33
Only government employees	27
Only private employees	4
Grand Total	112



From 112 respondents, 48 respondents are correctly aware about the eligibility for joining NPS. Which is Only 42% of total respondents.

**Option preferred for selection under NPS scheme**

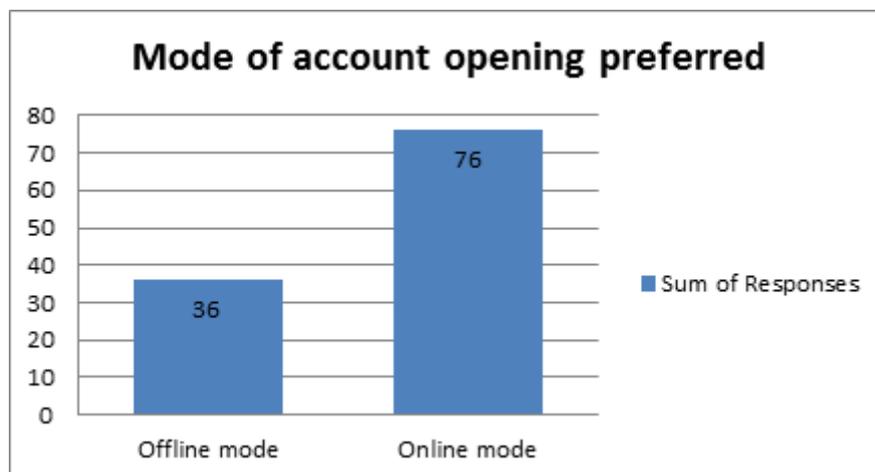
Both Tier-1 & Tier-2	40
Tier-1	72
Grand Total	112



Respondants were asked for their preference to opt for Tier 1 or both Tier 1 and Tier 2 option for their NPS account. The majority of the respondents ie. 72 person have preffered for Tier 1 option of account opening under NPS which is 64% of total respondents. Whereas 40 resportants preferred both Tier 1 & 2 option of account opening under NPS.

**Mode of account opening preferred for NPS account opening**

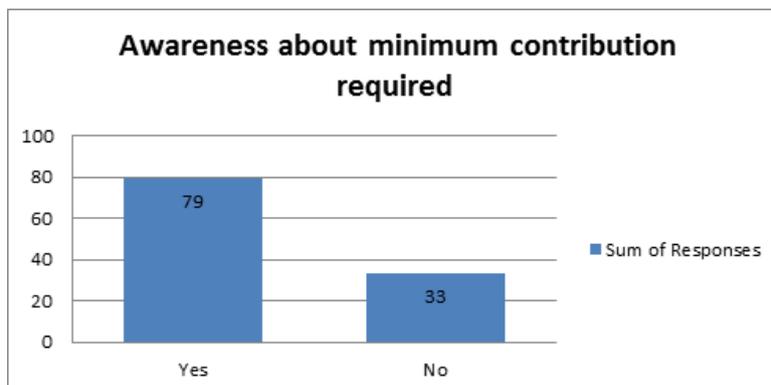
Particulars	Sum of Responses
Offline mode	36
Online mode	76
Grand Total	112



Above figure shows the proportion of respondents who preferred to opt for online or offline mode for opening their NPS account. The majority of the respondents i.e. 76 person have preferred for online mode of account opening under NPS which is 67% of total respondents. Whereas 36 respondents preferred offline mode of account opening under NPS.

**Awareness about minimum contribution required for opening NPS Account**

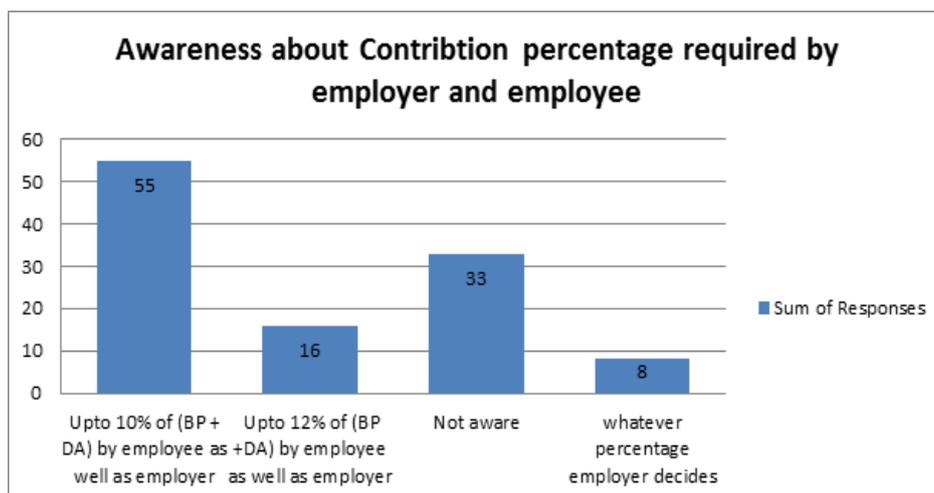
Yes	79
No	33
Grand Total	112



Study shows that 79 respondents out of 112 are aware about the minimum contribution required for opening NPS account which is approx 71% of total respondents.

**Awareness about Contribution percentage required by employer and employee**

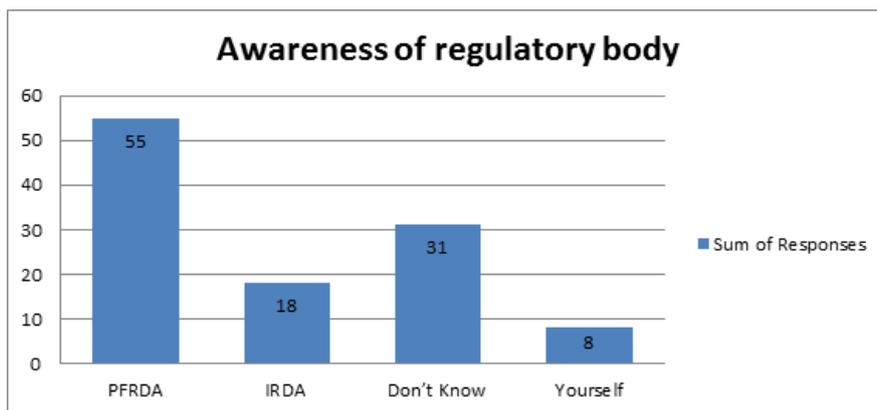
Particulars	Responses
Up to 10% of (BP + DA) by employee as well as employer	55
Up to 12% of (BP +DA) by employee as well as employer	16
Not aware	33
whatever percentage employer decides	8
Grand Total	112



Study shows 55 participants of total respondents were correct in selecting the contribution percentage. Whereas few were wrong, few agreed no contribution required and 33 respondents were not even aware about the same.

**Awareness of regulatory body who decides about contribution of subscriber to be invested**

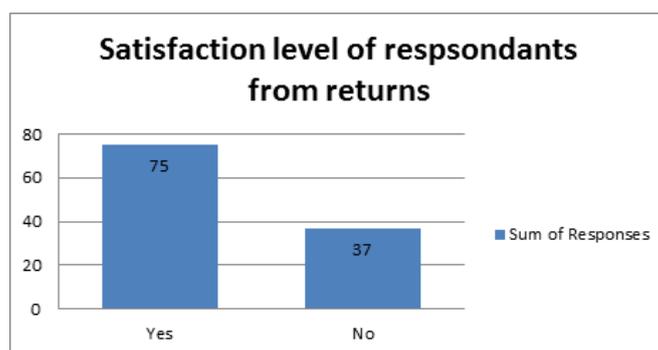
PFRDA (Pension Fund Regulatory and Development Authority)	55
IRDA (Insurance Regulatory and Development Authority)	18
Don't Know	31
Yourself	8
Grand Total	112



Study shows that 49% of total respondents knew which regulatory authority will decide where the contribution will be invested, whereas 27% were not aware of the same.

#### Satisfaction level of respondents from returns of NPS

Choices	Response
Yes	75
No	37
Total	112



From study we can conclude that 75 respondents are satisfied with the returns provided under NPS. Which is approx 67% of total respondents. Whereas only 37 respondents are not satisfied with the returns provided by National Pension Scheme.

## 6. SUGGESTIONS

### To the Investor

- Investors must do thorough study of all best available options of Investment keeping purpose of Investment in mind before deciding about any Investment
- NPS is one of the safest options for Investment
- Those who are looking for best retirement options can take up these plans
- Those who want tax saving for them also this is one of the best scheme with good returns

### To the Government

- More proportions of stimulus and motivation is needed to pull in more financial specialists
- The government should give least guaranteed benefits amount to the financial specialists. So that, more monetary experts will get captivated
- Government should take more measures to create awareness about National Pension Scheme among the citizens

### To the Company

- To grow incredible return in any occasion to meet out the seat mark, by then the monetary experts might stop their excess resources at the present time
- To decrease the cost/charges for impelling more monetary trained professionals

## 7. CONCLUSION

National pension scheme offers various benefits to the subscribers as it is the most minimal expense annuity scheme in the world with the further developed strategy of opening accounts from any place of the country through online mode. Applicants can in like manner pick his/her own endeavor decision and Pension Fund or pick up Auto choice decision to give indications of progress and needed returns. This scheme gives openness in venture guidelines as well. Another included piece of room of this scheme is that it provides tax reductions to the subscribers.

At last, this can be concluded after fundamental examination that people of Mumbai are well aware about the NPS of who all can join NPS, strategies for opening different accounts, aggregate amount, rate and regulatory position who contributes the responsibility of monetary experts further. Similarly, this can be said that larger piece of the respondents were content with the benefits which are given under the National Pension Scheme (NPS).

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## A Study of Behaviour Pattern of Dividend and Earnings of Some Selected Listed Companies in India

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### ABSTRACT

A listed company is company whose shares can be traded on a stock exchange. Listing also provides an exclusive privilege to securities in the stock exchange. It's only listed shares are quoted on the stock exchange. The Stock exchange facilitates transparency in transactions of listed securities in perfect equality and competitive conditions. Listing is not only beneficial to the company but also to the investor and to the public at large. The objective of this study is to calculate the three different measures of dividend policy of ten selected listed companies of India (Hindustan Unilever Ltd., Asian paints, Nestle India Ltd., Titan Company Ltd, Bajaj Auto Ltd., Britannia Industries Ltd., Wipro Ltd., Ultratech Cement Ltd., Cipla Ltd. and ICICI Prudential LIC) and observe the behaviour pattern of the three different measures of dividend policy of these companies.

Keywords: Earnings per share, Dividend per share, Dividend payout Ratio, Listed Companies

### INTRODUCTION

In the present scenario, wealth maximisation of shareholders is one of the important factor and all the decisions of firms are linked to it. Dividend policy forms an integral part of the firm's financial decision. The dividend payout ratio (DPR) is a source of financing and it also determines the amount of earnings that can be retained in the firm. At the same time, fewer amounts of rupees will be available for current dividend payments if a greater amount of current earnings is retained in the firm. Any firm faces a major challenge to determine the optimal allocation of profits between dividend payments and addition to the firm's retained earnings.

#### Earnings per share (EPS):

Earnings per share (EPS) describes a public company's profit per outstanding share of stock, which is calculated on a quarterly or annual basis. EPS is calculated by taking a company's quarterly or annual net income and thereby dividing by the number of its shares of stock outstanding. EPS is a basic yardstick of a company's profitability and is used to tell investors whether it is safe to invest in the company.

There are different ways earnings per share can be calculated. The below are two different versions of the earnings per share formula

- $EPS = (\text{Total Net Income} - \text{Preferred Dividends}) / \text{At end of the period Shares Outstanding}$
- $EPS = (\text{Net Income} - \text{Preferred Dividends}) / \text{Weighted Average of Shares Outstanding}$

#### Dividend per share (DPS):

Dividend per share (DPS) is the sum of declared dividends given by a company for every ordinary or equity share outstanding. This figure can be arrived by dividing the total dividends paid out by a business, over a period of time, which is usually a year, by the number of outstanding ordinary shares issued. It also includes interim dividends.

The formula for calculating dividend per share (DPS) has two following variations

- $\text{Dividend per Share} = \text{Total Dividends Paid} / \text{No. of Shares Outstanding}$
- $\text{Dividend per Share} = \text{Earnings per Share} \times \text{Dividend Payout Ratio}$

#### Dividend Payout Ratio (DPR)

DPR i.e. Dividend payout Ratio is the amount of dividends paid to the shareholders in comparison to the total amount of net income the company generates i.e. the dividend payout ratio measures the rate of percentage of net income that is available and distributed to shareholders in the way of dividends.

There following are the different formulas for calculating DPR

- $DPR = \text{Total dividends} / \text{Net total income}$
- $DPR = 1 - \text{Retention ratio}$  (the retention ratio, which measures the rate of percentage of net income that is kept by the company in the way of retained earnings, is the reverse, or inverse, of the dividend payout ratio)

- $DPR = \text{Dividends per share} / \text{Earnings per share}$

#### **IMPORTANCE:**

##### **Dividend per Share**

- Dividend per share (DPS) is an important financial ratio to understand the financial health and long-term growth prospects of a company.
- A steady or growing dividend payment by a company can be a signal of stability and growth.
- A decline in DPS may be due to debt reduction or reinvestment in a firm's operations, but may also indicate poor earnings and be a red flag for financial hardship.

##### **Earnings per Share**

- EPS helps to measure if investing in a company would help investors generate more income.
- A higher Earnings per Share indicates a profitable status of the company and this in turn, suggests that over a period of time the company may increase dividend payout.
- Similarly, with the help of EPS investors and other financial investors can determine a company's existing and anticipated stock value.
- EPS helps to measure a company's current financial position and also helps to track its past financial performances.

##### **Dividend per Share**

- The dividend payout ratio is the amount of dividends paid by the company to investors which is proportionate to the company's net income.
- The earnings are therefore heavily reinvested into the company to provide further expansion and growth and therefore Fast-growing companies usually report a comparatively low dividend payout ratio
- More mature companies that are Slower-growing have comparatively less scope for expanding their market share through large their capital expenditures. They usually report a high dividend payout ratio.
- Income-oriented investors most probably look for relatively high dividend payout ratios while choosing to invest in these companies.

#### **LITERATURE REVIEW**

Amidu and Abor (2006) studied and analysed 22 listed companies in Ghana that accounted for seventy six per cent of the listed companies covering a period of 6 years from 1998 to 2003. The main aim of the study was to analyse the factors which determine the dividend payout ratio. The study showed positive correlation between dividend payout ratio (DPR) and, profitability, cash flow and tax. Negative 29 correlations existed between DPR and risk, growth, market to-book value and institutional holdings.

Anil & Kapoor (2008) studied the dividend payout ratio of all the companies belonging to the CNX IT index of NSE in the Indian Information Technology sector over a period of 6 years from 2000 to 2006. They identified current and anticipated earnings, liquidity, risk, growth and corporate tax as the key factors influencing the dividend payout ratio. The study revealed that risk and liquidity were the most important determinants of dividend payout in the Indian Information Technology sector.

Ayan Majumdar (2013) focused on the examination of the dividend payout trends of the selected 87 companies from 9 industries from the Indian corporate sector. It analysed the assessment of the influence of various factors individually and jointly on the dividend policy of the selected companies and it covered a period of ten years from 1998-99 to 2007-08 for analysing the 35 dividend payout trends and identifying the factors which influence the dividend policy of the selected companies during the post liberalisation era. The study reveals that past years' profit and interest expenses of the selected companies made significant contribution towards enhancing their DPR.

Agila M (2021) studied Impact of Dividend Policy on Profitability and Share Price of NIFTY Companies which covered a period of 15 financial years from 2004-2005 to 2018-2019. Hence, a total of 34 companies (8 from Financial Sector, 5 from Automobile Sector, 8 from Energy Sector, 4 from Pharmaceutical Sector, 5 from Information Technology Sector, 4 from Metal Sector) were taken. Various Statistical methods were involved in planning, organizing, collecting, analysing and interpreting the data. The determinants contributing to dividend

policy identified from the study proved that the dividends disseminated highly influenced the dividend policies of financial, energy, IT and metal sectors.

Pinto, Geetanjali (2020) analysed Factors Influencing Dividend Payouts of Listed Indian Firms - 500 corporations registered with NSE were studied. The study considers the records for each corporation from 2006 – 2017 which were selected to evaluate the recent status of dividend policy for listed Indian firms. It uses both time-series and cross-sectional data, an empirical panel data model is developed for evaluating the aspects affecting dividends. It was observed that bulk of the theories on dividends that are typically grounded on the advanced economies are pertinent to emergent market nations such as India. This inference is derived because the majority of the aspects reported as crucial for influencing dividends of Indian companies are the same as those recognized in advanced countries.

### OBJECTIVES OF THE STUDY

- 1) To understand and calculate the three measures of dividend policy of ten selected listed companies of India
- 2) To analyse the behavioural pattern of the dividend policy adopted by the ten selected listed companies of India

### RESEARCH METHODOLOGY

The study has been conducted purely based upon secondary data collected from various sources such as book, websites of BSE, SEBI, journals, etc. In order to analyse the above objectives, this study has taken up a period of 2015 to 2021.

### LIMITATIONS OF THE STUDY

- The study is purely based on the secondary data and is restricted to behavioural pattern of the dividend policy adopted by the ten selected listed companies of India.
- The limited tools have been used in the study.

### FINDINGS AND DISCUSSIONS

The dividend payout ratio is an important financial metric used to determine the sustainability of dividend payment program of the company. It is the amount of dividends paid to shareholders compared to the total net income of a company.

**Table No. 1:** Eps –Earnings Per Share

	Hindustan Unilever Ltd.	Asian paints	Nestle India ltd	Titan Company Ltd	Bajaj Auto Ltd.	Britania Industries Ltd.	Wipro Ltd.	Ultratech Cement Ltd.	Cipla Ltd.	ICICI Prudential LIC
2015-16	19.12	16.65	58.42	7.95	135.80	62.44	33.38	86.37	18.21	11.54
2016-17	20.75	18.78	96.10	8.58	132.30	70.31	33.61	95.74	12.13	11.73
2017-18	24.20	19.75	127.07	13.10	140.60	78.46	16.26	81.27	18.25	11.28
2018-19	27.89	22.23	166.67	15.48	161.60	46.71	12.67	84.33	23.45	7.95
2019-20	31.31	27.67	204.28	17.09	176.30	61.75	14.88	189.15	28.76	7.44
SUM	123.27	105.08	652.54	62.2	746.6	319.67	110.8	536.86	100.8	49.94
Mean	24.654	21.016	130.508	12.44	149.32	63.934	22.16	107.372	20.16	9.988
Max	31.31	27.67	204.28	17.09	176.3	78.46	33.61	189.15	28.76	11.73
Min	19.12	16.65	58.42	7.95	132.3	46.71	12.67	81.27	12.13	7.44
Range	12.19	11.02	145.86	9.14	44	31.75	20.94	107.88	16.63	4.29
SD	4.4910	3.7793	51.2687	3.6431	16.8951	10.5387	9.325	41.1735	5.5985	1.8846
C.V	18.2162	17.9828	39.2839	29.2850	11.3147	16.4838	42.0843	38.3466	27.7703	18.8685

**Source:** Calculated from the respective listed company's website

Table 1 EPS is showing Earnings per Share (EPS) of the 10 selected listed companies in India. Total highest EPS in 5 years was achieved by Bajaj Auto Ltd (Rs. 746.60) and the total lowest EPS in 5 years was paid by ICICI Prudential (Rs. 49.94).

Average highest earning per share in five years was paid by Bajaj Auto Ltd. (Rs. 149.32) and the average lowest EPS in five years was paid by ICICI Prudential (Rs. 9.988). Standard deviation of EPS was highest for Nestle India Ltd. (51.2687) and the lowest for ICICI Prudential (1.8846).

Variation in EPS is more as compared to other companies in Wipro Ltd (C.V.42.0843) and the most consistent EPS is given by Bajaj Auto Ltd. (C. V. 11.3147). Range is highest in Nestle India Ltd. (145.86) and the lowest in ICICI Prudential (Rs. 4.29).

**Table No. 2: Dps – Dividend Per Share**

Year	Hindustan Unilever Ltd.	Asian paints	Nestle India Ltd	Titan Company Ltd	Bajaj Auto Ltd.	Britannia Industries Ltd.	Wipro Ltd.	Ultratech Cement Ltd.	Cipla Ltd.	ICICI Prudential LIC
2015-16	16.00	7.50	48.50	2.20	55.00	20.00	6.00	9.50	2.00	8.40
2016-17	17.00	10.30	63.00	2.60	55.00	22.00	2.00	10.00	2.00	5.25
2017-18	20.00	8.70	86.00	3.75	60.00	25.00	1.00	10.50	3.00	7.80
2018-19	22.00	10.50	115.00	5.00	60.00	15.00	1.00	11.50	3.00	3.15
2019-20	34.50	12.00	342.00	4.00	120.00	35.00	1.00	13.00	4.00	0.80
SUM	109.5	49	654.5	17.55	350	117	11	54.5	14	25.4
Mean	21.9	9.8	130.9	3.51	70	23.4	2.2	10.9	2.8	5.08
Max	34.5	12	342	5	120	35	6	13	4	8.4
Min	16	7.5	48.5	2.2	55	15	1	9.5	2	0.8
Range	18.5	4.5	293.5	2.8	65	20	5	3.5	2	7.6
SD	6.6513	1.5544	107.9187	1.0062	25.0998	6.6513	1.9391	1.2409	0.7483	2.8458
C.V	30.3713	15.8607	82.4436	28.6661	35.8569	28.4244	88.1396	11.3850	26.7261	56.0197

**Source:** Calculated from the respective listed company's website

Table 2 DPS is showing Dividend per Share (DPS) of the above 10 selected listed companies in India. Total highest DPS in 5 years was paid by Nestle India Ltd. (Rs. 654.50) and the total lowest DPS in 5 years was paid by Wipro Ltd (Rs. 11.00).

Average highest dividend per share in last five years was paid by Nestle India Ltd. (Rs. 130.90) and the average lowest DPS in five years was paid by Wipro Ltd (Rs. 2.20). Standard deviation of DPS was highest for Nestle India Ltd. (107.92) and the lowest for Cipla Ltd. (0.75).

Variation in DPS is more as compared to other companies in Wipro Ltd (C.V. 88.14) and the most consistent DPS is given by Ultratech Cement Ltd. (C. V. 11.39). Range is highest in Nestle India Ltd. (293.50) and the lowest in Cipla Ltd. (2.00).

**Table No. 3: Dpr – Dividend Payout Ratio**

	Hindustan Unilever Ltd.	Asian paints	Nestle India Ltd	Titan Company Ltd	Bajaj Auto Ltd.	Britannia Industries Ltd.	Wipro Ltd.	Ultratech Cement Ltd.	Cipla Ltd.	ICICI Prudential LIC
2015-16	81.07	45.03	83.01	27.67	73.63	32.03	43.49	12.37	12.37	72.77
2016-17	79.53	42.32	65.55	0.00	3.77	28.44	10.75	9.92	16.50	32.82

2017-18	74.39	52.14	67.67	19.84	39.12	27.86	7.05	12.30	10.95	61.14
2018-19	75.31	40.03	67.80	24.22	37.13	26.74	7.16	14.40	12.79	61.66
2019-20	77.11	65.59	149.88	29.24	102.12	28.44	7.93	6.97	24.34	31.57
SUM	387.41	245.11	433.91	100.97	255.77	143.51	76.38	55.96	76.95	259.96
Mean	77.482	49.022	86.782	20.194	51.154	28.702	15.276	11.192	15.39	51.992
Max	81.07	65.59	149.88	29.24	102.12	32.03	43.49	14.4	24.34	72.77
Min	74.39	40.03	65.55	0	3.77	26.74	7.05	6.97	10.95	31.57
Range	6.68	25.56	84.33	29.24	98.35	5.29	36.44	7.43	13.39	41.2
SD	2.5094	9.2296	32.1619	10.6005	33.732 6	1.7760	14.170 5	2.5436	4.8359	16.6943
C.V	3.2386	18.827 5	37.0607	52.4932	65.943 2	6.1878	92.763 1	22.7271	31.422 2	32.1094

**Source:** Calculated from the respective listed company's website

Table 3 DPS is showing Dividend Payout Ratio (DPR) of the above 10 selected listed companies in India.

Average highest Dividend Payout Ratio in last five years was paid by Nestle India Ltd. (Rs. 86.78) and the average lowest Dividend Payout Ratio (DPR) in five years was paid by Ultratech Cement Ltd. (Rs. 11.19). Standard deviation of DPR was highest for Bajaj Auto Ltd. (33.73) and the lowest for Britannia Industries Ltd. (1.78).

Variation in DPR is more as compared to other companies as coefficient of variation (CV) is more in Wipro Ltd (C.V. 92.76) and the most consistent DPS is given by Hindustan Unilever Ltd. (CV 3.24). Range is highest in Nestle India Ltd. (84.33) and the lowest in Britannia Industries Ltd. (5.29).

## CONCLUSION

It may be therefore from the above finding be concluded that the highest dividend per share is paid by the company- Nestle India Ltd. And thus the study of mean, range, standard deviation, co-efficient of variation and the maximum and minimum value of Hindustan Unilever Ltd., Asian paints, Nestle India ltd., Titan Company Ltd, Bajaj Auto Ltd., Britannia Industries Ltd., Wipro Ltd., Ultratech Cement Ltd., Cipla Ltd. and ICICI Prudential LIC of the data has helped to analyse and draw the conclusion. Bajaj Auto Ltd. has the highest of EPS and Nestle India ltd. has good DPS and DPR. The Earnings per share of Nestle India ltd. is also good. So from this we can conclude that Nestle India ltd. has given good returns to its shareholders.

Therefore the dividend payout ratio is not intended to assess whether a company is a good company or bad company investment. Instead it is used to help investors identify the type of returns i.e. – dividend income vs. capital gains – a company is more likely to offer to the investor. Looking back through a company's historical DPR helps investors determine whether or not the company's likely returns on investment are a good match for the investor's returns, portfolio, risk tolerance and investment goals.

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## Data Mining In Management Information System: Methods and Applications

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### ABSTRACT

Data mining (DM) is a powerful instrument in management information system (MIS). DM through formal information processing becomes intelligent tool that can help to accumulate and process data and make use of it to extract and verify patterns from large databases resulting in the knowledge discovery which helps in taking up organizational decisions. DM can apply various methods and use different applications. This paper traces these methods and applications of DM. It was found that data mining(DM) methods can be categorized based on various criteria such as the knowledge to mined and on the data-mining applications and their purposes. For the types of knowledge mined, summarization, clustering, Partitioning, association, classification are the DM major used methods. About data-mining applications to achieve descriptive/predictive data mining tasks, seven categories of DM applications are observed including engineering design, manufacturing systems, decision support systems, shop floor control and layout, fault detection and quality improvement, preventive maintenance, and customer-management relationship.

### INTRODUCTION

For the section of "Data Mining", Wikipedia, expressed: "Information mining is the most common way of finding designs in huge informational indexes including strategies at the convergence of AI, measurements, and data set frameworks. Data mining is an interdisciplinary subfield of software engineering and measurements with a general objective to extricate data (with wise strategies) from an informational collection and change the data into a fathomable design for additional utilization. Data mining is the examination step of the information revelation in data sets process". Wikipedia.

Data mining, in fact, is identified with Artificial Intelligence, design acknowledgment, factual, and data set networks. Nonetheless, DM is utilized to connect numerous specialized regions, including information bases, insights, AI, and human-PC association. This it has been created as a subject of data set applications that in succession identified with data set administration and to data frameworks field, there exists a hole between the Data mining and data frameworks networks.

DM is incredible instruments for authoritative critical thinking in management information system (MIS). DM through proper data handling becomes astute devices that can assist with aggregating and interaction information and utilize it. Hammawa, M. B. what's more Sampson, G. (2011). The course of DM is utilized to remove and check designs from huge information bases bringing about the information disclosure which help in taking up hierarchical choices.

### DATA MINING METHODS

Data mining methods can be sorted dependent on different measures. As per Köksal, G., Batmaz, I., and Testik, M. C. (2011), DM can be ordered by the kinds of information mined like outline, bunching, Partitioning, affiliation, characterization, etc for accomplishing elucidating/prescient data mining undertakings.

#### 1. SUMMARISATION

It is the introduction of general qualities of an informational index. Fundamental methodologies are OLAP and quality situated enlistment. There are various factual techniques accessible for information synopsis. Clear insights and graphical showcases can viably depict univariate information. For bivariate information, extra techniques (for example correlation analysis (CA), disperse plots) can be utilized to decide the relationship that might exist between the factors. For portraying multivariate information, notwithstanding, reliance and affiliation gauges just as multidimensional charts, for example, disperse plot lattice and Andrews bends are required.

#### 2. CLUSTERING

It is the most common way of collection information into classes of comparative items. The comparability among objects is typically estimated by distance measures. Significant distance-based clustering strategies can be coordinated in two classifications.

#### 3. PARTITIONING

This technique orders the information into k parts so that perceptions in each part are firmly identified with one another. Various leveled techniques bunch the information into a tree of clusters by either utilizing base up

(agglomerative) or hierarchical (divisive) approaches. Moreover, there are others classified as density-based, grid-based and model-based methods.

#### **4. ASSOCIATION**

This strategy attempts to recognize gatherings of things that happen together. Expecting that an information base comprises of a bunch of records which contains a bunch of things, most calculations achieve the affiliation task in two stages: observing successive thing sets, and afterward creating intriguing assuming principles. Köksal, G., Batmaz, I., and Testik, M. C. (2011)

##### **Data Mining Applications Relevant to Manufacturing**

The utilization of data mining procedures in assembling started during the 1990s and it has continuously advanced by getting consideration from the creation local area. Harding, J. A., Shahbaz, M., and Kusiak, A. (2006). Data mining is presently utilized in various regions in assembling designing to separate information for use in prescient upkeep, shortcoming discovery, plan, creation, quality affirmation, booking, and choice emotionally supportive networks. Information can be dissected to distinguish stowed away examples in the boundaries that control fabricating processes or to decide and work on the nature of items. A significant benefit of Data mining is that the necessary information for examination can be gathered during the ordinary activities of the assembling system being considered and it is subsequently commonly not important to present devoted cycles for information assortment. Since the significance of data mining in assembling has unmistakably expanded throughout the most recent 20 years, it is presently proper to fundamentally audit its set of experiences and application.

Harding, J. A., Shahbaz, M., and Kusiak, A. (2006) have assessed the commitments of analysts and professionals in various spaces of assembling from the last part of the 1980s to 2006. The writing was looked through widely in changed diaries, individual website pages, web and citeseers sites. Their survey is especially centered around data mining applications and contextual analyses in assembling and firmly related fields. In the accompanying, there is a record for the utilization of data mining , its turn of events and execution in the specific spaces of Manufacturing:

##### **i) Engineering Design.**

Engineering design is a multidisciplinary, multidimensional, and non-linear decision-making process where parameters, activities, and parts are chosen. The significance of thinking about how as an item ought to be produced during the plan stage and the requirements forced on plan by specific assembling cycles and advancements have been acknowledged for a long time. There is for sure incredible potential for data mined information to incorporate assembling, item attributes, and the designing plan processes.

##### **ii) Manufacturing Systems:**

Information assortment in assembling is normal however its utilization will in general be restricted to rather couple of uses.

AI and computational knowledge apparatuses give great potential to more readily control of assembling frameworks, particularly in complex assembling conditions where discovery of the reasons for issues is difficult.

##### **iii) Decision Support Systems:**

Information is the most significant resource of an association. Choices are made dependent on a blend of judgment and information from different spaces. Choice help, information the board, and handling are associated exercises in numerous associations. Preferably, all important information (, for example, Data Mining applications identified with Decision Support Systems) ought to be accessible prior to settling on a choice. The information extricated from data sets (prescriptive information mining) can be incorporated with existing master frameworks.

##### **iv) Shop Floor Control and Layout.**

Information is the most significant resource of an association. Choices are made dependent on a blend of judgment and information from different spaces. Choice help, information the board, and handling are associated exercises in numerous associations. Preferably, all important information (, for example, Data Mining applications identified with Decision Support Systems) ought to be accessible prior to settling on a choice. The information extricated from data sets (prescriptive information mining) can be incorporated with existing master frameworks.

**v) Fault Detection and Quality Improvement.**

Issue analysis is a region that has seen the absolute most punctual uses of data mining. A typical and natural way to deal with critical thinking is to inspect what has occurred in the past to all the more likely comprehend the cycle, then, at that point, anticipate and further develop the future framework execution. Thus, the errors rates in assembling are generally utilized for information obtaining to help the quality control engineers. Data mining can help in distinguishing the examples that lead toward likely disappointment of assembling gear.

This technique helps in distinguishing the blemished items as well as all the while decide the huge variables that impact the achievement or disappointment of the cycle. The information in this manner created via looking through huge data sets can be incorporated with the current information based frameworks to upgrade process execution and item improvement.

**vi) Data Mining in Maintenance**

Preventive maintenance is of key significance in cycle and assembling designing. Data sets containing the occasions of disappointment of the machines and the conduct of the pertinent hardware at the hour of the disappointment can be utilized in the plan of the maintenance management systems.

**vii) Customer Relationship Management.**

The promoting model has moved from item centered to client centered. Client Relationship Management is worried about expanding the worth of cooperation with clients and amplifying the benefit. In this serious and worldwide business climate, the use of information mining in Customer Relationship Management identified with assembling industry has drawn in research interest. Client Relationship Management is pretty much as significant as delivering superior grade and minimal expense items and is correlative to request the board which might be characterized as a bunch of practices pointed toward overseeing and organizing an interest chain, beginning from the end client and working in reverse to natural substance and providers. To gather suitable data, client request information are gathered and dissected and afterward the item configuration highlights are changed to satisfy the client's needs. Essentially, in help businesses, information from clients is the main wellspring of information about their fulfillment with the item. Harding, J. A., Shahbaz, M., and Kusiak, A. (2006).

**CONCLUSION**

In conclusion DM set of processes can achieve their aims through different methods and applications. The methods of DM, based on the knowledge to be mined, are summarization, clustering, Partitioning, association, classification. The literature and studies on DM in the field of MIS observed different data-mining applications such as engineering design, manufacturing systems, decision support systems, shop floor control and layout, fault detection and quality improvement, preventive maintenance, and customer-management relationship.

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## The Success Factors of Management Information Systems: A Review

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### ABSTRACT

Success factors contribute significantly to management information system (MIS). The concept of success factors in the MIS literature and studies literature is well established for numerous contexts where it has been attempted to generate lists of success factors, each list varies in its scope and purpose covering requirements analysis, MIS planning and project management to mention only some. However, lacking a comprehensive list makes it difficult not only for managers but also for researchers to evaluate projects based on these relevant factors. Thus, this review paper aims to identify and classify the major success factors which influence MIS success.

### Introduction to the Success Factors of Management Information Systems:

"The importance of achievement depends upon the viewpoint of the person who portrays it. It turned out to be clear almost immediately in the exploration that individuals frequently mean various things when discussing data frameworks" Moohebat, M. R., Asemi, A., and Jazi, M. D. (2010:100).

The achievement factors characterize the vital spaces of execution that are fundamental for the association to achieve its objectives. Supervisors ought to certainly know and consider these key regions when they put forward objectives and as they direct functional exercises and undertakings that are critical to accomplishing objectives. Nonetheless, when these vital spaces of execution are made unequivocal, they give a typical perspective for the whole association. In this way, any movement or drive that the association embraces should guarantee reliably superior execution in these key regions; if not, the association will be unable to accomplish its objectives and thus might neglect to achieve its objectives. Caralli, R. A., et al. (2004)

It is hard to characterize the achievement factors. "Crucial accomplishment components can be viewed as composed models that help with extending the goals of interest improvement, and whose effect is out and out more extravagant at whatever point saw inside the setting of their significance in each phase of the execution cycle. Somers, T. M., and Nelson, K. (2001:2)

"Fundamental achievement variables can be seen as coordinated models that assistance with extending the limitations of cooperation improvement, and whose impact is considerably more limit whenever saw inside the setting of their importance in each period of the execution cycle. Somers, T. M., and Nelson, K. (2001:2)

There are numerous meanings of a basic achievement factor at the essential arranging level. Caralli, R. A., et al. (2004) have summed up the meanings of basic achievement factor given by Bullen, C. V., and Rockart, J. F. (1981) as:

- "Key area of improvement in which positive outcomes are totally indispensable to appear at targets.
- key regions where things should go appropriate for the business to prosper
- "factors" that are "basic" to the "achievement" of the association
- Key area of exercises that ought to get steady and cautious thought from the board.
- A somewhat modest number of genuinely significant issues on which an administrator should concentrate consideration." Caralli, R. A., et al. (2004:11-12)

### Critical Success Factors as a method

The achievement component might be considered a strategy utilized for recognizing the significant components of accomplishment. "It was at first advanced to change information headway assembling with the significant course of an affiliation". Caralli, R. A., et al. (2004:xi)

The Success Factors methods have been used in many ways in management field. Below are some of the most important uses:

- i. Identifying the vital worries of senior administration
- ii. Assisting in the advancement of vital plans

- iii. Identifying the key center regions in each phase of an undertaking life cycle and the significant reasons for project disappointment
- iv. Evaluating the dependability of a data framework
- v. Identifying the business dangers and openings
- vi. Measuring the efficiency of individuals.

#### **Factors Contributing to Success**

There are certain factors that might face any organization when implementing any MIS system, as solutions to such issues. According to Al-Shargabi, B., & Sabri, O. (2015), the list of key factors that will lead to a successful implementation for MIS systems in the organization:

1. Specialized attributes of MIS frameworks.
2. Client association of the association
3. MIS framework support
4. The MIS execution project group, their collaboration, along with coordination and participation in the task group.
5. The organization should have key preparation to be reflected in execution of MIS frameworks.
6. After the execution of MIS frameworks in the association, the frameworks should be tried appropriately prior to sending such frameworks.

#### **Success factors and MIS**

MIS is "the study of data frameworks zeroing in on their utilization in business and the board". Laudon, K. C., and Laudon, J. P. (2011:G-7). MIS is exceptionally significant to utilize and to study. "What makes the board data frameworks the most thrilling theme in business is the persistent change in innovation, the executives utilization of the innovation, and the effect on business achievement". Laudon, K. C., and Laudon, J. P. (2011:6)

- i. **IT Innovations.** A proceeding with stream of data innovation advancements is changing the conventional business world. Distributed computing, the development of a versatile advanced business stage dependent on cell phones and tablet PCs, large information, business examination, and the utilization of interpersonal organizations by directors to accomplish business destinations are some significant models in the new developments.
- ii. **New Business Models.** The arising new models of business have come up because of the new advancements in innovation and a resulting of utilizing the board data frameworks. The internet based video administrations like Netflix for web based, Apple iTunes, Amazon, are instances of the new models of business.
- iii. **E-commerce Expanding.** E-commerce is changing how firms configuration, produce, and convey their items and administrations. Internet business has rehashed itself once more, disturbing the customary showcasing and promoting industry and placing significant media and content firms in danger. Facebook and other long range interpersonal communication destinations like YouTube, Twitter, and Tumblr alongside Netflix, Apple Beats music administration, and numerous different media firms represent the new essence of internet business in the twenty-first century.
- iv. **Management Changes.** The management of business firms has changed: With new versatile cell phones, rapid remote Wi-Fi organizations, and tablets, far off salesmen out and about are just seconds from their supervisors' inquiries and oversight. Business is going portable, alongside buyers. Supervisors moving are in immediate, persistent contact with their workers. The development of big business wide data frameworks with exceptionally rich information implies that directors presently don't work dazed of disarray however rather have on the web, almost moment admittance to the truly significant data they need for precise and convenient choices. Notwithstanding their public uses on the web, wikis and websites are becoming significant corporate instruments for correspondence, cooperation, and data sharing.
- v. **Changes in Firms and Organizations.** Contrasted with modern associations of the earlier century, new quickly developing twenty-first-century business firms put less accentuation on chain of command and construction and more accentuation on workers. Laudon, K. C., and Laudon, J. P. (2011)

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**The List of success factors affecting the IT and MIS acquisition:**

A cautious investigation of writing and studies on the achievement factors influencing the IT and Information framework the board obtaining noticed 43 achievement factors bunching around 6 measures. Beforehand, Jawad, Ali Qasim (1996:22) expressed "none of the exploration endeavored to recognize a thorough rundown of elements of progress. The best number of elements found in one paper was 9."

**The success factors can be classified into the following 6 measuring categories:**

**1- Technological:** includes those factors which concern purely technical matters related to hardware and software:

- i. Use of current innovation
- ii. Use of demonstrated innovation
- iii. Ease of utilization
- iv. Enhancability of the framework
- v. Open framework interconnection
- vi. Off-the rack programming
- vii. Existence of IT standers

**2- Organizational:** includes those factors which relate to the management structure of an organization and its resources.

- i. Internal correspondence
- ii. Indigenous innovative work abilities
- iii. Previous IT experience
- iv. Sufficiency of monetary assets
- v. Indigenous ability level
- vi. Clarify of business goals
- vii. Existence of Information Technology technique
- viii. Existence of Information System technique
- ix. Organizational structure
- x. Presence of Information Technology champion

**3- Management:** includes those factors concerning all aspects of management of the IT projects.

- i. User association
- ii. Top the executives support
- iii. Realistic project objective
- iv. Feasibility study
- v. Piloting the task
- vi. Appointment of a task director
- vii. Use of task the executives system
- viii. Accurate proclamation of prerequisites
- ix. Stable client prerequisite
- x. Sufficient time for consummation
- xi. Considering stowed away expenses
- xii. Supplier examination

- xiii. Provision of client preparing
- xiv. Provision of specialized preparing
- xv. Exhaustive agreement terms

**4- Human:** includes those factors relating to the experience and ability of individuals at all levels:

- i. Top the board IT mindfulness
- ii. IT administrators business understanding
- iii. IT staff specialized abilities
- iv. User development
- v. User acknowledgment

**5- External:** includes those factors which are outside the acquiring organization, such as suppliers, consultants, and general regulations.

- i. Client provider relationship
- ii. Supplier capability
- iii. Use of autonomous specialist
- iv. Flexibility of general guidelines

**6- Data:** includes those factors which concern the availability and validity of data which is put to the system.

- i. Data availability
- ii. Data validity.

## CONCLUSION

The reviewed literature and studies on the success factors affecting the IT and MIT acquisition have revealed a comprehensive list of factors of success which is a very helpful to researchers who are interested in evaluating the impact of success factors on the field of management. The scheme used to classify the success factors explain the interaction between factors clustering around their measures. The list given above may be used in questionnaires, structured interviews and designing frameworks for studies outlines.

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## **Views of Dr. B.R. Ambedkar on Law and Justice for the Empowerment of Women and Weaker Section in India - An Analysis**

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### **ABSTRACT**

Bharatha Ratna Dr. Bheem Rao Ramji Ambedkar is a great son of India known for his hard work, patience, tolerance peace and sincerity throughout his life. His birthday, the 14<sup>th</sup> of April every year is celebrated as 'Knowledge Day' as declared by the United Nations Organization (UNESCO). Thanks to the NDA government at Centre for issuing a notification for celebration of the day of adaption of our Constitution, the 26<sup>th</sup> November as 'Constitution Day' to remember Dr. B.R. Ambedkar contribution for drafting our Indian Constitution.

Dr. B.R. Ambedkar contribution for empowerment of women and weaker sections is ever remembered in history of our democratic India. He has put all his efforts for convincing great men and women intellectuals in Constituent Assembly for framing the Constitution. As a result, the affirmative action, non-discrimination provisions and provisions for ensuring socio-economic and political justice for all eligible men and women in our great nation got guaranteed by the Constitution. The author of this article discuss Constitutional Provisions, the Hindu Code Bill and other laws along with debates of constituent assembly in the matter of empowerment of women and weaker section and finally the message given to women by Dr. B.R. Ambedkar.

Keywords: Constitution, Women, Weaker section, Empowerment, Law and Justice

### **INTRODUCTION**

There has been a constant transformation for overall progress of men and women belonging to weaker section through the process of awareness, sensitization, for empowerment in ensuring socio-economic and political justice. A very pertinent and relevant question arises in mind of the author and many readers in society has to what is meant by justice? The word Justice is a most complex and hidden with many things. The term justice is not defined but rather described. Therefore, the concept of justice forms anything and everything for guarantying the same.

A great philosopher and scholar of Harvard University, U.K elaborated the concept of justice in his book published in 1971, according to him the first principle of Justice means "all the freedoms of claims is equal for all the people in society". The second principle of Justice is divided into two parts the first part is "originally the people will tolerate inequalities if the jobs that they do pay them more assigned unfairly". The second part of principle of Justice is "difference principle" is "nether freedom nor opportunity is governed by the difference principle".

In order to make common man understand about the concept of Justice, the author of this article submits that, Justice is of two kinds namely, Distributive Justice and Corrective Justice. Distributive Justice means and signified that as much as practicable and possible the Justice should be delivered equally in society. Whereas Corrective Justice means and signifies that whenever and wherever any wrongs are done due to violation of basic and legal rights such wrongs to be corrected and justice should be ensured. In this regard, the author likes to remind an interesting quote made by a Judge who said "Justice should not only be done but should manifestly and undoubtedly beseem to be done".

Dr. B.R. Ambedkar concept of justice is quiet more interesting. He says that there is a strong belief in society that, Reason and religion will remove social injustice, however he further says that there is vested interest in Hindus for want of social superiority and economic exploitation when weaker section conflicts with this vested interest reasoning fails to give social and economic justice. According to Dr. B.R. Ambedkar reason means what is good and what is bad. In simple sense, the concept of justice is that which is of religion and reasoning by man in society.

According to Ambedkar there is a belief that the moral insight in man are planted by religion therefore man feel sinfulness when he does against the moral insight as mandate by religion, further he says Nobody can deny that this is the function of religion and to some extent religion may succeed in this mission. But here again there are limits to what religion can do. Religion can help to produce justice within community. Religion cannot produce justice between communities. For example, religion has failed to produce justice between Negroes and whites

in the United States. It has failed to provide justice between the Germans and French and amongst other nations. The call of nation and the call of community has proved more powerful than the call of religion for justice.

The preamble of our Constitution reflects the spirit of Justice in the form of socio-economic and political justice for the people of India. However due to the tireless effort and power of expression, tolerance and patience, Dr. B.R. Ambedkar was successful in providing justice for all but then subject to some exceptions as mentioned in Article 15 and Article 16 of our constitution for Backward class or SC/ST communities. In the matter of education and employment for women and the persons who are socially and educationally backward in the society.

The author provided yet another example of recent times in the United States of America during the year 2020, George Floyd belonging to Asia African race was nailed for 7 minutes on his neck by the police and brutally crumpled to death again after some days a lawyer by named Robert luke was also subject to police brutality while he was in custody. These instances only says to explain even in the modern era of advanced technology and advanced media these instances occurred. The occurrence of incidents of police brutality over the back American (Nigroes) received worldwide attention and there were protest in USA and other countries in the world against racial injustice. Such type of incidents upon women and men of low caste and poor are also subject to police torture while in custody in India too.

**1. Debates of constituent assembly on draft Article 10 (Present Article 16) and draft Article 9 (Present Article 15) pertaining empowerment of women and backward classes or the Schedule Caste and Schedule Tribe.**

Basically the present article 16 of our Constitution provide for equality of opportunity in public employment. By virtue of the article there shall be equality of opportunity for all the citizens of our country in the matter relating to employment or appointment to any office under the state. Therefore, as a result the said article provide there shall be no discrimination on the grounds of caste, decent, place of birth, race, religion, residence and sex or any of them be ineligible for or discriminated against in respect of any employment or office under the state. As far as afore portion of the article is concerned there was no much debate except on using of some terms, however there were heated debates on the other portion of the draft article 10 (present article 16) in regards to providing exceptions for citizens in relation to matter of employment or appointment to any office under the state. Mainly for providing reservation of appointment or posts in favour of any backward classes of citizens wherein which in the opinion of the state is not adequately represented in the services under the state. The using of the word backward, the period for reservation, were more debated by the learned member of the constituent assembly. The debates that took place are mentioned as under.

One member Mr. Hirday Nath Kunzru wanted reservation for only period of 10 years from the date of commencement of the constitution by amending the word 'shall' in the draft article 10

Another learned member Mr. A.B. wanted to insert word educationally and economically backward class instead of backward in the draft article 10 of sub clause (3) of the draft constitution and also included the 'Gurkhas' belonging to Nepal since they are serving in our Indian Army, be covered within the word 'educationally and economically backward.

Another learned and experienced member of the constituent assembly Mr. T. Chinniah said that the word 'Backward' used in the draft constitution article 10 sub-clause (3) is not defined. He drew the attention of the assembly by narrating the understanding the meaning of the word backward by the north Indian and South Indian. He said North Indian understand that there are two groups namely the Hindus and Muslims. Whereas Hindus have peoples such as agriculturist and artisan who belong to backward class whereas in South Indian the backward are either socially backward or educationally backward. Therefore, he said that social and educationally backward class of citizens in South Indian should be adequately represented in the services (reservation in services under the state) and further he said that economically forward are disinterested to be part of backward class. In course of his debate Mr. T. Chinnaih wanted the reservation for 150 years from the date of commencement of the constitution.

Yet another illustrious member of the constituent assembly Mr. Dharam Prakash wanted reservation in public employment for religious and cultural groups of citizens. Further he wanted the clarification of the word backward class and argued for reservation for the same class in legislature.

Another member belonging to the minorities Sir Mohammad Ismail Khan said that in the province of madras the word backward class is defined by indicating them in a schedule where nearly 150 class of persons belong to

backward classes wherein which SC & ST do not find place in that list therefore Mr. Mohammad Ismail Khan wanted the clarification of word backward class used in the draft article 10 sub-clause (3) in the draft constitution. He urged strongly that the word backward class should include SC, ST, Muslim and Christian since there are not adequately represented for the services under the state. He said whenever people of such type (ST, ST etc.) are given reservation the dominate group comes to oppose on the grounds of communalism. Therefore, he said that to avoid this type of opposition to have harmony in society there must be reservation for backward classes inclusive of SC & ST. Further he also argued that there should be no time limit for providing reservation for the backward classes.

A most experienced learned senior member Mr. K. M. Munshi in course of his presentation in constituent assembly clarified the meaning of the word 'Backward class'. According to him there should not be any inch of misunderstanding or misapprehension and any confusion about the fact that the term backward class will not include SC/ST. He refers to the discussion that took place in "Fundamental Right Committee" and the "Minority Committee" on draft article 10 sub clause (3) and categorically made clear that there was no any doubt expressed by any member about word backward class since no member urged for exclusion of SC & ST from the term Backward Class. Therefore MR. K.M. Munshi said that there should not be any other meaning couched to backward class. Further he also refers to the draft article 296 which provide for 'maintenance of efficiency' in the services of the state while providing reservation for the backward class. He further said this draft article 296 (present article 335) in highly supported and accepted by the house and the other committee. Therefore, there should not be any doubt that the reservation for backward class is depended solely on maintenance of efficiency in the services of the state.

Another most experienced member Mr. T.T. Krishnamachari raised objection for using the word citizens in clause (2) and clause (4) of draft article 10 and the meaning to be clarified. While making his observation he referred to a most popular administrative law Prof. and Jurist Sri Ivor Jennings Vice-chancellor of the Ceylon University, who said part III of the Indian Constitution dealing with Fundamental Rights is a "Paradise for lawyers" since there are word which are loosely used for giving scope for interpretation by lawyers and particularly judges in the court while making decisions. Mr. T. T. Krishnamachari further argued that whether the word "citizen" includes literate or illiterates persons.

Finally doubt raised by T. T. Krishnamachari and others was clarified in his reply by Hon'ble Dr. B.R. Ambedkar in the constituent assembly. He strongly opposed Mr.T.T. Krishnamachari submission that our constitution is a paradise for lawyer according to Sir Ivor Jennings. Dr. B. R. Ambedkar said any country that as a constitution. Such as USA, Canada and other countries do have provisions that are bound to be interpreted legal and judicial therefore over constitution is not an exception. Addressing to the meaning of 'Backward Class' Dr. B. R. Ambedkar said that article 10 clause (1) is based on equality of opportunity which in turn has three principles to convey:

1. Equality of opportunity

2. There shall be reservations in favor of certain communities due to their non-representation 3. who have so far not entered into services under the state.

Further Dr. B.R Ambedkar said the using of the 'word 'backward class' is very appropriate due to the reason it can accommodate persons seeking reservation belonging to some communities, who are underrepresented or not represented at all under the services of the state directly on the ground of equality of opportunity.

The author of this article like to inform to the readers how clause (3) of draft article 10 and present Article 16 clause (4) is misconveyed or wrongly conveyed to the innocent masses of citizens such as students, teachers, workers, and common man by "So-called intellectuals" of high repute in our society. The author has personally corrected with patiently and peacefully such intellectuals who wrongly conveyed and misdirect the people in society on the aspect of namely the "Period of reservation".

Intellectuals wrongly conveyed that constitution of India in the present form puts a limitation on reservation for a maximum period of 10 years from the commencement of the constitution. According to the author the intellectual's version is wrong, incorrect and misdirecting. When one reads carefully clause (4) of article 16 reservation in relation to matter of employment and any office under the state is guaranty for the backward classes or SC and ST until they are "adequately represented in the services of the state" therefore the period of limitation has a restriction on the reservation is wrong and incorrect.

Thanks to our parliament for extending the benefit of political reservation of backward classes or SC and ST for 10 years from the year 2020 till year 2030. Further the author wish to submit that in the era of globalization, liberalization and privatization there has been a decrees in the area of public employment due to economic reasons therefore it would be appropriate for the government to generates debate and discussion amongst various private employers mainly in the organized sector for convincing them to adopt and follow the affirmative action's or reservations to the backward classes. Further the Government has to make skill educational program a success one to reach every unemployed by way of getting training for skills through the institutions established by the government. The author feels it would be appropriate to provide some incentives (Tax exemption and other benefits) for the private employers of organized sectors for providing reservation to the deserving trained and skilled citizens belonging to the backward classes.

After clarifying the meaning of the word 'Backward class' by Dr.B.R. Ambedkar and how the period of limitation for reservation is misconstrued and misconveyed to the masses as noted by the author.

The author now discusses the debates of constituent assembly in the matter of empowerment of women and weaker sections.

## **2. Debates of The Constituent Assembly on Draft Article 9 and Present Article 15 In The Constitution– On Prohibition of Discrimination on Various Grounds.**

Draft Article 9 of the constitution was debated in length by the members of the constituent assembly for bring out the true intent and content of the draft article 9. Few learned members moved there amendments for change of some words used in the article. The author here below mentions the debates as under.

Article 9 of the draft constitution provides for prohibition of discrimination of citizens on the grounds of caste, place of birth, race, religion, sex or any of them. The author of this article limits the discussion to extent of discrimination against women, SC / ST communities. sub-clause (a) of clause (1) of draft article 9 prohibit discriminations on the grounds of race, religion, caste, sex, place of birth or any of them be subject to disability, liability, restriction in regards to entry into shops, public restaurants, hotels etc. further sub clause (b) of the same article provide for access to tanks, wells, bathing ghats, public resorts etc.

One learned member Mr.Mohd. Tahir of the constituent assembly strongly argued that there should be some penal provisions for not providing entry into afore mentioned places (a) and (b) category. The penal provisions may be in form of punishment imposed according to law. He cited some of the bad practices in different parts of India. for example, people belonging to SC/ST community are not allowed into many places of public character. If any persons of this community goes on to draw water from the bore well, tanks etc. they will be attacked and circumed to death. In many temples in India SC/ST community are not allowed to enter. Further Mr. Tahir said he wanted the backward class (SC/ST) to entry into Dharamsalas and musafirkhanas.

Another learned member Mr. S. Nagappa wanted the clarification of the word 'Shop' used in sub-clause (a) of clause (1) of draft article 9, he wanted to clarify whether shop includes barber shop, washer man shop, etc. because according to him members of SC/ST are not allowed to barber shop etc. and also he meant the word 'Public Resort' may also include burial grounds.

The author respectfully submits that sub-clauses (a) and (b) of clause (1) of draft article 9 is a very secular provision in the constitution for the simple reason that the said provision prohibits discrimination for the entry of places belonging to all citizens of India irrespective of religion, caste, creed etc.

One of the learned member of the constituent assembly namely Prof. K. T. Shah wanted to add the word SC, Backward Tribe for their advantage, safeguard and protection for entry and for use of the places mentioned therein the article (shops, tanks, wells etc).

After hearing and taking note of various amendments moved by the learned members of the constituent assembly, Hon'ble Dr. B. R. Ambedkar finally replied for accepting the draft Article 9 as under:

9. (1) The State shall not discriminate against any citizen on grounds only of religion, race, caste, sex or any of them. In particular, no citizen shall, on grounds only of religion, race, caste, sex or any of them, be subject to any disability, liability, restriction or condition with regard to-

(a) Access to shops, public restaurants, hotels and places of public entertainment, or

(b) The use of wells, tanks 3, roads and places of public resort maintained wholly or partly out of the revenues of the State or dedicated to the use of the general public.

(2) Nothing in this article shall prevent the State from making any special provision for women and children.

Replying to the arguments submitted by Mr. Tahir Mohd for prescribing punishment for restricting entry and use of places like shops, wells etc. mentioned in the draft article 9 and prescribing punishment treating discrimination as crime.

Dr. B.R. Ambedkar said that there is already draft Article 11 (present Article 17) which abolishes untouchability and whosoever practice it any form will be committing an offence punishable in accordance with law as provided by the parliament. Therefore Dr. B. R. Ambedkar said there is no strength in the submissions of Mr. Tahir Mohd argument. Dr. B. R. Ambedkar further said Article 11 is a uniform provision applicable for all the states in the territory of India.

Dr. B.R. Ambedkar answered to the submission made by Prof. K. T Shah for insisting on the that the words backward classes, be included with SC and ST. Dr. Ambedkar replied to Prof. K. T Shah as under.

Dr. B. R. Ambedkar does not want SC and ST community, women, children be isolated from the main stream of the society. If the submission of Prof. K.T. Shah is accepted to add SC/ST along with women and children to the word backward classes in the draft article 9 there will be some problem in future. Dr. B. R. Ambedkar said then state in course of time may say that it is making special provisions of law for establishing special schools for members of SC/ST communities on the pretext of "Extending special provisions to women, children, SC/ST member of the citizens for their advancement and protection as used in draft article 9", as used in draft article 9. Therefore Dr. B.R. Ambedkar rejected the arguments of Prof. K.T Shah in order to avoid all sorts of confusions.

Answering to the submission made by the learned member of the constituent assembly Mr. S. Nagappa, who asked for clarifying the meaning of word 'shop' in the draft article 9. Dr. Ambedkar very coolly replied that, he used the word shop in a generic and general sense. Further he said anyone who opens the shop will always think to render service to the general public. Therefore, Dr. B. R Ambedkar clarified Mr. Nagappa that there are no possibilities for disallowing SC/ST members into the shops. Hence the submission of Mr. S Naggappa was rejected.

The author respectfully submits that the parliament and state legislature have enacted many legislations for the empowerment of women and children. Such legislation are child labour abolition Act, prevention of sexual harassment for women at work place Act and POCSO Act etc

The author of this article submits that originally in the draft article 9 there were only 2 clauses namely clause 1 provided that there shall be no discrimination for any citizen only on the grounds of religion, race, caste, sex or any of them. clause 1 sub clause (a and b) of article 9 provided there shall be no discrimination upon any citizen in the matter of entry to shops and places, such as roads, well, tanks, hotels and restaurants etc. further sub clause 2 provided the state is empowered for making any special provision for advancement, protection and safeguards for women and children.

Where has sub-clause (4), sub-clause (5), sub-clause (6) of the article 15 in the present constitution which were added and. inserted by way of amendment to the constitution.

For instances sub clause (4) was inserted as the very first amendment in the life time of Dr. B. R. Ambedkar into the constitution due to the judgment delivered by the Hon'ble Supreme Court of India in Champakam Dorairajan Case's in the year 1951. Again sub-clause (5) was inserted in the year 2005 while sub-clause (6) was inserted in the year 2019.

Sub-clause 4 of the Article 15 in the present constitution provides that the state is not prohibited to make any law under 15 (4) or Article 29(2) for making any provisions for the socially and educationally backward classes of citizens or the scheduled castes and scheduled tribes.

The author submits that sufficient energy has been applied through the debates in the constituent Assembly while providing reservations for backward classes. Further what the term backward classes should include and exclude. Opinions such as economically and educationally backward, socially and educationally backward religious and culturally backward, etc were mooted to be included as a suffix to the word backward classes.

The only term which is found in the adapted constitution is "economic and educational interests" used in the head note of Article 46 of our constitution mentioned in part IV (DPSP). Further the author submits that neither the constituent Assembly nor the adapted constitution defined the words Backward Class. Nor the present constitution or the adapted constitution defines the word 'backward classes'. However, the word 'backward

classes' is used in the head note of Article 340 of the adapted constitution which provides for the appointment of the commission by the president for investigating the conditions of backward classes. Further in the said Article the term 'socially and educationally backward' is used in clause (1) of Article 340, but not defined. However subsequently in the year 2018 Article 342-A was inserted in the constitution.

Article 342 A provides that the president of India issue notification as to who are socially and educationally backward class of citizens in a state or union territory. Further the said Article provides the power to the parliament to make law for inclusion or exclusion of any clause from the central list of backward classes and accordingly issue notification to that effect. Further such notification issue cannot be varied by subsequent notifications by the government of India.

The author submits that Article 366 inserted sub clause 26-C in the year 2018. The said 26-C Article 366 defined the term 'socially and educationally backward classes' which means such backward classes as are so deemed under Article 342 A for the purpose of this constitution. The author is of the view that no clear-cut meaning is provided in the definition of the term 'socially and educationally backward classes of citizens' in our constitution.

The author of this article is not willing to accept women and the members of the SC and ST belong to "weaker section". This is for the simple reason that the adopted constitution did not refer the women and SC/ST as weaker section in Part III of our constitution.

However, the word "weaker section" is mentioned in the head note of Article 46 of our constitution which is mention in chapter Directive principles of state policy in Part IV of our constitution. The head note of Article 46 read as "Promotion of educational and economic interests of Scheduled castes, Scheduled Tribes and other weaker sections. The readers of this article should carefully note the head note of Article 46 for the simple reason that there is a word "and" between the phrases educationally and economic interest of schedule caste, schedule tribe and other weaker sections. As a result, as per the head note of Article 46 that SC/ST members do not included other weaker section category. The author of this article mention the content in verbatim of Article 46 which is as under "The State shall promote with special care the educational and economic interests of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes, and shall protect them from social injustice and all forms of exploitation".

The author again appeals the readers of this article to carefully note the phrase the weaker section of the people and in particular schedule caste and schedule tribe. This indicates that the people of weaker section include SC and ST. Therefore, there is confusion in the mind of the author about the fact that whether weaker sections do include or do not include members of SC/ST communities. Be it as it may, the author by all means submit that the constitution does not exclusively refer "women" as "weaker section"]".

Sub-clause (5) of Article 15 provides that the state is not prohibited from making any laws under Article 15(5) or Article 19(1)(g) for ensuring advancement of socially and educationally backward classes of citizens or SC/ST in the matter of providing admissions in private and un-aided educational institutions except the minority educational institutions referred to clause (1) of Article 30 of our constitution.

The author further submits that Article 15 (6) and Article 16 (6) were added to the constitution in the year 2019 by way of amendment. In the said two Articles of our constitution mention the word 'weaker section' is used in the economic sense by stating that any citizens who belong to economic weaker section of the society such citizens pursuant to Article 15 (6) will be provided admissions in private and un-aided educational institutions except minority institutions as used in Article 30(1) of the constitution. Again as per Article 16(6) the citizens belonging to economically weaker section is provided 10% reservation of posts in each category of appointment under the services of the state.

The author respectfully submits that the history of reservation has taken a new turn for the reason that the citizens who are so called as 'Economically weaker sections' who were opposing reservation for the SC/ST communities are now demanding for reservation for them under the services of the state without suffering any historic injustice" example (jatts, patels and other dominant castes) in society like that of the members of SC/ST who suffered years of injustice and exploitation by the dominant classes of society.

Therefore, Hon'ble Dr. B.R. Ambedkar aptly said 'history repeats and one who forgets history will never create history'. The author cautions the members of SC/ST community and so called economically weaker section should bear in mind that the quantum of reservation is going down and down and is likely to decrease fastly in the era of liberalisation, privatisation and globalisation.

Therefore, there should be a mass social movement to save reservation and get the benefit of it and end it no sooner the members of the SC/ST are adequately represented in the services of the state and so also the economically weaker section feel that they too are benefitted by reservation to the best of their satisfaction.

### **3. Contribution of Dr. B.R. Ambedkar for The Empowerment of Women:**

Women in India from the time of civilisation has a special place in society. Originally women were confined to kitchen, care of children's and house hold work.

After seeking education, knowledge and awareness gradually the status of women enhanced. women turned from vehicle of procreation of children to that of the vehicle of participation in various fields of life activity making her more progressive.

50% of the population of women belong to India. Moreover, the voters list is divided more or less equal between men and women. Therefore, the role of the women as a citizen in the participation of democratic process should not be ignored. The service of women are now in demand in ITBT sectors, Airways, Army, Information and communication technology and Media. As a result, it will be wrong to say our women are weak and nowhere our constitution uses the word women belonging to weaker section in an exclusive manner. However, women are included in the weaker section of the backward classes or the SC/ST. Most of the women in our country were involved in agriculture and are there still up to larger extent. Most of the women are in the unorganised work force, working in different unorganised industries, factories, establishments, etc. Women are marking and moving ahead along with men to contribute for the purse of the family, to the treasury of the nation and to the society at large.

Now coming to the main theme of our Article about the contribution of Dr. B.R Ambedkar for the empowerment of women, the process of emancipation of women in society has been from sensitisation to participation and from participation to gender justice and from gender justice to economic empowerment followed by sustainable development.

Dr. Bhim Rao Ambedkar was a great admirer and believer of women contribution to society. Therefore, he always said if at all any movement remain to be successful then the movement should have to be launched with equal or more number of women participation. He further said, if man succeeds in convincing the women, there will be a great chance for the progress of man in various spheres of activities of life in society. Keeping these points in mind Dr. B.R Ambedkar did anything and everything to best of his ability and capacity for empowering the women through the constitution and from his personal contribution as well.

Dr. B.R. Ambedkar is one among the very few politicians who sacrifice the political power that too as a central minister resigned after becoming the very first law minister of democratic India due to the reason his Hindu code Bill was not passed by the central legislature.

The said Hindu Code Bill, was like a Magnacarta' for the women, as per many great persons including great Dr.B.R. Ambedkar. The Hindu Code Bill was defeated due to the vested interest of the dominant class of the society who opposed to such an extent Pandit Jawahar lal Nehru, the then prime minister of India had to go down to their pressure.

What is Hindu Code Bill? Hindu Code Bill is a uniform code for Hindu women for guaranteeing them equality in society. The Hindu code bill has main points to provide for women namely:

1. abolition of the doctrine of the rights by birth,
2. absolute right over property to women,
3. share to daughter and
4. provisions for divorce

Dr. B.R. Ambedkar wanted to provide equal share in property for women like that of a son in the joint family property. His dream of Hindu Code Bill provisions came to be true and real when our Indian parliament amended the Hindu Succession Act 1956 in the year 2005 for conferring equal rights by way of equal share in joint family property for son and daughter. In a way a woman is now treated as a coparcener. Various judgements have been delivered by the High Court and the Supreme Court in the matter of interpreting sec. 6 and connected provisions of the Hindu Succession Amendment Act 2005. By now the codes in India are convinced in guaranteeing equal share to women like that of a son in the joint family property.

Another important contribution of Dr. B.R Ambedkar is for reforming the age old existing dowry system in India. If at all if there is any case of giving or taking of dowry by the bridegroom by the bride family, then any property or money so taken should be kept as a trust property which is beneficial for the spouses. He further strongly advocated for intercaste marriages and he believed by this the age old practice of evil of untouchability will be reduced considerably.

The author submits that presently the Karnataka State is paying a sum of Rs. 3 lakhs as prize money for the couples of intercaste marriages. Finally, the author wants to convey the readers of this article about the message given by Bharat Ratna Dr. Bheem Rao Ramji Ambedkar to the women of this great nation in one of his address to women during his life time, the message is as under: women should be convinced by men. If they are convinced there will be a sea change in the life of man in different spheres of his life activity. Women should always mix with men in different movements, conferences, etc. for his successful end.

He said women should learn to be clean. Women should be free from all vices. Women should give education for her children. Women should always remove inferiority complex from their minds. Women should always be a good friend of her husband. Dr.Ambedkar said women keeping low aim is a crime. Therefore, she should have ambitious goals to achieve in her life. Self-help is the best help. Provide advanced education to children in and outside India. Education is the only weapon which brings women from lower levels to higher levels.

### CONCLUSION

The author respectfully submits by concluding that mere words are not sufficient to tell, speak and describes Dr. B.RAmbedkar a great champion of Human Rights. His contribution to our nation is highly remembered forgiving us such an excellent constitution.

Further to conclude the author says that our courts are courts of law 'but not 'courts of justice' as they are called as such. But then the contribution of Supreme Court and High Courts is highly commendable due to one reason Dr. B. R.Ambedkar gave the higher judiciary a unique place in the constitution, so that it remains independent as long as possible.

The contribution of Dr. Ambedkar to the empowerment of weaker section and women is highly admired and hailed by all in society. Dr. Bheem Rao Ramji Ambedkar remains to be an everyday morning star' for millions and millions of Indians. The author ends with the quote "Sathyameva jayathey".

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4. 2nd Principle 1st part "since, as far as they know, they might be the worst off, this maximizes the quality of their worst possible outcome. This is called the difference principle".
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6. Draft Article 10 (3) "Nothing in this Article shall prevent the State from making any provision for the reservation of appointments or posts in favour of any backward class of citizens who, in the opinion of the State are not adequately represented in the services under the State".
7. Prof. Iver jennings, Vice Chancellor of the Ceylon University
8. The Constitution (One Hundred and Fourth Amendment) Act, 2019
9. Article 15 Prohibition of discrimination on grounds of religion, race, caste, sex or place of birth.
10. The Sexual Harassment of Women at work place (Prevention, Protection) Act 2013, The Protection of Children from Sexual Offence Act, 2012, The Child Labour (Prohibition and Regulation) Act, 1986;
11. The Constitution (First Amendment) Act, 1951
12. The State of Madras v. Champakam Dorairajan, (AIR 1951 SC 226)
13. The Hindu Succession (Amendment) Act, 2005

14. The Constitution (One Hundred and Third Amendment) Act, 2019
15. Article 342 A, The Constitution (One Hundred and Second Amendment) Act, 2018
16. The Constitution (One Hundred and Second Amendment) Act, 2018
17. (5) Nothing in this article or in sub-clause (g) of clause (1) of article 19 shall prevent the State from making any special provision, by law, for the advancement of any socially and educationally backward classes of citizens or for the Scheduled Castes or the Scheduled Tribes in so far as such special provisions relate to their admission to educational institutions including private educational institutions, whether aided or unaided by the State, other than the minority educational institutions referred to in clause (1) of article 30
18. Article 15(6) Nothing in this article or sub-clause (g) of clause (1) of article 19 or clause (2) of article 29 shall prevent the State from making,—
19. any special provision for the advancement of any economically weaker sections of citizens other than the classes mentioned in clauses (4) and (5); and
20. (b) any special provision for the advancement of any economically weaker sections of citizens other than the classes mentioned in clauses (4) and (5) in so far as such special provisions relate to their admission to educational institutions including private educational institutions, whether aided or unaided by the State, other than the minority educational institutions referred to in clause (1) of article 30, which in the case of reservation would be in addition to the existing reservations and subject to a maximum of ten per cent. of the total seats in each category.
21. The Constitution (One Hundred and Third Amendment) Act, 2019

## A Study of Perception of Undergraduate Students towards Employability after Graduation in Kalyan City

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### ABSTRACT

This research aims to identify which category of students try for employment. The Paper also reveals Information about the challenges faced to get appropriate employment. The study aims to understand the source of Information for employment for students intending to get it after graduation. This research is based on primary data. Information from 210 students from Kalyan City is collected towards their employability after graduation. Data is collected through a structured questionnaire method. Primary data is analysed using SPSS software. For the analysis of data, statistical techniques such as mean, standard deviation, Cornbrash Alpha validity test, and Chi-square test are applied. Results of the study indicate that the most important source of Information for employment is through campus recruitment by the college. The biggest challenge for the students is a lack of confidence in facing an interview. This study has importance for students who do not know what skills are required for employability and to give them an understanding of the same

**Keywords:** Perception towards, Employability, Undergraduate Students, Skills

### INTRODUCTION

Economically, work gives money to fulfil needs, generates domestic demand for products and services, and boosts overall growth. Employing people can also help to increase social welfare in the long term. Employers frequently search for candidates who possess abilities that go beyond formal education. Each employer has different perceptions and expectations toward required skills, and capabilities are viewed and expected differently as per each workplace. In getting and developing a career path, employability skills are of utmost importance. For students' survival in the job market, various soft skills are required such as problem-solving skills, communication skills, time management, positive attitude, adaptability, knowledge of computer technology, listening skill, etc. While studying, students should learn various skills by joining multiple courses and participating in various activities. Soft-skilled employees are more likely to be strong team members as well as effective supervisors. Soft Skills enable undergraduates to develop their own traits, habits, and attitudes as well to interrelate with others.

### REVIEW OF LITERATURE

1. **Doret Botha** (2021), , An undergraduate student at a South African university rated his or her own employability as a primary goal of this study. Their confidence in internal employability was higher than their confidence in external employment opportunities. Determining skills and experience required in the labour market is critical for young people, especially given the current economic climate and structural unemployment in South Africa. Employability skills will help students find work, become productive citizens, and employees.
2. **Khalizani Khalid, Abdul Majeed Ahmad** (2021), This study confirms the importance of IR 4.0 skillsets and job adaptability for managing career resources and subjective career success. We hope this study will help clarify the complex relationship between career adaptability and job outcomes. In this study, undergraduates in the UAE are examined to illuminate the understudied relationship between employability skills and career adaptability.
3. **Osama El-Temtamy and K. Kathleen O'Neill, Sadiq Midraj**(2015), Volunteering, internships, and role-playing are some of the ways that undergraduate students can improve their employability skills. As a result, the WOW program has helped ZU graduates gain employment and thus helped the UAE economy. This study found that participating in WOW, the university's sponsored employability skills development programme, improved post-graduation employment for female ZU undergraduate students. In other parts of the world, similar findings have been made
4. **Nita Chhinzer, Anna Maria Russo** (2017), Employer-specific employability models for graduate students are provided in this groundbreaking research. Employers base graduate student employability on professional maturity (based on a sample of work-term assessments). To define graduate student employability in Canada, employers look for soft skills + problem solving, ongoing learning and subject-specific knowledge. The employability construct must be viewed holistically by graduate students.

5. **Oscar Espinoza, Noel McGinn, Luis González, Luis Sandoval, Dante Castillo(2019)**, This study confirms previous findings: graduates of more selective universities are hired faster, paid more, and have higher opinions of their degree programme. Both employers and graduates believe these graduates will be more productive than graduates from less selective universities. The study also supports (some) claims that university selectivity exacerbates existing social and economic inequalities. Because family income influences early childhood education, university admissions favour those from wealthier families. The more prestigious universities in Chile also tend to offer more government-funded scholarships. Admission test scores are strongly linked to family SES. Employers know little about programme quality; selective universities promote their students' test scores.

#### OBJECTIVES OF STUDY

1. To study and understand important source of Information, challenges and skill activities by the students for employment.
2. To study the important challenges on employment by the students across demographics.

#### RESEARCH METHODOLOGY

Primary Data: Primary Information regarding the research study on "Perception of undergraduate students towards employment in Kalyan city" is collected through a structured questionnaire. There are total 210 respondents considered as primary data for this study. The required Information collected via Questionnaire is classified and presented in the table.

Secondary Data: Gathered from Government official websites, Published reports, Research papers, electronically delivered data

#### DATA ANALYSIS

##### DEMOGRAPHIC FACTORS

The primary data relevant to the study consists of demographic factors such as Gender, Stream of education, Year of study, Grades, family income and future plans of the respondents. For further investigation, demographic Information on these 210 respondents is as follows:

Demographics		Frequency	Percent
Gender	Male	70	33.3
	Female	140	66.7
Stream of Education	Commerce	174	82.9
	Science	32	15.2
	Arts	4	1.9
Year of study	Second year	129	61.4
	Third year	81	38.6
Grades secured	Grade O	63	30.0
	Grade A	139	66.2
	Grade B	7	3.3
	Grade C	1	0.5
Family Income	Up to Rs 2.5 lacs	145	69.0
	Rs 2.5 to Rs 5 lacs	41	19.5
	Rs 5 to Rs 10 lacs	18	8.6
	Above Rs 10 lacs	6	2.9
Future plans after graduation	Get Employment	149	71.0
	Not decided	61	29.0

The above table indicates that out of 210 respondents, 70 are male while 140 are female respondents. Among these respondents, 174 are from commerce stream, 32 from science stream and 4 from Arts stream. 129 student respondents are from Second year, while 81 are Third year students. 63 students have received 'O' grade, 139 have received 'A' grade, 7 have received 'B' grade and 1 student have received 'C' grade in their last examination. 145 have a family income of up to Rs 2.5 lacs, 41 have Rs 2.5 lacs to Rs 5 lacs, 18 have family income of Rs 5 lacs to Rs 10 lacs and 6 have family income above Rs 10 lacs. 149 respondents stated that they want to get employment, while 61 are not decided.

Since there are only 149 student respondents who intend to take employment after graduation, only these 149 responses are considered for further investigation.

### Source of Information for Employment

Using the appropriate ratings and formula, mean score for source of Information is calculated. It is 61.36 percent with corresponding standard deviation of 11.92, suggesting that there is a moderate variation in the responses.

### Challenges for Employment

Using the appropriate rating and formula, mean score for Challenges faced by students is calculated. It is 54.69 percent with corresponding standard deviation of 12.11, suggesting that there is a moderate variation in the responses.

### Important Skill activities

Using the rating and appropriate formula, the mean score for challenges students face is calculated. It is 87.79 percent with a corresponding standard deviation of 13.61, suggesting that there is a moderate variation in the responses.

### Cronbach's alpha test

To validate the scale used in this study Cronbach Alpha test is applied for all 149 respondents whose responses were recorded for questions 9B (Important source of Information) 10B (Challenges), and 11B (Skill activities). The Cronbach Alpha value is 0.705, 0.761, and 0.703 respectively for all three questions under consideration, and it is more than the required value of 0.700. Hence the test is accepted. Conclusion is **scale is reliable and accepted.**

**Objective 1: To study the important source of Information, challenges and skill activities by the students for employment.**

**Null Hypothesis H<sub>01</sub>:** All sources of information, challenges and skill activities interest by the students for employment are equally important.

**Alternate Hypothesis H<sub>11</sub>:** All sources of information, challenges and skill activities interest by the students for employment are not equally important.

To test the above Friedman test is applied. The p-value is calculated and is shown in the below table:

Factors	p-value	Result
Source of information	0.000	Significant
Challenges	0.000	Significant
Skill activities	0.001	Significant

The above table indicates that the p-value is 0.000, 0.000 and 0.001 respectively for source of Information, challenges and skill activities. It is less than 0.05. Therefore, Friedman test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted for source of Information, challenges and skill activities of the respondents for employment.

### SOURCE OF INFORMATION

#### CONCLUSION

There is a significant difference in the most important and the least important source of Information about employment. It is observed that the source of "Campus placement organised by college" is the most important source of Information of all as it has the highest rank of 3.80, while the least important source is "Advertisement in Newspaper" as it has the lowest rank of 2.51. This verifies our conclusion.

### CHALLENGES

#### CONCLUSION

There is a significant difference in the most important and the least important challenges about employment. It is observed that the challenge of "Not knowing how to face interview" is the most important challenge faced by the students while seeking employment of all as it has the highest rank of 3.93, while the least important challenge is "Raw writing skills" as it has the lowest rank of 3.02. This verifies our conclusion.

### Skill Activities

#### CONCLUSION

There is a significant difference in the most important and the least important skill activities interest of the student for employment. It is observed that the skill of "Personality development program" is the most important skill activity interest of the students while seeking employment of all as it has the highest rank of

2.65, while the least important activity is “English speaking course” as it has the lowest rank of 2.27. This verifies our conclusion.

**Objective 2: To study importance of challenges for employability by the students across demographics.**

**Null Hypothesis H<sub>02</sub>:** There is no significant difference in the challenges of students in getting employment across their Gender, stream of education and grades.

**Alternate Hypothesis H<sub>12</sub>:** There is a significant difference in students' challenges in getting employment across their Gender, stream of education, and grades.

To test the above Null Hypothesis ANOVA is obtained and F-test is applied. Results are shown in the table below:

Demographic factor	p-value	Result
Gender	0.099	Not significant
Stream of education	0.875	Not significant
Grades secured	0.413	Not significant

The above table indicates that the p-value is 0.099, 0.875, 0.413 for gender, stream of education and grades respectively. It is more than 0.05. Therefore, F test is accepted. Hence Null hypothesis is accepted and Alternate hypothesis is rejected for all three demographic factors.

**GENDER**

**CONCLUSION**

There is a no significant difference in the challenges faced by students for employment across the gender of students. The challenges are similar for all respondents irrespective of their gender. This can be observed in the table as follows:

Challenges			
2. Gender of student	Mean	N	Std. Deviation
Male	52.2464	46	12.29382
Female	55.7929	103	11.93630
Total	54.6980	149	12.11812

The above table indicates that the mean score for challenges for male students is 52.24 percent, while that for female students it is 55.79 percent, suggesting that both have similar nature of challenges for employment.

**STREAM OF EDUCATION**

**Conclusion:** There is a no significant difference in the challenges faced by students for employment across the stream of education. The challenges are similar for all respondents irrespective of their stream of education. This can be observed in the table as follows:

Report			
Challenges			
3. Stream of Education	Mean	N	Std. Deviation
Commerce	54.7934	121	12.10978
Science	54.6667	25	12.72938
Arts	51.1111	3	10.18350
Total	54.6980	149	12.11812

The above table indicates that the mean score for challenges for commerce students is 54.79 percent, for science students it is 54.66 percent while that for Arts students it is 51.11 percent, suggesting that all students irrespective of their stream of education have similar challenges for employment.

**Grades secured**

**CONCLUSION**

There is a no significant difference in the challenges faced by students for employment across the grades secured by them. The challenges are similar for all respondents irrespective of their grades. This can be observed in the table as follows:

Report			
Challenges			
5. grades in exam	Mean	N	Std. Deviation
Grade O	54.8611	48	12.56582
Grade A	54.8485	99	11.97383
Grade B	43.3333	2	.00000
Total	54.6980	149	12.11812

The above table indicates that the mean score for challenges for students with 'O' grades is 54.86 percent, for students with 'A' grades it is 54.84 percent while that for students with 'B' grade it is 43.33 percent. According to the F test, this difference in the highest and lowest percent is not significant, suggesting that all students irrespective of their grades have similar challenges for employment.

### FINDINGS AND SUGGESTIONS

**From the above hypotheses testing following key observations are noted:**

1. The most important source of Information is through 'Campus recruitment by college'.
2. Lack of confidence for facing interview is the biggest challenge for the students. It would be helpful if they up skill themselves in personality development and soft skill training.
3. There is no significant difference in the source of Information for employment for students intending to get employment after graduation, with respect to their gender, stream of education and grades secured.
4. There is no significant difference in the challenges faced by students intending to get employment after graduation, with respect to their gender, stream of education and grades secured. It would be helpful for the students to secure a job by doing internships while still studying for their undergraduate courses. Also. it would be a good idea to upskill themselves with soft skill training. A good resume highlighting their educational and internship achievements will also be beneficial.

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## Perception and Perspective of Social Entrepreneurship among Generation Z

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### ABSTRACT

The concept of social entrepreneurship is prominently established in business and in society. Numerous books and editorials are published regarding the characteristics of businesses engaging in social entrepreneurship. It holds a place in the literature studied by students of leading business schools, and it is discussed in professional and academic meetings across the globe. There are organizations devoted to analyzing and assessing social entrepreneurship, and there are numerous online platforms on which one may become familiarized with the concept and retrieve information and/or advice on putting social entrepreneurship into practice.

Social Entrepreneurship is upcoming and recognized as an innovative outlook for dealing with complicated social needs. It combines the enthusiasm of a social mission with a structure of business-like discipline, creativity, and determination. The time in our country is certainly appropriate for entrepreneurial viewpoints to social problems. Social entrepreneurs shall be the developers of new models in India of a new century.

Despite this, it is imperative to study the perception of social entrepreneurship among the next generations of the country, as based on this perception they will be developing a perspective towards this field as a field of future study and career. Or else, it will only remain a theoretical concept and will remain from becoming a viable career option for the current and future generations.

Generation Z is born and raised with the social platforms, their lives are centered around digital devices and technology is their identity. This generation will be entering in frontline of society in the coming years but not much is known of this generation about their personality, wants, attributes and work ethic. They seem to have different attitudes towards work and life than the previous generations.

The Generation Z is widely recognized as one which is full of compassion and understanding towards the underprivileged and weaker sections of society. They are also environmentally conscious and are aware of the consequence of long term degradation of environmental resources.

This research paper aims to understand the perception towards social responsibility and the outlook towards social entrepreneurship specifically through the eyes of member of this generation.

**Keywords** Social entrepreneurship, social, entrepreneurship, Generation Z

### INTRODUCTION

The concept of social entrepreneurship can be applied to a wide array of ventures and establishments ranging from innovative not-for-profit organizations, social purpose businesses, such as for-profit community development banks, and hybrid organizations mixing not-for-profit and for-profit elements, such as homeless shelters that innovate and establish small/ medium scale businesses to provide training and employment to their residents. Social entrepreneurs are always in search of the most effective methods of achieving their social objectives.

Though the concept of “social entrepreneurship” is gaining recognition, it means different things to all. What does “social entrepreneurship” really imply? What does it take to become a social entrepreneur? To understand this, we should start by looking into the word “entrepreneur.”

#### Who is an entrepreneur?

The term encompasses venturesome individuals who drive economic progress by finding new and effective ways of doing things. The entrepreneur shifts economic and physical resources out of an area of lower and into an area of higher productivity and greater yield. Entrepreneurs create value.

Entrepreneurs fundamentally are the change agents in the economy.

#### Differences between Business and Social Entrepreneurs

Social entrepreneurs are entrepreneurs with a primary social mission. For social entrepreneurs, the social mission is explicit and at the core of their business. This obviously affects how social entrepreneurs look at and evaluate opportunities. Mission-related impact becomes the central criterion, not wealth creation. With business entrepreneurs, wealth creation is a way of measuring value creation. This is because business entrepreneurs are

driven by market discipline, which determines in large part whether they are creating value. If they do not shift resources to more economically productive uses, they tend to be driven out of business.

### Defining Social Entrepreneurs

**Social Entrepreneurs can be defined as follows:**

- They create social value by adopting a mission
- They recognize new opportunities to serve the social mission
- They believe in continuous innovation, learning and adaptation
- They are not defeated by limited resources and they act boldly
- They are accountable to the communities they serve and the results/ impact they create

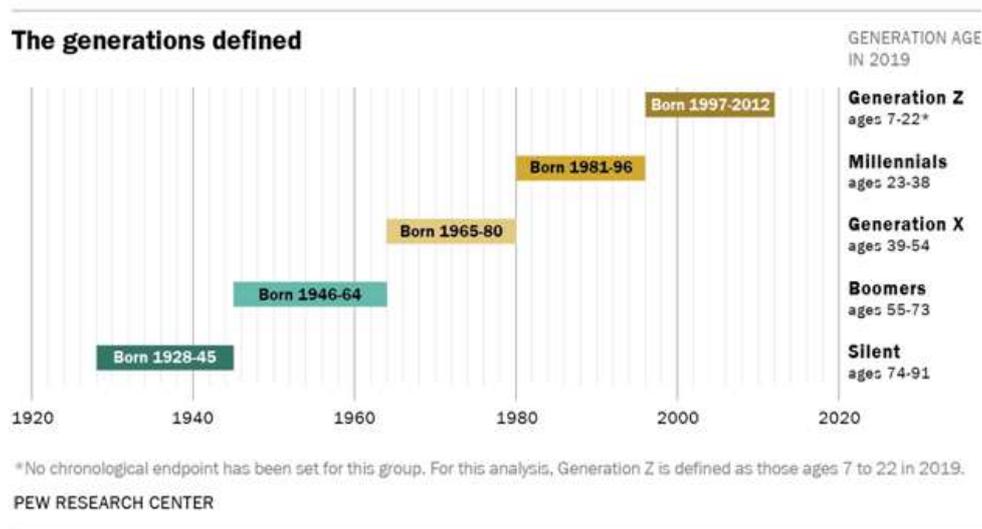
### Who is Generation- Z?

**Merriam Wester Definition of Generation Z**

: the generation of people born in the late 1990s and early 2000s

Generally, members of Generation Z are tech-savvy, pragmatic, open-minded, individualistic but also socially responsible.

Anyone born between 1981 and 1996 (aged 23 to 38 in 2019) is considered a Millennial, and anyone born from 1997 onward is part of Generation Z.



**Figure 1:** Definition of Generations

### REVIEW OF LITERATURE

According to Forbes article, members of Generation Z are taking action to bring about the change they want to see in the world. They are making a conscious effort to ensure they spend their money with companies that encompass their values and drive for change on societal issues. They believe in their power of a single person to strike a difference, but they are also demanding that businesses and governments fulfill their role to help build a better future.

A McKinsey study of Gen Z captures how technology is responsible for producing a "hypercognitive generation very comfortable with collecting and cross-referencing many sources of information and with integrating virtual and offline experiences." As the lives of this generation unfold, everyone is continually learning how they will impact the social entrepreneurship sector.

Gen Z's are technology and internet natives. Gen Z's smart ability to use technology is unmatched to any other demographic. They're likely to have an online presence at a young age. In terms of social enterprise, with a world consistently evolving to be more tech-centric, a generation who are fluent and agile in its applications is going to be irreplaceable.

This generation is the most empathetic generation of its kind. They have a heightened social consciousness and the means of connection to do something about social issues. In the near future we shall be able to witness Gen Z leaders who are empathetic and purpose-driven in various sectors of society.

To enumerate the entrepreneurial qualities of Gen Z, we can take an excerpt from 2016 NAB report stating that 44% of Gen Z believe that owning their own business is the key to success. Gen Z are more open to diverse ways of working and are likely to have 17 different careers in their lifetime.

### **NEED/IMPORTANCE OF THE STUDY**

This study aims to explore an existing relationship between members of Generation Z which makes up 27% of India's population and their understanding of social issues and means and methodologies to solving them.

### **STATEMENT OF THE PROBLEM**

Social Entrepreneurship is a growing field of interest among young adults. This study aims to understand the image of social entrepreneurship in the minds of Generation Z and to evaluate their awareness and understanding. The study shall also capture the outlook and standpoint of these young members of society to this field of activity.

### **OBJECTIVES**

1. To study the foremost preferred method for helping poor/ underprivileged members of society from the perspective of Generation Z.
2. To evaluate the awareness of 'social entrepreneurship' as a concept among Generation Z.
3. To understand the preference of social entrepreneurship as a career option among Generation Z.

### **HYPOTHESIS**

H1- Social entrepreneurship is a preferred career choice among generation z.

### **RESEARCH METHODOLOGY**

#### **INTRODUCTION**

This part explains the research procedure and techniques used to conduct the study. It includes a description of the research design, the information needed, the data sources, the sampling plan, the analytical tools. Overall, it lays up a general framework for collecting and analysing research data.

#### **RESEARCH DESIGN**

The study's scope was to include several components of understanding of members of Generation Z regarding social entrepreneurship. As a result, descriptive research design was judged to be the most suited for the study because it has supported the smooth sailing of all research operations by accumulating information about different features of respondents.

#### **INFORMATION REQUIRED**

Data on behaviour of Generation Z, their perspective on society and society's problems, their willingness towards social work and their awareness of social entrepreneurship.

#### **DATA SOURCES**

Data sources includes gathering of both primary as well as secondary data.

- a) Secondary data was gathered from previous research publications, newspapers, magazines, and online data.
- b) Primary data was gathered from students of a premier coaching institute involved in training students for competitive examinations located in Mumbai but having students coming from across the country. For the data collection, total 118 students were included in the study.

#### **SAMPLING PLAN**

Following sampling plan were adopted for present study.

#### **UNIVERSE**

All the members of generation being born between 1995 and 2015 — and comprises 1.8 billion people, making up for almost a quarter of the global population.

India has a Generation Z population of 375 million people. 27% of the total population of India.

#### **Sampling technique**

118 students from a coaching institute were selected for the study. Random sampling (Probability sampling) was considered and survey was conducted. The average age of the sample was 16 years. The sample consisted of 93 male and 25 female respondents.

**Probability sampling (random sampling) technique was used because of the following reasons:**

- To ensure that the sample is relevant yet really representative of the population.
- To reap the advantage of practicality that probability selection offers.
- To economies costs without compromising on proper representation of the sample design.

### RESEARCH INSTRUMENTS

The structured questionnaire (Annexure 1) was carefully designed to ensure that there is no ambiguity, simplicity of language, proper sequencing of questions, and completeness in terms of the overall research objective. The questionnaire was then pre-tested with students of the required age group. All the questions were close ended.

### ANALYTICAL TOOLS

Microsoft Excel and charts created in Microsoft Word.

### RESULTS & DISCUSSION

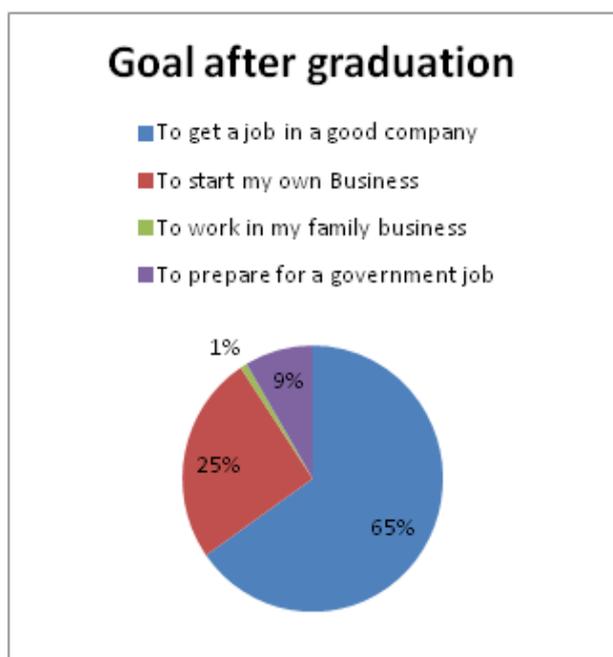


FIGURE 2

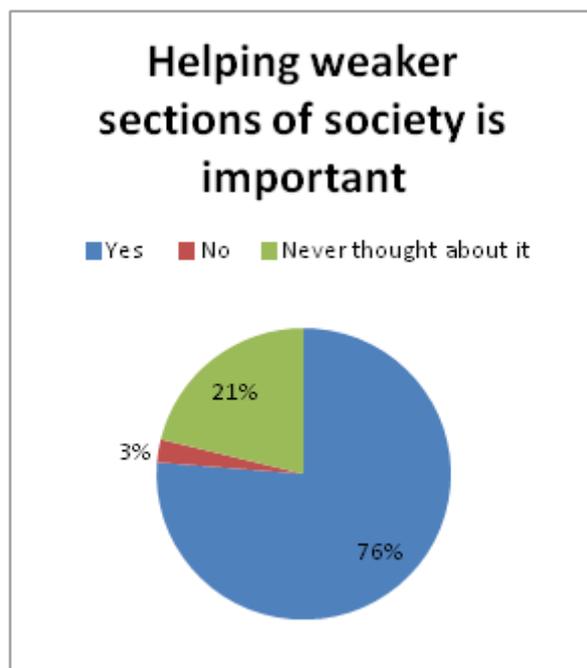


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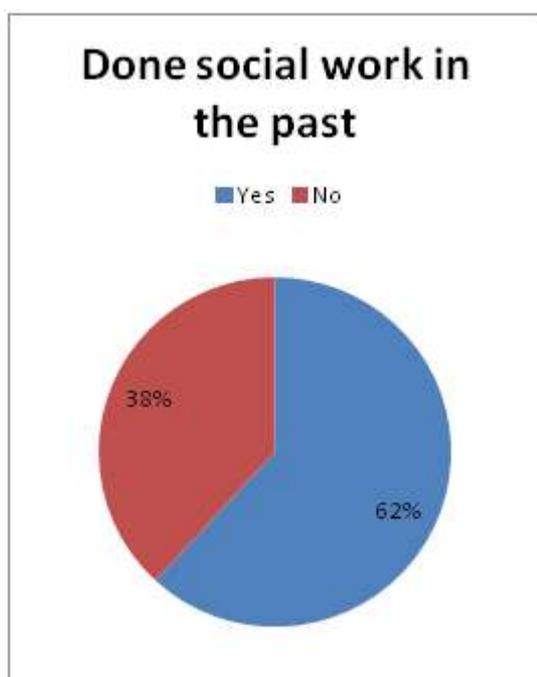


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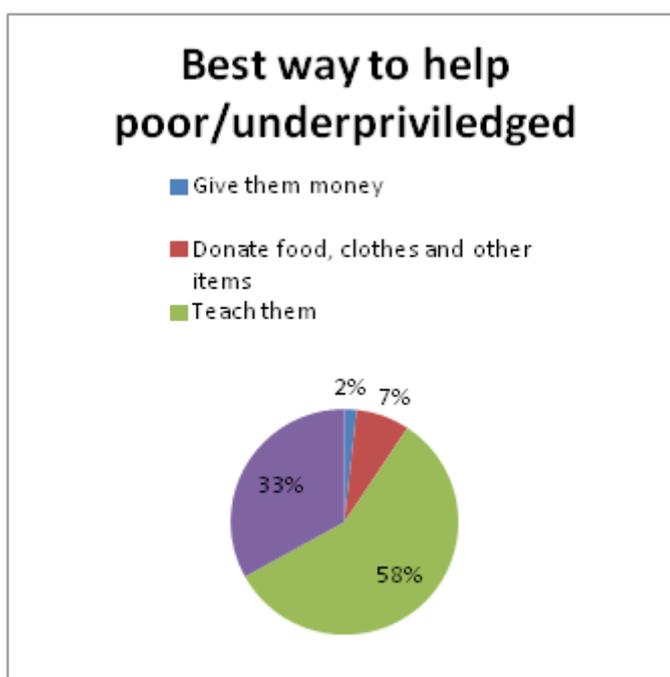


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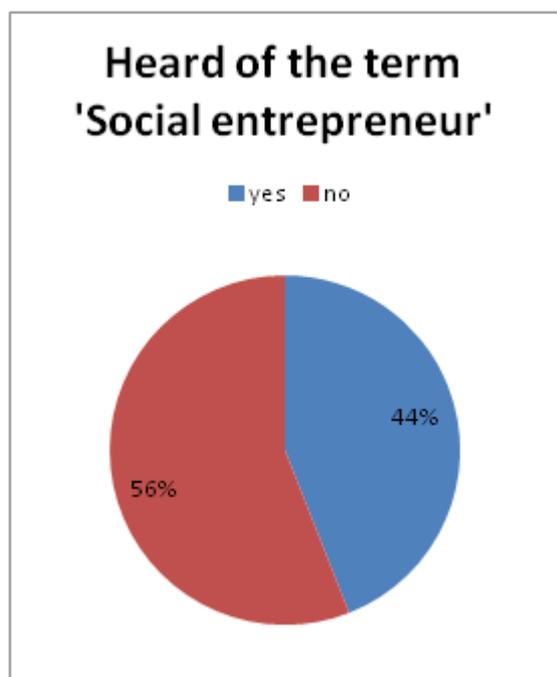


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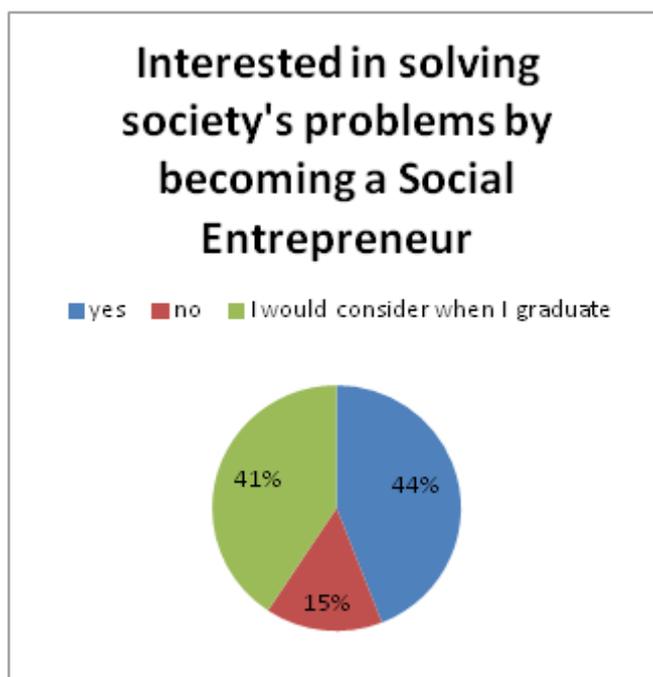


FIGURE 7

## FINDINGS

1. 76% of the respondents considered that helping weaker sections of society is important.
2. 62% of the respondents had done some form of social work in the past i.e. as a part of school activities.
3. 58% of respondents considered that the best way to help the poor/underprivileged is to teach them. This is significant as the previous generations believe that donating money, clothes and food items is paramount, which in this case only a total of 9% of respondents were in favor of.
4. Majority of respondents had not heard about the term 'social entrepreneur'.
5. After being exposed to the meaning of the term, 44% of respondents were completely agreeable to taking up social entrepreneurship as a career option, and 41% said they would consider when they graduate.
6. Only 15% were opposed to the idea of becoming a social entrepreneur.

## RECOMMENDATIONS/SUGGESTIONS

Based on this research, following are the suggestions

1. The younger generations are more aware of their social responsibilities, thereby it is important to allow them to be exposed to various means and methodologies for helping out and resolving societal issues at a micro or even macro level.
2. Awareness of social entrepreneurship as a win-win option for society as well as the entrepreneur needs to be increased among school pupils.
3. This can be achieved by including lives and examples of prominent social entrepreneurs as a part of social studies curriculum across School Boards.
4. Workshops and boot camps explaining the process for social entrepreneurship in a practical and applicable fashion, should be mandatory.
5. Projects and discussions on social entrepreneurship and the possible applications of this model in solving immediate societal issues.
6. Prominent social entrepreneurs of the country or region can be invited to share their journey, its challenges to the students through webinars/seminars.

## CONCLUSION

Social entrepreneurship is a spectrum of entrepreneurial activities which can range from 'not' adversely affecting society and environment to 'positively' affecting society and environment. This range is where all businesses and entrepreneurial ventures should fit it at any point.

With a sensitive generation like Generation Z, a little motivation to explore society's problems and viable solutions to solving them, can go a long way. Through the recommended suggestions, it is possible to inculcate a positive fervor and long term association among this generation and social entrepreneurship.

Especially in a Post Covid world and country, the awareness of societal issues has become paramount and the innovation that social entrepreneurship offers can be relied on for establishing a business model to solve societal issues.

It's difficult to predict exactly what the future holds for this generation and social entrepreneurship. Gen Z are inheriting some of the greatest challenges that our world has faced, but we can rest assured that they're going to be more prepared than previous generations. Digital natives from birth, more connected and empathetic, and with an entrepreneurial spirit, this seems to be an excellent combination for social entrepreneurship to thrive.

#### **LIMITATIONS**

1. Insufficient sample size for statistical measurements.
2. Methods/instruments/techniques used to collect the data.
3. Limited access to data.
4. Time constraints.

#### **SCOPE FOR FURTHER RESEARCH**

This topic and various nuances of this can be researched further. The empathetic generation and their preferences for helping society can be understood in order to find possible gaps in understanding.

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Figure 7: Pie chart depicting respondents' inclination to become a 'social entrepreneur'

## Retirement Planning in Post Pandemic Times – Challenges and Prospects

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### ABSTRACT

The COVID-19 Pandemic changed the way in which we value and perceive things. Since December 2019, when the virus was first detected, there has been an impact on the economic scenario globally. The extension in lockdown soon came to be known as the new normal as there was absolute uncertainty about the future. The lockdown and the aftermath came with multiple challenges, which posed a threat to not just physical but financial survival as well. In these challenging times, the personal financial planning of individuals also suffered. This paper attempts to study the effect of the pandemic on retirement planning and savings.

**Keywords:** Retirement, Savings, Pandemic

### 1. INTRODUCTION

The COVID-19 outbreak originating from Wuhan to all over the world had led to an economic crisis all over the world. The lockdown that began in March 2020 was only a tip of the iceberg. The lockdown continued throughout the year. When things seemed to be reviving the country was once again caught in the second wave which seemed to have more devastating effects. Over the last 2 years trade and business grappled with the fear of uncertainty and economic turmoil.

The losses faced by business with slow economic growth led to a crisis situation for households and individuals across the country. Many had to deal with job loss, health scare and inadequate income. The COVID-19 Pandemic brought to the fore the many challenges of working in an isolated and different environment. These tough situations, once again stressed on the importance of Personal Financial Planning, Retirement Planning being a part of it.

### 2. REVIEW OF LITERATURE

Kanojia (2020) in her paper has studied the impact of COVID-19 on individuals in Kota, Rajasthan. According to the study people over all age groups, and work sectors said that saving was necessary and the need of the hour.

Hurwitz, Michelle, Sade (2021) in their paper have examined the individuals' perceptions about and advice to others regarding retirement savings and annuitization during the pandemic. They concluded that economic factors were responsible for the results and advice given by people to others about retirement savings. The pandemic has led to long term impact on peoples willingness to save.

Horowitz, Brown, Minkin (2021) in their report published by Pew Research Centre studied the savings habits of we surveyed 10,334 U.S. adults in January 2021. They concluded that almost half of the working adults felt that due to the pandemic it is harder for them to achieve their financial goals.

### 3. OBJECTIVES OF THE STUDY

1. To understand the issues and challenges with regards to savings during pandemic
2. To understand the impact of pandemic on Retirement Savings

### 4. RESEARCH METHODOLOGY

Data is collected from Secondary sources such as journals, newspapers, reports and websites.

### 5. Issues/ Challenges in saving towards Retirement

- 1) Loss of Jobs: The nationwide lockdown led to a halt in the business activities. Many organisations found it difficult to pay their employees and had to discontinue with their services. A report published by Centre for Economic Data and Analysis (CEDA) based on the ILOSTAT database of International Labour Organisation mentioned that India's rate of unemployment sharply increased to 7.11 per cent in 2020 from 5.27 per cent in 2019. According to a nationwide survey of 1.75 lakh households survey conducted by Center for Monitoring Indian Economy (CMIE), in April 2021, around 1 crore Indians lost their jobs during the pandemic. Getting new employment opportunities in these challenging times takes longer.
- 2) Reduction in Income: The ones who had jobs were not safe from the situation however those working also had to face a reduction in their incomes. As per The Center for Monitoring Indian Economy report, only 3 per cent of the respondents stated that they saw an increase in income, while 55 per cent said their income

declined in a year that saw two waves of COVID-19. This shows a worrisome movement on income generation during the last one year. An additional 42 per cent respondents said their incomes remained same as that in the year-ago period. This shows that because of the pandemic there has been a reduction in the income of the people.

- 3) Increase in Medical Expenses: The effect of COVID can be mild or even severe leading to medical expenditure. Hospitalisation can burn a hole in the pocket if a person does not have medical insurance. Even Mediclaim policies sometimes do not reimburse the entire cost and some payment needs to be done out of own pocket. Likewise if a person does not have a cashless Mediclaim Policy, then we need to first spend the money by ourselves. A Report by the State Bank of India concluded that medical expenses could rise by as much as 11% on average for families because of COVID-related hospitalizations.
- 4) Disruption in Regular Savings Plan: Loss of jobs, irregular income led to a disruption in regular saving habits as well. People found it difficult to manage their expenses and also other compulsory obligations like servicing of their loans. Regular savings took a back-seat due to this.
- 5) Irregular Income: Salaried individuals are supposed to receive regular income. However many companies delayed the regular payments or received the amounts at irregular intervals. Hence they had to make provisions during such situations.

#### **6. Impact of Pandemic on Savings for Retirement**

Due to the above-mentioned reasons, there has been an impact on Retirement Savings due to the Pandemic.

The Employee Provident Fund Organisation (EPFO) that manages the mandatory contributions towards Provident Fund of nearly 60 million salaried employees and employers reported that between April and July 2020, i.e., the beginning of the lockdown, withdrawal amounting to around Rs.30,000 crore have been reported. More than ₹73,000 crore were withdrawn from the EPF for the nine months ended 31 December, 2020. Loss of jobs, irregular income, increasing medical expenses were some of the reasons that led to people digging into their retirement funds. This will have a long term impact as the PF accounts help to build a retirement corpus.

To provide relief measures to the citizens, the Government provided a special window for withdrawal from PF accounts for COVID expenses. Likewise, The Pension Fund Regulatory and Development Authority of India (PFRDA) also allowed National Pension Fund (NPS) subscribers to allow partial withdrawal to provide for expenses related to COVID-19.

This shows that in times of emergency, people do not have any alternate options and exhaust their retirement savings. Also, their regular savings are also impacted and they may be saving less towards their Retirement.

#### **7. SUGGESTIONS**

As we have seen above, due to the pandemic there apart from the threat of our physical health, there is also a threat to our financial health and well-being. The following measures can be considered:

- 1) List down Priorities: The pandemic has made us rethink our priorities. Prioritising one's health with an active and healthy lifestyle is necessary. Likewise saving towards important financial goals like Retirement is also something that should be considered a necessity.
- 2) Evaluate Lifestyle Expenses: Over the years lifestyle inflation i.e., spending on lifestyle expenses like leisure outings, shopping for luxury items, social events etc. have increased. This had led to spending on unwanted items rather than those important.
- 3) Adequate Insurance: The purpose of insurance is protection from risk. Many either do not have insurance or do not have sufficient cover. An adequate insurance cover can protect in such uncertain times.
- 4) Emergency Fund: It is necessary for every household to have an emergency or contingency fund. Experts suggest that one should have an amount equivalent to around 6 months expenses as a contingency fund.
- 5) Right Type of Investment: Indians have a fascination for physical assets like gold, jewellery and house property. These assets are mostly illiquid and cannot be easily realised when required. One must instead consider investing in financial assets such as mutual funds, equity shares which can be easily liquidated when required.
- 6) Procrastinating important life goals: One must not delay in savings and investing towards important life goals like retirement. The youth should start saving towards retirement as a priority. Studies have suggested that those who start early are better prepared for retirement.

## 8. CONCLUSION

The COVID-19 Pandemic is something that happened unexpectedly. However, one must be prepared for any such situation that may arise in the future. A regular savings and goal-based investment can help overcome a difficult phase. One can always get back on track and have a disciplined approach towards retirement savings. Today technology has also enabled ease of savings and investments. One must make use of these facilities to stay on track with your financial planning for retirement. There is no doubt that a good financial plan can help us tide over tough and uncertain times. With proper financial planning, important financial goals like retirement planning can be fulfilled.

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## Study of Opportunities and Challenges in Digital Payment System for Small Traders and Street Vendors in Dombivli

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### ABSTRACT

The world has evolved into a digital world nowadays. India is attempting to move closer to an electronic payment system. The term "digital payment system" refers to a payment system that operates through an electronic network. In other words, electronic payment is a mechanism. In this system, a person can make Online Payments for their purchase of products and services without the need to physically transfer cash or cheques, regardless of where they are or what time they are doing so. In a pandemic situation, all business activities are more or less affected. Physical transactions were minimal and, as far as possible, avoided by customers as well as bankers. The purpose of the study is to identify the advantages and obstacles associated with electronic payment systems, as well as to provide some suggestions for improving the e-payment system. The significance of the study is to identify opportunities for digital payment systems for small traders and street vendors and to examine the challenges in using digital payment systems. Research is based on primary data, with sample size of 80 respondents. For data analysis, SPSS software is used, and descriptive as well as inferential statistical tools are applied.

**Keywords:** Digital Payment Systems, Small traders, Street Vendors, Opportunities, Challenges

### INTRODUCTION

A cashless society is an economic situation in which financial transactions are not done with money in the form of real banknotes or coins but rather with digital currency, such as cryptocurrency, which is used in place of digital currency. With the advancement of technology, the digital payment system has become an integral aspect of financial transactions. The government requires digitalization because it is necessary for the development of the financial sector in accordance with the requirements of the modern age and for the country to compete with developing countries. The digital payment system is a component of the objective; as a result of this, cashless transactions would be possible throughout India, and the spread of black money and money laundering will be curtailed. It is also crucial to note that the development of techniques has an impact on the conventional system and that there have been some difficulties in adapting to the new system. Online banking services were launched by ICICI Bank in India, and Digi Bank is also a leader in the digitalization of transactional services that are made available to customers. The State Bank of India (SBI) is a public sector bank that has benefited from digitalization. SBI launched the green Channel in 2011 in order to promote the digital system while also conserving the environment.

**Digital Payment Methods** considered in this study are as under

- 1. Debit Card:** Is a payment card that deducts money directly from a consumer's checking account when it is used. Also called "check cards" or "bank cards," they can be used to buy goods or services; or to get cash from an automated teller machine or a merchant who'll let you add an extra amount onto a purchase.
- 2. Credit card:** The card which facilitates its holder to pay for the goods and services which will be repaid by the holder to the card issuing authority at a future date. There is a limit prescribed on the amount that can be spent with the card.
- 3. Mobile Banking:** It is a service provided by a bank or other financial institution that allows its customers to conduct financial transactions remotely using a mobile device such as a smartphone or tablet. Unlike related internet banking, it uses software, usually called an app, provided by the financial institution for the purpose. Mobile banking is usually available on a 24-hour basis.
- 4. Internet Banking:** Also known as net banking or online banking, is an electronic payment system that enables the customer of a bank or a financial institution to make financial or non-financial transactions online via the internet. This service gives online access to almost every banking service, traditionally available through a local branch, including fund transfers, deposits, and online bill payments to the customers.

**5. UPI:** UPI is a single platform that merges various banking services and features under one umbrella. A UPI ID and PIN are sufficient to send and receive money. Real-time bank-to-bank payments can be made using a mobile number or virtual payment address (UPI ID).

**6. BHIM App:** Bharat Interface for Money is an Indian mobile payment app developed by the National Payments Corporation of India (NPCI), based on the Unified Payments Interface (UPI). Named after B. R. Ambedkar and launched on 30 December 2016, it is intended to facilitate e-payments directly through banks and encourage cashless transactions.

**7. Mobile Wallet:** It is a type of payment service through which individuals can receive and send money by mobile devices. It is a form of an e-commerce model designed for mobile devices for convenience and ease of access. Mobile Wallet is also known as Mobile Money or Mobile Money Transfer.

**SIGNIFICANCE OF STUDY:** Information technology is used in every sector for improvisation in services. In the banking sector, the 'Digital Payment System' is easily adopted by customers. But, it is interesting to identify the adoption of the 'Digital Payment System' by customers such as small traders and street vendors. In general, street vendors are less educated, and most of the small traders are also not having good academic education. This research is to identify if the education of respondents is a challenge for the adoption of the 'Digital Payment System.'

#### REVIEW OF LITERATURE

**Gourab Ghosh, (2021)** concluded that digital payments not only help individuals to make payments or receive money, it also performs multiple functions. They are giving reminders about dues of any kind of payments to be made, it gives various offers to the user, and it saves a lot of time. As per the initiative taken by the government of India to make digital India and due to the increase in smartphone selling and availability of internet at high speed and at an affordable price, this is one of the core factors for consumers to adopt the digital payment system.

**Sudiksha Shree et al (2021),** While governments, regulators, and service providers collaborate to improve electronic payment systems and related infrastructure, it makes sense to research how end-users view these options. Our research shows that incorporating feedback and gauging public perception can help accelerate digitisation. Positive attitudes toward digital payments fueled a negative attitude towards cash.

**Anuja Erandekar et al (2020),** India's goal of becoming a cashless economy is a big one, and digital payments are the way to do it. With the advent of new payment options, the digital payments industry has exploded. This industry's success has been aided by a solid infrastructure and timely government support. It has also helped physical bank branches.

**N. Divyapriya, R. Velanganni (2020),** Payments digitalization is a great opportunity for India. Complete digital payment transfers may leave India without currency. Most respondents would use a debit card as a payment method: less balance inquiry, bank statement, and fund move. The respondents have no strong feelings about the bank's digital payment protection. Wi-Fi payment for the elderly is very popular. In order to promote digital payments, most users agree that cashless transactions are critical.

**Dr. D. S. Borkar, Mr. Avinash Galande (2020),** In a developing country like India, digital payment business is booming. The study of Digital Payment shows that the transaction is rapidly growing. Because of the government's Digital India initiative and the banks' customer education, it is required of bank customers. Nigerians see the benefits of digitalisation and they accept various digital payment methods. Transparency in digital payments. Money transactions help eliminate the risk of physical currency handling.

**Dr. Kota Sreenivasa Murthy (2019),** Most people are rushing to cashless payments, with limited cash and no snacks in sight. It brings liquidity, scalability and accountability. The move will encourage more merchants to accept e-cash. It offers real-time domestic fund transfers, 24/7 availability, and more. Simple, quick, cheap, and secure. Cashless payments are more convenient, easier, and safer than cash payments. A cashless society promotes transparency and accountability, reduces payment or transaction costs, and reduces the grey or informal economy.

#### RESEARCH GAP

From the review of literature, it is observed that there is a considerable amount of research on 'Digital Payment Systems.' Most of the research is based on opportunities and challenges of customers towards adoption of 'Digital Payment System.' There was no study conducted for small traders and street vendors.

## METHODOLOGY

It is exploratory research, based on primary data. Information is collected through structured questionnaire. Sample size of 80 respondents is considered for the analysis of data. Data is analyzed using SPSS version 21. Cronbach Alpha test is applied to validate the questionnaire. To study objectives of research hypothesis are designed and validated using inferential statistics. Tools applied for testing of hypothesis are ANOVA, F-test and Friedman test.

## OBJECTIVES

1. To identify impacting factors of the digital payment system on the benefit of the Business
2. To study challenges faced by small traders and street vendors in using digital payment systems

## DATA ANALYSIS

Information is presented in two parts. First part is the classification of demographic factors and descriptive statistics of variables. Second part consist of inferential statistics, in which hypothesis are tested.

## DEMOGRAPHIC FACTORS

The primary data relevant to the study consists of demographic factors such as Nature of Business, Total number of years in Business and Qualification of the respondents.

There are 80 respondents considered for this study, of which 47 are small traders while 33 are Street vendors. Out of these respondents, 13 are into Business for up to 2 years, 18 are into Business for 2 to 5 years, 28 are into Business for 6 to 10 years, and 21 are into Business since more than 10 years. Out of these 80 respondents, 32 are qualified up to SSC, 17 are HSC passed, 29 are graduates and 2 are qualified as postgraduates and above.

Information related to Benefits and challenges of digital payment system is obtained from response to questions of these variables. Suitable rating is given to responses and descriptive statistics is obtained.

Table 1

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Benefits	80	33.33	95.83	71.30	12.50
Challenges	80	37.50	100.00	62.91	15.29

## Test of reliability of scale

To validate the scale in this study Cronbach Alpha test is applied for all 80 respondents. Following table gives the results.

Table 2

Variable Name	No. of subgroups	Cronbach's Alpha	Result
Benefits	6	0.900	Scale is reliable and accepted
Challenges	6	0.888	Scale is reliable and accepted

## HYPOTHESIS TESTING

The Mean score for Benefits and Challenges of digital payment system is compared across Nature of Business and Qualification of respondents.

**Null Hypothesis H<sub>01</sub>:** There is no significant factor impacting the benefits of using digital payment system.

Friedman's test is applied, and p-value is calculated. Results are shown in the table below:

Table3

Test Statistics <sup>a</sup>	
N	80
Chi-Square	21.263
df	5
p-value	.001
a. Friedman Test	

## INTERPRETATION

The calculated p-value is 0.001. It is less than 0.05. Therefore, Friedman's test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

## CONCLUSION

There is a significant factor impacting the benefits of using digital payment system.

## FINDING

the factors impacting the benefits of using digital payment system are significantly different. It is observed that there is a significant difference in the mean rank of the most important and the least important factor impacting the benefits of using digital payment system. This can be observed in the following table:

Table4

Ranks		
Factor no.	Benefits of DPS	Mean Rank
F1	A Digital payment system is better than traditional payment channels	3.50
F2	Digital payment system is much more efficient than traditional payment channels	3.62
F3	Learning to use a Digital payment is easy	3.37
F4	The structure and contents of the web site are easy to understand	3.10
F5	It saves my time and cost for using a Digital payment system	<b>3.76</b>
F6	The billing and transaction process are accurately handled	3.65

The table indicates that the factor "It saves my time and cost for using a Digital payment system" is the most important factor impacting the benefits of using digital payment system as it has the highest rank of 3.76, while the factor "The structure and contents of the web site are easy to understand" is the least important factor impacting the benefits of using digital payment system as it has the lowest rank of 3.10.

**Null Hypothesis H<sub>02</sub>:** There is no significant difference in the benefits of using digital payment system across the Nature of Business and Qualification of respondents.

ANOVA is obtained, and F-test is applied.

The result of the F-test indicates that the p-value is 0.000. F test is rejected. Hence Null hypothesis is rejected, and the Alternate hypothesis is accepted.

## CONCLUSION

There is a significant difference in the benefits of digital payment system across the nature of Business of respondents. The mean score of benefits observed for small trader is 77.39%, and for street vendors is 62.62%. Digital Payment System is more beneficial for the small traders as compared to the street vendor.

Regarding results of qualification p-value of the F-test is 0.000. It is less than 0.05. Hence Null hypothesis is rejected, and the Alternate accepted.

**Conclusion:** There is a significant difference in the benefits of using digital payment system according to the Qualification of respondents. Digital Payment System is more benefited to respondents who are qualified as postgraduates and above. The mean score of benefit for postgraduate respondents is the highest. It is 79.16 percent. The mean score decreases as the qualification level decreases. The mean score is lowest, 62.89 percent for the respondent of Qualification up to SSC.

**Null Hypothesis H<sub>03</sub>:** There is no significant difference in the challenges of using digital payment system across the Nature of Business and Qualification of respondents.

ANOVA is obtained, and F-test is applied. Results indicate that the p-value is 0.000. F test is rejected. Hence Null hypothesis is rejected, and the Alternate hypothesis is accepted.

**Conclusion:** There is a significant difference in the challenges of using digital payment systems according to the nature of the Business of respondents. The mean score of challenges for street vendors is 70.20% and for small traders is 57.80%. Street vendors are facing more challenges as compared to small traders in the adoption of the digital payment system.

Results related to the Qualification of respondents indicate that the p-value is 0.008. F test is rejected. Hence Null hypothesis is rejected, and the Alternate hypothesis is accepted.

**Conclusion:** There is a significant difference in the Challenges of using digital payment systems across the Qualification of respondents. The challenges are observed to be higher in the respondents who are less qualified as compared to the other respondents. The mean score of challenges for postgraduate respondents is 62.91%, and it is increasing as qualification level is decreasing. The mean score of challenges for respondents of Qualification up to SSC is 68.88%. Results indicate that challenges have an impact on Qualification. Respondents who are less qualified face more challenges. The challenges score is highest for the respondents having Qualifications up to HSC. The score of challenges is least for respondents of category postgraduate and higher Qualification.

#### **FINDINGS AND RECOMMENDATIONS**

Results of this study indicate that the digital payment system is used partially or majorly by small traders and street vendors. It is observed that small traders are getting more benefits from the digital payment system as compared to Street vendors. The education of respondents also plays a significant role in the use of digital payment systems. Respondents with higher qualifications are taking more benefits from the use of digital payment systems. Qualification of respondents gives advantage who adopt and understand the technology required to follow in the digital payment system. In this study, challenges faced by respondents are studied. It is observed that street vendors face more challenges in adopting a digital payment system as compared to small traders. This is because street vendors are less qualified as compared to small traders. Street vendors find it difficult to understand and adopt the technology. There is a lack of Technical Support for understanding and adaptation of digital payment systems. It is recommended that banks and Financial Institutions may provide services to make the respondents aware, give the knowledge, and encourage them to follow digital payment systems. There is fear Factor of risk of fraud, found for many respondents while using the word digital payment system.

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## FTIR Spectroscopy and Thermal Properties of Zinc Borate Glasses Doped with NiO

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### ABSTRACT

Among new low melting glasses, bismuthate glass is deemed to have the most potential. Current studies of these glasses focus on the thermal and structural influence of the additional oxide (NiO). The glass transition temperature,  $T_g$  and peak crystallization temperatures ( $T_{p1}$  and  $T_{p2}$ ) was studied in all samples using a differential scanning calorimeter. We found that the glass transition temperature and crystallization temperature increases with the increase in the content of NiO. Further, NiO-ZnO-Bi<sub>2</sub>O<sub>3</sub>-B<sub>2</sub>O<sub>3</sub> glasses were investigated spectroscopically with Fourier-Transform Infrared (FTIR) spectra recorded for glass with different main oxide contents. The formation of B-O-Bi and B-O-Zn/Ni bridging bonds in the glass structure is suggested from FTIR spectra. In the present work, the thermal and structural properties of zinc bismuth borate glasses doped nickel ions have been carried out.

Keywords: FTIR spectroscopy, zinc bismuth borate glasses

### 1. INTRODUCTION

The early research on bismuth-borate glass was of great importance because it first attempted to systematically study the relationship between a glass's composition and its physical and chemical properties. It also demonstrated the wide range of compositions that would form glasses [1]. ZnO is an essential additive that acts to reduce the melting points in the oxides glass matrix formation. Here ZnO is chosen to modify some of structural and thermal properties. While NiO was introduced to modify the stability, to enhance the amorphousness of matrix, and help in the melting of all batch components (*i.e.* Bi<sub>2</sub>O<sub>3</sub>, B<sub>2</sub>O<sub>3</sub>, and ZnO) and force some of the Zn<sup>2+</sup> cations to share in the glass matrix as glass network formers of tetrahedral co-ordination states [2]. B<sub>2</sub>O<sub>3</sub> is one of the most common glass formers because molten B<sub>2</sub>O<sub>3</sub> does not crystallize by itself even when cooled at the slowest rate [7]. According to Krogh-Moe [3], the arrangement of vitreous B<sub>2</sub>O<sub>3</sub> consists of a random network of boroxyl rings and BO<sub>3</sub> triangles connected by B-O-B linkages. Borate glasses could transform the triangular BO<sub>3</sub> units to BO<sub>4</sub> tetrahedra with a coordination number four [4]. It is reported that Bi<sub>2</sub>O<sub>3</sub> has a solid effect of lowering the melting temperatures in various glass matrix [8]. In Bi<sub>2</sub>O<sub>3</sub>-based glasses, the bismuth ions may appear in BiO<sub>3</sub> pyramidal and BiO<sub>6</sub> octahedral units [5-6]. It is well known that structural stability has a crucial influence on the properties of the materials. Building a connection between structural and crystallization of NiO-ZnO-Bi<sub>2</sub>O<sub>3</sub>-B<sub>2</sub>O<sub>3</sub> should be of great importance for better understanding this material's thermal and structural properties. The present work will concentrate on modern aspects of the application of Bismuth Borate Glasses containing Nickel oxide in the fields of optics and related techniques together with their structural basis.

### 2. Experimental procedure

A series of four glass samples of formula xNiO-(20-x) ZnO -40Bi<sub>2</sub>O<sub>3</sub>-40B<sub>2</sub>O<sub>3</sub>; where x= 0, 0.5, 1.0 & 2.0 mol% were prepared by using the conventional melt quenching Method. The required amount of chemicals, zinc oxide (ZnO, purity ≥ 99%, Merck), bismuth oxide (Bi<sub>2</sub>O<sub>3</sub>, purity ≥ 99.99%, Sigma-Aldrich), boric oxide (B<sub>2</sub>O<sub>3</sub>, purity ≥ 99.98%, Sigma-Aldrich), and nickel oxide (NiO, purity ≥ 99%, Rankem) all were weighed and mechanically mixed in an agate pestle-mortar to obtain a fine powder. The obtained mixture was melted in a High-Grade Alumina Crucibles (Ants Ceramics) in a muffle furnace at a temperature of 1100 °C for 2 Hours. Then these melt are poured on a brass plate maintained at 0 °C to perform the quenching because at room temperature outer surface of glass will quench more rapidly than the inner surface. This may result in the crystallization of inner surface of glass after than these glasses were annealed at 250 °C for about 6 hours to eliminate thermal stresses. All samples were coded as seen in Table 1.

Table 1. Samples code and oxides ratios.

Code	The Ratio of each component in mol %			
	ZnO	Bi <sub>2</sub> O <sub>3</sub>	B <sub>2</sub> O <sub>3</sub>	NiO
N <sub>0</sub>	20	40	40	0.0
N <sub>0.5</sub>	19.5	40	40	0.5

N <sub>1.0</sub>	19	40	40	1.0
N <sub>2.0</sub>	18	40	40	2.0

The amorphous nature of all the samples was confirmed by the absence of Bragg's peak in the X-ray diffraction pattern. The glass transition temperature,  $T_g$ , was studied in all samples using a differential scanning calorimeter (TA Instruments). All the glass batches were heated at the standard rate of  $10\text{ }^\circ\text{Cmin}^{-1}$  up to  $800^\circ\text{C}$  in alumina pans. FTIR spectra were used to identify structural stability and bond formation within the glass matrix, at room temperature, using Fourier transform Infrared (FTIR) spectrometer in the range from  $2000$  to  $400\text{ cm}^{-1}$ . Where, the powdered samples were mixed well with KBr and were then pressed to make pellets suitable for IR measurements. Since, each FTIR band composed of more than one peak, each represents a fixed type of vibration, it should be de-convoluted each band by separating all possible individual peaks.

### 3.RESULT AND DISCUSSION

#### 3.1. XRD Characterization

Fig. 1: shows as deposited XRD for all studied samples, from  $10^\circ$  to  $80^\circ$  at  $1^\circ/\text{minute}$  respectively. These graphs demonstrated all studied glass matrix did not show any Bragg's peaks and, only two extensive humps around  $29.5^\circ$  and  $51.8^\circ$  are detected; such humps distinguish amorphous solids. Therefore, it can be stated that all studied samples are amorphous (glass solids) [9-11]. The existence of two humps in XRD, as seen in figure 1, may be an indication of the genesis of two dissimilar micro-nucleating agents (regulate and control crystallinity) Zn (about  $29.5^\circ$ ) and Bi (about  $51.8^\circ$ ) all over the glass-matrix.

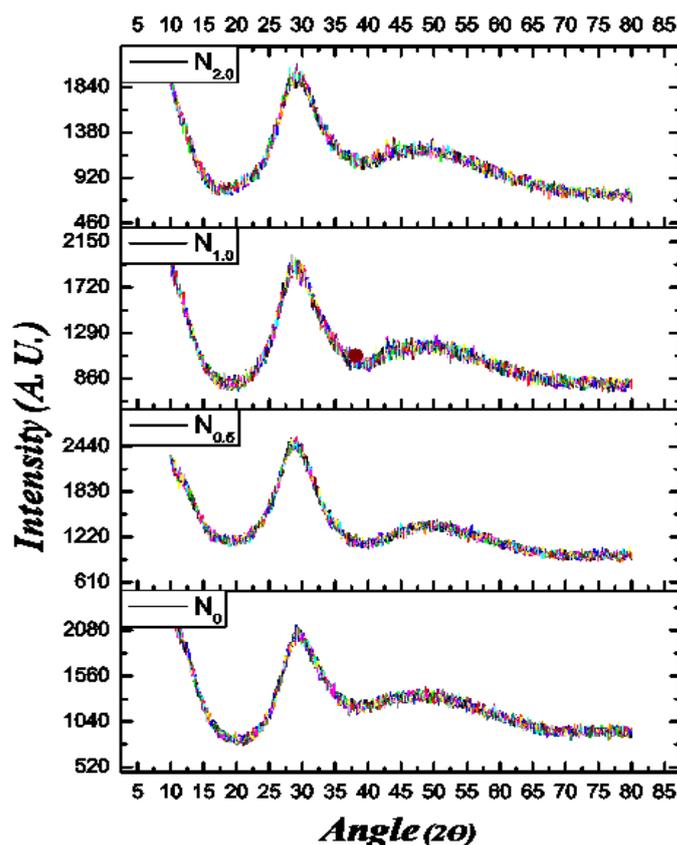


Fig. 1:- XRD Spectrogram for samples with codes N<sub>0</sub>, N<sub>0.5</sub>, N<sub>1.0</sub> and N<sub>2.0</sub>

#### 3.2. Thermal analysis

Fig. 2 (a-d) shows the DSC curves for samples with codes N<sub>0</sub>, N<sub>0.5</sub>, N<sub>1.0</sub> and N<sub>2.0</sub>, respectively. All the DSC curves reveal an endothermic peak accompanied by the glass transition temperature ( $T_g$ ). The  $T_g$  can be ascertained as the mid-point (point of inflection) of two temperatures, namely extrapolated onset temperature  $T_g^{\text{on}}$  and the extrapolated end temperature  $T_g^{\text{end}}$ . All the DSC curves exhibit two edged exothermic peaks attributes to the peak crystallization temperature indicated as  $T_{p1}$  and  $T_{p2}$ . The curves also exhibited two temperatures corresponding to the onset of crystallization, indicated as  $T_{c1}$  and  $T_{c2}$  [12-13]. Corresponding to the two crystallization temperatures, only one glass (Sample Code N<sub>0</sub>) batch ( $20\text{ZnO}-40\text{Bi}_2\text{O}_3-40\text{B}_2\text{O}_3$ ) had two

crystallization peak temperatures ( $T_{m1}$  and  $T_{m2}$ ), and other batches except for  $N_0$  had one crystallization peak temperature ( $T_{m1}$ ).

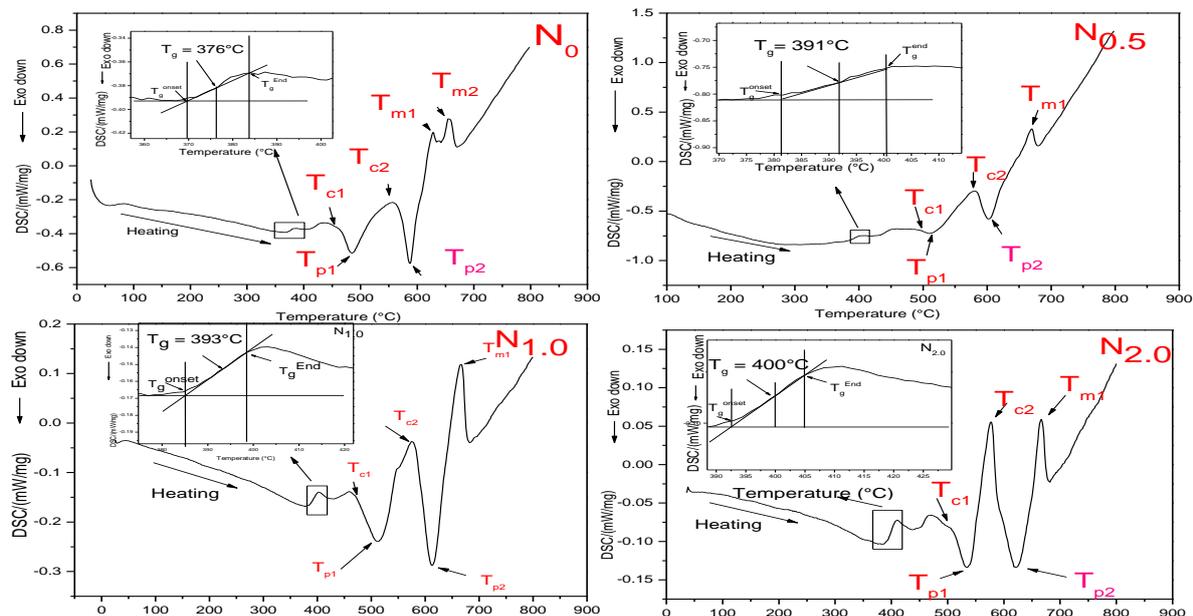


Fig. 2:- DSC curves for samples with codes  $N_0$ (a),  $N_{0.5}$ (b),  $N_{1.0}$ (c) and  $N_{2.0}$ (d).

All the above-mentioned parameters with their values obtained from DSC curves are listed in Table 2.

Table 2: All the DSC parameters for sample with code  $N_0$ ,  $N_{0.5}$ ,  $N_{1.0}$  and  $N_{2.0}$  respectively.

Sample Code	$T_g$	$T_{c1}$	$T_{c2}$	$T_{p1}$	$T_{p2}$	$T_{m1}$	$T_{m2}$
$N_0$	376	452	557	486	585	626	657
$N_{0.5}$	391	499	581	512	602	671	--
$N_{1.0}$	393	471	575	514	614	667	--
$N_{2.0}$	400	502	577	536	622	666	--

Fig. 3 shows that how the transition temperature was changed with the increment in the NiO fraction. It is conspicuous from the table 2 and Fig. 3 that the glass transition temperature and crystallization temperature increases with the increase in the content of NiO. This direct effect of the concentration of NiO (which is a network modifier) on  $T_g$  values is observed as chemical bond modification between the glass former and modifier is involved while glass transition [14]. The value of  $T_g$  is highest for  $N_{2.0}$ , indicating the more the concentration of NiO results in more compacted glass structure [15]. Using the DSC data, the thermal stability of the glasses can be evaluated employing the equation by Dizetel [16]

$$\Delta T = T_{c1} - T_g$$

Where  $\Delta T$  represents the thermal stability, and the values obtained are 76, 108, 78 and 102 °C for  $N_0$ ,  $N_{0.5}$ ,  $N_{1.0}$  and  $N_{2.0}$ , respectively. The glasses were having a value of  $\Delta T$  greater than 100 °C are considered to be stable. The more the value of  $\Delta T$ , the lesser is the tendency of glass for crystallization [16].

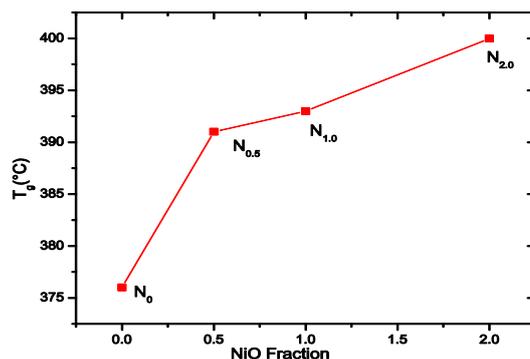


Fig. 3 Transition temperature v/s NiO fraction

### 3.3. FTIR Studies

The infrared absorption spectra of  $x\text{NiO}-(20-x)\text{ZnO}-\text{Bi}_2\text{O}_3-\text{B}_2\text{O}_3$  glass matrix are shown in Fig. 4. Table 3 and Table 4 sum up the fundamental absorption bands observed in the studied glasses matrix and their vibration types, respectively. In the IR spectra of  $x\text{NiO}-(20-x)\text{ZnO}-\text{Bi}_2\text{O}_3-\text{B}_2\text{O}_3$  glasses (Fig. 4), as the content of NiO increases, the band at  $521\text{ cm}^{-1}$ , contributing to the *Bi-O-Bi* vibration of distorted  $[\text{BiO}_6]$  octahedral units [17,18], results in increment of intensity and shift of wave-numbers towards lower. Since the  $[\text{BiO}_3]$  polyhydra vibration band at  $840\text{ cm}^{-1}$  [22] does not show any appearance in the IR absorption, it can be concluded that only  $[\text{BiO}_6]$  octahedral units are the building blocks of bismuthate glass matrix. In contrast, we observed a more significant shift at the band from  $679$  to  $696\text{ cm}^{-1}$ , which are related with the bending vibration of *B-O-B* in  $[\text{BO}_3]$  units [19,20]. This shift may be introduced by the electrostatic field of the intensely polarizing  $\text{Bi}^{2+}$  ions. The rising NiO content results in the increase of the electron cloud density around oxygen of  $[\text{BO}_3]$  unit thus leads to an increase in the roll-torque of *B-O-B* band and consequently contributes to the bending vibration of *B-O-B* band shifts to a higher wavenumber.

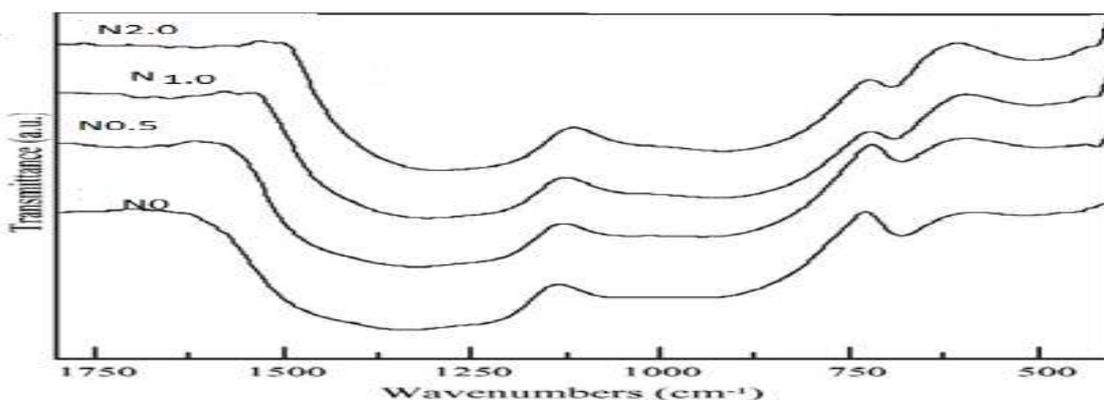


Fig. 4:- Infrared absorption spectra of  $x\text{NiO}-(20-x)\text{ZnO}-\text{Bi}_2\text{O}_3-\text{B}_2\text{O}_3$  glasses.

Table 3- Observed IR absorption bands in  $x\text{NiO}-(20-x)\text{ZnO}-\text{Bi}_2\text{O}_3-\text{B}_2\text{O}_3$  glass system.

Glass code	IR absorption bands ( $\text{cm}^{-1}$ )			
$\text{N}_0$	1335	945	681	521
$\text{N}_{0.5}$	1325	943	681	494
$\text{N}_{1.0}$	1301	924	690	503
$\text{N}_{2.0}$	1290	918	694	507

The IR spectral range of  $900-950\text{ cm}^{-1}$  is assigned for of  $[\text{BO}_4]$  units [21]. The existence of  $[\text{BO}_4]$  units in glass matrix shows that the addition of NiO to  $\text{ZnO}-\text{Bi}_2\text{O}_3-\text{B}_2\text{O}_3$  causes a cumulative transformation of  $[\text{BO}_3]$  units to  $[\text{BO}_4]$  units. Bands between  $1200$  and  $1300\text{ cm}^{-1}$  are assigned to  $[\text{BO}_3]$  units [19,20].

Table 4- Vibration types of different IR wave numbers.

Range of wave-numbers( $\text{cm}^{-1}$ )	Vibration types
420–520	Bi-O-Bi vibration of $[\text{BiO}_6]$ octahedral units [17,18]
680–720	Bending vibration of B-O-B in $[\text{BO}_3]$ triangles [19,20]
900–950	Stretching vibration of $[\text{BO}_4]$ units [21]
1200–1300	Stretching vibration of B-O-B in $[\text{BO}_3]$ triangles [19,20]

As the NiO content increased, the intensity of both the bands decreases and a shift towards lower wave-numbers is observed. This is explained by capitulation the assumption that by the inducement of intensely polarizing  $\text{Ni}^{2+}$  ions a new bridging bond of *Bi-O-B* is formed. Since the stretching force constant of *Bi-O* bonding is substantially less than that of the *B-O*, the stretching frequency of *Bi-O-B* might tend to the lower side.

#### 4. CONCLUSION

Thermal and structural properties of glass system  $x\text{NiO}-(20-x)\text{ZnO}-40\text{Bi}_2\text{O}_3-40\text{B}_2\text{O}_3$  have been studied. The amorphousness of glass samples was confirmed by XRD analysis. The result revealed the addition of NiO into the glass system increase the transition temperature of the glass system. The FTIR absorption spectra show that bismuth ions are incorporated in the glass network in  $\text{BiO}_3$  pyramidal and  $\text{BiO}_6$  octahedral units, and boron ions are incorporated in  $\text{BO}_3$  and  $\text{BO}_4$  units. The intensity of absorption bands of these structural units suggests that the structure of the glass matrix is very stable and is influenced by the presence of NiO ions.

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## Effect of TeO<sub>2</sub> Ions on Structural, Thermal and Optical Properties ZnO-Bi<sub>2</sub>O<sub>3</sub>-B<sub>2</sub>O<sub>3</sub> Glasses Doped with NiO

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### ABSTRACT

The goal of this study is to measure the effect of shifting from B<sub>2</sub>O<sub>3</sub> to TeO<sub>2</sub>, as the principal glass forming in order to acquire novel optical materials. The glass transition temperature (T<sub>g</sub>) values increased as the TeO<sub>2</sub> doping ratio increased, but the melting temperatures (T<sub>m</sub>) did not follow the trend. All of the glasses' thermal stability and glass forming ability were also calculated. The values of optical band gap energy were established by measuring the absorption spectra of glasses in the wavelength range of 200–800 nm. The glass powders' Fourier transform infrared (ATR-FTIR) spectra were measured in the 400–1500 cm<sup>-1</sup> range. Strong and weak bands can be seen in spectra at 1403, 1338, 1247, 1213, 1059, 851, 68, 523, and 448 cm<sup>-1</sup>. The non-bridging oxygen alteration in the structure was linked to changes in physical, thermal, and optical characteristics. All of the findings were explained in terms of the structural alterations caused by the transition metal ions.

Keywords: Glass, Optical Materials, Glass Powders, Optical Characteristics

### 1. INTRODUCTION

In optoelectronic devices such as solid-state lasers, solar cell efficiency improvement, white light emitting diodes, optical waveguides, fiber amplifiers, radiation detectors, and temperature sensors, optical materials-based non-crystalline hosts play an essential role [1, 2]. Based on the desired use, the host glass should have superior solubility, chemical inertness, low melting point, and excellent optical transparency [3]. To overcome the disadvantage and acquire efficient characteristics, it is important to understand the characteristics of the component of the chosen host matrix [4]. In reality, the glass forming has an impact on the glass matrix's overall qualities. Because of the unusual properties of these two oxides, the combination of borate and tellurite has gotten a lot of interest from researchers among various glass-based oxides [5]. The great transparency, low melting point, and exceptional thermal stability of glass-based borate are well recognized [1,4]. Furthermore, adding more tellurite to the borate matrix improves glass transparency and quality while also raising the refractive index [5]. In reality, boron atoms may form BO<sub>3</sub> or BO<sub>4</sub> with three or four oxygen atoms. The boroxol rings, diborate, tetraborate, and pentaborate groups are formed by the aforementioned groups, but the main structural units in tellurite are TeO<sub>4</sub> and TeO<sub>3</sub>. The addition of B<sub>2</sub>O<sub>3</sub> to the B<sub>2</sub>O<sub>3</sub>-TeO<sub>2</sub> glass causes TeO<sub>3</sub> groups to become TeO<sub>4</sub> and BO<sub>4</sub> units to become BO<sub>3</sub>, resulting in non-bridging oxygen's and a reduction in the stiffness of the glass matrix [6]. Adding alkaline components to the glass composition may help to minimize crystallinity and enhance amorphousness [7]. Furthermore, NiO will improve the glass' mechanical strength [8]. It is essential to include ZnO in these glasses to enhance the influential attributes of these glasses against crystallization [3,4,9]. When experimental preparations are restricted or difficult to obtain, it is a good technique to examine physical parameters. In this work, we studied systematical effect of TeO<sub>2</sub> ions on structural, thermal optical and properties ZnO-Bi<sub>2</sub>O<sub>3</sub>-B<sub>2</sub>O<sub>3</sub> glasses doped with NiO.

### 2. Glass Synthesis

Glass can be designed in several of methods (i.e. sol-gel, Vapor Deposition, neutron irradiation of crystalline materials). However, in this study, the traditional approach (melt-quenching) is employed to create the six glass samples shown *Table 1*. B<sub>2</sub>O<sub>3</sub>, TeO<sub>2</sub>, ZnO, Bi<sub>2</sub>O<sub>3</sub>, and NiO powders in oxide form were bought in high purity from CDH, Rankem, and Merck for usage in these glasses. After weighing all chemicals involved in the individual compositions (weights are accurate to four decimal places), a final powder of 15 g was produced for each specified glass. The powders were then carefully combined in a high-grade mortar pestle (Ants Ceramics) to ensure homogeneity, and then put in high-purity alumina crucibles (Ants Ceramics) that can endure high temperatures of up to 1500 degrees Celsius. A bench-top high temperature muffle furnace was used to melt the glass batch in this investigation. A high-precision digital temperature controller with 5°C accuracy is used to manage the temperature in this system.

**Table 1:** Samples code and oxides ratios (in mol%)

Sample code	B <sub>2</sub> O <sub>3</sub>	TeO <sub>2</sub>	ZnO	Bi <sub>2</sub> O <sub>3</sub>	NiO
BS1	60	10	15	13	2
BS2	50	20	15	13	2

BS3	40	30	15	13	2
BS4	30	40	15	13	2
BS5	20	50	15	13	2
BS6	10	60	15	13	2

The furnace's temperature was set at 1000 degrees Celsius. Based on our research, we determined that 1 hour was an appropriate period to totally melt the glass batches. We weighed the produced glasses to test the correctness of the time and melting temperature, and discovered a match stuck to the crucible wall before and after melting, with a loss of 10-15 percent. This was solid indication that the time and temperature chosen in the experiment were sufficient to prevent glass batches from evaporating. The melts are then placed onto a brass plate that is kept at 0°C to execute the quenching process. To reduce thermal stress and strain, the glasses were annealed at 250°C for 3 hours in air.

### 3. RESULT AND DISCUSSION

#### 3.1 XRD Characterization

Glass is a non-crystalline substance that lacks the periodicity of the elements that make it up. To put it another way, the molecular configuration of glasses is disordered, similar to that of gases, but it has a distinguishable shape and volume. The conventional experiment approach, such as X Ray Diffraction, tends to limit its structural information. The XRD profile of all synthesised samples can be seen in *Figure 1* that confirms the amorphous phase of glass (i.e. the absence of discrete and sharp peaks).

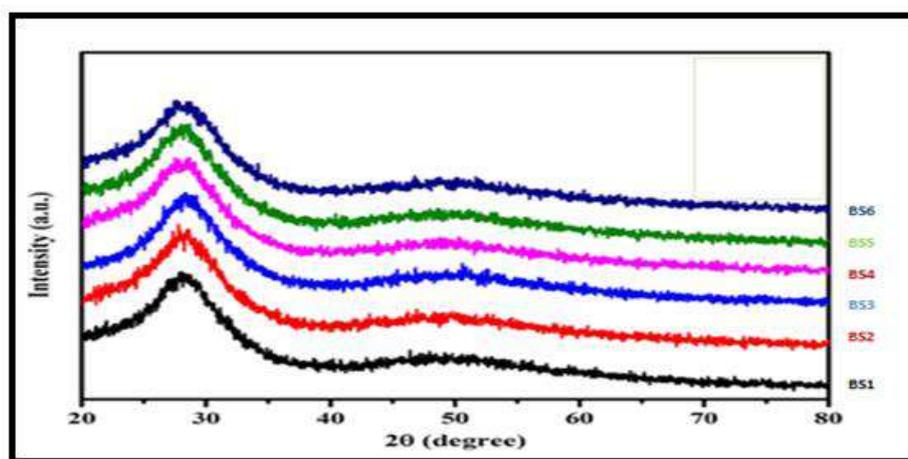


Figure 1: XRD Spectrogram of BS1, BS2, BS3, BS4, BS5, BS6

Glass transition characteristic distinguishes between the crystalline and non-crystalline phases in any substance that professes to be a glass. The temperature dependency of such behaviour or qualities may alter over time. Glass is any inorganic, organic, or metallic substance that exhibits this property [10].

#### 3.2 Thermal Analysis

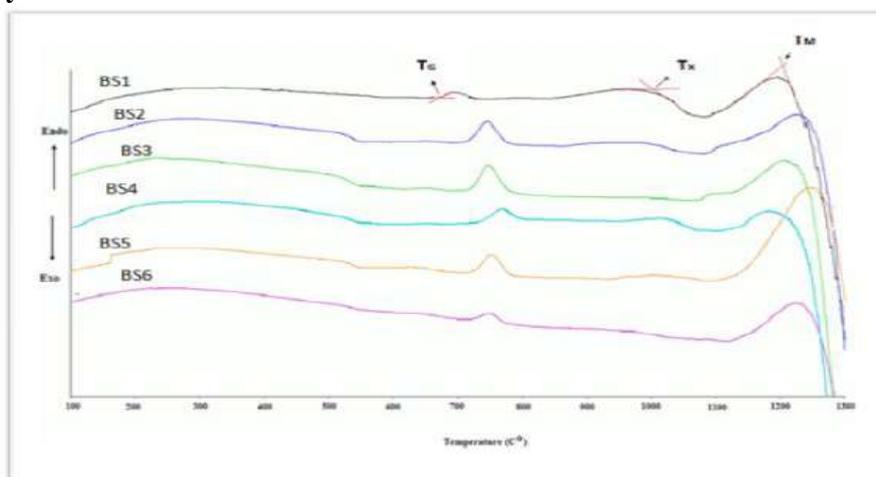


Figure 1: XRD Spectrogram of BS1, BS2, BS3, BS4, BS5, BS6

Figure 2 shows typical DTA curves for produced glass batches, and Table 2a summarizes the acquired thermal parameters. Because of the glass transition temperature,  $T_g$ , the curves indicate an endothermic effect (which is defined as the onset temperature of the glass transition peak [11]). The emergence of a single  $T_g$  peak in the DTA pattern of all the glasses suggests that the glasses are homogeneous [12]. The glass transition temperature was raised by adding  $TeO_2$  to the bulk glass structure. The presence of an increase in  $T_g$  indicates that  $TeO_2$  is entering the glass as a network forming ion [13, 14]. Furthermore, when the doping rate of the components grew, the  $T_g$  value increased. As the  $TeO_2$  entered the structure, the oxygen density in the network changed, resulting in the structure becoming more compact and the glass thickness rising. [15].

$T_x$  is the initial crystallisation onset temperature, followed by an endothermic peak caused by the glass melting temperature ( $T_m$ ). In DTA measurements, the NiO-containing glass showed no detectable crystallisation features.  $T_x$  values rose when NiO and  $TeO_2$  were added to the glass structure. The addition of  $TeO_2$  ions to the bulk glass structure raised the melting temperature of the glass ( $T_m$ ).

**Table 2:** All the above mention thermal parameter.

Sample code	Glass transition temperature ( $T_g$ ),	Crystallization temperature ( $T_x$ )	Melting temperature ( $T_m$ )	Thermal stability ( $\Delta T$ )
BS1	679	996	1203	322
BS2	712	1011	1231	304
BS3	720	1041	1213	326
BS4	740	1028	1193	293
BS5	721	--	1252	--
BS6	726	--	1230	--

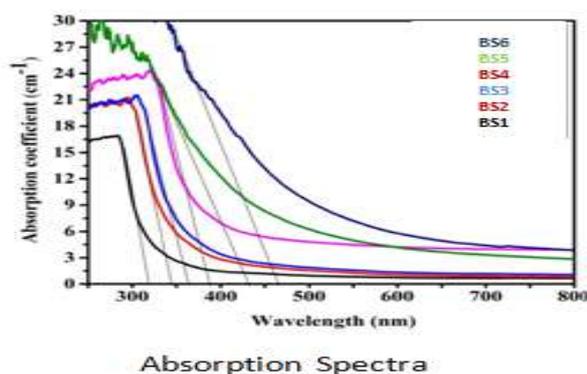
By noting the difference in temperature found between  $T_g$  and  $T_x$ , we can determine the thermal stability of a glass, as presented by Dietzel [16]:

$$\Delta T = T_x - T_g$$

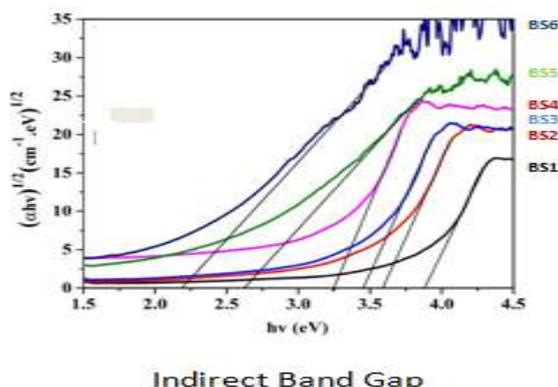
This standard indicates that as  $\Delta T$  increases, so does the kinetic resistance to crystallization and that this interval between the two temperatures is indicative of the thermal stability of the glass. This in turn suggests that a small  $\Delta T$  implies that the glass contains structural units with a high crystallization propensity and the other way around [17]. Table 2 shows that the  $\Delta T$  values are quite high. These results are reinforced by the absence of a sharp exothermic pinnacle of crystallization temperature in DTA measurements. Likewise, greater contrasts amongst  $T_x$  and  $T_g$  demonstrate better thermal stability properties in the glasses [18].

### 3.3 Optical absorption studies and indirect band gap determination.

Optical absorption is a function of various wavelengths of light travelling through a glass and the light absorbed by the glass, as is widely understood. This absorption occurs when the photon energy of light equals the energy necessary to excite an electron in the glass to a higher energy state, and the glass absorbs the photon energy [11]. In reality, since the glass can only admit wavelengths with energy greater than the glass band gap, glasses as amorphous materials are transparent in visible light. As a result, UV wavelength ranges may be absorbed by glasses [12]. When light has a wavelength that is longer than the cutoff wavelength, glass may enable it to pass. In other words, the energy of the cutoff wave length is equal to or greater than the energy band gap of glass [13]. Glass does not have a sharp cutoff since it is an amorphous material with no long range order, conduction band, or valence band, but it does have a tail band. Therefore, optical absorption is not sharp.



**Figure 3.**



**Figure 4**

No bands were observed within the visible–ultraviolet spectral wavelength range, as shown in *Figure 3*. The cutoff wave length was determined as described in [14] and is given in *Table 3*. It is evident that when the TeO<sub>2</sub> concentration grew, the cutoff wavelength shifted to a longer wavelength. The cutoff wavelengths for BS1, 345 nm for BS2, 363 nm for BS3, 389 nm for BS4, 432 nm for BS5, and 464 nm for BS6 were determined. The cutoff wavelength found increased as the TeO<sub>2</sub> concentration increased. The cause for this may be explained by changes in the oxygen bonding strength in the glass network, such as the formation of non-bridging oxygens, which can reduce the stiffness of the glass system [15]. In most cases, there are two types of energy transfers: direct and indirect transitions.

**Table 3:** Cut of wavelength and Indirect band gap.

Sample Code	Cutoff wavelength	Indirect band gap
BS1	330	3.889
BS2	350	3.599
BS3	365	3.465
BS4	395	3.254
BS5	430	2.645
BS6	460	2.320

In an indirect transition, an electron at a higher level is transported to the ground state indirectly, resulting in a change in momentum and energy [16, 17]. The absence of a long organized structure in glasses leads to a variety of energy levels, particularly when transition metal ion is included in the glass composition. As a result, it's classified as an indirect band transition substance. Two approaches were utilized to explore the optical transitions and electronic band for the synthesized BS1–BS6 amorphous glasses: following formula can be used to calculate an indirect transition:

$$\alpha(\nu) = A (h\nu - E_g)^n / h\nu$$

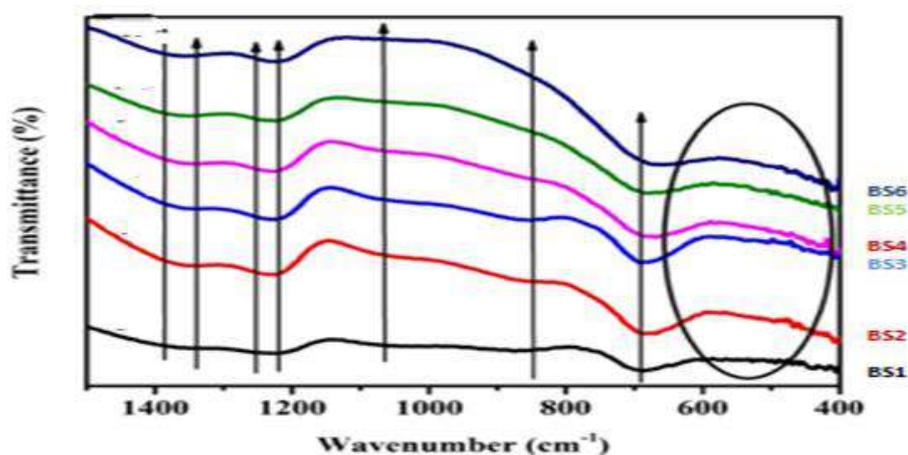
Where the exponent  $n=1/2$  is for allowed direct transition, while  $n=2$  is for allowed indirect transition.  $E_g$  is optical band gap energy, and  $A$  is a constant that gives band tailing information. It is a temperature-independent constant that depends on the refractive index  $n_0$ , and it is given by

$$\text{Where } A = (4\pi/c) \sigma_0 / n_0 \Delta E$$

and  $n = 1/2$  for indirect transition. To determine the indirect allowable optical band gap energy,  $(\alpha h\nu)^{1/2}$  vs.  $(h\nu)$  was plotted and is shown in *Fig. 4*. Extrapolating the linear area of  $(\alpha h\nu)^{1/2}$  vs.  $(h\nu)$  at the values where  $(\alpha h\nu)^{1/2} = 0$ , the optical band gap energy was computed, and all those values were extracted and given in *Table 3*. Both approaches yielded similar optical band gap values; the reduction in the optical band gap with increasing TeO<sub>2</sub> concentration is attributable to an increase in the production of bridging oxygen (BO<sub>4</sub> units).

### 3.4. FTIR spectroscopy studies

The Fourier transform infrared spectroscopy (FTIR) is the most extensively used technique for obtaining structural information on molecular vibrations of organic and inorganic substances.



**Figure 4** FTIR spectra of glass Samples (BS1 to BS6)

The glass powders' attenuated total reflectance Fourier transform infrared (ATR-FTIR) spectra were measured in the 400–1500  $\text{cm}^{-1}$  range and are shown in *Figure 4*. The spectra show strong and weak bands at 1403, 1338, 1247, 1213, 1059, 851, 683, 523 and 448  $\text{cm}^{-1}$ .

B–O stretching vibrations in triangular structure units of  $\text{BO}_3$  from distinct borate units [19, 20–22] cause bands approximately 1403  $\text{cm}^{-1}$ . The stretching of  $\text{BO}_3$  units in a variety of borate groups [21] is attributable to the conversion of some  $\text{BO}_4$  to  $\text{BO}_3$ , which combines the resultant bands at 1338  $\text{cm}^{-1}$ . Asymmetric stretching B–O bonds of  $\text{BO}_3$  structural units from boroxyl rings are responsible for the bands at around 1247  $\text{cm}^{-1}$  [19, 20, 21]. The stretching of B–O in the  $\text{BO}_4$  units [21–23] is allocated to weak bands at about 1059  $\text{cm}^{-1}$ . Bond stretching of  $\text{BO}_4$  units is responsible for bands approximately 851  $\text{cm}^{-1}$ . It is generally known that pure borate has a prominent peak at 683  $\text{cm}^{-1}$  owing to boroxyl rings, however we could not see this band in the current mixture, suggesting that these structural units are unavailable. It may be changed to  $\text{BO}_3$  and  $\text{BO}_4$  in another [21]. Because of Te–O from trigonal bi-pyramidal units with bridging oxygen [22], bands usually emerge at 640  $\text{cm}^{-1}$ . Due to the content, these bands migrated to higher frequencies and were positioned at 683  $\text{cm}^{-1}$  in our glasses.

#### 4. CONCLUSION

In summary, six boro-tellurate glasses have been synthesized using melt quenching method. XRD profile presents clearly broad peaks in the XRD spectrogram, and the result shows the absence of any sharp peaks which indicate the amorphous structure of these glasses with the absence of any long arrangements. Based on the measured optical absorption with wavelength range 200–800 nm at room temperature, it was found that the cutoff wavelength shifted to higher wavelength with increase in  $\text{TeO}_2$  concentration. From thermal analysis we found that the glass transition temperature was raised by adding  $\text{TeO}_2$  to the bulk glass structure. Furthermore, when the doping rate of the components grew, the glass stability is also increased. From FTIR we found that the triangular structure units of  $\text{BO}_3$  changed to  $\text{BO}_4$  units and Te–O form trigonal bi-pyramidal units with bridging oxygen bands migrated to higher frequencies and were positioned at 687  $\text{cm}^{-1}$ .

**Acknowledgement:** The authors are thankful to Karan Singh Gill (Ass. Professor, Govt. College, Hisar) and Harpreet Kaur (Delhi Technological University) for providing DTA and FTIR data and for their valuable suggestions. Also the authors are thankful to Sophisticated Instrument Center (SIC), Dr HariSingh Gour Vishwavidyalaya, for using their instrumentation facilities.

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## **Isolated Combined Effects of Yogic Practices Continuous Training on Selected Physiological and Bio Chemical Variables among Aiu Middle Distance Runners**

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### **ABSTARCT**

The study aims to determine the isolated and combined effect of yogic practices continuous training, physiological variable (Vital Capacity) and Biochemical Variables (Lactic Acid) among the male athletes of AIU. The research involved a random subject selection of twenty athletes with age ranging from 17-25 years and had two equally divided groups' namely experimental groups with 10 athletes each. The groups endured the training activities for twelve weeks with a schedule of thrice a week whereas the control group remained with no activities. The data procured in prior and after the training programme was examined with the application of Analysis of variance and the fixation of level of significance at 0.05.

**Keywords:** Yogic Practice, Continuous training, Vital capacity, Lactic Acid.

### **INTRODUCTION**

The conditioning and coaching are the chief words in sports training. Conditioning is a process of gradually preparing the body for strenuous physical activity for focusing attention on development of physical and motor fitness components and indirectly enhancing sports performance. The characteristic feature of training as a program of activities intends for the enhancement of the ability of force of a person for a specific occasion. The coordinative process of logical and instructive standards drives an individual to the best level of execution in sports. Sports training is a procedure of flawlessness coordinated by logical and instructive standards and goes for driving an individual to high and best level execution in sports through planned methods of change in the status and limit of execution.

### **YOGA**

"Yoga" is gotten from the underlying foundations of Sanskrit 'Yuj' which intends to join, to connect, to tie and burden and to focus on one's consideration. The exacting significance of "Yoga" is Yoke. It additionally implies association. It implies the experience of unity or solidarity with inward being. Yoga means joining the individual soul with the general soul, or God.

### **CONTINUOUS TRAINING**

Endurance is the ability to engage in activity with high caliber for a long time without fatigue. Every athlete requires energy for which endurance, the resultant of all the organs of psychic and physical systems is necessary. This kind of extended training with fair intensity enhances the abilities of aerobic that aim to build up the systems of energy generation.

### **PHYSIOLOGICAL**

Physiology deals with the functional elements of the human physical body impacted by the execution of physical actions. The general health of a person with fitness and performance can be improved through the exercises of sports.

### **LACTIC ACID**

When glucose is catabolised anaerobically, the end result obtained is Lactate. Anaerobic glycol state after breakdown results in the formation of Lactic acid which is a byproduct and oxidizes unless removed from cell.

### **METHODOLOGY**

The research was designed to discover isolated and combined effect of yogic practices, (bhujangasana (CS), virabhadrasana(LS) and adhomukhashvanasana(PS). Continuous training physiological variable (Vital Capacity) and Bio Chemical variables (Lactic acid) among middle distance runners. For this purpose, fifty athletes from the University were chosen randomly as subjects for the study and their age ranged between 17 to 25 years.

DATA ANALYSIS

TABLE - I

Analysis of variance for the pre and post test of yogic continuous training group and control group on vital capacity

TEST	YOGIC AND CONTINUES TRAINING GROUP	CONTROL GROUP	SOS	DF	MEAN	F RATIO
PRE	3.504	3.538	.006	1	.006	.0857
			.121	18	.007	
POST	3.701	3.531	.155	1	.155	22.14*
			.119	18	.007	

Significant level 0.05 table value 4.10 df 1.18

The analysis presented in the Table-I that indicate variance value of pre-test of the combined yogic practice and continuous training and control group pre- test value 3.504 and 3.538 correspondingly. The obtain 'F' ratio .0857 of pre-test was lesser than the table value 3.49 for df 1 and 18 mandatory for significance at 0.05 level of assurance on vital capacity. The post-test mean value on vital capacity of yogic practice and continuous training group and control group are 3.701 and 3.531 correspondingly. The obtain 'F' ratio 22.14\* of post-test was greater than the table value 3.49 for df 1 and 18 mandatory for significance at 0.05 level of assurance on vital capacity.

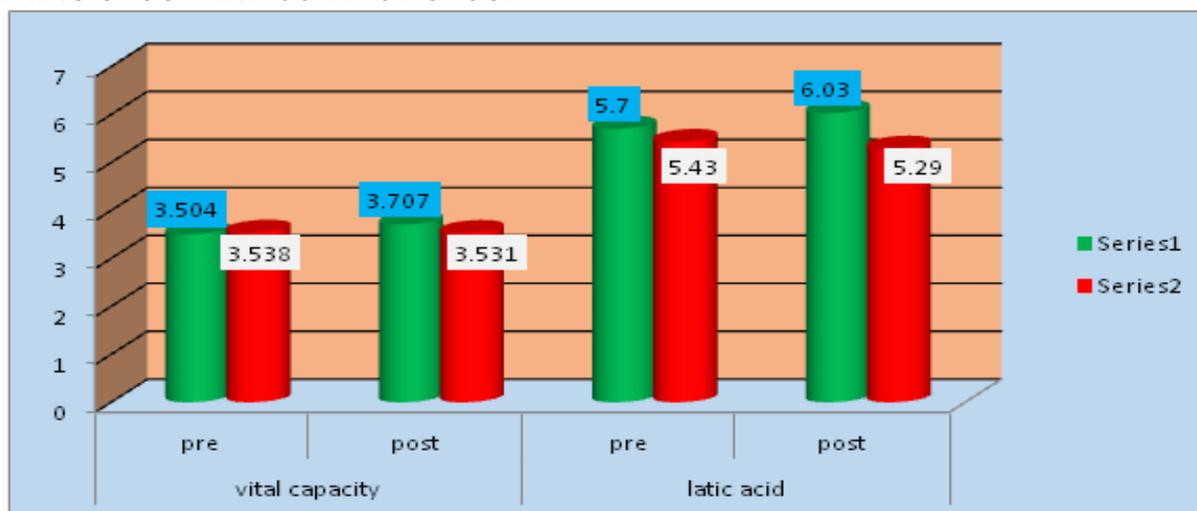
TABLE – II ANALYSIS OF VARIANCE OF YOGIC CONTINUES TRAINING GROUP AND CONTROL GROUP ON LACTIC ACID

TEST	YOGIC AND CONTINUES TRAINING GROUP	CONTROL GROUP	SOS	DF	MEAN	F RATIO
PRE	5.50	5.43	.272	1	.272	1.087
			4.503	18	.250	
POST	6.03	5.29	2.204	1	2.024	14.45*
			2.527	18	.140	

\*Required C.I Value 14.45\*at 0.05 level

The analysis presented in the table-II that indicate variance value of pre-test of the combined yogic practice and continues training group and control group pre-test value 5.50 and 5.43 correspondingly. The obtain 'F' ratio 1.087 of pre-test was lesser than the table value 3.49 for df 1 and 18 mandatory for significance at 0.05 level of assurance on lactic acid. The post-test mean value on lactic acid of yogic practice and continues training group and control group are 6.03 and 5.29 correspondingly. The obtain 'F' ratio 14.45\* of post-test was greater than the table value 3.49 for df 1 and 18 mandatory for significance at 0.05 level of assurance on lactic acid.

BAR DIAGRAM OF THE VITAL CAPACITY AND LACTIC ACID OF YOGIC PRACTICE CONTINUES TRAINING GROUP AND CONTROL GROUP



### CONCLUSIONS

The results of the study reveals that there was significant improvement in the experiment group selected variables when compared to the control group after the completion of 12weeks combined yogic practices continuous training. It was concluded that the combined group and control training had greater influence on vital capacity and lactic acid.

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## A Study of Examination and Evaluation for Excellence in Higher Education

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### ABSTRACT

Excellent higher education is a high priority task in India's. Improvements in higher education quality are viewed as crucial for enabling effective youth participation in knowledge production and the knowledge economy, improving national competitiveness in a globalised world. This study is conducted to understand the difference in satisfaction and perception of teachers and students regarding conduct of examinations in their respective colleges.

Keywords: Higher Education, Knowledge Economy, Employability, Alternative Learning

### 1.1 INTRODUCTION

Fostering excellent higher education is a high priority task in India's future education development agenda. Further improvements in higher education quality are viewed as crucial for enabling effective youth participation in knowledge production and the knowledge economy, improving national competitiveness in a globalised world, and equipping young people with the skills pertinent to global and national standards, as well as enhancing opportunities for social mobility. Consistent initiatives are needed to institutionalise an outcome-oriented higher education system and to enhance graduate employability through curriculum reform based on a learning outcomes-based curriculum framework, improving/upgrading academic resources and learning environments, striving to improve the quality of teaching and research across all higher education institutions; and technology use and integration to strengthen teaching-learning processes and reach a larger body of students through open and distance learning, as well as the use of MOOCs, that are examples of alternative learning modes.

In recent times, our country's educational system is advancing at a breakneck pace. It has gained worldwide recognition and bolstered our country's talent pool. Continue to make additional efforts to develop the sense of quality requirements in order to gain an advantage in the popularisation of higher education. However, the current educational evaluation methods are not flawless; they are too sweeping and ambiguous. In the assessment criteria, there are more non-deterministic, non-figurative, and soft signals, but fewer quantitative, detailed, accurate, or hard signs. In higher education, it has placed a greater emphasis on final results and scientific research. The key characteristics of educational performance evaluation are that the tasks involve numerous components, each of which involves a number of judgments, frequently based on imprecise data, such as details about student examinations and grades, educator performance, and other information such as staff performance. These kinds of experiences are difficult to express or quantify using statistical or analytical theory. There are insufficient study results for qualitative indicators in evaluation technologies and techniques, as well as a lack of power in operability and depth on the quantitative perceptual stage. As a result, it has an impact on the accuracy of evaluation outcomes. The shift from elite to mass higher education, in which educational resources are insufficient to satisfy the demands of rapid expansion of higher education, necessitates a fresh approach to the problem of higher education quality. Countless challenges in education quality have arisen as a result of the rapid expansion of higher education; in other words, the challenge of education quality has shifted from explicit to implicit.

### 1.2 Problem of the Study

While reading about examinations and evaluations in Autonomy and after going through the studies conducted in this area from other parts of India. The Researcher found that there is research gap in the study of innovative measures adopted by the Autonomous Colleges in examination and evaluation, affiliated to University of Mumbai. Autonomous colleges are given freedom to design their own curriculum, syllabus, pedagogy and to conduct examinations to satisfy the need of students. This study is conducted to understand the difference in satisfaction and perception of teachers and students regarding conduct of examinations in their respective colleges.

### 1.3 REVIEW OF LITERATURE

There is a good content uploaded by **Northern Illinois University, Faculty Development and Instructional Design Centre** related to theories of education. One of such Modules on 'Formative and Summative

Assessment', defined Assessment and Evaluation explains Assessment, Evaluation and Result (Decision Making) as three steps of process of Examination.

**Amy Reilly (2018)** emphasised on how balance of all four types of tests help parents to understand the strengths and weakness of their children and to get holistic view of academic performance. She discussed four common types of testing in schools —diagnostic, formative, benchmark (or interim), and summative.

**Amartya Neogi (2012)** conducted doctoral research on 'Performance Evaluation of Indian Education'. The study is focused on problems related to evaluation of Students Performance in higher education and analysis of different measures suggested to solve these problems. The Researcher further suggested new fuzzy models, superior in his opinion, as compared to earlier measures, as solution to such problems with its evaluation.

**S. Rajasingh (2009)** studied perception of different stakeholders of Higher Education like Faculty, Students, Industry and Alumni, on the different parameters of quality in higher education, under his doctoral research. He found a significant difference in their perception which should be further investigated so that a gap can be filled up to improve quality of higher education.

**Cordelia Bryan and Karen Clegg (2006)** discussed the need of innovation in assessment and how different methods work different cultures. The Book narrated various case studies showing problems arise from traditional methods of assessment and how invention in methods could be actually implemented without negotiating on standards

**Popham, W.J. (2008)**, in his book on '*Transformative Assessment*' elaborately discussed about classroom assessment. It doesn't mean conducted test during lectures. He called Formative Assessment as Transformative Assessment because classroom assessment can bring a drastic change in the way Teacher teaches in class. He concluded that there are no fixed methods of formative assessment because such methods are required to be changed as per the profile of the students, their interest by experimenting innovative methods.

Apart from the above mentioned literature, lot of other work was read and referred but nothing much was found related to examination and evaluation measures adopted by autonomous colleges affiliated to University of Mumbai.

## 1.4 Theoretical Framework

### 1.4.1 MEANING

It is critical to understand the terms 'Assessment' and 'Evaluation.'

They are defined as follows by Oxford Dictionary:

**Assessment:** An opinion or a judgement about someone or something that has been carefully considered is referred to as an assessment.

**Evaluation:** After careful consideration, creating an opinion about the amount, value, or quality of something is called evaluation.

It is defined as follows according to Theory of Education:

### ASSESSMENT

Assessment is the process of gathering data in order to track progress and, if necessary, make educational decisions. An assessment can contain a test, but it can also include methods like observations, interviews, behaviour monitoring, and so on, as mentioned in my definition of test.

**Evaluation:** Procedures used to establish whether the topic (i.e. student) fits a set of criteria, such as meeting the requirements for special education services. This method employs assessment (note that an assessment might be a test) to reach a determination of qualification based on pre-set criteria.

Few experts define Assessment as the process of acquiring data from learners, evaluation as examining such data using rubrics, and result as process of advising the learner of the areas in which he or she must focus in order to overcome their inadequacies, as shown below :



### 1.4.2 Types of Assessment and Evaluation

Diagnostic, formative, benchmark (or interim), and summative testing are the four most prevalent types of testing. They all serve different functions and should be used in conjunction to create a comprehensive or balanced evaluation program. Diagnostic testing is frequently used to identify student misconceptions or to

determine where students are in stages along a progression of concepts or skills, such as by grade level. Formative assessment is used to determine how well students are learning throughout a lesson. Interim testing is frequently used to determine if learners have mastered a unit of instruction during the semester. Summative exams are used to measure how much content students learnt overall at the end of the year or course.

#### **1.4.3 Qualities of Good Measuring Instruments**

In order to serve the purpose of testing, Validity that is content validity and Concurrent Validity, Reliability, objectivity, adequacy and usability are considered as good qualities of the instrument of testing. The questions should be covering the syllabus

#### **1.4.4 Major trends in improving the examinations**

The following changes took place in order to improve the quality of examination in the last century.

1. From standardised traditional form to a more flexible purposeful form of questions
2. From pure memory-based questions to analytical questions
3. From important questions to comprehensive questions
4. From Pencil and Paper Tests to Alternative Assessments
5. From assessment of learning to assessment for learning
6. From end of the term exams to CCE
7. From Marks to Grades
8. From testing in isolation to testing in context
9. From subjective scoring to using rubrics
10. From Closed-Book Examinations to Open-Book Examinations

The UGC recently issued Learning Outcomes-based Curriculum Framework for Undergraduate Education. It included various assessment methods relevant to each disciplinary/subject area, to assess course/programme learning outcomes achieved. Formative assessment is given more emphasis. Time-constrained examinations; closed-book and open-book tests; problem-based assignments; practical assignment laboratory reports; observation of practical skills; individual project reports (case-study reports); team project reports; oral presentations, including seminar presentations; viva voce interviews; computerised adaptive testing; peer and self-assessment, and other pedagogic methods as per the context will be used to assess progress toward achievement of learning outcomes.

#### **1.5 OBJECTIVES**

1. To discuss theoretical premise of Assessment and Evaluation.
2. To identify various modes used for Internal Evaluation in Autonomous Colleges
3. To find out and compare satisfaction of students and Teachers of Autonomous Colleges regarding the process of Examination and Evaluation
4. To Compare the perception of Students and Teachers regarding the attributes getting tested by the evaluation system

#### **1.6 HYPOTHESES**

##### **HYPOTHESIS 1**

H<sub>0</sub> - There is no significant difference between the perception of Teachers and Students regarding the attributes getting tested by the evaluation system of the College.

H<sub>1</sub> - There is a significant difference between the perception of Teachers and Students regarding the attributes getting tested by the evaluation system of the College.

##### **HYPOTHESIS 2**

H<sub>0</sub> - There is no significant difference between the degree of satisfaction of Teachers and Students regarding the process of examination and evaluation of the College.

H<sub>1</sub> - There is a significant difference between the degree of satisfaction of Teachers and Students regarding the process of examination and evaluation of the College.

## 1.7 RESEARCH METHODOLOGY

**1.7.1 Research Design:** The present study is focused on investigating the process of Examination and Evaluation adopted by the Autonomous Colleges and to find out about degree of satisfaction regarding such process of Students and Faculties. Since non-autonomous colleges don't have freedom to conduct the process of examination different from that of Affiliated University, the data is collected from 100 Teachers and 100 students of Autonomous Colleges via Google Questionnaire.

**1.7.2 Sampling Design:** The Population of the study consists all B.Com students of Autonomous Colleges affiliated to University of Mumbai. Since it was difficult to include all of them in the purview of this study, the samples were selected randomly from the TEN colleges which got a status of Autonomy by 2018-19, so that they had at least TWO to THREE years of time till date to invent the process of examination and evaluation to attain the desired quality.

### 1.7.3 LIMITATIONS

The study is restricted to students and Faculties of Commerce and that too Aided B.Com program of Autonomous Colleges.

Because non-autonomous colleges follow the structure given by Parent University for Examination and Evaluation.

Due to Pandemic conditions samples were selected on the basis of availability under Convenient Sampling Method and data was collected online through Google Form.

### 1.7.4 Descriptive Statistics

**Objective 1-** Definition, meaning, types and evolution is discussed in 1.2

#### OBJECTIVE 2 –

a. In the questionnaire, respondents were asked to choose modes used in their colleges, the mean of responses are mentioned below :

Modes of Evaluation	Teachers	Students
Project	95	98
Assignment & Presentation	100	95
Case Study	50	46
Group Discussion	35	42
Debates	15	20

**Table 1** Source : Self Compiled

The result shows that Projects, Assignment and Presentation are used in most of the colleges where as Debates are least used followed by Case Study and Group Discussion, as responded both by Teachers and Students.

b. When asked about ratio of Internal and External Evaluation, Following results were found:

	Teachers	Students
80 : 20	11	8
75 : 25	34	38
60 : 40	55	52
50 : 50	0	2
	100	100

**Table 2** Source: Self Compiled

It was found that around 50 % responded as 60:40 and approximately 30 % responded as 75 : 25. Hence 60:40 is the ratio, most of the colleges have adopted.

The Teachers were asked that such ratio of external and internal evaluation was followed as per the Instructions of Management and whether votes of teachers were considered, following responses were found : **Table 3**

Source: Self Compiled

	Such ratio of external and internal evaluation was followed as per the Instructions of Management	Such ratio of external and internal evaluation was selected based on votes of Teachers
--	---	--

Yes	67	50
No	33	50
Total	100	100

Majority of the teachers (67%) agreed that the ratio of external and internal evaluation was followed as per the Instructions of Management. Whereas 50% of the teachers agreed that votes of teachers were considered while finalising such ratio.

- c. Further the average response to a Question ‘Considering the volume of students in each class, modes of internal evaluation are justified’, is 4.37 which means the students were more than happy about the modes adopted by their colleges for internal evaluation keeping in mind the volume of students.

The Students and Teachers were asked about their opinions on Surprise Test, checking knowledge of the students before and after each topic and Nature of Test for Internal Evaluation. But means are found almost similar, hence percentage of Responses were found out.

**Table 4 Source: Self Compiled**

Teachers	Surprise tests are conducted during the lectures and students are given feedback about areas of improvement.	Knowledge of the students is tested before and after each topic is taught.	Internal evaluation is done only by conducting small test like Traditional writing examination.
Agree & Strongly Agree	60	56	53
Neutral	30	29	39
Disagree or Strongly Disagree	10	15	8
Total	100	100	100
Means	3.547	3.305	3.3857

**Table 5 Source: Self Compiled**

Students	Surprise tests are conducted during the lectures and students are given feedback about areas of improvement.	Knowledge of the students is tested before and after each topic is taught.	Internal evaluation is done only by conducting small test like Traditional writing examination.
Agree & Strongly Agree	33	1	59
Neutral	0	73	22
Disagree or Strongly Disagree	67	26	19
	100	100	100
Mean	3.507	3.285	3.3457

This shows that :

- 60% of the Teachers agree that surprise tests are conducted during the lectures and students are given feedback about areas of improvement whereas 67% of the students don't agree to this.
- 56% of the Teachers agree that the knowledge if the students is tested before and after each topic is taught whereas 73% of the students choose to be neutral on this and 26% disagreed.
- 53% of the teachers and 59% of the students agreed that Internal evaluation is done only by conducting small test like Traditional writing examination.

The average Classroom volume of students in B.Com is 100 and hence probably it might be difficult for teachers to check knowledge before and after the topic or to conduct Surprise tests. Hence the class size is

required to be reduced so that teachers can give personal attention and do experiments in internal evaluation, instead of just conducting a small test

When respondents were asked how would they like results to be published, 65% of the students wanted it in Marks and Grades both.

**Table 6** Source: Self Compiled

In marks alone	9
In grades alone	23
In marks and Grade both	65
In grades and marks only on demand	3
	100

### 1.8 Hypothesis Testing, Data Analysis & Interpretation

#### HYPOTHESIS 1

The Respondents were asked their opinion about the following attributes that gets tested by the evaluation system of their college on Five Point Likert Scale.

- i. Creativity
- ii. Analytical and logical thinking
- iii. communication skill
- iv. capacity to arrive at judgement or decisions
- v. ability to put theoretical knowledge to practical application
- vi. mastery of knowledge rather than dependency on borrowed knowledge

Since the perception was to be compared and the data collected were on interval scale and size of the sample was appropriate from parametric statistical point of view, the 't' test was used to analyze data for testing null hypotheses and found the following results:

**Table 7** Source: Self Compiled  
**One-Sample Statistics**

	N	Mean	Std. Deviation	Std. Error Mean
Teacher	100	3.7233	.32691	.03269
Student	100	3.3244	.26693	.02669

**Table 8** Source: Self Compiled

<b>One-Sample Test</b>						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Teacher	113.895	99	.000	3.72333	3.6585	3.7882
Student	124.544	99	.000	3.32444	3.2715	3.3774

Since p-value is less than 0.05, null hypothesis is rejected. It is accepted that there is a significant difference between the perception of Teachers and Students regarding the attributes getting tested by the evaluation system of the College.

The difference is significant specially in case of ability to put theoretical knowledge to practical application as mean in case of students is much less that is 2.84 than that of Teachers responses which is 3.96. It can be inferred from the Table No 5 that examination process needs to adopt measures that will test the ability of applying theory in practice. The gap will be reduced by introducing exercises in classroom teaching or by Formative Assessment, where students will have to solve real life problems by applying the subject knowledge.

**Table 9** Source: Self Compiled

Attribute	Teachers	Students
Creativity	3.84	3.09
Analytical and logical thinking	3.68	3.66

Communication skill	3.66	3.90
Capacity to arrive at judgement or decisions	3.61	3.88
Ability to put theoretical knowledge to practical application	3.96	2.84
Mastery of knowledge rather than dependency on borrowed knowledge	3.99	3.5

## HYPOTHESIS 2

Since the satisfaction of students and teachers was to be compared and the data collected were on interval scale and size of the sample was appropriate from parametric statistical point of view, the 't' test was used to analyze data for testing null hypotheses and found the following results :

**Table 10**Source: Self Compiled

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Students	100	4.480	.5021	.0502
Teachers	100	3.810	.7063	.0706

**Table 11**Source: Self Compiled

One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Students	89.222	99	.000	4.4800	4.380	4.580
Teachers	53.942	99	.000	3.8100	3.670	3.950

Since p-value is less than 0.05, null hypothesis is rejected. It is accepted that there is a significant difference between the degree of satisfaction of Teachers and Students regarding the process of examination and evaluation of the College.

But the mean of responses of Students that is 4.380 is higher than that of Teachers responses that is 3.670 which indicates that students are satisfied more than the teachers as far as examination and evaluation is concerned.

## 1.9 CONCLUSION

**It can be concluded from all the above inferences that:**

The ratio of Internal and External evaluation is finalised as per the instructions of the Management in case of most of the Colleges. Few colleges take voting of teachers before finalising such ratio. 60 : 40 is the most preferred ratio of external and Internal evaluation followed by 75 : 25. As far the process of examination and evaluation is concerned, students seem to be more satisfied than teachers. But the Colleges need to concentrate more on developing the ability to apply theoretical knowledge into practical though teaching and examination, both. Case Study method helps students to apply knowledge to solve a challenging situation or to analyse the situation and take their own decision to resolve the conflict. But it is adopted by very few colleges as a mode of internal evaluation. Hence more emphasis can be given on case study method during teaching as well as in examination. Considering the volume of students in the class of Aided B.Com Program, surprise tests or formative assessment is not feasible for teachers. Hence if Volume per class is allowed to be reduced by the Government, then Quality of Graduates can be improved by personal attention via diagnostic or formative assessment and enhancing standard of Examination and Evaluation thereby.

## 1.10 Future Scope and Recommendation

A study can be conducted for other self-financing programs of Commerce and aided, unaided programs of ARTs and SCIENCE students as well. Also, this study was restricted to perception of students and teachers of Autonomous colleges affiliated to University of Mumbai. Similar study can be conducted for students and teachers of colleges affiliated to other universities of Maharashtra.

**From the findings of the study, the Researcher recommend the following;**

\*To introduce methods which will enhance ability to apply theory into practice like Case Study.

\*To conduct test before and after each topic

\*To Conduct surprise tests during the lectures and feedback to be given to students

\*To emphasise more on formative assessment under Internal Component rather than conducting test in Traditional Format

\*The ratio of Internal and External Examination should be reviewed and to attain desired quality of Graduates

\*To adopt innovative measures in conducting examinations so that students will give more importance in understanding the subject rather than scoring marks in Examination.

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## Synthesis, Characterization and Antimicrobial Activity of Metal Nanoparticles Using Biomaterials

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### ABSTRACT

Present study describes the cost of effective and environment friendly technique for the synthesis of copper nanoparticles from copper sulphate using the extract of *Ocimum Sanctum* as reducing agent. This can be characterized by UV-Visible Spectroscopy, X-Ray Diffraction Studies, Scanning Electron Microscopy, Energy Dispersive Spectroscopy and Antimicrobial studies. SEM showed that relatively spherical and uniform sized nanoparticles. EDX analysis data confirms that the main components of the materials. Antibacterial studies indicated that the copper nanoparticles synthesized from *Ocimum Sanctum* leaf extract showed effective antimicrobial activity in both Gram positive and Gram-negative bacteria. The nanoparticles synthesis using medicinal plant extract did not affect by variation in temperature and energy. These green syntheses of Copper nanoparticles are environmentally benign, simple and convenient to handle.

**Index terms:** *Ocimum Sanctum*, Copper nanoparticles and antimicrobial studies.

### INTRODUCTION

Nanoparticles are building blocks of nanotechnology and are referred to a natural incidental or manufactured material, contains particles in an unbound state or as an aggregate or as an agglomerate and where for 50% or more of the particle in the number size distribution one or more external dimensions is in the range 1mm-100nm(1). A nanometer is therefore, defined as one billionth of a meter, mathematically given as  $10^{-9}$ m. Nanotechnology, in the field of medicine offers many exciting possibilities. Use nanorobot in treating human disease is one of the major developments of modern medicine [2]. Nanomedicine has found wide applications in drug delivery [3], gene delivery, molecular diagnostics, fluorescent biological labels [4], cardiovascular [5], cancer imaging purposes [6], detecting anti-microbial activity, detection of protein analyses, purification of biomolecules and cells, and many others. Nanowire, nano sensors are used in detecting a wide range of chemical and biological species and this is exhibited in in-vivo diagnostics [7]. Metallic nanoparticles have possible applications in diverse areas such as electronic, cosmetics [8], coatings, packaging and biotechnology [9] Copper nanoparticles are exploited in wound dressing and socks to give them biocidal properties. Iron is highly reactive to both air (oxygen) and water, and in nanoparticles it is even more rapid than the bulk material. In this study, it has been found that methanol extract of *ocimum sanctum* showed healing effect against chronic gastric ulcers induced in experimental rats. It has been found that Tulsi has excellent anti-malarial properties as well.

## 2. MATERIAL AND METHODS

### 2.1 Preparation of *Ocimum Sanctum* leaf extract

The extract was prepared by taking 30g of *Ocimum Sanctum* leaves. These were thoroughly washed with deionized water and cut and boiled with 100 ml of deionized water for 30 minutes using water bath. Under reflux condition and cooled down to room temperature. The prepared solution was filtered through whatmanNo.1 filter paper there by powdered leafy materials were filtered out and clear solution was obtained. The filtrate was stored at 4°C for further experiments.

### 2.2 Preparation of Copper Sulphate solution

0.1M copper sulphate pentahydrate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ) solution was prepared in a 100 ml standard measuring flask using deionized water.

### 2.3 Synthesis of copper nanoparticles

The plant extract of *Ocimum Sanctum* leaves (25ml) was mixed with 100ml of 0.1M copper sulphate pentahydrate solution under continuous stirring. After complete mixing of leaf extract with precursor the mixture was kept for incubation at 31°C for 24 h. A change in the colour from light green to dark green was observed and this indicated the formation of copper nanoparticles. The solution was then centrifuged at 6000 rpm for 30 minutes.

### 3. RESULTS AND DISCUSSION

#### 3.1 UV-Visible Spectroscopy

The copper nanoparticles were characterized by UV-Visible Spectroscopy. The absorption peak for Copper nanoparticles using Ocimum Sanctum leaf extract at 320nm (Fig.1), copper nanoparticles are macro in size.

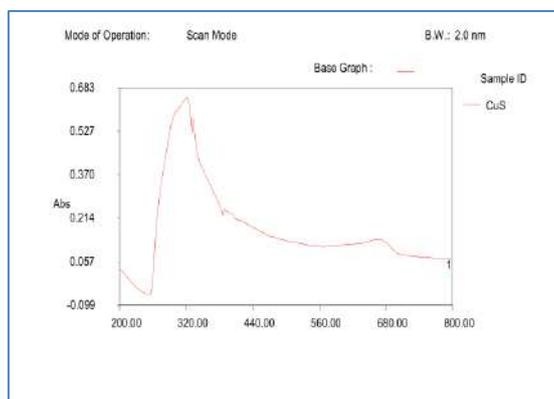


Fig (1): UV Vis spectrum of Copper nanoparticles from Ocimum Sanctum leaf extract

#### 3.2 X-Ray Diffraction studies

The biosynthesized copper nanoparticles were purified by repeated centrifugation at 800rpm for 15minutes followed by redispersion of the pellet of nanoparticles into 10 ml of deionized water. After freeze drying of the purified nanoparticles, the structure and composition were analyzed the dried mixture of nanoparticles was collected for the determination of the formation of nanoparticles by XRD. The diffraction peak at  $2\theta = 18.7375$ ,  $16.0000$ ,  $9.0250$  were assigned to (Fig.2) (110), (101), (001) planes respectively.

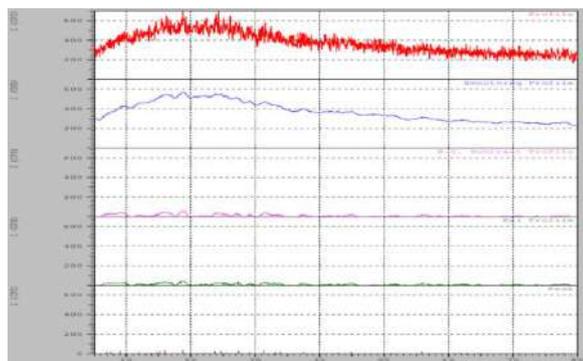


Fig (2) X-ray Diffraction of Copper nanoparticles from Ocimum Sanctum extract.

#### 3.3 Scanning electron microscope (SEM) Analysis:

Scanning electron microscope is one of the powerful tools to identify the morphology of the nanoparticles. SEM image showed that relatively spherical and uniform sized nanoparticles (Fig.3). Each individual nanoparticle was aggregated and shows large nanoparticles. This aggregation took place due to the presence of cell component and the surface of nanoparticles act as a capping agent.

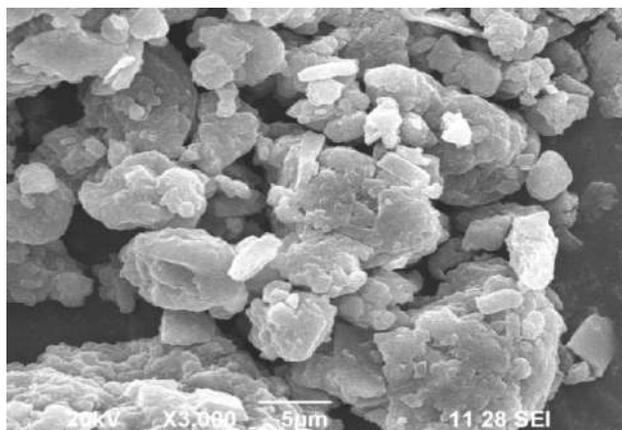
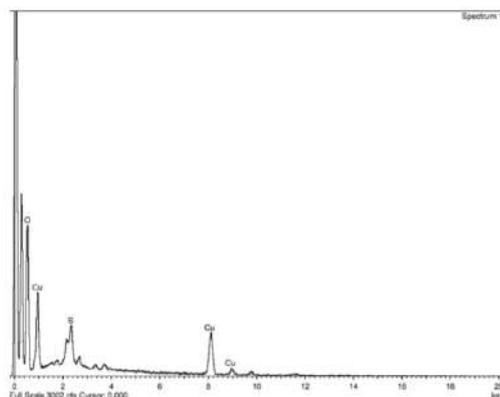


Fig 3: SEM image of Copper nanoparticles from Ocimum Sanctum extract

### 3.4 Energy Dispersive X-ray spectroscopy

The EDX technique detects x-rays emitted from the sample during bombardment by an electron beam to characterize the elemental composition of the analyzed volume. EDX analysis data confirms that the main components of the materials. The weight percentage of copper in bio nanoparticles are synthesized using plant extract is 29.29 % (figure: 4) respectively.



**Figure 4.** Energy Dispersive X-rays spectroscopy of Copper nanoparticles from plant extract

The antibacterial activity is estimated by zone of inhibition. Antimicrobial activity of synthesized copper nanoparticles was studied against Gram positive (staphylococcus aureus) and Gram negative (Escherichia coli) bacteria and their activity were measured (Fig.5). These results indicated that the copper nanoparticles synthesized from OcimumSanctum leaf extract showed effective antimicrobial activity in both Gram positive and Gram-negative bacteria.



**Figure5:** Antimicrobial activity against S.Aureus and E.Coli for Copper nanoparticles from Ocimum Sanctum leaf extract

### CONCLUSION

The bio-reduction of aqueous copper ions by the plant extract has been demonstrated. The reduction of the metal ions through leaf extract leading to the formation of copper nanoparticles of fairly well define dimension. The synthesized copper nanoparticles were characterized by UV-Vis, EDX and XRD. SEM image provided the morphology and size of the nanoparticles. The synthesized copper nanoparticles were effectively used for antimicrobial activity. It was studied against Gram positive (staphylococcus aureus) and gram negative (E.Coli) bacteria and their activity which showed good antimicrobial activity. The nanoparticles synthesized using medicinal plant extract did not affect by variation in temperature in temperature and energy.

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## Investigation on the Production of Bioplastics from *Chlorococcum Oleofaciens* and Optimization using Response Surface Methodology

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### ABSTRACT

This study investigates the use of *Chlorococcum oleofaciens* for the production of bioplastics. The bioplastic producing algal species was visualized under the microscope and 60% accumulation of PHB was evaluated after the extraction of bioplastics. Furthermore, Response Surface methodology optimization was performed to understand the cruciality of parameters such as pH, Temperature, Concentration and PHB yield. The extracted PHB was also investigated using FTIR and TGA analysis.

Keywords: Bioplastic, Response Surface Methodology, Plastics, Environmental Pollution

### INTRODUCTION

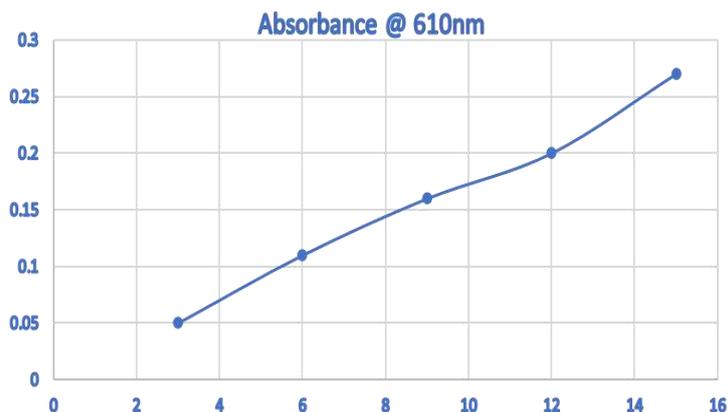
Plastics are emerging pollutants and being classified based on size as micro and macro debris. Humans are producing prominent levels of plastic because of its cheapest cost and durability. Moreover, its complex chemical structure makes them resistant to many natural degradation mechanisms and hence as a result shows slow degradability (Arias, D *et al.*, 2018) These two criteria have led to a high eminence of environmental pollution caused by plastics accumulation in the environment. Plastic pollution can affect flora and fauna and thereby affects the food chain particularly marine animals, can be harmed either by mechanical effects, such as entanglement in plastic objects or problems related to ingestion of plastic waste, or through exposure to chemicals within plastics that interfere with their physiology (Kulpreecha, S *et al.*, 2009). Humans are also affected by plastic pollution, such as through disruption of various hormonal mechanisms. The procedure of adding chemical additives during manufacture of plastics would lead to potentially harmful effects thereby results in carcinogenic or encourage prominent endocrine hormonal disruptors. (Balaji, S *et al.*, 2012; Beyatlı, Y *et al.*, 2006)

As an alternative to challenges faced by the environmental pollution, bioplastics are proved to be partly or wholly from polymers derived from biological sources such as lignocellulosic fibers, cotton fibers, microbial production. Bioplastics are combination of materials with differing properties and applications. According to European carbon footprint of a bioplastic is significantly reliant on whether the plastic enduringly stores the carbon extracted from the air by the plants. A bioplastic made from an organic foundation sequesters the CO<sub>2</sub> seized by the plant in the photosynthetic progression. (Vincenzini, M *et al.*, 1910;

Algae are hired here for the production of biodegradable plastics. Industrial utilization of Algae as bioplastic producers has the benefit of altering waste carbon-dioxide to ecologically friendly plastics using the energy of sunlight. Algae serve as an outstanding feedstock for bioplastic production owing to its many rewards such as high profit and the ability to grow in a controlled environment. Algal bioplastics mainly progressed as a byproduct of algae biofuel production, where companies were reconnoitering alternative sources of revenues along with those from biofuels. In addition, the use of algae opens up the likelihood of utilizing carbon, neutralizing greenhouse gas emissions from factories or power plants. Algae based bioplastics have been a recent trend compared to traditional methods of utilizing feedstocks of corn and potatoes as plastics. While algae-based plastics are in their early stages, once they are into commercialization, they are likely to find applications in a wide range of industries. (Saodah binti ali 2010; Hempel, F *et al.*, 2011)

### MATERIALS AND METHODS

Medium used for the algal growth was MSM (Minimal Salt Medium) (g/L) which includes Glucose (5.4g), Dipotassium hydrogen phosphate (0.5g), Sodium nitrate (1.413g), Urea (2.63g), sodium chloride (1g), Magnesium sulphate hepta hydrate (0.017g), Calcium chloride (0.004g), Potassium sulphate (1g), Ferrous sulphate (17.9 mM), Potassium dihydrogen phosphate (1.25g) and EDTA (14.8 mM) (Coelho, V. C *et al.*, 2015). The axenic cultures were grown in 250 ml Erlenmeyer flasks containing 100 ml of MSM. Experimental cultures were incubated at 25±2°C, 14/10 light/dark cycle. Every day the cultures were mildly shaken by hand for 10 minutes. Absorbance of *Chlorococcum oleofaciens* at 610 nm. The graph was plotted between Number of days and Absorbance at 610 nm (Roberta Carpine *et al.*, 2020)



### Microscopic examination of algae

The alga was viewed under microscope and it appeared spherical. It were a unicellular cyanobacteria. It is widely present in freshwater.

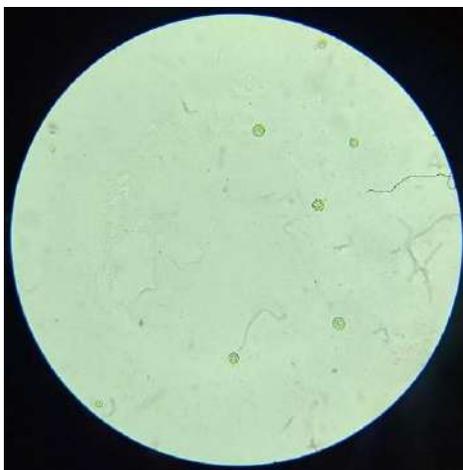


Fig: Microscope image of Live *C. oleofaciens* viewed under Light microscope at 40x magnification.

### Extraction of PHB

100 ml of sample was taken and centrifuged at 10,000 rpm for 15 minutes. The supernatant was discarded and the pellet was treated with 10 ml of sodium hypochlorite and the mixture was incubated at 30°C for 2 hours. After incubation, the mixture was centrifuged at 5000 rpm for 15 minutes and then washed with distilled water and methanol respectively. After washing, the pellet was dissolved in 5 ml of boiling chloroform. A volume of cold methanol was added and the sample was refrigerated overnight. The precipitated PHB was collected by Centrifugation. The precipitated PHB was used to estimate the wet cell weight (WCW in g/ml) and dry cell weight (DCW in g/ml). (Robert, R., & Iyer, P. R. 2018)



### PHB accumulation

The algae cultures were centrifuged at 10000rpm for 5mins. to obtain cell pellet. Dry weight of PHB extracted - 0.03(g/ml) whereas Wet cell weight - 0.05(g/ml)

$$\text{PHB accumulation (\%)} = \frac{\text{Dry wt. of PHB extracted (g/ml)}}{\text{WCW (g/ml)}} \times 100$$

$$\text{PHB accumulation (\%)} = 60\%$$

### Optimization using Response Surface Methodology

The factors taken for Response Surface Methodology are PH (A), Temperature (B) and Substrate fed concentration. The statistical software package, Design-Expert 6.0.10\_ was used for regression analysis of the experimental data and also to plot the response surface graphs. Analysis of variance (ANOVA) was used to estimate the statistical parameters. The second order polynomial equation was employed to fit the experimental data. To optimize the level of each factor for maximum response ‘‘Point Optimization’’ process was employed. The combination of different optimized parameters, which gave maximum response, i.e. maximum PHB yield was tested experimentally to see the validity of the model.

**Table 1:**  
**ANOVA for Quadratic model**

Response 1: PHB

Source	Sum of Squares	df	Mean Square	F-value	p-value	
<b>Model</b>	31.06	9	3.45	255.00	< 0.0001	significant
A-pH	0.0666	1	0.0666	4.92	0.0620	
B-Temperature	17.05	1	17.05	1260.17	< 0.0001	
C-Concentration	0.2628	1	0.2628	19.42	0.0031	
AB	0.0196	1	0.0196	1.45	0.2679	
AC	0.0056	1	0.0056	0.4157	0.5396	
BC	0.0225	1	0.0225	1.66	0.2382	
A <sup>2</sup>	0.5419	1	0.5419	40.05	0.0004	
B <sup>2</sup>	11.76	1	11.76	869.07	< 0.0001	
C <sup>2</sup>	0.6040	1	0.6040	44.63	0.0003	
<b>Residual</b>	0.0947	7	0.0135			
Lack of Fit	0.0947	3	0.0316			
Pure Error	0.0000	4	0.0000			
<b>Cor Total</b>	31.15	16				

**Table 2**

### Fit Summary

Response 1: PHB

Source	Sequential p-value	Lack of Fit p-value	Adjusted R <sup>2</sup>	Predicted R <sup>2</sup>	
Linear	0.0118		0.4560	0.2737	
2FI	0.9982		0.2953	-0.4362	
<b>Quadratic</b>	<b>&lt; 0.0001</b>		<b>0.9930</b>	<b>0.9513</b>	<b>Suggested</b>
Cubic			1.0000		Aliased

### Quadratic equation

Thus the mathematical regression model for PHB production fitted in terms of coded factors was obtained as follows:

$$Y (\text{PHB}) = 0.0913A - 1.46B + 0.1813C - 0.070AB + 0.0375AC - 0.075BC - 0.3588A^2 - 1.67B^2 - 0.3788C^2$$

PHB yield for different levels of the variables was predicted from the respective contour plots. Each contour curve represents an infinite number of combinations of two test variables with the other two maintained at their respective zero levels. Elliptical nature of the contour in 3D-response surface graphs depicted the mutual interactions of all the variables. (Gopi, K et al., 2014)

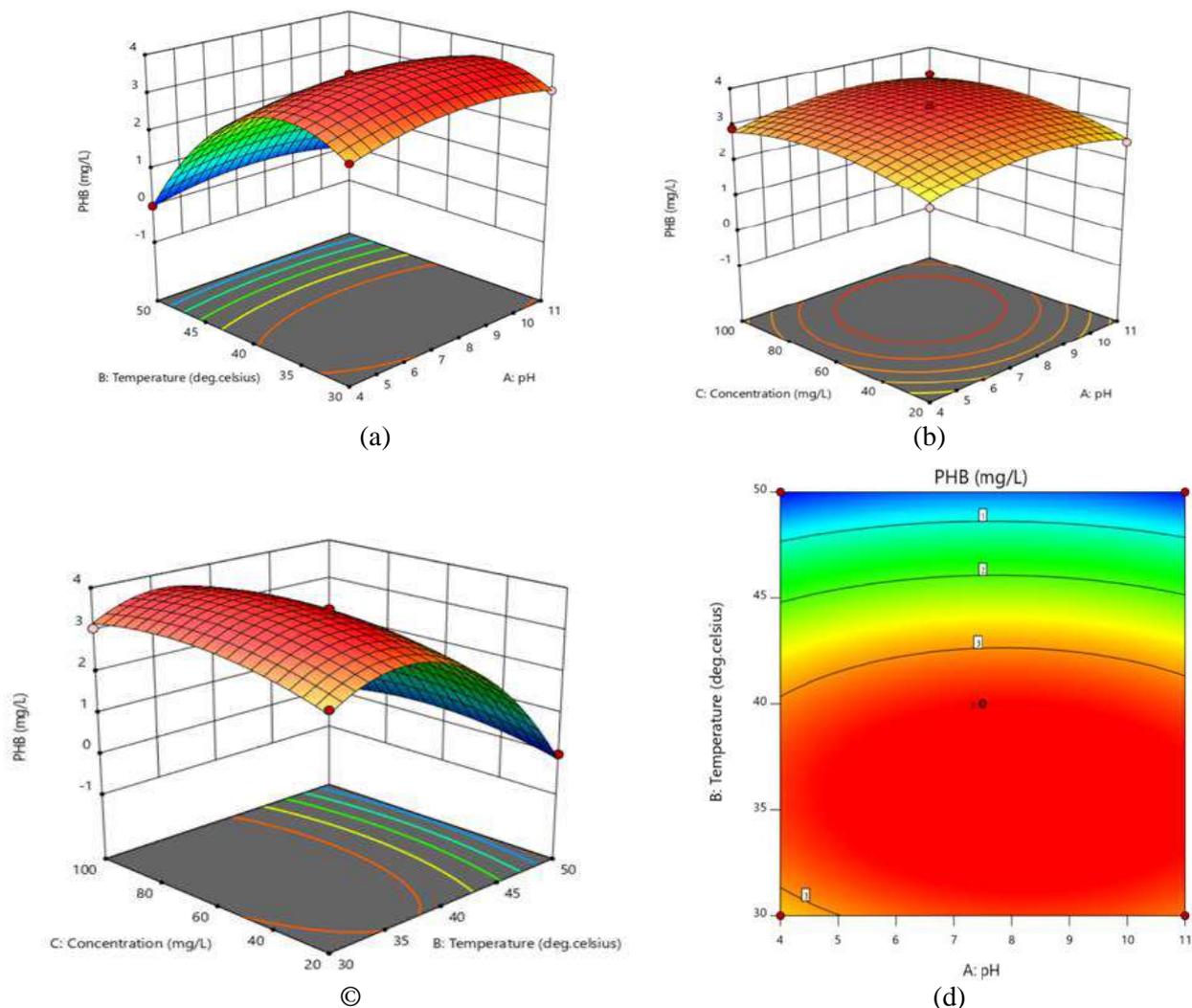
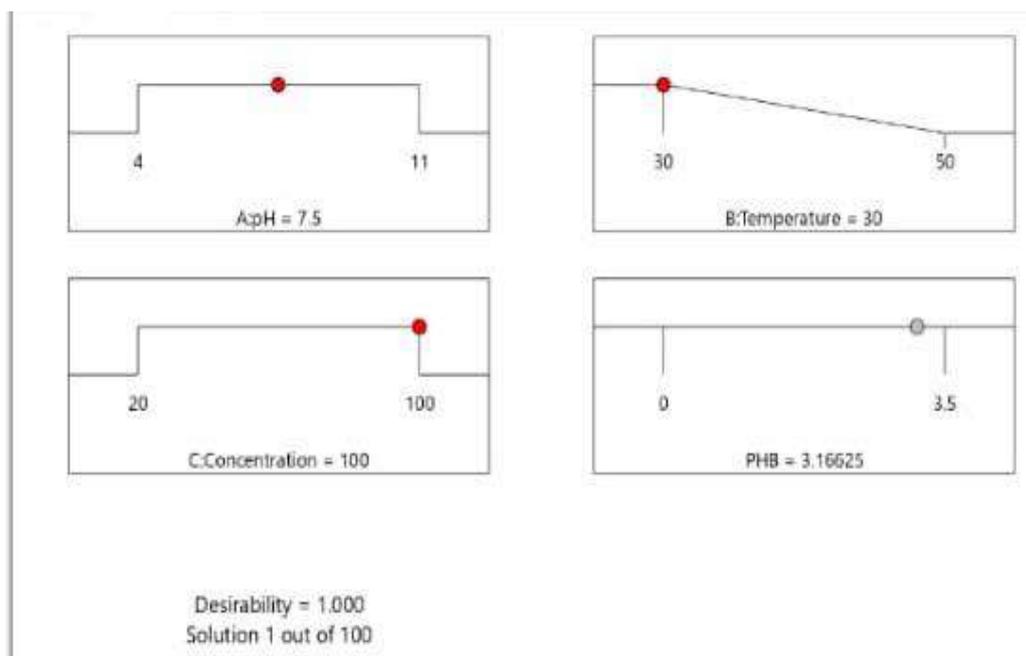


Fig: 3D response surface (a) varied pH and Temperature (b) varied pH and concentration (c) varied Temperature and Concentration (d) PHB yield variation at different pH and Temperature



The experimental result depicts that the maximum yield of PHB at pH 7.5, Temperature 30 and concentration 100 mg/ml

## RESULTS AND DISCUSSION

### Characterization of PHB

#### FTIR Analysis:

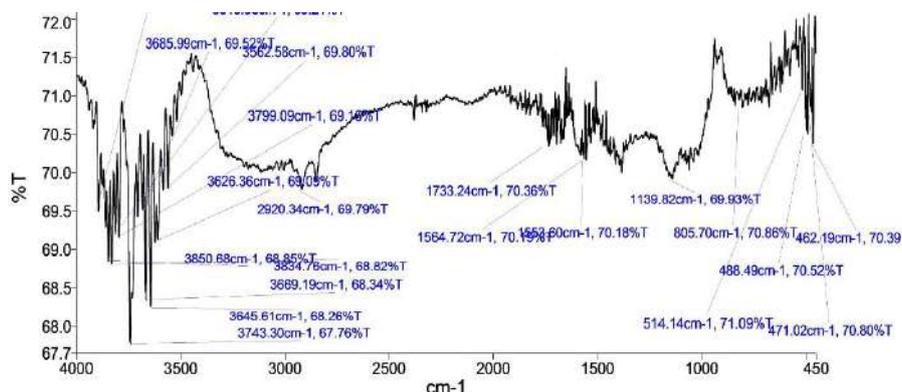


Fig: FTIR result of PHB

The FT-IR spectrum showed prominent peaks at  $1733\text{cm}^{-1}$  and  $1139\text{cm}^{-1}$ . These peaks denote carbonyl (C=O) and asymmetric C-O-C stretching vibration. Other adsorption bands obtained at 1553, 1564, 2920 and  $3626\text{cm}^{-1}$  denote the  $-\text{CH}_3$ ,  $-\text{CH}_2$ ,  $-\text{CH}$  and O-H groups respectively. The adsorption bands at 1138  $\text{cm}^{-1}$  to  $805\text{cm}^{-1}$  were consigned to C-O and C-C stretching vibration which could be attained by amorphous PHB. Almost identical peaks at 1382, 1733, 2978, 2934,  $3439\text{cm}^{-1}$  denoting the various functional groups of PHB. (Falcone DB, 2004; Khanafari, A et al., 2006)

#### TGA analysis

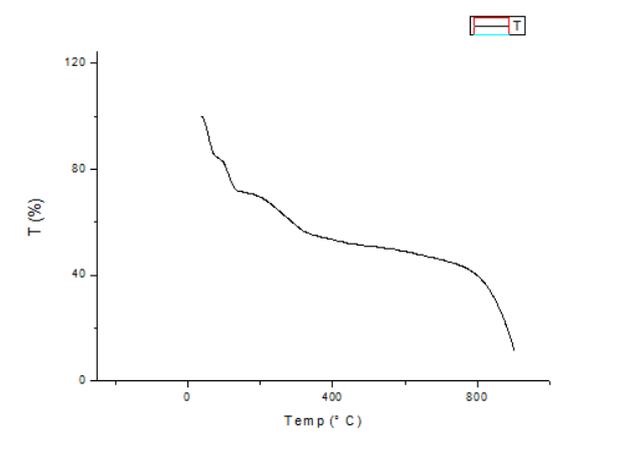


Fig: TGA result of PHB

The thermal degradation of PHB is known to occur through random chain scission reaction of the PHB ester groups to form shorter chains with carboxylic and olefinic terminal groups. The characteristic decomposition temperatures viz. initial decomposition temperatures at 2% weight loss (Tonset) and the decomposition temperature at 10% weight loss (T10) were determined directly from the TGA curve whereas the temperature of maximum rate of decomposition (Tmax) was determined with the help of the respective derivative thermogravimetric (DTG) curve of the extracted polymer. Tmax value for PHB has been found to be  $287^\circ\text{C}$ . Tmax for standard PHB has been found to be  $295^\circ\text{C}$ . (Paveshwari Sithambaranathan 2011)

## CONCLUSION

Production of Poly Hydroxy Butyrate was done from the algae *Chlorococcum Oleofaciens* and these conclusion are made: *Chlorococcum Oleofaciens* takes 20 days for their growth by utilizing the Minimal Salt medium. From the growth curve *chlorococcum oleofaciens* grows rapidly with respective culture conditions. And from the microscopic observation we could confirm that the organism was *chlorococcum oleofaciens* because it is rod shaped unicellular cyanobacteria. PHB was extracted from the culture by certain protocol and its accumulation percentage was 60%. The culture was optimized using box behnken design. The contour plots in 3D response depicted the variation in PHB yield. Characterization process like FTIR and TGA was performed. The peaks in

FTIR graph represents the various functional groups of PHB and TGA curve shows that the maximum degradation point of PHB.

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## Teachers' Competencies of Primary School Teachers of Cbse Schools of Kota City

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### ABSTRACT

Educationist all over the world have started realizing that only securing enough teachers will not do, most important is giving the right type of teachers having the right type of knowledge, skills, attitudes and competencies. Recognizing that competent teachers are key factors that will contribute to the advancement and improvement of education, the search for what makes teachers competent is ongoing. This research is an attempt to find out teachers' competencies in relation to their gender and working experience. A sample of 155 primary school teachers of CBSE schools of Kota city have been selected randomly. A self-administered questionnaire seeking administrators' responses on teachers' competencies was developed constituting 64 statements pertaining to teachers' competencies. Data was analysed using mean, S.D., t- test and One Way ANOVA. The analysis revealed that gender and working experience have significant impact on teachers' competency of primary school teacher.

**Keywords:** Teachers' Competencies, Primary School Teacher, Gender, Working Experience

### 1 INTRODUCTION

A rapid change in the world of the 21st century is being observed and our children need to be educated in a new way to survive in this new world. It is the responsibility of the educators to help the students to connect with the rapidly changing world and to face the challenges raised by it. In this new environment teachers are less of instructors and more of facilitators of information, preparing their students to develop the ability of converting knowledge into wisdom. 21st century teachers need to cultivate and maintain the child's interest and curiosity in the learning material by depicting how the learnt knowledge could be applied in the real world. They must also work towards increasing their student's motivation, which would make them lifelong learners. They should also bring in flexibility and variety in their teaching and motivate learners by providing the resources to continue learning outside the school. A competent teacher applies all these teaching skills, understands the level and nature of students and alters teaching accordingly. Competency is the ability of the teacher educators to perform these teaching events effectively (Srivastava & Bhargava, 1984). Teachers' competencies in relation to CBSE schools do not only involve different teaching skills but managerial skills and awareness regarding various guidelines issued by CBSE. In order to significantly expand their roles and responsibilities, teachers must demonstrate a high degree of professionalism in each task. Thus, the present paper is an attempt to find out whether gender and working experience have significant impact on teachers' competencies.

### 2 LITERATURE REVIEW

Singh, S. (2003) conducted a study on teaching competency of primary school teachers. The results of the study revealed that teaching competencies includes the acquisition and demonstration of the composite skills required for student teaching like introducing a lesson, fluency in questioning, probing question, explaining, pace of lesson, reinforcement, understanding child psychology, recognizing behaviour, classroom management and giving assignment. While assessing the impact of demographic variables on teachers' competencies, the researcher found different research outcomes. In a study done by Syeeda Shanavaz (2007) Male teachers were found to be more competent than female teachers and teachers' competency is not influenced by length of experiences, locality and type of management of school. In another study, Abdul et al. (2010) found that all the teachers were competent and there existed a significant relationship of gender, teaching experience and specialization with their competency, whereas, academic qualification had found no significant influence on their teaching competency. In a study done by Hamdan & Li (2010), teachers' competencies were determined through teaching skills, concern for school, concern for students and concern for self. The result indicated that all teachers were found to be competent and there were significant relationships between teaching competence and gender and between specialization and academic achievement. On the other hand, Naree Aware Achwarin R, N (2009) revealed that intervening demographic variables had no significant influence on teaching competence. Further, Das et al. (2017) revealed that there is no significant difference towards teaching competency among selected secondary school teachers with respect to personal variables like Gender, Marital Status, Educational Qualification, Type of Management and Teaching experience.

### 3 METHODOLOGY

#### OBJECTIVE OF THE STUDY

- To find out teachers' competencies of primary school teachers in relation to Gender.
- To find out teachers' competencies of primary school teachers in relation to Working Experience.

#### HYPOTHESES

H<sub>01</sub>: There is no significant difference in Teachers' Competencies in relation to their Gender.

H<sub>02</sub>: There is no significant difference in Teachers' Competencies in relation to their Working Experience.

#### DELIMITATION

- The study is limited to CBSE Primary School Teachers.
- The area of the study is confined only to Kota city of Rajasthan State.
- Only the variables- gender and working experience have been taken under consideration.

#### POPULATION

In the present study population comprises of primary school teachers teaching in different CBSE schools of Rajasthan.

#### Sample and Sampling Method

155 primary school teachers of CBSE schools of Kota city have been randomly selected. Simple random technique has been used for the purpose of data collection.

#### Survey Tool

A self-administered questionnaire including Five-point Likert type numerical scale ranging from Not at all to Very much was constructed to seek information about teachers' competencies. Information regarding teachers' competencies were sought on 7 dimensions including, planning, presentation, closing, evaluation, managerial skills, and awareness about CBSE guidelines.

#### Statistical Techniques

In this study, the researcher applied mean, standard deviations, Independent Samples t-test, and One Way ANOVA for analyzing data.

### 4 Analysis and Interpretation of Data

The analysis of data and the results have been discussed under three sections in relation to the objectives of the study.

**Objective-1** To find out teachers' competencies of primary school teachers in relation to Gender.

**H<sub>01</sub>: There is no significant difference in Teachers' Competencies in relation to their Gender.**

To test this hypothesis, independent Samples t-test was applied.

**Table-1** Comparison of Teachers' Competencies in relation to Gender

Variable	Gender	N	Mean	Std. Deviation	T Test	P Value	Result
Total Competencies	Female	118	255.00	37.281	2.107	0.037	Sig
	Male	37	270.81	47.137			

The above table shows the comparison of mean competencies of teachers in relation to their gender.

The difference between the mean competencies of female and male teachers was found to be statistically significant ( $P < 0.05$ ). The mean competencies of male teachers (270.81) was significantly higher than that of female teachers (255.00).

It implies that mean competencies of teachers vary with their gender. Thus, null hypothesis (H<sub>01</sub>) gets rejected and it is accepted that there is a significant difference in Teachers' Competencies in relation to their Gender.

**Objective-2** To find out teachers' competencies of primary school teachers in relation to Working Experience.

**H<sub>02</sub>: There is no significant difference in Teachers' Competencies in relation to their Working Experience.**

To test this hypothesis One Way ANOVA was applied. Post Hoc Tukey test was also applied to conduct pair wise comparisons.

**Table-2** Comparison of Teachers' Competencies in relation to Working Experience

Variable	Experience	N	Mean	Std. Deviation	F Test	P Value	Result
Total Competencies	0-5 Years	36	209.94	31.643	61.846	0.000	Significant
	5-10 Years	63	272.32	29.555			
	>10 Years	56	274.93	29.677			
	Total	155	258.77	40.263			

The above table shows the comparison competencies of teachers in relation to their working experience. The difference among the three experience groups was found to be statistically significant ( $P < 0.05$ ), showing that competencies of teachers change significantly with their working experience. The mean competencies of teachers having more than 10 Years of experience (274.93) was found to be the highest and it shows the lowest score for teachers having less than 5 years of experience (209.94).

#### Post Hoc Tukey Test

Variable	Pairwise comparisons		Mean Difference	Std Error	P Value	Result
Total Competencies	0-5 Years	5-10 Years	-62.373	6.287	0.000	Sig
		>10 Years	-64.984	6.428	0.000	Sig
	5-10 Years	>10 Years	-2.611	5.527	0.884	Non Sig

Based on the test, a statistically non-significant ( $P > 0.05$ ) difference was found in the pair 5-10 Years & >10 Years while, competencies of teachers having less than 5 years of experience significantly differs than that of teachers having more 5 or more years of experience.

Thus null hypothesis ( $H_0$ ) gets rejected and it is accepted that there is a significant difference in Teachers' Competencies in relation to their Working Experience.

## 5 CONCLUSION

Teachers are the most critical component of any system of education. How well they teach depends on their demographic factors, motivation, training, aptitude and a mass of other factors, not the least of these being the environment and management structures with in which they perform their role. Based on findings, the results of the study revealed Teachers' Competencies get affected by their Gender and Working Experience. Gender wise, the findings show that male teachers were found to be more competent than female teachers. This finding is in line with other research (Hamdan & Li, 2010; Abdul et al., 2010; Syeeda Shanavaz, 2007; Jayakanthan, 2003). Moreover, it is concluded that teachers having 5 or more years of experience showed more competence than their less experienced counterparts.

## 6 Implications of the study

The study entails following implications-

First, although the teachers in the study were found to be 'competent', still there is a need to evaluate their performance on a constant basis and based on that training programmes must be organized periodically. Moreover, emphasis should be given to weak areas with regard to competencies; however, reinforcement should also be provided with respect to those developed and learned skills.

Third, teachers who were found more competent may instruct and train peers who need assistance. This way, it would be cost saving to enhance competencies among teachers, and the practice may extend a stronger bond among teachers.

Further, reasons should be identified behind the difference in competencies of female and male and more research is required to be done to find solutions to bridge the gap.

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## **Impact of Covid on Stock Market Trading in India with Special Reference to National Stock Exchange**

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### **ABSTRACT**

Covid-19 pandemic has not only affected the health of individuals around the world but also significantly impacted businesses and stock markets around the globe. In India, a lockdown was imposed in March 2020, which led to severe disruptions of all types of businesses and affected the livelihood of millions of Indians. However, the Indian Stock Market, after a knee jerk reaction post introduction of lockdown, has given handsome returns rising from a low of 7511 on Nifty 50 on 23<sup>rd</sup> March 2020 to 18604 on 19<sup>th</sup> October 2021. This paper attempts to study the impact of Covid-19 on the trading activity at NSE and revealed that the rise in stock market has come along with many retail investors and traders participating in the stock market rally during the lockdown period and also continuing post lockdown.

Keywords: Livelihood, Covid-19, Stock Markets, Nifty 50

### **1. INTRODUCTION**

Covid 19 pandemic which started in Wuhan, China in the last week of December 2019, has caused more than 55 lakh deaths and infected more than 32.8 cr people around the world. Covid 19 is an abbreviation used for SARS-COV-2 virus which mainly causes pneumonia of an unknown cause in humans. The World Health Organization (WHO) declared Covid 19 as a pandemic on February 11, 2020. This pandemic has led to breakdown of health and economic infrastructure around the world. No vaccines were available against this disease in February 2020, when it was first declared as a pandemic by WHO. Due to this, the only solution available to countries around the world was an imposition of strict lockdowns wherein people were forced to remain at home to prevent further spread of this virus.

In India, as of January 2022, more than 3.73 crore people are infected with this deadly virus. India also recorded 4.86 lakh deaths due to Covid 19. (Mygov.in). The Indian government, under the leadership of our Prime Minister Narendra Modi, announced a strict nationwide lockdown on 24<sup>th</sup> March 2020. The first lockdown was announced for 21 days till 13<sup>th</sup> April 2020. This lockdown was further extended from 14<sup>th</sup> April 2020 to up till 03<sup>rd</sup> May 2020.

Covid-19 pandemic has not only affected the health of individuals around the world but also significantly impacted businesses and stock markets around the globe. In India, lockdown led to severe disruptions of all types of businesses and affected the livelihood of millions of Indians. The ever-bustling Indian cities of Mumbai and New Delhi came to a screeching halt in the lockdown with a total ban on people venturing outside their houses, except for emergency medical needs. Globally and in India all economic activity came to a halt and Brent crude futures which are an indicator of economic activity all over the world, even became negative which will be part of the economic history. Covid -19 has affected India in a major way with impact ranging from health to economic development and also stock market.

In India, National Stock Exchange (NSE) is the leading stock exchange which accounts for 98-99% of derivatives trading and is one of the main exchanges dealing in equity derivatives ranking 1st in index options across the world as per data released by World Federation of Exchange (WFE) in 2020. The entire global economy runs in a well-coordinated and synchronized manner, inter-dependent and any disruption or financial shock in a single economy leads to massive financial disruption across the globe. Covid-19 was once such financial shock which impacted the stock market around the world. This paper attempts to study the impact of Covid-19 on the trading activity at NSE.

### **2. OBJECTIVES OF THE STUDY**

- i) To study the increase in demat accounts post lockdown.
- ii) To study the increase in cash market volumes at NSE in post Covid period.
- iii) To analyze the reason behind the increase in trading activity in the post covid period.

### 3. REVIEW OF LITERATURE

Very few studies are available analyzing impact of Covid 19 on the stock market as it is a recent event.

Baker, S. R., Bloom, N., Davis, S. J., Kost, K. J., Sammon, M. C., & Viratyosin, T. (2020) observed that No previous infectious disease outbreak, including the Spanish Flu, has impacted the stock market as forcefully as the COVID-19 pandemic. In fact, previous pandemics left only mild traces on the U.S. stock market. We use text-based methods to develop these points with respect to large daily stock market moves back to 1900 and with respect to overall stock market volatility back to 1985. We also evaluate potential explanations for the unprecedented stock market reaction to the COVID-19 pandemic. The evidence we amass suggests that government restrictions on commercial activity and voluntary social distancing, operating with powerful effects in a service-oriented economy, are the main reasons the U.S. stock market reacted so much more forcefully to COVID-19 than to previous pandemics in 1918-19, 1957-58 and 1968.

He, P., Sun, Y., Zhang, Y., & Li, T. (2020) used an event study approach to empirically study the market performance and response trends of Chinese industries to the COVID-19 pandemic. The study found that transportation, mining, electricity & heating, and environment industries have been adversely impacted by the pandemic. However, manufacturing, information technology, education and health-care industries have been resilient to the pandemic.

Onali, Enrico. "COVID-19 and stock market volatility." Available at SSRN 3571453 (2020) investigated the impact of COVID-19 cases and related deaths on the US stock market (Dow Jones and S&P500 indices), allowing for changes in trading volume and volatility expectations, as well as day-of-the-week effects. The results, based a GARCH(1,1) model and data from April 8, 2019 to April 9, 2020, suggest that changes in the number of cases and deaths in the US and six other countries majorly affected by the COVID-19 crisis do not have an impact on the US stock market returns, apart from the number of reported cases for China. However, there is evidence of a positive impact, for some countries, on the conditional heteroscedasticity of the Dow Jones and S&P500 returns. VAR models suggest that the number of reported deaths in Italy and France have a negative impact on stock market returns, and a positive impact on the VIX returns. Finally, Markov-Switching models suggest that at the end of February 2020 the magnitude of the negative impact of the VIX on stock market returns increased threefold.

Al-Awadhi, A. M., Alsaifi, K., Al-Awadhi, A., & Alhammadi, S. (2020) investigated whether contagious infectious diseases affect stock market outcomes. As a natural experiment, we use panel data analysis to test the effect of the COVID-19 virus, which is a contagious infectious disease, on the Chinese stock market. The findings indicate that both the daily growth in total confirmed cases and in total cases of death caused by COVID-19 have significant negative effects on stock returns across all companies.

Anh, D. L. T., & Gan, C. (2020) The study confirms the adverse impact of the daily increasing number of COVID-19 cases on stock returns in Vietnam. The study also discloses that the Vietnam stock market before and during the nationwide lockdown performed in opposing ways. Though COVID-19 pre-lockdown had a significant, negative impact on Vietnam's stock returns, the lockdown period had a significant, positive influence on stock performance of the entire market and the different business sectors in Vietnam. The financial sector was hardest hit on the Vietnam stock market during the COVID-19 outbreak.

Ozili and Arun (2020) analyze the impact of COVID-19 on the global economy; the period of the study started from the beginning of 2020 to March when COVID-19 spread to most of the countries. The study used the major policies of the government like fiscal monetary policy, public health measure, and restrictive measures that were adopted during the period of the study. The empirical investigation used by the author to find the impact of the social distancing policies on the economic activities and stock market indices of the country found that restriction on internal movement and higher fiscal policy spending had a positive impact on the level of economic activities, although the increasing number of confirmed coronavirus cases did not have a significant effect on the level of economic activities.

Topcu, M., & Gulal, O. S. (2020) investigate the impact of COVID-19 on emerging stock markets over the period March 10 – April 30, 2020. Findings reveal that the negative impact of pandemic on emerging stock markets has gradually fallen and begun to taper off by mid-April. In terms of regional classification, the impact of the outbreak has been the highest in Asian emerging markets whereas emerging markets in Europe have experienced the lowest. We also find that official response time and the size of stimulus package provided by the governments matter in offsetting the effects of the pandemic.

#### 4. HYPOTHESIS

i) Hypothesis (H0): There has been a significant increase in number of demat accounts post Covid 19 lockdown in India.

Hypothesis (H1) There is no significant increase in number of demat accounts post Covid 19 lockdown in India.

ii) Hypothesis (H0): There has been a significant increase in cash market turnover in post Covid 19 lockdown in India.

Hypothesis (H1) There is no significant increase in cash market turnover in post Covid 19 lockdown in India.

#### 5. RESEARCH METHODOLOGY

The data for study has been collect from various sources such as NSE, CDSL and NSDL website. The researchers have referred to various research journals to understand review of literature. The data is analysis by using CAGR and trend analysis.

#### 6. Data Analysis and Interpretation

**Table 1 - Business Growth in Cash Market Segment (In Cr)**

Month	Turnover	Month	Turnover	Month	Turnover
Apr-19	33690	Apr-20	50322	Apr-21	70036
May-19	35827	May-20	52656	May-21	78396
Jun-19	31370	Jun-20	61395	Jun-21	70668
Jul-19	30992	Jul-20	58631	Jul-21	62653
Aug-19	33682	Aug-20	61074	Aug-21	62923
Sep-19	37395	Sep-20	55606	Sep-21	68525
Oct-19	37647	Oct-20	52328	Oct-21	81361
Nov-19	41713	Nov-20	66864	Nov-21	66982
Dec-19	32475	Dec-20	62480	Dec-21	53597
Jan-20	35015	Jan-21	72472		
Feb-20	39838	Feb-21	81373		
Mar-20	47917	Mar-21	66617		
<b>Avg Turnover</b>	<b>36463</b>		<b>61818</b>		<b>68349</b>

Source : NSE

Table 1 depicts the increase in cash market volumes in financial year 2019-20(Pre Covid) and subsequent two financial years. It shows that the average cash market volume was Rs. 36463 cr in 2019-20 which increased to Rs. 61818 cr in 2020-21. Thus, average cash market turnover has increased by 70% in 2020-21 vis-à-vis 2019-20. In 2021-22, the average cash market volume recorded was Rs. 68349 crs. This is an increase of 87% over 2019-20.

**Table 2 – Growth in Demat Accounts from FY from March 2015 to March 2021**

Month -Year	CDSL			NSDL			TOTAL		
	No. of Accounts (in lakh)	No. Of Accounts (Change from previous Year)	% Increase in Numbers	No. of Accounts (in lakh)	No. Of Accounts (Change from previous Year)	% Increase in Numbers	No. of Accounts (in lakh)	No. Of Accounts (Change from previous Year)	% Increase in Numbers
Mar-15 (*April-15 for CDSL)	96.83	-	-	137.08	-	-	233.91	-	-
Mar-16	107.91	11.08	11.44%	145.66	8.58	6.26%	253.57	19.66	8.40%
Mar-17	122.67	14.77	13.68%	155.8	10.14	6.96%	278.47	24.91	9.82%
Mar-18	148.40	25.73	20.97%	170.92	15.12	9.70%	319.32	40.85	14.67%
Mar-19	173.86	25.46	17.16%	185.22	14.30	8.37%	359.08	39.76	12.45%
Mar-20	211.82	37.96	21.83%	196.85	11.63	6.28%	408.67	49.59	13.81%
Mar-21	334.38	122.56	57.86%	216.89	20.04	10.18%	551.27	142.60	34.89%

(#Source-CDSL & NSDL Websites)

Table 2 depicts the growth in number of demat accounts from Mar-15 to Mar 21. It shows that there has been an increase of 34.89% in the number of demat accounts from 2019-20 vis-vis 2020-21.

**This rise in cash market turnover and demat accounts can be attributed to the following:**

- i) The Covid 19 induced lockdown forced scores of people to work from home. Many people also became unemployed. This has led people to search for an alternate source of income which can be earned from home and they found stock market as a perfect platform to earn extra income from home.
- ii) Most of the accounts that were opened belong to young investors in the age group of 25-40 years. These young investors are generally more adaptive to technology and have an urge to learn and share knowledge about the stock market trading
- iii) The process of opening of demat account is much easier with brokerages opening up accounts within 24 hrs with the help of e-KYC.
- iv) Most retail participants view options trading as an easy way to speculate in the market and with the introduction of weekly options expiries it has become a popular tool to take short term or intra day exposure in the stock market.
- v) In India, the broking space has shifted from traditional brokers to discount brokers. Discount brokers offer many innovative schemes such as brokerage per trade, easy to use online trading platform, less maintenance charges to attract young investors who find them attractive and trade with them for quick short-term profits.
- vi) Post Covid, major central banks like the Federal Reserve and European Central Bank have adopted easy monetary policy by printing more dollars in order to support their people and businesses adversely affected by the pandemic. This has led to low interest rates and traditional means of savings like Fixed Deposits offer very less interest rates. This is also one of the major factors attracting investors to stock market who are looking for alternative investment product to increase their returns.
- vii) In March 2020, markets all over the world, including India, crashed due to outbreak of Covid and Lockdown. In India, Nifty 50, fell to level of 7509 from 12400 in Jan 2020. This made the equity valuations very attractive and many investors poured in their capital in the stock market to take advantage of this downfall. Post March 2020, the stock markets rallied from 7509 to 18600 in October 2021 and this phenomenal rise lured more and more Indians who were at home in strict lockdown situation to invest in the stock markets.
- viii) Covid 19 lockdowns have normalised work from home culture which has in turn led to deeper internet penetration among the Indian households. This has made equity trading and investing much easier compared to earlier.
- ix) In India, SEBI has undertaken various regulatory measures on March 20, 2020 “to ensure orderly trading and settlement, proper risk management, price discovery and maintenance of market integrity”. This has ensured smooth trading without any major collateral damage to the financial ecosystem during the high volatile pandemic period in which many new retail investors entered the stock market. SEBI has also conducted various awareness campaign such as publication of social advertisement in major newspapers to raise awareness among retail investors.

## **7. LIMITATIONS**

This study is restricted to cash market turnover at NSE only. The cash market turnover of BSE is not studied. The turnover of equity F&O is should be studied to get an overall picture of trading activity post Covid.

## **8. CONCLUSION AND SUGGESTIONS**

In the present study we analysed the impact of Covid-19 pandemic on the stock market trading in India by using secondary data from National Stock Exchange (NSE), Central Depository Limited (CDSL) and National Stock Depository Limited (NSDL). The study compared the cash market turnover pre-pandemic and post pandemic and the growth in number of demat accounts in the five years preceding the pandemic period. The results show that average cash market turnover has increased by 70% in 2020-21 vis-à-vis 2019-20. In 2021-22, the average cash market turnover recorded was Rs. 68349 crs. This records an increase of 87% over 2019-20. Similarly, there has been an increase of 34.89% in the number of demat accounts in 2020-21 vis-à-vis 2019-20. In brief, the Covid-19 pandemic and subsequent imposition of lockdown has positively impacted the stock market activity by registering a growth in number of demat accounts and increase in cash market turnover. This paper tries to prove this analogy by presenting simple data points.

Although Covid 19 has dented the economies of almost all the countries around the world, there has been an increase in stock market trading by retail investors in India as per the results depicted by this paper. It is therefore suggested that the stock market regulators in India should run awareness campaigns to ensure that new breed of retail investors do not get lured by short term speculation and instead focus on adopting a long-term approach to investing in good quality stocks to ensure that their capital appreciates over a longer time frame. Retail investors should avoid taking tips from unsolicited advisors and social media to avoid getting their hands burned. New retail investors who have entered the stock market post March 2020 have seen a one-way bull run and not experienced any significant downfall. Such retail investors should carefully study the previous bear markets and should be aware that such high returns are not possible every year, Therefore, they should carefully study the company fundamentals and invest in the stock market.

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## **A Study on Advertisement Appeals and its Impact on Consumer Buying Behavior with Special Reference to Fast Moving Consumer Goods Sector in Mumbai**

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### **ABSTRACT**

Advertising is an essential thing of commerce and management. Advertising is a capacity of conversation with the users of a product or service. Advertising is continually present, although human beings might also no longer be aware of it. In cutting-edge world, marketing uses each possible media to get its message through. It does this via television, print (newspapers, magazines, journals, etc.), radio, press, internet, direct selling, hoardings, mailers, contests, sponsorships, posters, clothes, events, colours, sounds, visuals, and even humans (endorsements). Advertising appeals are communication methods that advertising and selling consultants use to grab interest and persuade individuals to shop for or act. Fast Moving Consumer Goods (FMCG) are merchandise that is offered rapidly and at a distinctly low cost. Examples include non-durable family items such as packaged foods, beverages, toiletries, over-the-counter drugs, and other consumables. Many fast-moving purchaser goods have a quick shelf life, either as a result of excessive customer demand or as a result of quickly deterioration. Some FMCGs, such as meats, fruits, vegetables, dairy products, and baked goods are distinctly perishable. Other goods, such as pre-packaged foods, soft drinks, candies, and toiletries have excessive turnover rates. Sales are from time to time influenced through holiday and/or seasonal durations and also by using the reductions offered. The packaging is vital for FMCGs. The business enterprise no longer solely has to be acquainted with the consumer, brands, and logistics, but also, it has to have a sound grasp of packaging and product promotion. The packaging has to be both hygienic and customer-attracting. Logistics and distribution structures frequently require secondary and tertiary packaging to maximize efficiency. Unit or major packaging protects products and extends shelf lifestyles while providing product records to consumers. The profit margin on FMCG products can be fantastically small; however, they are generally offered in massive quantities; thus, the cumulative earnings on such products can be substantial. This research paper will enable the researcher to understand the appeals of advertisement and its impact on consumer buying behaviour through hypothesis testing.

**Keywords:** FMCG Sector, Advertisement Appeals, Food, Packed Goods

### **INTRODUCTION**

In traditional times, Advertising was primarily used to sell products, and in the current scenario, advertising is also used to build brands, create a reputation, and much more. Advertising can be a one way or a two communication that employs that includes celebrity sponsored generalized messages to promote a product, service, or an idea. Sponsors of marketing and advertising are usually businesses wishing to promote their merchandise, such as their products or services. Advertising can influence consumers, manipulate and change the mind-sets of consumers. Advertising can be done for private labels as well as national products. Advertising includes a variety of mass media along with other media such as newsletters, newspapers, magazines, television, and radio, out of home (transit) and marketing through direct mail which can be considered as personal advertising or One-on-one advertising; and new emerging media such as search results, blogs, social media, websites, or textual content. Advertising also plays an influential role in creating a brand out of a product or a service, which can increase brand awareness, brand reputation, and brand image, which will ultimately increase the recall value in consumers' minds.

### **Three main segments of FMCG**

Fast-moving client objects (FMCG) is the fourth greatest area in the Indian economy. There are three essential segments in the vicinity – meals and beverages, which account for 19 percent of the sector; healthcare, which cash owed for 31 percentage of the share; and household and personal care and the rest of the 50% shared has be owed.

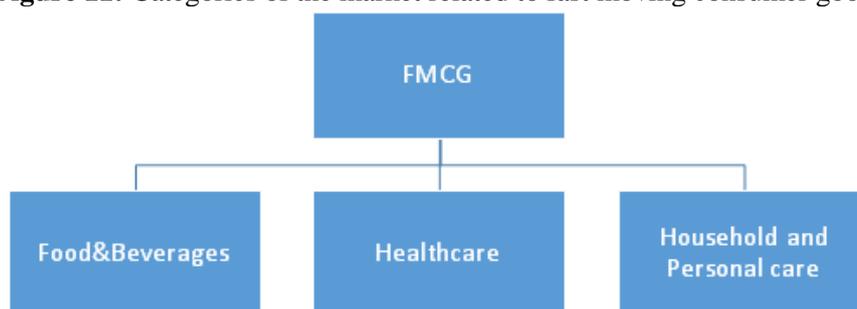
FMCG market has been forecasted to improve its worth to more than 10 percent. As per the reports, “FMCG's urban phase grew by approximately 8 percent, whereas its rural phase grew 5 percent in in the year 2019” because of the increase in the rural consumption, increase in the income of rural consumers and less inflation affecting on people's purchasing power.

Rural segment contributes to about more than 45 percent which makes them the larger contributor in the economy. The rural consumers have had a huge demand for the branded products and services which have led the leading manufacturing companies to enhance their produce. The city phase accounted for an earnings share of fifty-five percent of the established earnings recorded with the FMCG quarter resource in India.

In the long term, the analysts have written various research papers in which they have advised the FMCG companies to opt for cost-effective management, which will decrease the amount of money they spend currently. The region witnessed a healthful FDI inflow about 16.29 US Billion Dollars significant from March 2020. There has been considerable growth in the companies' investments made in the FMCG sector to enhance their products in a particular product such as "Vegetable Oil, Toiletries, Sanitation products, and other products as well."

The consumer market has been changing considerably, and the consumer behavior towards purchasing FMCG products are too. Many factors drive consumer behaviors, which have to take into account to enhance their sales. The social infrastructure is the primary concern of the companies in the current scenario, primarily on the medium and small scale enterprises, education sector, and even the health care sector played a significant role in the report of the Union Budget of the year 2019. The rural consumers have witnessed an increase in their disposable income, and specific initiatives have been taken to upgrade this particular sector. The rural sector of India has always been one of the key sectors for the FMCG market to flourish in. However, the companies have to make a lot of effort to establish themselves in the rural sector, initiatives for which have been taken. The consumer behavior is one such topic to be analyzed to understand the impact of FMCG sector and the advertisements pertaining to it.

**Figure 11:** Categories of the market related to fast moving consumer goods



Source: Created by the Author

- **Food and Beverages**

It contributes to 19 proportion of the sector. This segment includes all the processed food. The food and beverage industry is an ever-growing industry. "According to the Indian Council of Agricultural Research (ICAR), the total rate of Indian meal processing business enterprise is predicted to contact USD 194 billion by using 2015 from a price of USD 121 billion in 2012". Packaged ingredients part is anticipated to boost up to 9% annually to come to be a considerable amount of six lakh crore rupee business by the year 2029 in the particular areas of such as "dairy products, snack business, and the processed meat business are some of the products that will boost up" as by the reports of CII-Mckinsey. In the coming four to five years, the beverage industry will supposedly move upwards and reach 2,500 crores; this data has been taking from the "World Tea and Coffee Expo 2013". The companies nowadays are also concentrating on branding their products, which has proved to be very attractive from the consumer's perspective. The soft drink market has also anticipated growth in the current years. The FMCG market has had many contributions from the rural areas, making it one of the essential sectors to be looked into because a massive profit has been generated from this particular sector.

- **Healthcare**

It contributes to 31 percent of the sector. This section consists of OTC products and ethics.

- **Household and Personal Care**

The sector contributes up to more than 50 percent of the entire FMCG sector. The products such as hygiene products and dental health products are the important parts of the care.

The cloth wash market dimension is estimated to be USD 1 billion, household cleaners to be USD 239 million, with artificial detergents' production at 2.6 million tonnes. The demand for detergents has been creating regularly at an annual make a more significant rate of 10 to 11% at some stage in the past five years.

With the alternate lifestyles, prolonged disposable incomes, more considerable product choice, and availability, people turn into more extraordinary alerts about personal grooming. As a consequence, the segment is expected to take off in the coming years. The oral care market can be segmented into toothpaste-60%; toothpowder-23%; toothbrushes – 17%.

#### **Problem in hand**

In the current instructive observation, the fast-moving patron desirable industry will benefit by way of appreciation patron conduct and understand which advertisement appeals to be used to persuade the customer to amplify their sales. Fast-moving Consumer Good Industry is one of the very best Gross Domestic Product (GDP) increasing sectors. While appreciation commercial enchantment and it's have an impact on client buying behaviour is vital for an FMCG business enterprise to accomplish its vision.

#### **OBJECTIVES**

- To study the growth and development of the sector that is based on the FMCG products.
- To find out the relationship between advertising and sales in FMCG sector.
- To compare the productivity and performance of people in FMCG sector between different companies.
- To evaluate the factors contributing to Consumer Buying behaviour.
- To suggest measures to improve the sales of FMCG sector through advertisement appeal.

#### **SCOPE OF RESEARCH WORK**

Research in any challenge of inquiry has four purposes, i.e., describing, explaining, and predicting phenomena, and in the end, controlling events.

- **Describing and explaining**

Research is involved with obtaining knowledge, establishing facts, and growing new methods.

- **PREDICTION**

The phrase prediction in research is termed to be called a hypothesis, which competencies that all unambiguous statements might also be a hassle to differ from the proper search for work or some rejection in the lookup work. In research, the hypothesis is drawn to understand the lookup's acceptance or rejection, which will help the researcher conclude the lookup work carried out in theories or generalization, considering pretty a quantity situation. The predictions or hypothesis helps to arrive at an assumption that given this scenario, then this is probably to show up on the research.

- **CONTROL**

The word manipulates outcomes from our expertise, which acts on the speculation as worthwhile verifications. The period manipulation helps the researcher examine the real troubles and prerequisites in a sensible way toward the research, which allows it to shape the surroundings of business. The research about exterior variables, if understood correctly, will help the organization to manipulate the inner things to do that suit the activity of an organization.

The time duration scope relates to the significant element of the research, which depends on the theme's interpretation to the readers who learn about the study. There are a lot of speculation considering the advertising industry and its connectivity with the FMCG sector in India.

**Following are the scope that has been incorporated by using the researcher, which are as follows:**

- Advertising Appeals
- Consumer Buying Behaviour and FMCG sector
- Productivity and Sales

#### **HYPOTHESIS**

**Null speculation No. 1** - There is no direct relationship between advertising and sales

**Alternate hypothesis No. 1-** There may also be a considerable relationship Advertising and sales.

**Null speculation No. 2-** There is no direct relationship between advertising appeals and consumer buying behaviour

**Alternate hypothesis No. 2-** There is a direct relationship between advertising appeals and purchaser buying behaviour

**Null speculation No. 3 -** There is no direct relationship of outlets closer to buyers shopping

**Alternate hypothesis No. 3-** There is a direct relationship of retailers in the direction of buyers shopping.

### CONCLUSION

The most important reason or the purpose of this learning is to understand the commercial enchantment and its impact on patron shopping for behaviour with different reference to fast transferring customer items in Mumbai. Quick shifting consumer items enterprise is a necessary enterprise as it contributes to the country's financial increase. This study may also assist in grasping patron behaviour, which will help the advertisers of the FMCG agencies promote following their goal audience.

The time length speculation is ought to in lookup work, which a researcher has to reflect on consideration as it's the quintessential assumption to take appear at the validity of the lookup work. On the other hand, the hypothesis has to be examined, the utilization of vary of steps and strategies as a place of tips to get the gorgeous outcome.

### REVIEW OF LITERATURE

- **Calfee J Ringold D(1994)** is his learn about "The 70% Majority: Enduring Consumer Beliefs about Advertising" stated that preponderance of 70% humans in the world has now not changed a tad bit about advertising and how legendary and false commitments are made by using the commercial creators. Even in the aggressive commercial era, the customers are very nicely aware of giving their affirmation closer to the suitable product/services. The entire commercial gallant is established on the final 30% of the world's population, which satisfies the whole advertising and marketing business.
- **Chakravarthi Narasimhan et al. (1996)**, in their study "Promotional Elasticity and Category Characteristics," referred to that the relationship between product class characteristics and revenge manufacturer promotional elasticity inside the category. There have been only three kinds of promotion and seven types of features. The effects indicated that promotional elasticity was higher in information for classes with comparatively less variety of brands. Higher penetration into the market and a higher propensity to the warehouse has been witnessed.
- **Ronald E. Goldsmith et al. (1999)**, in their find out about "Fashion innovativeness and self-concept: A replication," noted that the consequences of a survey of 281 women in Florida. Fifteen adjectives were used as pairs of the self-concept of Malhotra's to measure their self-image through scale. A self-report scale which is valid and dependable through scale are measured their trend innovativeness; for reason, figuring out the consumers that mostly buy new fashions majorly when they launch in the market. Out of certain tests, T-tests are the mean ratings on the adjective of self-image pairs between 251 late adopters and 30 innovators. Karl Pearson's correlation was also performed on this research. The result of both T-Test and Pearson's Correlation confirmed that the fashion innovators explained themselves to be more uniquely as umpteen comfortable, different than the later adopters. The effects had been pretty consistent with a posted study of university students, giving self-belief to this approach to profiling fashion creators and giving suggestions that creating and using self-image may want to be a result giving way to appeal to necessary consumers.
- **Antreas D. Athanassopoulos (2000)**, in her learn about "Customer Satisfaction Cues to Support Market Segmentation and Explain Switching Behaviour," states that the clients in Greece are plenty of variety as compared to clients in other parts of the world. The customers continuously long for innovation and convenience, which the product/service carriers may also lack sometimes. The writer emphasizes Customer satisfaction as the primary ingredient to decorate any product into the market as penetration can be manageable; however, survival will become extraordinarily difficult.
- **Ahmad Jamal et al. (2001)**, in their find out about "Consumers and brands: a study of the effect of self-image congruence on brand choice and satisfaction," stated that the self-image product photo congruity (commonly acknowledged as self-image congruence) can impact the preferences of the consumers. The consumers can change their perspective towards a particular brand depending upon a lot of factors. Self-image is something that can change the attitude and beliefs on an individual towards the services offered or the products procured. It also enhances the implications for manufacturer managers to roll their brands in a beautiful way.

- **Marylyn Carrigan et al. (2001)** in their study about "The delusion of the moral client - Do ethics depend in purchase behaviour?" stated that advertising ethics and corporate social responsibility are generally controversial in nature, and years of continue research has come up to a conclusion to current disputes and challenges for entrepreneurs on the value of a socially accountable strategy to advertising activities and functioning. This paper helps in finding out that may or may not the customers care about moral behaviour and investigate the effect of correctly and terrible ethical habits on purchaser buying behaviour. Through the centre of attention team discussions, it turns into apparent that even though we are greater state-of-the-art as customers in the current scenario; there is no translation into behaviour favouring moral corporations and unethical firms are punished. The conclusion of the article is some ideas on how encouragement can be provided by the marketers to the customers for engaging them in an outstanding purchasing behaviour that favours ethical marketing.
- **Watson, Anna et al. (2002)**, in their find out about "Consumer attitudes to utility products: a patron behaviour perspective," mentioned that customer desire was one of the critical motivations underpinning the more than a few public utility privatizations of the 1980s and 1990s, along with bettering the fantastic of provider provided to consumers. This was mostly the case in electricity supply, the place a timetable for the introduction of opposition used to be protected in the original legislation. However, evidence from the enterprise regulator suggests that customers are proving reluctant to exercising choice, no matter the intensity of the furnish companies' instruction and advertising and marketing campaigns.
- **Barry J. Davies et al. (2005)**, in their find out about "Exploring the connections between visible merchandising and retail branding," noted that side theory and creating a method for mapping the relationship between branding (particularly brand recognition) and retailing and available merchandising. The facet principle and SSA software have been mainly splendid for a relationship to investigate retail branding products, services, and visual merchandising. This research stems from a clear and steady approach derived by using this technique to structure the research.
- **Kay Henderson (2005)**, in his study about "Marketing strategies for digital library services," noted how advertising and marketing strategies can be utilized in the digital library context. The creator has used the methodology of an as it should be installed advertising method, with examples of digital library purposes as an illustration of its relevance in practice. It used to be observed out Relationship advertising and marketing affords unique benefits to libraries and can be applied to a specific impact in marketing digital library services.
- **Timothy J. Richards et al. (2005)**, in their learn about "Sales Promotion and Cooperative Retail Pricing Strategies," noted that Supermarket shops make strategic pricing choices in a high-frequency, repeated sport surrounding each in procuring and selling freshly produce goods. In this text, there is some question about whether a non-cooperative equilibrium can emerge that makes margins above the aggressive level. Supermarket pricing outcomes from tacitly collusive equilibrium are supported utilizing trigger fee strategies performed in upstream markets. Upstream activities are, in turn, driven through periodic retail rate promotions. This speculation is tested using a pattern of fresh produce pricing records from 20 US grocery store chains. The consequences aid the existence of tacitly collusive non-cooperative equilibrium in upstream and downstream markets.

#### DATA ANALYSIS AND INTERPRETATION

- **Advertisement Appeals known by the consumers:**

Advertising appeals are communication techniques that marketing and advertising and marketing authorities use to seize interest and persuade humans to purchase or act. Advertisement appeals are an emotional touch to the entire advertisement. People feel connected to the advertisement because of its appeal. It is imperative to recognize which commercial appeals the customer is aware of so that the FMCG quarter can listen on developing advertisements like that.

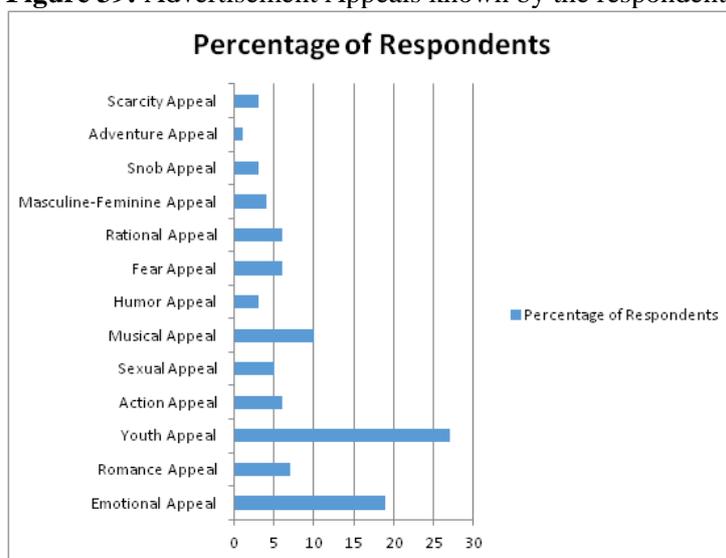
**Table 9:** Advertisement Appeals known by the respondents

Sr. No.	Advertisement Appeals known by the consumers	Number of Respondents	Percentage
1.	Emotional Appeal	100	19
2.	Romance Appeal	40	7
3.	Youth Appeal	140	27
4.	Action Appeal	30	6

5.	<b>Sexual Appeal</b>	<b>25</b>	<b>5</b>
6.	<b>Musical Appeal</b>	<b>50</b>	<b>10</b>
7.	<b>Humor Appeal</b>	<b>15</b>	<b>3</b>
8.	<b>Fear Appeal</b>	<b>30</b>	<b>6</b>
9.	<b>Rational Appeal</b>	<b>30</b>	<b>6</b>
10.	<b>Masculine-Feminine Appeal</b>	<b>20</b>	<b>4</b>
11.	<b>Snob Appeal</b>	<b>15</b>	<b>3</b>
12.	<b>Adventure Appeal</b>	<b>6</b>	<b>1</b>
13.	<b>Scarcity Appeal</b>	<b>15</b>	<b>3</b>
14.	<b>Other</b>	<b>0</b>	<b>0</b>
	<b>Total</b>	<b>516</b>	<b>100</b>

Source: Primary Data Collection

**Figure 39:** Advertisement Appeals known by the respondents



Source: Primary Data Collection

The above graph shows that 27 percent of respondents have an notion about Youth Advertisement appeal, 19 percentage of respondents have an thought about Emotional Advertisement Appeal, 10 percentage of respondents have an thinking about Musical Advertisement Appeal, 7 percentage of respondents have an concept about Romance Advertisement Appeal, 6 percent of respondents have an thinking about Action, Fear and Rational Advertisement Appeal, 5 percent of respondents have an concept about Sexual Advertisement Appeal, four percent of respondents have an thought about Masculine- Feminine Advertisement Appeal also known as Gender-based Appeal, 3 percentage of respondents have an concept about Humor, Rational and Scarcity Advertisement Appeal and 1 percent of respondents have an notion about Adventure Advertisement Appeal. The important purpose of the question is to understand the consumer understands about on hand Advertisement appeals and how many consumers can differentiate between advertisement appeals. The study is strongly structured on how a commercial enchantment affects purchaser conduct in buying FMCG merchandise for which the client knew of advertisement appeal was essential.

• **Fast Moving Consumer Goods (FMCG) brands:**

Fast-moving consumer goods (FMCG) are merchandise that is bought shortly and at a notably low cost. Examples include non-durable household goods such as packaged foods, beverages, toiletries, over-the-counter drugs, and other consumables. Brands of Fast Moving Consumer Goods (FMCG) are very essential for a customer to make a purchase. Hence, it is necessary to understand which FMCG company a client prefers.

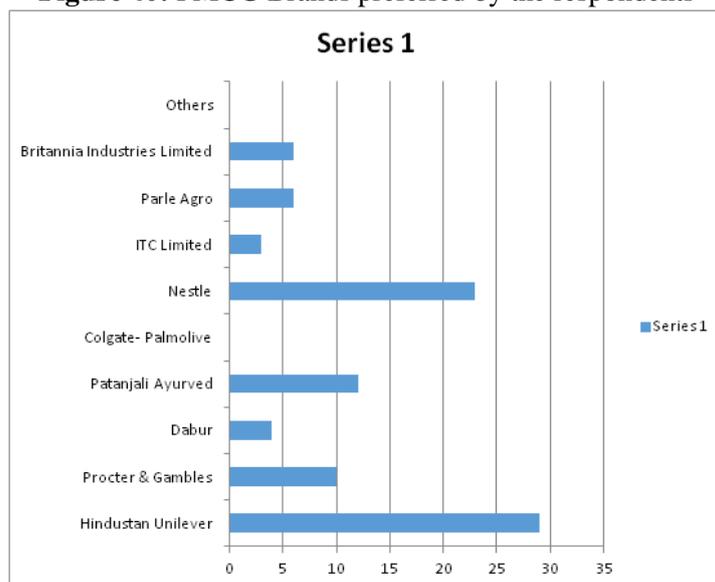
**Table 10:** FMCG Brands preferred by the respondents

Sr. No.	FMCG Brands	Number of Respondents	Percentage
1.	<b>Hindustan Unilever</b>	<b>150</b>	<b>29</b>
2.	<b>Procter &amp; Gambles</b>	<b>50</b>	<b>10</b>
3.	<b>Dabur</b>	<b>20</b>	<b>4</b>
4.	<b>Patanjali Ayurved</b>	<b>60</b>	<b>12</b>

5.	Colgate- Palmolive	40	
6.	Nestle	120	23
7.	ITC Limited	16	3
8.	Parle Agro	30	6
9.	Britannia Industries Limited	30	6
10.	Others	0	0
	<b>Total</b>	<b>516</b>	<b>100</b>

Source: Primary Data Collection

Figure 40: FMCG Brands preferred by the respondents



Source: Primary Data Collection

In the on top of graph, twenty nine percent of respondents elect their merchandise from geographical region Unilever, twenty three percent of respondents decide their merchandise from Nestle, twelve proportion of respondents decide their merchandise from Patanjali Ayurved, ten percent of respondents choose their merchandise from Procter & Gambles, seven proportion of respondents like buying their merchandise from Colgate-Palmolive, vi proportion of respondents select buying their merchandise from Parle Agro, five p.c of respondents choose buying their merchandise from Britannia Industries restricted, four percent of respondents choose buying their merchandise from Dabur, 3 percent of respondents decide upon shopping for their merchandise from ITC restricted and 1 percent of respondents decide on buying their merchandise from other FMCG industries. The fundamental cause of the query is to apprehend the consumer's desire in buying the Fast Moving Consumer Goods (FMCG) products.

**Q. Advertisements are essential for product sale.**

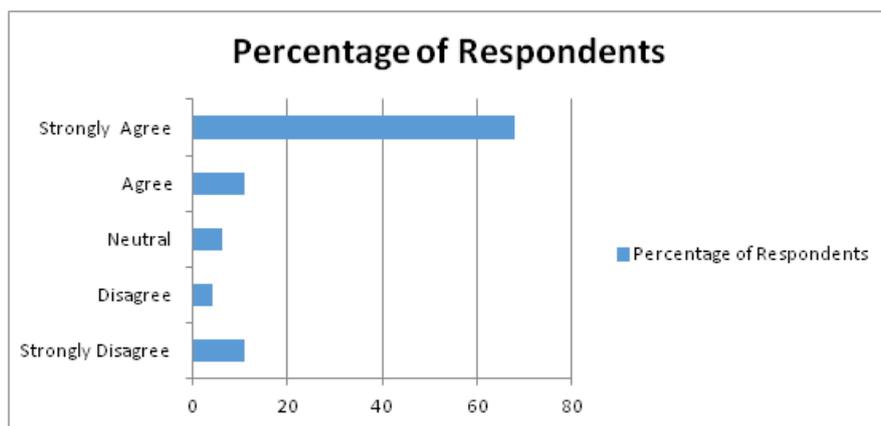
Advertisements have a huge impact on consumer's mind and the companies try to understand consumer preferences and develop an advertisement according to that so that their sales get higher.

Table 11: Opinions of Respondents on Advertisements are essential for Product Sale

Sr. No.	Advertisements are essential for product sale	Respondents	Percentage
1.	Strongly Disagree	55	11
2.	Disagree	21	4
3.	Neutral	30	6
4.	Agree	55	11
5.	Strongly Agree	355	68
	<b>Total</b>	<b>516</b>	<b>100</b>

Source: Primary Data Collection

Figure 41: Opinions of Respondents on Advertisements are essential for Product Sale



Source: Primary Data Collection

With the assistance of the higher than graph, it is taken into thought that sixty eight percent of respondents powerfully agree on the question of sales promotions area unit elementary for product sale, eleven percent of respondents Agree on the question of commercials area unit integral for product sale, eleven percent of respondents powerfully Disagree on the question of commercials area unit elementary for product sale, six percent of respondents had an impartial reaction on the question of sales promotions area unit imperative for product sale and four percent of respondents Disagree on the question of sales promotions area unit integral for product sale. The main purpose of the question is to understand the opinion of the respondents on whether the advertisements are essential for the product sale which will help the FMCG industries to understand consumer behavior and make advertisements according to that.

**Q. Advertisements persuade our purchase of products.**

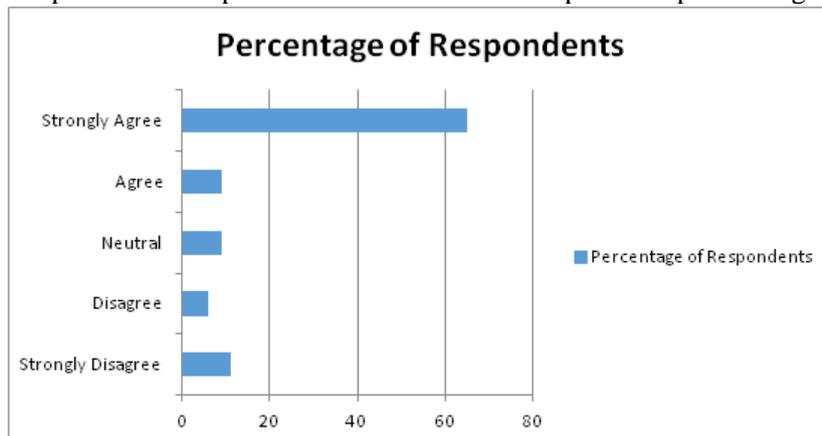
Advertisements are persuasive, and the advertisements’ primary aims are to encourage consumers to make a purchase. The advertisements are made after the understanding of the consumer’s demand. It’s another aim to change the consumers' entire perception so that the customer buys the product or the companies’ service. The another aim of the advertisement is to have an effect on the buyer to take action and change brands, attempt a new product, or remain loyal to a present day brand.

**Table 12:** Opinions of Respondents on Advertisements persuade purchasing of products

Sr. No.	Advertisements persuade our purchase of products	Number of Respondents	Percentage
1.	Strongly Disagree	59	11
2.	Disagree	29	6
3.	Neutral	48	9
4.	Agree	46	9
5.	Strongly Agree	334	65
	<b>Total</b>	<b>516</b>	<b>100</b>

Source: Primary Data Collection

**Figure 42:** Opinions of Respondents on Advertisements persuade purchasing of products



Source: Primary Data Collection

With the assistance of the higher than graph, it will be taken into thought that, sixty five percent of respondents powerfully agree on the opinion that the advertisements persuade buying of product, eleven percent of respondents powerfully disagree on the opinion that advertisements persuade buying of product, nine percent of respondents agree and are neutral on the opinion that advertisements persuade buying of product and half dozen percent respondents disagree on the opinion that the advertisements persuade buying of product. The main purpose of the question is to understand the ideology of the consumer in purchasing a particular product. Advertisements play a huge part in shaping up the consumer's buying behavior. Hence, the above question will serve the purpose of understanding whether the consumer gets persuaded by an advertisement or not.

#### Q. Has your shopping experience changed due to pandemic of COVID-19?

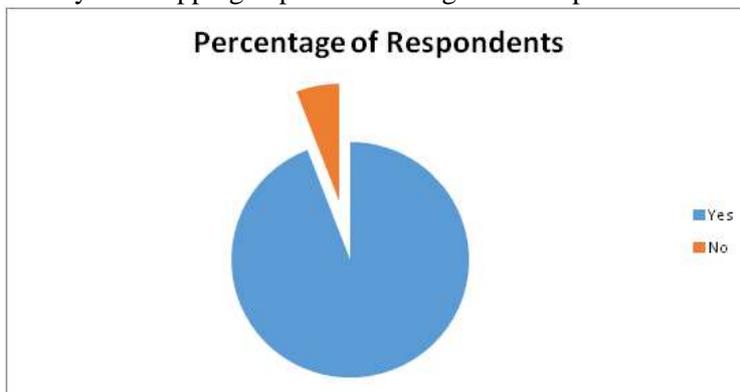
The COVID-19 pandemic in India is section of the global pandemic of coronavirus disease 2019 (COVID-19) brought about by using severe acute respiratory syndrome e coronavirus 2 (SARS-CoV-2). The first case of COVID-19 in India, which originated from China, was stated on 30 January 2020. India currently has the biggest quantity of demonstrated cases in Asia and has the third-highest wide variety of demonstrated instances in the world after the United States and Brazil. Post that, there was a complete lockdown in India which might have totally changed the perception of people towards shopping of Fast Moving Consumer Goods (FMCG). There was a lot of scarcity of FMCG items and their availability was very difficult. Hence, the consumers were facing a lot of problems in purchasing of consumer goods. There were time restrictions and availability restrictions which could have totally affected their shopping pattern.

**Table 13:** Has your shopping experience changed due to pandemic of COVID-19?

Sr. No.	Has your shopping experience changed due to pandemic of COVID-19?	Number of Respondents	Percentage
1.	Yes	497	96
2.	No	19	4
	Total	516	100

Source: Primary Data Collection

**Figure 43:** Has your shopping experience changed due to pandemic of COVID-19?



Source: Primary Data Collection

The on top of diagram indicates that ninety six percent of respondents had associate degree agreeing opinion that affirmative, their shopping for expertise has modified throughout the pandemic of COVID-19, and exclusively four percent of respondents had a disagreeing opinion that no, their shopping for journey has not modified in any respect within the course of the pandemic of COVID-19. The cause of the above question used to be to apprehend that has the purchasing trip of the consumers changed all through the pandemic of COVID-19. There was an entire lockdown in India and there had been FMCG items which are an individual's necessity that had been made handy for the consumers. People had to preserve social distancing and additionally due to the psychological impact on them, human beings started hoarding goods. So, the above question was to recognize their experience of shopping for FMCG goods in the lockdown in the course of COVID-19.

#### Q. In what format do you like to receive your Advertisement?

There are more than a few sorts of formats in which a purchaser can acquire their advertisements. For E.g.: - Newspaper advertising, Magazine advertising, Radio advertising, Television, Directories, Outdoor and transit, Direct mail, catalogs and leaflets, Online, etc. In the modern-day world, there are a lot of preferences for a client to see advertisements and get persuaded by way of them. As radio and television is no longer only the choice in

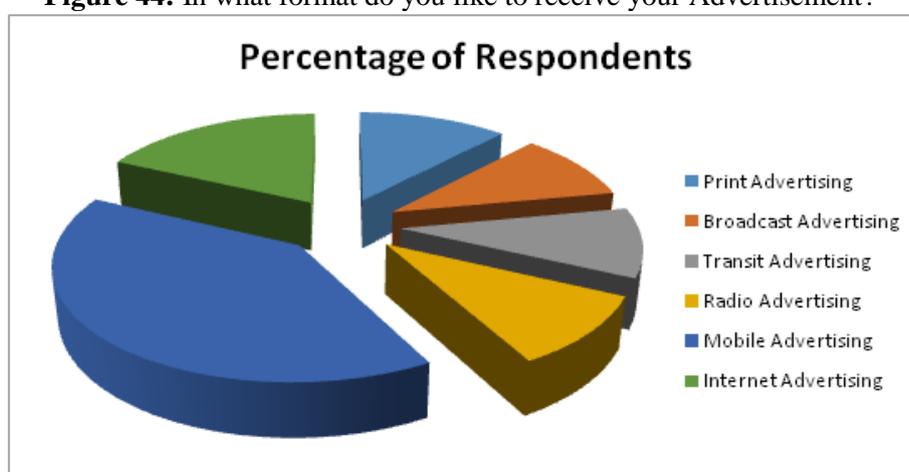
the modern scenario and with cellphones being comfortably accessible with people, the groups have to come up with distinct sort of commercials for the consumers.

**Table 14:** In what format do you like to receive your Advertisement?

Sr. No.	In what format do you like to receive your Advertisement?	Number of Respondents	Percentage
1.	Print Advertising	60	12
2.	Broadcast Advertising	50	10
3.	Transit Advertising	50	10
4.	Radio Advertising	50	10
5.	Mobile Advertising	206	40
6.	Internet Advertising	100	18
	<b>Total</b>	<b>516</b>	<b>100</b>

Source: Primary Data Collection

**Figure 44:** In what format do you like to receive your Advertisement?



Source: Primary Data Collection

The on top of sketch suggests that forty percent of respondents value more highly to line up of their advertisements by Mobile phones, eighteen percent of respondents decide to induce hold of their commercials via net, twelve proportion respondents choose receiving their ads via medium and ten percent of respondents choose receiving their ads by manner of Broadcast Advertising, Transit Advertising, and Radio Advertising. Completely different forms of ads expand the chances for shoppers to look at commercials and get fast-paced goods (FMCG) product. The predominant cause of the above query was to recognize the consumer's preference for receiving commercials in the contemporary scenario.

**Q. Do you get influenced by an Advertisement due to its appeal?**

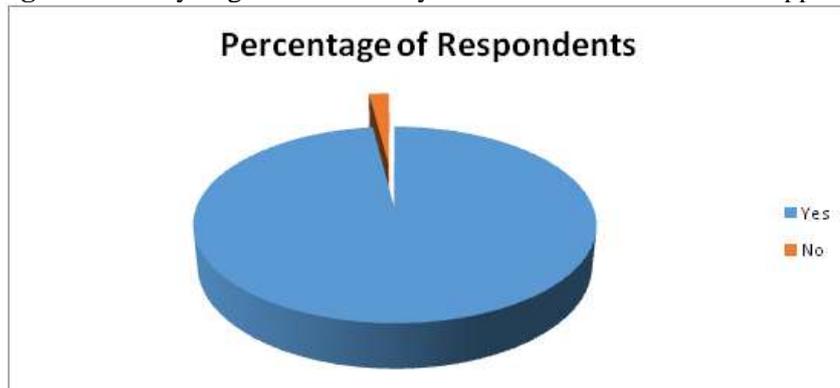
Advertising appeals are conversation techniques that advertising and marketing professionals use to take hold of interest and persuade people to purchase or act. In different words, you (or your communication) appealed to humans because you had been credible, you affected their emotions, or you made logical sense. The seven predominant sorts of marketing appeals include musical, sexual, humor, fear, emotional, rational, and scarcity, which all have the common goal of influencing the way consumers view themselves and the advantages of the products or services being advertised. Advertisement appeals are very essential for an advertisement as it gives a theme to the commercial as well as a storyline with which the viewer generally connects with getting persuaded to purchase the product.

**Table 15:** Do you get influenced by an Advertisement due to its appeal?

Sr. No.	Do you get influenced by an Advertisement due to its appeal?	Number of Respondents	Percentage
1.	Yes	505	98
2.	No	11	2
	<b>Total</b>	<b>516</b>	<b>100</b>

Source: Primary Data Collection

**Figure 45:** Do you get influenced by an Advertisement due to its appeal?



Source: Primary Data Collection

With the assistance of the higher than figure, it is taken into thought that ninety eight percentages of the respondents have united to the question of them being influenced through a business because of its enchantment and a couple of percentages of respondents ail the truth that they are doing not get influenced by persuasion of an advert because of its attractiveness. The foremost purpose of the query was once to apprehend whether or not the consumer's alternate their perception closer to a precise product by using seeing their commercial appeal. Advertisement Appeals play a very important section in a commercial as it shapes the complete advertisement which helps the buyers to purchase a specific product.

**Q. Do you consider T.V. Advertisement is more effective any other form of Advertising?**

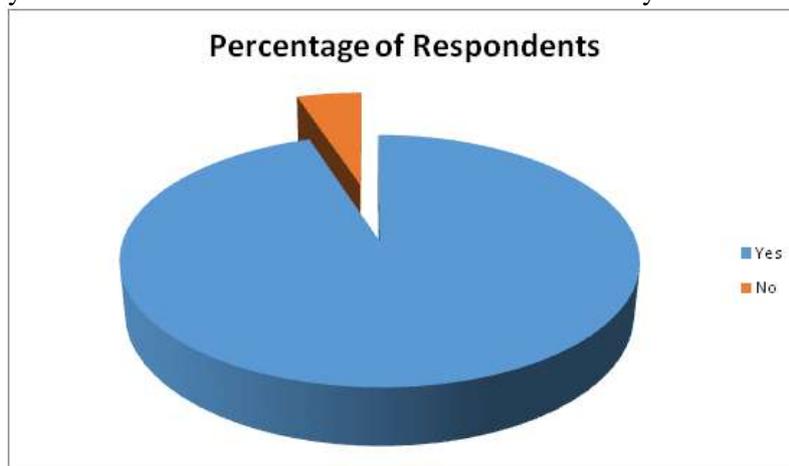
Television advertising potential is conveying a message, generally to market a product or service. Television marketing blessings are TV reaches a plenty large audience than neighborhood newspapers and radio stations, and it does so during a brief period. It reaches viewers when they're the most attentive.

**Table- 16:** Do you consider T.V. Advertisement is more effective any other form of Advertising?

Sr. No.	Do you consider T.V. Advertisement is more effective any other form of Advertising?	Number of Respondents	Percentage
1.	Yes	494	95
2.	No	22	5
	<b>Total</b>	<b>516</b>	<b>100</b>

Source: Primary Data Collection

**Figure 46:** Do you consider T.V. Advertisement is more effective any other form of Advertising?



Source: Primary Data Collection

With the assistance of the higher than figure, it will be taken into thought that ninety five percent of the respondents comply with the actual fact that they realize television packaging to be a lot of high-quality than any completely different completely different structure of advertising and five proportion of respondents afflict the fact that they are doing not realize television industrial to be additional advantageous than any different style

of advertising. The essential reason of the above question used to be to recognize whether the viewer's assume that Television advertising was extra nice than any different form of advertising. Television advertising has proved to be very a lot high quality on the grounds that the time it has been launched because humans register more than looking at instead than reading. Television advertising and marketing is a one-way communication process so it can additionally furnace back. So, the advertisers decide on to take a survey before launching any advertisement so that they recognize what a purchaser would join within an advertisement. They can see the Fast Moving Consumer Goods (FMCG) products depicted in altogether a specific way as compared to print advertising.

## CONCLUSION

- It was observed that the shopping experience of the respondents has changed due to pandemic of COVID-19
- Influencing consumers is one of the essential factors for generating sales and majority of the respondents agreed to the fact that they get influenced by an Advertisement due to its appeal.
- There are different types of advertising mediums available for companies to advertise their products out of which a lot of respondents agreed to the fact that T.V. Advertisement is more effective any other form of Advertising for them.
- Fast Moving Consumer Good products are considered to be essential products which are used by consumers on daily basis and it is essential to find out whether the consumers buy FMCG products by viewing advertisements to which they responded with high numbers.
- According to the respondents, Advertisements do help in generating sales in FMCG industry. FMCG industry is one of the vast industries and the advertisements play a very important role in their sales generation.
- Campaigning has a long term impact on the minds of the people and campaigning of FMCG products changes the choices of the consumers as per the changing advertisements and its appeals. Advertisements are essential for product sale.
- Advertisements persuade our purchase of products and According to the majority of consumers, youth and emotional appeals are best suited for toothpaste.
- Finance is one of the key factors whilst making a purchase. It was observed that respondents are considerate about their financial condition while making a purchase.
- Brand influences a lot of people while making a purchase. Hence, Even if the consumers are a brand conscious person, he/she will switch to other products due to their advertisement appeals. Advertisement appeals have a huge impact on the minds of the people.
- Sample size products are a very vital form of sales promotion. It has proved to one of the most effective form of advertising. It was observed that a lot of respondents also agree to the fact that they will use sample size product first rather than full size.
- There are two ways of shopping available for an individual which are traditional form and online form of advertising. Due to the pandemic, in the initial times online facility was not available for the consumers hence, the consumer prefers online method of purchasing over offline but due to the pandemic offline method had become much more popular.
- Decision making process is very critical process that a consumer has to make before making any purchase. A lot of respondents agreed to the fact that their purchase decision majorly depends on Advertisements they see.
- Family is the first social contact that an individual has. Hence, all the values, cultures and traditions imbibed in an individual shape a mindset of an individual. It was observed that the family culture of an individual affects their buying behavior. Human being is a social animal, hence a lot of respondents agreed to the fact they care about other people's opinions before making a purchase.
- Local shopkeepers are one of the important factors to be considered while traditionally shopping of FMCG products. Hence, a lot of respondents purchase their FMCG products primarily based on the service provided by the shopkeeper and not the product and if purchasing from Traditional shops, they prefer

buying from local shopkeepers.

- Ambiance and Aesthetics are also considered to be one of the importance factors whilst purchasing a FMCG product through traditional shopkeepers. Hence, Ambiance and Aesthetics of the retailing store matters to the respondents during Fast Moving Consumer Goods product purchase. The vicinity (Distance) of the retailing store also matters to the consumers while making a purchase of FMCG products while buying products from the local retailer stores.
- Consumers have been very aware of the products that they purchase especially the products for consumption. Hence, it was found out that they check the ingredients while purchasing a FMCG product.
- As per the respondents, products from brands such as HUL, P&G, Dabur, Patanjali, Palmolive, Nestle etc. are readily available in the local retail stores as compared to other FMCG brands and FMCG products are readily available as compared to other products.
- Discounts are one of the important elements of sales promotion and the respondents check for Discounts regularly during the purchase of FMCG products.

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## Effectiveness of HRM in Banking Industries with Reference to the State Bank of India

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### ABSTRACT

The purpose of this research is to check the "Effectiveness Of HRM In Banking Industry With Reference To The State Bank Of India." The study is aimed to discover how human relations have aided in achieving effectiveness in management, discovering the effect of supervision and in group management performance. The study also highlights how training and feedback from the employees are used as a tool of effective human resource management. The study has tried to give concrete advice and suggest how human relations can be used for effective banking and promoting a reference point where future researchers or students can draw inspiration for their research.

In this survey a descriptive type of research design is used. The survey yielded a total of 30 valid responses. On the basis of these responses gathered and analysed, the findings revealed that Human Resource Management serves as a tool for effective management in the banking business. The study also recommends that the firm's HR professionals have to be well-trained in order to perform their functions successfully and efficiently, as they serve as a tool for effective management in any organisation.

**Keywords:** Human Relations, Human Resource Management, State Bank of India

### INTRODUCTION

The word bank is derived from the Italian word banca, which is derived from German language and means bench. Money lenders in Northern Italy originally did business in open areas, or big open rooms, with each lender performing from his own bench or table.

The most important function of a bank is to provide services related to the storing of deposits and the providing credit facilities. The evolution of banking dates back to the earliest writing, and continues within the present where a bank may be a financial organization that gives banking and other financial services. Currently the term bank is usually understood as an establishment that holds a banking license which is granted by financial supervision authorities and supply rights to conduct the foremost fundamental banking services like accepting deposits and making loans. There also are financial institutions that provide certain banking services without meeting the legal requirements of a bank, a so-called non-bank. Banks are a subdivision of the financial services industry.

Essentially, they're all human-to-human interactions. As a result, human relations is an important area of management that integrates people into work circumstances in a way that drives people to work together with economic, psychological, and social satisfaction, boosting productivity. As a result, Human Resources Management will focus on:

1. Perception, personality, learning, intra- and interpersonal relationships, and inter-group and intra-group relationships
2. Keeping all personnel motivated.
3. Increasing staff morale
4. Improving communication abilities.
5. Improving leadership abilities.
6. Satisfactory redress via a well-defined grievance procedure. Handling disciplinary cases by established disciplinary procedures & in all fairness.
7. Providing timely counseling to solve employees' personal & family problems, thereby releasing their stress & workload.

### Overview of State Bank of India

The State Bank of India(SBI) is India's largest and oldest commercial bank, having been in operation for more than 200 years. In India, the bank offers a comprehensive variety of corporate, commercial, and retail banking services. With a 59.7% ownership, India's central bank, the Reserve Bank of India(RBI), is the bank's largest stakeholder. Total is worth 359.237 billion dollars, with the public(other than promoters) owning 40.3 percent of the company. SBI has the largest branch and ATM network in India, with locations in every state. There are around 15004 branches in the bank's network(including subsidiaries). It is India's largest banking and financial services company, having 157 foreign operations in 41 countries and correspondent relationships with 520 international banks in 123 countries. SBI has recently purchased banks in Mauritius, Kenya, and Indonesia. SBI is India's largest commercial and public sector bank, with a diverse range of business operations that include financial institutions and also established a voluntary retirement programme(VRS) to reduce its employment when it was suggested that the banking industry was overstaffed. SBI adopted a VRS system, often known as the "Golden Handshake." Following the bank's computerization, the large workforce that was once considered one of SBI's strongest strengths became a burden. SBI faces the prospect of losing its brilliant staff and being left with less efficient employees as a result of the implementation of this system, which has sparked considerable criticism.

### Statement of the Problem

The topic "*Effectiveness Of HRM In Banking Industries With Reference To The State Bank Of India*" was chosen to examine the company and its management from a Human Relations perspective. Human resources had essentially taken on a permanent function within the business; nonetheless, it is crucial to remember that without the organization's management supporting human relations, the firm's success (in the banking industry) may only be a facade.

As a result, the following issues will be addressed in this study:

- (a) How effective is the banking industry's Human Relation System?
- (b) How motivated are employees as a result of their social interactions?
- (c) In the financial industry, how effective is communication?
- (d) Do psychological elements have an impact on performance?

These and other related issues are what we aim to investigate closely; it is also crucial to note that one of the underlying causes of low employee productivity is a lack of excellent human relations in today's businesses, which is still addressed at every level in most businesses.

### AIMS & OBJECTIVES

**This research will look at a variety of goals, including:**

- i. To determine how human relations have increased the level of performance.
- ii. To determine how human relations have aided in the attainment of managerial effectiveness.
- iii. To determine the impact of managerial supervision and/or group performance.
- iv. To explain, advise, or suggest how human relationships might be leveraged to improve the banking business.

### REVIEW OF LITERATURE

**Anand, V. V., Banu, C. V., Balachandran, S., Kumar, S. A., Sarayu, R. S., Hemalatha, J., & Banu, M. S., (2016):** Looked at the impact of employee engagement practices on bank productivity in India's Trichy region. 124 bank employees in the area were polled for information. Statistical procedures such as the chi-square test, one-way ANOVA, and regression analysis were used to analyse the data. Employee productivity is influenced by elements such as coworkers, department, rewards & recognition, opportunity, teamwork, and direct supervisor, according to the findings. The authors stated that banks should use effective HRM strategies to combine the above determinants of employee engagement, resulting in a rise in bank employee productivity.

**Anuradha, S., & Prasanth, M. S., (2016):** Employee opinions of HRM procedures among public sector banks in the Puducherry region of India were investigated. A multi-stage sampling technique was used to collect data from 328 workers from 22 different public sector banks via a structured Primary Data. For data analysis, statistical procedures such as the t-test, ANOVA, coefficient of variation, and multiple regression analysis were employed. The study's findings revealed that diverse HRD approaches had a substantial impact on public sector bank organisational performance.

### Statement of Hypothesis

Ho: In the banking industry, human relations do not serve as a tool for good management.

H<sub>1</sub>: Human Relationships (HR) are used in the banking business as a tool for good management.

### Significance of the Study

The study's significance is clearly indicated below

1. The study will assist SBI and maybe other banks in the banking industry in improving or implementing Human Relation policies inside their organizations to address issues arising from such a reason.
2. Human Relations can also educate employees (both individuals and groups) on the concept of human relations and how it affects managerial effectiveness.
3. The study will highlight the link between human interactions and productivity as it relates to the growth and survival of an organization.
4. The research will assist in identifying benefits to the banking industry in terms of human relations and successful management.

### Scope and Limitation of the Study

This study is centered on Human Relation in Banking industry with a reference to SBI. The study is constrained by a number of factors and revolves around Human Relations and how it may be used as a tool for good management.

### RESEARCH METHODOLOGY

In order to evaluate the stated hypothesis for analysis, the data received from respondents via Primary Data is in simple percentages, frequency tables, and the Chi-square method is used. This depicts how the data was presented, as well as information on the type or activities of the bank (SBI), which serves as a summary of all the facts in this project.

The information was gathered by administering Primary Data to SBI employees in order to obtain their perspectives on the impact of "human relations in the banking industry management." Only thirty (30) of forty (40) surveys were filled completely and used for data presentation and analysis which was collected using the "LIKERT 5 Point Grading System" under the headings of Strongly Agreed, Agreed, Undecided, Strongly Disagreed, and Disagreed. It's worth noting that the data is provided in the order in which it was gathered.

### Data Analysis And Interpretation

**Table 1:** Assessing the Human Relation of SBI.

S/N	VARIABLES	SA	A	N	SD	D	TOTAL
a.	The SBI has an effective human relation in place.	6	14	3	4	3	30
b.	The human relation in SBI is definite and positive.	8	8	10	2	2	30
c.	Communication plays an important role in SBI.	10	9	8	2	1	30
d.	Communication between the management and workers has helped in locating problems in SBI.	13	8	3	4	2	30
e.	Management and workers depend on each other, through good human relations to achieve the organization objective.	19	6	1	3	1	30
f.	Employees participate in decision making of the organization.	14	12	4	3	2	30
g.	Psychological factor influences performance.	11	10	4	3	2	30
h.	Workers perform the same under different condition of work.	13	8	2	5	2	30
i.	Money is the most efficient and effective condition of work.	10	10	2	6	2	30
j.	Social needs actually have precedence over economic needs.	13	8	2	4	3	30

Source: Primary Data

**Table2:** Evaluating the effectiveness of Human Relation in Banking Industry.

S/N	VARIABLES	SA	A	N	SD	D	TOTAL
a.	The SBI has an effective human relation in place.	6	14	3	4	3	30
b.	The human relation in SBI is definite and positive.	8	8	10	2	2	30
c.	Management and workers depend on each other through good human relation to achieve the organizational objectives	19	6	1	3	1	30

Source: Primary Data

**Analysis: Table 1** - Assessing the Human Relation of SBI.

The data presented in the previous section are analysed using:

The mean to determine whether the questions are accepted or rejected, the cut-off point for acceptance is 3.0 and mean below is thereby rejected for the purpose of this analysis the “Likert Rating System” is used.

S/N	VARIABLES	MEAN SCORE	REMARKS
a.	The bank (SBI) has an effective human relation in place.	3.5	Agreed
b.	The human relation in SBI is definite and positive.	3.6	Agreed
c.	Communication plays an important role in SBI.	3.8	Agreed
d.	Communication between the management and workers has helped in locating problems in SBI	3.8	Agreed
e.	Management and workers depend on each other, through good human relations to achieve the organization's objective	3.9	Agreed
f.	Employees participate in decision making of the organization.	4.2	Agreed
g.	Psychological factor influences performance.	3.8	Agreed
h.	Workers perform the same under different condition of work.	3.8	Agreed
i.	Money is the most efficient and effective condition of work.	3.7	Agreed
j.	Social needs actually have precedence over economic needs.	3.8	Agreed

Number of responses = 30 cut – off point = 30

### INTERPRETATION

Item (a) shows that SBI has human relations in place, which contains social interaction, this goes to show the extent to which the number of the organization identifies with the human of the bank.

Item (b) response collected indicated that the human relation in the organization is definite and positive.

Item (c) response collected and analysed in this section shows that communication is an important tool to achieving organizational objectives.

Item (d) response collected shows the strong level of communication between management and employee has helped in locating problems in SBI.

Item (e) this response is in favour of identifying the extent to which both management and employee depend on each other for good human relation in achieving the bank's goals as well as gaining competitive advantages.

Item (f) response collected shows that employees in the organization participate in decision making of the organization.

Item (g) response collected also how psychological factors influence performance of workers in the organization.

Item (h) response collected and analysed indicates that people perform the same under different conditions.

Item (i) The response indicates effectiveness and efficiency of money as a condition of work.

Item (J) from the response collected, it indicates how social need has precedence over economic need in the organization.

**Analysis: Table 2** - Evaluating the effectiveness of human relation in Banking industry.

S/NO	VARIABLES	MEAN SCORE	REMARKS
a.	The bank SBI has an effective human relation in place	3.5	Agreed
b.	The human relation in SBI is definite and positive	3.6	Agreed
c.	Management and workers depend on each other through good human relation to achieve the organisation's objectives	3.9	Agreed

### INTERPRETATION

Item (a) The response implies that the Human relation ensures social interaction and also allows the organization (SBI) to attain a competitive advantage over other banks.

Item (b) shows that it is clear the impact of human relation leading to achieving effective management in the bank.

Item (c) indicates that human relations cannot be run in isolation in any organization that desires to achieve its values and objectives without the participation of both management and employees which is the only way an organization can attain market leadership.

### HYPOTHESIS TESTING

Table2: will be used to test the hypothesis.

**H<sub>1</sub>: Human Relationships (HR) are used in the banking business as a tool for good management.**

Level of Significant  $\alpha$  0.05

Degree of freedom  $(r - 1) (c - 1)$

=  $(3 - 1) (5 - 1)$

=  $2 \times 4 = 8$

$\alpha = 15:51$

Testing Statistics  $X^2 \Sigma \{O - E\}^2$

E

**Decision Rule:** Accept **H<sub>0</sub>** if  $X^2$  Is than 15:51

**Contingency Table Depicting the Effectiveness of Human Relation in Banking Industry**

Questions	Strongly	Agreed	Neutral	Strongly Disagreed	Disagreed	Total
A	6(11)	14(9.3)	3(4.7)	4(3)	3(2)	30
B	8(11)	8(9.3)	10(4.7)	2(3)	2(2)	30
E	19(11)	6(9.3)	1(4.7)	3(3)	2(2)	30
<b>TOTAL</b>	33	28	14	9	6	90

### Computation

O	E	O - E	(O - E) <sup>2</sup>	$\frac{(O - E)^2}{E}$
6	11	-5	25	2.3
14	9.3	4.7	22.1	2.4
3	4.8	-18	3.24	0.7
4	3	7	1	0.3
3	2	1	1	0.5
8	11	-3	9	0.8
8	9.3	-1.3	1.69	0.2
10	4.8	5.2	27	5.7
2	3	-1	1	0.3
2	2	0	0	0
19	11	8	64	5.8
6	9.3	-3.3	10.9	1.2
1	4.8	-3.8	14.4	3
3	3	0	0	0
1	2	-1	1	0.5
				23.7

### DECISION

The computed  $X^2$  value 23.7 is greater than the critical  $X^2$  value 15.51.

The researcher therefore, accepts  $H_1$  and rejects  $H_0$  which states that Human Relation serves as a tool for effective management in the banking industry.

### FINDINGS & SUGGESTIONS

The beginning of this work presents a broad concept of Human Relationship based on the various experiments conducted. It should be noted that the physical variables studied included illumination, rest period, work period length, and work week length, all in an attempt to find the optimal level of each. However, as Human Relations, Supervising Methods, Social Interactions Incentive System, and Worker Autonomy have improved.

Although the Human Relations movement has its limitations, it has had a significant impact on management programmes on topics such as communication, counselling, understanding people, and leadership. It was discovered that improved communication increased morale, and that the relationship and participation of superiors and subordinates played a significant role in increasing production levels.

Employee management was valued for its ability to comprehend their psychological and social demands at work, as well as for its ability to improve management processes. The importance of informal organisation and the complexity of people's demands, which motivates them to work for reasons other than monetary gain, were recognised.

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## CONCLUSION

Banks are now concentrating their efforts on developing programmes, processes, and services to attract, develop, and retain outstanding personnel. Using cutting-edge technology, the HR department has developed sophisticated web tools that inform employees on benefits, salary, special initiatives, and internal career prospects.

In the banking business, HRD's main goal is to help companies improve their performance, which is measured not only in terms of financial indicators of operational efficiency, but also in terms of the quality of financial services they provide. Human capital factors such as skills, attitudes, and knowledge play a critical part in shaping the financial sector's competitiveness. The ability of banks to give value to consumers is determined by the quality of their human resources. Human capital, unlike money and technology, must be valued as a highly valuable resource in order to achieve a competitive advantage. Integrating human resource management strategies with company strategy should be the major focus. Managing change, building commitment, gaining flexibility, and boosting teamwork are all HRM techniques. Recruitment, placement, and performance management are the other procedures that comprise the visible parts of HRM.

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## **Influence of Product and Place Factors on Consumer Buying Behavior in Formal Footwear Sector**

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### **ABSTRACT**

Indian Leather Industry holds a position of conspicuousness in Indian economy due to its tremendous potential for monetary development, business age and product. Footwear Industry is a piece of Indian cowhide Industry. It has its place of noticeable quality in the homegrown market just as commodities. This study tires to recognize the impact of item and put factors on shopper purchasing conduct in proper footwear area. Information was gathered from 256 respondents in Bangalore through an overview administrated poll. The goal of the review is to distinguish the elements and to recognize the most persuasive factors under each element. The other goal is to decide if the significance appointed to each elements differ across orientation and pay. The survey attempts to catch the purchasing conduct in light of the selection of elements. It likewise conveys questions like buy recurrence, value that the client will pay, and so on The poll catches 17 factors, 10 under item factors and 7 under place factor. The review will be profoundly valuable for the shoe making organizations and formal footwear stores in Bangalore. Distinguishing proof of the variables will help the shoe-production organizations to fit their advertising and assembling systems to exploit these impacts such that will fulfil both the buyers and advertisers. This study can likewise assist the organizations with plainly understanding the shopper conduct, so they can plan viable systems and assist with fostering the organization and the business at large.

**Keywords:** Formal Footwear, Product Factors, Place Factors, Consumer Buying.

### **INTRODUCTION**

#### **BACKGROUND OF THE STUDY**

The footwear business is a significant section of the cowhide business in India. It contributes a significant piece of the pay of Indian calfskin industry. China is the biggest maker of footwear. India positions second among the footwear creating nations simply close to china. Footwear industry is a work serious area in India. The world's significant creation is in women footwear yet India delivers a bigger number of gentlemen's footwear than women footwear. The interest for footwear is developing step by step and there is an enormous market in India for the producers. This review assists the makers with recognizing the changing necessities and requests of Indian clients in footwear area and to distinguish the significance given by the clients to every one of the item and spot factors

#### **Purpose of the Study**

The reason for the review is to recognize the significance given to different variables by the clients while buying a couple of formal footwear. The review estimates various parts of buyer purchasing conduct. The motivation behind the review is to recognize the variables to which clients give more significance and the buy recurrence and cost paid by the clients in light of these elements. The concentrate additionally examinations how shopper conduct fluctuates among orientation and pay gatherings. The principle motivation behind the review is to help the producers and little stores in Bangalore to get what precisely is the client searching for and the purchasing conduct of the clients.

#### **Conceptual Framework**

Purchaser spending in India can be grouped into standard spends and way of life spends. Standard spending incorporates the fundamental necessities of life while way of life spending remembers spending for a PC, web, vehicle, cell and so forth Individual purchasers think about various elements while buying any ware, which is a need. The likely factors can be arranged into four gatherings Product, value, advancement and spot. This study endeavors to examine item and spot factors affecting the buy choice of formal footwear in Bangalore.

#### **Marketing Mix Strategy**

Kotler (2003) recognized the showcasing blend is the arrangement of offering apparatuses for assisting organizations with pointing the objective clients in advertising. The most notable advertising procedure instruments are the 4 Ps model. McCarthy and Perreault (1994) proposed the 4 Ps models that the advertising methodology envelops four variables, like Product, Price, Promotion, and Place.

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## PRODUCT

An item as characterized by Armstrong and Kotler (2006), is whatever can be proposed to a business opportunity for consideration, securing, use, or utilization that may fulfill a need or need. Item is the center of the advertising blend methodology where retailers can offer novel credits that separates their item from their rivals. Item is described by quality, brand, plan, strength, bundling, solace, and so forth

## PLACE

Place variable can be characterized as a bunch of reliant associations that takes care of the most common way of making an item accessible to the shoppers. The technique of spot needs compelling circulation of the company's items among the channels of showcasing like wholesalers or retailers. An association should focus on place choices, in light of the significance of the item and utilization happening simultaneously and at a similar spot; a spot that gives all data of client, rivalry, advancement activity, and promoting task. It should focus on how it can convey the item brilliantly and at the perfect locations, and which channel ought to be utilized to convey the item.

## Consumer Behaviour

This represents the processes by which individuals search for, select, purchase, use, and dispose of goods and services, in satisfaction of their needs and wants. In other words, consumer behaviour is a set of dynamic decision-making processes that encompass the purchase and use of products. Consumer behaviour in this study is measured through the importance given to each factors, the price that the customer is willing to pay and the frequency of purchase by the customer.

## REVIEW OF LITERATURE

Purchaser conduct is the investigation of how people spend their accessible assets on utilization-related things. It incorporates the investigation of what they purchase, why they get it, when they get it, where they get it, how frequently they get it, and how regularly they use it. (Schiffman and Kanuk, 1996).

Saha, Dey, and Bhattacharya (2010) in their review "Variables influencing shopper purchasing conduct of shoes in Kolkata" attempts to distinguish different elements in the advertising blend that impacts the purchasing conduct of clients in Kolkata. In this concentrate on they distinguish factors under 4 significant heads-item, value, advancement and spot. Sub-factors were recognized under every one of the variables. A portion of different factors utilized in this study incorporate brand, discounts, value, show, area, salesman impact, and so on the review was endeavoring to break down the general significance to this large number of factors by the clients. A portion of the significant discoveries from the review are-Quality and solidness are the main variable under item factors. Under cost paid by the clients an incentive for cash was the most compelling element. Clients will quite often incline toward stores were a few models are accessible. In advancement customers give more significance to the after deal administrations. The paper helps the organizations in Kolkata to plainly comprehend the buyer conduct with the goal that they can form successful systems and assist with fostering the organization also industry at large. One more review in the comparative field which was checked on for the exploration is "The outside factors that impact Taiwanese understudies shoe buy aim".

This study depended on 6 outside factors which incorporate brand, value, advancement, style, toughness and solace. The motivation behind this study was to explore the outer variables that impact Taiwanese undergrads. The consequence of different relapse examination demonstrated that the client lean toward solace and style more than some other variable. The aftereffect of one way anova uncovered that main brand shows critical contrast between both the sexes and grade level. The concentrate additionally gives different proposals to the shoe produces in Taiwan. The review reasons that solace and style factors are the most compelling elements for Taiwanese understudies shoe buy goal. (Chen, 2008).

One more article checked on for the exploration is "Administration quality as an arbiter of the connection between showcasing blend and shopper unwaveringness". There are 3 variables contemplated under this-Marketing blend, Service quality and client dependability. 14 sub factors were recognized under advertising blend, 21 under assistance quality and 3 under client devotion. The outcomes uncovered that there is a solid and measurably huge connection between in general advertising blend and by and large client unwaveringness and a positive connection between generally administration quality and generally speaking client faithfulness. The outcome likewise recommended that there is no intervention impact of administration quality between the view of showcasing blend and customer steadfastness. (Hu, 2009).

Survey was likewise done on the article named "Mature client determination of Apparel and footwear brands in retail chains". There were various factors under each tops of the review. The review tries to look at mature

clients intentions in choice of attire and footwear brands and explanations behind belittling retail chains. Contrast in brand decision intentions are surveyed among age associate gatherings inside the full grown purchaser section just as experienced buyer portions characterized by different socio segment and way of life factors. The outcomes shows the more seasoned customer vary from their more youthful partners as well as heterogeneous with regards to explanations behind picking explicit brands and retail chains. Value decrease and unique deals drive most of mature shoppers brand choice. (Moschis, Ferguson, and Zhu, 2011).

Cengiz and Yayala (2007) did their exploration on impact of advertising blend on sure verbal correspondence. There were sub factors under every p. The venture distinguished 7 variables contributing towards the inescapability of informal. The review recognizes specific things that the organizations ought to consider to construct a positive informal correspondence. The key for positive informal correspondence is the conveyance of superb administrations. The concentrate additionally recommends that the association should focus on building viable promoting blend so it can affect spreading of positive verbal correspondence. One more review investigated for the review is "Elements affecting acquisition of Apparels and Footwear from coordinated retail outlet". Through the review a position of variables which the clients think more significant were style, quality, assortment, value, claim, brand name and reference bunch.

Survey was likewise done on an article named "Brand demeanor and picture coinciding among youngsters" The review says that there is no huge contrast between circumstances as far as pre exploratory knowledge of the brands pre test perspectives, age and orientation. There were 2 distinct circumstances in the review. Tests were picked for every circumstance. In both the circumstances brand have effectively impacted the subject mentality and the impact to pick. (Gi and Ali, 2009).

Another article investigated was "Data hotspots for understudies Athletic shoe buying". The review uncovered that the general companions were the most persuasive and every now and again referenced data hotspot for understudies. The finding is reliable with past examinations. Buyer might choose not to purchase an item in the event that they fell that the item isn't predictable with their own impression of themselves as individuals from specific culture. The investigation discovered that the data source didn't essentially contrast among sexual orientations and pay hotspots for athletic shoe buys. One potential clarification is that athletic shoes are not orientation related item. (Yoh & Pitts, 2005).

## **RESEARCH METHODOLOGY**

### **RESEARCH PROBLEM**

To comprehend the impact of put and item factors on purchaser purchasing conduct in the conventional footwear area.

1. What are the elements under place factors that impact a purchaser in buying a specific brand of formal footwear?
2. How item includes treats the purchaser considers while buying formal footwear?

### **OBJECTIVES**

1. To decide the spot factors affecting the purchasing conduct of formal footwear.
2. To decide the item factors affecting the purchasing conduct of formal footwear.

### **VARIABLES**

The review considers just 2 components under the showcasing blend Product and spot factors.

### **HYPOTHESIS**

Hypothesis 1

H0: Product factors don't impact recurrence of procurement.

H1: Product factors impact recurrence of procurement.

### **HYPOTHESIS 2**

H0: place factors don't impact recurrence of procurement.

H1: Place factors in all actuality do impact recurrence of procurement.

### **DESIGN OF THE STUDY**

endeavours to recognize the variables under spot and item blend which impacts the buyer purchasing conduct in proper footwear area. Around 17 sub-factors are distinguished under the 2 elements 10 sub-factors under item

component and 7 sub-factors under place factor. The review endeavours to recognize the most persuasive element under each head and the overall significance given to each variables by the clients who needs to buy new conventional footwear. The examination will be led uniquely in Bangalore.

### RESEARCH INSTRUMENT

A questionnaire is planned which catches the item and spot factors that impact formal footwear buy choice. The poll likewise catches segment factors in the review. Review technique for information assortment is utilized. Likert scale with rating from 1 to 5 was utilized in the poll. To gather the essential information the survey is utilized. Through organization of survey the review attempts to investigate the significance given to each elements while buying new footwear.

### SAMPLING METHODOLOGY

Non probabilistic inspecting will be utilized for this exploration. Information is gathered through assessor administrated surveys. It is gathered from customers in the request for their appearance and advantageous inspecting is utilized with the end goal of information assortment. Information is gathered from the buyers who came to purchase another pair of formal footwear in the display area as and when they show up at the display area. There will be no probabilistic strategies followed for information assortment. Respondents will be chosen based on their openness and based on accommodation or by a purposive individual judgment.

### Population Sample Frame

The objective gathering comprises of the individuals who need to buy a conventional footwear just as client who have as of now bought pair formal footwear. Testing component in this exploration are individual buyers who are living in Bangalore. The example bunch incorporates guys and females with age above 18years.

### Sampling Unit

People buying formal footwear in light of spot and item factors.

### Statistical Tools

All the examination will be finished utilizing Excel and IBM SPSS19.0. The fundamental test that will be utilized for the investigation of the information is Reliability test for testing the dependability of the scale that has been utilized in the overview. Different relapse examination is done to explore the impact of the autonomous factors brand, value, style, toughness, solace, and so on customer purchasing conduct of formal footwear.

### DATA ANALYSIS AND INTERPRETATION

#### Reliability testing

Prior to beginning the investigation the unwavering quality of the scale must be tried. Test was directed on 68 examples which is over 20% of the example size for the review.

**Table1:** Reliability Test- Case Processing Summary

		N	%
Cases	Valid	68	100.0
	Excluded <sup>a</sup>	0	.0
	Total	68	100.0

Source: Primary data

**Table 2:** Reliability Statistics

Cronbach's Alpha	N of Items
.832	16

Source: Primary data

he Cronbach's Alpha value is .832 which is more than .7. So the scale used for analysis in the questionnaire is reliable.

### Factor Analysis

Factor investigation was done to distinguish and bunch the factors in to normal variables. Factor examination is finished both item and spot factors together to distinguish normal variables.

**Table 5.5: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.766
Bartlett's Test of Sphericity	Approx. Chi-Square	1512.728
	df	136
	Sig.	.000

Source: Primary data

KMO and Bartlett's test show that the sampling adequacy is  $0.766 > 0.50$ . This means that the sampling adequacy is fine for factor analysis.  $\text{Sig.} = 0.000 < 0.05$ , hence factor analysis is significant.

**Table 5.6: Rotation sum of square loadings**

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.951	29.126	29.126	2.584	15.199	15.199
2	2.071	12.182	41.307	2.353	13.842	29.040
3	1.345	7.910	49.217	2.132	12.539	41.579
4	1.202	7.072	56.289	2.005	11.792	53.371
5	1.085	6.382	62.672	1.581	9.300	62.672
6	.955	5.619	68.290			
7	.867	5.100	73.391			
8	.831	4.888	78.279			
9	.654	3.845	82.124			
10	.582	3.426	85.550			
11	.529	3.113	88.662			
12	.451	2.654	91.317			
13	.376	2.209	93.526			

14	.337	1.980	95.506			
15	.306	1.800	97.307			
16	.245	1.440	98.746			
17	.213	1.254	100.000			

This table identifies 5 factors which is a combination of both product and place factors. It says that the 5 factors identified explain 62.67 % of the variance (data contained in the variables) of the sample.

**Table 5.7: Rotated component matrix**

	Component				
	1	2	3	4	5
Branded Footwear					.760
Product_Design		.503			
Product_Quality		.712			
Product_Durability	.562	.615			
Product_Warranty	.707				

Product_Repairability	.812				
Product_Material	.627				
Product_Package			.557		
Product_Comfort		.758			
Product_Color					.502
Place_Location				.890	
Place_Convenience				.865	
Place_Display			.565		
Place_Decor			.781		
Place_Wellknown			.619		
Place_Layout					
Place_onlyformal					.606

Source: Primary data

Pivoted part network distinguishes 5 significant parts under item and spot factor. Part 1 incorporates toughness, guarantee, reparability and material. This can be for the most part arranged into sturdiness part. second part incorporates plan, quality and comfort. 3rd part incorporates bundle, show, notable store and stylistic theme. This can be called as stylish component. fourth part incorporates area and comfort. Brand, shading and stores which sell just conventional footwear goes under the fifth part

Testing of Hypothesis

### Hypothesis 1

H0: Product factors don't impact recurrence of procurement.

H1: Product factors impact recurrence of procurement.

Table 5.11 Chi-Square test- Product factors and frequency of purchasing

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	284.749 <sup>a</sup>	92	.001
Likelihood Ratio	214.905	92	.001
Linear-by-Linear Association	6.594	1	.010
N of Valid Cases	236		

Source: Primary data

P esteem is under .05 so we can dismiss H0. So item factor impact the buy recurrence of formal footwear.

### HYPOTHESIS 2

H0: place factors don't impact recurrence of procurement.

H1: Place factors truly do impact recurrence of procurement.

Table 5.14 Correlation- Place factor and frequency

		Frequency
Frequency	Pearson Correlation	1
	Sig. (2-tailed)	
	N	256
Place_Location	Pearson Correlation	-.481
	Sig. (2-tailed)	.004
	N	256
Place_Convenience	Pearson Correlation	-.349
	Sig. (2-tailed)	.069
	N	256
Place_Display	Pearson Correlation	.139*
	Sig. (2-tailed)	.026
	N	256

Place_Decor	Pearson Correlation	-.074
	Sig. (2-tailed)	.241
	N	256
Place_Wellknown	Pearson Correlation	.071
	Sig. (2-tailed)	.257
	N	256
Place_Layout	Pearson Correlation	.153*
	Sig. (2-tailed)	.014
	N	256
Place_only formal	Pearson Correlation	.002
	Sig. (2-tailed)	.969
	N	256

Source: Primary data

From this table obviously place area and comfort have a negative relationship. That implies clients inclining toward area and comfort component will buy often. P esteem is under .05 so H<sub>0</sub> is dismissed. This implies that Place factors in all actuality do impact the buy recurrence of formal footwear.

## FINDINGS, CONCLUSION AND SUGGESTIONS

### FINDINGS

The discoveries of the review will uncover that item and put factors altogether affect buy recurrence. Discoveries on Importance of different variables for purchasers are:

- The main item factor for clients of formal footwear is solace trailed by Quality, Durability and Brand.
- Item factors likewise impact recurrence of buying. Clients who are favoring style will buy habitually.
- Place factors likewise impact recurrence of buying. The review shows that clients favoring area and accommodation advantage as a rule buy regularly

### CONCLUSION

The review will be valuable for the shoe produces in recognizing the buyer inclinations and shopper purchasing conduct. This study was done to discover different variables under spot and item factors which impact purchaser purchasing conduct. Buyer purchasing conduct was estimated through the recurrence of procurement. The concentrate on likewise distinguished 5 most significant component which is a blend of both spot and item factor through factor investigation. Clients give more significance to item factors than the spot factors. In item factors solace, quality, toughness and brand are the main four variables for the buyers. The review shows that the client is least worried about the area factor rather they are prepared to invest more energy and cash to get a reasonable, familiar and quality item.

### SUGGESTIONS

This study will be valuable for the shoe makers and the footwear stores to get to realize their client needs and necessity. They need to zero in on the item and spot factors recognized in this review to fulfill their clients with the goal that they return to the store.

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## **A Study on Attraction of Young Investors towards Securities Markets and Crypto Currencies**

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### **ABSTRACT**

The research paper under the study is about the opportunities that the young investors have towards their investment in securities market and crypto currencies. The researcher in her research paper has presented the sorry state of the knowledge among the young investors about the securities markets and Crypto currencies. The researcher has referred various literature, articles and research papers on the related topic and found the gap analysis. Based on the review of literature and scope of the research, the research has framed three objectives which were measured and achieved through data analysis and interpretation.

The researcher has collected the primary data from the potent respondents through Google form, which was circulated among the known groups. 118 respondents responded to the Google form circulated and data was analysed and interpreted through tables, pie charts and graphs. Findings and conclusions were drawn upon based on the interpretations. The researchers found that the knowledge of investment opportunities in securities markets and crypto currencies are low among young investors. The young investors are afraid of taking the risk in the speculative markets. They lack financial assistance and funds for investment.

**Keywords:** Investments, Risks, Profit, Bitcoin, Systematic Investment planning (SIP),

### **INTRODUCTION**

Investments with lucrative offers and high profit margin have always attracted the investors of all ages, be it young or old every investor wants to enjoy the super profits and looks for more. Their search for the investment options takes them towards the securities market which is the barometers for the Indian economy. With various options like Equity, bonds, derivatives, sip's, Debentures etc. the securities market gives options for the small, medium and large investors to invest their funds. Individual and institutional investors exchange billions of shares of stock in over 10,000 firms on a daily basis via securities markets. Individual investors put their own money into investments in order to meet their own financial objectives. With the help of securities markets, the savings of households, business firms and government can be channelized to fund the capital requirements of a business enterprise.

The new buss word in the investment segment is crypto – bitcoins, which has changed the dynamics and have questioned the regulated markets. This unregulated form of investments in the name of crypto currencies are traded on the virtual platform. A crypto currency (or “crypto”) is a digital currency that can be used to buy goods and services, but uses an online ledger with strong cryptography to secure online transactions. The Indian government is now talking to regularise crypto currency in India and also to launch their own crypto.

### **REVIEW OF LITERATURE**

#### **1. A Study on Investment preferences of young investors in the city.**

**Shinki K Pandey, Abhishek Vishwakarma**

There are several investment choices accessible in the market as a result of economic liberalization, and the major goal of this research study is to determine the respondent's preferences among the investment alternatives available in the market. Investment is the process of earning money by putting money into a Financial Asset or a Physical Asset. Because life is unpredictable and the future cannot be anticipated, a person must invest to ensure a secure future. Investors invest their money with several goals in mind, such as profit, security, and appreciation, among others. As a young investor with a decent risk appetite and a long time horizon, he has a variety of possibilities to invest in to earn a fair return on his investment until he reaches the age of 40. Bank deposits, post office deposits, equity market, mutual funds, physical gold, and real estate are only few of the investment options accessible in the market. The study's major goal is to determine the preferences of today's Young Investors, who are between the ages of 21 and 35.

file:///C:/Users/Sanjay%20Mishra/Downloads/5951-Article%20Text-11596-1-10-20210124.pdf

#### **2. Acceptability of Investing In Crypto currencies**

**Eunice M Chua**

Crypto currencies have become a special attraction that most people are aware of, but not everyone understands how they function. With the introduction of this potentially profitable investment alternative, the researchers wanted to learn about the willingness of a small group of people to invest in crypto currencies such as Bit coin and Ethereum. This study used a descriptive-relational research approach to see if there are significant differences in participants' desire to invest in crypto currencies based on age, gender, educational attainment, civil status, monthly income, and employment. The findings revealed that while the participants are not particularly eager to engage in crypto currencies, they are clear in their belief that they should do more study before investing, and that the majority of them see crypto currencies as volatile and dangerous investments. This survey shows that the individuals who are younger are more inclined to invest in crypto currency. The researcher suggests that this study be utilised as a learning tool in classroom discussions on the investment possibilities of Bit coin and Ethereum

[https://www.researchgate.net/publication/344727426\\_ACCEPTABILITY\\_OF\\_INVESTING\\_IN\\_CRYPTOCURRENCIES](https://www.researchgate.net/publication/344727426_ACCEPTABILITY_OF_INVESTING_IN_CRYPTOCURRENCIES)

### 3. A Study on the Factors Influencing Investors Decision in Investing in Equity Shares in Jaipur and Moradabad with Special Reference to Gender

Jeet Singh and Preeti yadav

The current study seeks to identify the elements that have a significant impact on the share investing decisions of a sample of 100 investors in Moradabad, Uttar Pradesh. The introduction and evolution of behavioural finance has resulted in a financial sector revolution. Decision-making while investing Investors just act on the information that is available to them. React appropriately. Before investing in the stock market, a great lot of thought must be given. When investing in the capital market, technical and financial research of the firm, as well as fundamental study of the economy, must be considered. The current article seeks to ascertain male and female investors' perceptions of key issues to be kept in mind while investing in the equities market. The report attempts to condense the attitudes of male and female investors regarding a number of investment options.

<https://amity.edu/UserFiles/admaa/195Paper%209.pdf>

### 4. Stock Market Awareness among the Educated Youth: A Micro-level Study in India

Aabida Akhter and Mohiuddin Sangmi.

The stock market is referred to be an economic pulse or an economic mirror since it reflects a country's economic situation. Investors are said to constitute the securities market's backbone. As a result, their education and awareness are critical to restoring and keeping their interest in the securities market. The idea of stock market awareness is part of the wider concept of financial literacy. This research aims to examine young understanding of several facets of the stock market, such as concepts, goods, procedures, and institutions. The study's findings show that kids have a low to moderate degree of stock market knowledge.

[https://www.researchgate.net/publication/283523732\\_Stock\\_Market\\_Awareness\\_among\\_the\\_Educated\\_Youth\\_A\\_Micro-level\\_Study\\_in\\_India](https://www.researchgate.net/publication/283523732_Stock_Market_Awareness_among_the_Educated_Youth_A_Micro-level_Study_in_India)

#### RESEARCH METHODOLOGY

##### OBJECTIVE OF THE RESEARCH STUDY

1. To understand various factors that attract young investors towards security markets.
2. To explore different types of investment opportunities in security and crypto market.
3. To find different job opportunities available in security markets.

##### Data Analysis and Interpretation

Table no.1 Demographic data collection			
Demographics	Particulars	Respondents	Percentage
Gender	Male	62	52.5%
	Female	56	47.5%
Age bracket	15-30	103	87.3%
	30-45	9	7.6%
	45-60	6	5.1%
	Above 6	0	0

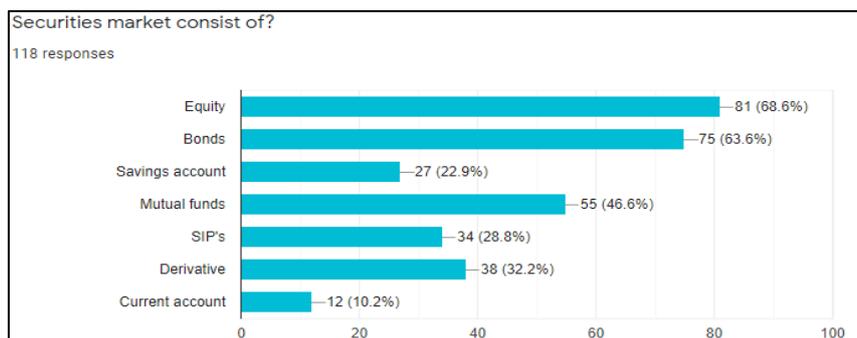
Source: Primary Data.

The above table shows that there are 62(52.50%) male respondents and 56(47.5%) female respondents who have responded through Google form circulated by the researcher. Total 118 respondents responded through the circulation of the Google form. The table also shows that out of 118 respondents 103 i.e. (87.3%) lies in the age bracket of 15-30. And others belong from different age groups.

Questions	Do you trade in securities market or crypto currencies?	Do you think that crypto currencies should be regularized?	Is investing in securities market safe?
<b>Yes</b>	36	53	50
<b>%</b>	30.5	44.9%	42.4%
<b>No</b>	71	16	14
<b>%</b>	60.2	13.6	11.9
<b>Maybe</b>	11	49	54
<b>%</b>	9.3	41.5	45.8

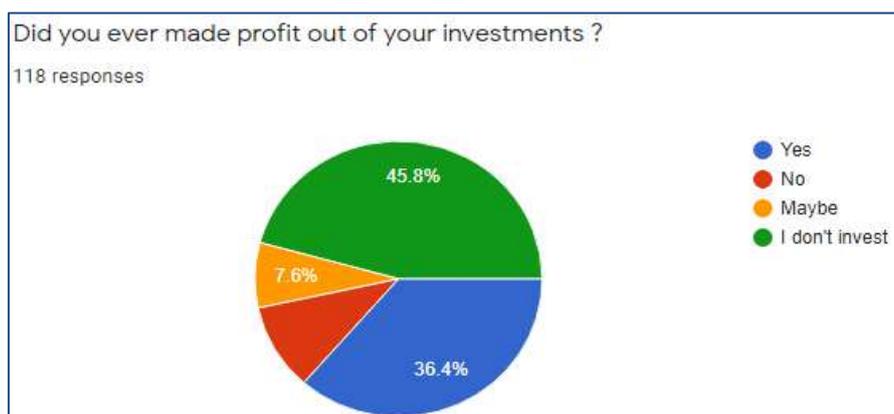
Source: Primary Data

The above table specifies that the respondents are not trading in securities market or crypto currencies because most of the respondents are in the age bracket of 15 to 30 where the earning is limited or almost zero they do not have financial support to invest in the markets. 71 i.e. (60.2%) respondents do not trade in securities market or crypto currencies. Youngsters seems to have limited knowledge about regularized market which bring more safety and security of the investments. 65 i.e. 55.1% of the respondents negative responds towards regularising of the market. Due to less knowledge about the safety and security of the market 68 i.e. 57.7% of the respondents don't not feel safe about investing in the securities market.



Source: Primary Data

From the above bar graph we can find out that the knowledge of securities market among the respondents is somewhat mixed in nature. They are not aware about what exactly the securities market consist of. Due to low awareness 39 i.e. (33.1%) of the respondents have responded that securities market consist of savings and current account. The respondents are aware that the securities market consist of equities and bonds where the percentage is high.



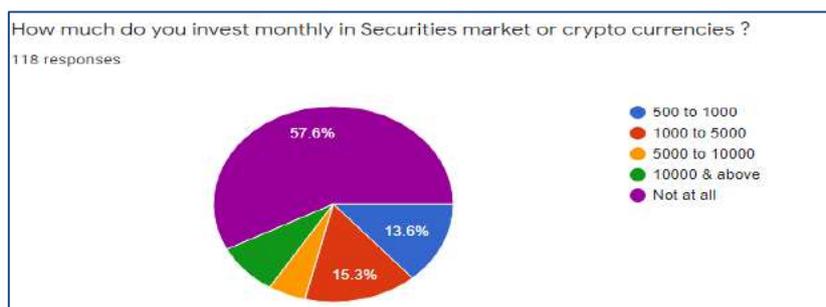
Source: Primary Data

The above pie diagram shows that 54.2% of the respondents invest in the market and 36.4% have made profit out of their investment. The % of the respondents not yet entered in the securities market or crypto currencies accounts to 45.8% this shows that there is a huge potential of investment for the young investors in the market.

Question	Are you aware of the term Securities market and Crypto currency?	Question	Do you agree that Crypto currencies are new generation's lucrative investment option?	Question	Have you ever worked on practicing through paper trading?
Not at all aware	17	Strongly Disagree	8	Never	78
%	14.4%	%	6.8%	%	66.1%
Slightly aware	27	Disagree	11	Rarely	15
%	31.4%	%	9.3%	%	12.7%
Moderately aware	29	Neutral	49	Occasionally	12
%	24.6%	%	41.5%	%	10.2%
Very aware	21	Agree	37	Frequently	9
%	17.8%	%	31.4%	%	7.6%
Extremely aware	14	Strongly Agree	13	Always	4
%	11.9%	%	11%	%	3.4%

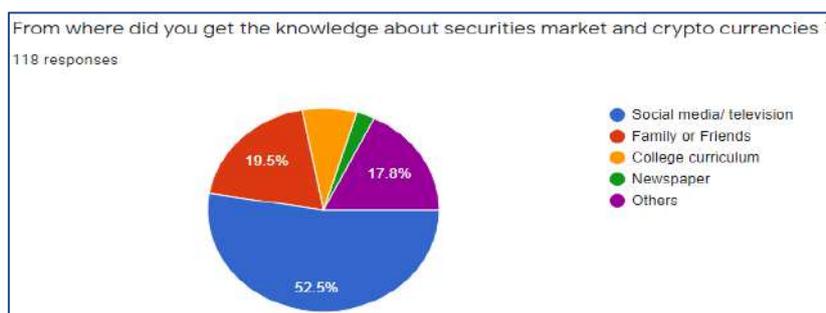
Source: Primary Data

The above table shows that the respondents lack awareness about the securities and crypto market which accounts for 70.4%. Nearly 57.6% of the respondents gave their negative opinion that securities and crypto markets are not lucrative investment options. The above table also shows that young investor (80%) have never learned the concept of paper trading nor are they aware about such term which helps in understanding the securities markets.



Source: Primary Data

The above pie chart shows that 57.6% of the respondents are not at all investing in the securities market or crypto currencies. Due to lack of knowledge about the safety and limited financial earnings youngsters are not willing to invest their money in the markets.



Source: Primary Data

Social media and television (52.5%) are the main source for the respondents to get knowledge about securities market and crypto currencies. The pie diagram shows that the college curriculum does not provide required information about the securities market to the young investors. There is a bit knowledge gap which is the main area of concern and requires due attention of the academicians and the government authorities.

### **SIGNIFICANCE OF THE STUDY**

The research signifies on the investment awareness of the young investors. The research emphasises on teaching and motivating the young investors about the investments of their saving in securities market and crypto currencies. The researcher through the research work has shown the true state of awareness about securities market. There is a lack of knowledge transfer which shows a gap between the curriculum and the requirement of the economy. The study is just a granule of the sand in the large dessert and can be taken further with a broader sense and approach to understand the gap. The academicians and government authorities needs to take appropriate steps which would help the young minds to understand the securities and crypto markets in a batter way.

### **SCOPE OF THE STUDY**

- The study under the research title covers various forms of investment options available under securities market.
- Investment opportunities for young investors in securities market and crypto currencies can be explored for good profits.
- The study can be undertaken at broad level to find out the awareness among the investors regarding the crypto currencies and securities markets.
- The scope of study is not just confirmed to young investors, but it can be undertaken for various sect of the society to understand their investment pattern.

### **Source of Data Collection**

#### **Primary Data**

The main source of collecting the data was through Google form. A questionnaire was prepared by the researcher based on the Objectives. In all 118 respondents responded by filling the Google form. Primary data being the first hand data, has helped the researcher in data analysis and interpretation, on the basis of which the findings and suggestion are drawn.

#### **SECONDARY DATA**

The Secondary data was collected by browsing different websites. It gave the researcher different articles and information based on the topic. Review of literature helped the researcher to get a detailed view about the previous studies related to the topic. Gap analysis was done on the basis of review of literature.

### **LIMITATION OF THE STUDY**

#### **This study has the following limitations**

1. The study undertaken by the researcher is based on primary data with limited responses.
2. The secondary was not objective specific and available in bits and pieces
3. The respondents may have been bias in filling the questionnaire which cannot be overlooked.

#### **Findings and conclusion of the research paper**

1. The study undertaken by the researcher shows that people lying in the age group of 15-30 are not so aware about the securities market and crypto currencies.
2. Young investors are not ready to risk their savings by investing in the markets.
3. Due to lack of knowledge they don't see investment in the market as an opportunity to earn profit.
4. There is a bit knowledge gap which is the main area of concern and requires due attention of the academicians.
5. To make these young investors understand the pros and cons of the market educational institutions should organise different campaigns and provide practical knowledge to them.

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## To Study the Financial Evaluation of Selected Dairy Sector of Gujarat

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### ABSTRACT

India is ranked 1<sup>st</sup> in milk production contributing 23 per cent of global milk production. Milk production in the country has grown at a compound annual growth rate of about 6.2 per cent to reach 209.96 mn tonnes in 2020-21 from 146.31 mn tonnes in 2014-15. Dairy sector is very organized sector in Gujarat. The paper study the financial performance of selected Dairy sector of Gujarat.

Keywords: Milk production, Dairy, Compound Annual Growth Rate, Financial Accounting

### INTRODUCTION

The term ECALUTUIN cannot be put into a tight framework of definition. It is a vague phenomenon and it can be interpreted and measured in different ways. Performance can be evaluated from various angles and by different users from their own point of views. The word 'Performance is derived from the word 'parfourmen', which means 'to do', 'to carry out' or 'to render'. It refers the act of performing; execution, accomplishment, fulfillment, etc. In broader sense, performance refers to the accomplishment of a given task measured against preset standards of accuracy, completeness, cost, and speed. In other words, it refers to the degree to which an achievement is being or has been accomplished. A financial analyst will judge the performance from profitability and growth point of view. An economic planner will be concerned with the equal distribution of gains and wealth besides efficient utilization of resources. A welfare economist will be concerned with the equal distribution of gains and wealth besides efficient utilization of resources. From the national viewpoint the various indicators of performance can be employment generation, research and development, health, education, and economic development etc

According to Accounting Point of view financial statements are prepared by a business enterprise at the end of every financial year. "Financial Statements are end products of financial accounting." They are capsulated periodical reports of financial and operating data accumulated by a firm in its books of accounts-the General Ledger.

### AREAS OF EVALUTION

There are areas where the performance can be improved by effective evaluation of various activities performed by a business enterprise in different areas of operations. The areas of operations may be termed as the areas of performance. The important areas are as follows:

#### 1 PROFITABILITY PERFORMANCE

Profitability is the ability of an enterprise to earn profits. The business management is vitally interested in profit as it is often used as performance measure. Measurement of profitability is the overall measurement of performance. Profit is also important to company, creditors and investors. Moreover, even a layman also assesses the performance of a business enterprise by its ability to earn profit. Profitability performance can be made by computing and interpreting various profitability ratios.

#### 2 LIQUIDITY PERFORMANCE

By checking the fluctuations most probably in current assets, the researcher can take the estimate of liquidity performance.

#### 3 WORKING CAPITAL PERFORMANCE

Generally working capital is said to be the excess of current assets over current liabilities. It is used for regular business operations consisting of loans and advances, Payment of wages, direct and indirect expenses, investments, credit granted to customers and cash on hand. It is lifeblood of each business. As soon as the heart gets blood, it circulates the same in the body. In the same manner working capital funds are obtained and circulated in business operations. As and when this circulation stops, the business organization becomes lifeless. So we can say that the working capital has an important place in the area of performance, hence working capital performance indicates the adequacy of working capital in the company and the efficiency as regards utilization of working capital.

#### **4 FIXED ASSETS PERFORMANCE**

The amount invested in these assets is realized gradually from every unit of sales made during the serviceable life of the assets. Analysis of fixed assets structure, average annual growth of fixed assets, and impact of gross block on sales and operating profit margin and efficiency in the use of fixed assets may depict the performance of fixed assets. Since the depreciation is directly related to fixed assets, the study of depreciation and the depreciation provision policy in using fixed assets can also be useful. As fixed assets in nature are long term tangible assets therefore, they should basically be financed through long-term sources. In this respect, the ratio of fixed assets to net worth can be calculated to study financing of fixed assets. This ratio is very important as it shows that owners have provided enough funds to finance fixed assets.

#### **5 FUND-FLOW PERFORMANCE**

Here a fund-flow statement of business is prepared to check the receipt & usage of fund.

#### **6 SOCIAL PERFORMANCE**

The social performance of any company can be evaluated by considering different parties like government, creditors, investors, customer and employees. All these parties are members of the society. Some important accounting ratios can be helpful to know the contribution made by the company to the society.

#### **CONCEPT OF FINANCIAL ANALYSIS**

Financial analysis is the evaluation of a firm's past present and anticipated future financial performance and financial condition. Robert. H. Wessel has defined analysis and interpretation of financial state meant as "a technique of x-raying the financial position as well as the progress of a company."<sup>6</sup> In short financial analysis is a systematic and specialized treatment of information obtain in financial statements in order to measure the liquidity, profitability, solvency, operational efficiency and growth potential of an enterprise. It is an important tool for the analyst to identify the financial and operational strength and weakness of the concern

There are 17 leading District Co-Operative Milk Producers' Unions in all over the Gujarat. Researcher has taken them 7 District Co-Operative Milk Producers' Unions as the study for research purpose. The study of these units mostly shows the financial picture from various aspects. Before analyzing the data of the units undertaken for the study, here is the overview of the District Co-Operative Milk Producers' Unions. This chapter consists with sample profile of the sample unit. The list of sampled District Co-Operative Milk Producers' Unions is as under:

1. Mehsana District Co-operative Milk Producers' Union Ltd., 'Dudhsagar Dairy' - Mehsana.
2. Rajkot District Co-operative Milk Producers' Union Ltd., 'Gopal Dairy' - Rajkot.
3. Kaira District Co -operative Milk Producers' Union Ltd., 'Amul Dairy' - Anand.
4. Surat District Co-operative Milk Producers' Union Ltd., 'Sumul Dairy' - Surat.
5. Valsad District Co-operative Milk Producers' Union Ltd., Vasudhara Dairy'- Alipur.
6. Sabarkantha District Co-operative Milk Producers' Union Ltd., 'Sabar Dairy' - Himmatnagar.
7. Gandhinagar District Co-operative Milk Producers' Union Ltd., 'Madhur Dairy' - Gandhinagar.

#### **ANALYSIS OF PROFITABILITY**

Profit is the main goal for establishing a business concern. Profit is the primary motivating force for economic activity. Profits have to be earned and they have got to be earned on a regular or continuous basis. Business concerns that is unable to generate sufficient profits from their operations cannot remunerate the providers of their capital and this makes it difficult for them to maintain the continuity of their existence. Profits are needed not only to remunerate capital but also to finance growth and expansion. The survival of a firm in growing economy cannot always be ensured simply by maintaining the status queue. If the firm is to survive in competitive and expanding environment, it has to go on expanding the scale of its operations on a regular and continuing basis. "Profits are the record card of the past, the inventive lord star for the future. If an enterprise fails to make Profit, capital invested is eroded and in this situation prolongs the enterprise ultimately ceases to exist." Thus profit is the soul of the business concern without which it becomes weak and lifeless. In fact profits are useful intermediate beacon towards which a firm's capital should be directed.

#### **CONCEPT OF 'PROFIT' AND 'PROFITABILITY'**

**PROFIT** The word 'Profit' has had French / Latin origin in 'Proficere' (being useful or proficient), 'Profectus' and 'Profectum' (to make progress). Thus, profit is in index of proficiency or progress, as typified by 'the gain

resulting from the employment of capital', the excess of returns over expenditure; pecuniary gain in any transaction / occupation. Profit can arise when the price paid by the customers for the product of the business firm exceeds the cost that has been incurred for it. Profit has been defined in a number of ways, by accountants, economists and others as per its use and purpose. There have 145 been many theoretical discussion of the concept of profit, but there is no consensus on the precise definition of this theoretical construct.

### **PROFIT AND PROFITABILITY**

Profit is essentially an internal measure of new wealth creation. It reflects the excess of earnings over expenses or costs. If the costs are more than earnings, it will mean a loss. Profit is the excess of net sale revenue over the cost of goods sold while profitability is the profit making ability of the business firm showing either steady or increased or decreased state of such ability during a specified time. Profit is an absolute connotation showing absolute figure which alone cannot give an exact idea of changes in efficiency of business firm whereas profitability is a relative concept which gives a clear idea of variation in efficiency. Thus, profit and profitability are two different concepts; however, they are closely related and mutually interdependent, 146 having distinct role in business. Hence, it can be said that profitability is broader concept comparing to the concept of profit. Profitability is the overall measure of efficiency.

### **ADVANTAGES OF RATIO ANALYSIS**

Following are some of the advantages of ratio analysis:

1. **Simplifies Financial Statements:** Ratio analysis simplifies the comprehension of financial statements ratio tell the whole story of change in the financial condition of the business.
2. **Facilities Inter Firm Comparison:** Ratio analysis provides data for inter firm comparison. Ratio highlights the factors associated with successful and unsuccessful firms. They also reveal strong firms and weak firms, overvalued and undervalued firms.
3. **Helps in Planning:** Ratio analysis helps in planning & forecasting over a period of time, a firm or industry develops certain norms that may indicate future. If relationship changes in firm's data over different time periods, the ratio may provide clues on trends and future problems. Thus, "Ratio can assist management in its basic function of forecasting, planning, co-ordination, control and communication."

### **LIMITATIONS OF RATIO ANALYSIS**

Ratio analysis suffers from a number of draw backs: Difficulty in comparison due to

A. Different procedures and practice followed by different firms.

B. Different accounting periods.

C. Every firm differs in age, size, etc,

- Price-level changes between two periods.
- Conceptual diversity. • Different meaning of the terms.
- Accounting limitations.
- Several ratios to draw conclusions.
- Ratio analysis conveys observations.
- Ratio may be misleading.

### **NET PROFIT RATIO**

Net profit margin is good indicator of the efficiency of a firm. It is obtained by deducting operating expenses, interest and taxes are subtracted from the gross profit. The net profit margin ratio is determined by relating net income after taxes to net sales.

**The formula can be narrated as under**

$$\text{Net Profit Ratio} = \text{Net Profit} / \text{Net Sales} \times 100$$

Net profit margin ratio establishes relationship between net profit and sales. It also indicates management's efficiency in manufacturing, administering and selling the products. This ratio is overall measure of the firm's ability to turn each rupee sales into net profit. If the net margin is inadequate, the firm will fail to achieve satisfactory return on shareholders' funds.

**Net Profit Ratio of Dairy Units under Study  
(FROM: 2010-11 TO 2019-20) (IN Percentage)**

YEAR	Dudhsagar dairy	Sabar dairy	Gopal dairy	Amul dairy	Sumul dairy	Madhur dairy	Vashudhara dairy	Average
2010-11	0.41	0.52	0.53	0.44	0.25	0.43	0.095	0.3821
2011-12	0.38	0.66	0.56	0.43	0.23	0.51	0.057	0.4039
2012-13	0.37	0.37	0.68	0.25	0.21	0.39	0.08	0.3357
2013-14	0.39	0.35	0.64	0.24	0.19	0.35	0.06	0.3171
2014-15	0.38	0.38	0.62	0.26	0.18	0.38	0.10	0.3285
2015-16	0.42	0.42	0.65	0.26	0.21	0.42	0.12	0.3571
2016-17	0.43	0.43	0.61	0.34	0.25	0.46	0.18	0.3857
2017-18	0.42	0.45	0.63	0.42	0.26	0.56	0.21	0.4214
2018-19	0.43	0.51	0.62	0.46	0.24	0.52	0.24	0.3971
2019-20	0.45	0.67	0.69	0.48	0.29	0.54	0.25	0.4814
TOTAL	4.08	4.76	6.23	3.58	2.07	4.56	1.392	3.8103

**NET PROFIT RATIO**

Net profit ratio establishes relationship between net profit and sales. It also indicates management's efficiency in manufacturing, administering and selling the products.

Dudhsagar Dairy, Gopal Dairy, Amul Dairy, Sumul Dairy, Sabar Dairy and Madhur Dairy were recorded positive net profit during the study period.

Vasudhara Dairy suffered losses during 2003-04. The net profit ratio of Vasudhara Dairy was 0.12 percent in 2015-16, which was the highest as compared to other Selected Dairy Units. The average net profit ratio of the all selected dairy units was 0.3571 percent. It can be concluded that the average of net profit ratio of Sabar Dairy (0.42 percent), Gopal Dairy (0.65 percent) and

Amul Dairy (0.26percent) was better as compared to other dairies. On the other hand the performance of Dudhsagar Dairy (0.42percent), Sumul Dairy (0.21 percent), Vasudhara Dairy (0.12percent) and Madhur Dairy (0.42 percent) was satisfactory.

Co-operative is a democratic institution run by the members who take active role in the overall functioning and success for their individual and mutual benefit. As per ICA (International Co-operative Alliance) there are 1 billion members in different types of co-operatives in the World of which 239 million people are registered as members from India. The co-operative movement in India began with the passing of the Co-operative Societies Act of 1904. The Government of India has been making efforts in creating co-operative a vibrant organisation to uplift the condition of the rural people. Thus a number of Committees constituted by Government of India in different years for suggesting different issues related to Co-operatives. The Committees recommended different measures that can be taken by the Government for the growth and development of co-operatives. Government of India also accepted many recommendations of these Committees. 244 There are different forms of Co-operatives of which Dairy Co-operative

is one of the rapidly growing co-operatives in India. The real beginning of the dairy co-operatives in India was during the period of 1940s. Prior to 1949 due to the exploitation by the middlemen of a private farm named, Polson Dairy, the co-operative movement

was initiated; thus an infant co-operative dairy, namely, Kaira District Co-operative Milk Producers' Union Limited, now known as Amul, was born in the year 1946. The Amul pattern of co-operatives had been so successful, that in 1965, then the Prime Minister of India, Shri Lal Bahadur Shastri, desired to replicate Amul pattern of Cooperatives on a nationwide basis. Thus National Dairy Development Board (NDDB) was set up for the purpose and it completed Operation Flood (OF)-I (1970-1981), OFII (1981-1985) and OF-III (1985-2002).

The future of the Indian Dairy Industry is promising and its growth potential is high as there is sufficient domestic demand and good scope for exports of milk and milk products. In the early 1990s the Government of India initiated major trade policy reforms, which favored increasing privatization and liberalization of all sectors of the economy and dairy sector was no exception to this. Dairy industry particularly, the handling, processing and marketing of fluid milk, which was reserved mainly for the co-operative sector, was delicensed in June 1991. At the time in changing scenario Gujarat state is undergoing considerable modernization with latest technology. It will be right to study and analyze the performance of the district co-operative milk unions of

Gujarat and to suggest measure to cost control and improve their profitability. The present study deals with performance analysis of co-operative dairy industry of Gujarat state which are engaged in processing and selling of milk and milk products.

### SUGGESTIONS

**To make co-operative dairy industry more financially sound following suggestions can be made:**

\* In the present scenario of new economic policy of liberalization, privatization and globalization, co-operative dairies have to be alert against competitions from corporate level private dairies within India and outside India.

\*Those dairies having less profitability should control and reduce unnecessary expenses and improve marketing to increase sales. The net profit in Dudhsagar Dairy, Sumul Dairy, Vasudhara Dairy and Madhur Dairy is lower as compared to other units under study.

\*They are required to increase net profit by decreasing processing expenses, marketing expenses, interest expenses, and salary and wages expenses etc. Vasudhara Dairy should try to increase their earning per share by taking different remedial steps like proper utilisation of borrowed funds, better utilisation of assets, and effective utilisation of share holder's fund.

\*To create sufficient funds from its members, they should be given attractive return on shareholders' funds.

\*In Dudhsagar Dairy and Amul dairy the total asset turnover ratio is low as compared to other units under study.

\*This proves that there is under utilization 259 of assets. The idle assets should be amortized and volume of sales is required to increase. The capital structure of the units should be re-organized by converting part of the loan into equity.

\*Co-operative dairies which have liquid crisis or net working capital crisis should manage their affairs efficiently so that stock of goods does not remain unsold and arrears are cleared at the earliest to avoid bad-debts. In Gujarat, dairy industry has been developed in co-operative sector.

\*These cooperative dairies are managed by the representatives of member of the milk producers' on democratic base.

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## Effect of Work Life Imbalance on Employees in Banking Sector

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### ABSTRACT

Work life balance is the ability to manage balance between work and personal life and to stay productive and competitive at work while maintaining a happy, healthy home life with sufficient leisure, despite having work pressure and endless activities which requires your time and attention. Still there are some factors which affect work life balance of employees in organization. The present paper aims at identifying the effects of work life imbalance of employees in banking sector. The present study would be beneficial for organizations in designing work life policies and programs for employees.

**Keywords:** Work life Balance, effects of work life balance, policies and procedures.

### 1. INTRODUCTION

**Work life Balance:** Work life balance is the ability to manage balance between work and personal life and to stay productive and competitive at work while maintaining a happy, healthy home life with sufficient leisure, despite having work pressure and endless activities which require time and attention. Work life balance is the worldwide phenomenon and requisite of each and every individual. Though each and every organization may have a different work culture, working condition, rules and regulation facilities which vary from one organization to other organization. The purpose of this study is to identify the effect of work life imbalance of banking employees and to determine the causes of work life imbalance in these banks and to provide as insight for employees so that they can plan for proper work life policies and initiatives.

**Banking sector:** Rapid changes in the political, social, and economic scenario have influenced highly both the nature of employment and its relationship with personal life. Managing between professional life and work life is a big challenge. Work life balance is on the priority for choosing on professions by today's generation with the changing role of employees in every sphere of life. The banking industry, vital to our commercial and personal lives, has always been a preferred destination for job. Nowadays banks are more diversified and easily are getting into new products and with the expansion of the banking sector and its coordination with other different sectors such as insurance, NBFC's and Capital markets etc. More number of opportunities are been created to the employees in the banking sector.

**Personal Life:** Personal life is completely different then professional. Both the aspects are different in terms of their comparison. Everyday many working people are struggling and finding it difficult to deal with their personal and professional life. However, with the change in working patterns it is complicated to keep personal life separate from work life. Personal life includes individual health, home, personal relationships, hobbies, interests etc. This jiggling with personal and professional life creates an urge for work life balance.

### 2. OBJECTIVE

- To study the effects of work life balance on employees of private bank.
- To analyze the findings of work life balance.

**3. Significance of Research:** Work life balance is the worldwide phenomenon and it is also a requisite to each and every individual. Though each and every individual or organization has different work culture, working condition, work related policies, rules and regulations to be followed by each employees, facilities provided varies from one organization to other organization. The purpose of this study is to identify the impact of work life imbalance of bank employees in Mumbai region and to provide an insight for employees so that they can take proper work life initiative and frame new policies for maintaining work life balance.

**4. Scope of the Study:** The proposed research work is limited to analyze the impact of work life imbalance of bank employees in private sector in the region of Mumbai. Though they may differ from organization to organization, geographically, demographically and on individual level depending on individual perceptions, attitude, values, personality etc.

**5. Review of Literature:** A review on the previous studies the effects of work-life imbalance of employees and is also necessary to know the areas already covered. This will help to find our new areas uncovered and to study them in depth. The earlier studies made on Work-life balance of employees are briefly reviewed here.

- ❖ **Das and Kushwaha (2013):-** Identifying critical factors of work-life balance and its impact on insurance employees in India- An exploratory factor analysis. This study was conducted in order to identify the factors influencing work-life balance practices of insurance companies and assessing the impact of work-life balance practices on the employee's work domain. The study identified four factors comprising sixteen items having Eigen values of more than 1 which accounted for about 52.9% of variation in data.
- ❖ **Saravanan and Dharani (2014):-**A Study on Factors Influencing Work Life Balance of School Teachers in Coimbatore. This study was conducted to analyze the factors determining the work and life balance with respect to school teachers. Independent sample t-test is used to analyze the effect of independent variables on work life balance with respect to private school teachers. In this authors analyzed that female private school teachers feel more balance between work and life than the male private school teachers and concluded that the factors influencing work life balance of male and female private school teachers is different.
- ❖ **Shobitha and Sudarsan (2014):-** Work Life Balance: A Conceptual Review. In this paper authors made an attempt to compile the previous researches on WLB studies undertaken to search for newer and deeper avenues of future research. Authors find out that the concept of work life balance has attracted the attention of not only different organizations but also researchers and HR practitioners. This mainly could be attributed to ever increasing demands of work along with increased family demands owing to the necessity of spouses to be employed and quest for personal achievements in personal life.
- ❖ **Fisher-McAuley et.al., (2003) in** their paper titled “**Modelling the relationship between work life balance and organizational outcomes**” explain role as the totality of formal tasks, informal tasks and acts as organized by an individual. Each individual is a member of social systems and the expectation as well as demand of one may put pressure on the other. There are two role systems: Role Space and Role Set. Both have a built-in potential for conflict and stress. It may be expected that organizational role stress will operate in interaction with the general ill-being and well-being. There is an expected high relationship of organizational role stress with these two. The stress diathesis model essentially says that the effect of stressors on illness and wellness is not absolute, but a function of moderating factors like inner strength and coping techniques.
- ❖ **Shubham Goswami (2014)** examines the source of conflict from work responsibilities across demographic characteristics and also analyses the impact of work – life imbalance on organizational commitment for employees of IT and ITES industry. Statistics on burnout cited clearly show that IT workers experience time, strain and role based conflicts, and these conflicts have implications for the satisfaction and organizational commitment. The study reveals that work –life imbalance is negatively associated with job commitment in IT – ITES industries

## 6. Methodology and Data Collection

Sample size of 50 were collected for the pilot study on the basis of convenient sampling from the employees of the private banks from Mumbai region. Primary data was collected using the questionnaire. The respondent surveyed with the view to gain information regarding their banking profession from work and personal life perspectives. The questionnaire contained the questions related to effects of work life imbalance. Statistical tools were used to identify the effects of work life imbalance on employees in banking sector using correlation analysis.

## 7. Data Analysis & Interpretation

On the basis of questionnaire filled by the respondent which consist of statements to judge their responses on 5point scale (Strongly Agree, Agree, Neutral, Disagree, Strongly disagree) and giving them score 5 is maximum and 1 is minimum using SPSS software to analyse and interpret the effects of work life imbalance on employees.

Descriptive Statistics on effect of work life imbalance on employees of banking sector.					
	N	Minimum	Maximum	Mean	Std. Deviation
1. I often keep on worrying about work even when I am not at work	50	1	5	3.12	1.573
2. I often feel depressed because of my work and family life	50	1	5	3.76	1.271
3. My job doesn't excite me anymore	50	1	5	3.44	1.387
4. I feel frustrated at work	50	1	5	3.50	1.249

5. I wish people would leave me alone at work	50	1	5	2.86	1.443
6. I communicate in hostile manner in work	50	1	5	2.30	1.389
7. I am always confused	50	1	5	4.20	1.088
8. I get disturbed when there is delay in completion of work.	50	1	5	3.28	1.356
Effects of work life imbalance	50	16.00	33.00	26.4600	5.17533
Valid N (listwise)	50				

## 8. FINDINGS OF THE STUDY

1. For the first parameter I often keep on worrying about work even when I am not at work the mean value is 3.12 and standard deviation is 1.573. Out of 50 respondents 60 % agrees that they keep on worrying when they are at work.
2. 74 percent of respondent agrees that they often feel depressed because the respondents find it difficult to manage their work and family life pressure. The mean value is 3.76 and standard deviation is 1.271 this states that employees feel depressed when they try to manage to balance their work and personal life.
3. 64 percent of respondent feels that their job does not excite them and 36 percent disagrees for the same, the mean value is 3.44 and standard deviation is 1.387 this states that the employees don't find excited to perform their task and go to their job.
4. 64 percent feels frustrated at work and 36 percent disagrees for the same and the mean value is 3.50 and the standard deviation is 1.249, this states that the respondent agrees with the statement.
5. 48 percent respondent wish people should leave alone at work and 52 percent do not agrees with the statement and the mean value is 2.86 this states that almost 50 percent would like to be alone and to communicate less.
6. 32 percent respondent agrees that they communicate in a hostile manner and their mean value is to be 2.30 states that the respondent view do not correlate with the statement.
7. 86 percent respondent always feel they are confused in delivering their duties towards work and family related issues. The mean value is 4.20 which states maximum response by the respondents towards delivering their duties.
8. 60 percent respondent agrees that they get disturbed when there is delay in completion of work and mean value is 3.28 wherein maximum respondent feels that they get disturbed when the things get delayed.

## 9. Suggestions of the study

For further improvement in the work – life balance of bank employees, the HR should follow necessary steps to balance work –life of employees in banks. The present study suggests the following points to balance work- life.

1. Bank should take initiative to provide separate policies for work life balance.
2. Regular exercises, meditation, and other soft skill practices can improve the emotional balance of the employees.
3. Banks should avoid the factors affecting employees like overtime, work on holidays, and negative attitude towards colleagues.
4. Respondents need policies like flexible working time.

## 10.LIMITATION

The study concludes that the work life has become a quest for employees of banking industries both in private and public sector and also it is noticed that the employees can work better when they get time for family and personal interests. Future research much focuses on a wider sample in order to get more generalized result. Moreover, it must be directed at understanding individual differences so that employees' specific initiatives to improve work life balance could be initiated by organizations.

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## **The Effect of Covid-19 on Prospective Buyers' Attribute Preferences for Term Insurance Plans: An Application of Conjoint Analysis**

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### **ABSTRACT**

Term insurance, as the title indicates, is a Life Insurance policy that is taken for a specific period or term and in the event of the policyholder's unfortunate death, the sum assured is paid to the beneficiary. Nothing is paid out to the policyholder if he or she survives the policy term, making term insurance a pure life insurance policy that can provide you with a very high cover for a very low premium when compared to conventional life insurance policies. The epidemic of this global crisis, the coronavirus, is a wake – up call for all those who thought buying a life insurance policy was unnecessary and have been avoiding it for a long time. COVID-19 insurance is essential and will be one of your most important investments and protection at the same time. In today's world, a coronavirus term insurance coverage is a critical component of your financial planning. The sooner you purchase a life insurance policy, the longer you will be insured and the lower the premium you will have to pay. The conjoint technique is used to examine the effect of COVID-19 on prospective buyers' attribute preferences for term insurance products. The study's sample is made up of people who identified themselves as insurance decision-makers by acquiring term insurance. Customers are asked to score the questionnaire's numerous term life insurance policy profiles. The consumer is chosen using the non-probability judgmental sampling method. According to the report, the most important aspects of a term insurance policy are the brand and payment options. The selling channel, term assured, and rider benefits, on the other hand, are proven to be the least important elements of the term insurance plan.

**Keywords:** Conjoint Analysis , Term Insurance Plan , Attributes, COVID-19

### **INTRODUCTION**

The third wave of COVID-19 is currently affecting India, and it is far worse than the first. The virus's emotional and physiological consequences are far beyond anyone's wildest dreams. A third wave of the virus, according to scientists, is on its way to the planet. India has also suffered the most as a result of the COVID-19 situation as a whole. Despite the fact that the COVID-19 immunization has brought some solace in these tough times, the situation remains perilous. Everyone is frightened about the risk of becoming ill and leaving loved ones unable to provide for themselves. The coronavirus epidemic of this worldwide disaster is a wake – up call for all those who thought purchasing a life insurance policy was optional and had been postponing it for a long time. COVID-19 insurance is required and will be one of your most crucial investments as well as protection. A coronavirus term insurance policy is an important part of your financial planning in today's society. The sooner you buy a life insurance policy, the longer you will be covered and the lower your premium will be.

### **REVIEW OF LITERATURE**

According to Tati, R. K., and Baltazar, E. B. B. (2018), tax savings is one of the most important elements that impact the investor when investing in a life insurance policy. Braun, A., Schmeiser, H., and Schreiber, F. (2016) find that traditional pricing systems, which were also used in the insurance business, are demonstrably inferior than priority pricing methodologies. Fischer, I., and G. Buchenrieder (2009) investigate the insurance preferences of rural agricultural households. In addition, we've discovered that smallholders are particularly interested in livestock coverage. Because the 'insured animal' is the most important feature for all participants, the bull is the most valuable animal. According to Yadav, B., and Tiwari, A. (2012), while acquiring an insurance policy, the demography component of the community plays a very essential impact. Suneja, A., and Sharma, K. (2009) discover that promotional activities are important factors when selecting a private health insurance business over a public sector insurer. According to Tati, R. K., and Baltazar, E. B. B. (2018), tax savings is one of the most important elements that impact the investor when engaging in a life insurance policy. Guan, L. P., Yusuf, D. H. M., and Ghani, M. R. A. (2020) determined that the price of the insurance policy is the most essential attribute for the client when acquiring an insurance policy, followed by specific product, promotion, and distribution system. According to Gupta, U., and Sinha, R. (2015), the demand for a home loan in India has been increasing due to the need for residence. The constant rate of interest is by far the most key factor affecting customer purchasing behaviour when it comes to housing loans. According to Dominique-Ferreira (2017), the most significant element in selecting non-life insurance is the price, followed by the bundling approach, the intermediary's advice, and the insurer's brand. Using a logarithmic goal programming

method, Dutta, G., Basu, S., and John, J. (2010) discover that low premium is the most important factor in picking life insurance business products in the Indian market.

### RESEARCH METHODOLOGY

The focus of this research is to look at how COVID-19 affects prospective buyers' attribute choices for term insurance products. The conjoint technique is used to examine the effect of COVID-19 on prospective buyers' attribute preferences for term insurance products. The conjoint questionnaire is created with the SPSS questioner, which is a random selection of the probable profile of the different options of the term life insurance policies' selected attributes after the COVID -19. The responses of 94 consumers who described themselves as insurance decision-makers were gathered. Customers are asked to rate the various term life insurance policy profiles provided in the questionnaire. The non-probability judgmental sampling technique is used to determine the client. The results are gathered from clients with various demographic features, such as gender, age, income, and employment.

### DATA ANALYSIS AND INTERPRETATION

This section of the chapter investigates how COVID-19 influences prospective buyers' attributeselections for term insurance products. The study is attempting to identify and include many qualities. In such instances, the worth of term insurance becomes obvious. Many people have discovered that a term plan is more than just a tax-saving instrument since the virus's debut.

Good term insurance policies cover COVID-19 claims, giving families who have lost their breadwinner a ray of hope. The conjoint analysis helps to describe the buyer's preference for the various elements of the Term insurance plan. The Conjoint analysis begins by finding the most important preferred insurance policy qualities. Brand, sales channel, term assured, and rider are the term insurance plan factors that have been identified. Based on a literature review and a discussion with the customer, these traits are identified to be quantifiable attributes. The next step in the conjoint analysis process is to identify the various possibilities available with qualities that have a greater number of options but may have fewer options. Aside from the possibilities listed, the combination of term insurance plan qualities; however, some may have fewer options. The conjoint arrangement is a combination of possibilities within each attribute.

The table below depicts a Conjoint arrangement depiction of numerous selected attributes alongside selected term insurance plan alternatives in this study:

Attributes -->	Brand	Sales Channel	Payment Option	Term Assured	Rider
Options-->	A well-known insurance company	Digital	Yearly	5	Available
	Insurer who was not Verywell known	Non -Digital	Half yearly	15	Not Available
			Quarterly	20	
			Monthly	25	

A questioner (for conjoint approach) is designed for data collection in the study using the above-mentioned COVID-19, which affects potential buyers' attribute choices for term insurance products. This conjoint questioner comprises the many profiles comprised of the various term insurance plan options. The responses of 94 consumers who described themselves as insurance decision-makers were gathered. The consumers chosen for the study were asked to rate the different mention profiles of Term Insurance plan with a specified combination of Term Insurance plan alternatives. The ratings of term Insurance plan profiles are on a scale of 1 to 10, with 1 representing the least preferred Term Insurance plan profile and 10 representing the most recommended Term Insurance plan profile.

The following are the details of the Term Insurance profiles chosen for the conjoint questioner: Profiles

Card ID	Brand	Sales	Payment Option	Term Assured	Rider
1	Insurer who was not Very well known	Non -Digital	Quarterly	5	Available
2	A well-known insurance company	Non -Digital	Quarterly	25	Not Available
3	Insurer who was not Very well known	Digital	Monthly	25	Available
4	Insurer who was not	Non -Digital	Half yearly	5	Not

	Very well known				Available
5	A well-known insurance company	Digital	Yearly	5	Available
6	Insurer who wasnot Very well known	Non -Digital	Yearly	15	Available
7	A well-known insurance company	Digital	Half yearly	15	Not Available
8	A well-known insurance company	Digital	Monthly	5	Not Available
9	A well-known insurance company	Digital	Quarterly	15	Available
10	Insurer who wasnot Very well known	Digital	Quarterly	20	Not Available
11	Insurer who wasnot Very well known	Digital	Yearly	25	Not Available
12	A well-known insurance company	Non -Digital	Yearly	20	Not Available
13	Insurer who wasnot Very well known	Digital	Half yearly	20	Available
14	Insurer who was not Very wellknown	Non -Digital	Monthly	15	Not Available
15	A well-known insurance company	Non -Digital	Half yearly	25	Available
16	A well-known insurance company	Non -Digital	Monthly	20	Available

The multiple regression model is utilized, with many dummies serving as the independent variable. In the regression model, the estimated average of ratings collected from term insurance buyers is considered the dependent variable, and different term insurance attribute selections are assumed to be different independent variables. The multiple regression model is represented as follows:

$$\text{Rating} = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i}$$

In the regression model, the rating is the dependent variable, and the dummies of the Term insurance attribute selections are the independent variables. The following is the outcome of the regression model:

**Table :** Regression Model for Conjoint

Dependent Variable	Independent Value	Regression Coefficient	T Statics P Value	F State P Value	R2
Customer Rating	(Constant)	6.585	22.748 (.000)	3.213	82.8
	Brand- insurer who was not well known	-.046	-.252 (.809)		%
	Sales channel non-digital	.122	.666 (.530)		
	Payment option Half-yearly	-.392	-1.515 (.181)		
	Payment option Quarterly	.352	1.359 (.223)		
	Payment option Monthly	.156	.601 (.570)		
	Term assured 15	.006	.022 (.983)		
	Term assured 20	-.890	-3.436 (.014)		
	Term assured 25	-.095	-.366 (.727)		
	Rider Not available	.304	1.663 (.147)		

The cardinal utility of all Term insurance attribute options in the conjoint arrangement can be calculated using the following equation:

For the attributes "Brand" $a_1+a_2 = 0$

$$a_2 - a_1 = -0.46$$

For the attributes "Sales Channel" $b_1+b_2 = 0$

$$b_2-b_1 = .122$$

For the attributes "Payment Option" $c_1+c_2+c_3+c_4=0$

$$c_2-c_1 = -.392$$

$$c_3-c_1 = .352$$

$$c_4-c_1 = .156$$

For the attributes "Term Assured"

$$d_1+d_2+d_3+d_4=0 \quad d_2-d_1 = .006$$

$$d_3-d_1 = -8.90$$

$$d_4-d_1 = -0.95$$

For the attributes "Rider" $e_1+e_2 = 0$

$$e_2-e_1 = .304$$

The cardinal utility of all Term insurance attribute options in the conjoint arrangement can be calculated using the following equation:

Attributes	Choices	Utilities	Remark
Brand	A well-known insurance company	0.023	Highest in Brand
	Insurer who was not Very wellknown	-0.023	
Sales Channel	Digital	-0.061	
	Non digital	0.061	Highest in Sales Channel
Payment	Yearly	-0.029	
	Half yearly	-0.421	
	Quarterly	0.323	Highest in PaymentOption
	Monthly	0.127	
Term assured	5	0.24475	
	15	0.25075	Highest in Term assured
	20	-0.64525	
	25	0.14975	
Rider	Available	-0.152	
	Not available	0.152	Highest in Rider

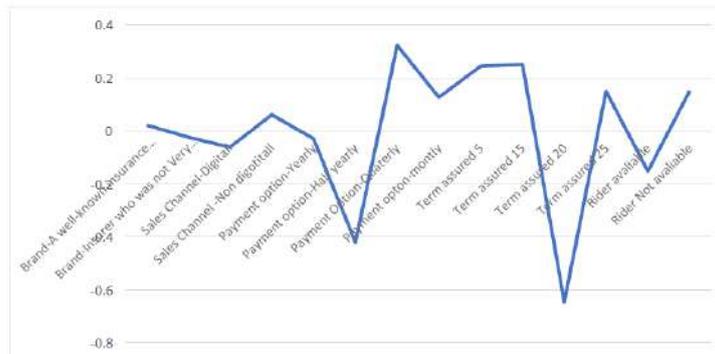
According to the findings of the conjoint analysis, in the case of the attribute Brand preference of the consumer when purchasing a Term Insurance plan, A well-known insurance business had the highest positive cardinal utility of 0.023. This can be deduced from the fact that consumers, by nature, avoid danger and seek safety. This could be because a well-known insurance provider provides them with security and reduces the possibility of disappointment

.When acquiring a Term insurance plan, the relative importance of a consumer's brand preference is found to be 3%. Similarly, the 'Quarterly' premium payment option was determined to have the highest positive cardinal utility of 0.323, followed by the 'Monthly' (0.127) premium payment option. In the case of Yearly(-0.029) and Half-yearly(-0.421) premium payment options, the cardinal utility is shown to be negative. This can be deduced from the fact that consumers prefer to pay quarterly and monthly premium instalments rather than annual and semi-annual premium instalments. The relative importance of the payment alternatives category is discovered to be 20%, which is lower than the predicted Term guaranteed. In the case of the sales channel, the consumer prefers the Digital (0.061) over the

Non-digital (0.061). (-0.061). Similarly, in the case of Rider benefit, the consumer has greater utility without the rider benefit (0.152) than with the rider advantage (-0.152). In the Term assured category, the 15-year term plan

has the highest positive cardinal utility of 0.25075, followed by the 5-year (0.24475) and 25-year (0.14975) year term plans. In the instance of a 20-year term plan, the utility is determined to be negative (-0.64525).

**Table:** The Cardinal Utilities of Various Term Insurance Attributes



The table below shows the relative relevance of the various Term Insurance factors. Table: The Importance of Term Insurance Factors

Attributes	Range	Relative Importance (inpercentage value)
Brand	0.046	3%
Sales Channel	0.122	7%
Payment option	0.352	20%
Term Assured	0.896	52%
Rider	0.304	18%
Total	1.72	100%

According to the findings, the most essential attribute for a consumer when purchasing a Term insurance plan is the Term assured (52%), followed by the payment option (20%), the Rider (18%), and the Sales Channel (18%). (7 percent). However, brand (3%) is the least important factor for a consumer when selecting a term insurance plan.

### CONCLUSION

Many people in this situation are anxious about whether or not their life insurance policy will cover death caused by COVID-19. Health-related death is covered by life insurance policies, including term plans. If a policyholder dies as a result of COVID-19, the sum assured will be paid to his or her nominee. The importance of life insurance cannot be stressed at this time. The study concludes that in the case of the parameters Brand image of term insurance plan, the choice well-known insurer has the highest positive cardinal utility. However, when choosing a lesser-known insurer, the cardinal utility is found to be negative. This can be deduced from the fact that consumers, by nature, avoid danger and seek safety. This could be because a well-known insurance provider provides them with security and reduces the possibility of disappointment. The relative importance of a consumer's brand preference is discovered to be 3%. Similarly, in terms of payment, the 'Quarterly' premium payment option was discovered to have the highest positive cardinal utility, followed by the 'Monthly' premium payment option. In the case of choosing between quarterly and monthly premium payment alternatives, the cardinal utility is determined to be negative. This can be deduced from the fact that consumers prefer quarterly and monthly premium instalments over annual and semi-annual premium instalments. The relative relevance of the payment choices category is discovered to be 20%, which is higher than the projected importance of the Brand. In the case of the sales channel, the consumer prefers the non-digital to the digital. Similarly, in the case of Rider benefit, the consumer has greater utility without the rider than with the rider benefit. In the Term assured category, the 15-year term plan has the highest positive cardinal utility, followed by the 5-year and 25-year term plans. In the instance of a 20-year term plan, the utility is determined to be negative. Furthermore, after the COVID-19, the most essential features of the Term insurance plan are the Term Assured and payment alternatives. However, the least essential term insurance plan elements are identified to be Brand choice, Term assured, and Rider.

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## Financial Analysis: A Study of HCL Technologies Ltd

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### ABSTRACT

**Finance** is the way of moving funds for any kind of expenditure. Finance is the study of money. It contains activities like investing, borrowing, lending, budgeting, saving, and forecasting. Finance is the life blood of a business. Therefore, every business needs finance to run business smoothly. In the modern era of economy, finance is one of the basic fundamentals of all types of economic activities. The Financial Analysis is the process of defining strength and weakness of business. Most of the business decisions are made on financial statements. This study is also made on five years financial statement of HCL Technologies Ltd from 2016-17 to 2020-21. This study has analyzed the financial performance of HCL Technologies Ltd in terms of Profitability and Efficiency. For evaluating financial performance, researcher has used various ratios like Net profit Margin, Return on Capital Employed, Return on Net Worth, Fixed Assets Turnover Ratio and Stock Turnover Ratio.

**Keywords:** IT Companies, Financial Analysis

### INTRODUCTION

Originally HCL Technologies is the subsidiary of the HCL Enterprise. HCL Enterprise was established in 1976 with three subsidiaries, namely HCL Technologies, HCL Info systems and HCL Healthcare. Initially HCL Technologies is the R & D division of HCL Enterprise. HCL Enterprise is also wants to focus on hardware but because of HCL Technologies, software and services became main focus of the enterprise. In 1991, it becomes independent company and come into the software services business. Initially it was started as HCL Overseas Limited. On 14 July, 1994, it was renamed as HCL Consulting Limited and then finally for better reflection of its activities, it was renamed as HCL Technologies Limited. The company has its headquarters in Noida, India. The company extended software development capacities in different countries such as US, European and APAC markets between the years 1991 and 1999. HCL Technologies work in 50 countries like Australia, China, Hong Kong, India, Indonesia, Israel, Japan, Malaysia, New Zealand, Saudi Arabia, Singapore, South Africa, the United Arab Emirates and Qatar. In Europe, company has offices in Belgium, Bulgaria, Czech Republic, Denmark, Estonia and Romania, Finland, France, Germany, Italy, Lithuania, Netherlands, Norway, Poland, Sweden, Switzerland, Portugal, and United Kingdom. And in the Americas, offices are in Brazil, Canada, Mexico, Puerto Rico, Guatemala, and United States.

At present, HCL Technologies is the subsidiary of Vamasundari Delhi as it holds majority of shares in utmost HCL group companies and Shiv Nadar is the owner of the business. HCL Technologies acquired Gulf Computers Inc. in 2002. It acquired some products of IBM on 1 July, 2019 and also acquired the full possession of research and development, sales, marketing, delivery and support for AppScan, BigFix, Commerce, Connection, Digital Experience, Notes Domino and Unica. And in March 2021, it develops partnership with Google Cloud Unica Marketing Cloud.

### REVIEW OF LITERATURE

**Mr. P. Kanagaraj and Ms. M. Dakshika (2021)** have carried a research paper on the financial performance analysis of HCL Technologies Ltd. The Researchers has taken data of six years from 2014 to 2020. The data was analyzed by using different ratios namely, Current Ratio, Liquid Ratio, Net Profit Ratio, Gross Profit Ratio, Return on Asset Ratio, Proprietary Ratio, Total Asset Turnover Ratio and Inventory Turnover Ratio. The results indicated that financial performance of the company is satisfactory. It showed that sales maintain well but it was not effective on profit. Company should focus on decreasing liabilities and debts to increase profit. Liquidity position of the company was also not so good.

**Rajput Vijaybhai M. (2020)** has carried thesis on topic "An Analysis of Financial Performance of Selected Telecom Companies in India". For this analysis, researcher has selected 6 companies which have capitalization of more than 1600 cr. as on December 2017. This study has carried for the period 2007-08 to 2016-17. This study concluded that liquidity positions of the companies were weak and both the public sector companies producing continual loss from 2009-10. Efficiency and productivity level were also not so good. So it can be said that the financial performance of telecom companies is not so good and suffering from huge losses. Hence it has been suggested that the companies should advance their resources and performance.

**Joshi Radhika S. (2019)** has conducted a study and the title of thesis is “An In-Depth Study on Financial Performance of Selected Information Technology Companies in India”. Data collected and analyzed for financial years 2008-09 to 2017-18. For the study, researcher has selected 10 large scale IT Companies.

The results revealed that TCS and Tech Mahindra Limited indicates mix trend in Profitability. Tech Mahindra Limited and Infosys Limited indicates mixed trend in Liquidity Ratios. There is an increasing trend in Liquidity Ratios of WIPRO, Mphasis, Hexaware Technologies Limited, NIIT Technologies Limited while Mindtree Limited. and HCL Technologies indicates increasing trend in both the Liquidity and Profitability Ratios. ANOVA test determined that there is significant difference in Current Ratio, Quick Ratio, Net Profit Margin Ratio, Return on capital Employed Ratio, Return on Assets Ratio, Debt-equity Ratio, Asset Turnover Ratio, Inventory Turnover Ratio between selected IT companies.

**Musheer and Ganesamoorthy (2017)** have mainly focused on analysis of the profitability of five IT companies in India based on secondary data. Researchers have used ratios, mean, standard deviation and coefficient of variation for analysis. In terms of Net Profit Ratio and Operating Profit Ratio, Tata Consultancy Services, Infosys and HCL Technologies have shown good level of profitability whereas Tech Mahindra has shown low level of profitability. Wipro Company also shows low Operating Profit Ratio. Return on Assets Ratio is good in Tata Consultancy Services And Infosys Companies but in Tech Mahindra and Wipro Companies, it was not so good. Return on Shareholder’s Fund Ratio is high in all the selected companies but Tata Consultancy Services has highest one. Infosys has highest profitability in term of Earning per Share. Infosys has good profitability performance in all the aspects.

**Mahendra Maisuria and Idrish Allad (2016)** have carried a comparative study of selected five Indian IT Companies in terms of Profitability Ratio for the period of five years spanning from 2010-11 to 2014-15. Ratio Analysis is used for analysis and for Hypothesis Test, One-way ANOVA used by researchers to analyzed data. The comparative study determined that in terms of Net Profit Ratio and EPS, financial performance of Oracle Fin. Services is satisfactory but Net Worth Ratio and Return on Capital Employed is not so good. TCS performed well in terms of Net Worth Ratio and Return on Capital Employed whereas Tech Mahindra has lowest performance. ANalysis of EPS has shown that Infosys pays highest EPS e.g. Rs. 139.49 and Wipro pays lowest EPS e.g. Rs. 20.58.

## RESEARCH METHODOLOGY

This research has analyzed profitability and efficiency of HCL Technologies Ltd for the five years from 2016-17 to 2020-21. This study needed a financial data for analysis. The data used for analysis is completely secondary data and it was collected from research papers, thesis, dissertations, financial statements and annual reports of the company. And this financial statements and reports were collected from websites like moneycontrol. Researcher has used varying ratios for analysis in terms of profitability and activity turnover ratio such as Net profit Margin, Return on Capital Employed, Return on Net Worth, Fixed Assets Turnover Ratio and Stock Turnover Ratio.

## OBJECTIVE OF THE STUDY

1. To measure and analyze financial performance of HCL Technologies Ltd.
2. To determine and compare profitability of HCL Technologies Ltd.
3. To analyze and compare efficiency of HCL Technologies Ltd.

## FINANCIAL PERFORMANCE ANALYSIS

### ❖ PROFITABILITY RATIOS

(In Percentage)

Year	Net Profit Margin Ratio	Return on Capital Employed Ratio	Return on Net Worth Ratio
2016-17	35.57	31.49	26.46
2017-18	33.35	32.52	26.70
2018-19	31.46	32.00	26.88
2019-20	27.50	28.84	24.04
2020-21	24.50	27.76	20.07
Average	30.476	30.522	24.83

Source: www.moneycontrol.com

### 1. NET PROFIT MARGIN

Net Profit Margin Ratio establishes a relationship between net profit and net revenue. It is a financial ratio which is used to estimate the percentage of profit made by company from its total revenue. Net Profit Margin Ratio is also known as Profit Margin and Net Profit Margin Ratio. It is calculated by dividing the Net Profit to Net Revenue.

**Net Profit Margin Ratio = Net Profit/Total Revenue x 100**

Above table indicates Net Profit Margin of HCL Technologies Ltd. for the period of five years 2016-17 to 2020-21. It shows decreasing performance of the Net Margin Profit Ratio. In 2016-17, there is highest ratio i.e. 35.57% and lowest is 24.50% in the 2020-21. Average Net Profit Margin of HCL Technologies Ltd. is 30.48%. There is continuously decreasing flow in Net Margin Profit Ratio so it can be concluded that the company is not efficiently working on increase profit and sources of income.

### 2. RETURN ON CAPITAL EMPLOYED

Return on Capital Employed Ratio is profitability ratio which is used to evaluate a company's capital efficiency and to know how efficiently a company is making profits from its capital. Return on Capital Employed Ratio is generally used by financial managers, investors and stakeholders to analyze the company to invest in it.

It is calculated by dividing EBIT (Earnings before interest and tax) to Capital Employed. EBIT is calculated subtracting the cost of goods sold and operating expenses from revenues. Capital Employed is calculated by subtracting current liabilities from total assets.

**Return on Capital Employed Ratio = EBIT/Capital Employed**

Above table indicates Return on Capital Employed Ratio of HCL Technologies Ltd. for the period of five years 2016-17 to 2020-21. In 2017-18, there is highest ratio i.e. 32.52% and lowest is 27.76% in the 2020-21. Average Return on Capital Employed Ratio of HCL Technologies Ltd. is 30.52%. In 2017-18, it is somewhat increasing and then it decreases. So it can be concluded that in 2017-18, company used capital more efficiently than another years.

### 3. RETURN ON NET WORTH

Return on Net Worth Ratio (RoNW) is the amount of profit a company made from shareholder's money. It indicates how efficiently a company is using the shareholder's money. It is also known as Return on Equity. It is calculated by dividing Net Profit to Shareholder's Equity.

**Return on Net Worth Ratio = Net profit/ Shareholders' Equity**

Above table indicates Net Worth Ratio of HCL Technologies Ltd. for the period of five years 2016-17 to 2020-21. In 2018-19, there is highest ratio i.e. 26.88% and lowest is 20.07% in the 2020-21. Average Net Worth Ratio of HCL Technologies Ltd. is 24.83%. Up to 2018-19, it is continuously increasing and then it decreases. So it can be said that shareholder's fund is not efficiently used in all years except 2018-19.

### ❖ ACTIVITY RATIOS

Year	Assets Turnover Ratio (In Percentage)	Stock Turnover Ratio (In Times)
2016-17	59.67	214.64
2017-18	67.25	551.83
2018-19	69.44	1445.11
2019-20	60.92	2329.00
2020-21	64.43	1981.83
Average	64.342	1304.482

### 1. ASSETS TURNOVER RATIO

Asset Turnover Ratio is an activity ratio. It is useful in knowing how well company used its asset to make sales. It is also known as Total Asset Turnover Ratio. Asset Turnover Ratio is equal to Net Sales divided by Total Assets.

**Asset Turnover Ratio = Net Sales/Total Assets.**

Above table indicates Asset Turnover Ratio of HCL Technologies Ltd. for the period of five years 2016-17 to 2020-21. In 2018-19, there is highest ratio i.e. 69.44% and lowest is 59.67% in the 2016-17. Average Asset Turnover Ratio of HCL Technologies Ltd. is 64.34%. Up to 2018-19, it is constantly increasing and then it falls in 2019-20. But in 2020-21, it is increasing again. So it can be determined that company utilized assets well to generate profit in 2018-19.

## 2. STOCK TURNOVER RATIO

Stock Turnover Ratio is used to understand relationship between inventory and cost of goods sold. It is also known as Inventory Turnover Ratio and Stock Velocity ratio. It indicates how speedily stock converted into sales or revenue. It is indicated in times. It is calculated by dividing Cost of Goods Sold by Average Stock. Cost of Goods Sold is equal to Opening stock plus Purchases Less Closing Stock and Average Stock is the mean of Opening Stock and Closing Stock.

### **Stock Turnover Ratio= Cost of Goods Sold /Average Stock**

Above table indicates Stock Turnover Ratio of HCL Technologies Ltd. for the period of five years 2016-17 to 2020-21. In 2019-20, there is highest ratio i.e. 2329.00 times and lowest is 214.64 times in the 2016-17. Average Stock Turnover Ratio of HCL Technologies Ltd. is 1304.48 times. It can be said that in 2016-17, there is a weak sales performance of the company however in 2019-20 sales is good.

## FINDINGS AND SUGGESTIONS

- There is highest Net Profit Margin Ratio of HCL Technologies Ltd. is in the year 2016-17 i.e. 35.57% but after that it continuously decreasing.
- There is highest Return on Capital Employed Ratio of HCL Technologies Ltd. is in the year 2017-18 i.e. 32.52%. And then again fall down continuously.
- There is highest Return on Net Worth Ratio of HCL Technologies Ltd. is in the year 2018-19 i.e. 26.88%. Till 2018-19, it is increasing and then starts drop down.
- There is highest Asset Turnover Ratio of HCL Technologies Ltd. is in the year 2018-19 i.e. 69.44%. Until 2018-19, it is going well and then decreases in the year 2019-20. But in the year 2020-21, company works efficiently on use of asset to generate profit.
- There is highest Stock Turnover Ratio of HCL Technologies Ltd. is in the year 2019-20 and that is 2329.00 times. Up to the year 2019-20, company works well on stock turnover. But in the year 2020-21, ratio is falling down to 1981.83 times.
- It can be suggested that HCL Technologies Ltd. should focus more on the improving profitability by maximum potential efforts and techniques of cost cutting and company should use capital and shareholder's fund efficiently to increase profit.

Asset Turnover Ratio is also fluctuated more, so company should improve techniques of utilization of asset to enhance the profit. Stock Turnover Ratio is good till the year 2019-20 but in the year 2020-21, it shows less sales of the stock. So company should focus on maintain sales of the company.

## CONCLUSION

On the basis of research carried by researcher it can be concluded that HCL Technologies Ltd is playing major role in encouraging Indian IT sector and Indian economy. On the basis of analysis it can be summarized that in terms of profitability HCL Technologies Ltd. is not doing well whereas in terms of activity, there is also fluctuation and not constant growth in efficiency.

For further study, it is commended that researchers should go for analyzing financial performance of HCL Technologies Ltd. by taking another ratios and different techniques of analysis and testing.

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## Real Estate Development in India

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### ABSTRACT

This study inspects the conduct factors that impact the Indian Investors to put resources into the Real Estate Market. Among the different variables that influence the inclination of financial backers to put resources into the genuine market, certain elements are significantly affected the financial backers at most prominent stretch out while others basically level. From this concentrate on it is uncovered that inspiration from the land engineers and dealers (mean worth 3.46) is most impacting element and occurring of dubious occasions (mean worth 1.75) is the least variable that impacts the financial backers' venture conduct. In this review, the conduct factor like carelessness and the theories with respect to schooling, religion was examined and observed that strict variable impacts the Indian financial backers to put resources into the land.

**Keywords:** Housing market, Investment information, Neutral Information, Motivation from Advisers, Investment Risk, Behavioural variables.

### INTRODUCTION

Land is a decent chance to utilize assets for both long and transient ventures. It is protected and gives high return venture when contrasted with unpredictable gets back from the securities exchange and restricted gets back from bank stores. Wikipedia, the free reference book alluded land as 'Lawful term (in certain wards) that incorporates land alongside anything forever fastened to the land, like structures'. Top to bottom, land, which is additionally characterized as the enduring property or even realty is regularly considered indistinguishable with genuine property contrast with individual property. Technically, land isn't characterized by such actual parts as land and structures. Rather, land is almost inseparable from genuine property, the privileges that related with land and along with the installations, for example, streets and structures that are forever appended to the land. The housing market has been on a development and extension stage since the time 2002. The reasoning of interest in land is to produce the benefit return in future while swearing off the current utilization by taking into the thought of vulnerability and hazard. The globalization and the rising of Worldwide Corporation in India results to the development of housing market and financial development. Besides, development of populace, ascending in pay level, fast urbanization factors affected to the development of Indian housing market. Since the Indian housing market is developing business sector in immature economy, the job of land financial backers' play and fundamental job of Indian economy. Land is a resource structure with restricted liquidity comparative with different ventures, it is likewise capital serious and is exceptionally income subordinate. In the event that these elements are not well understood and overseen by the financial backer, land turns into a hazardous speculation. The investigation of financial backer's conduct unveils that different variable impact their put portfolio in the housing market.

### LITERATURE REVIEW

Bharat Mittal, 2007 Indian land speculation region has shown colossal advancement in the course of the most recent couple of years with the worldwide and neighbourhood factors. With the development and extension of the housing market, different regions got encountered the development which made the development of economy. Gill, A, S.P Sharma, H.S Mand, N. Mathur, 2012. The globalization and the emanant of Multinational Corporation in India results to the development of housing market and monetary development. In addition, development of populace, ascending in pay level, fast urbanization factors affected to the development of Indian housing market. Since the Indian housing market is developing business sector in immature economy, the job of land financial backers' play and imperative job of Indian economy. Gill and Biger (2008) (2012) likewise show that financial backers' inclination to contribute capital is decidedly impacted by their own apparent information on unbiased data. Consequently, financial backers don't depend on a solitary coordinated methodology, yet rather on numerous classes of elements, for example, value development in the housing business sector and current monetary markers e.g., business cycle, GDP, etc. Byrne (2005) clarifies that financial backers take better speculation choice through the superior the venture information and experience. The financial backers can precisely see the danger and the return accumulating from the venture portfolio.

### **2.1. Investment Knowledge**

Y.A. Hamid (1999) has seen that the financial backers' speculation information and experience contrarily affect their propensity to put capital in the housing market. That is, assuming Indian financial backers see higher danger in the Indian housing market, they are hesitant to contribute capital as well as the other way around. Financial backer information on 'unbiased data' assumes a significant part in venture dynamic interaction. The idea was grown quite a while in the past by Siegel et al.

#### **Neutral Information**

S.G. Siegel, K.J. Dow, and E. Calderaro, et al (1979) who found that numerous financial backers of the view that budget reports alone as worse enough for speculation dynamic purposes. They accepted that there are different wellsprings of data viz. unbiased data which impact financial backers to cause a superior to believe to venture.

#### **Motivation from Advisors**

R.A. Nagy and R.W. Obenberger (1994) demonstrate that the suggestions of relatives and companions sway on the venture choices of financial backers. Gill and Biger demonstrate that venture inclination of financial backers is emphatically impacted by their own apparent counsel with a counsellor. In comparable habits, land intermediaries, relatives, and companions can go about as speculation guides in the housing market. O'Neal likewise proposes that venture counsels assume a critical part in speculation choices of financial backers. As a delegate, the realtor quickly utilizes a dealer's property information available to be purchased; give various posting administrations to acquire the upper hands in the housing market. All administrations then, at that point, conjoined with viable showcasing apparatuses like promoting, which thusly help to expand the pace of appearance of expected purchasers, who are better educated and along these lines' better counterparts for the vender's land property, bringing about a higher pace of offers, or higher offers or both.

#### **Investor behavior**

Slovic, 1972; Alfredo and Vicente, 2010. Speculation practices are characterized as how the financial backers judge, foresee, examine and audit the methodology for independent direction, which incorporates venture brain science, data assembling, characterizing and getting, examination and investigation.

The entire interaction is designated "Speculation Behavior". The element that influences the property venture conduct is that not all speculation is accidental. Financial backers settle on speculation choices with an expectation to hold the property for either long haul or present moment.

So, writing audit uncovers that conduct factors like speculation information, impartial Information, inspiration from counselors, venture hazard and over assumption impact the financial backers to put resources into the housing market.

#### **Investment Risk**

Return assumptions were emphatically connected with speculation portion. Arrangement of past execution data seems to make an assumption for future returns around a similar level as past returns. The executives and assessment of hazard is a significant piece of any effective land venture technique. Hazard happens in a wide range of ways at each phase of the venture interaction.

#### **Overconfidence**

The financial backers are generally arrogant with regards to their capacities to finish the troublesome jobs effectively. Some of the time they accept that their insight will be more exact and even think choice is additionally exact. Carelessness is as "The self-image traps" and note that arrogance is inescapable. Overconfident financial backers accept emphatically in their exercises and not concern the conviction and experience of others. Carelessness makes financial backers exchange or contribute excessively and to a lot of hazards. As an outcome, financial backers pay a lot as commission, pay a lot in charges, and are powerless to weighty misfortune. So, expanded degree of data or presumptuousness don't really prompt more prominent information on the grounds that numerous financial backers might not have appropriate preparation, experience, or abilities to comprehend the data with respect to the housing market which may fundamentally make an antagonistic impact on land speculation of the financial backers.

### **OBJECTIVES OF THIS STUDY**

#### **Main objective of this study is:**

- To concentrate on the conduct of the financial backers to put resources into the housing market in India. Simultaneously, following explicit destinations are likewise set for this review:

- (i) To examine the meaning of the inspiration from guides impact the financial backers to settle on their speculation choices.
- (ii) To examine the religion based financial backers and their availability to take speculation hazard in the housing market.

#### **METHODOLOGY OF THE STUDY**

The information was gathered with the assistance of a survey. The poll gathered through direct private meeting technique which included 36 things that have a place with five classifications: (1) land venture information (2) unbiased data, (3) inspiration from consultants (4) speculation hazard in housing business sector and (5) social variables of Indian financial backers in the housing market. In research plan, essential and auxiliary information were gathered. The essential information was gathered from 300 financial backers in driving and potential housing markets at Kochi, Aluva, Nedumbassery (Kochi) International Airport Area and Perumbavoor in Ernakulam locale. The review was directed for a time of 60 days. The review is pointed toward recognizing the most and the most un-impacting variables of the singular financial backers. The apparatuses utilized for the investigation incorporate Chi-Square Test. The review dissects individual and social elements of Indian financial backers. The review covers land speculation information, impartial data, inspiration from consultants, venture hazard data and these elements are sorted 20 quantities of social variables. This study has attempted to break down above variables and discover what are factors that most and least affecting the conduct of the Indian financial backers to put resources into the genuine market. It was observed that there are additionally a few social elements like the financial backer's assumption and hazard taking in venture which impact the financial backer's conduct.

#### **SCOPE OF THE STUDY**

The discoveries of the review give a more extensive knowledge to financial backers and to the individuals who includes in housing market exercises which thus assist the financial backers with accomplishing wanted objective from the interest in the land. According to the advertising perspective, it will broaden the upper hands especially when choose to make an essential anticipating land venture. The current review uncovered wide extension for enhance the portfolio allotment choice for the financial backers.

#### **HYPOTHESIS:1**

**1.1H0:** Religion has no effect in interest in land property.

**1. 2 H1:** Religion has an effect in interest in land property.

Since the likelihood esteem is under 0.05, the speculation 1.1: H0 is dismissed and 1.2 .H1 is acknowledged as it is critical.

#### **HYPOTHESIS:2**

**2.1H0:** Education has no effect in interest in land property.

**2.2 H1:** Education has an effect in interest in land property.

Since the likelihood esteem is under 0.05, the speculation H0 (2.1) is dismissed and H1 (2.2) is acknowledged as it is huge.

#### **RESULTS OF THE STUDY**

- The review uncovered that master counsel of the land designers and specialists (M. Esteem 3.46) are most impacting element to rouse the conduct of financial backers to put resources into the land and least affecting element is going on of questionable occasions (M. Esteem 1.75).
- The greater part of the financial backers (56%) will contribute on land for a time of 1 to 3 years, 22% under 1 year, 16% for 3 to 5 years, and 6% of financial backers for most extreme period. This shows that larger part of financial backer's incline toward brief years speculation to long or greatest period.
- From the review, it was tracked down that larger part of the financial backers (60%) are hopeful person in their monetary resistance and 25% are displayed over assumption in their demeanour towards their speculation, 5% are doubter and 10% financial backers are nonpartisan.
- Among the financial backers 52% has a place with Muslims, Christians 29% and Hindus 15%
- Larger part of the financial backers (88%) is male and 12% are female. Capability of greater parts of the financial backers (45%) is between tenth to 12th standard

- The respondents are under various phases of life level and the larger part is financial specialists (half) and 20% of retiree. They wish to put resources into the housing market and have mental self-portrait to realize the housing economic situation and other impacting factors.
- It was observed that the dangers and portfolio execution fluctuate with changes in the housing market costs.
- The speculation on land for the most part got prospered where Muslim individuals are huge in numbers.
- However, the strict explanation not influences the financial backers to contribute, the inclination to put resources into land is principally showing a predominant job of Muslim individuals. So, the review uncovers that moderate conduct of such classification changed and they are prepared to face challenge to acquire benefit from business.

### SUGGESTIONS

- Since the land designers and intermediaries are persuading specialists to the land financial backers, the engineer's direction and exhortation in light of the previous experience and attention to most recent market patterns would be assisted the financial backers with choosing a superior speculation choice.
- The exhaustive endeavour to give the social and mental attention to realty financial backers and designers.
- Guarantee proper resource distribution procedures for effective portfolio the board of their customers which might be founded on their life stage, passionate danger resilience and their monetary education level.
- Offer better types of assistance to assist financial backers with making ideal determination from the portfolio also prepared them to broaden the assets to guarantee get back from venture.
- The land engineers probably agreed the business morals and virtues to fortify the business exercises and the techniques took on to acknowledge benefit.
- The land engineers and specialists are to be habitually spoken with financial backers, be guaranteed individual consideration towards financial backers, offered quality types of assistance as guaranteed.

### LIMITATIONS OF THE STUDY

- The review covers just with specific expected spots in the area of Ernakulum, Kerala.
- The job of land engineers and specialists can't be considered as significant for the financial backers in the venture direction. Some of the time, the financial backers pick the best portfolio without the guidance of specialists and land engineers.

### Concluding Remarks

This study would help the land designers and merchants to comprehend the elements that affecting the financial backers to put resources into housing market. Through this review, the specialist gives further bits of knowledge which empowers to advance the exhibition of land designers and financial backers. The assistance quality that inspirations conveyed to financial backers makes better venture information to them to choose ideal speculation choice and in this way being saved and dangers. the financial backers from land venture misfortune.

**Table I:** Gender Classification

Sl. No	Gender	No. of Investors	Percent
1	Male	264	88
2	Female	36	12
	Total	300	100

(Source: Survey Data)

**Table III:** Profession Classifications

Sl. No.	Expectation of Tolerance	No. of Respondents	Per-cent
1	Retired	60	20
2	Private Employee	42	14
3	Business	150	50
4	Semi-Government	27	9
5	General People	21	7
	Total	300	100

(Source: Survey Data)

**Table IV:** Educational Classifications of Investors

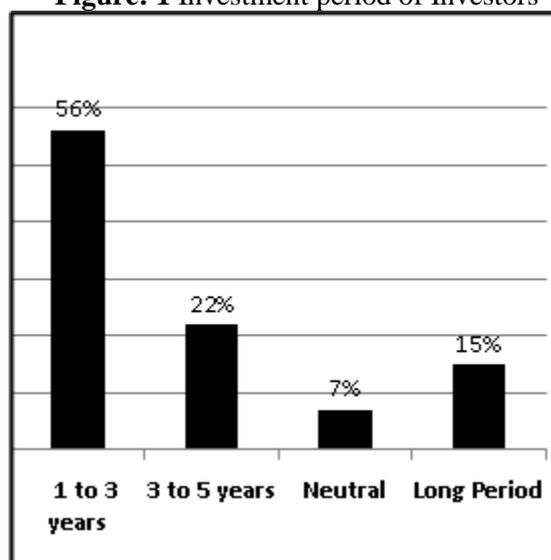
Sl. No	Qualification	No. of respondents	Per-cent
1	Below 10 <sup>th</sup> Std	60	20
2	10 <sup>th</sup> -12 <sup>th</sup>	1350	45
3	Degree Level (Professional)	45	15
4	Post Graduate	15	5
5	Others	45	15
	Total	300	100

(Source: Survey Data)

**Table V:** Religious classifications

Sl. No.	Religion	No. of respondents	Per-cent
1	Hindu	45	15
2	Christian	87	29
3	Muslim	156	52
4	Others	12	4
	Total	300	100

**Figure: 1** Investment period of Investors



(Source: Survey Data)

**Table: VI.** Factors Influencing the Investors Behaviour to Invest in the Real Estate Property

Sl. No	Neutral Information						Mean	Rank
	Factors	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree		
1	Recent price movement in the real estate market.	84	18	41	72	81	3.19	2
2	Current Economic Indicators.	48	84	78	51	39	2.82	6
3	Information from the internet	102	69	99	12	18	2.24	13
4	Coverage in the press	87	102	87	15	9	2.19	14
	Motivation from the Advisors							
5	Motivation from the real estate developers and brokers.	32	42	84	90	52	3.46	1
6	Motivation from self-	78	96	51	45	30	2.50	8

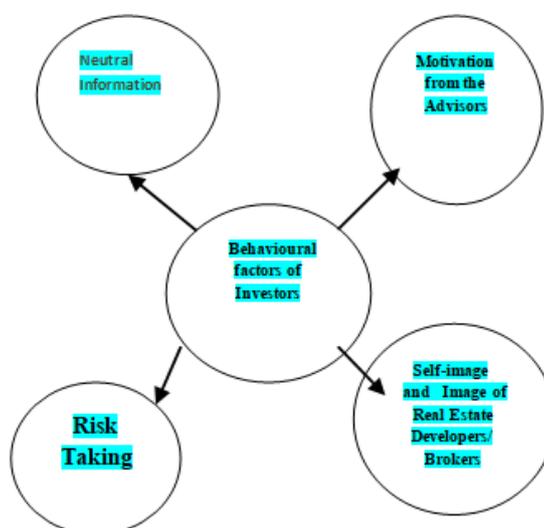
	experience.							
7	Motivation from the Family members.	88	96	68	21	27	2.32	10
8	Motivation from the friends.	93	102	90	6	9	2.13	16
Investment Risk								
9	Portfolio selection to achieve the desired object.	60	69	51	54	66	3.01	5
10	Long period return on investment interrupted by the inflation.	78	75	57	54	36	2.64	7
11	Loss of initial investment Made for the purchase property within the period of agreement.	99	114	39	27	21	2.19	15
12	Failure to fulfill the agreement between the parties involved in real estate market	114	111	45	12	18	2.02	17
13	Happening of uncertain events	150	93	45	6	6	1.75	20
Self-Image and the Image of Real Estate Developers/Agents Image								
14	Real estate broker's efficiency to shape the investor for suitable and profitable investment	57	60	57	69	57	3.04	3
15	Involvement of realty developers to solve the investors' problems.	48	45	111	45	51	3.01	4
16	Organized Real Estate Market.	84	90	96	21	9	2.29	12
17	Wish to get rich quickly.	90	57	96	9	21	2.30	11
18	Reputation of the firm	74	82	120	15	9	2.34	9
19	Efficiency of realty developers and its members.	120	105	54	12	9	1.95	18
20	Feelings regarding firms' service.	108	117	63	6	6	1.94	19

**Table: VII** Factors Influencing the Most and those Influencing the Least (with Mean and Rank)

Sl. No	Factors	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean	Rank
1	Motivation from the real estate brokers and developers.	32	42	84	90	52	3.46	1
2	Recent price movement in the real estate market.	84	18	41	72	81	3.19	2
3	Real estate broker's efficiency to shape the investor for suitable and profitable investment.	57	60	57	69	57	3.04	3
4	Involvement of realty developers to solve the	48	45	111	45	51	3.01	4

	investors problems							
5	Poor Portfolio selection to achieve the desired object.	60	69	51	54	66	3.01	5
6	Current Economic Indicators.	48	84	78	51	39	2.82	6
7	Long period return on investment interrupted by the inflation.	78	75	57	54	36	2.64	7
8	Motivation from self-experience	78	96	51	45	30	2.50	8
9	Reputation of the firm.	74	82	120	15	9	2.34	9
10	Motivation from the Family members.	88	96	68	21	27	2.32	10
11	Get rich quickly.	90	57	96	9	21	2.30	11
12	Organized Real Estate Market	84	90	96	21	9	2.29	12
13	Information from the internet.	102	69	99	9	18	2.24	13
14	Coverage in the press.	87	102	87	21	9	2.19	14
15	Loss of initial investment Made for the purchase property within the period of agreement	93	114	39	12	21	2.19	15
16	Motivation from the friends.	99	102	90	15	9	2.13	16
17	Failure to fulfill the agreement between the parties involved in real estate market.	93	111	45	27	21	2.02	17
18	Efficiency of realty developers and its members.	114	105	54	12	9	1.95	18
19	Feelings regarding firm's service.	120	105	54	12	9	1.94	19
20	Happening of Uncertain events.	150	93	45	6	6	1.75	20

**Figure: II** Behavioural Factors



**Testing hypothesis-No.1**

Religion	Frequency	%
Hindu	38	19.0
Christian	58	29.0
Muslim	104	52.0
Total	200	100.0

**Chi-square value: 34.360 (p-value <0.05)**

O	E	O - E	(O - E) <sup>2</sup>	(O - E) <sup>2</sup> / E
38	66.67	-28.67	821.78	12.33
58	66.67	-8.67	75.11	1.13
104	66.67	37.33	1393.78	20.91
200	200.00			34.36

**Testing hypothesis No.2**

Qualification	Frequency	Percentage
Below SSLC	40	20.0
SSLC - +2	90	45.0
Graduate	30	15.0
Post Graduate	10	5.0
Others	30	15.0
Total	200	100.0

**Chi-square value: 90.000 (p-value <0.05)**

O	E	O - E	(O - E) <sup>2</sup>	(O - E) <sup>2</sup> / E
40	40	0	0	0.00
90	40	50	2500	62.50
30	40	-10	100	2.50
10	40	-30	900	22.50
30	40	-10	100	2.50
200	200			90.00

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## **A Study on Curtailment of Unethical Practices Followed by the Learners in Research Projects/Assignments at Graduation and Post-Graduation Levels**

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### **ABSTRACT**

The researcher through this abstract and his piece of research writing intends to create an alarming buzz to curtail the unethical practices followed by the undergraduate and postgraduate while completing their major and minor research projects, work assignments and group presentations, group assignments, etc. The unethical practices followed by the learners include coping from the past research work submitted by the seniors, browsing from the internet, taking paid service for the individuals for completion of the research project work, procurement the research work from the market, sharing files (copy –paste concept) and so forth. All this is followed to earn better grades and complete the project or assignment within the time frame for submission at the college. To understand the ways and means to curtail unethical practices followed by the learners, the researcher through the questionnaire has collected the data which is objective specific.

The researcher has collected the primary data through the Google form questionnaire. **120 respondents** (54 female and 66 male) have responded to the circulated questionnaire. The respondents are mostly learners studying at UG, PG, and Professional Courses levels. Three objectives framed were measurable and achievable through interpretations of research conclusions and findings. The hypothesis framed were tested using the statistical test and tools like the Z test and F test. The researcher has also provided suggestions to the various stakeholders like students, teaching faculties, Board of Studies - University of Mumbai, and the policymakers to curtail unethical practices.

**Keywords:** Unethical, research methodology, plagiarism, major projects, graduates, research culture, etc.

### **INTRODUCTION**

“Some folks believe immoral behaviour is acceptable if it’s done for the right reason. WRONG!” – **Author Frank Sonnenberg.**

Whatever be the case, immoral behavior is not acceptable whether it be at a professional workplace or at an institute where your take knowledge. The teaching-learning process demands the highest level of ethics and moral value, which are preached and followed at the educational institutions. Ethical behavior and culture need to be practiced and followed in a professional way, be it the researcher or the learner at the graduate and postgraduate level. The researcher in this research work would bring the facts and figures collected from the learners about their approach towards the completion of minor/major projects. Cheating of any sort is never and cannot be tolerated under any circumstances in educational institutions. It is a major problem with the youths and a big social concern. Unethical practices can have reach negative impact on their qualification, work-life, mannerism, etiquettes and also their professional career. The main goal of this research paper is to know if the students are aware of the ethics to be followed while also completing their project work and the way and means to curtail the unethical practices followed by the learners. Cheating today can have great implications for your tomorrow. Respondent’s responses showed that they fear punishments and penalties. For them, their behaviour is not at all immoral for completion of their work within the time frame. The unethical behaviour among the learners is just a daily sort of practice and increases frequently during the research project completion, assignment submission, and examinations.

The role of teachers in curbing unethical practices and immoral ways needs to be enforced by the authorities. Illegal collaboration, outsourcing of the assignments, purchase of old assignments, and research projects including means of cheating plagiarism software are on high. Academia needs to adopt such rules where moral ethics, values, positive behavior, and hard work are motivated among the learners. Teaching methodologies by the teachers must be centered on all-around personality development for the learners. As wrong deeds today can lead the learners in trouble tomorrow at their work-life, social life as well as their family. The damages can be worst including financial, relationship and reputation leading to depression, mental trauma, suicidal attempts, loss of appetite, low morale and so forth. One of the main causes of adopting unfair means is the habit of procrastination towards study, assignments, project work and the other is the pressure to get good grades.

The mentor teachers need to walk the extra mile and discuss the progress of work completed in phases so that the learners are compelled to work on their research projects and assignments on daily basis. This practice would help the students in attaining the required skill, knowledge, positive behaviour, and research thirst. To retain the high end of a competitive environment and maintain the fighting spirit, the learners need to be fed with booster doses of energy-packed motivational lectures.

## REVIEW OF LITERATURE

### 1. Unethical Behavior of the Students of the Czech University of Life Science.

Author(s) – L. Domeova and Andrea Jandrova

This research paper presented by the above author's states that cheating is a grey area of concern for educational institutions and society at large. This practice of the students can impact their qualifications, job prospects, and professional mannerism. The inquire investigation showed that cheating is a common practice and the frequency increases during exam time. The teachers and the university needs to take efficient steps to stop this unethical behavior among the students.

### 2. Academic Dishonesty of Undergraduates: Methods of Cheating

Author(s) - Michelle Witherspoon PhD, Nancy Maldonado PhD, Candace H. Lacey PhD

The research paper presented at the Annual Meeting of the American Educational Research Association is about the frequency of unethical practices adopted by undergraduate students and also the traditional methods of cheating and contemporary cheating methods. The findings of the study reveal that most of the students cheat during their exams, but there are some unashamed students, though small in number, who cheat very frequently that too using contemporary methods.

### 3. Cheating behaviors of college students

Author - Kathryn Louise Holleque

This study was conducted on freshman college students and submitted in Montana State University. The thesis presents states that the when the college students were allowed to correct their own examinations, they cheated and there were some proportion of students who would not admit that they adopted the cheating means. The below average students would tend to cheat more as compared to the above average students. The students adopted the means of cheating as a result of perceived importance given by the parent towards grades rather than themselves.

### 4. Influence of Cheating Practice of Graduate Students in IT Courses: What are the Factors?

Author(s) – Judy Sheard and Martin Dick

The research paper presented by the authors is an analysis of survey conducted at Monash University on the graduate students in IT Course that aimed on students view about cheating and their knowledge about cheating. Various factors of cheating behaviour and categories of reasons for cheating were found using factor analysis. The factors helped to understand the possible influences on different types of cheating behaviour.

## Research Gaps identified in the proposed field of Investigation

The researcher, from the review of the literature, was able to find the gaps which helped him frame the objective and the hypothesis of the study. The review of various works of literature gave insight into studies undertaken across the globe on unethical practices and cheating.

1. The unethical practices followed by learners for Research Project Work and Assignments were not specifically studied.
2. The researcher came across the fact that no strong emphasis was laid down on teaching professional ethics to the learners at the graduate and postgraduate levels, though studied was on a narrow scale.
3. The link of the research project with the job opportunities, recruitment and selection was studied on a narrow scale.
4. The researcher has not found any literature which highlighted plagiarism check to be taught or made compulsory for the research project works and assignments. It might have been studied in brief at times, but couldn't find impeccable literature.

## RESEARCH METHODOLOGY

### OBJECTIVE OF THE STUDY

1. To know the awareness of the learners towards professional ethics in research work.
2. To understand the reasons for cheating in the research projects and assignments

3. To find out ways to curtail unethical practices from learners' point of view.

### Hypothesis of the Study

1. **Alternative Hypothesis (H1)** – The learners are highly aware of the professional ethics followed in Research work.

**Null Hypothesis (H0)** – The learners are not aware of the professional ethics followed in Research work.

2. **Alternative Hypothesis (H1)**- The learners cheat during their research projects and assignments.

**Null Hypothesis (H0)** – The learners do not cheat during their research projects and assignments.

3. **Alternative Hypothesis (H1)** – Unethical practices can be curtailed by teaching professional ethics to the learners.

**Null Hypothesis (H0)** – Unethical practices cannot be curtailed by teaching professional ethics to the learners.

### Data Analysis and Interpretation

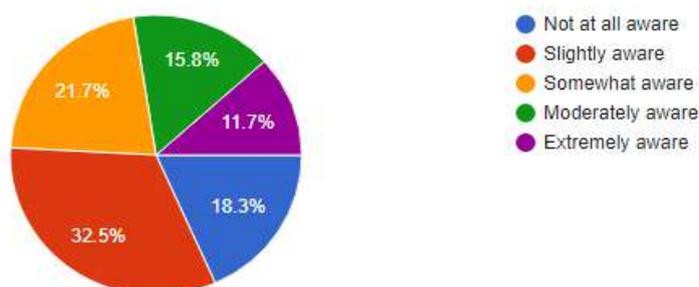
Sr. No	Particulars	Responses	Percentage
1	Gender	Male	66 (55%)
		Female	54 (45%)
2	Plagiarism awareness	Yes	59 (49.2%)
		No	61 (50.8%)
3	Research project linked with Job	Yes	66 (55%)
		No	10 (8.3%)
		May be	44 (36.7%)
4	Awareness of Intellectual Property Rights	Yes	87 (72.5%)
		No	8 (6.7%)
		May be	25 (20.8%)
5	Wish to go for patent	Yes	75 (62.5%)
		No	7 (5.8%)
		May be	38 (31.7%)

Table No.: 1.1 Source – Primary Data

The data in the above table 1.1 shows that 55% of Male and 45% of females have responded to the questionnaire circulated. When asked for the awareness of plagiarism to the respondent, it shows that 50.8% respondents are not aware of plagiarism, which is a sign of concern for the teachers and educationists. Awareness of IPR is high which accounts for 72.5% of the respondents. When asked for the patents, 62.5% of the respondents wish to go for patenting their innovation and concepts which is really a positive sign. The area of concern is the professional ethics and cheating cases.

6. Are you aware about Professional Ethics to be followed while doing research projects/assignments.

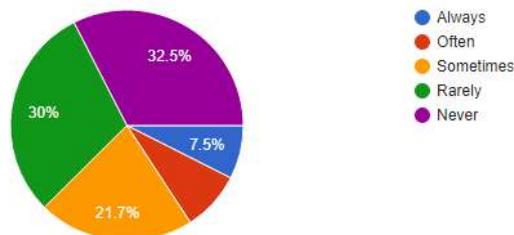
120 responses



The above pie charts show that nearly 72.5% of learners are not properly aware and only 27.5% show awareness about the professional ethics to be followed for research work. Though the learners at UG and PG levels have subjects like Research Methodology, still the awareness is low, which is the area of concern. The reason behind it is that Research Methodology is just considered as a subject for scoring better grades, rather than a practical approach and application of knowledge.

7. Do you cheat for completion of research projects/assignments (be truthful and open)

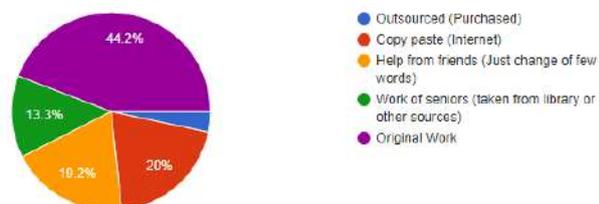
120 responses



The pie chart shows that only 32.5% of the learners have never cheated for their research projects or assignments, which clearly indicates that nearly 67.5% of learners are engaged or involved in cheating during their performance in the research project/assignment. The educators need to find some solution for this issue which has killed the thirst for novel and innovative research in the learners.

8. My research project work is

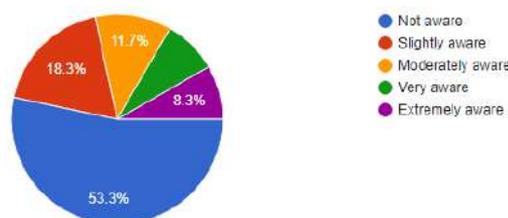
120 responses



The learners' responses to the above question clearly indicate that more than 56% of the research project are copied from some or the other sources. The element of biasness cannot be ignored towards the response of original work. So it clearly indicates that the learners cheat and copy the research projects/assignments.

11. Are you aware of Plagiarism check in research work

120 responses



The respondents have clearly indicated that their awareness of plagiarism checks is very low. Nearly 83.3% of the respondents have responded negatively to their awareness of plagiarism checks. The learners need to be taught the importance of plagiarism checks and various software used for it.

12. Reason for cheating from your view point

120 responses

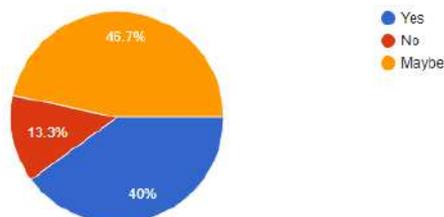


Somewhere the response to this question has really compelled us to think wisely for evaluation systems that are used for assignments and projects works. Out of 120 respondents, 62 respondents (51.7%) has stated that

pressure to obtain good grades is the reason for cheating in the research projects and assignments. The responses also indicate that it's high time we change the teaching methods, evaluation patterns, and grading systems which has somewhere hindered the novelty and innovativeness of the learners.

13. Do you regret following unethical practices

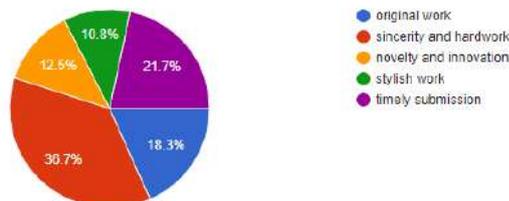
120 responses



The above pie charts is again an eye-opener for the policymakers and educationist which clearly indicate that only 40% of learners regret the unethical practices that they adopt during their research work. This demands strict rules for change of psychology of the learners towards unethical practices.

14. What makes you different from other colleagues in terms of project work/assignments

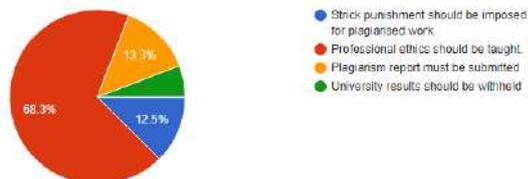
120 responses



The pie chart clearly indicates that novelty and innovation (12.5%), original work (18.3%), has very low responses from the respondents. The learners need to be motivated to bring in new ideas and thoughts for their research work. They should be guided for writing research papers and articles which will help them to explore various themes and areas of research.

16. Your opinion to curtail cheating/unethical practices

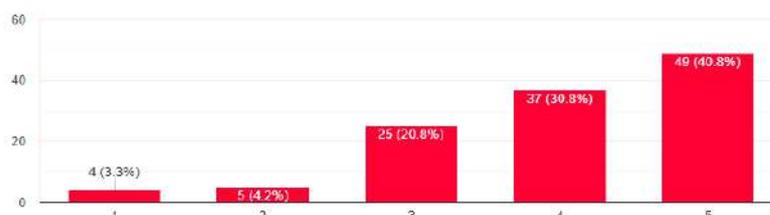
120 responses



When asked for the responses for curtailment of cheating/unethical practices followed in research work, 68.3% of respondents have stated that professional ethics should be taught in colleges. The respondents are not in the favor of strict punishments, university results to be withheld or plagiarism reports must be submitted rather they are very positive in learning professional ethics and applying it in research work. The educationist and college faculties should take note of learners' positive psychology for learning.

18. Do you think that your innovative research project would help you get better job opportunities?

120 responses



The above bar graph shows that respondents are very sure that an innovative research project would provide them ample opportunities for better job prospects. Nearly 71.6% of responses indicate that learners are aware of the novelty of thoughts and out of box ideas can build their career.

### HYPOTHESIS TESTING

**Objective 1: To know the awareness of the learners towards professional ethics in research work.**

H0: The learners are not aware of professional ethics followed in research work

H1: The learners are aware of professional ethics followed in research work

#### Observed Value

	Yes	No	Total
Professional ethics	33	87	120
Plagiarism	59	61	120
Total	92	148	240

### T-TEST

t-Test: Paired Two Sample for Means

	Yes	No
Mean	46	74
Variance	338	338
Observations	2	2
Pearson Correlation	-1	
Hypothesized Mean Difference	0	
Level of Significance	0.05	
df	1	
t Stat	-1.07692	
P(T<=t) one-tail	0.238216	
t Critical one-tail	6.313752	
P(T<=t) two-tail	0.476432	
t Critical two-tail	12.7062	

Since P value is more than Level of significance, therefore, **Null Hypothesis is accepted**

Therefore, we conclude that the learners are not aware of professional ethics in Research work

### ANOVA TEST

ANOVA: Single Factor

SUMMARY						
Groups	Count	Sum	Average	Variance		
Yes	2	92	46	338		
No	2	148	74	338		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	784	1	784	2.319527	0.267207	18.51282
Within Groups	676	2	338			
Level of significance	0.05					
Total	1460	3				

Since, P value is more than level of significance, therefore **Null Hypothesis is accepted.**

H0 is accepted. We can conclude that the learners are not aware of professional ethics followed in research work.

### Hypothesis Testing

**Objective 2: To understand the reasons for cheating in the research projects and assignments**

**H0:** The learners do not cheat during their research projects and assignments

**H1:** The learners do cheat during their research projects and assignments

**Observed Data**

	Yes	No	Total
Cheat	81	39	120
Copied	67	53	120
Total	148	92	240

(Use: Z Proportion test)

p = Probability of cheat during the research projects and assignments (50%)

p = 0.05

q = 1 - q = 0.05

N = 240 (Sample Size)

P = Probability of sample proportion of cheat during the research projects and assignments

P = 148/240 = 0.621

Level of significance = 1%

Test statistics: (under H<sub>0</sub>)

$$z = \frac{P - p}{\sqrt{\frac{pq}{N}}}$$

$$z = \frac{0.617 - 0.50}{\sqrt{\frac{0.50 \times 0.50}{240}}} = 3.624$$

(H<sub>0</sub> is rejected if and only if -2.58 < Z & Z > 2.58)

Z = 3.624 > 2.58 (Obtained result)

It is significant at 1% level of significance hence the **Null Hypothesis is rejected**.

Therefore, alternative hypothesis is selected.

**CONCLUSION**

Above results shows that the learners do cheat in their research projects and assignments.

**Hypothesis Testing**

**Objective 3: To find out ways to curtail unethical practices from learners' point of view**

H<sub>0</sub>: Unethical practices cannot be curtailed by teaching professional ethics to the learners

H<sub>1</sub>: Unethical practices can be curtailed by teaching professional ethics to the learners

**Observed Data**

**Total Number of responses: 120**

	Curtail	Uncurtail	Total
Professional Ethics	82	38	120
Good Practices	81	39	120
Total	163	77	240

**ANOVA**

**ANOVA: Single Factor**

SUMMARY						
Groups	Count	Sum	Average	Variance		

Curtail	2	163	81.5	0.5		
Uncurtail	2	77	38.5	0.5		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1849	1	1849	3698	0.00027	18.51282
Within Groups	1	2	0.5			
Level of significance	0.05					
Total	1850	3				

Since, P values is less than significance value, thus Ho fall under critical region

Therefore, **Null Hypothesis is rejected.**

Therefore, Unethical Practices can be curtailed by teaching professional ethics to the learners.

### T-TEST

#### t-Test: Paired Two Sample for Means

	<i>Curtail</i>	<i>Uncurtail</i>
Mean	81.5	38.5
Variance	0.5	0.5
Observations	2	2
Pearson Correlation	-1	
Hypothesized Mean Difference	0	
Level of Significance	0.05	
df	1	
t Stat	43	
P(T<=t) one-tail	0.007401221	
t Critical one-tail	6.313751515	
P(T<=t) two-tail	0.014802443	
t Critical two-tail	12.70620474	

Since, P values is less than significance value, thus Ho fall under critical region

Therefore, **Null Hypothesis is rejected.**

Therefore, Unethical Practices can be curtailed by teaching professional ethics to the learners.

### Source of Data Collection

#### PRIMARY DATA

The questionnaire based on the Likert scale using the tool Google Form was created to collect the data for the target respondent studying the undergraduate, postgraduate or professional courses. 120 responses were collected for the data analysis and interpretation. Various questions were asked which were objective specific and helped the research in measuring the objectives. The primary data helped the researcher in understanding the true sense of the problem at study.

<https://forms.gle/6mtrmHHDVZd9GPnt7>

#### Secondary Data

Through the secondary data, the researcher was able to incorporate the subject under study and understand the views of the research scholars who have presented papers on a similar subject. The review of literature help the researcher for gap analysis, which helped in framing the objective and hypothesis of the original work of

research. The scope of study under the research title is precisely argued & discoursed with extensive and has varied implications to policymakers, government authorities, university, and educational institutes management. The students and teachers being the core need to find the solution for the grave situation.

#### **LIMITATION OF THE STUDY**

##### **This study has the following limitations**

1. The study was undertaken with only a limited number of respondents (120)
2. The respondents were mostly from undergraduate colleges, whereas postgraduate college students were not approached in large numbers.
3. The secondary data available in bits and pieces on the internet was only browsed, which was not objective specific.
4. The possibility of biasness of the respondents towards the questionnaire circulated for data collection cannot be overlooked.

#### **SIGNIFICANCE OF THE STUDY**

The study under the research has its repercussion on the evaluation system followed in the mainstream of the education system at the graduate and postgraduate level. The study clearly states that learners are not aware of the professional ethics to be followed in the research project and assignments. The knowledge of plagiarism software is also limited to the learners. The researcher through his study would bring forth the significant fact that learners are not very innovative, novel and original in their research project works. They tend to cheat and follow unethical practices for the completion of the research work. They are grade-oriented and lack a thirst for research in their course. The researcher through his research paper would appeal and plead before the Ministry of Education, University Grants Commission, Universities, Colleges and all other government machinery involved in the education system to take disciplinary action and put forth strong norms, which would motivate the young mind to develop research thirst.

#### **FINDINGS/ SUGGESTIVE MEASURES OF THE RESEARCH STUDY**

1. Plagiarism software app should be taught in the undergraduate, postgraduate and professional levels of education.
2. The learners need to submit the plagiarism report within the prescribed format along with research project work.
3. The universities and colleges should decide for forming stricter norms of penalty for plagiarised work.
4. Professional ethics, research ethics should be taught to each and every learner at UG and PG level along with evaluation tests.
5. The researcher insists that every learner should be asked to compulsorily write at least one research paper before submission of major projects.
6. The academic should collaborate with the industry and request the job providers to demand original research work of the candidate at the time of the Recruitment and Selection Process.
7. University results should be withheld for the non-submission of the original research project along with a plagiarism report.
8. Viva/Voce should be conducted through external referees on pre-set parameters provided by the universities.
9. The learners to be motivated through seminars, webinars, and competitions for novelty and innovative ideas which can be patented in the near future.
10. The current evaluation pattern has created pressure on the learners for scoring high grades. Their focus is more on achieving grades rather than learning the insight of research and applying it in their life for professional growth. This evaluation system needs serious revamping, with the learner-centric approach for enhancing the research culture in education.

#### **CONCLUSION OF THE RESEARCH STUDY**

The research would like to conclude the research study under the given title with the hope that, expected changes in the education system would bring research culture. The implementation of the New Education Policy 2020, is the ray of hope which would bring changes at the grass-root level. Much emphasis needs to be given to

the practicality of the subject for hands-on training. The implementation of NEP would provide a research environment to the young enthusiast for experimenting with their innovative ideas. The study under the title can be taken up at large for understanding ramifications on learners' behavioural and psychological change.

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## **A Study on Importance of Cyber Security in Current Technical Era and Information Security Awareness among the Youth in Thane Region**

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### **ABSTRACT**

Today use of various online applications with emergence of the internet along with that the exposure to the social media platforms are evolving day by day, which can result into highly vulnerability by loss of valuable and personal information getting into wrong hands. Hacking, online fraud, cyber-bully, phishing attack, leaking of personal information are among those risks students are exposed to in their daily activities. To safeguard ourself from this type of attacks one has to aware about cybersecurity and adopt some easy habits to protect their personal info.

The intentions of this research is to inspect the students' awareness on basic knowledge of cybersecurity while using internet for daily task. For this study a quantitative approach is used for primary data collection using a set of designed questionnaires, this approach is used to examine the students' knowledge and awareness about cybersecurity, to conduct the survey I have collected responses total 100 students from Thane region. Finally results found from the research were analysed and it shows the students' cybersecurity awareness is at a satisfactory level and more than average of the students are not much aware about how to protect personal information on internet. The survey influence is, there is no cybersecurity awareness program organized by education ministry to education students how to deal with cybercrime.

**Keywords:** Cybersecurity, Awareness program, Information security, Online Platform, Cyber Attacks

### **INTRODUCTION**

The use of internet is becoming gradually intertwined in the routine life of everyone, every organisation and in all nations. Also, it has a positive effect on the way that people communicate it brings the world very closer. Apart from this it has also created new avenues for start-ups and contributed business growth worldwide and has open door of opportunity to govern online. However, even though cyberspace offers us an endless list of facilities and opportunities, it is also accompanied by numerous risks. One of these risks is cybercrime. The vast use of internet has given offenders a platform through which cases of fraud are increasing day by day. Because of the abstract nature of the Internet, it becomes very easy for the cyber attackers to go scot-free.

Children now a days spend a large amount of time online, for either entertainment or educational purposes in their age, it is difficult for them to assess the opportunities and risks of using the and digital ways, kids are unaware about their lives are which digitally recorded by potentially creating long-term effects on their safety and privacy. Even sometimes, young kids do not understand and identify the dangers or risks until it is too late. Resulting that they can easily fall victim to online abuses, fraud, mental harassment etc.

Moreover, it is observed that many users of the Internet are unaware of such threats; All users, irrespective of age, knowledge are daily come across to various security risks when spending significant time on the internet. It has been observed that victim of cybercrime themselves put their personal data, along with businesses and governmental assets and infrastructure on risk. In view of this, there is a need for awareness about cyber security and initiatives taken to promote cyber education from schooling itself which will endorse users well versed and more protective while dealing with the risk associated with the Internet. For that purpose, Cyber security consciousness is the best way to educate individual while carrying out daily activity on internet.

### **LITERATURE REVIEW**

#### **1. Title: Cybersecurity Awareness Among Students and Faculty**

As per the study [1] it has been observed the increasing growth in the internet usage which has contributed organizational activities on tips than its use to be, the clients, team members and upper-level managers can interconnect anytime with their employee and also remotely, but on other hand this rise in use of technology has also taken a negative influence on some organization or individual where they faced cyber threats recurrently.

#### **2. Title: Stalking in the Twilight Zone: Extent of Cyberstalking Victimization and Offending Among College Students**

According to [2] they reported that 4.9% of students had experienced cyberstalking. Here the role of Cybersecurity awareness can be applied to help minimize some basic attacks to individuals by educating them in college itself, it has been observed that teenagers or young generation are more likely to suffer cyber-attacks.

**3. Title: Information security: Management's effect on culture and policy**

According to survey of the researcher [3] suggested that there is a stout relationship between defensive measures and information network security which help individual to protect personal information on internet and enhance security performance.

**4. Title: A vocabulary test to assess information security awareness.**

Whereas in research paper [4] it is recommended that the basic knowledge and act of an individual has a robust relationship when it comes to use of online platforms and cybersecurity threat mitigation. Therefore, students specially must have the knowledge and also aware and alert before dealing with cybersecurity.

**5. Title: Recommendations for information security awareness training for college students.**

According to this survey [5] students of the business department at new England to regulate their attitude toward information and network security awareness, which will helps them to assist in manipulative an effective awareness training program, the survey analysis indicates that there is a the need of the awareness program as it upsurges their knowledge while handling cybersecurity.

**6. Title: The Need for Effective Information Security Awareness**

In other survey which was carried out by [6] to educate the security awareness of academic from the Arab continent, the survey was conducted for students and academicians, and the results show less insight on awareness and also didn't show any significant interest in how to reduce cyberattacks, however, it shows the strong need of active cybersecurity awareness program.

**7. Title: Students Information Security Practices and Awareness**

A survey was also conducted in California State University by [7] and it is observed that main problem is not the lack of basic knowledge but also the method which students practice it in real life, it also shows acquiescence with information security knowledge is which is less than understanding it.

**RESEARCH METHODOLOGY**

**RESEARCH OBJECTIVES**

The primary research objective is

1. To understand a cyber security awareness and education framework in Indian youth.
2. To explore whether students are alert while responding internet fraud.
3. To identify the consciousness of the user in terms of password security

**Data Analysis and interpretation**

Demographic data collection			
Demographics	Particulars	Respondents	Percentage
Age	17-21	81	81%
	22-26	13	13 %
	27-31	2	2 %
	32-36	4	4 %
Education	Undergraduate	81	81 %
	Graduate	10	10 %
	Post graduate	9	9 %
Field of study	Science student	58	58 %
	Others	42	42 %

**Table 1:** Demographic data

Table 1 shows the questionnaire based on demographic information and few topics related questions as the survey was based on awareness among youth so most of the responded are in the age bracket of 17 to 21 that is (81%). There are 13% of respondents who belong to age group between 22-26. As shown in table there are only approx. 4% of students above age group 30 years. When it comes to education most of the respondent are undergraduate that is 81% of total responses. Apart from this 58% percent of students belongs to science and 42% from another field.

Data Collection	
Question	Are you aware of the term Cyber security?
<b>YES I am aware</b>	66
<b>Yes I am aware but not in detail</b>	20

aware but with with very little knowledge	14
Never heard	0

**Table 2:** Opinion concerning awareness about term cyber security

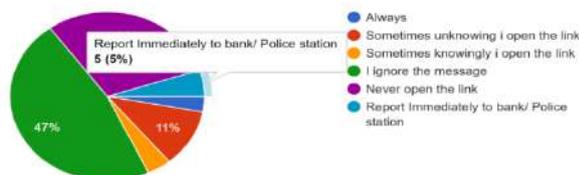
Above table 2 represents the view of the respondent's concerning awareness of Cyber security' and opinion of the respondent clearly state that they are aware about it. As per responses received 66% of students says that yes they are totally aware about it. On the other hand, 20% of students says that they are somehow aware they don't have detail knowledge and 14% of students are having very little knowledge. Study also clearly shows that there is not a single student who is unaware about cyber security.

Question	
Always	3
%	3
Sometimes unknowingly I Open the link	11
%	11
Sometimes knowingly I Open the link	4
%	4
I ignore the message	47
%	47
Never open the link	30
%	30
Report Immediately to bank or Police station	5
%	5

**Table 3:** Responses of scenario-based question

The table 3 shows awareness among the students when it comes to cyber fraud the question was framed to know how students responds on fake message with link claiming a lottery from banks and the results clearly states that 3% of respondents always open the link. 11% sometimes unknowing opens it. And the surprising fact is that 47% of people leave it attended by simply ignoring it. And Only 5% are aware about reporting this fraud to police station. Figure 1 show the analysis of the same.

When you receive random message mentioning you have won lottery and asked you to access link, how frequently you open the link without any detail verification  
 100 responses



**Figure 1**

If you are selling you T.V on some online platform and buyer ask you to scan a bar code for further payment process, what action will you do?  
 100 responses



**Figure 2**

Figure 2 depicts another scenario-based question when respondent ask about while using any online selling platform how they deal with scanning of bar code when any random buyer ask them to scan a code and result is

showing that 63% of students are ready to scan the bar code after verifying user identity which is totally wrong and can lead to big financial fraud. Only 7% of the students are aware that they should report such cases in police station.

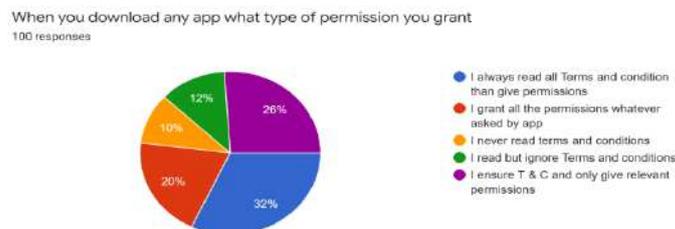


Figure 3

In another scenario shown in Figure 3 the question was framed to know awareness about app permissions about the permissions given by user to access the different folder like gallery, call records it has been observed that 32% respondents always reads the terms and condition and give access but they not understand it only 26% of the students are aware about they should aware about Terms and Conditions before giving permissions and after understandings terms and conditions only user needs to give only relevant permission not all. 20% of students grants the permissions whatever asked by app which is very serious threat to their private data in mobile phone.

Figure 4 shows that awareness about password as passwords are a first line of defence against many internet ills, but few people actually treat them lightly and keep same password for all accounts and the reason can be anything like it is easy to remember or simple to keep track of it. To know about password awareness among students 2 questions are framed and result are surprising more than 30% of students keep all passwords same as it is easy to memorize it which is quite dangerous.



Figure 4

No one enjoys working with passwords, but they're necessary for keeping your accounts secure one should change their passwords after every few months. Below figure 5 shows that there is less awareness in youth while updating password it is observed that 30 % of youth are not aware about the same as they never change it.



Figure 5

## Hypothesis Testing Test 1

**Objective 1: To understand a cyber security awareness and education framework in Indian youth.**

H0: There is no awareness about cyber security among youth

H1: There is awareness about cyber security among youth

Total Number of respondents (Sample size): 100

Level of significance: 5% (0.05) & Degree of freedom: 3

Decision Criterion:

H0 is rejected if  $\chi^2 > \chi^2(3, 0.05) = 7.81$

H0 is accepted if  $\chi^2 \leq \chi^2(3, 0.05) = 7.81$

Data Collection	
Question	Are you aware of the term Cyber security?
YES I am aware	66
Yes I am aware but not in detail	20
aware but with with very little knowledge	14
Never heard	0

SCALE		Observed (O)	
YES I am aware		66	
Yes I am aware but not in detail		20	
aware but with with very little knowledge		14	
Never heard		0	
Expected(E)	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
25	41	1681	67.24
25	-5	25	1
25	-11	121	4.84
25	-25	625	25
		Total	98.08

**Conclusion based on test 1.**

Thus,  $\chi^2 = 98.08 > 7.81$

Therefore, Reject H0 at 5% level of significance and accept H1.

Thus it is proved that there is a awareness about cyber security among students.

**TEST 2**

**Objective 2: To explore whether students are alert while responding internet fraud.**

H0: Students are alert while responding internet fraud

H1: Students are not alert while responding internet fraud.

Level of significance: 5% (0.05) & Degree of freedom: 5

Decision Criterion:

H0 is rejected if  $\chi^2 > \chi^2(5, 0.05) = 11.07$

H0 is accepted if  $\chi^2 \leq \chi^2(5, 0.05) = 11.07$

<b>Question</b>	when you received random message, you have won lottery and asked you to access link, how frequently you open link without any detail verification.
<b>Always</b>	3
<b>%</b>	3
<b>Sometimes unknowingly I Open the link</b>	11
<b>%</b>	11
<b>Sometimes knowingly I Open the link</b>	4
<b>%</b>	4
<b>I ignore the message</b>	47
<b>%</b>	47
<b>Never open the link</b>	30
<b>%</b>	30
<b>Report Immediately to bank or Police station</b>	5
<b>%</b>	5

SCALE	Observed (O)	Expected(E)	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
when you received random message, you have won lottery and asked you to access link, how frequently you open link without any detail verification.					
<b>Always</b>	3	25	-22	484	19.36
<b>Sometimes unknowingly I Open the link</b>	11	25	-14	196	7.84
<b>Sometimes knowingly I Open the link</b>	4	25	-21	441	17.64
<b>I ignore the message</b>	47	25	22	484	19.36
<b>Never open the link</b>	30	25	5	25	64.2
<b>Report Immediately to bank or Police station</b>	5	25	-20	400	128.4
				Total	256.8

### Conclusion based on test 2

Thus,  $\chi^2 = 256.8 > 11.07$

Therefore, Reject H<sub>0</sub> at 5% level of significance and accept H<sub>1</sub>.

Hence, from above information it is clear that respondents are not much aware while dealing with cyber fraud.

### TEST 3

**Objective 3: To identify the consciousness of the user in terms of password security.**

H<sub>0</sub>: There is consciousness is found among the user while dealing with the password.

H<sub>1</sub>: There is no consciousness is found among the user while dealing with the password.

Level of significance: 5% (0.05) & Degree of freedom: 4

Decision Criterion:

H<sub>0</sub> is rejected if  $\chi^2 > \chi^2(4, 0.05) = 09.488$

H<sub>0</sub> is accepted if  $\chi^2 \leq \chi^2(4, 0.05) = 09.488$

Questions	Generally, I keep my password same because it is easy to memorize
Neutral	21
Strongly Disagree	15
Disagree	25
Agree	31
Strongly agree	8
SCALE	Observed (O)
Neutral	21
Strongly Disagree	15
Disagree	25
Agree	31
Strongly agree	8

Expected(E)	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
25	-4	16	0.64
25	-10	100	4
25	0	0	0
25	6	36	1.44
25	-17	289	11.56
		Total	17.64

### Conclusion based on test 3

Thus,  $\chi^2 = 17.64 > 09.488$

Therefore, Reject H<sub>0</sub> at 5% level of significance and accept H<sub>1</sub>.

Hence, from above information it is found that there is no consciousness among the user while dealing with the password

### SCOPE OF THE STUDY

In this era with increase the use of digitalization and high dependences on online platform for entertainment, work, study, shopping, payment and hang out purpose and by looking the immediate negative impact related to cyber security the research has been conducted to understand how much youth is aware while using technology. The scope of the study is limited to recruiting 100 volunteers between the ages of 18 and 32. Which will be conducted via google forms.

### Significance of the study

We are living in an era where information technology has bridged the gap between countries. Either it can be any organisations or individuals, everyone now is storing their personal data on world wide web which means that digital footprints are growing on a large scale. This dependency on internet has open the door for hackers and can misuse technology for their advantage.

### Source of Data Collection

**Primary Data:** The form of the survey was created using Google forms and was distributed through WhatsApp groups for students to get access to it. The survey took one month for entire research, a total of 100 valid responders were able to fill the survey without missing data, This sample is sufficient for the analysis of my research topic in their paper where a total 16 questions and are designed. The estimated time required to completely fill google form is 10 to 12 minutes

### LIMITATION OF THE STUDY

- 1.The study is based on only 100 responadent so Sample size small
- 2.The Data collection is through google forms only as are different ways to collect data like interviews, face to face communication, case study, etc. but here its only via google form

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### FINDINGS AND CONCLUSION

Cybersecurity awareness is need of today's lifestyle when most the things are going digital at all level, this is more important for Students as well since they are going to be the future of nation most them will work in IT organizations so it is important to educate them about how to handle internet carefully as they use the internet at their daily activity so, some basic cybersecurity knowledge is needed for every individual. The result of this research indicated that even though the students shown a high level of awareness in some questions like in confidentiality and privacy but they are lacking basic knowledge on the aspect of password management system, phishing, and Two Factor Authentication. This research also shows there is strong need of cyber security related subject included in school curriculum itself.

### FUTURE SCOPE

The future scope of this research is to create cybersecurity awareness programs and also implement it specially for youth. It has been observed that the participants as the results show they are more vulnerable to cyber-attacks so if they slightly pay attention they can move quite safer side.

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## Calcined *Artocarpus Heterophyllus* Seed Husk Powder as an Effective Photocatalyst for the Degradation of Bromocresol Green Dye

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### ABSTRACT

In this study the Calcined *Artocarpus Heterophyllus* seed husk powder used as a green and cost effective photocatalyst for the degradation of Bromocresol green dye. Various techniques used to characterize Calcined *Artocarpus Heterophyllus* seed husk powder like Fourier Transform Infra-red (FT-IR) spectroscopy, Scanning Electron Microscopy (SEM) with EDAX and Brunauer-Emmett-Teller (BET). The degradation of Bromocresol green dye using visible light irradiation was investigated for photocatalytic efficiency of Calcined *Artocarpus Heterophyllus* seed husk powder. For the degradation of Bromocresol green dye using Calcined *Artocarpus Heterophyllus* seed husk powder recyclability was also studied and the results obtained have been discussed.

**Keywords:** Photocatalyst, Bromocresol green dye, Recyclability.

**Abbreviations:** CAHSHP = Calcined *Artocarpus Heterophyllus* seed husk powder

### INTRODUCTION

Major environmental threat that needs immediate attention is water pollution. Industrial wastes are significant contributors to the surface as well as groundwater contamination and pollution. The effluents from industries like textile, paper printing, cosmetics, leather, dyestuff, and plastic carry large quantities of dye-contaminated water that is very difficult to undergo natural biochemical degradation. This is due to its complex composition, high toxicity, variable pH ranges, dark color, and strong odour. These factors are adversely affecting the aquatic life, and deregulating the self-purification of water using the natural micro biota. This is also interfering with the biological water cycle of nature, leading to toxicity to humans. Toxicity and carcinogenicity are the principal effects on human beings (Albadarin et al. 2014; Adeyemo et al. 2017; Yaseen and Scholz 2018). Therefore, there is an urgent need to remove toxic dyes from wastewater before the release into the environment.

Bromocresol green is highly water-soluble dye, which is widely used for colouring textile materials, paper, carpet, wood, and leather, etc., and during these processes, excess dye enters into the wastewater. These dyes cause many adverse health effects such as irritation to eyes, tumours, birth effects, respiratory problems, high genotoxicity, cytostaticity, cytotoxicity, mutagenicity, and carcinogenicity (Ashraf et al. 2013; Njoku et al. 2014; Guerrero-Coronilla et al. 2015; Liao and Wang 2018). Therefore, from an environmental, and safety perception, the removal of bromocresol green before their discharge is an important task. There are several conventional physicochemical treatment technologies, such as coagulation/flocculation (Saritha et al. 2017), photodegradation (Rosu et al. 2016), advanced oxidation process (Nidheesh et al. 2018), ion exchange (Ma et al. 2019), membrane filtration (Qi et al. 2019), chemical oxidation/reduction (Li et al. 2014), adsorption (Munagapati et al. 2019), etc., have been developed and successfully applied to remove the dye contaminants from the wastewater. However, each of these techniques has several disadvantages, such as very harsh reaction conditions, low efficiency, high expensive, incomplete removal, generation of harmful substances and time-consuming.

Agricultural waste material has a potential role in the treatment of wastewaters which can eliminate different dyes (Gunduz and Bayrak 2017; Kamranifar et al. 2018; Munagapati et al. 2018; Stavrinou et al. 2018; C,elekli et al. 2019). Moreover, these materials are composed of lignocellulosic compounds, i.e., lignin, hemicelluloses, and cellulose which are known to supports the adsorption phenomenon (Chen et al. 2011). *Artocarpus Heterophyllus* (Jackfruit) tree is an evergreen tree that is found worldwide which include the India, Florida, South-East Asian Nations, Caribbean islands, Central and Eastern African nations, Australia and most of the pacific islands (Prakash et al. 2009). The tree bears huge fruit with pungent fleshy yellow pulp and huge seeds. For most of the time, only the fleshy pulp is eaten while the seeds are considered as by-products and are usually discarded which represented 8-15 % of the total fruit weight (Madruga et al. 2014). The seeds are mainly consumed in the lower-income countries where the seeds can be roasted, boiled and steamed which produce aromatic and nutty taste. Locally the seeds are usually diced and cook with curry, however they are not popular cuisines due to the texture of seed and bland taste. The bland taste may be due to its high starch content which is

approximate 93 to 95 % (Madruga et al. 2014). As a result, *Artocarpus Heterophyllus* (Jackfruit) seed is often not consumed and thrown away as waste.

In the present study CAHSHP is used as a cost effective and efficient green photocatalyst for the degradation of bromocresol green dye under visible light irradiation. The product obtained was analysed by Fourier Transform Infrared Spectroscopy (FT-IR), Brunauer-Emmett-Teller (BET), Scanning Electron Microscopy (SEM) with EDAX techniques.

### Preparation of CAHSHP

*Artocarpus Heterophyllus* used in the present study were collected from the local market of Nashik, Maharashtra, India. It was first cleaned and washed with tap water and then with distilled water several times to remove dust like impurities. The cleaned seed was oven dried at 60 °C for 24 h and then husk of seed was removed and calcined at 600 °C. The husk was powdered, pulverized and stored in a plastic bottle for further use. No other chemical or physical treatments were used prior to experiments.

### Characterization

CAHSHP was characterized by appropriate physiochemical techniques including Fourier Transform Infra-red (FT-IR) spectroscopy, Scanning Electron Microscopy (SEM) and Brunauer-Emmett-Teller (BET). IR adsorption study (KBr Pellets) were performed on a Shimadzu, 8400-S FT-IR spectrometer in the range of (4000 to 400)  $\text{cm}^{-1}$ . Surface morphology was studied by scanning electron microscopy JEOL-JEM-6360A model equipment JEOL-JEC-560 autocation coater.

## RESULTS AND DISCUSSION

### Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)

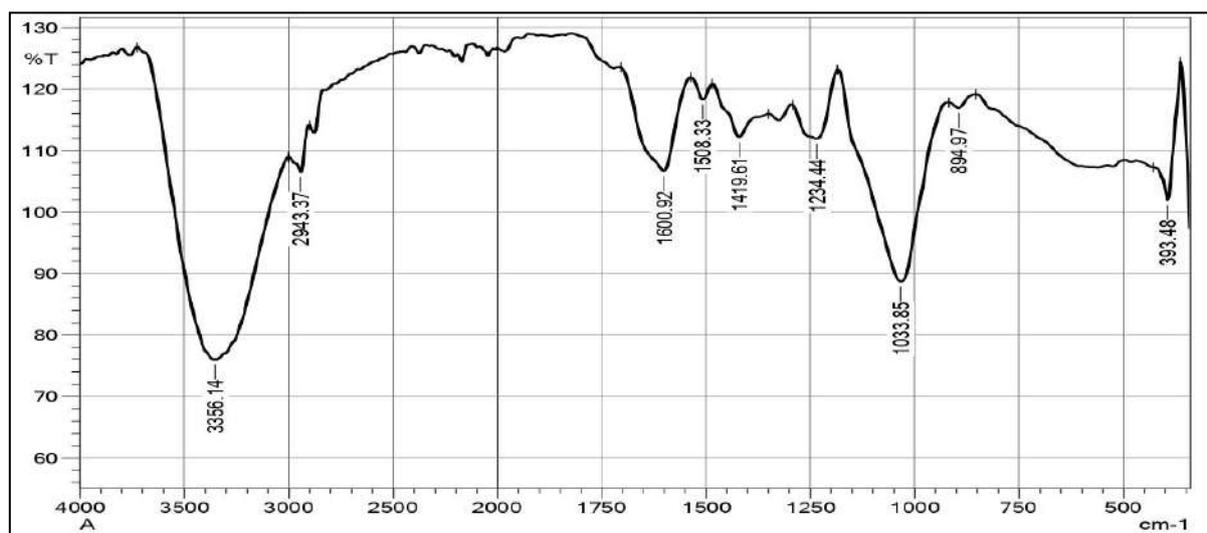
The composition of CAHSHP was evaluated using elemental analysis (ICP-AES) and results obtained are shown in Table 1.

**Table 1** Elemental analysis of Catalyst (ICP)

Catalyst	Ca	Fe	Mg	Mn	Na
	ppm	ppm	ppm	ppm	ppm
CAHSHP	2117.76	48.49	46.75	4.205	25.23

### FT-IR Spectroscopy

Figure 1 depicts the infrared spectrum of CAHSHP and it showed that broad intense peaks at  $3356.14 \text{ cm}^{-1}$  is due to C-H stretching. The band at  $1600.92 \text{ cm}^{-1}$  is observed due to hydroxyl group. Band appearing at  $393.48 \text{ cm}^{-1}$  correspond to IR absorption band.



**Fig. 1** FT-IR spectrum of CAHSHP.

### Scanning Electron Microscopy (SEM) with EDAX

The surface morphological analysis of CAHSHP is performed by SEM and is shown in Fig.2. A careful inspection shows that most of the crystals are big and collection of small particles. The agglomerate, non-adhesive, porous and irregular surface structure of adsorbent is distinctly observed in SEM image. The EDAX

analysis (Fig.3) of CAHSHP shows that it is composed of elements nitrogen (N), calcium (Ca), oxygen (O), gold (Au) and Carbon (C).

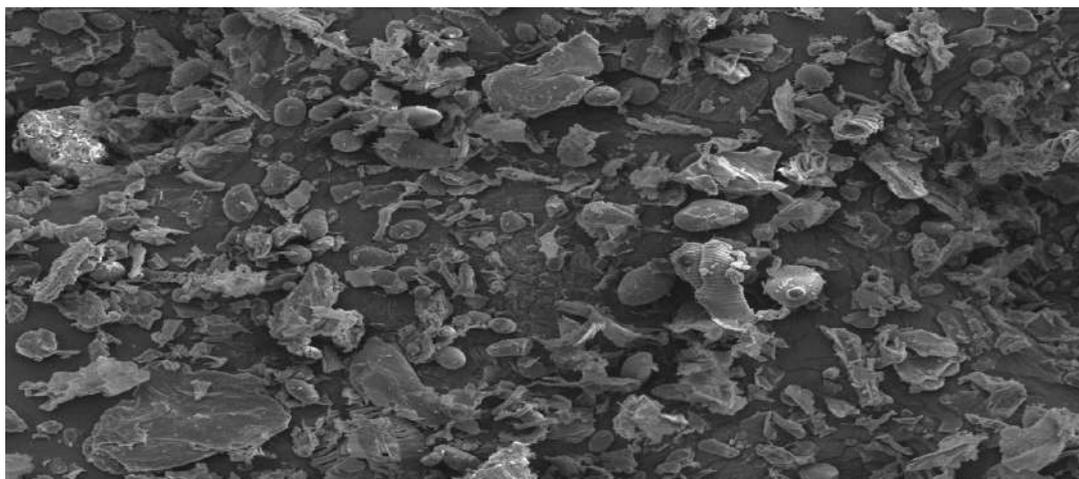


Fig. 2 SEM picture for CAHSHP.

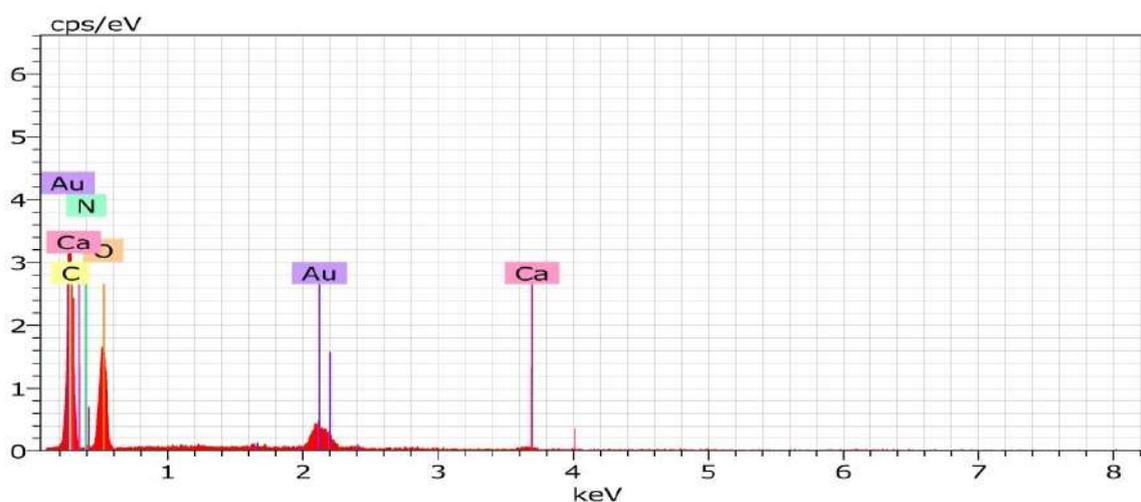


Fig. 3 EDAX analysis for CAHSHP.

#### Brunauer-Emmett-Teller (BET)

Figure 4 depicts N<sub>2</sub> adsorption/desorption isotherm for CAHSHP. It shows that the N<sub>2</sub> adsorption/desorption isotherm for CAHSHP satisfies IV N<sub>2</sub> adsorption/desorption isotherm with H1 hysteresis. The BET surface area ( $S_{BET}$ ) estimated by this method was found to be 21.6 m<sup>2</sup>/g.

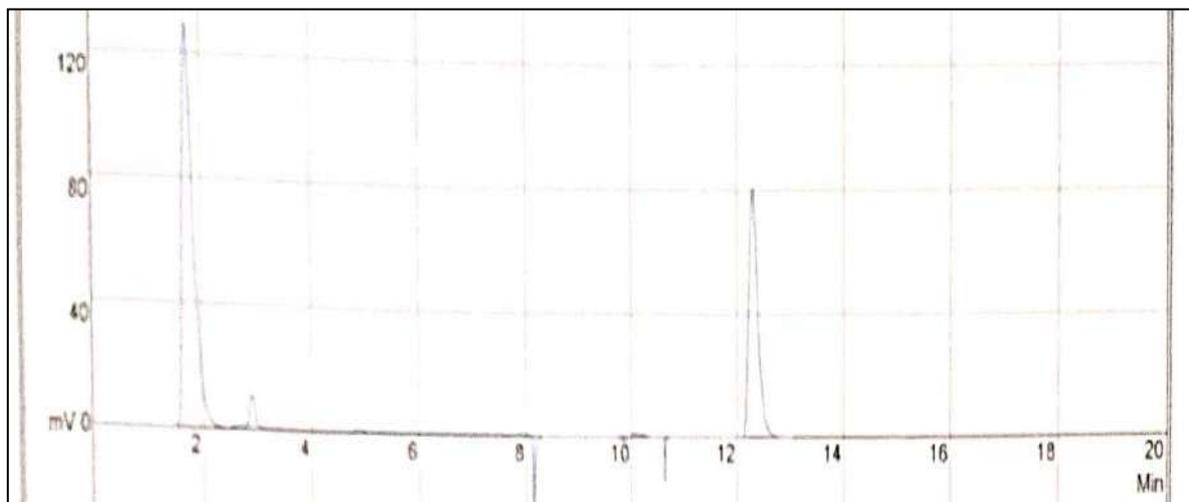


Fig. 4 BET Surface area of CAHSHP.

### Photocatalysis

In the present work photodegradation of Bromocresol green dye was studied in presence of CAHSHP as shown in Fig.5. Three kinds of experiments were performed. In the first experiment 50 ml 10 ppm solution of Bromocresol green dye was irradiated in a photoreactor using 1.0 gm of CAHSHP. The second experiment was carried out in absence of light. In third experiment only Bromocresol green dye solution without catalyst was irradiated to visible light. The decrease in absorbance due to mineralization of dye was recorded on double beam UV-Visible spectrophotometer (systronics) after every 10 min. For complete study on degradation of Bromocresol green dye was performed by using 1.0 gm of photocatalyst with 50 ml of 10 ppm dye solution under constant environment.

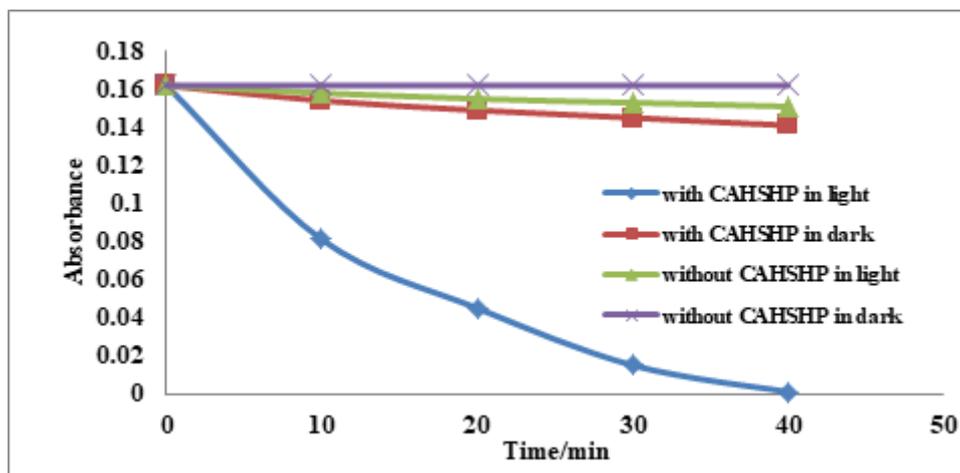


Fig. 5 Effect of catalyst and light irradiation on dye degradation using CAHSHP.

### Effect of Initial Dye Concentration

The photocatalytic degradation of Bromocresol green dye with various initial concentrations in the range of 10 to 50 ppm was investigated as a function of visible light irradiation time with natural pH of suspension with the loading of 0.5 gm CAHSHP in 100 ml dye solution (Fig. 6). A careful inspection of Fig. 6 reveals that as the amount of Bromocresol green dye increases the rate of degradation of the dye shows a smaller rise initially and then decreases gradually. It was mentioned that at lower amount of the dye, the photocatalytic reaction rate is nearly proportional to the dye concentration (Konstantinou and Albanis 2004). This is due to the fact that, when concentration of dye exceeds an optimum value, the light penetration decreases through solution thus decreasing, thus reducing the absorption of photon on CAHSHP. Due to adsorption of dye on photoactive surface of catalyst there occurs a decrease in active sites. Present study reveals that, with increase in dye concentration upto certain range, the photocatalytic activity goes on decreasing. The lower range concentration of Bromocresol green dye used in the present study is 10 ppm.

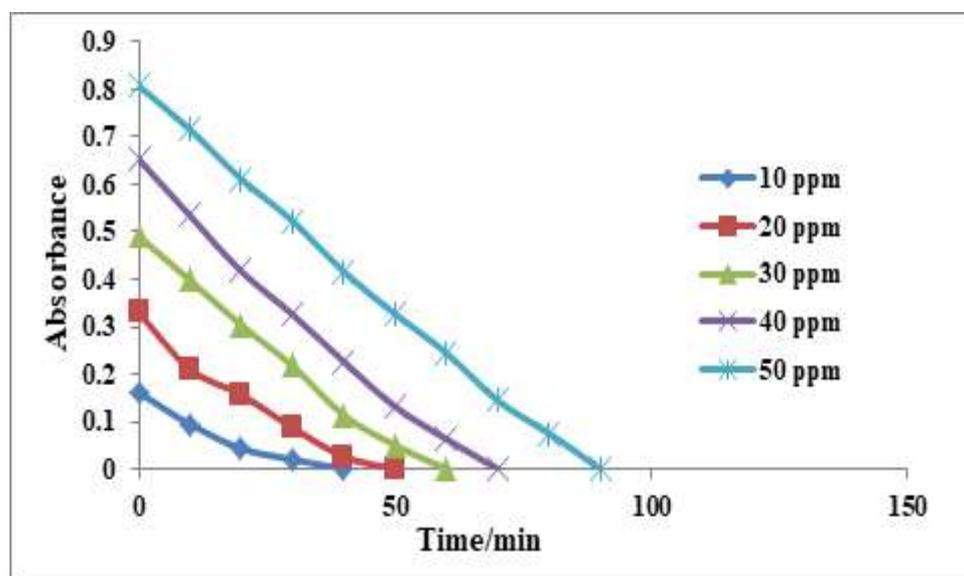


Fig. 6 Effect of initial concentration of Bromocresol green dye in presence of CAHSHP.

### Effect of amount of catalyst

The amount of catalyst is an important factor for the study of photodegradation. Figure 7 shows variation of amount of catalyst (0.2 to 1.0 g) at constant concentration of dye solution (10ppm) at neutral pH. At low catalytic concentration, degradation rate is diminishing because less number of surface active sites is available. With rising dose of catalyst, the degradation efficiency increases. On Excess addition of photocatalyst the photons are get scattered from its surface and hence degradation rate diminishes. In this work, the minimum addition of CAHSHP was found to be 0.6 gm per 100 ml. Figure 7 reveals that the degradation of dye before and after exposure to the visible light and photocatalyst. It is observed that with increasing time of irradiation, the chromophoric absorption peak at 423 nm completely diminishes dark colorization of Bromocresol green dye solution. The colour of solution (absorbance 423 nm) decreased remarkably reaching a discoloration. Figure 7 confirms that within 120 min the absorbance reaches to minimum in presence of CAHSHP.

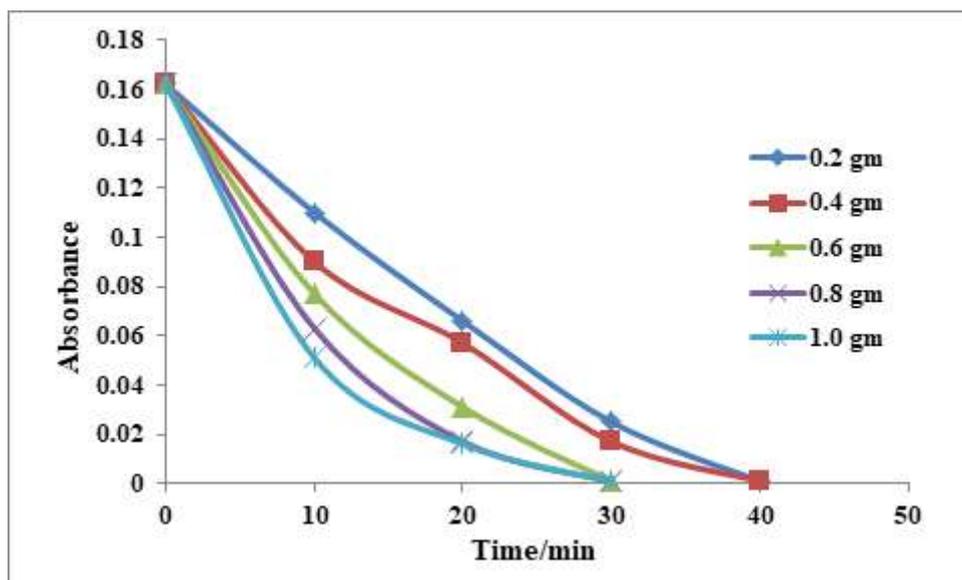


Fig. 7 Effect of amount of CAHSHP on dye degradation of Bromocresol green dye

### Recyclability of CAHSHP for Degradation of Bromocresol green dye

The recyclability for degradation of Bromocresol green dye using CAHSHP was checked over four runs (Fig.8). After every use, the photocatalyst was washed with distilled water and dried at 120 °C and redistributed in fresh dye solution. The favourable reusability was showed by CAHSHP after four times recycling. We did observe that during each run some extent of catalytic loss, this may cause decrease in degradation.

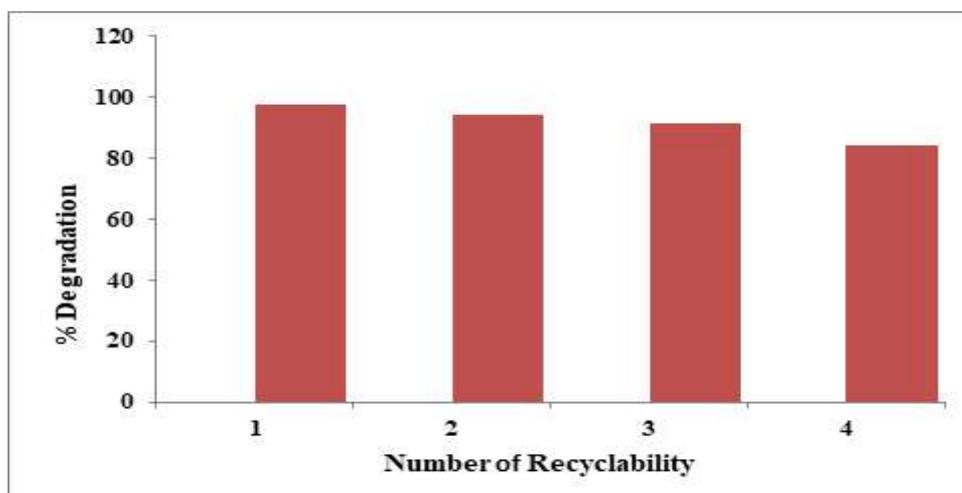


Fig. 8 Recyclability of CAHSHP for degradation of Bromocresol green dye.

### CONCLUSION

Photocatalytic degradation of Bromocresol green dye was investigated using CAHSHP as a cost effective photocatalyst. Various parameters such as concentration of dye, amount of photocatalyst and recyclability were studied. This work investigated that photocatalysis is a very effective technology for the degradation of

Bromocresol green dye. This study also confirms that CAHSHP is cheap and eco-friendly catalyst for degradation of Bromocresol green dye.

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## **A Study on the Impact and Relevance of Social Computing Tools Used in Social Media to Enhance the Efficacy of Collaborative Learning**

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### **ABSTRACT**

Collaborative learning has been a concept that has been given importance and now with the pandemic creating havoc, it has become most essential. This paper aims to look at and study how social media can be used to enhance the learning outcomes of students. The various techniques that have been used by various educators would be discussed. The researcher intends to understand the various social computing tools that may be used to improve the collaborative teaching learning techniques. Considering the current situation where the pandemic has changed the educational structures and has increased our interdependence on technology. This paper takes a descriptive approach in understanding the way in which social computing applications can support the higher education institutions (HEI) in improving the learning processes and outcomes.

**Keywords:** web 2.0, social computing, higher education, collaborative learning

### **INTRODUCTION**

The use of social media and mobile devices in terms of accessing course contents, instructional material etc has increased exponentially due to the pandemic. Mobile devices and social media have been used extensively to collect data, information, or any other content in textual, audio or video formats. The principles of collective exploration and interaction on which social media is based helps create various opportunities to students for collaborative learning and sharing of e-learning resources. Neil Selwyn, a researcher and educationist in his research papers has outlined a number of factors that benefit the students while using digital technology in a formal or informal educational setting. (Selwyn, 2012) Many studies conducted by reputed institutes and universities are testimony to the fact that Online use of social media for collaborative learning has been beneficial in improving student outcome and performance. Various barriers that students may face while using these technological devices might be in terms of accessibility of devices, internet connectivity issues but the constant evolution of technology has made it more accessible to the learners. Now to facilitate daily activities and tasks people oriented, context aware tools have emerged which have given rise to new disciplines like ambient technologies and Computer Supported Collaborative Learning (CSCL). The use of mobile phones has allowed the students to connect from anywhere and access educational content on demand at any time. These technologies assist the educational process both in terms of teaching and the learning process. Such tools have also helped in improving and enhancing the professional growth of staff by the numerous opportunities provided by these affordances and technologies. As per a recent EDUCAUSE report of 2019, the ninety-eight expert global panel discusses how educational technology is increasing by leaps and bounds but the implementation is where the challenge lies.

In comparison, advances in the field of technology have made it much easier to increase accessibility. Use of Ambient Intelligence is bound to improve the quality of the users, who in this scenario would be the students. They would be able to use their potential to the maximum and find new ways to interact and communicate using information and communication technologies (ICT). Using social media for collaborative learning seems to be the most logical approach to be taken especially while higher educational institutions have found themselves to be in the midst of the pandemic and their dependency on technological tools have increased exponentially.

### **SOCIAL COMPUTING**

When computational devices are used to facilitate interactions amongst users of a medium, it is defined as social computing. The intention is to ensure that websites can be used to interact on various levels in an organisation whether it be governmental or private owned businesses. (Sadiku, Shadare, & Musa, 2017)

The recent studies in social computing have helped develop various social systems which when integrated with technology have helped create software or tools that resolve problems or difficulties faced by the end user. High level of complexities of these tools can only be managed by the use of artificial intelligence which can effectively manage artificial societies. When such systems are developed, they include the structural compositions of the agent and functional behaviour. To control the behaviour of the agent, its normative regulations are also included to ensure that the dynamic formations of the agent groups don't create

complexities. For instance, the social computing systems are responsible for helping create recommendations to users. (Sadiku, Shadare, & Musa, 2017)

Twitter uses various social computing tools like CAPTCHA (Completely Automated Sensors, Public Turing test to tell Computers and Humans Apart) to predict dynamics of social behaviour from behavioural data and also helps authenticate users. Another application of these tools can be for changing consumer behaviour, initiatives in this regard are already being applied in social media platforms like Facebook and Twitter. Human machine interactions are usually not addressed in many researches that have been done in this field. Contextual information is very important while discussing such systems as it will help us understand the working infrastructures that allow the integration of different technologies. Social Computing and context awareness will help enhance the understanding of various learning scenarios and provide relevant solutions to the learners.

### **COLLABORATIVE LEARNING**

Collaborative Learning Theory is a form of Social Learning Theories that was introduced by Lev Vygotsky. He has described learning as a social process. The focus of social learning theories is on the fact that the teachers are responsible for creating active learning communities. According to this theory, it stresses on the fact that the learner learns through their interactions and communications with others. Lev Vygotsky examined and understood how the learning process would be influenced by the social environments hence proving that teachers can act as facilitators and maximise the learner's ability to interact with their peers, experts and teachers and thereby improve their understanding of the subject. Culture is said to be a very important fact which can help determine the construction of knowledge. The concept of learning by seeing or doing can be mirrored in a society where individuals learn different aspects of culture by interacting with others and following the norms, values and traditions that are a part of it. According to Vygotsky, "language is an important tool that can help in promoting thinking, reading and writing." In a classroom context, instructional strategies can help promote understanding towards the curriculum in place when combined with aspects of group learning can help when the discussions based in classroom are followed using the Socratic dialogue. This technique can help students feel like their views are being expressed and valued when it is led by an instructor. This has been proven to be a great motivational technique and has also helped in deeper understanding of the subject. The teacher becomes the facilitator and they are responsible for environments that are created which must be directed and guided while interactions may occur. (Vygotsky, 1978)

Collaborative Learning is a type of social learning which can occur between peers or in larger groups. Peer learning and Peer instruction can help in learning from one another and it can also help in clearing doubts or misconceptions if any. Various collaborative learning techniques are used in a classroom by instructors and they are as follows: Think/Write, Pair, Share-This is an example of cooperative learning wherein students are asked to think and write about any topic or question. Students may be grouped in pairs of smaller or larger groups. Ideas are shared and such techniques also help in reducing the fear that students have while vocalising their opinion or giving an answer. Round Table is another collaborative technique which helps students' assess any information that they have on the topic, recall the same and present it to the group. It may be presented orally or in written form. The written form is much more effective as it can help in equal chances being given to each member of the group and all ideas will be presented without any bias. Jigsaw is a technique which students are given practise to acquire a new skill and become an expert in the same. The student then explains the concepts to the team members and they collaborate to complete the said work. In such a scenario, students are expected to have develop interdependence skills and status equalisation is developed. The fourth technique is concept mapping where in students write terms related to a concept in their course work and create concepts in relation to that concept. This technique is beneficial in identifying and organising information to establish meaningful relationships between the information gathered. (Vygotsky L. , 1962)

Using collaborative learning strategies help in developing various capabilities in individuals like how to share responsibility, improving outcomes and authority. It helps in facilitating interdependence amongst group members, active participation thereby helping improve their understanding of the subject knowledge. Active learning strategies help in improving the engagement of students hence it would be beneficial in understanding how technologies can help in facilitating collaborative learning. Various studies support the importance and effectiveness of collaborative learning as compared to learning individually.

In the paper published by García, Ó., Tapia, D.I., Alonso, R.S., Rodríguez, S., Corchado, J.M, where they have discussed the importance of integrating Information and Communication systems to execute daily tasks. Ambient Intelligence (AmI) was a concept that was discussed to help improve the learning outcomes of

students by introducing context aware technologies which would help design learning applications that could be deployed to create a dynamic and adaptive environment not only for teachers but also students. The concept of introducing context aware technologies was defined as CAFCLA (Context-Aware Framework for Collaborative Learning Activities) which focused on collaborative learning through the use of contextual information. It is a multi level framework that helped develop learning applications to support various pedagogical approaches with respect to Ambient Technology and CSCL(Computer Supported Collaborative Learning). (García, Tapia, Alonso, & Rodríguez, , 2011)

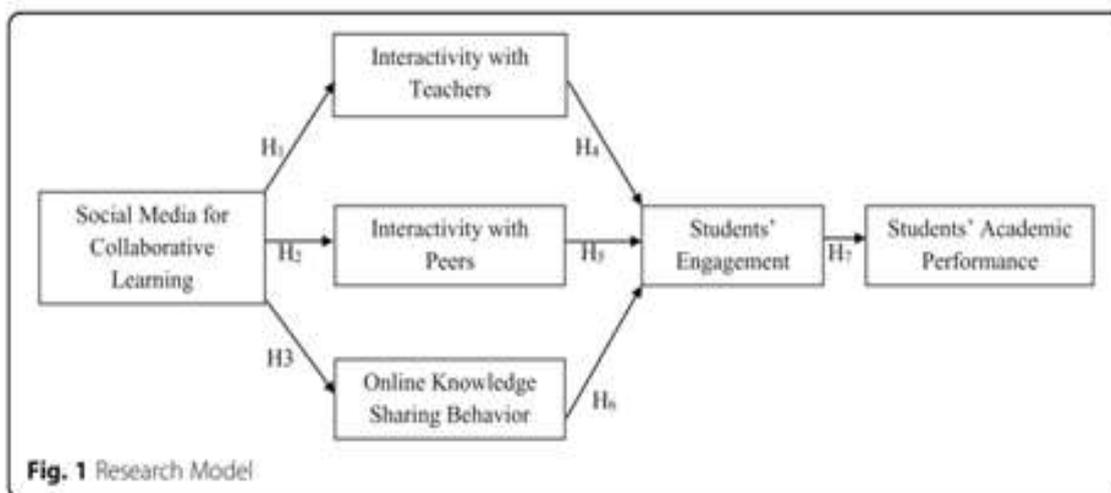
### **SOCIAL MEDIA**

Social Media can be defined as, “a group of Internet based applications built on ideological and technological foundations of Web 2.0 and allows the creation and usage of User Generated Content.”(Kaplan, Haenlein, 2010). From the time of its inception, social media has seen an increasing number of users and has become an integral part of all our lives both on a personal and professional level. (Chugh and Ruhi, 2018). A set of social computing tools on social media like blogging services, bookmarking services, discussion forums and social networking sites (SNS) have helped in creating private and public profiles to interact with other individuals and better social connections. There have been numerous studies which have stressed in the positive impact that social media has on improving learning outcomes of students.

### **SOCIAL MEDIA AND SOCIAL COMPUTING**

Multiple collaboration platforms can be created easily on any social networking platforms for people to share experiences. The same can be applied in education as well where blogs, discussion forums can be used to improve meta cognitive skills and reflection levels of students when they update their blogs on a weekly basis. Studies conducted in this regard indicate how it helped students overcome feelings of isolation by promoting communication and interaction amongst teachers and students which supports meta competencies. It also helped promote critical thinking skills, active participation and meta cognitive skills. Using social media can help improve metacognition, which essentially refers to the processes used to plan, monitor and assess one's understanding and performance. Such practices will help in improving the capabilities of the student and they can easily adapt themselves to a new environment. Collaborative learning will help students actively understand their weaknesses while working amongst peers or in a group and they can monitor their readiness to perform certain tasks simultaneously also expanding the knowledge to improve one's ability. Team based classrooms is a concept that was introduced to motivate students to do collaborative learning. These were learning spaces that were basically designed to ensure that active learning took place. It was not only an attempt to replicate a traditional classroom but in the technological sense it was supposed to give tools to the learner to improve his or her involvement in student led discussions and reduce the frequencies of instructor led pedagogy which in turn positively impacts student participation and collaboration. While deploying social computing tools in higher education institutions (HEI), various areas can be explored. It can not only be used as an institutional tool but can also be used as a communication avenue for students. It can help support exchange of information thereby creating an environment of assistance and understanding, thereby improving knowledge acquisition.

The illustration given below is from an empirical research paper on ‘Exploring the role of social media in collaborative learning the new domain of learning Jamal Abdul Nasir Ansari and Nawab Ali Khan, which was published in Springer. The model talks about how mobile devices have helped improve the student performance by incorporating collaborative learning. This model that was created and it was found that collaborative learning using social media had a positive impact on peers, teachers and also on student achievements. The study also argued on aspects that made the online social media platforms an avenue for creating a creative, dynamic and research-oriented platform that was purely create for knowledge sharing and personal development.



## CONCLUSION

Collaborative learning is a model that motivates creation of knowledge among participants when they actively shared experiences in a common setting when they agree to co-operate with a group of students in problem solving and task-oriented environment. Active engagement with the participants and objects in the technology led instruction is absolutely important. Maloney (2007) stresses on the role that social networking sites(SNS) plays in enhancing the student involvement, cooperation, development of interpersonal relationships and social compliance while on a virtual network.(Schrader, 2015). The ease and accessibility of using social media for education can now be of relevance considering the current scenario. The user interfaces and applications in social media platforms do motivate students and creates a favourable learning environment for them, at the same time it can pose challenges for researchers who aim to understand the various motivating factors that can help in student engagement.

The social computing tools can help assist the current and prospective students. The social networking sites provide an interactive and productive community of learners who are goal centric and intend to share and grasp new knowledge. It has also been seen to enhance learning outcomes in the following ways. It helps in improving personal knowledge management and collective learning resources and databases are formed. It fosters personalised learning environment which helps promote higher order skills like reflection and metacognition thereby empowering the learner in this process. The challenges lie on the instructor's part wherein he or she has to ensure that they select social computing application on social media platforms which fit their learning objectives and programme outcomes. The tasks implement must be user friendly and it must ensure the improvisation of student performance and achievement. Hese tools need to be embedded in a supportive environment where they can be guided and support thereby minimising any negative pressures that the virtual environment can offer like cyber bullying etc. Hence the tasks need to be transparent and digital divides must also be kept in mind while applying these practices for everyone.

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## A Study on Impact of Digital Literacy on E-Commerce

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### ABSTRACT

It's astounding the way the internet has brought about change in the way individuals communicate and collaborate, organisations conduct business, and governments execute their strategies. Businesses also took a leap ahead with customers buying from groceries to jewellery through e-commerce. This has made it imperative for individuals to be well equipped with the necessary digital knowledge and awareness to use their digital resources in an optimum way. Digital literacy indicates the ability to use electronic and digital technology. Therefore, there lies a relationship between digital literacy and e-commerce. The study examines the digital literacy of the respondents and analyses the impact of it on e-commerce with the help of primary data collected from 110 respondents through a questionnaire. Data has been analysed using SPSS for significance of sample.

**Keywords:** Digital Literacy, E- Commerce, Internet, Social Transformation

### INTRODUCTION

Digital literacy traditionally describes the extent to which a person is able to use interactive digital devices for working and living, such as computers and smartphones, as well as those services which are delivered through such devices. The advent of the digital society at large and electronic business, in the past few decades specifically, has widened the use of digital devices beyond the isolated uses of working and simple communication. With easy Internet accessibility and the affordability of electronic devices like laptops, smartphones, tablets etc. Social media platforms and integrated shopping and media platforms have emerged in the market. This advent has created a shift in the buying and selling habits of individuals to the online platforms.

E-Commerce or electronic commerce uses electronic platforms for buying and selling various products and services. E-Commerce can be categorised as Business to Business (B2B), Business to Consumer (B2C), Consumer to Consumer (C2C) and Consumer to Business (C2B). E-commerce allows businesses to conduct their business activities from any place at any time. E-commerce has the power to overcome the geographical barriers which makes all the individuals and businesses potential customers and suppliers. Amazon, Flipkart, Myntra etc. are some of the examples of leading e-commerce businesses in India. They are able to sell all items from multiple categories like salt to jewellery using the internet. For the internet to work smoothly, power and telecommunication infrastructure is required which will ultimately help in smooth implementation of e-commerce.

E-commerce is one of the drivers of growth of the world economy. Rapid technology adoption, access to the internet and Digital literacy has brought about revolution in the e-commerce sector which led to an increase in online consumer base which helps to this growth. The increase in usage and demand for network information and connectivity is reflected in the internet penetration rates among the whole world. This penetration has brought about fast development for the country due to adaptation of digital resources.

Developing digital skills through digital literacy serves as the necessary premise for developing the sector of e-commerce. The incidents of e-payment frauds and not providing the correct reasonable commodity as per the specification shown on the online platform is also continuing to rise. To conquer the negative impact of e-commerce, it is even more imperative now to empower the society digitally.

India is one of the largest consumer markets in the world and Indians are born industrialists. Through the internet, India has a good opportunity to achieve a better economic status and E-Commerce growth. The Indian Government is trying to facilitate Indians through some ambitious campaigns like e-governance, digilocker, e-basta etc. Digital India is one of the Indian government's projects which is trying to ensure that the government services are made available to citizens electronically by reduction of paperwork and connecting rural areas through digital infrastructure.

### LITERATURE REVIEW

Javaligi and co. (2005) assessed the development of e-commerce in Asia-Pacific region and suggested the strategic guidelines for the same. Researchers identified digital education to be one of the factors hindering the growth of e-commerce in the Asia-Pacific region and suggested guidelines to improve and develop the e-commerce sector. A study by Anooja (2015) helped in analyzing that the Digital India programme is promising

and will revolutionise the E-Commerce sector through the internet and broadband to remote corners of India. It also identified that the products which are consumed and sold by rural citizens may not get an effective price due to lack of demand for the products in the limited local market. Therefore, rural Indians have an opportunity to tap e-commerce with the help of digital literacy. Biagi (2017) conducted research on the impact of ICT/e-commerce activities on labour demand. This data is based on new and unique data for 10 European countries for the period of 2002–2010. The conclusion of the study is that the increase in ICT/e-commerce activities over time has not led to a decline in jobs. This holds true for both manufacturing as well as service industries.

### RESEARCH GAP

The researches that have been done in the field of digital literacy and e-commerce are undertaken in a general setup and no sufficient research has been undertaken in understanding the impact of digital literacy on e-commerce. The present study on e-commerce aims to study the impact of digital literacy.

### OBJECTIVES

- To analyse the digital literacy of individuals
- To study the e-commerce activities of individuals
- To analyse the impact of digital literacy on e-commerce

### RESEARCH METHODOLOGY

The study involves the use of quantitative and qualitative research. The quantitative research aims to assess the digital literacy of individuals, usage of e-commerce amongst individuals and analyse the impact of digital literacy on e-commerce by collecting the primary data with the help of questionnaires using google forms. A well-structured and close-ended questionnaire is drafted using Likert's scale. The population for the current study included individuals from various qualifications and age groups. 110 samples have been collected using the convenience sampling method. The data collected is presented using Tables and Bar Graphs. Simple descriptive Analysis is performed on the data which includes Percentages, Frequency, Mean and Standard Deviation. T-test has been applied on the data using SPSS for testing the significance of the sample. The Qualitative research involved studying the available secondary information from e-sources including Surveys, Articles and Research Papers.

### LIMITATIONS

The research study is subject to the following limitations

- The main constraint related to the research is limitation of time.
- Stronger evidence of limiting factors is none other than population.
- The secondary data for the study is restricted to only the open and free e-sources.

### FUTURE SCOPE OF STUDY

- The primary focus of this research is on the impact of digital literacy on e-commerce. Thus leaving a broad scope for future studies with the inclusion of other variables.
- The current study is based on a small population from Mumbai and Navi-Mumbai area, this further gives a scope to future researchers to undertake a similar study in either rural or urban areas.

### Data Analysis and Interpretation

Descriptive Analysis

		Statistics				
		Gender	Age	Your Educational Qualification	Your Annual Income	Your Profession
N	Valid	110	110	110	110	110
	Missing	0	0	0	0	0

**Table 1:** Descriptive Statistics sourced from SPSS

It is observed that all the 110 samples collected have valid data and there is no missing data.

Gender				
	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Male	49	44.5	44.5	44.5
	Female	61	55.5	55.5	100.0
	Total	110	100.0	100.0	

**Table 2:** Descriptive Statistics (Gender) sourced from SPSS

It is observed that 44.5% of the respondents are male and 55.5% of the respondents are female.

		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25 and under	70	63.6	63.6	63.6
	26 - 33	29	26.4	26.4	90.0
	34 - 45	10	9.1	9.1	99.1
	46 and above	1	.9	.9	100.0
	Total	110	100.0	100.0	

**Table 3:** Descriptive Statistics (Age) sourced from SPSS

63.6% of the respondents are in the age group of 25 and under followed by 26.4% in the age group of 26 to 33 years, 9.1% in 34 to 45 years and 0.9% of 46 and above age group.

		Your Educational Qualification			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School or equivalent	20	18.2	18.2	18.2
	Diploma	3	2.7	2.7	20.9
	Bachelor Degree	62	56.4	56.4	77.3
	Master Degree	23	20.9	20.9	98.2
	Doctoral Degree	2	1.8	1.8	100.0
	Total	110	100.0	100.0	

**Table 4:** Descriptive Statistics (Educational Qualification) sourced from SPSS

It is observed that the majority of the respondents have a Bachelor's degree followed by a Master's degree. After that, respondents are high school or equivalent degree, diploma and doctoral degree holders.

		Your Annual Income			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Upto Rs 2 Lakh	15	13.6	13.6	13.6
	Rs 2 Lakh - Rs 5 Lakh	36	32.7	32.7	46.4
	Rs 5 Lakh - 10 Lakh	11	10.0	10.0	56.4
	Above Rs 10 Lakh	6	5.5	5.5	61.8
	Other	42	38.2	38.2	100.0
	Total	110	100.0	100.0	

**Table 5:** Descriptive Statistics (Annual Income) sourced from SPSS

It is observed that since the majority of the respondents are having bachelor's degree and under the age group of 25, the income of the majority of the respondents lie in the bracket of Rs 2 Lakh to Rs 5 Lakh.

		Your Profession			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business	9	8.2	8.2	8.2
	Salaried	43	39.1	39.1	47.3
	Student	53	48.2	48.2	95.5
	Homemaker	3	2.7	2.7	98.2
	Other	2	1.8	1.8	100.0
	Total	110	100.0	100.0	

**Table 6:** Descriptive Statistics (Profession) sourced from SPSS

It is observed that the majority of the respondents are students with 48.2% followed by Salaried respondents of 39.1%, Business at 8.2%, Homemakers at 2.7% and others at 1.8%.

Mean and Standard Deviation of Self-Assessment of Digital Literacy

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Rate yourself (Scale: Very Poor = 1, Poor = 2, Acceptable = 3, Good = 4, Very Good = 5) [Your typing skills]	110	1	5	3.70	.924
[Your web search skills]	110	1	5	3.91	.973
[Your computer literacy (the ability to use the computer)]	110	1	5	3.91	.934
[Your internet literacy (the ability to use the internet)]	110	1	5	4.12	.926
[Your digital literacy (the ability to use digital technologies)]	110	1	5	3.79	.920
Valid N (listwise)	110				

**Table 7:** Descriptive Statistics (Digital Literacy) sourced from SPSS

Majority of the respondents have assessed themselves having digital skills above acceptable level. Since the mean value for all the questions is more than 3, it can be assumed that the typing skills, web search skills, ability to use the computer, ability to use the internet, ability to use the digital technologies of the respondents is in the range of good to very good.

#### Inferential Analysis : T-test

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
What measures would you recommend for promotion of e-commerce in India? [Promotion of internet]	110	4.10	.834	.080
[to increase the awareness levels]	110	4.25	.744	.071
[Focus on increasing the digital literacy]	110	4.36	.843	.080
The challenges to the implementation of e-commerce in India? [Low digital literacy]	110	3.90	.928	.088
[Lack of trust]	110	3.95	.850	.081
[Security concerns]	110	3.81	.981	.094
[Slow penetration of internet]	110	3.51	1.081	.103

**Table 8:** One Sample Statistics sourced from SPSS

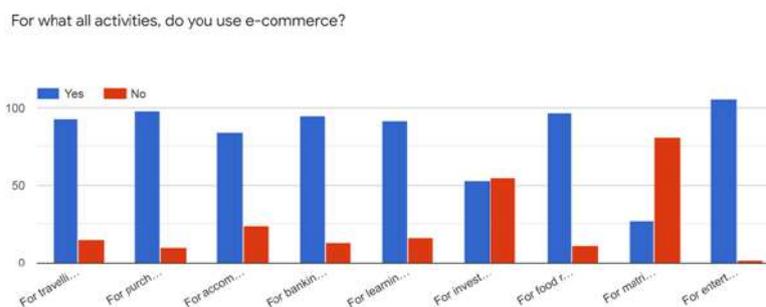
One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
What measures would you recommend for promotion of e-commerce in India? [Promotion of internet]	13.826	109	.000	1.100	.94	1.26

[to increase the awareness levels]	17.552	109	.000	1.245	1.10	1.39
[Focus on increasing the digital literacy]	16.966	109	.000	1.364	1.20	1.52
The challenges to the implementation of e-commerce in India? [Low digital literacy]	10.170	109	.000	.900	.72	1.08
[Lack of trust]	11.777	109	.000	.955	.79	1.12
[Security concerns]	8.646	109	.000	.809	.62	.99
[Slow penetration of internet]	4.937	109	.000	.509	.30	.71

**Table 9:** One Sample Test sourced from SPSS

Since  $p < 0.05$  for all the questions, the test is **significant** (the sample is significantly different than mean value = 3). Majority of the respondents strongly agreed to increase the awareness levels and focus on increasing the digital literacy of the individuals. Maximum respondents agreed that lack of trust and low digital literacy were the major challenges for implementation of e-commerce in India.

## FINDINGS



### The following are the findings of the quantitative study

- A majority of 96.36% respondents have been using e-commerce for entertainment purposes (movies, series etc.) followed by 89.09% for purchasing apparels (clothes, shoes, bags etc).
- 88.18% respondents use e-commerce for food related purposes (ordering online, offers, ratings, reservations etc.).
- Banking purpose (86.36%), travelling purpose (84.54%) and learning and knowledge purpose (83.63%) are the next preferred reasons for using e-commerce platforms.
- Least preference for using e-commerce was found for the purpose of matrimony (73.63%) and investments (50%).

## CONCLUSION

India is gradually moving towards becoming a digital economy. Digital empowerment of all strata of the society is necessary for development and growth of the nation. Businesses have also moved towards online platforms to be a part of digital India. E-commerce has proved to be advantageous by helping in providing choices and saving time for the consumers. However, several challenges like digital literacy, keeping up technological progress, internet connectivity and so on come in the way of absolute implementation of e-commerce. Thus, it is imperative for individuals to be well equipped with the necessary digital knowledge and awareness to use their digital resources in an optimum way.

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## **The Difference in Coverage of Health News in Digital Print Media of Developed and Developing Nations**

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### **ABSTRACT**

The Covid-19 pandemic has affected the whole world in varying degrees. The pandemic has swept off large hordes of population and until the time the vaccine was invented and tested, the whole world was under conundrums. The pandemic brought to the fore many laxities in both the developing and developed nations' health department's infrastructural and intellectual capacity to deal with such an outbreak. While on one hand there was desperation to discover a vaccine, on the other hand there was a need to meet the medical requirements of growing patients and dead bodies. The news media definitely has a strong role to play when it comes to the coverage of news pertaining to health of the citizens as the basic responsibility of each nation to look after the welfare of its citizens. The role of digital news media became especially important since print newspapers were not allowed to be circulated as a safety mechanism to avoid the spread of the virus. The present paper aims to explore and compare the differences in the coverage of news in the e-papers of any two leading news agencies of each of developed nation and developing nation viz. United Kingdom and India. The study is based on Secondary information gathered from the official news website source of the aforementioned agencies.

### **INTRODUCTION**

The Covid 19 pandemic has affected the entire globe colossally, though it was detected and spread at different times since 2020. It was on March 11, 2020 that the World Health Organisation declared the Covid 19 virus spread as a pandemic. The virus was spreading like wild fire killing almost everyone who stood in its path. Only a rare few were spared. The world kept grappling with how to contain the virus and a vaccine was far from discovery. At such times the citizens naturally turn to journalism for providing them with information that helps them make a sense of the situation. The news press has certain roles and responsibilities that they are expected to carry out in case of a crisis to ensure that they serve the public well.

COVID-19 is caused by the SARS-CoV-2 virus that primarily spreads between people when an infected person is in close contact with another person. Small liquid particles are transmitted by an infected person who coughs, sneezes, speaks, sings or breathes heavily into another person's mouth, nose or eyes (World Health Organization, 2020). After studying how the virus spreads, the health professionals recommended three important practices for containing the virus such as social distancing, mask wearing and using sanitisers for disinfecting. Keeping a set distance from others—the suggested space is six feet—is meant to keep distance preventing the droplets from infecting a healthy person. Wearing a facial mask is meant to add an additional protection.

As the medical professionals were handling such a case for the first time, they were changing methods and developing them and the political leaders were fighting to understand the information and implement ways to effectively control the situation. In India, Prime Minister Narendra Modi announced the first lockdown on March 24, 2020. As a part of the lockdown all public movement was confined to their households. Only doctors and medical job related personnel along with the police were allowed to travel and that too strictly on work purpose only. Now it was the job of the journalists to distribute that information and give it meaning and proper context for members of society.

During a time when the world is experiencing a global pandemic, people turn to journalists. Now more than ever, when little hope is found and so many questions are left unanswered, it is imperative for journalists to fulfill the roles that the public expects them to. Fulfilling journalism roles shows the public that journalists are committed to being a watchdog for the public.

The purpose of this study is to examine the roles and responsibilities the press should fulfill that are in accordance with journalism ethics and what the public believes the press should be doing to serve its community well. The roles and responsibilities will primarily be assessed during a health crisis such as the coronavirus pandemic. This fulfillment of the role will be analysed with the framing of the news in the newspapers.

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## LITERATURE REVIEW

### Watchdog role of the press

The characterization of journalism as a social 'watchdog' springs from a classical liberal conception of the power relationship between government and society within a democratic state. The watchdog theory of journalism is based on a pluralistic view of social power and can be seen as 'a simple extension to the (newspaper) press of the fundamental individual rights to freedom of opinion, speech, religion and assembly' (McQuail, 1994: 128). The watchdog metaphor imbues the press with the role of being a forum for discussion, investigators of impropriety, an adversary to monopoly over power and knowledge and the defenders of truth, freedom and democracy. This is embodied in the traditional idea of a 'fourth estate', historically accredited to Edmund Burke: 'There are three estates in Parliament, but in the reporter's gallery yonder sits a fourth estate more important than they all' (Carlyle, 1841, cited in Donohue et al., 1995:118).

### Normative theory and Social Responsibility Theory

At its most basic definition, normative theory explains the things people ought to do. The theory outlines what roles and responsibilities people have, and when applied to journalism, scholars think of normative theory as the basis for why journalists have these roles and responsibilities. There are four components of normative theory: the authoritarian theory, the libertarian theory, the social responsibility theory of the press and the Soviet communist theory.

The social responsibility theory in particular applies to the relationship between the press and the public. Social responsibility theory lays out six tasks that journalists should carry-out: (1) serve the political system by providing information, discussion, and debate on public affairs; (2) enlighten the public to make it capable of self-government; (3) safeguard the rights of the individual by serving as a watchdog against government; (4) service the economic system by bringing together the buyers and sellers of goods and services through advertising; (5) provide entertainment; and (6) maintain its own financial self-sufficiency so as to be free from the pressures of special interests (Siebert et al., 1956). Scholars point out that despite these six functions being crucial parts of what makes journalism work, some news media organizations have failed to interpret them and carry them out in a way that is beneficial to the public (Siebert et al., 1956). Social responsibility theory is grounded in its focus on the public. Scholars say servicing the economic system or entertainment area should never take precedence over functions that promote democratic processes or enlighten the public, but they feel some news organizations have not followed this social responsibility ideal (Siebert et al., 1956).

### Agenda-setting theory of the press

The Agenda-setting theory stated by Dr. Max McCombs and Dr. Donald Shaw, in a study on the 1968 presidential election deemed "the Chapel Hill study", suggests that media has a great influence to their audience by instilling what they should think about, instead of what they actually think. That is, if a news item is covered frequently and prominently, the audience will regard the issue as more important. Therefore in this case the journalists played a major role in shaping how people think about what medical professionals and government leaders do during a public health crisis by how they choose to frame the information they share. Not only do journalists choose what stories are most important to cover, they also choose how they will cover them.

Agenda setting occurs through a cognitive process known as "accessibility". Accessibility implies that the more frequently and prominently the news media cover an issue, the more instances of that issue become accessible in audience's memories. The agenda-setting effect is not the result of receiving one or a few messages but is due to the aggregate impact of a very large number of messages, each of which has a different content but all of which deal with the same general issue. Mass-media coverage in general and agenda-setting in particular also has a powerful impact on what individuals think that other people are thinking, and hence they tend to allocate more importance to issues that have been extensively covered by mass media.

### Framing of News

Media framing analysis goes beyond identifying which issues (and aspects of issues) are important to think about, and explores the parameters of the discussion itself—the words, symbols, overall content, and tone used to frame the topic. When compared to agenda setting, framing includes "a broader range of cognitive processes—such as moral evaluations, causal reasoning, appeals to principles, and recommendations for treatment of problems." In other words, if agenda setting tells us what issues and topics to think about, and second-level agenda setting suggests which aspects of those topics are more/less salient, media framing takes it another step by exploring "how" specific devices can shape our understanding of the topic itself.

Framing's roots go back, in part, to Erving Goffman's (1974) exploration of how we organize our own experience. He argued that we experience life—both in terms of how we receive and interpret, and how we

engage—through frames. What we consider “reality” depends on the frames we employ to approach, analyze, and understand the world around us. Accordingly, given the power of the media in setting the public agenda, then, how media frame certain topics and events influences this process, and directly affects how we “know what we know” about the world around us. Journalists use frames, however, to help break down often-complex situations into digestible content for public consumption. In the process, as Goffman suggested, they inevitably do so using their own lens and experience—their own frames.

Episodic and thematic frames are two particular framing devices studied extensively by Shanto Iyengar and fellow scholars. Episodic frames focus on the specific details of a breaking news story and often follow a narrative format. Conversely, thematic frames focus on the overarching problem from which that single event (the event of focus in episodic frames) stems, and provide an examination of related historical and political trends (Iyengar, 1991). Specifically, Iyengar (1991) suggested that episodic frames, which have been found to be more prolific in mass media reports in comparison to thematic frames, are far too simplistic, and thus, potentially problematic to American society. However, it is important to note that journalists are not merely reporters; they are also storytellers. Storytelling is a basic characteristic of humankind (Fisher, 1985). Within persuasive communication, storytelling and narrative forms of communication have been shown to facilitate message processing (Niederdeppe, Shapiro, & Porticella, 2011; Oliver, Dillard, Bae, & Tamul, 2012). This suggests that news articles written in narrative format perhaps have a significant potential to influence human behavior, as stories have the ability to arouse basic, universal human emotions. When readers experience an emotional connection to subject matter, they may be more inclined to support the enactment of overarching laws and measures related to the “big picture” – or the outcome and treatment of tragic events. In this sense, episodic news framing can potentially have a positive impact in terms of intent for improving social issues.

Message frames are defined based on features like headlines and word choice, which can have powerful effects on audiences’ emotions and attributions in various contexts (Aarøe, 2011). This is especially true for topics that unveil aspects of the human condition and the current political and economic climate, including crime and terrorism (Iyengar, 1991). The following literature review explores message frames relating to coverage of Covid 19 pandemic in both developed and developing countries namely England and India.

However, a major debate among researchers within the framing paradigm revolves around the explication of the concept of framing. No uniform definition of framing exists. Entman (1993) describes frames as a way to diagnose, evaluate and prescribe; “To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described” (p. 52). Iyengar (1991) describes frames as “subtle alterations in the statement or presentation of judgment and choice problems” (p. 11).

The present research draws from Tankard, Hendrickson, Silberman, Bliss and Ghanem’s (1991) definition of framing. They state, “A frame is a central organizing idea for news content that supplies a context and suggests what the issue is through the use of selection, emphasis, exclusion, and elaboration” (as cited by Tankard, 2001, pp. 100- 101). Tankard (2001) focuses on conceptualization and measurement by utilizing a systematic method of defining frames, which he refers to as framing mechanisms. These mechanisms focus on story headlines, kickers, subheads, leads, selection of sources, selection of quotes, use of statistics, and concluding statements of articles.

Iyengar (1991) explored episodic and thematic framing through experimental design. Episodic framing focuses on recent, sensational news, while thematic framing discusses the general background and implications of current issues. Iyengar examined attributions of responsibility, which he divided into causal and treatment responsibility, with causal relating to where the problem originated, and treatment focusing on who has the power or authority to remedy the problem (Iyengar, 1991). He studied these within various contexts including crime, terrorism, poverty, and war. Iyengar’s (1991) overarching findings were that episodic frames often fail to convey the bigger picture of societal problems due to their focus on and elaboration of isolated events. The current study seeks to apply episodic and thematic framing to the subject of health to test viewers’ attributions of responsibility and affective responses. Episodic and thematic framing are discussed here with an emphasis on their relation to health reporting.

## **METHOD**

For this research the researcher has reviewed two newspapers ‘The Indian Express’ – a news daily from India and ‘The Times’ – a news daily from London, in terms of its coverage in terms of which page was dedicated (both page number and section), the number of articles and the type of coverage based on the framing.

For the aforementioned, the page defines the priority given to the news as per the role of agenda-setting. In this research, the researcher has noted the coverage on the front page, the editorial page and/or if there were any specific pages dedicated to the coverage of Covid related news. The 'number of articles' constitutes the number of different sections under which the topic was covered for example Health infrastructure, Political decisions, Availability of vaccine etc. all with the focus on health reporting only.

The type of framing of the coverage has been divided into episodic and thematic representation (Iyengar 1991). Episodic representation caters to coverage of a single news event as an occurrence whereas thematic representation covers the issue in a detailed and intellectual manner considering the overall far reaching effect it has on the society at large.

To have a fair analysis both the newspapers have been reviewed with both the regular weekday and Sunday editions for the month of October 2021 i.e. for a period of thirtyone days.

## **FINDINGS**

The study found that the coverage was extensive in 'The Times' in comparison with 'The Indian Express' in the number of articles. 'The Times' has in fact dedicated two pages on the coverage of Covid with the section named 'Coronavirus news'. The two pages printed on all week days except for Sunday has covered all the areas ranging from Patient numbers to the vaccine news to the political and the health commission's stand. The coverage was both of episodic and thematic nature. The front page news have ranged from the restrictions or alert form as the one appearing on October 8- PCR tests for travelers ditched before half term, to more serious revelations of a health committee report published on October 12- 'Britain must learn from 'big mistakes' on Covid says report. The October 15 article 'Use cheap but accurate Covid tests at half term' article covers the UK governments introduction of cheaper and more faster tests for covid detection. The October 21 news on the front page was equally detailed where *Sajid Javid* - Secretary of State for Health and Social Care warned of rising numbers published in the article 'Javid warns daily covid cases could hit 1,00,000. A political angle news was covered on October 19 in front page news of 'Campaign will push for bigger uptake of boosters'. The October 22 article 'Booster dose of Pfizer vaccine offers near total protection' takes a detailed view on the efficacy of the vaccine and informs the reader of its total benefit. The October 23 article 'Booster jabs will prevent lockdown' presents a picture of positive outcome if the people opt for the booster soon.

While the above is the representation in 'The Times', the representation in 'The Indian Express' has been limited to the coverage in terms of episodic events. There was no dedicated special page on any of the days.

'The Indian Express' too covered the news with the economic and health aspects with the front page news on October 2 'Covid Relief: Centre clears Rs.7274 cr to 23 states as its share'. There was an education related news on October 5 'Lockdown back schools shut in 61 villages of Ahmednagar. The October 13 news was health news stating that the panel approval has is almost on its way 'Panel approval is in Covaxin for children is one step away'. October 15 article on front page stated 'Health ministry raises alert over Covid team vacancies; Acute Stress. Also on the same day there was an article stating 'Colleges reopening, teens below 18 can travel by local train even if not vaccinated'. On October 18 there was an article titled 'Vacci billion nation' celebrating the coverage of one billion people. On October 31 there was an article 'Covid distress: MNREGS demand above Rs.2 cr level 10<sup>th</sup> month in a row'.

On the more thematic note 'The Times' covered more articles including feature and editorials on the topic of pandemic where diverse subjects were handled. A total of 15 articles of thematic discussion in Editorial section, Columns etc were published as opposed to the 7 editorials and columns printed in 'The Indian Express'.

As mentioned above 'The Times' had two special pages named 'Coronavirus News' that were published on all weekday pages (Monday to Saturday) and they carried a total of 71 articles covering education, health, civic issues.

## **CONCLUSION**

The researcher thereby looking at the sheer number of the news articles covered under episodic and thematic representation concludes that the representation in 'The Times' is much more exclusive than in 'The Indian Express'.

The coverage of news by the newspaper 'The Times' since it comes from a developed country has more vast coverage owing to its capacity to gather news from every angle and 'The Indian Express' as a newspaper from a developing country is unable to give that much detailed coverage.

The 'The Times' with its printing of dedicating two special pages brings focus on an issue and makes the reader pay attention to the issue more seriously.

As also special features, columns and editorials allow the reader to develop a deeper understanding over the topic so here too the number of articles makes a difference and 'The Times' was seen to be leading in its coverage.

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## Predicting the Accuracy of Cardiovascular Diseases using Artificial Intelligence Algorithms

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### ABSTRACT

Cardio Vascular Diseases (CVD) is resulted due to the disorder developed in blood vessels and heart which caused heart attack, stroke etc. For detection of Coronary Heart Diseases(CHD), very expensive and time consuming test like stress testing, echocardiography, electrocardiogram and angiography is done. Researchers are therefore forced to find an alternate method through different methodologies like machine learning algorithms which may predict and detect the coronary heart diseases at the first stages. This research paper mainly aims at prediction and detection of coronary heart diseases by hybridizing computational intelligence algorithm. The suggested research are going to be administered through three major levels mainly preprocessing, feature selection, classification. At the initial level, preprocessing is done, where the primary data set collected is preprocessed by replacing missing value and by converting numeric value to nominal value and also conversion of the unstructured data into structured data set. The next stage is feature selection which is employed for improving the prediction performance, giving quicker and budgeted predictions. When it comes to unstructured data, dimensionality reduction plays an very important role as it consist of multiple attributes which is an important part of feature selection. And the last stage is hybridizing the computational algorithm which will be used for the classification. The proposed system will be compared and analyzed with the existing system based on the accuracy and adaptability.

**Keywords:** Support Vector Machine (SVM), K-nearest neighbor (KNN), Coronary Heart Diseases (CHD), Cardio Vascular Diseases (CVD), Multi-layered perceptron (MLP),

### 1. INTRODUCTION

Heart diseases is considered to be the greatest problem of mortality for the last few years.

But due to the advancement in technology and Artificial intelligence in the field of health care, different software's are developed to help health workers in making decisions as well as prediction on heart diseases at the initial stages itself. Heart diseases prediction model can help medical professional in predicting heart diseases status, grounded on the clinical data of the patients. For this, data mining with intelligence algorithm is used to handle the problem of prediction in medical data sets consisting of multiple inputs.

According to the research analysis[1], heart diseases are one of the major reason of deaths. The survival of human being is totally dependent on how healthy the human heart works, which is used for supplying the blood to the entire human body. Any problems to the heart will create problems to other parts of the body mainly brain, kidney, lungs etc. When it comes to risk factors of heart diseases, there exist several factors, mainly the fluctuating blood pressure, alcohol consumption, obesity, lack of exercise and smoking

According to World Health Organization (WHO), 17.5 million death occurred universally during the year 2012 and they are predicting that by 2030, it may rise up to 23.6 million. Since the mortality rate in India and other countries is mainly due to heart problems, this points to the important need to check the organ periodically for the well-being of the human beings. Heart diseases is a chronic non-Communicable disease and any major heart problems lead to blockage in the arteries.

Heart diseases has both socio economical and health impacts. Long term treatments may have financial impact on middle class and low income families. In rural areas, where the medical and health care sector is not advanced, detection of diseases would be late, which in turn results the death of the patients, leading the reduced expectancy of life in the country.

There are basically three types of diseases prevention. The primary prevention refers to the care taken by an individual at the basic level to prevent any diseases. This is done by healthy life style such as diet, exercise and low salt intake. Secondary prevention mainly aims at early diagnosis and prediction of the diseases prior to any critical damage. Tertiary prevention is used for long term effect by increasing the life expectancy and quality of life through medical intervention.

The secondary prevention of heart diseases include prediction and prevention of heart diseases. Main step of secondary prevention is early prediction of the diseases which will allow the cardiologist and medical practitioner to provide adequate care for the patients. Main importance of secondary prevention above tertiary prevention is the cost factor. Cost of secondary prediction is very less compared to tertiary prevention of heart diseases. Tertiary prevention involves lots of major medical procedure whereas secondary prevention involves awareness.

As explained in the earlier section, a study on classification of diseases is examined since it has the better prospective for the betterment of human health and further diagnosis. This research paper compares six accepted classifiers used for heart diseases predictions. The algorithms used are Random Forest, Singular Vector Machine, Decision tree, K-Neighbor, Ada Boost Classifier and Multilayer Perceptron.

The main purpose of this investigation is to predict the risk of heart diseases for everybody without the need of ECG or visiting hospital for medication or diagnosis. This study mainly aims at early prediction of heart diseases so that necessary precaution and prevention can be done at the initial stages itself. However, this study is mainly applicable for an initial diagnosis.

## 2.Data Set Description And Analysis

The health care industry consist of large amount of data sets which needs to be processed as well as the data can be utilized to find different patterns which helps to do the prediction of heart related problems at the initial stage. Here we have collected primary data from a survey from different parts of maharashtra,India and find out the correlation among the different risk factors

We have collected the primary data sets from different parts of Maharashtra, India

The Input variables taken during this study is as follows

Table 1.1 Data details

Sr.No	Variables	Description	Value
1	Age	Age(years)	Numeric
2	Height	Height in cms	Numeric
3	Weight	weight in cms	Numeric
4	Gender		1.Female
			2.Male
			3.Others
5	Demographic Location		1.Urban 2 Rrtal
6	Smoke		1.No Smoke
			2.Occasionally
			3.Chain Smoker
7	Alcohol		1.No 2.Ocasionally 3.Daily
8	Cholesterol		1.No 2.yes
9	Diabetics		1.No 2.Yes
10	Blood Pressure		1.No 2.Yes
11	Obesity		1.No
			2.yes
12	Physical Exercises		1.No 2.Ocasionally 3.Daily
13	Sleep duration		1.Less than 8 hrs
			2.8 hrs

We have chosen the input and output variables by consulting with a medical doctor. These input variables were considered based on various correlation and reason of heart diseases.

## 3.MATERIALS AND METHODS

Objective of this paper is to diagnosis and analyses the possibility of heart diseases on the basis of age, alcohol consumption, smoking etc.

- 1.To understand the possibility of getting heart diseases due to stress, alcohol consumption etc.
- 2.To study the relation of healthy life on healthy heart

Research design is exploratory and descriptive in nature. This research paper had conduct an online survey using questionnaire from the public from different demographical regions of Maharashtra.

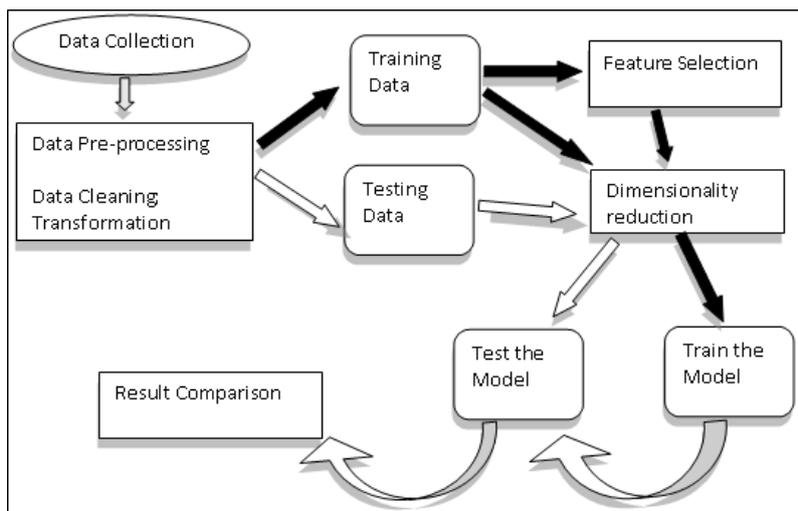


Figure 1-Data Analysis Framework

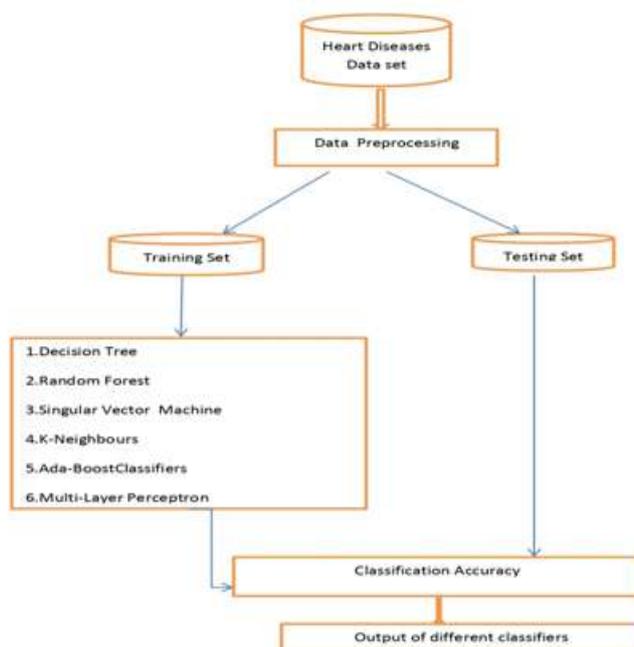


Figure 2. Conceptual Framework

### 3.1. Decision Tree

Decision Tree executes in making decisions under many circumstances and increases communication. It helps data analyst and scientist to abstract the idea that how different decisions can be taken in different situations. Decision trees take an optimal decision. Decision trees are mainly used for data exploration and make many assumptions but they also have many limitations on the linearity of data. Another major decision is mainly based on exceptions which may lead to bad decision making. Decision trees are also widely used in data science.

Timestamp	Email Add	I have rea	Education	Age	Target	Predicted	
1	11/15/202	sahilambh	yes	graduate	19-20	1	yes
2	12/11/202	rsbelar58	No	Bsc IT	20 to 2	2	no
3	11/11/202	pramodz@	yes	Bachelor	30 to 4	3	no
4	12/8/2020	nkhan251	yes	MCA	20 to 2	4	no
5	12/8/2020	smore619	yes	12 pass	18	5	yes
6	12/10/202	pranatali	yes	SY	20 to 2	6	no
7	11/13/202	aravinda	yes	BSCIT	20 to 2	7	no
8	12/8/2020	subraman	yes	Bsc IT	20 to 2	8	no
9	12/8/2020	superfran	yes	Bsc IT	20 to 2	9	no
10	11/20/202	dilpk162	yes	Bsc it	20 to 2	10	no
11	12/8/2020	rutujacho	yes	SY BSC I	19-20	11	no
12	12/7/2020	nagmasha	yes	MSc IT part	20 to 2	12	no
13	11/12/202	skumar_n	yes	PG	30 to 4	13	no
14	12/10/202	dimplepat	yes	12th com	18	14	no
15	11/13/202	swetab22	yes	PhD schola	30 to 4	15	no
16						16	no

```
C:\Windows\system32\cmd.exe
D:\Classifier1>python -W ignore Classifier.py
Confusion Matrix
[[43  0]
 [ 1  5]]
DecisionTreeClassifier(max_depth=250) Accuracy: 0.980
```

### 3.2. Random Forest

Random Forest algorithm is based on ensemble tree-based learning algorithm. This random forest algorithm is the set of decision trees mainly from randomly selected subset of training set. This algorithm aggregates the different decision trees to decide the final class of the test object.

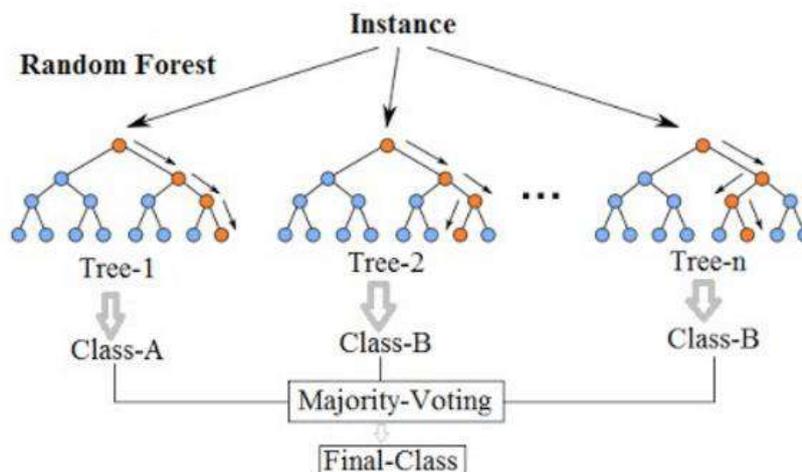


Figure 2 Structure of Random Forest Classification

### 3.3 Support vector machine(SVM)

This model is a supervised machine learning model that mainly uses classification algorithms. This classification algorithm is fast and a reliable classification algorithm that performs well with a constrained amount of data to do analysis.

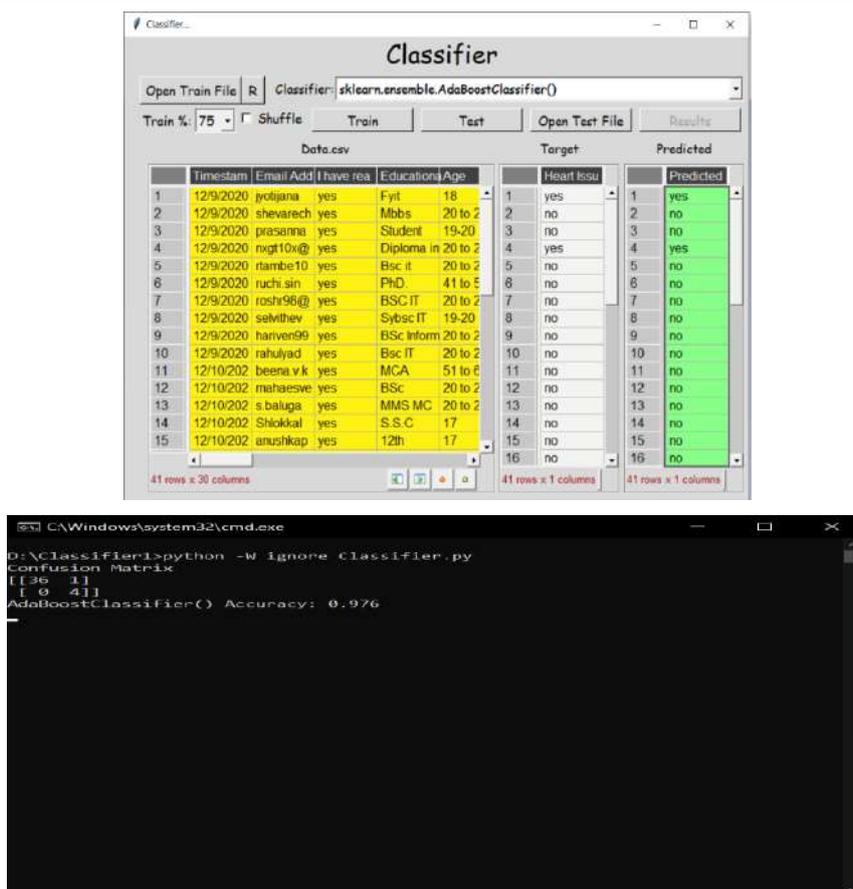
### 3.4. k- nearest neighbour

k-nearest neighbour is one of the simplest machine learning algorithm related to supervised learning method. This machine learning algorithm predicts the similarity between data and the existing cases and then the new data is put into most suitable similar categories. With the help of KNN algorithm, new data can be classified into suitable category. With the help of this algorithm, we can use both classification as well as regression but it is most commonly used for classification problems. KNN algorithm is also known as lazy learner algorithm because this algorithm does not learn from a training data set instead it stores data set and when at the time of classification, this algorithm performs the required action on the data sets.

### 3.5 Ada Boost algorithm

This algorithm is also known as Adaptive Boosting is mainly used in ensemble methods in machine learning. It is called as Adaptive because the weight are reassigned to each instance with a higher weights to incorrectly classified instance.

Initially, when it comes to the working of boosting algorithm, it makes  $n$  number of decision trees during the training period of data. In this case the first decision tree/model is created, the data which is wrongly classified in the initial model is given most priority and these records are taken as input for the second model. This process will continue until user specify the number of learners which need to be create. The repetition of records is sanctioned with all boosting techniques.



When we are using random forest, this algorithm makes  $n$  number of trees. This algorithm develops a consistent trees that contain a start node with several leaves nodes. In this case, some trees are bigger than rest, but in this case there is no fixed depth in a random forest. But with Ada boost, that's not the case. In Ada Boost, the algorithm only makes a node with two leaves, and this is known as Stump.

### 3.6 Multi-layered Perceptron (MLP)

This algorithm is one of the most commonly used neural network models in the field of deep learning. This algorithm can be used for different diversity of tasks, especially image identification, stock prediction, election voting predictions and spam detection. This algorithm mainly contains interconnected *neurons* exchanging information to one another, similar to like the human brain. Each neuron is assigned a value.

## 5 RESULTS AND DISCUSSIONS

In this section, the classification accuracy of models is assessed

**Table 2:** Comparative analysis and accuracy of 6 models

Models	Accuracy
Decision tree	98.0%
Random Forest	91.8%
Support Vector Machine(SVM)	85.7%
K-Neighbour	81.6%
Ada-Boost Classifier	97.6%
MultiLayer Perceptron	87.8%

Table 2 displays the results of comparison accuracy of six models. The top accuracy are Decision Tree and Ada Boost Classifier with accuracy percentage of 98.0% and 97.6%.

## 6. CONCLUSION

This research paper proposed the comparison of different classifiers and their accuracy by using the diseases classifiers and real time data sets. In this research paper, the dataset used is collected from different parts of Maharashtra, Mumbai. We have used six classification models for evaluating the risk and to use for prediction model. These models consist of Decision Tree, Random Forest, Singular Vector Machine, K-Neighbour, Ada

Boost Classifier and Multi layered Perceptron. To calculate the robustness of each model, accuracy were calculated and compared with each other. The top accuracy are Decision Tree and Ada Boost Classifier with accuracy percentage of 98.0% and 97.6%. Hence Decision tree algorithm was selected as the best model for heart diseases risk prediction

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## Development of Facial Expression Database and to Study Facial Features for Recognition of Human Emotion

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### ABSTRACT

Emotion Recognition is the recent research domain growing very fast in Human Computer Interaction (HCI) field. Facial Emotion Recognition (FER) is an important in various applications such as robotics, medicine, and education. This paper objective is to develop effective facial expression database and to study the facial features which plays an important role in emotion recognition. This paper also highlights the information of existing facial expression database. The features like eyes, eyebrow, nose and mouth are the basic features of face that can decide the exact emotion of human being. The variation in these parts is responsible to find emotion. The feature extraction techniques such as Discrete Cosine Transform (DCT), Fast Fourier Transform (FFT), and Active Appearance Model (AAM) are used to extract the useful characteristics for emotion recognition from facial expressions.

Keywords: Emotion Recognition, FER, Feature extraction, AAM

### 1. INTRODUCTION

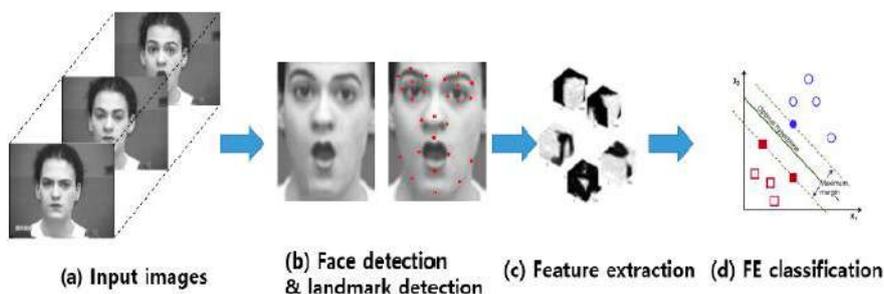
Human communication includes verbal and non-verbal communication. Facial expression and tone of the voice are used by the human to express their feelings and hence their emotions. The interaction between human and computer will be more natural if computers are able to understand the emotions of human being.

Automatic emotion recognition is very important area of research due to its application in various fields like robotics, health, medical, entertainment and education. It is very recent research topic in the Human Computer Interaction (HCI) field.

To make the human-computer interaction more natural, it would be beneficial to give same way as human does. Automatic Emotion Recognition (AER) can be achieved by using different approaches like by using facial expressions, tone of voice (speech), and body gestures of human being. While communicating only 7% effect of message is contributes by verbal part as a whole, 38% by vocal parts and 55% effect of facial expression [4].

In facial expression approach, the different features like eyes, eyebrow, nose and mouth are very important portions of facial region. These features are responsible to decide the exact human emotion by reading the muscles statutes like distance, stretchiness, or normal position of these portions. Various feature extraction techniques are used by researcher in the field of emotion recognition. The basic facial features like eyebrows, eyes, mouth and nose are extracted using facial geometry, edge projection analysis.

In general FER approach consists in three major steps as shown in the following figure. (1) Face and facial component detection, (2) feature extraction, and (3) expression classification [3]. First, a face image is detected from an input image, and facial components (e.g., eyes and nose) or landmarks are detected from the face region. Second, various spatial and temporal features are extracted from the facial components. Third, the pre-trained FE classifiers, such as support vector machine (SVM), Naïve Bayes Classifier, Hidden Markov Model and hybrid algorithms produce the recognition results using the extracted features.



( Fig.1 shows the process of Emotion Recognition )

The different techniques such as Principal Component analysis (PCA), PCA with SVD (Singular Value Decomposition), Radial Basis Function Network (RBFN) for classification and Fisher's Linear Discriminate (FLD) are used for feature extraction and classification. Also some researcher used AAM (Active Appearance Model) [5] method for feature extraction. Various feature extraction techniques such as Discrete Cosine Transform (DCT), Fast Fourier Transform (FFT) are used to extract the useful features for emotion recognition from facial expressions [6].

## 2. Feature Extraction From Facial Expression Image

The features such as eyes, eyebrow, nose and mouth are the principal components of face which are responsible to find human emotion. The variation in these parts or stretchiness of muscles may play vital role in recognizing emotion. Active Appearance Model (AAM) is a statistical model including two aspect: model building and fitting algorithm. In AAM, an object is described by a set of landmarks which indicate important positions at the boundary of the object. Landmarks are labelled manually on each object in the training data. A shape  $s$  is defined as coordinates of  $v$  vertices:

$$S = (x_1, y_1, \dots, x_i, y_i, \dots, x_v, y_v)$$

Where  $(x_i, y_i)$  is the coordinate of the  $i$ -th landmark in the object and  $v$  is the number of the landmarks in an image. Given a set of labelled shapes, we first align these shapes into unified framework by procreates analysis method. Then, PCA is applied to extract shape eigenvectors and a statistical shape model is constructed as

$$s = s_0 + \sum_{i=1}^n s_i p_i$$

Where  $s_0$  is the mean shape,  $s_i$  is the  $i$ -th shape eigenvector corresponding to the  $i$ -th eigenvalue computed by PCA, and  $p_i$  is the  $i$ -th shape parameter.

## 3. Formation of Feature Vector

Bounding box location of feature segments obtained in the previous step are used to calculate the height and width of left eyebrow, height and width of left eye, height and width of right eyebrow, height and width of right eye, height and width of nose and height and width of mouth. Distance between centre of left eye and eyebrow, right eye and eyebrow and mouth and nose is also calculated. thus in this proposed method 15 parameters are obtained and considered as feature vector. Thus

$$F_v = \{H_1, W_1, H_2, W_2, H_3, W_3, H_4, W_4, H_n, W_n, H_m, W_m, D_1, D_2, D_3\}$$

Where,

$H_1$ = height of left eyebrow

$H_2$ = height of left eye

$H_3$ =height of right eyebrow

$H_4$ =height of right eye

$W_1$ =width of left eyebrow

$W_2$ =width of left eye

$W_3$ =width of right eyebrow

$W_4$ =width of right eye

$H_n$ =height of nose

$W_n$ =width of nose

$H_m$ =height of mouth

$W_m$ =width of mouth

$D_1$ =distance between centre of left eyebrow and left eye

$D_2$ =distance between centre of right eyebrow and right eye

$D_3$ =distance between centre of nose and mouth

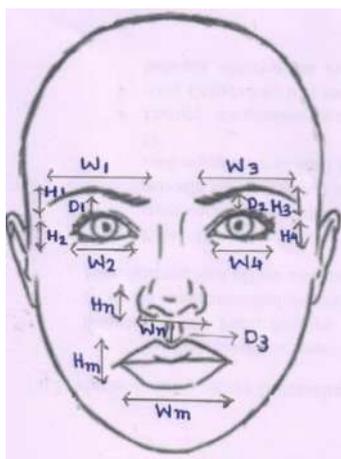


Fig.2 Facial feature points

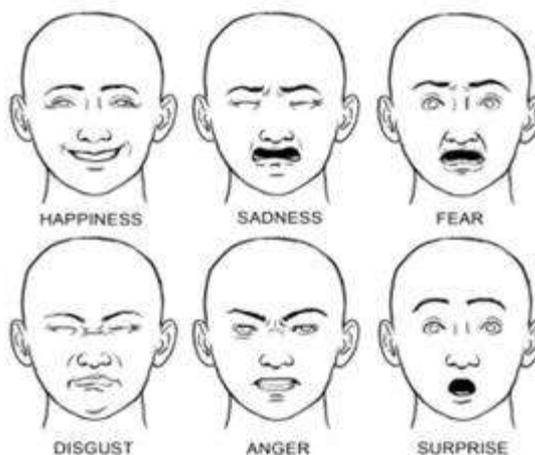


Fig.3 Feature points for different emotion

### FEATURE DISTANCES

As per the feature points extracted from the face region, fifteen distances can be obtained by Euclidean distances between these points. In figure total fifteen feature distances are shown. The feature distances are normalized with the distance between the innermost corners of the two eyes. This is based on an observation that the innermost corners of the two eyes are fixed for individuals. The normalized distance is obtained by scaling the distance  $n$ :

$$X_{nor}^{exp} = \frac{X^{exp}}{n}, \quad X \in \{a, b, \dots, l\} \quad \dots(1)$$

Where  $n$  denotes the distance between the innermost corners of the two eyes;  $X_{nor}^{exp}$  are normalized distances; and  $X$  denotes the feature distances  $a, b, \dots, l$ . The superscript  $exp$  stands for different expressions (happy, surprise, sad, angry). For example  $a^{happy}$  denotes the feature distance  $a$  of expression "happy". The natural feature distance (without mood induction event) is the base in comparing different emotions. The natural feature distance is normalized by:

$$X_{nor}^{unexp} = \frac{X^{unexp}}{n}, \quad X \in \{a, b, \dots, l\} \quad \dots(2)$$

Where  $X^{unexp}$  denotes the feature distances ( $a, b, \dots, l$ ) of natural facial expression.

Facial Feature Vector: After obtained the normalized expressional and natural feature distances, we can define the individual feature offset as

$$off_x = X_{nor}^{exp} - X_{nor}^{unexp}, \quad X \in \{a, b, \dots, l\} \quad \dots(3)$$

with Equation(3), the feature offset vector is arranged by:

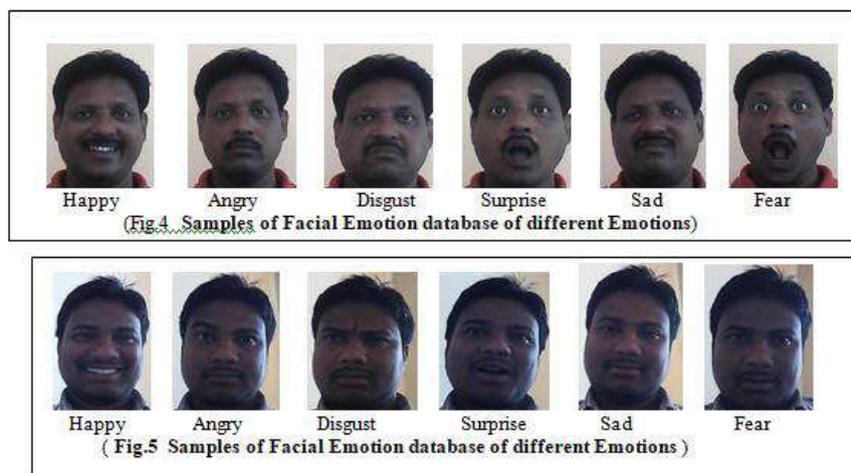
$$F = [off_a, off_b, \dots, off_l]^T \quad \dots(4)$$

Where  $off_i$  denotes the  $i$ -th feature offset between the normalized expressional and natural feature distances.

### 4. Development of Facial expression Database

Similarly the proposed work needs to develop Facial database for emotion recognition. As per proposed work, we have captured frontal pose of nine students and me also. We have developed our own facial expression database of me and the students who are studding at Post Graduate in M.Sc. computer science. All these images captured by Web cam iball c8.0 face2face this device. The device contains the features like High quality CMOS sensor, 480k pixels(interpolated 8M still image resolution, high quality 5g wide angle lens for sharp and clear picture, snapshot button for still image capture, 4X Digital Zoom & Auto Face Tracking having with this web cam device. The images are captured in normal lightening room.

The facial images are captured of various emotional actions from these expresser student. The sample images are shown in fig.4 and fig 5.



This database is developed in the laboratories of Solapur University, Solapur. For total 10 students we have captured their facial expression photo. We have covered all seven basic emotions of human being in this database. Some properties of this database are summarized below:

**Table 1:** Properties of Local Facial Expression Database

Properties	Descriptions
Number of Subjects	10
Number of Images	70
Static/Videos	Static
Single/Multiple faces	Single
Gray/color	color
Resolution	250*300
Face pose	Frontal-view
Facial expression	7 facial expressions : neutral, sad, surprise, happy, fear, anger and disgust

## 5. Conclusion and future work

This newly developed facial expression database is very useful in Emotion Recognition System. Due to its applications in various fields like Education, Entertainment, Medicine, Gaming etc. Researcher can use this facial expression database in different application as per their requirement. Also in this paper some feature extraction techniques are discussed that are beneficial for researcher those who are interested in doing their research in this domain.

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## Cyber Profiling Based on Search Queries for Solving Crime

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### ABSTRACT

Cyber Behavior Profiling is the determination of user behavior on the basis of the keywords entered in the search engine. Users are often tracked online using various techniques. Many of those are used by online advertisers as well as by e-commerce websites for marketing their products. The tracking information is used for creating a user profile that has detailed information about specifics related to the user like location, timestamp, search terms, browser used, machine's identification, user identification, etc. There is a lot of ongoing research for online identification of users based on their internet usage. This paper aims to propose a methodology for using these techniques to generate a user cyber profile for solving crime. This paper is based on purely dummy data. We have taken five crimes and corresponding list of hypothetical keywords associated with them. We have demonstrated how the frequency of keywords can help us determine crime. We can use these indicators to compare user online behavior and flag online criminals and predators.

**Keywords:** user profile, crime detection, internet use, search engine, personalization of services

### INTRODUCTION

The internet has now become an indispensable part of everyone's lives. The internet contains a humongous amount of information which is readily available for consumption. It gives us opportunities to read, interact and contribute to information online. People use the internet to find information about the topics of their interest. A user's web history is a treasure trove of information about the user's choices and preferences. An individual's personality can be easily gauged by looking at their browser history. The anonymity provided by the internet allows human beings to bring out their true self. As the user interacts with the internet they leave a trail behind which can be used for identifying a user. This study aims at using these attributes for generating a user's profile. This user profile can help us detect crime online. Search engines are everyone's go-to tool for finding information online.

The queries we use in a search engine can help us identify the topics of interest to the user. A recent news article in the Indian Express dated 08 November 2019 about a suicide by hanging case disclosed the contents of the victim's phone. As per the article, "A day before her death, the victim had searched for the nearest police station and on the day of committing suicide she had looked for "types of knots in surgery" and "scouts"". This incidence highlights how the user search history is closely knit to the mindset of the user.

### LITERATURE REVIEW

User portrait technology for rapid detection of users with abnormal behavior was proposed by (Xu,2021) to find network criminal. They constructed a method to tag users based on their network behavior similar to the Anomaly Detection method of Intrusion Detection Systems. When a crime occurred the tag values in all user portraits are analyzed using the Naive Bayesian method to match each user portrait to determine the most likely network criminal suspects. The accuracy rate of using this method for fast detection of network crimes is 95.9%. However, this method is useful only for specific network users. Also, determining anomalous behavior is much easier based on a set of rules.

The importance of the criminal profiling is highlighted by (Asli et al, 2019) which explores the application of MLA to find the crime pattern. It uses attributes related to crime like date, time, and location of the crime. The study reveals that crime location and time are the most important profiling variables in criminological based analysis. This can help us in reducing the false positives usually associated with profiling.

The occurrence of cybercrimes with respect to attributes like the location of computer access along with various crimes can be used to determine the cyber criminal. (K.Veena, 2018)

An Internet user can be traced using various techniques. Each technique can reveal some aspect about the user. The ip address associated with the query can be used to determine the location of the user. This can give us almost accurate results except in cases where the user is using proxy-chaining or an advanced anonymizer. The user history or trail has been extensively researched for marketing or web personalization. The trail left by the user can help us determine the location of the user, user identity, gender in some cases, timestamp, language, etc. A user query entered in a search engine can be used to find information related to the topic of interest of the user. The terms used in the query can also help determine the location of the user. However, the user location

can be somewhat accurately determined using the ip address of the user. A user can be identified on the internet by means of the ip address and the browser used.

Every browser has a particular fingerprint which can help us determine the browser used for firing the query. A user who has signed into an account becomes much visible and easier to trace because of the verification involved in the creation of an account. However, the challenge lies in detecting users who have not signed into any account and are somewhat anonymous online.

If multiple people are using a computer, a cookie on a user's computer uniquely identifies all the users who are using the device. In recent times, browsers have an option of disabling cookies. However, there is a new form of cookie called the Supercookie or Evercookie which cannot be destroyed and is used successfully to log user activities (Claude, 2012).

It cannot be easily detected so it can store information related to activities performed online. Jansen et al., 2009 have conducted research related to creating profile from log data of search queries. These logs are found at the Server side. They listed various fields found in a transaction log and explained in detail how those fields helped in identifying various aspects related to an individual user.

The results of the research helped identify the topical interest of the user using various clustering techniques. Jansen, Booth and Spink (2008) have found a classification of user's interest into 3 broad categories. They developed an application was 74% accurate in classifying users intent on the basis of the web query.

Jansen (2009) has used k-mean clustering in addition to the above clustering to group similar queries into more granular sets of user intent with a success rate of 94%. Jansen (2009) had proposed a two level framework for user profiling. The internal level helped in determining the demographic profile of the user whereas the external level helped in identifying the behavior or interest of the user.

Ontology is the existence of a concept and its relation with other concepts. Sieg et al. (2007) have devised an approach of creating Ontological profiles for personalizing Web Search. An ontological profile of an online user is created using already documented or tested attributes of a particular type of user. This profile is further refined by observing the current behavior of a user. Ontological profiles are used for web personalization. These are specifically useful when we do not have any knowledge about the users for creating their profile. It can be considered as a skeleton profile used for Web search personalization.

A research article by Gill et al (2017) discusses a study conducted on 223 convicts in UK to understand the role of Internet in the commission of their crimes. The findings of the study state that young people are more inclined to use Internet for criminal activities as compared to older ones. The internet can be used for finding information about the ways in which a crime can be committed, the procurement of arms, planning the attack, reconnaissance of the area and the ways to escape. Gill, Horgan and Decker (2014) measured the degree to which individual criminals used internet for crime. A study found that 35% of individuals used the internet for communicating with like minded ideologists and 46% learned the various aspects of their attack method using the internet.

Gill et al (2017) used the bivariate technique to determine the use of internet to carry out a crime. The findings prove that the internet is definitely used by criminals for learning about techniques to carry out an attack, to find and collaborate with co-ideologues and to spread information. Another study on Profiling online sex-offenders and pedophiles (Young, 2005) highlights the use of internet for finding victims or co-ideologues. These predators usually visit chatrooms like "Daady4daughter", "Incest Room", "Men for barely legal girls" to connect to their co- ideologues. The offenders play out their fantasies on the Internet. They try to find their victims by visiting pages or chatrooms meant for teenagers. They might create a fake profile to connect to their victims and gain their trust. This connect can further be explored from the virtual world to the real world.

## **METHODOLOGY**

The behavior of a user with respect to a specific crime is postulated by means of certain words associated with the crime. These words help us in creating the ontological profile of a Criminal. The queries entered by the user are captured. The words within the query are analyzed by simple word count programs to count their number of occurrences. The frequency of a particular word helps in determining the intent of the user. The words are also analyzed as group of two or three frequently occurring words. These values can be compared with predetermined set of keywords defining the profile of a criminal. The word frequency is represented using a wordcloud as well as a chart. The Wordcloud is a representation of the frequency of the occurrence of words. We have considered five crimes viz. Pedophiles, Bank Robbers, Suicide, Kidnapper and Bomber. We have





unnecessary articles/words. The tables given below list down the frequency of words in a user search query for every crime. This frequency is calculated in terms of a single word, two word phrase and three word phrase. The frequencies of words as a phrase or a group of two/three words can help improve the accuracy of the research. The frequency of occurrence of a specific keyword will be used to update the ontological profile of a user. This profile can be compared with an established criminal profile. Thus, we can further study this as a viable option for crime detection using user online behavior.

### **DISCUSSION AND IMPLICATION**

The case studies discussed in the previous section as well as the methodology proposed in the previous section can be used for detecting crime. Hence, I propose the following steps for investigating crime using user behavior profile. We can devise a methodology where we can investigate a crime by looking at the criminals internet usage. We start by creating a generic ontological criminal profile specific to a crime. These profiles can be created by studying/meeting criminals who have committed that particular type of crime or a criminal psychologist. The user profiles are updated based on the user activity. These profiles are compared to criminal profiles. If profiles match we can use the techniques mentioned to identify the user. The above process can be used to detect and prevent a crime beforehand or to investigate a crime that has happened. Detecting a crime before it has happened means monitoring the user activity online which might invite law suites regarding online user privacy. However, if used judiciously, this can become an effective method for investigating a crime with all legal documents in place.

### **RESEARCH CHALLENGES**

There is a high chance of detecting false positive with respect to people who are medical students or professionals. However, the detection can be improvised by looking at the other attributes of the user which can help us determine their profession. The criminal profile creation can be a challenge because not all criminals are internet users. The construction of profiles for all crimes would take some time so we need to consider one crime at a time. This paper has a lot of scope for improvement with respect to the analysis of text. The comparison between both the profiles is to done accurately. The criminal profile is to be created after meeting criminals or criminal psychologists. Also, the analysis of text and the updation of user ontological profile is yet to be streamlined. This paper works on purely dummy data and aims to propose an outline for crime detection using user search history.

### **CONCLUSION**

User behavior profiling can indeed be used for crime detection. The success of the project depends on the accuracy of the criminal ontological profile. The frequency of certain occurring keywords can help create the user profile. We need to carefully determine the markers to reduce false positives. With the latest advent of technology we might find much better ways to determine the actual identity of the user.

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**Crime: Pedophile**

Number of characters (including spaces):	453
Number of characters (without spaces):	341
Number of words:	74
Number of sentences:	1
Number of syllables:	118

Some top phrases containing 2 words (without punctuation marks)	Occurrences
no clothes	3
porn movie	2
nude girl	2
naked girl	2
girl child	2
boy photo	2
photo nude	2
sex with	2
girl photo	2
naked boy	2
nude boy	2

**Unfiltered word count**

Order	Unfiltered word count	Occurrences	Percentage
1.	girl	10	13.5135
2.	boy	8	10.8108
3.	porn	5	6.7568
4.	photo	5	6.7568
5.	nude	5	6.7568
6.	naked	5	6.7568
7.	child	4	5.4054
8.	no	3	4.0541
9.	clothes	3	4.0541

10.	movie	2	2.7027
11.	teen	2	2.7027
12.	breast	2	2.7027
13.	with	2	2.7027
14.	sex	2	2.7027
15.	baby	1	1.3514
16.	bare	1	1.3514
17.	video	1	1.3514
18.	body	1	1.3514
19.	kids	1	1.3514
20.	boob	1	1.3514
21.	children	1	1.3514
22.	butt	1	1.3514
23.	sedative	1	1.3514
24.	image	1	1.3514
25.	exposed	1	1.3514
26.	kiddy	1	1.3514
27.	genital	1	1.3514
28.	teenager	1	1.3514
29.	unclothed	1	1.3514
30.	anesthesia	1	1.3514

Table 1: Word Occurrence-Pedophile

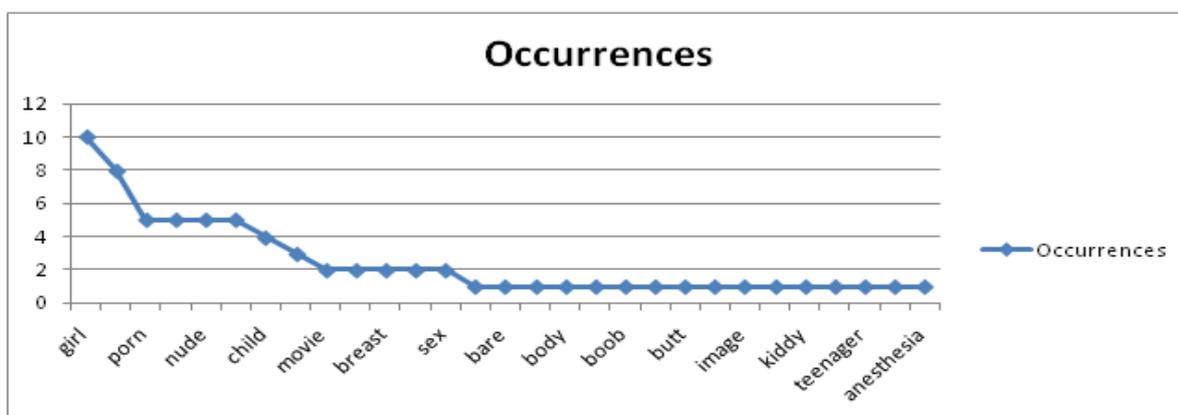


Chart1: Word Occurrence Chart-Pedophile

**Crime: Kidnapping**

Number of characters (including spaces):	646
Number of characters (without spaces):	503
Number of words:	92
Number of sentences:	1
Number of syllables:	166

Some top phrases containing 2 words (without punctuation marks)	Occurrences
how to	3
for ransom	3

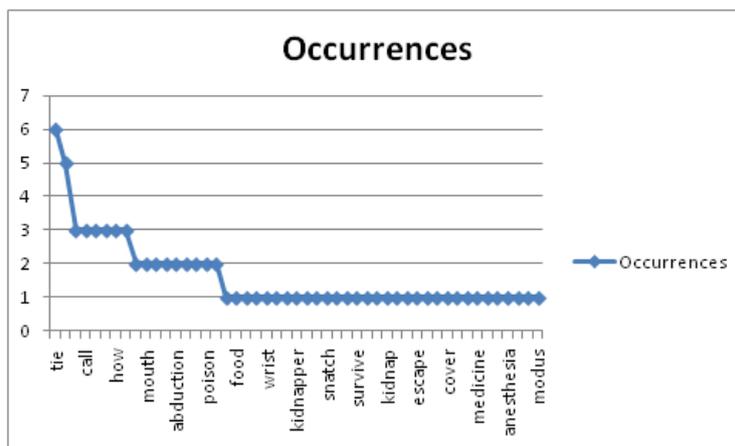
poison buy	2
for kidnapping	2
anonymous call	2

**Unfiltered word count:**

Order	Unfiltered word count	Occurrences	Percentage
1.	tie	6	6.5217
2.	ransom	5	5.4348
3.	for	5	5.4348
4.	to	3	3.2609
5.	kidnapping	3	3.2609
6.	call	3	3.2609
7.	buy	3	3.2609
8.	get	3	3.2609
9.	gun	3	3.2609
10.	how	3	3.2609
11.	anonymous	3	3.2609
12.	weapon	2	2.1739
13.	mouth	2	2.1739
14.	hostages	2	2.1739
15.	hostage	2	2.1739
16.	abduction	2	2.1739
17.	hide	2	2.1739
18.	ask	2	2.1739
19.	poison	2	2.1739
20.	abduct	2	2.1739
21.	blindfold	1	1.0870
22.	food	1	1.0870
23.	kill	1	1.0870
24.	without	1	1.0870
25.	wrist	1	1.0870
26.	fugitive	1	1.0870
27.	sedative	1	1.0870
28.	kidnapper	1	1.0870
29.	punishment	1	1.0870
30.	strangulate	1	1.0870
31.	snatch	1	1.0870
32.	plan	1	1.0870
33.	legs	1	1.0870
34.	survive	1	1.0870
35.	transport	1	1.0870
36.	basement	1	1.0870

37.	kidnap	1	1.0870
38.	sleep	1	1.0870
39.	strangulation	1	1.0870
40.	escape	1	1.0870
41.	duct	1	1.0870
42.	hands	1	1.0870
43.	cover	1	1.0870
44.	extort	1	1.0870
45.	knots	1	1.0870
46.	medicine	1	1.0870
47.	nab	1	1.0870
48.	mastermind	1	1.0870
49.	anesthesia	1	1.0870
50.	child	1	1.0870
51.	operands	1	1.0870
52.	modus	1	1.0870

**Table 2:** Word Occurrence-Kidnapping



**Chart 2 -** Word Occurrence Chart-Kidnapping

**Crime: Suicide**

Number of characters (including spaces):	587
Number of characters (without spaces):	466
Number of words:	92
Number of sentences:	2
Number of syllables:	142

Some top phrases containing 3 words (without punctuation marks)	Occurrences
death after poison	2
Some top phrases containing 2 words (without punctuation marks)	Occurrences
death after	4
how to	2
death under	2
painless death	2
after poison	2

for hanging	2
to die	2

**Unfiltered word count:**

Order	Unfiltered word count	Occurrences	Percentage
1.	death	10	10.8696
2.	poison	7	7.6087
3.	to	5	5.4348
4.	after	4	4.3478
5.	hanging	3	3.2609
6.	types	3	3.2609
7.	by	2	2.1739
8.	of	2	2.1739
9.	under	2	2.1739
10.	wrist	2	2.1739
11.	easy	2	2.1739
12.	cut	2	2.1739
13.	die	2	2.1739
14.	knots	2	2.1739
15.	for	2	2.1739
16.	how	2	2.1739
17.	painless	2	2.1739
18.	burning	2	2.1739
19.	is	1	1.0870
20.	on	1	1.0870
21.	from	1	1.0870
22.	kill	1	1.0870
23.	noose	1	1.0870
24.	suicide	1	1.0870
25.	time	1	1.0870
26.	police	1	1.0870
27.	wounds	1	1.0870
28.	oneself	1	1.0870
29.	inflicted	1	1.0870
30.	drugstore	1	1.0870
31.	cutting	1	1.0870
32.	sleeping	1	1.0870
33.	overdose	1	1.0870
34.	pharmacy	1	1.0870
35.	gunshot	1	1.0870
36.	painful	1	1.0870
37.	yourself	1	1.0870
38.	kitchen	1	1.0870
39.	make	1	1.0870

40.	nearest	1	1.0870
41.	bus	1	1.0870
42.	neck	1	1.0870
43.	station	1	1.0870
44.	gun	1	1.0870
45.	ways	1	1.0870
46.	bleed	1	1.0870
47.	medicine	1	1.0870
48.	pills	1	1.0870
49.	otc	1	1.0870
50.	terrace	1	1.0870
51.	self	1	1.0870
52.	killing	1	1.0870
53.	train	1	1.0870
54.	falling	1	1.0870

Table 3: Word Occurrence-Suicide

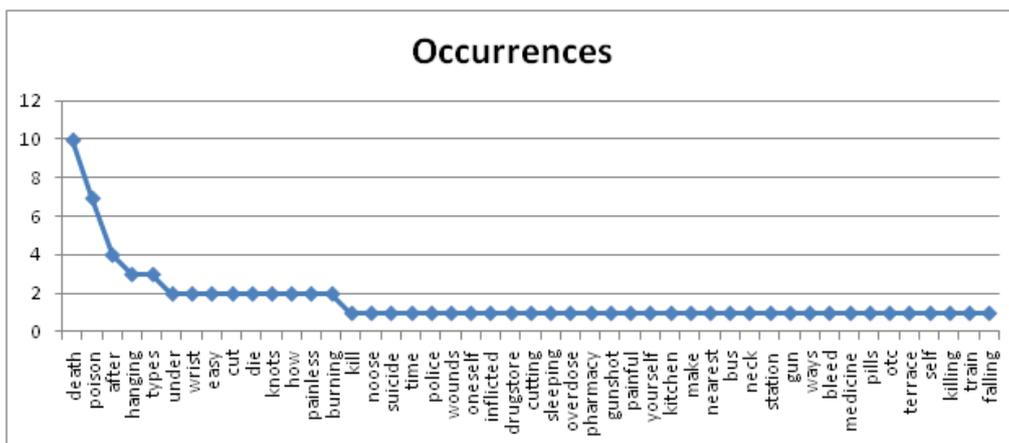


Chart 3: Word Occurrence-Suicide

**Crime: Bombing**

Number of characters (including spaces):	310
Number of characters (without spaces):	245
Number of words:	54
Number of sentences:	1
Number of syllables:	77

Some top phrases containing 2 words (without punctuation marks)	Occurrences
bomb ingredients	3
how to	2
bomb bomb	2
easy bomb	2
suicide bombers	2

**Unfiltered word count:**

Order	Unfiltered word count	Occurrences	Percentage
1.	bomb	12	22.2222

2.	how	5	9.2593
3.	to	4	7.4074
4.	ingredients	3	5.5556
5.	suicide	2	3.7037
6.	bombers	2	3.7037
7.	easy	2	3.7037
8.	die	2	3.7037
9.	a	1	1.8519
10.	timer	1	1.8519
11.	do	1	1.8519
12.	of	1	1.8519
13.	from	1	1.8519
14.	bombing	1	1.8519
15.	stand	1	1.8519
16.	hide	1	1.8519
17.	making	1	1.8519
18.	because	1	1.8519
19.	after	1	1.8519
20.	make	1	1.8519
21.	many	1	1.8519
22.	killings	1	1.8519
23.	escape	1	1.8519
24.	buy	1	1.8519
25.	diy	1	1.8519
26.	far	1	1.8519
27.	videos	1	1.8519
28.	rdx	1	1.8519
29.	where	1	1.8519
30.	people	1	1.8519

**Table 4:** Word Occurrence-Bombing

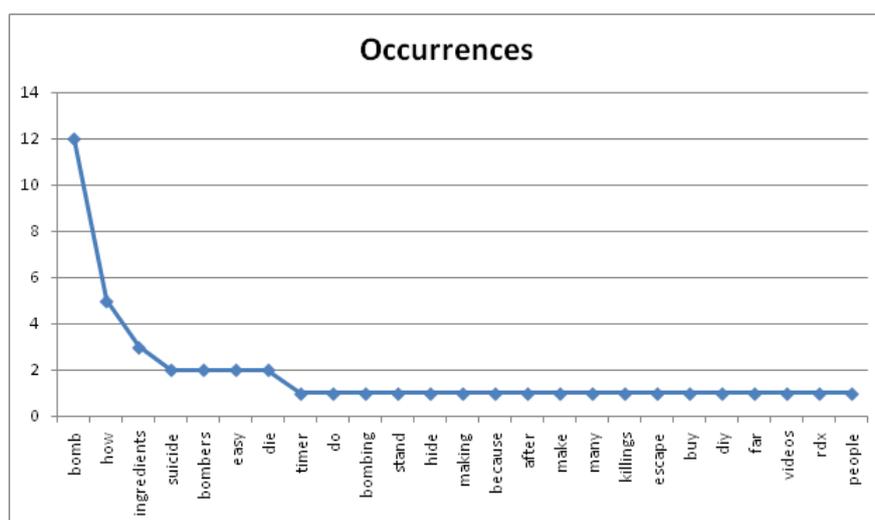


Chart 4: Word Occurrence-Bombing

Crime- Bank Robbery/Fraud

Number of characters (including spaces):	677
Number of characters (without spaces):	531
Number of words:	120
Number of sentences:	1
Number of syllables:	182

Some top phrases containing 4 words (without punctuation marks)	Occurrences
a bank how to	2
fake currency how to	2
Some top phrases containing 3 words (without punctuation marks)	Occurrences
how to hide	3
bank how to	2
fake currency how	2
currency how to	2
a bank how	2
Some top phrases containing 2 words (without punctuation marks)	Occurrences
how to	13
to hide	3
a bank	2
fake currency	2
currency how	2
bank how	2
is the	2

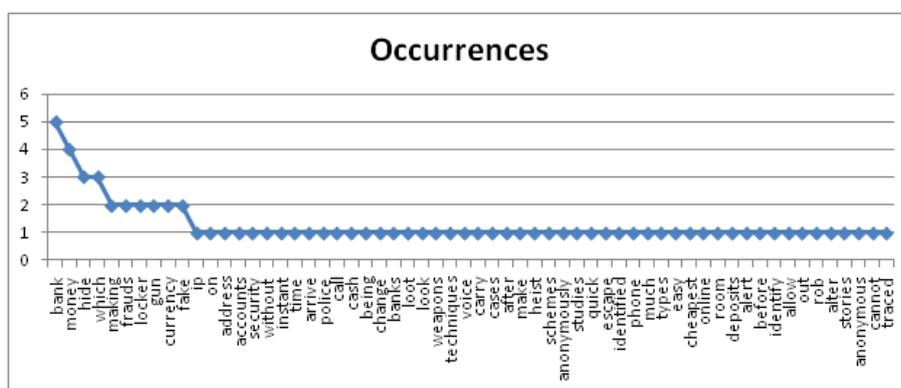
Unfiltered word count

Order	Unfiltered word count	Occurrences	Percentage
1.	how	14	11.6667
2.	to	13	10.8333
3.	bank	5	4.1667
4.	money	4	3.3333
5.	a	3	2.5000
6.	is	3	2.5000
7.	hide	3	2.5000
8.	which	3	2.5000
9.	your	2	1.6667
10.	making	2	1.6667
11.	frauds	2	1.6667
12.	locker	2	1.6667
13.	gun	2	1.6667
14.	the	2	1.6667
15.	currency	2	1.6667
16.	fake	2	1.6667

17.	be	1	0.8333
18.	in	1	0.8333
19.	ip	1	0.8333
20.	on	1	0.8333
21.	address	1	0.8333
22.	accounts	1	0.8333
23.	security	1	0.8333
24.	without	1	0.8333
25.	instant	1	0.8333
26.	time	1	0.8333
27.	arrive	1	0.8333
28.	police	1	0.8333
29.	call	1	0.8333
30.	cash	1	0.8333
31.	being	1	0.8333
32.	change	1	0.8333
33.	banks	1	0.8333
34.	loot	1	0.8333
35.	look	1	0.8333
36.	weapons	1	0.8333
37.	techniques	1	0.8333
38.	voice	1	0.8333
39.	carry	1	0.8333
40.	cases	1	0.8333
41.	after	1	0.8333
42.	make	1	0.8333
43.	heist	1	0.8333
44.	schemes	1	0.8333
45.	anonymously	1	0.8333
46.	studies	1	0.8333
47.	quick	1	0.8333
48.	escape	1	0.8333
49.	identified	1	0.8333
50.	phone	1	0.8333
51.	much	1	0.8333
52.	types	1	0.8333
53.	easy	1	0.8333
54.	cheapest	1	0.8333
55.	online	1	0.8333
56.	room	1	0.8333
57.	deposits	1	0.8333
58.	for	1	0.8333
59.	alert	1	0.8333

60.	get	1	0.8333
61.	before	1	0.8333
62.	identify	1	0.8333
63.	allow	1	0.8333
64.	what	1	0.8333
65.	out	1	0.8333
66.	rob	1	0.8333
67.	where	1	0.8333
68.	alter	1	0.8333
69.	stories	1	0.8333
70.	anonymous	1	0.8333
71.	cannot	1	0.8333
72.	traced	1	0.8333

**Table 5:** Word Occurrence-Bank Robbery/Fraud



**Chart 5:** Word Occurrence-Bank Robbery/Fraud

## Internet Addiction through Cellphone and its Effects on College Students during Covid-19

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### ABSTRACT

The internet itself is a neutral device originally designed to facilitate students' academic studies, performance and research. How some student has come to use this medium, however, has created a stir among the mental health community with a great discussion of internet overuse or addiction. The internet and mobile technology are increasingly important to the educational and social lives of college students and are becoming a part of students' identity. Especially during Covid-19, with the advent of broadband and mobile access to the internet giving college students access to the internet any place and at any time, thus entertainment, interaction and communication, there is a real risk that students can become so immersed in their online world that it can affect their academic studies and relationships with friends or family. The present descriptive study was undertaken to study internet addiction through cell phones and its effect on college students. Samples of 100 arts and science college students who are using the internet through cell phone during Covid-19 were selected for the study through a structured questionnaire using survey method in Ranipet District, Tamil Nadu in India.

**Keywords:** Internet addiction, College students, Cell phone, Academic studies and Covid-19.

### INTRODUCTION

This is the age of knowledge explosion where traditional methods of verbal instruction will not help to keep pace with the development of knowledge. We are on the threshold of a new information era, which is the mantra of today. Internet is the flower gifted by Information Technology (IT). It is the latest buzzword among computer users and users of information centres nowadays. Everyone, whether he is working in the field of IT or not, is eager to know about the internet and its uses. Internet is advancing so rapidly that it is affecting the lives of everyone. It can be said that we are living in the age of the internet. It has made an increasing and powerful impact upon almost every working place like home, school, college, office, industry, business, science, education, hospital, bank, railway, airway, airline traffic, research design, organization, society and so on. Almost all occupations and academic disciplines have been profoundly influenced by the use of the internet.

### Concepts Used In The Study

**Internet** – a global computer network providing a variety of information and communication facilities.

**Addiction** – is a treatable, chronic medical disease involving complex interactions among brain circuits, genetics, the environment, and an individual's life experiences.

**Cell Phone** – a phone with access to a cellular radio system so it can be used over a wide area, without a physical connection to a network, a mobile phone.

**College Students** – A Student enrolled in a college or university.

### INTERNET IN EDUCATION

Internet is an exciting innovation in the field of education. The following are the areas where the internet is being used effectively.

- ❖ Internet allocates learning resources to individuals and groups.
- ❖ Internet helps the students to collect related information from the outside world.
- ❖ The students can give the educational information with the help of e-mail on computer.
- ❖ The Internet provides direct interaction between students and the subject matter to be learned.
- ❖ Internet engages the students in tutorial interaction and dialogue
- ❖ the Internet provides easy access to files of information for reference and guidance.
- ❖ The Internet can be used as a supplement to traditional instruction methods,

- ❖ The Internet can be used to replace the traditional classroom situation.

#### **Benefits of Internet for Students**

- ❖ Students find it easier to refer to the internet than searching for knowledge and information in fat reference books. The process of learning has gone beyond learning from prescribed textbooks.
- ❖ Today students and teachers can fulfil their thirst for knowledge through the internet.
- ❖ The appropriate use of technology to support the learning process provides us with both challenges and opportunities, as we move into the next decade. When the expected reference is not available in a local library nowadays the students obtain much of the information from the World Wide Web(www.com)

#### **The Problem with Social Media**

The behavioural impact of smart phone social media use spans from obsessive behaviour (engaging in and checking smart phone apps until they no longer provide a rewarding dopamine hit) to behaviour addiction (compulsively seeking a dopamine hit via a reward provided by our phone). The average user in the US spends around five hours a day on functional smart phone activities such as texting, social media use, internet searchers, phone calls, half that time is spent on social media (including texting). Social media engagement, and constantly texting friends and family, may be more of a concern than the device, on which it is used, because it does lead to dopamine increases, and thus, pleasure or stress relief.

People are hard-wired to seek affirmation and acceptance in social settings. As adults, we know we can't socialise all the time because of other demands on our time. Yet, as young people, the social world is our priority, as it influences our identity development and our need to feel validated outside our tried and true friends and family. Those who have problems with prolonged use of smart phone functions such as social media, media streaming services, games and frequent texting, may fit the criteria of "problematic internet use".

#### **REVIEW OF LITERATURE**

To find out the researcher problems for the study, the researcher reviewed various articles collected from referred, blind-reviewed national and international journals and the same review was presented below.

**Louis Leung (2004)**<sup>1</sup> studied that the internet generation is the first generation to grow up surrounded by home computers, video games, and the internet. As children of the baby boomer, the internet is the medium of choice for the net-genes. Based on the assumption that net generations has unique characteristics, this study examined how net-genes addicted to the internet differ from the non-addicted and how these attributes, together with the seductive properties of the internet are related to internet addiction. **Lindsayh Shaw (2002)**<sup>2</sup> analysed that more people connect to the internet, researchers are beginning to examine the effects of internet use on users' psychological health. The study concluded that internet use is positively correlated with depression; loneliness and stress, public opinion about the internet have been decidedly negative. **Adriana Bianchi (2005)**<sup>3</sup> concluded that mobile phone use is banned or illegal under certain circumstances and in some jurisdictions. Nevertheless, some people still use their mobile phones despite recognized safety concerns, legislation, and informal bans. Drawing potential predictors from the addiction literature, this study sought to predict usage and specifically problematic mobile phone use from extraversion, self-esteem, neuroticism, gender and age. **Lauran Widyanto (2004)**<sup>4</sup> examined that there is growing concerned about excessive internet use and whether this can amount to an addiction. In researching this topic, a valid and reliable assessment instrument is essential. In her survey of internet addiction, young designed the Internet Addiction Test (IAT), which provides a basis for development. The IAT has high face validity, but it has not been subjected to systematic psychometric testing. This study sought to replicate and expand young's survey and to examine the IAT more systematically.

**According to Tessa Jones (2014)**<sup>5</sup> discussed that cell phone plays an essential role in communication throughout the world. The technological revolution that many Americans have experienced has drastically changed the way humans interact and communicate with one another. The author conducted field observations to examine Elon students' behaviour while walking around campus, along with an online survey. Findings suggest that students addicted an addiction to their cell phones per cent 64 per cent of students observed on campus interacting with their device one way or another. **Katherine Chak (2004)**<sup>6</sup> described that the new psychological disorder of internet addiction is fast accruing both popular and professional recognition. Past students have indicated that some patterns of internet use are associated with loneliness, shyness, anxiety, herself-consciousness, but there appears to be little consensus about internet addiction disorder. **Junghyun Kim (2009)**<sup>7</sup> concluded that the current research started from the assumption that one of the major motives driving individuals' internet use is to relieve psychosocial problems (example, loneliness and depression). This study showed that individuals who were lonely or did not have good social skills could develop strong

compulsive internet use behaviour resulting in negative life outcomes (examples, harming other significant activities such as work, school, college or significant relationships) instead of relieving their original problems. Such augmented negative outcomes were expected to isolate individuals from healthy social activities and lead them into more loneliness.

Another study conducted by **Emma I. Pelling and Katherine White (2009)**<sup>8</sup> studied that the increasing popularity of social networking websites (SNWs), very little is known about the psychosocial variables which predict people's use of these websites. The present study used an extended model of the theory of planned behaviour (TPB), including the additional variables of self-identity and belongingness to predict high-level SNW use internet and behaviour in a sample of young people aged between 17 and 24 years. **Louis Leung (2012)**<sup>9</sup> this study examines the interrelationships among internet literacy, internet addiction systems, internet activities and academic performance. Data were gathered from a probability sample of 100 students and adolescents using face to face interviews. Regression results show that adolescent internet addicts tended to be male, in low-income families and not confident in locating browsing and accessing information from multiple resources but, that they were technologically safe and frequent users of Social Networking Sites (SNS) and online games for leisure. **Andrew J (2006)**<sup>10</sup> analysed that the internet has often been argued to have adverse psychological consequences, such as depression or anxiety symptoms, among over users. The present study offers an alternative understanding suggesting the internet may be used as a forum for expanding social networks and consequently enhancing the chance of meaningful relationships, self-confidence, social abilities and social support.

**Kubey, Lavin and Barrows (2006)**<sup>11</sup> survey 576 students in Rutgers University. This survey included 43 multiple-choice items regarding internet usage, study habits, academic performance and personality. Internet dependency was measured with five-point Likert scale items. Dependents were four times more likely than non-dependents to report academic impairment due to their internet use. **Shapira, Lessig, Goldsmith Szabo, Lazohitz and Goldstein (2003)**<sup>12</sup> proposed a revised classification and diagnostic criteria for problematic internet use. Egger & Rautenberg framed a questionnaire for internet users to study emotions and experiences related to the internet. The questionnaires were resolved by 454 individuals: in that 70% of individuals were internet addicted. They felt they are drawn towards the internet. They felt stressed when they are restricted in the use of the internet. They felt frustrated and guilty.

### RESEARCH PROBLEM

Based on the review of literature, the problems identified for the study is that the student's grades from higher education institutions suffer more because of time spent on over usage of internet, students form a new non-academic relationship with fellow online users, which affects student's study habits, not submitting assignments on time, not attending class test and also it affects the academic performance of the students because of the internet addiction or overuse. The other problem associated with internet addiction is that, the student's fears that life without the internet would be boring, empty and joyless. Due to overuse of the internet student's sleep late due to late-night log in and it affects health-related issues like getting more stress, eye and neck problems. They also neglect household chores to spend more time online and choose to spend more time online over going out with family and others. Based on the above various problems, in India so far more studies were conducted on internet addiction, health issues due to overuse of the internet, internet for non-academic work and internet overuse by school children's only and so far no studies were conducted on the topic "Internet addiction through cell phone and its effects on college students during Covid-19", in Ranipet District, Tamil Nadu, so, the researcher wanted to study under the above topic to fill the research gap through objectives of the study.

### OBJECTIVES OF THE STUDY

1. To study the demographic profile of the respondents.
2. To know the reason for internet over usage through cell phones among college students.
3. To find out the internet addiction through cell phone and its effects on college students during Covid-19.

### RESEARCH METHODOLOGY

**Nature of study:** Descriptive research study.

**Sources of data:** Primary data was collected through a questionnaire using the survey method. Secondary data was collected through journals, magazines, working papers, annual reports, the internet and books.

**Data collection:** Through structured questionnaire.

**Sampling method:** Convenience sampling.

**Sample size:** Issued 140 questionnaires, collected 121, taken for analysis only 100 and the remaining 21 questionnaire was not taken due to incompletes.

**Sample area:** Students pursuing undergraduate programmes in arts and science college, Ranipet District, Tamil Nadu in India.

**Data analysis:** Statistical tools like percentage analysis, frequency distribution and mean score with rank correlation.

**Questionnaire design:** The questionnaire is carefully designed to meet the requirement of the research. The questionnaire consists of two sections, the first section deals with demographic profiles and the second section deals with internet overuse through cell phones using five points Likert scale ranging from 5 strongly agree to 1 strongly disagree.

**Period of study:** From April 2021 to June 2021 during Covid-19.

**Reliability test:** The output of the reliability test was 0.792, these results show that there is internal consistency among the variables and fit for analysis.

### LIMITATION OF THE STUDY

The major limitation of the study is that the result may not be universally applicable as a descriptive study. The opinion of respondents may differ at different points in time. Has a large number of sample respondents have been considered for the study, the result might have differed in that case. The sample size is restricted to 100 only and the study is also restricted to only Ranipet District.

### Data Analysis and Interpretation

#### 1. Demographic Profile

The data pertaining to the demographic profile of the respondents like, gender, education, location and level of internet daily usage were presented in table 1.

**Table 1** Demographic profile of the respondents

Variables	Category	Frequency	Percentage	Total
Gender	Male	52	52	100
	Female	48	48	
Location	Rural	40	40	100
	Urban	60	60	
Education	B.Com	45	45	100
	BCA	25	25	
	B.Sc	30	30	
Level of Internet daily usage	Daily Average 20% to 24% user	65	65	100
	Daily Moderate 50% to 79% user	20	20	
	Daily Severe 80% to 100% user	15	15	

**Source:** Primary data

### INTERPRETATION

From the above table 1, it is inferred that 52% of the respondents belong to the gender group of male and 48% belong to the female, 40% of the respondents belong to the location of rural area and 60% of the respondents belong to the location of the urban area, 45% of the respondents belongs to B.Com and 25% of the respondents belongs to BCA and 30% of the respondents belongs to B.Sc, 65% of the respondents were daily average users, 20% of the respondents were daily moderate users and 15% of the respondents were severe users.

#### 2. Reason for internet over usage through cell phone among college students

The data pertaining to the reason for internet over usage through cell phones and its effect on college students were presented in table 2 by applying mean score with rank correlation.

**Table 2** Reason for internet overuse among college students

Variables	5	4	3	2	1	Total	Mean Score	Rank
For learning and listening need	34	35	17	3	11	100	3.78	1
For seeking entertainment need	22	35	25	12	6	100	3.35	3
For socialization need	28	26	29	15	2	100	3.63	2
For psychological need	12	32	27	25	4	100	3.23	4

**Source:** Primary Data, 5-Strongly Agree 4-Agree 3-Unbiased 2-Disagree 1-Strongly Disagree

### INTERPRETATION

From the above table, for learning and listening need with mean score value 3.78 is ranked as 1, for socialization need mean score value 3.63 is ranked as 2, for seeking entertainment need mean score value 3.35 is ranked as 3 and finally psychological need mean score value is 3.23 is ranked as 4.

### 3. Internet Addiction through Cell Phone

The data pertaining to internet addiction through cell phones and its effects on college students during Covid-19 were presented in table 3 by applying mean score with rank correlation.

**Table 3.** Internet addiction through cell phone.

Variables	5	4	3	2	1	Total	Mean Score	Rank
Stay in Online longer than you intended.	12	34	37	13	04	100	3.85	05
Try to cut down the amount of time you spent online and fail.	32	27	22	13	06	100	3.96	04
Lose sleep due to late-night login.	28	20	30	13	09	100	3.26	12
Fear that life without the internet would be boring empty and joyless.	27	26	29	12	06	100	4.89	01
Prefer the excitement of internet intimacy with your partner.	28	17	31	18	04	100	3.54	09
Academic performance suffers because of the internet.	27	34	18	12	09	100	3.72	06
Grades or College work suffer because of the amount of time you spend.	20	34	10	23	13	100	4.18	03
Form a new relationship with fellow online users.	28	16	32	14	10	100	3.56	08
Life complains to you about the number of times you spend online.	18	36	12	32	02	100	4.22	02
Defensive or secretive when anyone asks you what do you do online.	04	27	25	32	12	100	3.33	11
Neglect household chores to spend more time online.	27	32	20	18	05	100	3.59	07
Try to hide how long you have been online.	20	33	15	13	19	100	3.44	10

**Source:** primary data, 5-Always, 4-Often, 3-Frequently, 2-Occasionally and 1-Rarely

### INTERPRETATION

From the above table it is inferred that, fear that life without internet would be boring, empty and joyless with mean score value is 4.89 is ranked as 1, Life complains to you about the amount of times you spend online with mean score value is 4.22 is ranked as 2, Grades or college work suffer because of the amount of time you spend with mean score value is 4.18 is ranked as 3, Try to cut down the amount of time you spent online and fail with mean score value is 3.96 is ranked as 4, Stay in Online longer than you intended with mean score value is 3.85 is ranked as 5, Academic Performance suffers because of internet with mean score value is 3.72 is ranked as 6, Neglect household chores to spend more time online with mean score value is 3.59 is ranked as 7, Form a new relationship with fellow online users with mean score value is 3.56 is ranked as 8, Prefer the excitement of the internet intimacy with your partner with mean score value is 3.54 is ranked as 9, Try to hide how long you have been in online with mean score is 3.44 is ranked as 10, Defensive or secretive when anyone asks you what do you do in online with mean score is 3.33 is ranked as 11, Lose sleep due to late night login with mean score 3.26 is ranked as 12.

### FINDINGS

- 52% of the respondents belong to the gender group of male and 48% belong to the gender group of female. 40% of the respondents belong to the location of rural area and 60% of the respondents belong to the location of the urban area.
- Learning and listening need with mean score value 3.78 is ranked as 1 and socialization need mean score value 3.63 is ranked as 2.
- Fear that life without the internet would be boring, empty and joyless with mean score value is 4.89 is ranked as 1, life complains to you about the number of times you spend online with mean score value is 4.22 is ranked as 2, Grades or school work suffer because of the amount of time you spend with mean score value is 4.18 is ranked as 3,

## SUGGESTIONS

It is suggested from this study that, over usage of the internet through cell phones or computers for collecting academic information during Covid-19 may cause anxiety, stress, frustrations and weaknesses. So, limited and meaningful usage of the internet through cell phones may help college students to improve academic performance, and also to protect their health, wealth, their family and society.

## CONCLUSION

It is concluded from the descriptive study that, we are living in an information and knowledge-based society. The internet has made an increasing and powerful impact upon every area and workplace like, home, college, hospital, bank and research and it has shown a great impact in the field of higher education that too for college students. In this age of competition, college students want to get the latest information not only in the field of academic studies but also in the field of job opportunities. So, the parents, faculties and educators should motivate them to access only academic, as well as different sites for different job opportunities and strongly advise college students not to spend more time on the internet for non-academic purposes because it will affect their physical, psychological, social and economical. And it is also concluded that the students of every stream understand the importance of this modern facility, which helps them to explore various aspects in depth. In this way, the internet has become part and parcel of every student's life. Growth and development depend upon the frequent use of the internet in every field. Finally, this study wants to conclude through one message that good faculty creates a good institution, the good institution creates a good student community, good student community creates a good nation and a good nation creates good citizens.

## SCOPE FOR FURTHER RESEARCH

1. Separate studies can be done about internet addiction through cell phones and its effects on engineering or medical students.
2. Comparative study can be done on internet addiction through cell phones and its effects between arts and engineering students.

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## **An Analysis of Student's Acceptance and Perception of online Learning during the Pandemic**

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### **ABSTRACT**

The COVID 19 pandemic has affected various sectors and the education Industry is also included in this crisis. In order to ensure continuity of learning among students during the pandemic, academicians shifted from the traditional teaching methods to online modes of sharing knowledge which is considered a more student centric approach. The perspective and satisfaction of the users of online education is an indispensable aspect in online education. Hence this paper attempts to study the perspective of students towards online learning and their overall satisfaction from the experience. The primary objective of this study is to be achieved by using both primary and secondary data. The primary data is collected through questionnaires which have been filled by 382 students pursuing B.Com and B.Sc. The findings of this micro study indicate that students enjoy the flexibility & comfort associated with online learning but feel the absence of personal relationship with the teachers and peer students. Students are fairly accepted and satisfied with online learning and are open to the combined use of both conventional and online learning tools and methods thereby taking utmost benefit of both the methods. The researcher is of the view that post pandemic education shall focus on making students more comfortable and adaptive to online modes of learning along with the conventional classroom teaching methods. The need of an hour is not only to incorporate technology into the educational framework but also to absorb it. After all, E-Learning is a step towards the new era of Education.

**Keywords:** Learners, Online learning, Education, Covid 19

### **INTRODUCTION**

COVID 19 pandemic has affected every industry across the globe and the Indian Education Industry is no exception. According to UNESCO, over 32 crore students are hit by COVID 19 as schools and colleges are shut. The HEIs immediately focused on the new need of imparting knowledge to the students during lockdown by way of online lectures. This helped the students to learn and revise the contents with the teacher either in live online (real time) classes or pre-recorded online lectures on digital platforms such as Zoom, MS Teams, Meet and Webex Meet .

The Education Industry has been incorporating various technological advances into the teaching-learning process which involve the use of powerpoint presentations, digital boards, smart boards, smart classes, etc. which mainly depends on the use of technology in a classroom. The educational institutions always have tried to incorporate technological advancements into their infrastructure, but the need of the hour is the adoption of various technological tools into the higher educational system. The pandemic has surely helped us rethink the use of technology and use it to the fullest as when the young minds and teachers are far from the classroom teaching by using the digital learning tools.

The teachers were the first ones to equip themselves with the technological knowledge to resume delivery of online lectures which was quickly adopted by the young students. Professors and teachers have been developing a variety of digital content to boost engagement of students including audio or video lectures, class exercises, group chats, collaborative documents, etc. Students are the ultimate users of online education and therefore it is very important to understand the comfort, satisfaction and problems of students with the new system. Continuous feedback from the students will help the educators redesign and rework their teaching methods which shall effectively serve students. This shift in the education industry will give a broader perspective to online content driven education. The teachers and students have the potential to enter into the new education era post pandemic by effectively responding to current shortfalls of online teaching-learning.

The HEIs are facing many challenges apart from imparting knowledge like conducting exams, taking admissions, providing placement opportunities, providing opportunities for add-on courses, etc. Institutions are shifting the examination and admission process online with the help of EdTech companies and partnering with national and international institutions and companies during the pandemic to provide their students with better placement and add courses.

Educational institutions work in the best interest of students and even during the pandemic. This aims not only at increasing accessibility to quality education in the country but also provides a holistic experience to students.

## REVIEW OF LITERATURE

1. A Study (Jo Coldwell-Neilson, 2006) explored that students were enthusiastic about learning in an online environment, this is mainly because online learning was found to be a convenient mode of gaining knowledge which gave students enough flexibility to study at their pace. A study (K.S.Wong, 2005) also has similar results with respect to flexibility but also mentions the inadequate opportunities for human interaction and missed the in depth learning from group discussions. Online learning comes with a higher level of accountability for one's own learning.
2. The students were found adopting the e-learning methods but according to (Magda Abde laziz, 2011) the students were satisfied with the one e-learning program they had taken but did not wish to opt for another such programme.
3. A study (Sean B. Eom, 2006) The findings of the study focus on making online education a superior mode of instruction by targeting learners' needs and taking timely feedback.

## RESEARCH GAP

The researches done in the field of online education and online learning are undertaken in a general setup and no sufficient research has been undertaken in understanding the student perception of distance online learning during the situation of pandemic when the option of classroom education is temporarily unavailable.

## OBJECTIVES

1. To understand student's perception and attitude of Online Learning with respect to their experience during the COVID-19 pandemic and to study the major factors behind the overall student satisfaction from online learning.
2. To study the perception of learners towards online learning with respect to Comfort, Flexibility, Convenience, Degree of Interest, Cost Effectiveness and Time Effectiveness during COVID 19 pandemic.
3. To understand the student's perception and acceptance with the Degree of Contact available during online learning.
4. To study the major problems faced by learners during online learning with respect to technical issues and monotony of lectures.
5. To study the overall satisfaction of learners considering the lecture content, professor's knowledge and facilitation, interaction with teacher and self-motivation.

## HYPOTHESIS

1. H1: There is a significant relationship between gender and constraints of online learning.
2. H2: There is a significant relationship between Overall acceptance, preference, perception and category wise responses of students towards E-learning.

## RESEARCH METHODOLOGY

This research study involves quantitative and qualitative research. The quantitative research aims to study the learner's perspective towards online learning with regards to Convenience, Flexibility, Cost and time effectiveness, degree of contact, overall satisfaction, etc. which involves collecting primary data with the help of questionnaires using google forms. A structured, open ended and close-ended questionnaire. The population for the current study included the data from various colleges from Navi Mumbai, out of which a random sample of 382 students was selected to have a more scientific approach. The data collected is through Tables and Bar Graphs. Simple descriptive Analysis is performed on the data which includes Frequency, Percentages, Mean and Standard Deviation.

The Qualitative research involved studying the available secondary information from e-sources including Articles, Surveys and Research Papers.

## Data Analysis

Table1: Descriptive Statistics

Variables	Mean	SD*
Comfort and Flexibility	3.20	.986
Convenience	3.09	1.127
Degree of Interest	2.98	1.125
Cost effective	3.46	1.113

Time saving	<b>3.66</b>	1.179
Degree of Contact with Teacher	<b>2.97</b>	1.211
Degree of Contact with students	2.55	<b>1.200</b>
Technical issues Faced	3.44	1.311
Monotony in Lectures	<b>3.48</b>	<b>.981</b>
OS** w.r.t.*** Lecture Content	<b>3.63</b>	<b>1.011</b>
OS w.r.t. Professor's Knowledge	3.60	1.098
OS w.r.t. Teacher-Student Interaction	3.20	1.237
OS w.r.t. Self-Motivation	3.39	1.108

Source: Primary Data collection \*Standard Deviation, \*\* Overall Satisfaction, \*\*\*with respect to

- The mean for Time Saving is highest which shows that the majority of the responses feel time saving is a very important variable in online learning. Respondents have the least variation in opinion when it comes to the comfort and flexibility associated with online learning.
- Monotony in lectures is one of the setbacks of online education setup with the mean of 3.48 with less variation in responses.
- The overall satisfaction of the learner depends on many factors, but out of the selected four variables in the study, Lecture content is a significant factor which is considered important by most of the respondents with least variation in the responses.

### Hypothesis Testing

MS- Excel tool was used for data analysis.

Independent T-test was applied for data analysis. Frequencies and percentages were computed for the demographics.

<b>Table No. 2: Demographics and choice of gadgets used for e-Learning.</b>		
	<b>Frequency</b>	<b>Percentage %</b>
<b>Gender</b>		
Male	137	35.90%
Female	245	64.10%
<b>Discipline</b>		
B.Com	204	53.40%
B.Sc	178	46.60%
<b>Year</b>		
First year	150	39.79%
Second Year	109	28.53%
Third Year	123	32.20%
<b>Choice of Gadget/Device</b>		
Mobile	289	75.70%
Computer	3	0.80%
Laptop	81	21.20%
Tablet	9	2.40%

Source: Primary Data collection

In Table No:2 shows the various parameters of data collection. Out of 382 respondents 39.79% were from First year students, 28.53% were from second year degree college students and 32.20% were from third year degree college students. The choice of gadget and device they used during online lectures are mobile i.e. 75.70 % followed by laptop 21.20%.

**Table No. 3: Bottleneck of Online learning**

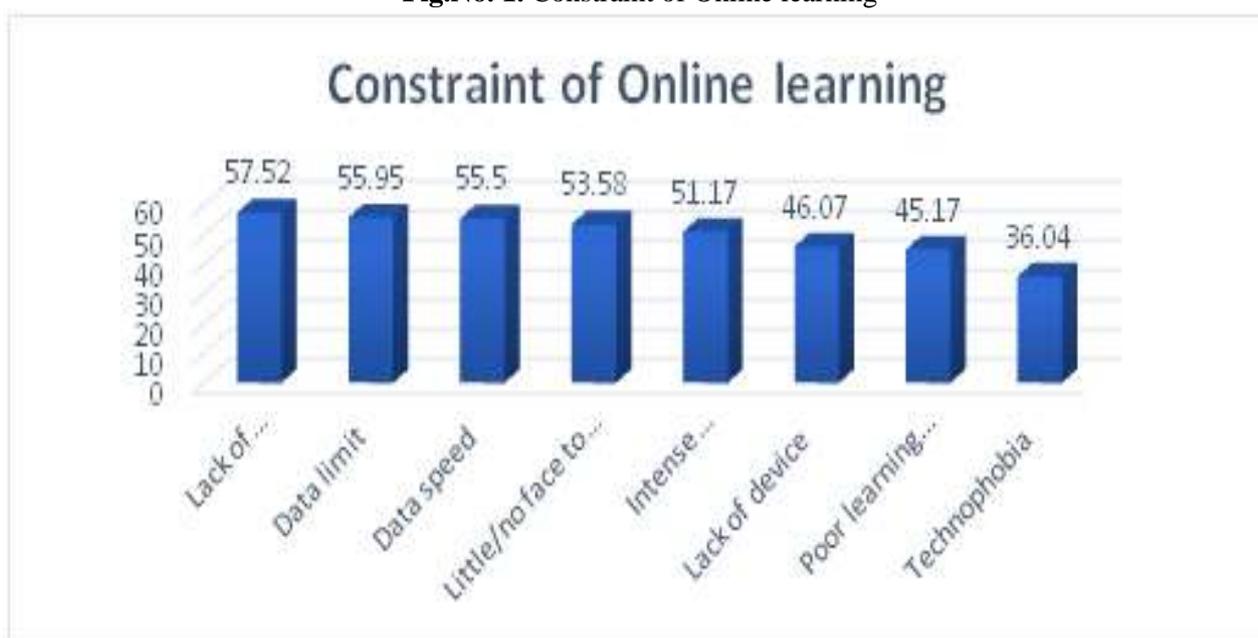
<b>Constraint of online learning</b>	<b>Average Score</b>	<b>Rank</b>
Lack of connectivity	57.52	1
Data limit	55.95	2

Data speed	55.5	3
Little/no face to face interaction	53.58	4
Intense requirement for self-discipline	51.17	5
Lack of device	46.07	6
Poor learning environment	45.17	7
Technophobia	36.04	8

Source: Primary data collection

The above chart shows the bottleneck of online learning i.e. constraint of online learning, majority i.e. 57.52 % respondents answer the lack of connectivity is the major constraint of online learning followed by technophobia by 8%.

Fig.No. 1. Constraint of Online learning

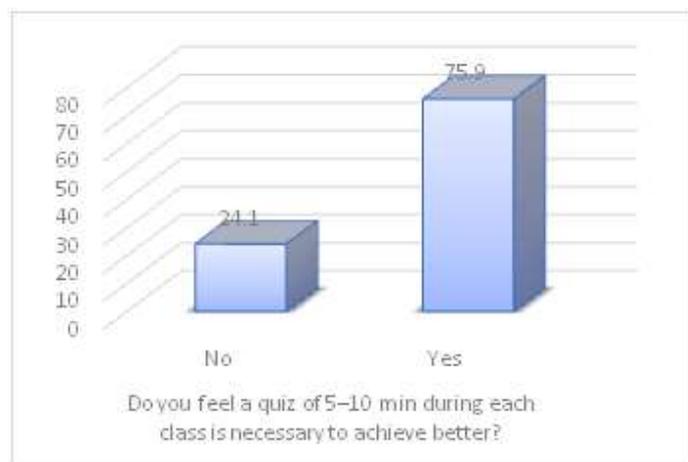


The above chart indicates that the lack of constraint of online learning depends upon the lack of connectivity and it was ranked as the major obstacle in online learning. The above obstacle is even worse in remote and rural areas. The above chart highlights the digital divide into data limit and data speed in all areas majorly in remote areas. The second and third constraints were data limit and data speed which were again the limitations of internet infrastructure. Next hindrance was lack of devices, poor learning environment followed by technophobia.

Table No. 4: Plans and Criteria for evaluation

Attributes		Percentage
Do you feel a quiz of 5–10 minutes during each class is necessary to achieve better?	No	24.1
	Yes	75.9
Do you feel assignments at the end of every class are necessary to achieve effective learning?	No	43.97
	Yes	56.03
Deadline for submitting assignments	1 day	2.93
	1 week	46.58
	2–3 days	14.98
	Before the next scheduled class	35.5
Do you like to attend online exams	No	39.74
	Yes	60.26
Nature of online exam	Both	26.06
	Objective	70.03
	Subjective	3.91

Fig. No. 2: Plans and Criteria for evaluation



**Table No. 5:** Addressing the queries

Attributes		Percentage
Way for clarifying queries	All three can be made available	0.33
	Both live chat and email	0.65
	Live chat	35.5
	Platform for posting queries	48.21
	email to the course instructor	14.33
	WhatsApp	0.97
Expected time for clarifying the queries by instructor	Within Next class.	0.33
	Within 2-3 days	17.59
	Within a day	40.39
	Within a week	12.05

**Table No. 6:** Overall acceptance, preference, perception and category wise responses of students towards online learning

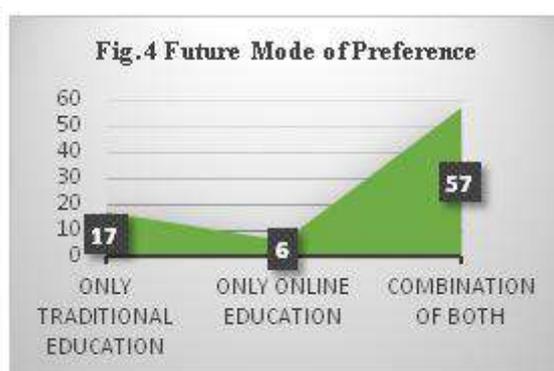
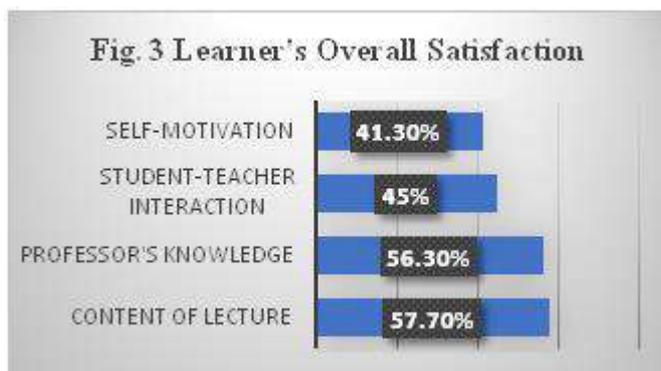
Overall acceptance, preference, perception and category wise responses of students towards online learning						
Parameters	Responses	N(%)	Mean	Std. Deviation	Std. Error Mean	p-value
Overall Perception	Positive	86 (23%)	37.5455	6.2754	1.09241	0.015
	Negative	296 (77%)	58.7249	8.16173	0.43689	
Future learning Preference	Positive	86 (23%)	4.2791	0.86298	0.09306	0
	Negative	296 (77%)	7.9392	1.38626	0.08057	
E-teaching is better than traditional teaching	Positive	56 (15%)	8.5	1.82906	0.24442	0
	Negative	326 (85%)	14.7546	2.56387	0.142	
Quality of e-teaching is satisfactory	Positive	119 (31%)	7.6134	0.66523	0.06098	0
	Negative	263 (69%)	10.2586	1.2847	0.07922	
Impact of e-learning is less	Positive	327 (86%)	18.2508	2.87118	0.11588	0
	Negative	55 (14%)	11.4545	1.87398	0.25269	
Student-Teacher interaction isolation has increased	Positive	320 (84%)	2.2875	0.63727	0.03562	0
	Negative	62 (16%)	4.1935	0.3983	0.05058	
Online teaching is Not secured	Positive	241 (63%)	1.9149	0.28003	0.02358	0
	Negative	141 (37%)	3.9087	0.77994	0.05024	

Overall perception and category wise responses of students towards E-learning of various parameters sample test  $s p=0.05$  (or 5%), the critical value of test is 0.000 for various parameters. The calculated value being less than p value, thus the difference is highly significant for each parameter; therefore the hypothesis that there is a significant relationship between Overall perception and category wise responses of students towards E-learning is **highly accepted**.

## FINDINGS

Out of 382 respondents 39.79% were from First year students, 28.53% were from second year degree college students and 32.20% were from third year degree college students. The choice of gadget and device they used during online lectures are mobile i.e. 75.70 % followed by laptop 21.20%.

1. A majority of 73% respondents have been using MS Teams and Zoom platform during pandemic to attend lectures and webinars
2. 52% of the respondents feel the pandemic gave them an opportunity to digitally learn beyond the course from prominent faculties across the nation.
3. The bottleneck of online learning i.e. constraint of online learning, majority i.e. 57.52 % respondents answer the lack of connectivity is the major constraint of online learning followed by technophobia by 8%.
4. The mean for Time Saving is highest which shows that the majority of the responses feel time saving is a very important variable in online learning. Respondents have the least variation in opinion when it comes to the comfort and flexibility associated with online learning.
5. Monotony in lectures is one of the setbacks of online education setup with the mean of 3.48 with less variation in responses.
6. The overall satisfaction of the learner depends on many factors, but out of the selected four variables in the study, Lecture content is a significant factor which is considered important by most of the respondents with least variation in the responses.
7. 46% of the respondents feel they now have more opportunities to learn from international faculties in a cost-effective manner.
8. 38.8% respondents favorably responded when asked about the comfort and flexibility associated with online learning whereas 23.8% do not agree to the same. The remaining 37.5% were neutral in their opinion.
9. Online learning is convenient to a majority forming 38.8% respondents whereas 27.6% find it inconvenient. The remaining 33.8% are neutral in their opinion.
10. 37.6% respondents find e-learning an interesting way to gain knowledge whereas 35.1% not finding online learning interesting. 27.5% stayed neutral in their opinion.
11. A vast majority of 50% and 66.3% of the respondents are of the opinion that online learning is Cost effective and Time effective respectively.



12. Majority of 57 (71.3%) students would prefer the Hybrid mode which is a combination of traditional and online teaching methods, followed by 17 (21.3%) respondents who prefer to take only classroom teaching. Only 6 (7.5%) respondents are willing to take entire education online in the post pandemic era.

## LIMITATIONS

- The current research study is only restricted to the degree college students of B.Com. and B.Sc in Navi Mumbai region
- The sample size of 382 represents 36% of the total population, which limits the generalization of results.
- The Secondary Data for the study is restricted to only the free and open e-sources.

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### **FUTURE SCOPE OF STUDY:**

- This paper attempted to study learner's perspectives with respect to selected variables including convenience, flexibility, cost and time effectiveness, technical issues, monotonous teaching methods, degree of contact and overall satisfaction from online learning. This leaves a broad scope for future studies with the inclusion of other variables.
- The current study is based on a small population from a semi-urban area, this further gives a scope to future researchers to undertake a similar study in rural or urban areas.

### **CONCLUSION**

Lockdown throughout the country seems to be disrupting the generation's education. The education institutes are facing challenges like taking virtual lectures, conducting exams, taking admission, providing placement opportunities to name a few. In a country like India these challenges magnify considering the limited digital infrastructure especially in semi-urban and rural areas. The Institutional leaders should use this time as an opportunity to reimagine the education system post- pandemic era. Academic institutions will be offering programs in hybrid mode which is a combination of traditional and online teaching post pandemic. This will gain momentum as the digital capabilities continue to evolve, and the psychological barriers to virtual learning among the various stakeholders continue to change. This is a major shift in the overall working of educational institutions especially in India since pandemic left no other alternative but to digitalise the system. The pandemic gives an opportunity to institutions to utilise and develop two key resources- faculty and infrastructure. As they navigate through difficult times, it is imperative to be better equipped to effectively serve students in a world where digitally centred communication is increasingly becoming a norm. This trend may continue to rise.

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## Study on Cost Benefit Analysis of *Tagetus Erecta* Inhibitor on Mild Steel

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### ABSTRACT

Corrosion can be justified at a very high cost by preventing the corrosion failures or by simply replacing a part at a very low cost which is the most economical solution for the problem. Hence Cost-benefit analysis is measured for both the sides for balancing economical issues. In the present study, the corrosion cost benefit analysis was estimated by using corrosion current conversion calculator. The objective of present study was to obtain a measure of the rate of corrosion for per year by using the herbal *Tagetus erecta* inhibitor; which will be more effective as well as beneficial to industries. The study revealed that by using *Tagetus erecta* herbal inhibitor 80-90% of corrosion can be inhibited which is very beneficial to the industries in addition may be considered as the cost to the economy.

**Keywords:** Corrosion, *Tagetus erecta*, Inhibitor, Economy, Cost Benefit Analysis,

### INTRODUCTION

In Today's era corrosion evils are faced by almost all industries; infact the cost of corrosion can be defined in various ways and it may depend upon what is incorporated and who is affected. In the earlier studies there are various definitions for the cost of corrosion which have been used and reached to various estimation

In 1999, a total of 70.7 million major home appliances and a total of 49.5 million comfort conditioning appliances were sold in the United States, for a total of 120.2 million appliances. The average consumer buying an appliance is only marginally interested in corrosion issues and during the useful life of the appliance; no corrosion management is done by consumers. For example, very few people realize that there is an anode in every water heater, and that this sacrificial bar of metal should be checked and, if necessary, replaced with a new one, to prevent water heater failure due to internal corrosion. The life expectancy of appliances is determined from past experience and sales data. Improved corrosion design for appliances can increase their life expectancy. However, if improved corrosion protection would mean the use of more expensive components for the appliances, then consumers may not be interested (Corrosion Doctors).

The study performed by using extract and acetogenins solution acted as good corrosion inhibitors for C-steel in 1M HCl media<sup>1</sup>. Azzaoui, K (2017) studied about the Eco friendly green inhibitor Gum Arabic (GA) for the corrosion control of mild steel in hydrochloric acid medium<sup>2</sup>. Gupta, N. K. et.al, (2016) has highlighted about Green Schiff's bases as corrosion inhibitors for mild steel in 1 M HCl solution<sup>3</sup>. Mobin, M (2016) emphasized about Polysaccharide from *Plantago* as a green corrosion inhibitor for carbon steel in 1M HCl solution. In the present study, the corrosion cost benefit analysis was estimated by using corrosion current conversion calculator. The objective of the present study was to obtain a measure of the rate of corrosion for per year by using the herbal inhibitor and also to understand whether it is effective and beneficial to industries. The cost of corrosion is defined as the corrosion division of design, manufacturing, operation and maintenance, technology development, and asset value loss.<sup>5</sup>

### Material and Methods

Electrochemical Measurements such as polarization resistance, and Electrochemical Impedance Spectroscopy results were used for the evaluation of the current density. It is this current which is a measure of the corrosion rate. The corrosion current conversion calculator was used to determine the value of corrosion rate @mpy.

### RESULTS AND DISCUSSION

Table 1 highlight about the values of corrosion rate (mpy) by using *Tagetus erecta* as an inhibitor for the mild steel in 1M HCl. As far as the values are concerned it shows that as the concentration of inhibitor is increased the rate of corrosion rate (mpy) is decreased. The decrease in the corrosion rate is found at maximum concentration of 2.0 $\mu$ l for *Tagetus erecta* extract. The mild steel exposed in 1M HCl without the inhibitors was showing more corrosion rate mpy than the mild steel exposed in 1M HCl with the inhibitor. The corrosion rate Te extract value for the higher concentration of 2.0  $\mu$ l was found to be 5119.2 mpy.

**Table 1:** shows Corrosion Rate (mpy) in the presence of inhibitor *Tagetus erecta*

Medium	Ecorr (mv/sec)	Icorr (Amp/cm <sup>2</sup> )	Corrosion Rate mpy
1M HCl	-0.1017	0.1837	83968.5 mpy
0.1 μl	-0.1011	0.0607	27744.2 mpy
0.5 μl	-0.1012	0.0407	18602.8 mpy
1.0 μl	-0.1013	0.0207	9141.4 mpy
2.0 μl	-0.1014	0.0112	5119.2 mpy

The results shown that there is difference in values found in the presence and absence of inhibitor. The herbal inhibitor (*Te*) shown good response in inhibiting stress corrosion and the corrosion rate values are decreased as the concentration range of inhibitor increased.<sup>1&2</sup> The reduction in corrosion rate values is assumed that the system can be free from corrosion in the presence of inhibitor.<sup>3</sup> There is variety of issues related to Mild steel for water systems. The corrosion rate is measured and discussed in this study and provides a cost-effective method by proving the effectiveness of the herbal inhibitor action.

The corrosion rate values obtained by potential measurements showed in the inactive state of corrosion reactions other than with constant trend towards active corrosion reactions behaviour. This indicates that the inhibitor is working as a good inhibitor for the corrosion inhibition.

As far as the cost-benefit analysis is concerned in the current period whether it is cooling tower or any appliances, firstly for corrosion cost we need to have knowledge about all materials and activities incurred. In the present study the corrosion management aspect is made by applying herbal inhibitor which helps us to know how much initial investment need to be done on yearly basis both for controlling corrosion on mild steel and also on water quality parameters which are the primary concern in leading to corrosion in cooling tower and appliances.<sup>4</sup>

#### The cost-benefit analysis values are as delineated below

Name of Inhibitors:-*Tagetus erecta*

Volume of extract required:-360 ml annually (will vary according to nature of industry)

Cost of herbal inhibitor used:-Rs 5000/-

Cost of Chemical inhibitor used:-Rs 50,000/-

#### CONCLUSION

The present value given differs both for herbal and chemical inhibitors. The reason behind highlighting the information about cost benefit analysis values was only to state that herbal inhibitors is having more ecofriendly approach which can be used without any difficulty because it is easily available and cheap instead of using chemical inhibitors to avoid corrosion for controlling the water quality parameters. Every year lot of flowers are used and disposed; so best way is to reuse this flowers which can be used as inhibitors in cooling tower and appliances to resolve the problem.

Hence it can be concluded that the inhibitor are working as good inhibitor for the corrosion effect on Mild steel and for controlling the water quality parameter in cooling tower and appliances. Hence the inhibitor can be implemented and used by the industries for the prevention of corrosion and to control water quality parameters

By using the inhibitor 80-90% of corrosion can be inhibited which is very beneficial to the industries. Hence this study may be considered as the cost to the economy, which can be reduced by broader application of corrosion resistant materials, by improving the practices in corrosion-prevention, and also by investing in corrosion research for a new and improved corrosion technology.

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## Detection of Malware for Android Using Machine Learning: A Review

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### ABSTRACT

During pandemics the use of smartphones and mobile devices has increased extensively so is the development of the android application. In this mobile ecosystem, there is also a tremendous increase in Android malware. This malware is becoming a serious threat to our privacy and security. Researchers have studied this problem and have proposed various techniques and methods for malware detection. Existing researches show that machine learning is an effective means to detect malware for Android. This paper presents a comprehensive survey of various malware detection approaches using machine learning.

**Keywords** Malware Detection, Android, Machine learning, Security

### INTRODUCTION

The popularity of the Android Operating system is continuously increasing since its release in 2008. At present, there are more than 3.5 billion smartphone users in the world [1] and this number is continuously increasing. Android is dominant in countries like Brazil, India, Indonesia, and Turkey. It has a global market share of 75%. There are about 2.9 million apps available on Google Store in 2020, which were downloaded 108 billion times. [2]. As per statistics in 2016 alone, more than 2.5 million applications were infected with malware. The main reason behind this is that these applications are not certified by any legitimate body. Various methods have been taken to ensure security in Android ecosystems like vulnerability detection, application reinforcement, and malware detection. Out of all the available options, malware detection is the most popular security measure. These days there is increased use of machine learning theory for malware detection. Machine learning provides better performance in malware detection as it has the ability to detect new malware which was not seen previously.

### ANDROID OPERATING SYSTEM

#### A. ARCHITECTURE

Android is an open-source Linux-based operating system. It has a software stack that is aimed to facilitate a variety of devices. The heart of this architecture is its Linux kernel. It is arranged in the top to bottom manner. Above kernel lies the native libraries and Android Runtime which is very important for running various applications that consume less memory and provide fast performance. The application framework includes Android API's which provide a lot of classes and interfaces for android application development. On top of the Android framework lies the android applications.



FIGURE 1. Android platform architecture [3]

## B. SECURITY

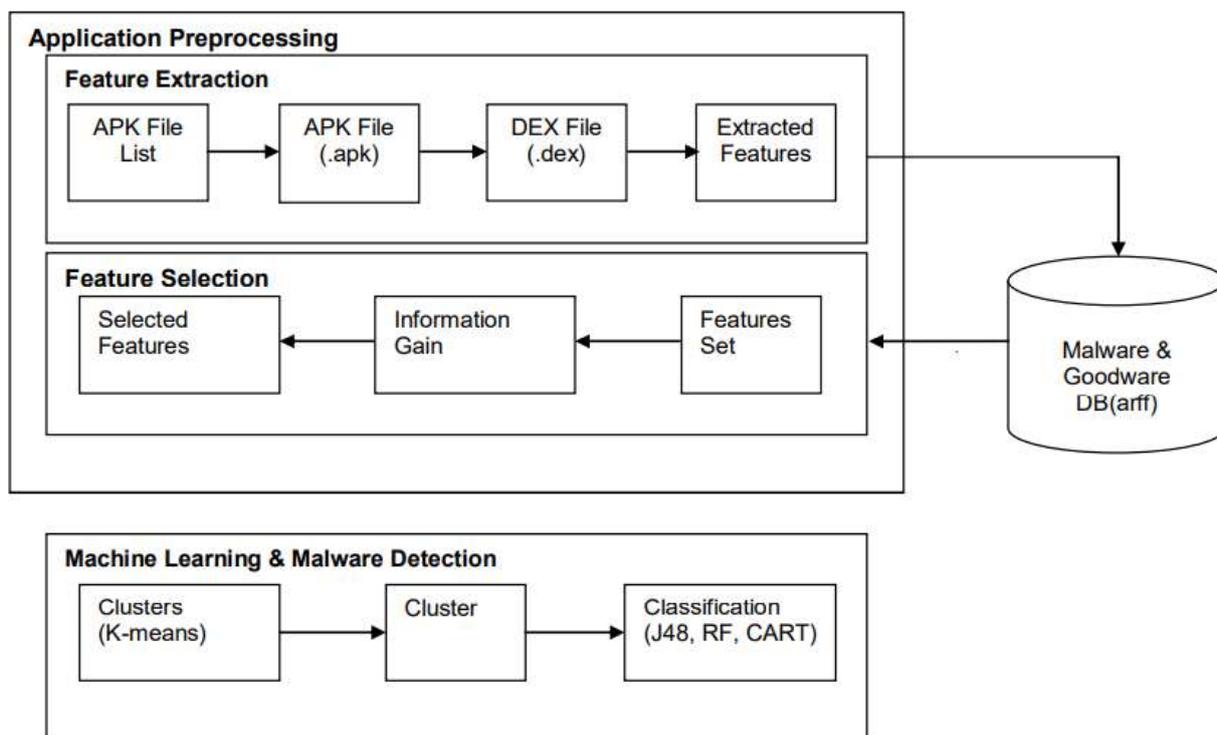
In order to protect users' information android uses a permission mechanism. When an app is installed, it asks for various permission from the users. If the user accepts these permissions the app is installed and it is able to use resources. The app needs to mention in the manifest.xml file all the resources that it wants to use. There are around 135 app permissions in android [4]. App permission is divided into four types according to security; namely normal, dangerous, signature, and signature/system. Low-Level permissions, including normal and dangerous levels, are authorized as soon as an app is used. Signature level and signature/system-level permissions are known as advanced permissions. Among them, Google proposed 24 dangerous permissions. Including SEND\_SMS, CALL\_PHONE, CAMERA, etc.—these permissions allow one to access users' sensitive information. [4].

## C. MALWARE CATEGORIES

The word Malware is a combination of two words malicious and software. The main purpose of it is to disrupt, manipulate or get unauthorized access to the target computer. Malware can be used for creating fraud, misuse of data and services, data theft, selling user information, and obtaining Ransome. It can enter the device through a network, malware installation, phishing, malicious payloads, and permission misuse.

Android malware can be divided into the following: trojan, backdoor, worm, botnet, spyware, aggressive adware, and ransomware [5]

## D. MALWARE DETECTION FRAMEWORK



Malware Detection Framework [5]

## MACHINE LEARNING

Machine learning is a branch of Artificial intelligence that uses data and past experiences to develop algorithms that will enable the computer to improve the experience. It allows computers to learn on their own instead of being programmed explicitly. It uses training data to build a mathematical model which identifies the pattern and correlation in the data set for making predictions or the best decision in the given situation. Hence machine learning with the help of statistics creates predictive models based on historic data.

## RELATED WORK

In 2009, [6]Faraz Ahmed proposed a tool that uses statistical features which are extracted from spatial and temporal argument. Their result shows improvement in detection accuracy of all classifiers.

In 2012, [7]Justine Sahs and Latifur Khan presented a machine learning-based malware detection system that trains a one-class support vector machine in an offline manner to achieve the higher computing power of a server.

In 2014 [8], Wen Chieh and Shih-Hao Hung proposed DroidDolphin which is a malware analysis framework that predicted 86.1 percent accuracy.

In 2016 [9], Abhijit Yewale and Maninder Sigh proposed a new method of detecting malware using the frequency of opCodes in a portable executable file and got a 96.67 percent success rate.

In 2016 [10], did a detailed study of Android malware technique and found that detection techniques and system that uses a static, dynamic and hybrid approach helped the system in counteracting. They also discovered that the lack of proper data set for studying still remains a great problem.

In 2016, [11], Huda Ali and colleagues proposed category-based machine learning classifiers to detect malicious apps under a certain category. The experiment reported a remarkable higher performance compared to non-category-based.

In 2016 [12], Lui proposed data processing modules with gray-scale images, opcode, n-gram, and import function which shows an effective classification of unknown malware with 98.9% accuracy and successfully detects new malware with 86.7% accuracy.

In 2017 [13], M. Asha Jerlin and K.Marimuthu gave an efficient system to detect and classify malwares in APIs. They used multi-dimensional Naïve Bayes Classification. They compared the existing results with proposed technique based on the measure of true positive rate, false positive rate, precision, recall, f-measure and accuracy. The experiment was highly successful

In 2018 [14], J.D. Koli proposed a system called "RanDroid" which extracts requested permission API calls that are vulnerable along with existing app's key information to classify malware with 97.7 percent accuracy.

In 2019 [15], Mohsen Kakawand and colleagues used two machine learning algorithms called support vector machine(SVM) and K-Nearest Neighbours for android malware detection. The experiment indicate average accuracy rate of 79.08 percent and 80.50 percent and true positive rate of 67 percent and 80 percent using SVM and KNN respectively.

In 2021 [16], Mahindru and Sangal introduced MLDroid, a web based framework that detects Android malware by performing dynamic analysis. It used four machine learning algorithms which are deep learning algorithm, farthest first clustering, Y-MLP and non-linear ensemble decision tree forest. It achieved the detection rate of 98.8 percent.

## PROBLEMS

From the above literature survey, it was observed that the lack of larger malware data set remains a great problem. Moreover, it also shows a false classification of apps. Some techniques require high execution time and significant consumption of resources.

## CONCLUSION

This survey listed various techniques and algorithms used for malware detection in Android along with their accuracy percentage. It gives a broad overview of existing technologies to the interested researchers.

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## **Understanding Role and Relevance of Community Engagement Initiatives of Mumbai University on Learner's Skill Required for Post Pandemic Changes in Labour Market – Learner's Perspective**

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### **ABSTRACT**

This study aims to understand the role and relevance of community engagement initiatives of Mumbai University like NSS, DLLE and WDC from learner's perspective. It focuses specifically on skills like communication, adaptability, empathy, leadership, inclusivity and sustainability, resilience, time management which are relevant to the post pandemic labour market and hybrid work culture.

A quantitative survey, employing a questionnaire as instrument, was used for measuring student's perspectives on impact of this initiatives on learner's skills and its relevance in post pandemic labour market. A total of 338 students from various committees including (National Social Service Scheme "NSS", Women Development Cell "WDC", Department of Lifelong Learning "DLLE") participated in the survey. The findings provided information that would enable both academia and industry to build initiatives to enhance learner's skills and understand their perspective.

**Keywords:** Community Engagement, soft skills development, industry academia gap

### **INTRODUCTION**

India is propelling towards growth and development but also faces major roadblocks in terms of population explosion, poverty, lack of resources, climate change etc. India faces the challenge of prosperity & poverty at same time. 32 million students will be part of education system in the country some form of education by the end of the 12th Five Year Plan (2012-2017). The Indian Government has also been increasing investment in the growth of tertiary and vocational education since the 11th Plan. In addition, private players in post-secondary education has also been growing at a rapid pace. Universities and Higher Education Institutions (HEI's) in India are responsible towards building future citizens who understand, relate and make decisions of engaging with the world to create sustainable solutions to build future which is inclusive and developed where innovation and ideation paves way for understanding reality and responsible way of thinking and acting.

Globally, industries are facing industry-academia skill gap which threatens to become even wider as Industry 4.0 and post pandemic era transforms business and jobs faster than employees can adapt.

Global leaders identify it as a need also a chance to realign jobs and skills and how potential employees can demonstrate them. The need of the time is for industry, governments and other key players in skill development to work together and align educational initiatives, workforce-development programs and public policy to bridge industry academia gap.

The India Skill Report 2021 aims to give insights on the skill gaps that exist in the employable population across India specifically when the Demand and Supply of talent is hugely impacted due to the pandemic. The report captures the skill levels of the supply side and needs of the demand side in the talent supply chain. This report tries to bring in a more realistic and holistic view of skill and talent landscape in the country.

To achieve holistic development of students on success indicators like Communication, Creativity, Innovation Leadership, Social Sensitivity skills institutes engage in multiple social engagement activities to provide a platform for students to build and enhance these skills.

To drive growth India requires democratic governance, sustainable growth creative and new solutions, enhanced human competencies and new institutional capabilities in the country.

### **STATEMENT OF PROBLEM**

HEI's concentrate on academics where core teaching and learning becomes the focus with grades and placements acting as the only indicators of student success but overall development of student potential is generally not evaluated. Institutions also have multiple activities under social engagement both statutory and non-statutory like National Social Service Scheme, Women development cells, National Cadet Corps, Department of Life long extension and various initiatives taken by multiple committees and department in an institute which involve multiple stakeholders – Faculties, Students, Community, Employers but the role these

activities have on development of students and their industry readiness in post pandemic labour market is difficult to assess as success of this depends on institutions and student commitment. The active role that these initiatives taken by university have in bridging industry-academia gap and skill development in student's volunteers is not given primary importance.

#### **AIM AND OBJECTIVE OF THE STUDY**

- To study role of National Service Scheme ,Department of Life Long Learning (DLLE) and Women Development Cell (WDC) in developing soft skills in learners relevant for post-pandemic labour market
- To understand perception of learners on relevance of volunteering in this committees on their soft skill development and corporate readiness.

#### **HYPOTHESIS**

- Ho: Community engagement initiatives do not have an impact on Communication Skills
- H1: Community engagement initiatives do have an impact on Communication Skills
- Ho: Community engagement initiatives do not have an impact on Leadership Skills
- H1: Community engagement initiatives do have an impact on Leadership Skills
- Ho: Community engagement initiatives do not have an impact on Resilience
- H1: Community engagement initiatives do have an impact on Resilience
- Ho: Community engagement initiatives do not have an impact on Time Management
- H1: Community engagement initiatives do have an impact on Time Management

#### **LITERATURE REVIEW**

The research literature related to the present study available in various books, journals, research reports, surveys and electronic sources has been reviewed.

Service to communities as part of the educational experience is not a new idea. John Dewey and others promoted "learning by doing" and linked service to personal and social development in the early 1900s (Duckenfield & Wright, 1995). Scholars are in general agreement that participation in service-learning activities enhances educational outcomes for students; they also agree on a core set of best practices to create these outcomes (Eyler & Giles, 1999).The relationship between social engagement and HEIs was given by (Onyx, 2008: 98).The increasing importance and value of in HEIs around the world has led to a strong emphasis on evaluating and measuring the impact of these activities, particularly as it relates to the mutual benefit between community and the university, and other related stakeholders, such as government, civil society etc. Also, any particular initiative has the responsibility to prove its worth and to justify its applicability in a given setting. The same stands true for Community University Engagement (CUE). Thus, assessment of the impacts arising from CUE activities provides the evidence and justification for the use of resources for achieving said objectives .A growing body of literature has developed in this field as universities across the world have clearly defined CUE as a visible part of their long-term strategic plan. However, less literature currently exists not only on how universities with clear CUE agendas are attempting to measure the impact of community engagement within their university (see Hart et al. 2009; Hart 2010 for similar findings). Anne Marie Gruber (2017) defines community engagement as "collaboration between institutions of higher education and their larger communities for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity."<sup>2</sup> Communities can be local, regional, statewide, national, or international. The Carnegie Foundation emphasizes that such partnerships not only address societal concerns and contribute to the public good, but also can enhance teaching, learning, and research, preparing students to be engaged citizens.

#### **RESEARCH DESIGN AND METHODOLOGY**

The research method used was quantitative in nature. A survey questionnaire on student's perception on impact of community engagement initiative on skill development and its role in employability in post pandemic labour market was used to collect the data. A five-point Likert scale was used to measure the responses to the items on the questionnaire. The responses varied from *I strongly agree* — (5) to *I strongly disagree* — (1).

A non-probability sampling strategy was used whereby all students currently in the institute under Mumbai University and part of anyone or more than one community engagement initiative like (NSS, DLLE, and WDC) were selected for the study. The selection was based on the following facts: they compulsorily are volunteers for

one of the committee. They are studying at an institute under Mumbai University. The sample size was 338 (n=338).

The sample size was relatively low and the study was conducted in limited time.

## Results and Interpretation

### Respondent Profile

**Table 1: Gender Distribution**

Gender		
	Frequency	Percent
Female	237	70
Male	101	30
<b>Total</b>	<b>338</b>	<b>100</b>

Source: Compiled from questionnaire

**Table 2 : Committee Representa**

Committee		
	Frequency	Percent
NSS	215	64
WDC	67	20
DLLE	15	4
More than one committee	41	12
<b>Total</b>	<b>338</b>	<b>100</b>

Source: Compiled from questionnaire

**Table 2: Sample Statistics**

Descriptives					
	N	Mean	Median	SD	SE
Communication Skills	338	4.57	5	0.53	0.0288
Leadership Skills	338	4.4	4	0.656	0.0357
Resilience	338	4.29	4	0.63	0.0342
Time Management	338	4.35	4	0.656	0.0357

Source: Compiled from questionnaire

## INTERPRETATION

As the Standard Deviation is less than 1 all the respondents have responded within the 68% range of the mean response. The Standard error is in the range of 0.288 to 0.0357 for all variables signifies that the sample responses are representative of the population.

**Table 2: Impact of Community Engagement Initiatives like NSS, WDC and DLLE on Skill Development.**

One Sample T-Test						
Skills Assessed	Statistic	df	P	Mean difference	95% Confidence Interval	
					Lower	Upper
Communication Skills	159	337	< .001	4.57	4.52	4.63
Leadership Skills	123	337	< .001	4.4	4.33	4.47
Resilience	125	337	< .001	4.29	4.22	4.36
Time Management	122	337	< .001	4.35	4.28	4.42

Source: Compiled from questionnaire

## INTERPRETATION

A p-value less than 0.05 suggests that the null hypothesis has been rejected. This shows that there is significant relationship between community engagement initiatives conducted by Mumbai University and development of following skills viz communication, leadership, resilience and Time Management required for post pandemic labour market according to learners perception.

## FINDINGS AND CONCLUSION

### FINDINGS

- Majority of respondents have shown positive relation between the community engagement activities and skill development viz Communication, Leadership, Resilience, and Time Management.
- Majority of respondents have shown positive relation between these skills and their relevance in post pandemic labour market.
- These skills are critical for the post pandemic labour market according to a skill survey conducted by Skill India Report.

### CONCLUSION

Community engagement is a part of institutional activities but the benefits and long term developmental impact this has on students' needs to be studied to create a more effective program focusing on community and student partnership which is mutually beneficial to both. Role of each stakeholder can be understood to create clear responsibilities and outcomes from the activities. The findings from the current study suggest that students have a strong positive perception about the impact of these activities on their skill development.

The focused development of these skills can help industry and Academia Bridge the skill gap for the post pandemic labour market

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## **A Study on Impact of Pandemic on Consumer Buying Behaviour with Respect to Smart Digital Wellness Products and Services**

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### **ABSTRACT**

The Covid 19 pandemic has restricted overall movement of people leading to changes in lifestyle and buying pattern. Digitalisation has led to behavioural changes in Indian consumers. People are choosing various digital wellness products and services for healthier, happy and balanced lifestyle. Wellness products and services are still in the infant stage in India. Therefore there is a need to gain knowledge about consumer's behaviour towards wellness products and services. This paper specifically aims at finding out awareness level, purchase behaviour and frequency of usage of Smart Digital wellness products and services during pandemic. A total of 136 questionnaires were collected online using convenient sampling method. The results of the study indicate a significant influence of gender on the purchase of wellness products and services since the outbreak of pandemic. A significant difference between family income and purchase of smart digital wellness products was observed. However, there is no significant difference between family income and purchase of smart digital wellness services since the outbreak of pandemic. Significant median differences were observed in the consumers' awareness level and frequency of usage of Smart Digital wellness products and services during pandemic. The study reveals that pandemic has made an impact on buying behaviour of Digital Smart wellness products and services. The findings offer more avenues of study for researchers. The finding can be used by marketers to design appropriate marketing strategy for wellness products and services.

**Keywords:** Consumer buying behaviour, Smart Digital Wellness products, Smart Digital Wellness Services, Pandemic

### **INTRODUCTION**

Wellness is self-care for the mind, body, and soul. In recent years, the wellness industry has gained widespread popularity for promoting a broad array of products and services related to nutrition, fitness, beauty products, sleep, yoga, natural remedies, meditation, and self-care. Wellness industry is currently valued at Rs. 490 billion as per FICCI's estimates. This rapid growth in the health and wellness market is being driven by various factors such as increasing demand for affordable healthcare delivery systems, rising disposable income within the Indian middle class, entry of private-sector investors in the new verticals of the health and wellness market, Government initiatives, such as 'National AYUSH (Ayurveda, Yoga, Unani, Siddha, and Homoeopathy) Mission', which cultivate the right environment and stimulate growth, tax benefits and incentives in the healthcare market, which attract investments and create a strong foundation to sustain this growth.

Wellness resonates well with consumers in the current climate. Rising incidences of chronic lifestyle diseases, stress and other ailments, societal changes, individual's lifestyle trends and globalization are creating greater awareness about the need of wellness among individuals. It is providing a lifeline to cope with the current anxieties and insecurities that surround us especially at times of Covid 19 pandemic. In the chaotic and frightening environment, wellness products and services are used by the consumers to provide a sense of individual control, help cultivate inner calm, and offer much-needed emotional support. Pre coronavirus pandemic, wellness industry was more focused on wealthy or higher income group target audience who were buyers of expensive wellness products and experiences. Since the coronavirus outbreak, wellness culture and its importance has grown in everyone's life globally. Consumers now give priority to their mental and physical health.

According to McKinsey survey, The number of U.S. consumers using telehealth rose from 11% in 2019 to 46% in 2020 and online sales of home based fitness equipment increased by 55%. Surge in COVID-19 cases have increased the consumer demand of various wellness products such as multi- vitamins, minerals and supplements, immunity boosters, organic food, natural products, personal hygiene and homecare products, nutritional supplements, Ayurvedic products, Keto diet, diabetic-friendly snacks, healthy meals being delivered to the doorstep, etc. There has also been increase in mental health issues resulting in frequent online mental health sessions on various wellness platforms. Some of the consumer behavioural changes emerging from the impact of COVID-19 are increased digital adoption, change

in mobility patterns, change in purchasing behaviour, increased awareness of health and changes in interpersonal behaviour. The COVID-19 pandemic is favouring digital transitions in many industries and in society as a whole. As wellness becomes increasingly homebound, the target market for wellness products and services has expanded tremendously making it accessible to more people leading to increase in its purchase. Healthcare is at the dawn of a paradigm change to reach the new era of smart disease control and detection, virtual care, smart health management, smart monitoring, and decision-making. The industry has seen stronger demand for convenient diagnostic and symptom tracking solutions, digital medical guidance and health education, home therapy, and products and services that support healthier cooking practices. Most wellness sites are offering virtual workout sessions to keen followers on Zoom, Google meet, You tube etc. Many health and wellness groups are promoting on various social media platforms such as whatsapp, Instagram, twitter etc. On-demand streaming classes and personal workouts are now more popular than ever. The rise of new fitness apps has played a significant role in boosting digital platforms. Fitness, health and data tracking wearables have become popular. Many Indians are using wearable devices such as digital fitness bands and smart watches to keep up with their health and fitness by indulging in self-care and tracking their fitness level. There is also rising demand in subscription of various health tracking and fitness apps which helps customers to watch and record their heart rate, daily burned calories, step counts, water intake, sleep, exercise and diet records. Thus, the wellness has become a lifestyle rather than an occasional activity and encompasses many angles of consumer's daily life.

### **STATEMENT OF PROBLEM**

Wellness industry is no longer a niche market, it is moving from exclusive to inclusive. Shift in buying behaviour of consumers has also been noticed. Moreover, due to the pandemic, virtual health and fitness are becoming the "new normal". There is a need to study the impact of pandemic on consumers' buying behaviour. There is a vast scope of research in wellness industry. However, only a few academic studies were made in the past. An empirical study can be made individually on each sector of the wellness industry to identify the impact of pandemic on its competitive advantage. The focus of research paper will be to understand the impact of pandemic on buying behaviour of smart digital wellness products and services.

### **OBJECTIVES OF THE STUDY**

The main aim of the study is to understand the impact of pandemic on consumer buying behaviour with respect to smart digital wellness products and services.

- To find out awareness level of Smart digital wellness products and services before and during the pandemic
- To understand the relationship between demographic factors and purchase behaviour with respect to digital smart wellness products and services during pandemic
- To know the frequency of usage of Smart Digital wellness products and services during pandemic.

### **HYPOTHESIS STATEMENT**

Following Hypothesis were set for conducting study-

- 1) **To understand the awareness level of smart digital wellness products and services during pandemic, following hypothesis were set.**

#### **HYPOTHESIS 1**

H0 There is no significant difference in median levels of awareness of Smart Digital wellness products and services during pandemic

H1 There is significant difference in median levels of awareness of Smart Digital wellness products and services during pandemic

- 2) **To understand the relationship between demographic factors and purchase behaviour of smart digital wellness and services, following hypothesis were set**

#### **HYPOTHESIS 2**

i. H0 There is no significant difference between family income and purchase of wellness products and services since the outbreak of pandemic.

H1 There is significant difference between family income and purchase of wellness products and services since the outbreak of pandemic

ii. H<sub>0</sub> There is no significant difference between gender and purchase of wellness products and services since the outbreak of pandemic.

H<sub>1</sub> There is significant difference between gender and purchase of wellness products and services since the outbreak of pandemic

iii. H<sub>0</sub> There is no significant difference between age and purchase of wellness products and services since the outbreak of pandemic.

H<sub>1</sub> There is significant difference between age and purchase of wellness products and services since the outbreak of pandemic

### **3) To know the usage of smart digital wellness products and services during pandemic, following hypothesis were setup**

#### **HYPOTHESIS 3**

H<sub>0</sub> There is no significant difference in median levels of frequency of usage of Smart Digital wellness products and services during pandemic

H<sub>1</sub> There is significant difference in median levels of frequency of usage of Smart Digital wellness products and services during pandemic

#### **RESEARCH METHODOLOGY**

Explorative and Descriptive research design is adopted.

- **Population and Sample of the Study**

- Elements - Individuals purchasing wellness products and services.

- Sampling units – Navi Mumbai and Mumbai city

- **Sample Size:** 136 respondents

- **DATA COLLECTION**

- Primary data was collected through online survey with the help of structured questionnaire. Convenience Sampling Method and Likert's 5-point scale was used in questionnaires for collecting first-hand information.

- Also, data was collected through secondary sources such as journals, articles, websites, books, magazines, journals, newspaper, reports etc.

- Extensive review of literature was conducted

- **Statistical Tools**

- Alongwith with Percentage analysis, Statistical Hypothesis Test- Chi-square test was used. Non-parametric method- Kruskal–Wallis H test was also conducted.

- **LIMITATIONS OF THE STUDY:**

- The survey of the study is limited to customers within the Navi Mumbai and Mumbai city only. The study is restricted to only few digital wellness products and services. The study is focused more on purchase behavior. Some of the data could not fully capture the true characteristics of buying behavior before and during pandemic.

#### **REVIEW OF LITERATURE**

Consumer behavior is complex and very often not considered rational. (Dey S, 2017). A further challenge will be consumer personalities which differ across borders and also between and within regions. The vulnerable consumer, who does not always have access to the same number of choices as the average consumer, also needs to be taken into account. From the market perspective, people of India comprise different segments of consumers, based on class, status, and income. Creating value along with delivering delight to the customer is what is most important. In the era of digital age it is important to keep up with new trends in the social media.

A significant proportion of youth has health impacting behaviours and conditions that affect their growth and development. (Gururaj S., 2014) Some of the major health impacting behaviours and problems among the young people include under nutrition and over nutrition, common mental disorders including stress and anxiety, suicidal tendencies and increased suicidal death rates, increased consumption of tobacco, alcohol and other substance use. Many of these problems are closely linked to on-going nutrition and epidemiological transition

and are behaviour related with a life course perspective. There is a need to promote health and healthy lifestyles amongst young people and establish mechanisms for strategic investments in health, nutrition, education, employment and welfare are critical for healthy growth of young people.

When referring to the retention of clients, it is important to mention that one of the main tendencies of the health and fitness industry is the development and the massive implementation of advanced Customer Relationship Management (CRM) systems – with a strong focus on technological novelty. (Peppers and Rogers, 2004). Using sophisticated hardware and software, health and fitness clubs will be able to know, in detail, the preferences of their members and that will also allow them to develop creative relationship marketing actions

Both male and female users may perform differently in their online activities such as communicating with others, viewing photos and videos, tracking people, events, posting or forwarding information, playing online games, reading and sharing promotional information with others (Luna-Nevarez and Torres, 2015).

The study evaluated the acceptability and usability of the Fitbit Flex 2 and app among inactive adolescent girls. (Voskuil, V. R., et al. 2020) Findings indicated good acceptability with high ratings on the Fitbit survey and participants noting that awareness, goal-setting, and motivation were facilitated by the tracker and app. Usability ratings were also high and most girls wore their device and used the app for one week; however, results from the qualitative analysis indicated areas for improvement with respect to usability.

The study aimed to understand health technology usage, perceived needs, and acceptability of app based interventions in patients with severe mental illness to improve illness management and reduce caregiver burden. (Sinha Deb K, Tuli A, Sood M, Chadda R, Verma R, Kumar S, et al. 2018) It systematically looked into the scope, design considerations and limitations of implementing a mobile technology based intervention for low resource settings. With only one-third of the patients and caregivers having access to smartphones and internet, parallel outreach strategies like IVRS were recommended while designing interventions.

The COVID-19 pandemic will change the way health care services are delivered, and there will be a greater reliance on and integration of technology going forward. (Ramsetty A, Adams C. 2020). The complexity of social and health issues that contribute to accessibility and adoption of health related technologies need to be more fully examined and addressed before the benefits could be realized to the fullest extent in all populations. Otherwise, despite advancements, there will be increase of disparities in healthcare access and outcomes, often to the detriment of those who are most vulnerable in times of crises.

The COVID-19 pandemic is favouring digital transitions in many industries and in society as a whole. (Golinelli D, B. E, Carullo G, Nuzzolese A, et.al. 2020). Health care organizations have responded to the first phase of the pandemic by rapidly adopting digital solutions and advanced technology tools. In the field of diagnosis, digital solutions that integrate with traditional methods, such as AI-based diagnostic algorithms based both on imaging and clinical data, appear to be promising. For surveillance, digital apps have already proven their effectiveness; however, problems related to privacy and usability remain.

## **SCOPE OF THE STUDY**

The present study emphasizes the need of studying the impact of pandemic on consumer buying behaviour with respect to smart digital wellness products and services. Collection of data was done from 136 respondents from Mumbai and Navi Mumbai region. The study includes understanding the awareness level of smart digital wellness products and services, relationship between demographic factors and purchase behaviour and usage of smart digital wellness products and services during pandemic.

## **RESULTS AND FINDINGS**

Percentage analysis method was used for demographic profile analysis.

A descriptive analysis was conducted on the demographic profiles of the respondents. The majority of the respondents were female (66.2%), whereas male accounted for 33.8 % of the respondents. Most of the respondents were 15 to 25 years old (70.4%) followed by 26-35 years old (26.7 %) and only 3 % above 35 years. 35.3% reported that their annual family income is less than Rs. 5 lakhs. 33.1 % respondents annual income is between 5lakhs and 10 lakhs, 14% respondents annual income is between 10 to 15 lakhs 6.6 % annual income is between 15 to 20 lakhs. 11 % of respondents above 20lakhs. In occupation, Students respondents (47.8%) were highest followed by employees (44.9%). The respondents also included self-employed (5.9%) and homemaker (1.5%)

### **Empirical Results**

### Awareness Level during Pandemic

Smart Digital Wellness Products	Before Pandemic %	During Pandemic %
Smart Watches	53.68	70.77
Fitness Bands	51.47	66.91

**Table 1**

The awareness level of smart digital wellness products has increased during pandemic. Table 1 shows that only 53.68% of respondents were aware about smart watches and 51.47% of respondents were aware about fitness bands before pandemic. During the pandemic there has been increase in awareness level of respondents by 17.09% for smart watches and increase in awareness level by 15.44% for fitness bands. At present, 70.77% of respondents are aware about smart watches and 66.91% about fitness bands.

Smart Digital Wellness Services	Before Pandemic %	During Pandemic %
Medical Tracking App	32.35%	57.35%
Pedometer App	26.48%	47.79%
Calorie Counter App	35.56%	52.94%
Workout Tracker App	47.06%	63.24%
Fitness Tracking App	53.68%	66.91%
Water Reminder App	13.24%	25%

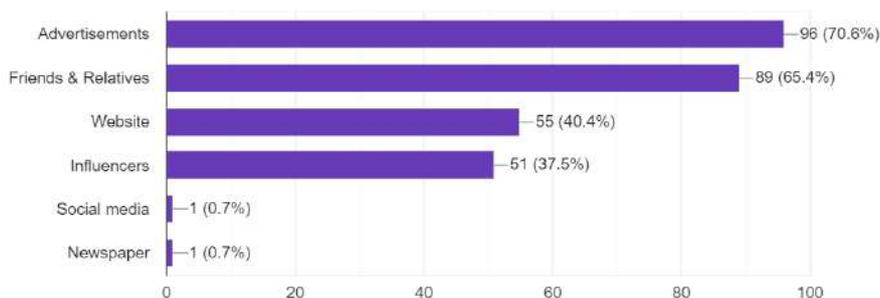
**Table 2**

There has been increase in awareness level of all smart digital wellness services during pandemic. The maximum increase in awareness level during pandemic is noticed in medical tracking app (25%), followed by pedometer (21.31%), calorie counter app (17.38%), workout tracker app (16.18%), fitness tracking app (13.23%) and water reminder app (13.23%).

Increase in Awareness level of all smart digital wellness services is noticed. However, consumers were more familiar with Smart watches, Fitness Tracking App, Fitness Bands and Workout Tracker even before pandemic. During pandemic, consumers became more aware with Medical Tracking App, Pedometer App and Calorie Counter App.

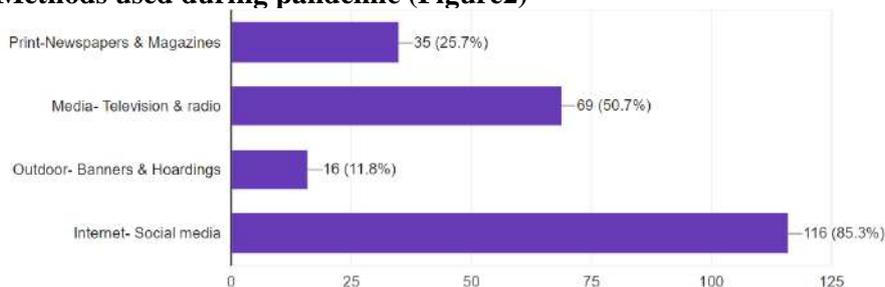
### Information during Pandemic

#### • Sources of Information during pandemic (Figure 1)



Traditional source of information methods like advertisements (70.6%) was used maximum followed by information through friends and relatives (65.4). Website (40.4%) and Social media influencers (37.5%) were also used to gather information about digital wellness products and services.

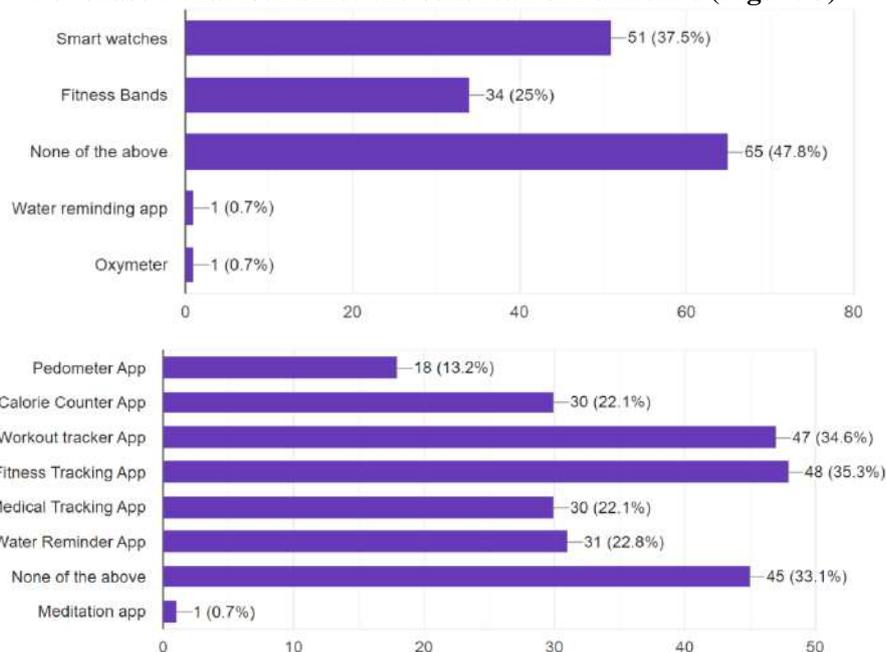
#### • Promotional Methods used during pandemic (Figure2)



During pandemic, due to lockdown and restrictions there was minimum usage of outdoor promotional techniques like banners and hoardings (11.8%) and print media like newspaper and magazines (25.7%). Instead, Wellness industry players preferred media like television and radio (50.7%) to promote their products. Pandemic paved way for maximum usage of internet through social media (85.3%) for promoting wellness products and services.

**Hypothesis Analysis was conducted to understand the Awareness Level of wellness products and services during pandemic.** Kruskal–Wallis H Test was performed for smart digital wellness products and services. Value of H (31.42) was found to be greater than Table Value (9.48). Hence H<sub>0</sub> was Rejected and H<sub>1</sub> Accepted. Hence, there is significant difference in median levels of awareness of Smart Digital wellness products and services during pandemic. This justifies that during the pandemic, the level of awareness has increased in all the smart digital wellness devices and apps.

**Purchase Behaviour since the outbreak of Pandemic (Figure 3)**



Majority (47.8%) have not purchased any Digital wellness products. Only 37.5 % have purchased smart watches and 25% of respondents have purchased fitness bands. Where as in Digital wellness services, Fitness Tracking App is subscribed by majority of respondents (35.3%) followed by Workout tracker app (34.6%). Only 22.8% of respondents purchased water reminder app, 22.1% purchased medical tracking app and calorie counter app and 13.2 % of respondents purchased pedometer app. 33.1% of respondents didn't subscribe to any smart digital wellness services.

Analysis for finding out reasons for purchasing smart digital wellness products and services was conducted. 34.56% strongly agreed for purchasing wellness products and services for healthier lifestyle and 41.18% moderately agreed wellness products and services as a solution to their medical problems. 36.76% of respondents purchased for fulfilling their psychological needs and 28.68% for their social status. Only 16.18 % of respondents brought wellness products services due to sales promotional techniques.

Majority of respondents (38.97%) remained neutral for pandemic being the only reason of purchase of smart digital wellness products and services. Only 23.53% of respondents agreed whereas 37.5 % of respondents disagreed that pandemic was the only reason of purchase of smart digital wellness products and services.

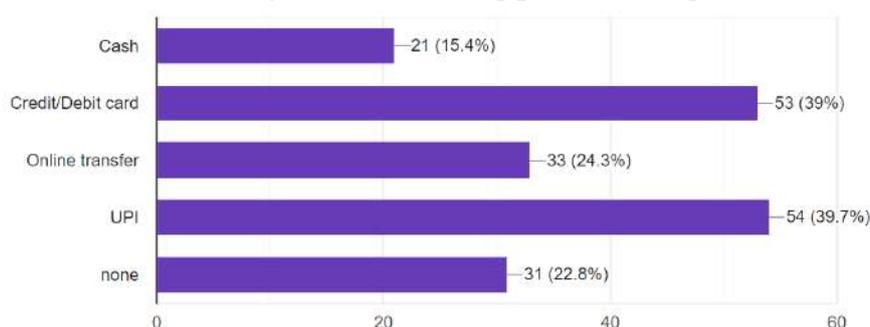
**Amount spent annually on purchase of Smart Digital Wellness Devices (Table 3)**

	0	Rs.1-10,000	Rs.10,001-25,000	Rs. 25,001-50,000	Above Rs 50,000
<b>Smart Digital Wellness Devices</b>					
<b>Before Pandemic</b>	55.88%	35.29%	5.15%	2.94%	Nil
<b>During Pandemic</b>	42.65%	47.06%	8.82%	1.47%	Nil

Smart Digital Fitness Apps					
<b>Before Pandemic</b>	66.91%	27.21%	2.21%	2.94%	0.74%
<b>During Pandemic</b>	55.15%	38.97%	5.14%	0.74%	Nil

From the table 3, it is understood that majority of the respondents have not spent any amount to purchase smart digital wellness devices and apps before as well as during pandemic. Majority of the respondents, 47.06% (smart digital devices) and 38.97% (smart digital fitness apps), have spent maximum up to Rs. 10,000 annually during pandemic. It has been observed that there has been increase in annual spending during pandemic in Rs. 10,001 to 25,000 category by 3.67% (smart digital devices) and 2.93% (smart digital apps). Whereas in annual spending during pandemic in Rs. 25001- Rs.50000 category, a decline in spending by 1.47% (smart digital devices) and 2.19% (smart digital app) is witnessed. None of the respondents have annually spent more than Rs.50,000 in smart digital devices and apps.

Mode of Payment used during pandemic (Figure 4)



It has been observed that Unified Payment Interface (39.7%), Cards (39%) and online transfers (24.3%) were preferred over cash transaction (15.4%) during pandemic.

**Hypothesis Analysis for understanding relationship between demographic factors (family income, gender and age) and purchase behavior during pandemic was done.**

- Chi square Test was conducted to find out relationship between family income and purchase behavior. It was found that in Smart Digital devices category,  $X^2$  (calculated value 25.78) was greater than  $X^2$  (tabulated value 21.03 at degree of freedom 12). P value  $0.012 < 0.05$  hence, rejected null hypothesis  $H_0$  and accepted alternative hypothesis  $H_1$ . Whereas in Smart Digital fitness app category,  $X^2$  (calculated 32.49) was lesser than  $X^2$  (tabulated value 41.34 at degree of freedom 28). P value  $0.255 > 0.05$  hence, null hypothesis  $H_0$  was accepted and alternative hypothesis  $H_1$  was rejected. Thus, we can state that there is a significant difference between family income and purchase of smart digital wellness products but there is no significant difference between family income and purchase of smart digital wellness services since the outbreak of pandemic.
- Chi square Test was conducted to find out relationship between gender and purchase behavior. It was found that in Smart Digital devices category,  $X^2$  (calculated 9.74) was greater than  $X^2$  (tabulated value 7.81 at degree of freedom 3). P value  $0.021 < 0.05$  hence, rejected null hypothesis  $H_0$  and accepted alternative hypothesis  $H_1$ . Also, in Smart Digital fitness app category,  $X^2$  (calculated 29.47) was greater than  $X^2$  (tabulated value 14.07 at degree of freedom 7). P value  $0.00 < 0.05$  hence, rejected null hypothesis  $H_0$  and accepted alternative hypothesis  $H_1$ . Thus, we can state that there is a significant difference between gender and purchase of smart digital wellness products as well as services since the outbreak of pandemic.
- Chi square test was conducted to find out relationship between age and purchase behavior. It was found that smart digital devices category,  $X^2$  (calculated value 2.24) was lesser than  $X^2$  (tabulated value 12.59 at degree of freedom 6) P value  $0.896 > 0.05$ , hence null hypothesis  $H_0$  is accepted and  $H_1$  is rejected. In Smart Digital fitness app category,  $X^2$  (calculated 7.69) was lesser than  $X^2$  (tabulated value 23.68 at degree of freedom 14). P value  $0.905 > 0.05$  hence, null hypothesis  $H_0$  is accepted and alternative hypothesis  $H_1$  is rejected. Thus, we can state that there is no significant difference between age and purchase of smart digital wellness products and services since the outbreak of pandemic.

- Thus we can state that consumers have purchased different types of Smart digital wellness device and fitness wellness apps based on their gender, family income and age during pandemic.

#### **Frequency of usage during pandemic**

- Majority of consumers are moderately using Smart watches (30.88%) followed by fitness bands (29.41%) and Calorie Counter app (29.41%) as well as Fitness tracking app (29.41%). Only 27.95% have moderately used workout tracker app. Water reminder app is moderately as well as never used by 25.73% of respondents. 27.21 % of respondents has never used pedometer app and 24.26% of respondents have never used medical tracking app. Thus, we can state that usage of digital Wellness devices as well as smart digital fitness apps was moderate in pandemic.

**Hypothesis Testing for Frequency of Usage of smart digital wellness products and services was done.** Kruskal–Wallis H Test was performed. Value of H (24.3626) > Table Value (9.48772) Hence H<sub>0</sub> is rejected and H<sub>1</sub> is accepted. Thus, there is significant difference in median levels of frequency of usage of Smart Digital wellness products and services during pandemic. We can state that during pandemic, consumers used various smart digital devices and wellness fitness apps as per their needs, knowledge and awareness.

There is an impact of pandemic on consumer buying behaviour with respect to smart digital wellness products and services in Navi Mumbai and Mumbai city. Awareness level of Smart Digital Wellness products and services has increased due to pandemic. Medical problems and shift towards healthier lifestyle are becoming major reason for purchase of wellness products and services during pandemic. There is variation in purchase behaviour with respect to demographic factors. However usage of wellness products and services is moderate.

#### **SUGGESTIONS**

The companies operating in global health & wellness market should embrace several strategies including consumer-centric approach, new product development, venture capital investment, strategic collaborations and agreements and product portfolio expansion. However post pandemic, wellness industry players will have to strategize and position effectively by designing unique Marketing mix and move towards more personalised wellness products and services. Consumer need based analysis should be done for customer engagement and customer motivation to increase the use the digital wellness products and services. Holistic online strategy should be developed to encourage habitual buying behaviour. Utilizing influencer marketing on Instagram and YouTube to reach out to target audience of young fitness enthusiasts should be used on large scale. Content and videos should be paired with authentic experiences. Artificial Intelligence should be used to expand service digital offerings, connected devices and virtual/online communities.

#### **CONCLUSION**

Significant median differences were observed in the consumers' awareness level and frequency of usage of Smart Digital wellness products and services during pandemic. A significant influence of demographic factors (family income and gender except age) on the purchase of wellness products and services were observed since the outbreak of pandemic. Pandemic has made an impact on purchase behaviour of Digital Smart wellness products and services. A rise in both consumer interest and purchasing power was noticed. Social media marketing has been instrumental in spreading the popularity of health and wellness products among all demographics. The current COVID-19 pandemic has made the society realise the importance of physical and mental health well-being. Wellness is now being looked at as a comprehensive and holistic approach towards the betterment of mind and body.

Post pandemic, physical and mental health will remain a priority for millions of people across the globe for a long time to come. The market will witness increase in spending on personal health, appearance, fitness, and other wellness products and services. The social and psychological approach of the consumer will draws the wellness industry to come up with out of the box solutions with integrated technologies for ease, experience and excellence. The wellness industry has great potential for research in every verticals of industry. A clear focus must be made by researchers, institutions, corporate's and government to explore to its optimum extent to reap maximum benefits.

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## **Study of New Normal and Financial Stability of Faculty in Higher Education Institutions during Covid as Pandemic Situation: Challenges and Opportunities**

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### **ABSTRACT**

New normal is a terminology repeatedly used whenever the economy or society has faced challenges and came out of those challenges and settled down following the crisis.

Higher education is one of the service industries which has got affected a lot. Due to COVID -19 working culture of this industry has got changed. Schools, Colleges, and various institutions have shifted from the traditional method of teaching and learning to the Online method of teaching and learning.

During this period teacher fraternity has faced a lot many problems like reduction in salary, Irregular Income, Loss of job of Visiting Faculty, Contractual basis teachers, Senior faculties those could not match with the criteria of technology adoption, Development of E-Content, etc. The study had been conducted to find out the challenges faced by Faculties in this Pandemic Situation and to determine various opportunities, envision by Faculties for the immediate future.

To determine the aforesaid purpose a well-structured questionnaire has been distributed among faculties and a total of 99 responses had got collected. The interpretation and analysis of data had been done by using SPSS and it has been found that COVID -19 has brought so many challenges for faculties and has affected their financial stability significantly.

**Keywords:** COVID-19, Financial stability, New normal, Higher education, Opportunities, and Challenges.

### **INTRODUCTION**

**NEW NORMAL IN THE RECENT COVID -19** Pandemic indicates the change in human behavior. How human has adopted the new normal to overcome the pandemic situation. It also has changed the work culture of society.

**Society has started adopting a changed lifestyle. The following behavior has been adopted by society in a new normal phase during the pandemic**

- 1) More emphasis is given on the use of sanitizer,
- 2) Use of Mask to prevent self, from the spread of infection
- 3) Started following the social distancing norms
- 4) Avoid social gatherings etc.

In a new normal after COVID -19 Pandemic the work culture also has changed a lot for many industries, with an exception in the work culture of Banks, Financial institutions, and Manufacturing units of necessity items.

Following challenges and opportunities has been observed at the workplace due to changes in the work culture

**Challenges observed in the following industry and by workers**

- 1) Education Industry
- 2) Retail Industry
- 3) Transportation
- 4) Tourist and Travel industry
- 5) Daily wages workers/ Unskilled laborer
- 6) Reduced Earnings
- 7) Fear of Job loss etc.

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At another hand, it also has come up with many opportunities. Which has been observed at the various level as under

- 1) Increased level of E-commerce business
- 2) Digital Marketing
- 3) Online Teaching and Learning
- 4) Skilled-based startups etc.

So, the new normal of life after the COVID-19 Pandemic is the adoption of challenges and coming up with new opportunities, and settling down in routine life.

**FINANCIAL STABILITY:** Financial stability is the state in which one's financial position is very strong. In this condition, an individual can plan their savings and Investment in a very thoughtful way; as do not have to worry about any kind of debt. When the individual is financially stable should plan for investment which will help to secure the future.

**FINANCIAL STABILITY OF FACULTY IN HIGHER EDUCATION DURING COVID -19:** The financial stability of the teacher's fraternity has got disturbed due to the loss of jobs and half payment system adopted by schools and colleges. Those teachers have phased lot many challenges during that period. In some families where both are working in the same field had hit very hard concerning financial stability. The financial balance in the family has been lost. Expenditures have got increased while Income had got reduced. In addition to the regular expenses; medical expenses also had got increased.

#### REVIEW OF LITERATURE

**(Acharya, 2020)** "Quest for Restoring Financial Stability in India" The title itself suggests what the author has tried to narrate with the help of this book. The author has talked about many ways to bring financial stability to the economy. He has suggested that the policies which have been framed by RBI and the government should be liberal to some extent. He also said that to achieve long-run growth in the future; one has to take small pains in the current scenario. The planning and plotting of the policies like fiscal policy, monetary policy, etc. should be in a way that can be easily acceptable in an economy and favorable for the businesses working under it.

**(Balasubramanian, 2020) Covid-19 the new age pandemic-** In this, the author has explained about the outbreak of COVID -19 Pandemic which is same as world war, only with the exception that everyone is on the one side of the world against COVID -19, and also have explained about how Indian economy along with global economy had taken a downturn due to prolonged countrywide lockdown. The author also has narrated about the lockdown impact on the economy and the various policies that have been announced by the central government and the RBI for different sectors which will help to come out from the economic shock and will also help to improve the damage caused to health, wealth and well-being of the society

**(Fleur Hull with Kym Kraljevic, 2020)** In the book named **Career after COVID-19** author has focused on, how pandemics have changed the way of doing work. Traditionally the work needs to be done by the physical presence of the employees in the location of their workplace. Documentation is one of the important modes earlier, that too in hardcopy format. For which one has to present physically at workplace due to that one have to think for so many things before grabbing the job like Location, Monetary benefit, Challenges in the job, Job security, etc. Earlier The second thought was that productivity will also affect.

But after Pandemic the views have got changed for doing the business. The business started accepting the employees working from their remote places, also has started accepting the E-form of documents, Instead of conference rooms meetings have started taking place on teleconference mode, Monetary transactions have started taking place through E-Payment i.e. via RTGS/ NEFT, Promotion of product have started by Digital marketing mode and lot many such changes have taken place for doing business.

**(Kaplan, 2021) Higher education at the crossroads of disruption;** In this book author has highlighted a few things which are going to disrupt the traditional way of education as in the current era of modernization and digitalization many corporates are believing that degrees only cannot get the knowledge; it should be attached with some value-added certification programs like MOOCs. So, many corporates are accepting those who all are holding additional certifications, or few corporates started developing their training centers to make the candidate profile updated to meet the requirements as candidature.

**(Kumar, 2020)** , In his book, he has highlighted the problem faced by the educational institute, the faculties, and the students during the pandemic. The problem faced by faculties includes institutions firing teachers,

Coaching institutions impacted, Temporary and Ad-hoc faculties not being renewed. He has also highlighted the problems faced by education institutions like an educational institution that has got closed, only limited Internet education going on, syllabi truncated, exams postponed, entrance exams for new session postponed, sessions delayed, etc.

(Wise, 2020), Save money and work from home: During and After Coronavirus” about which the author has mentioned various ways in which an individual can opt to remain financially stable during COVID -19 Pandemic. The author has suggested focusing on three things while planning for any kind of expenditure i.e., **Know the difference between Needs, Desires, and Goals** as well as the author also has said that there should be a **proper mindset and taking control of things that influence to manage one's money**. The Author has covered different areas and given the tips in three phases as Start Now (Short term tips), Medium -Term tips (to implement within the next few months), and Long -Term Planning for each of the areas. Areas covered were like Focus on food, Proof of your home costs, wired for small budgeting, Dress to impress, Travel tight, etc. The tips which he had given were like in the area of Focus on food, he gave short term tips as the switch to water for drinking instead of fruit juice, Packaged juice, etc. The medium-term tip which we had given under the same area was Buy in bulk when you can and Long term tip given by him develops a menu of the dishes you will cook and rotate them etc.

#### **AIM**

To study the financial stability of faculty in higher education institutions during COVID -19 pandemic situation

#### **OBJECTIVE OF THE STUDY**

- 1) To understand the philosophy and concept of New normal
- 2) To study the level of readiness to accept change of new normal life (w.r.t. job)
- 3) To identify the impact of New normal and financial stability of Faculties in COVID – 19 Pandemic situations
- 4) To find out the challenges faced by Faculties in this Pandemic Situation
- 5) To determine various opportunities, envision by Faculties for immediate future
- 6) To suggest some possible solutions for encouraging, developing, and improving the faculties

#### **SIGNIFICANCE OF THE STUDY**

- 1) To understand the potential of Faculties to overcome the COVID – 19 Pandemic situations
- 2) To understand is COVID -19, giving new shapes to the faculties as entrepreneurs

#### **RESEARCH METHODOLOGY**

**Primary Data:** Primary data was collected using a structured questionnaire

**Secondary Data:** with the help of Books, E-Journals, Published work, etc.

**Sample size:** Sample size taken as 99 respondents

**Sampling technique:** Stratified random sampling

**Data Analysis and Interpretation:** Percentage analysis, SPSS

#### **LIMITATIONS OF STUDY**

- 1) Limited time
- 2) Limited access to information
- 3) Due to a limited time, only a few respondents have been targeted for the survey

#### **HYPOTHESES STATEMENTS**

##### **HYPOTHESES: 1**

H<sub>0</sub>: There is no significant association between New Lifestyle and New Normal like Change in routine, financial instability, mental stress, and Feeling Low in the energy of Faculties in Higher Education during COVID-19

H<sub>1</sub>: There is a significant association between New Lifestyle and New Normal like Change in routine, financial instability, mental stress, and Feeling Low in the energy of Faculties in Higher Education during COVID-19

**HYPOTHESES: 2**

H<sub>0</sub>: COVID-19 has not opened up new opportunities for faculties to become an entrepreneur

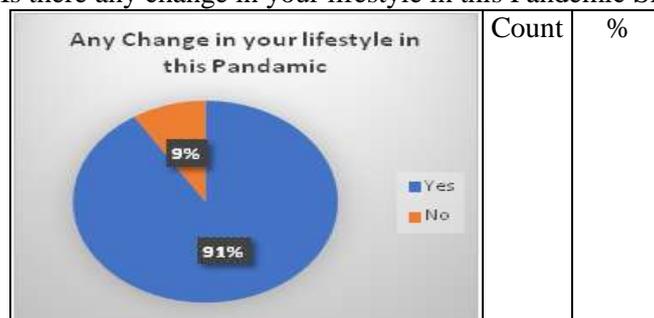
H<sub>1</sub>: COVID-19 has opened up new opportunities for faculty to become an entrepreneur

**DATA COLLECTION AND ANALYSIS**

**Table1.** Demographic Profile and Job-related Information of Respondents

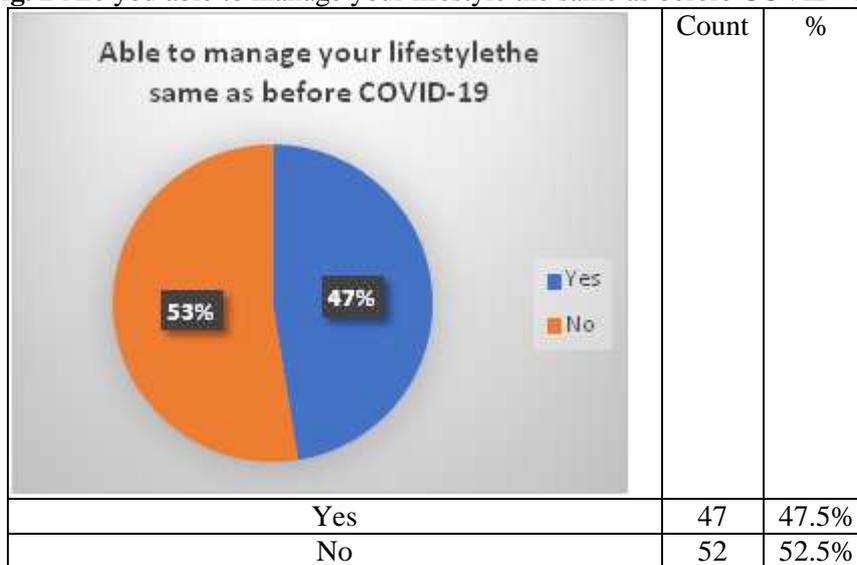
Demographic Factors	Number of Respondents	Percentage of Respondents
<b>Gender</b>		
Male	31	31.30
Female	68	68.70
<b>Total</b>	<b>99</b>	<b>100</b>
<b>Area</b>		
Rural	13	13.10
Urban	86	86.69
<b>Total</b>	<b>99</b>	<b>100</b>
<b>Department</b>		
Arts	5	5.10
Commerce	64	64.60
Science	15	15.20
Others	15	15.20
<b>Total</b>	<b>99</b>	<b>100</b>
<b>Section</b>		
Aided	18	18.20
Unaided	81	81.80
<b>Total</b>	<b>99</b>	<b>100</b>
<b>Level</b>		
Both	38	38.40
PG	10	10.10
UG	51	51.50
<b>Total</b>	<b>99</b>	<b>100</b>
<b>Status of Employment</b>		
Ad-hoc basis	1	1.00
CHB/Visiting	8	8.10
Contract Basis	40	40.40
Permanent	43	43.40
Self-Finance Course	6	6.10
Visiting Faculty	1	1.00
<b>Total</b>	<b>99</b>	<b>100</b>
<b>Year of Teaching Experience</b>		
0 to 5	21	21.20
5 to 10	31	31.30
10 to 15	24	24.20
15 and above	23	23.20
<b>Total</b>	<b>99</b>	<b>100</b>

**Fig. 1** Is there any change in your lifestyle in this Pandemic Situation?

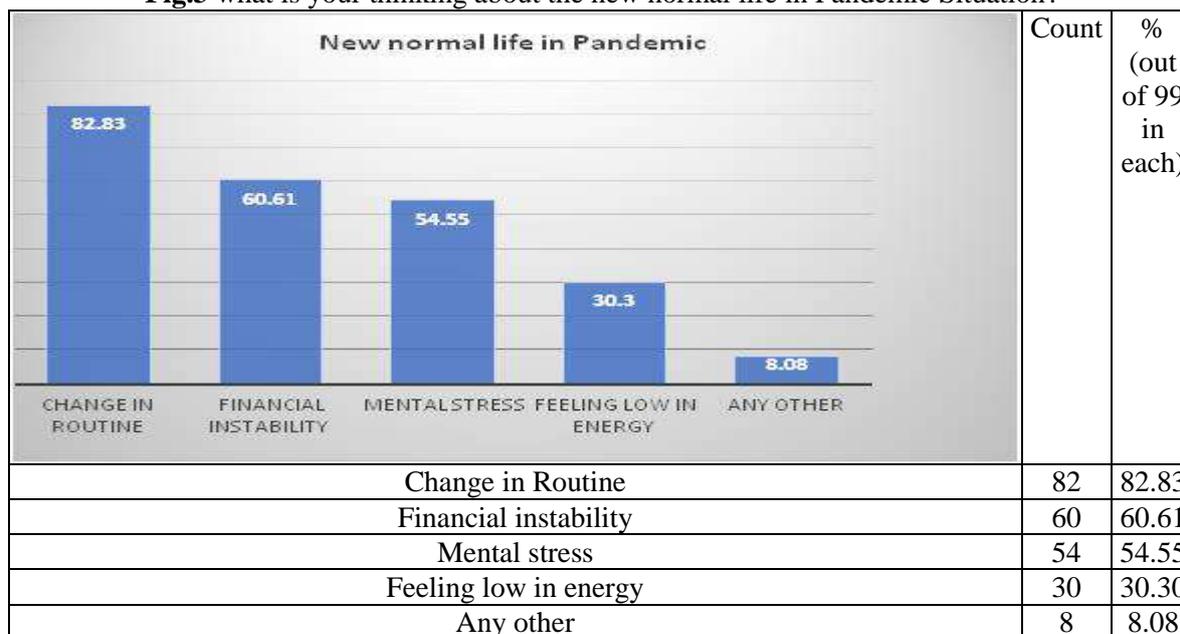


Yes	90	90.9%
No	9	9.1%

**Fig. 2** Are you able to manage your lifestyle the same as before COVID -19?



**Fig.3** what is your thinking about the new normal life in Pandemic Situation?



**Fig. 4** Are you ready to accept the change of new normal life (w.r.t. Job)?



Fig.5 has it impacted your Job as a teacher?

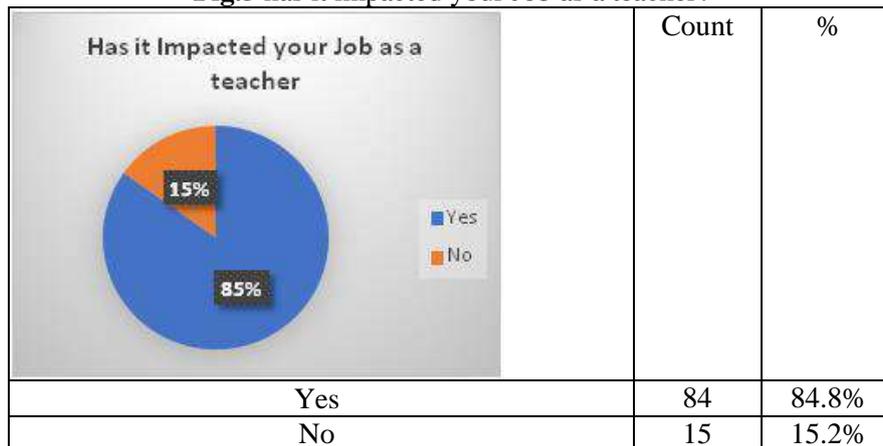


Fig. 6 what are the challenges you are facing in this Pandemic Situation?

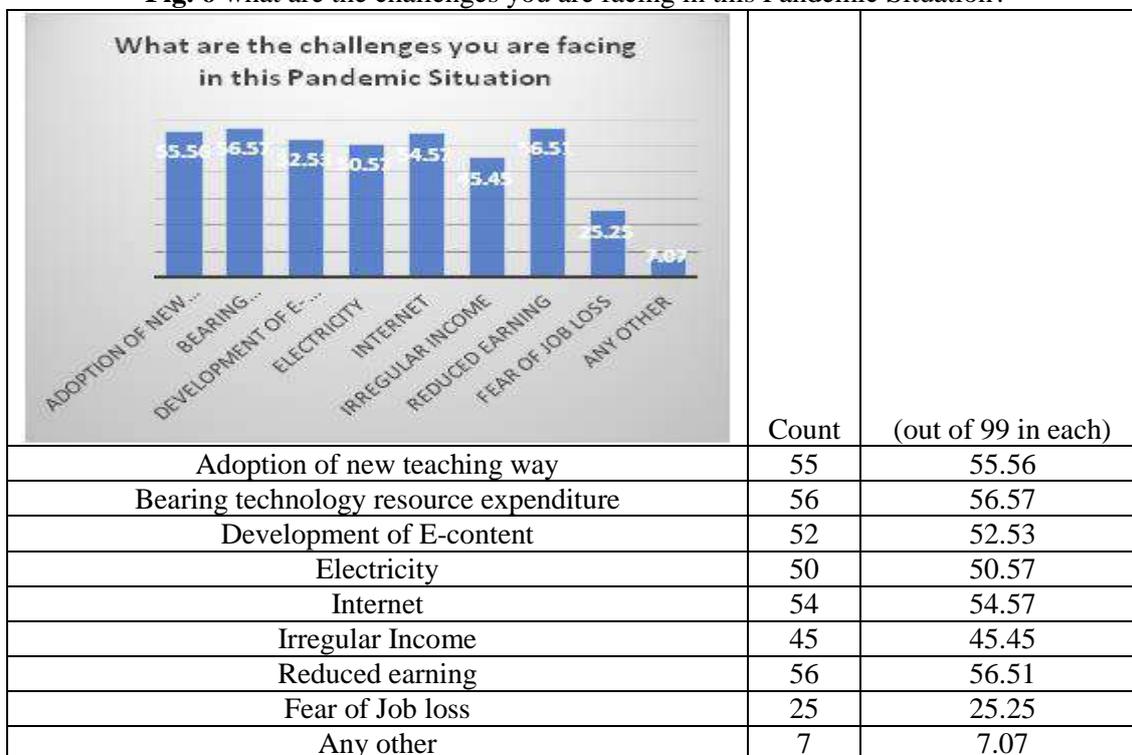


Fig. 7 Are you looking for different opportunities for earning in this Pandemic situation?

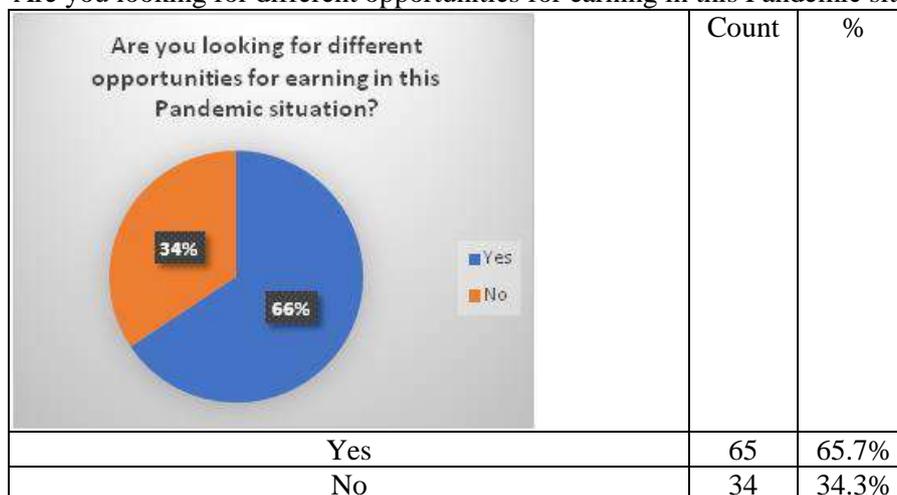
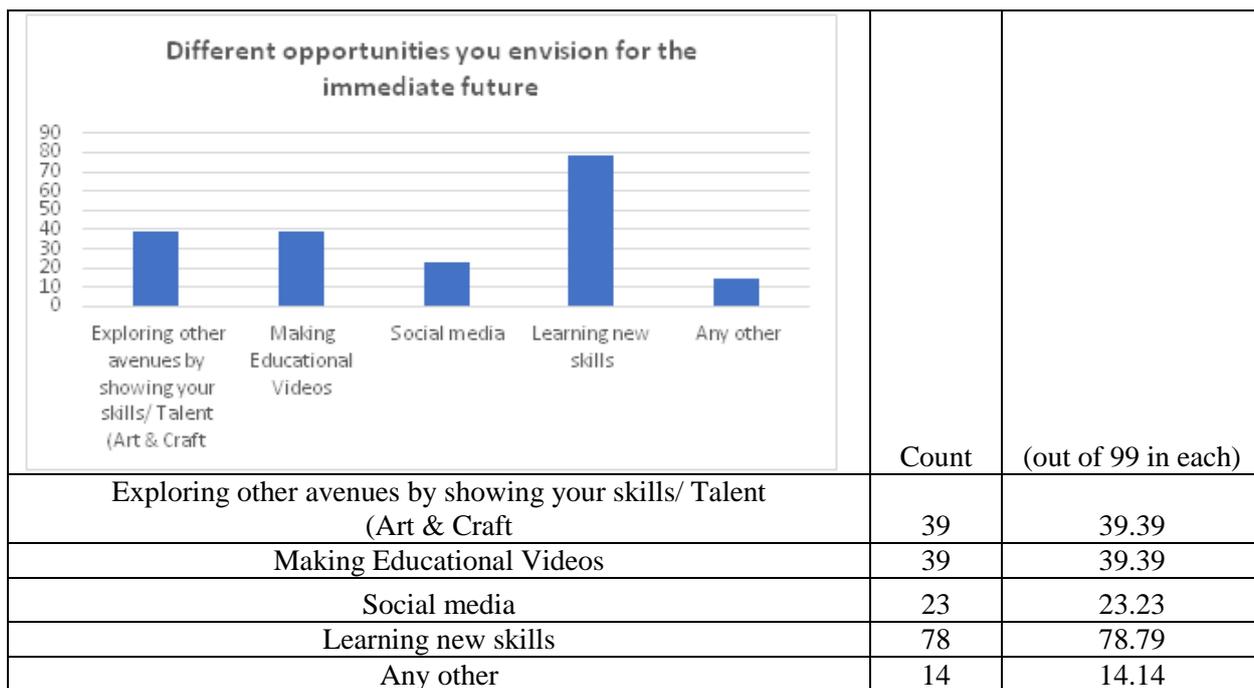
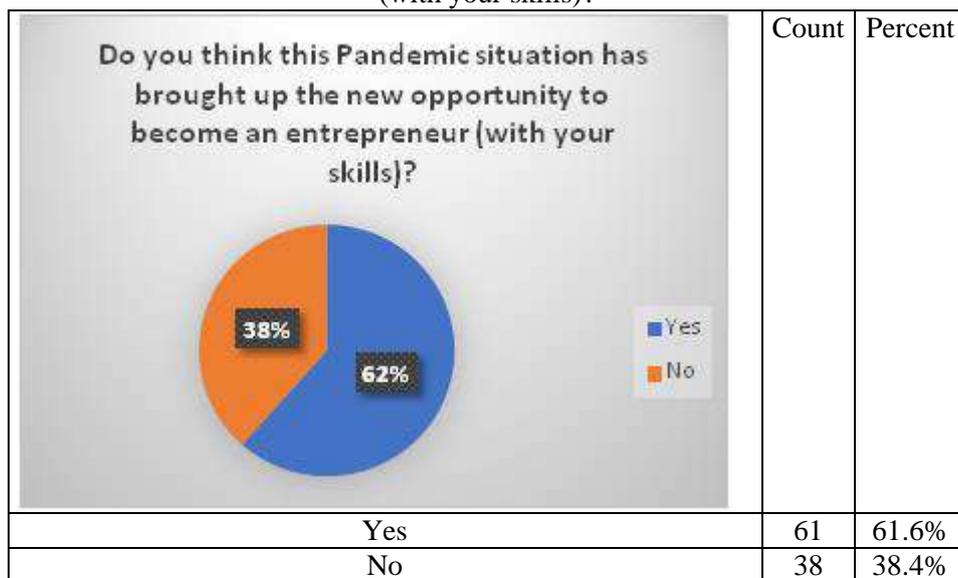


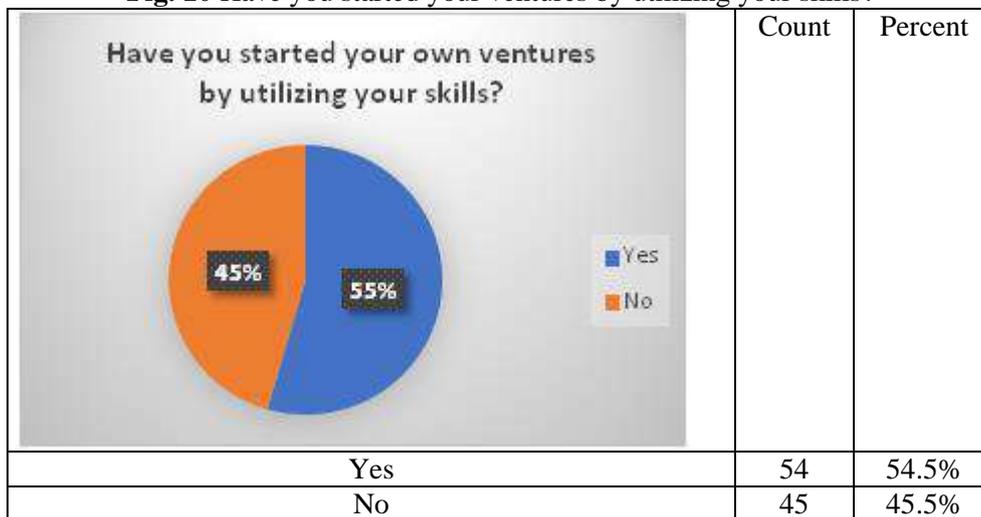
Fig. 8 what are the different opportunities you envision for the immediate future?



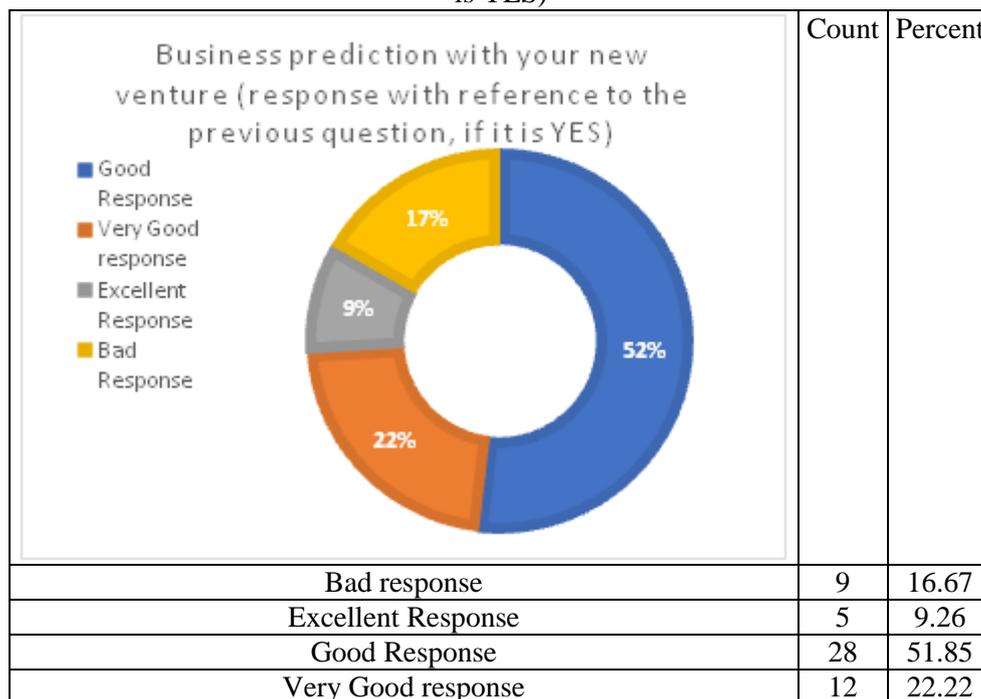
**Fig. 9** Do you think this Pandemic situation has brought up the new opportunity to become an entrepreneur (with your skills)?



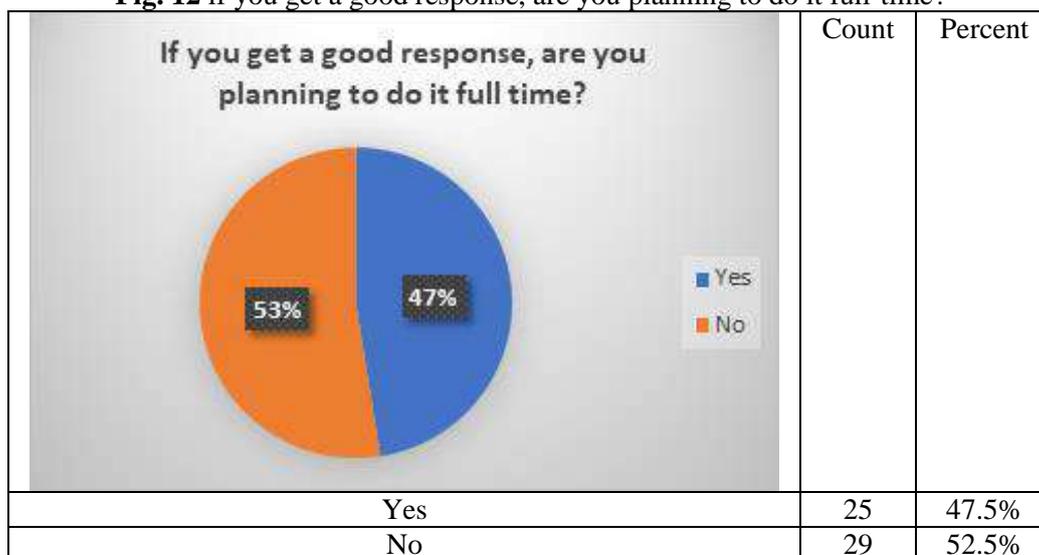
**Fig. 10** Have you started your ventures by utilizing your skills?



**Fig. 11** what is your business prediction with your new venture? (Response regarding the previous question, if it is YES)



**Fig. 12** if you get a good response, are you planning to do it full-time?



**TESTING OF HYPOTHESIS**

**HYPOTHESES: 1**

H<sub>0</sub>: There is no significant association between New Lifestyle and New Normal like Change in routine, financial instability, mental stress, and Feeling Low in the energy of Faculties in Higher Education during COVID-19

H<sub>1</sub>: There is a significant association between New Lifestyle and New Normal like Change in routine, financial instability, mental stress, and Feeling Low in the energy of Faculties in Higher Education during COVID-19

**Association of New Normal and Change in routine:**

Change in routine	Are you able to manage your lifestyle the same as before COVID -19			
	Yes		No	
	Count	%	Count	%
Yes	41	87.2%	41	78.8%
No	6	12.8%	11	21.2%

**Association of New Normal and Financial Instability**

Financial Instability	Are you able to manage your lifestyle the same as before COVID -19			
	Yes		No	
	Count	%	Count	%
Yes	23	48.9%	37	71.2%
No	24	51.1%	15	28.8%

**Association of New Normal and Mental stress:**

Mental stress	Are you able to manage your lifestyle the same as before COVID -19			
	Yes		No	
	Count	%	Count	%
Yes	23	48.9%	31	59.6%
No	24	51.1%	21	40.4%

**Association of New Normal and Feeling Low in energy:**

Feeling Low in energy	Are you able to manage your lifestyle the same as before COVID -19			
	Yes		No	
	Count	%	Count	%
Yes	12	25.5%	18	34.6%
No	35	74.5%	34	65.4%

**Chi-square test result:**

	Change in routine	Financial Instability	Mental stress	Feeling low in energy
Chi-square	1.221	5.104	1.136	.964
df	1	1	1	1
p-value	.269	.024*	.287	.326

**INTERPRETATION**

Since the p-value for the chi-square test is greater than that of 0.05 indicates that there is no association of New Normal and Change in routine, mental stress, Feeling Low in energy **except** for Financial Instability.

**HYPOTHESES: 2**

H<sub>0</sub>: COVID-19 has not opened up new opportunities for faculties to become an entrepreneur

H<sub>1</sub>: COVID-19 has opened up new opportunities for faculty to become an entrepreneur

**Chi-Square test result:** this Pandemic situation has brought up the new opportunity to become an entrepreneur (with your skills)

Value	d. f.	p-value
5.3434	1	0.0208

**INTERPRETATION**

p-value less than that of 0.05 indicates that the proportion of Yes and No is not the same for the “think this Pandemic situation has brought up the new opportunity to become an entrepreneur (with your skills)”, we conclude that the proportion of Yes is significantly more than No. **Therefore, we reject the null hypothesis and conclude** COVID-19 has opened up new opportunities for faculties to become an entrepreneur. We have compared this against demographic factors like Gender, Area, and status of employment as Permanent against Others.

**FINDINGS OF THE STUDY**

- 1) The researcher found that the lifestyle of respondents has got changed significantly and people started adopting new normal life
- 2) On survey, it has been observed that there is a tremendous impact on the jobs of the teachers in Higher education during the COVID – 19 Pandemic.
- 3) Teacher Fraternity has faced many challenges concerning reducing income, Irregular Income, Fear of job loss, development of E-content, Use of own resources, etc.
- 4) 66% of the respondent has started looking for different opportunities for earning in the immediate future to minimize the financial instability

- 5) More than half of the respondents have used their skills and came up with their start-up and have received good responses in it.
- 6) Researcher interpretation while analyzing the lifestyle with new normal on different parameters like Change in routine, Mental stress, Feeling low in energy, financial Stability was; Only financial stability of the respondent has got impacted during COVID -19 Pandemic

#### **SUGGESTIONS/ BENEFITS TO THE SOCIETY**

- 1) Today in this COVID-19 Pandemic situation it is the responsibility of the higher education institution to make the changes in the policy in such a way that, it will not impact the financial stability of an individual
- 2) Financial Institutions should come up with some policy which will help the lower-income group people of this profession to come up with new ideas of business.
- 3) Financial Institutions should support individuals to start their skill-based businesses by liberalizing certain policies and by lifting certain restrictions.
- 4) In the scenario of New normal where every sector has adopted technology to work with should train their employees to match the requirement of the job

#### **FUTURE SCOPE**

- 1) Proper planning by educational institutions will release the mental stress of those who all are working in this system
- 2) Equal importance needs to be given to educational industry for the growth of economy same as other industries as per the words of government \*पढ़ेगा भारत तो बढ़ेगा भारत\*
- 3) Government should make all the institutions compulsory to give the job security to avoid the phase of increasing unemployment.
- 4) Steps to be taken to reach to the rural and weaker section of the society for spreading awareness about online learning and teaching method.

#### **ACKNOWLEDGEMENT**

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## Cloud Services Reliability: Issues and Possible Solutions

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### ABSTRACT

Very recently and rapidly developed technology is the concept of cloud computing. Cloud provides a model for sharing resources over the web. It is a service, provided to the consumer in the form of software, infrastructure, platform with a “pay as you use” strategy. It's been more than a decade now and the world has witnessed its enhancement along with its limitations. Due to its rapid development and demand in the market, numerous enterprises have started adopting or shifted from traditional computing techniques to cloud computing techniques. For serving the ever-increasing needs of voluminous users, there needs to be an expansion in the cloud centers and its architecture. Enterprises enhance scalability to serve them and thereby increase the complexity of the system. This also introduces challenges to the security, scalability and most importantly reliability of the services being made available to the users. Optimum customer satisfaction and confidence is the ultimate goal for any cloud computing service provider. The real problem lies at identifying the reliability and high availability issues within the service and come up to solutions for the problem generated. This paper discusses how to identify the reliability issues, failures and study the algorithm for solving the issues related to reliability of cloud services.

Keywords: Cloud computing, reliability, high availability, failure, targeted solutions, FT CloudSim, MCS

### 1. INTRODUCTION

Cloud computing is a conceptual model for providing cost-effective, convenient, transparent, on-demand network access to a set of pooled, configurable computing resources (e.g., applications, networks, servers, storage, and services) that can be speedily prepared and released with minimal management effort or service provider interaction. Cloud computing is an amalgamation of varied computing technologies (distributed, grid, parallel, utility, ubiquitous).

#### 1.1. Cloud Fundamental Concepts

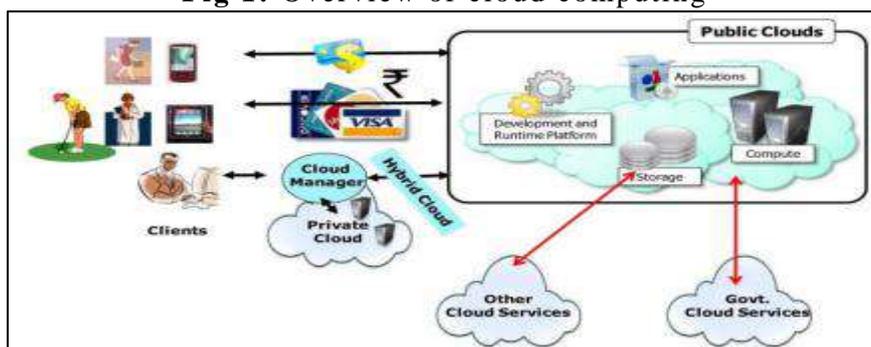
End users can feasibly and effectively access cloud computing using a set of working models which are as described below:

##### 1.1.1 Deployment Models

Defines the accessibility type to the cloud which can further be classified as Public, Private, Hybrid and Community.

*Public Cloud:* are developed, deployed and maintained by a third party service. The services are developed for the general public and lack security due to its openness., e.g., e-mail.

Fig 1: Overview of cloud computing



Private Cloud: services are developed, deployed and maintained for a single enterprise under its control thereby promising a more secure environment.

Community Cloud: Multiple customers can jointly work on projects and applications through a centralized cloud infrastructure using this mix of private and public cloud features.

Hybrid Cloud: The cloud provides the combined features of any one cloud which is being currently implemented.

### 1.1.2. Service Models

Are main models for implementing cloud computing. They indicate the functionality being utilized. Service models can be categorized as:

Software as a Service (SaaS): The SaaS is an off-the-shelf software made available to customers, developed by a hosted service and accessible through the internet.

- Platform as a Service (PaaS): Customers/clients are given the platform to develop programs and applications without the need of software and can even be tested for workability.
- Infrastructure as a Service (IaaS): Physical resources like servers, networks and storage can be held in shared mode for multiple clients. IaaS helps users to use that shared resources to deploy and run their applications.

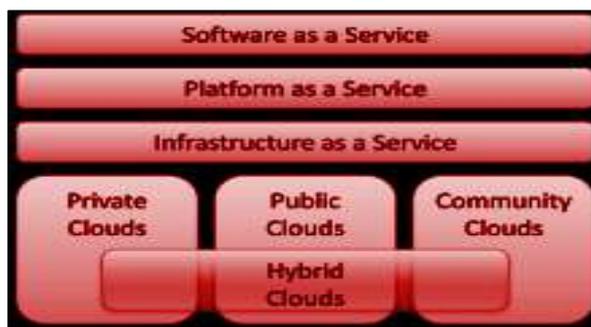


Fig 2. An overview of the common deployment and service models

The service models could be deployed on top of any of the four deployment models. Users can access services regardless of where or how they are hosted or delivered.

## 2. Cloud Computing System and its Failure Issues

Two decades before the applications were completely developed by organizations, but with the advent of service-oriented architecture, enterprises have moved to a new era where maximal usage of reusable components is desired and delegating some of the functionalities to already existing services developed by third parties seems to be an appropriate solution.

To meet ever-changing business requirements, organizations have to invest more in time and budget for scaling up IT infrastructures. The figure below depicts a typical cloud computing system which needs to perform numerous functionalities for managing request queues and efficiently scheduling them, managing computing and data resources.

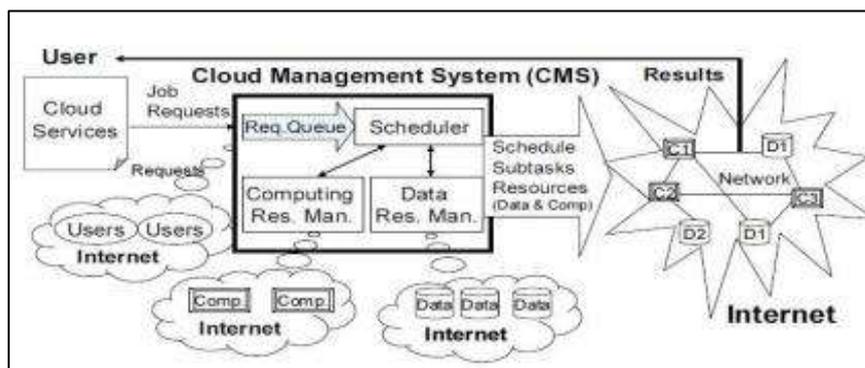


Fig 3. Cloud Service system

Despite many advancements, cloud computing still remains in its infant stage due to paucity of standardization. This leads to multiple issues that need solutions to be provided. A cloud computing business model introduces critical issues:

Load balancing, security, energy-efficiency, workflow scheduling, data/service availability, license management, data lock in and API design are few instances of issues. No matter how advanced the model is, cloud availability, reliability still has a question mark. The probability that a system is operational in a time interval with-out any failures is represented as the system reliability, whereas the availability of a system at any given time 't' is denoted as the possibility that the system is up and functional correctly at that instance in time. Various components in the cloud have complicated interactions. And owing to the heterogeneous nature of cloud services and models being deployed, it is difficult to apply a generalized reliability structure to all. Having a non-failure or failure resistant cloud is next to impossible.

### 3. Failure Analysis of Cloud Service

Various types of failures are categorized under two major headings (Request Stage failure and Execution Stage Failure) making it possible for the solutions to be thought of individually. Since they may affect the success/reliability of a cloud service:

#### Failure in Request Stage

1. **Overflow:** Assigning limitations on the maximal number of requests waiting time. On arrival of a new job request if the queue is full, the request would be simply dropped and the user is unable to get service, which is called an overflow failure.
2. **Timeout:** The timeout failure occurs if the waiting time of the request in the queue is over the due time (set by the user or the service monitor). Such timeout requests will be dropped from the queue so as not to affect other upcoming requests.

#### Failure in Execution Stage

1. **Missing data resource:** CMS maintains and registers data resources with the help of data resource manager (DRM) which might not be updated. Such non- updated resources assignment to a job request will lead to data resource missing failure.
2. **Missing computing resource:** Missing of computing resource might occur, such as PC turns off without notifying the CMS.
3. **Software failure:** Software programs running on different computing resources as sub tasks might fail.
4. **Database failure:** Subtasks when running cannot access the required data due to the database that stores the required data resources has failed.
5. **Hardware failure:** Both computing and data resources running on hardware such as computers or servers will encounter hardware failures.
6. **Network failure:** A broken communication channel (either logically or physically) during task execution generates network failure.

Cloud computing reliability model should consider all the above mentioned failures, which would be very complicated and existing reliability models cannot address all of these concerns in a all-inclusive manner although individually they can be tackled studied.

### 4. Research Background

Cloud computing provides virtualized computing resources and services on a pay-as-you-go model. Hosting the mission-critical applications and thus critical data through cloud services is being adopted by numerous IT companies and government organizations. This scenario demands quantification of cloud dependability in various aspects. Further five major actors and related roles in cloud environments were described in the NIST which includes cloud provider, cloud consumer, cloud broker, cloud carrier and cloud auditor. Of these two main roles- providers and consumers are discussed.

Actors	Definition
Cloud consumer	Any individual person or organization that has a business relationship with cloud providers and consumes available services
Cloud provider	Any individual entity or organization which is responsible for making services available and providing computing resources to cloud consumers
Cloud broker	An IT entity that provides an entry for managing performance and QoS of cloud computing services. It aids cloud providers and consumers for managing service negotiations.
Cloud auditor	A party that can provide an independent evaluation of cloud services provided by cloud providers in terms of performance, security and privacy impact, information system operations and etc. in the cloud environments.
Cloud carrier	An intermediary party that provides access and connectivity to consumers through any access devices such as networks. They transport services from a provider to consumers.

The availability and reliability is more critical for cloud consumers and performability is key for cloud providers. There exist numerous design principles such as 'Eliminating Single Point of Failure (SPOF)', 'Disaster Recovery' and 'Real-Time and Fast Failure Detection' that can help achieve high availability and reliability in cloud computing environments. Applying redundancy is one important facet for avoiding SPOFs thereby ensuring presence of each vital component in more than one instance. So, fast and real-time failure detection is requisite.

### 5. Suggested Strategies for Cloud Reliability

No matter how small or large the business is, it is of increasing importance that IT managers have an amplified knowledge of power management and enhanced visibility into systems to see when abnormal conditions threaten the IT infrastructure — and what business services are at risk, so proactive measures can be taken to maintain business continuity and protect data reducing exposure to downtime and data loss in cloud environments.

**The following mentioned strategies can be implemented:**

#### ❖ Integrated Power Management Software

Managing physical servers, virtual servers, UPSs, PDUs and much more can be supported with the use of integrated solutions.

#### ❖ Automated Replication Software

Virtual machines movement between sites is allowed, requiring a software which communicates with the UPS thereby identifying the failure. The software can initiate data synchronization and startup of a backup site without data loss, provided availability of battery run time at the data center.

#### ❖ Triggered Live Migration

With response to technical or maintenance requirements virtual servers are moved instantaneously from one physical host to another. But these systems have no built-in capabilities for responding to service outages.

### 6. Cloud Management System

There is a cloud management system (CMS) which is composed by a set of servers (either centralized or distributed). The CMS provides four different functions:

1. Manage a request queue that receives job requests from different users for cloud services.
2. Managing computing resources (such as PCs, Clusters, Supercomputers, etc.) all over the Internet.
3. Manage data resources (such as Databases, Publicized Information, URL contents, etc.) all over the Internet.

4. Scheduling and dividing a request into different subtasks and further assign these subtasks to different computing resources that may access different data resources over the Internet.

On requests for a certain given cloud service, a workflow is created. Fig.4. depicts a workflow template of a service that includes four different subtasks. With the given workflow of a cloud service, the scheduler in the CMS may assign various subtasks to different computing resources while allocating the data resources. On reception of commands/subtasks from the CMS for computing and data resources, formation of network is initiated.

The cloud network shown in Fig.4. can be very large, and each link in Fig. is composed of virtual link that may go through many components (routers/cables/optical fibers/machines) over a long distance. Thus, the computing resources will work together via the network to run the subtasks while accessing necessary data from the data resources. Job completion leads to result reception to the requested service.

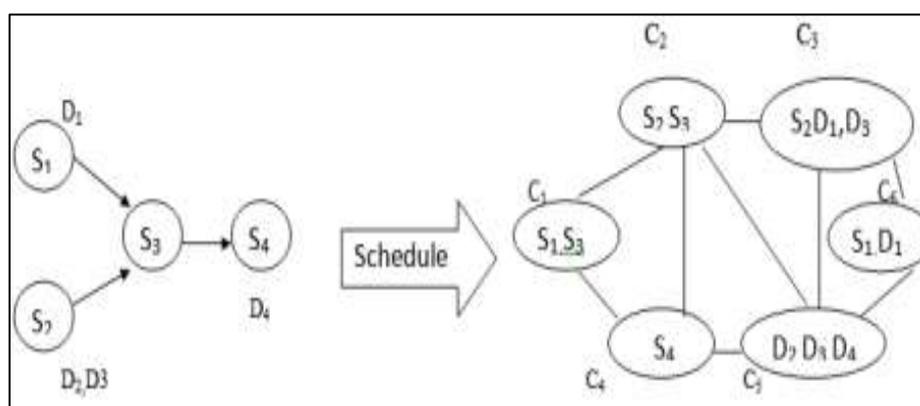


Fig. 4. Workflow of a Cloud Service and Scheduling

### 6.1 FTCloudSim

FTCloudSim is developed by extending the basic functionality of CloudSim. FTCloudSim, a CloudSim-based tool provides a protractible mechanism to augment the cloud service reliability. Implementation of check-pointing mechanism is used to handle the failure events.

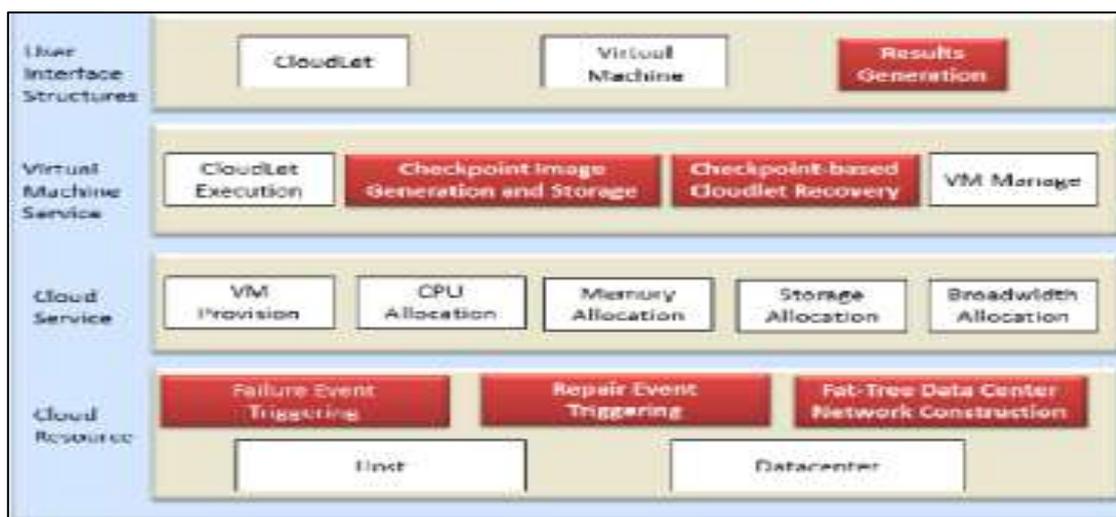


Fig 4: FTCloudSim Framework

#### 6.1.1 Design of FTCloudSim

FTCloudSim is established by adding 6 components to CloudSim: (fat-tree data center network construction, failure and repair event triggering, checkpoint image generation and storage, checkpoint based cloudlet recovery, and results generation)

- Fat-tree construction. FTCloudSim automatically constructs a fat-tree data center network. These forms of networks enable networks with any bandwidth and with any communication technology. This feature tries to ensure the cloud service providers and consumers to reliable communication of the data resources.
- Failure and repair event recording. With the help of FTCloudSim all the failure and repair events are set aside on a file so that through numerous tryouts cloud reliability can be improved.
- Checkpoint image generation and storage. A checkpoint image is generated and stored for the purpose of resuming the task from that stored point in the event of failure.
- Checkpoint-based task recovery. Any host failure will resume the task from the latest checkpoint image stored. In absence of checkpoint image necessary data will be fetched from the central database and restart the interrupted task from the beginning.
- Results generation. All the failure, repair and checkpoint results are generated for the user.

**6.2 MCS (Monte Carlo Simulation)** MCS or multiple probability simulation is a computer based mathematical technique, which is used to estimate the possible outcomes of an uncertain event that deals with the quantitative analysis of the risks occurred in the system. Uncertainty caused by a cloud component can be analyzed using MCS. It assesses the impact of risk in many real-life scenarios which is very well impacted in cloud systems MCS is a stochastic simulation tool which comes in two varieties: non-sequential and sequential. The general non-sequential MCS algorithm used for evaluating reliability. calculation, and convergence) are dependent on an efficient representation of individual states. Non-sequential Monte Carlo Simulation (MCS) is used for evaluating cloud service reliability.

## 7. CONCLUSION

Cloud and its applications have become the buzzwords. Although the reliability of cloud services is improved as compared to previously available grid and distributed computing structures, but, with ever increasing dependence of the society on cloud services, failure and availability issues need to be addressed instantly. The paper discussed about various failure issues in cloud and the kinds of roles in cloud services. Owing to the failure, measures have been suggested, and are being implemented to produce more robust and fault tolerant cloud system.

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## A Study on Investor's Perception towards Gold as an Investment Option

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### ABSTRACT

When it comes to making investments, the Covid-19 pandemic has been a major game changer. The uncertainty that tagged along forced people to redefine their financial portfolio in order to attain long-term security. In this cluttered market, many investors have shifted their focus towards gold- a safe haven during any economic distress. There is abundance of precious metals, but gold is placed in high regard as an investment. Gold investment in India can be done in many forms like buying jewellery, coins, bars, gold exchange-traded funds, gold funds, sovereign gold bond scheme, etc. The value of this precious metal rose significantly in the post-pandemic world, which can be largely attributed to lower interest rates, safe haven demand etc. In India as well, gold yielded some amazing returns in the past one year, which has made it an attractive investment option. The present study tries to study investor's perception regarding gold as an investment option and the awareness level about various forms of investment in gold. The study also aims to determine investors most preferred investment option during the post covid period. The study is based on the information gathered from the Primary and Secondary sources. Primary data is collected with the help of well-designed questionnaire from respondents from Mumbai city and secondary data consists of information collected through various websites, newspapers and articles.

Keywords: Safe Haven, Diversification, Digital gold.

### INTRODUCTION

Gold is one of the most preferred investments in India. Gold is a mainstream asset driven by many factors, not just investment demand. Today gold as an investment is just not limited to buying ornaments or jewellery but it has expanded into many different options like Gold ETF, Gold Mutual Funds etc. Gold provides competitive returns compared to other major financial assets. The return on gold investment has been in line with the rate of inflation. Gold also offers downside protection and positive performance. It has been observed there are situations when markets witness a fall in gold prices, it won't last for long, it makes a strong comeback. As such, it can play a fundamental role in an investment portfolio and adding gold to a portfolio can enhance risk-adjusted returns.

### OBJECTIVES:

- 1) To study the investors perception on gold as an investment option.
- 2) To study the investors awareness on various forms of gold investment.
- 3) To determine the most preferred investment option of investors during post Covid period.

### LITERATURE REVIEW

- 1) A study was done by Miss. Pranita M Waghmare, Dr. Smita Shukla, Dr. Sanjeev Thakur on the topic "Is gold investment decision of the Indian Investors being impacted by hyperbolic discounting bias during the pandemic period?. The authors find out that the respondents react spontaneously while making the intertemporal choices and they are considering the Gold ETF as the liquid assets during the COVID situation and physical gold as the illiquid assets. Henceforth, there is gold investment needs but it has impact of temporal discounting. They concluded that the gold investors are influenced by the present bias and hyperbolic discounting bias has impacted the preference choices of gold investors.
- 2) Mr. Navjot Kaur Research Scholar GNDU, Amritsar conducted research on the topic "AN EMPIRICAL ANALYSIS OF PERCEPTION OF INVESTORS TOWARDS GOLD. His paper was an attempt to highlight the motivating factors that influence the investment decision of the investors towards gold. • It is viewed as a good portfolio diversifier which provides an ideal means of diversification. Investors incline towards gold in times of economic and financial crisis. Investors seek gold not only for the financial security but also it preserves its real value in long term and is highly liquid investment. The results of his study also imply that in spite of the volatility in the price of gold, investors would prefer not to shift away from gold; rather they are regarding gold as a heritage as well as a safety buffer

**RESEARCH METHODOLOGY**

In order to get required information, the information is gathered from the Primary and Secondary sources. Primary data is collected with the help of well-designed questionnaire from 93 respondents and secondary data consists of information collected through various websites, newspapers and articles.

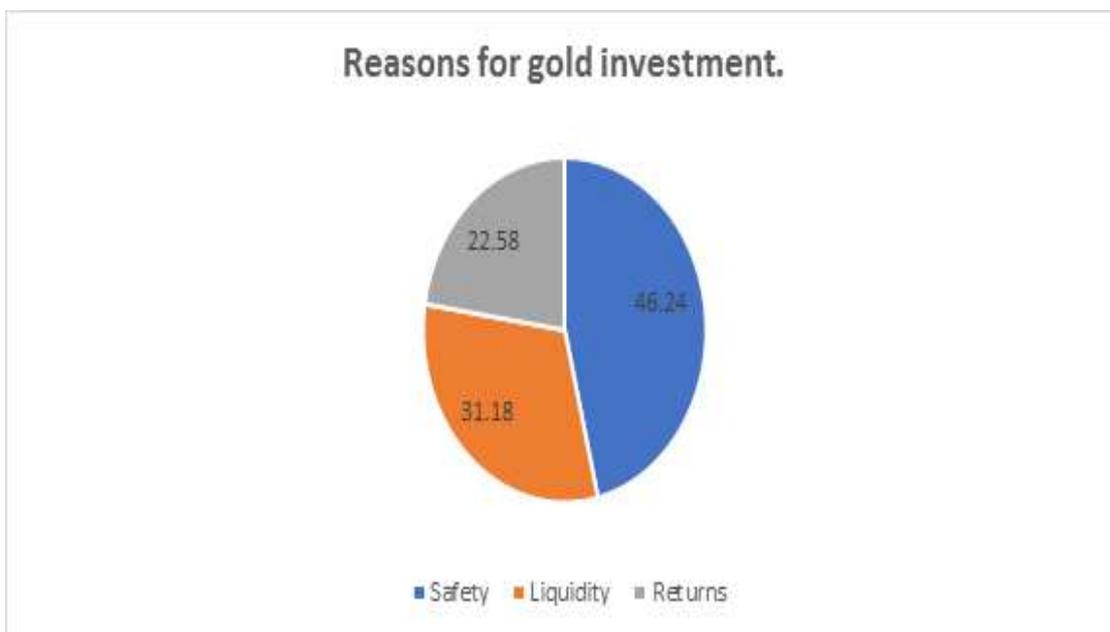
**Analysis and Interpretation of Primary data collected:**

**Table 1:** Demographic factors of Respondents:

		Number of Respondents	percentage
Gender	Male	49	52.69%
	Female	44	47.31%
	Total	93	100%
Age	18-30	37	39.78%
	30-45	47	50.54%
	45-60	09	9.68%
Occupation	Salaried	65	69.89%
	Businessman	11	11.83%
	Professional	17	18.28%
Income	Rs. 2,00,000 to 5,00,000	34	36.56%
	Rs. 5,00,000 to 10,00,000	52	55.91%
	Above Rs. 10,00,000	07	7.53%

**Table 2:** Showing reasons for investment in gold as compared to other investments.

	Number of respondents
Safety	43
Liquidity	29
Returns	21

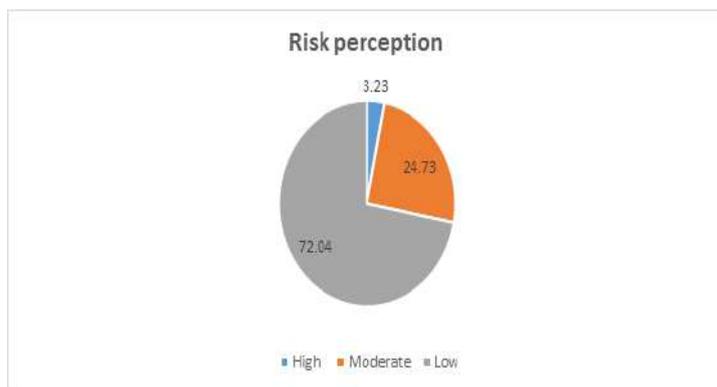


**INTERPRETATION:**

Above chart shows, 46.24% respondents, prefer gold investment as compared to other investments as they find it less risky, whereas 31.18% invest to diversify their portfolio and 22.58% invest in gold due to high returns.

**Table 3:** Showing Risk perception about investment in gold.

	Number of respondents
High	03
Moderate	23
Low	67

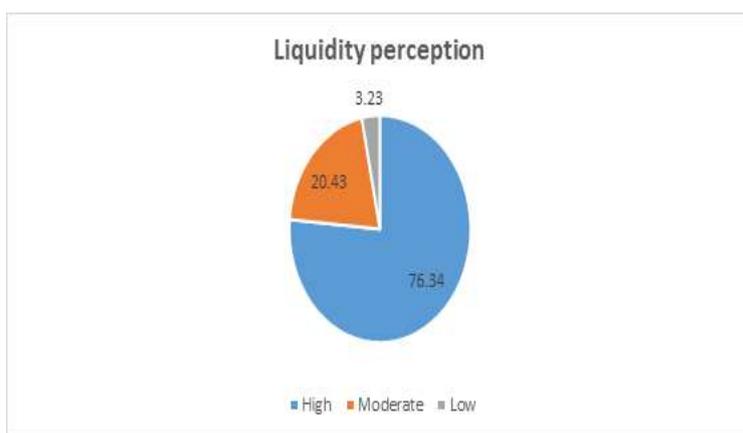


**INTERPRETATION**

Above chart shows, 3.23 % respondents feel that gold investment has high risk, 24.73 % respondents feel gold investment have moderate risk and 72.04% feel gold investment have low risk.

**Table 4:** Showing Liquidity perception about investment in gold.

	Number of respondents
High	71
Moderate	19
Low	03

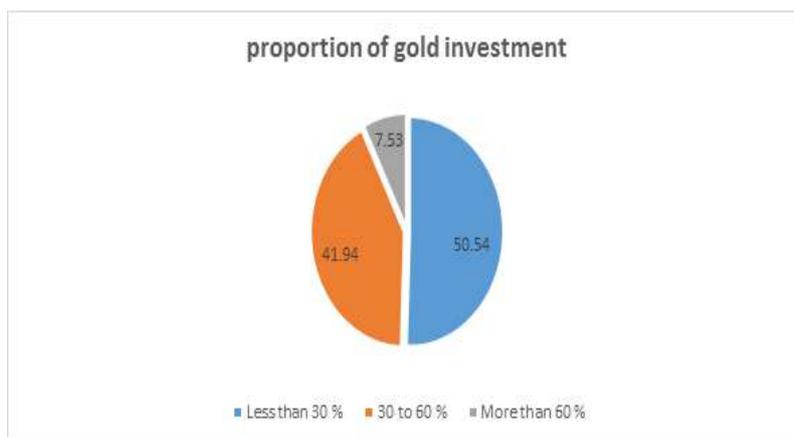


**INTERPRETATION**

Above chart shows that 76.34% respondents feel gold investment has highly liquid, 20.43% respondents feel gold has moderate liquidity while 3.23% feel gold investments have low liquidity.

**Table 5:** Showing proportion of gold investment in total portfolio

	Number of respondents
Less than 30 %	47
30 to 60 %	39
More than 60 %	07

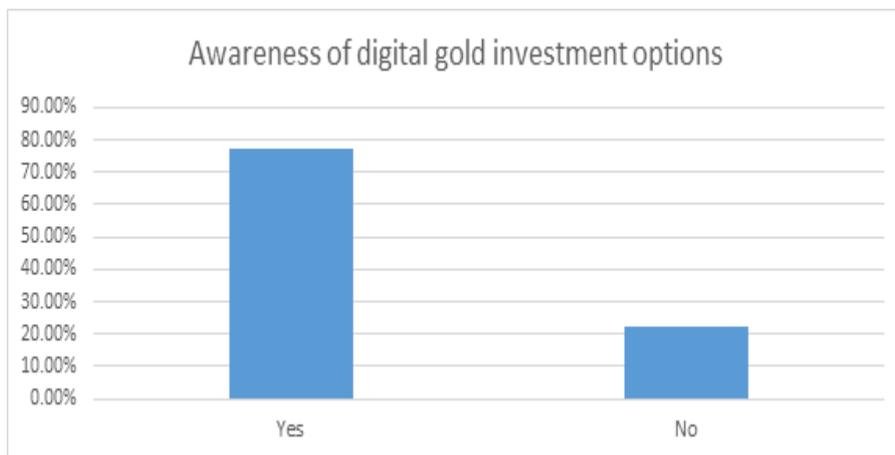


**INTERPRETATION**

Above chart shows that 50.54% respondents invest less than 30 % of total investments in gold, whereas 41.94 % invest between 30 to 60% in gold whereas 7.53% invest more than 60% of their total investments in gold.

**Table 6:** Showing awareness of digital gold investment options. (Such as Gold ETF, Gold mutual funds etc.)

	Number of respondents
Yes	72
No	21

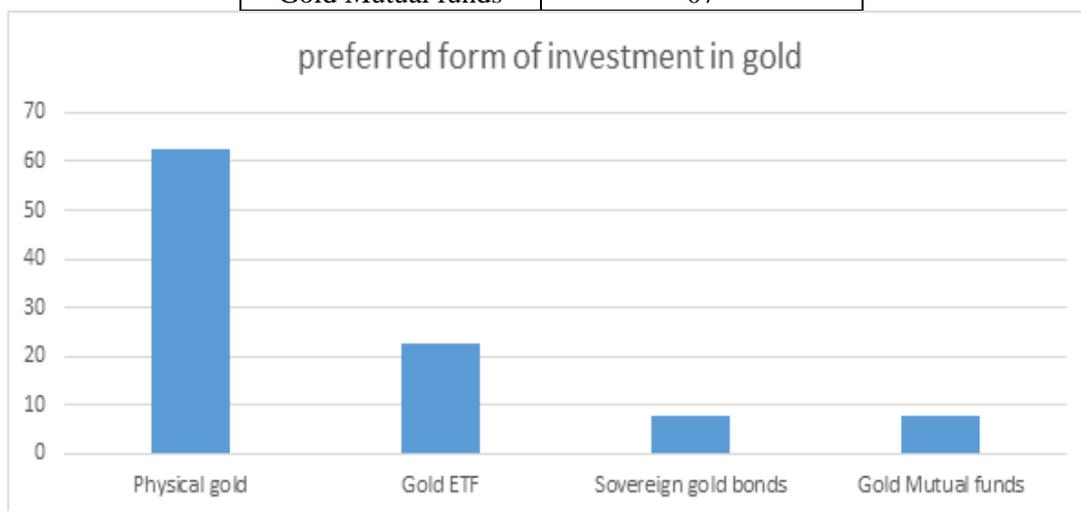


**INTERPRETATION**

Above chart shows 77.42% respondents are aware of digital gold investment options whereas 22.58% are not aware of digital gold investment options.

**Table 7:** Showing most preferred form of investment in Gold.

	Number of respondents
Physical gold	58
Gold ETF	21
Sovereign gold bonds	07
Gold Mutual funds	07

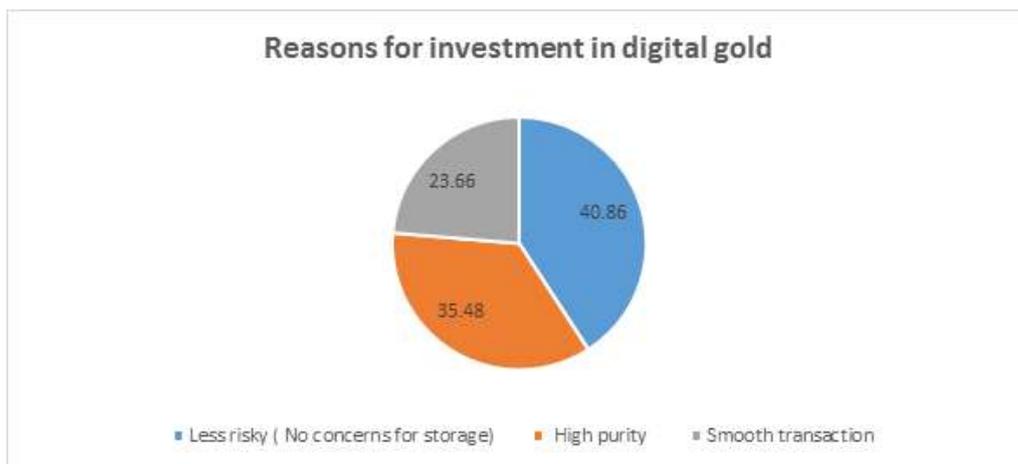


**INTERPRETATION**

Above chart shows 62.37 % of respondents prefer physical gold investment, 22.58 % prefer gold ETF, 7.53 % prefer sovereign gold bonds and 7.53 % prefer investment in Gold mutual funds.

**Table 8:** Showing reasons for investment in digital gold as compared to physical gold.

	Number of respondents
Less risky ( No concerns for storage)	38
High purity	33
Smooth transaction	22



### INTERPRETATION

Above chart shows that, 40.86% prefer digital gold investment as they it is less risky while 23.66 % invest because of ease in transaction and 35.48 % feel digital gold investment is better because of high purity.

**Table 9:** Showing Investors preferred investment during post Covid period.

	Number of respondents		percentage
Investment in Gold	Male	34	36.56%
	Female	31	33.33%
	<b>Total</b>	<b>65</b>	<b>69.89%</b>
Other investment options	Male	15	16.13%
	Female	13	13.98%
	<b>Total</b>	<b>28</b>	<b>30.11%</b>

### INTERPRETATION

Above table shows that, during post covid period 69.89 % respondents preferred investment will be gold, whereas 30.11% respondents will prefer other investments during post covid period.

### HYPOTHESIS TESTING

**H0:** There is no significant relationship with respect to preference for investment option (Gold v/s. other investment options) between male and female during post Covid period.

**T-Test:** Two-Sample Assuming Unequal Variances

t-Test: Two-Sample Assuming Unequal Variances	Variable 1	Variable 2
Mean	32.5	14
Variance	4.5	2
Observations	2	2
Hypothesized Mean Difference	1	
df	2	
t Stat	9.707253434	
P(T<=t) one-tail	0.005223124	
t Critical one-tail	2.91998558	

The above test indicates that P value is 0.005 which is less than 0.05. It means that null hypothesis is rejected at 5% level of significance. It clearly means our results are not consistent with null hypothesis. Thus, there is significant relationship with respect to preference for investment option (Gold v/s. other investment options) between male and female during post Covid period.

### CONCLUSION

Gold, the most desirable and most attractive metal of all. With its large market value and never-ending demand, it always acts as an asset from an investment point of view.

On an average investor invests approximate one third of total portfolio investment in gold.

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Majority of investors are aware of different kinds of investment in gold and they find investment in gold less risky as compared to other investments.

Also, majority of investors prefer physical gold as compared to digital gold, and those who invest in digital gold consider it more convenient and less risky.

During the post Covid period, investors prefer to diversify their investment portfolio and their most preferred investment option will be investment in gold. It acted as a safe haven investment during this pandemic.

I conclude by saying that INVESTING IN GOLD is Safe but it's risky too, so good research can do the job. And investing in Gold is only viable when it is of long-term investing.

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## **The Assessment of Financial Knowledge among Degree College Students of University of Mumbai: Evidence from Navi Mumbai City, Maharashtra, India**

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### **ABSTRACT**

#### **Objective**

The aim of the study was to assess the level of financial knowledge, analyse financial knowledge across courses of study and also examine financial knowledge across gender among degree college students of university of Mumbai residing and/or studying in Navi Mumbai Municipal Corporation region, Maharashtra (India).

#### **Research Approach & Design**

Descriptive research design was used, focusing on survey and fact finding through structured questionnaire. The sampling technique followed was convenience and snow ball sampling method. The survey covered 256 respondents, aged 18-24 years old. The questionnaire covered questions on socio-demographic characteristics of the respondents and financial knowledge questions "QUIZ" designed to test the understanding of basic concepts with respect to 8 areas of knowledge viz. Division, Liquidity, Simple interest, compound interest, Inflation, Time value of Money, Risk & Return, and Diversification. To study levels of financial knowledge, the data is divided into two groups using median percentage of correct answers of the sample, on questions of financial knowledge: More Financial Knowledge (score > 4) and less financial knowledge (score ≤ 4).

#### **Research Findings**

Based on responses on financial knowledge concepts, 53.91% are having more financial knowledge and 46.09% are having less financial knowledge. Financial knowledge across the arts, science & technology courses were observed slightly less as compared to other courses of study and the correct responses on financial knowledge questions across gender are approximately in equal proportion to the responses received.

#### **Conclusion and Policy Implications**

In every aspect there is a significant room for improvement in terms of financial knowledge: understanding of some every day financial concepts such as compound interest and inflation is lacking amongst sizeable proportions of the respondents. In this complex decision-making environment, to achieve optimal outcomes, it requires decision-makers to have adequate levels of financial knowledge and skills. The results highlight that policy-makers should concentrate on reducing 'skill-gaps' by incorporating the necessary learning knowledge content and improve financial knowledge of students.

Keywords: Financial Literacy, Financial Knowledge, Degree College Students, University of Mumbai

### **1. INTRODUCTION**

Financial literacy means the capacity to use knowledge and skills to manage financial resources effectively. Thus, the financial education is the process by which people improve their understanding of financial products and services etc., in order to become more aware of risk and return, so they are empowered to make informed choices, to avoid undesirable consequences and take necessary measures to improve their present and long-term financial well-being. Financially competent and well-informed, financially literate individuals are more likely to save their money, compare financial products and services and make better decisions for their families, increasing their economic security and wellbeing. Financial knowledge is an essential component of financial literacy, as having adequate and reliable knowledge allows individuals to compare financial products and make appropriate well informed financial decisions. A basic knowledge of financial concepts and the ability to apply numeracy skills in a financial context also ensure that individual can manage their financial matters and approximately react to news and other events that may have implications for their financial well-being.

### **2. REVIEW OF LITERATURE**

**Varcoe, K., A. Martin, Z. Devitto, and C. Go (2005)**, in their study on "Using a Financial Education Curriculum for Teens" analysed the effectiveness of the curriculum on financial knowledge and behavior of participants and indicated that using the curriculum the financial literacy of high school students is improved, behavior changed in a positive direction, knowledge improved and students appeared to have responded in ways to make their money go farther.

**Peng, T., S. Bartholomae, J. Fox and G. Cravener (2007)**, in their study on “The Impact of Personal Finance Education Delivered in High School and College Courses” found that there is no significant relationship between high school financial education and investment knowledge but there is significant relationship between college level financial education and investment knowledge.

**Danes, S. and H. Haberman (2007)**, in their study on “Teen Financial Knowledge, Self-Efficacy, and Behavior: A Gendered View” highlighted on gender differences before and as a result of the curriculum and found that the female teens learned significantly more about finances in areas with which they were unfamiliar prior to the curriculum whereas male teens reinforced their existing knowledge,

**Lynne M. Borden, Sun-A Lee, Joyce Serido & Dawn Collins (2008)**, in their pilot study on “Changing College Students’ Financial Knowledge, Attitudes, and Behavior through Seminar Participation” found that the seminar format effectively increased responsible attitudes toward credit and students’ financial knowledge, decreased avoidant attitudes towards credit and also observed that a seminar format may be useful in reaching a wider audience of college students.

**Robb, Cliff A.; James III, Russell N. (2009)**, in their study on “Association between Individual characteristics and financial knowledge among college students” tested students from a major mid-western university in the United States on a six-question measure of personal financial knowledge and found that experience with financial issues plays a strong role in knowledge development and there is some link between personal financial knowledge and financial behavior.

**Messy and Atkinson (2012)**, in their study observed that there is a positive relationship between education and financial literacy and more highly educated individuals are more likely to exhibit positive behaviour and attitude as well as show advanced levels of financial knowledge.

**Agnew and Harrison (2015)**, in their study observed that males outperform females on financial literacy quizzes, a similar result as in samples of university students from England and New Zealand and comparing between the two countries the attitude to student debt, it found that females were less likely to see the future benefits of higher education than their male counterparts.

**Domician Mate and Zsuzsanna KISS Human (2017)**, in their study on “An Assessment of financial knowledge in higher education” analysed the educational self-assessment of native (Hungarian) and non-native (international) undergraduate business economics students, examined and compared the gender and linguistic gaps and found substantial differences when comparing language background of the students.

**Andreou, Panayiotis, Philip, Dennis (2018)**, in their study examined financial literacy, financial aptitude and behaviour among university students in Cyprus and observed that 6.24% of students answered all questions correctly, with only 36.9% having a good financial knowledge proficiency level. The study observed that while socio-demographic characteristics, traits and soft skills distinguish high financial knowledge, parental background and advice does not seem to play an important role for high financial knowledge.

**ARYA P., Varkala (2018)**, study aimed to provide status of financial literacy in India with the help of various survey results and various financial education programs initiated in India to improve the level of financial literacy in India and recommended to make financial education programs more effective.

**Jayaraman, J. and Jambunathan S. (2018)**, in their study observed low levels of performance on standard measures of financial literacy. The study found gender differences, with females outperforming males, contrary to findings in developed countries. The study found that parental involvement has a significant influence on financial literacy. The study also observed that the understanding of societal and macroeconomic impacts of financial literacy was low.

**Nicolini, G. and Haupt, M. (2019)**, in their study analysed that the Lusardi–Mitchell questions remain a good measure in a first-step analysis, but for an in depth understanding of the association between financial literacy and financial behaviors benefits from the measures proposed in the study, should be considered as additional assessment tools in financial literacy research.

### **3. OBJECTIVE OF THE STUDY**

1. To assess the level of financial knowledge among degree college students of university of Mumbai.
2. To analyse financial knowledge across courses of study among degree college students of university of Mumbai.
3. To examine financial knowledge across gender among degree college students of university of Mumbai.

#### 4. RESEARCH METHODOLOGY

- 4.1. Type of Research:** Descriptive research design is used where focus is on survey and fact finding enquiries through structured questionnaire. The study also makes use of quantitative research approach as it allows to examine relationship among variables.
- 4.2. Source of data:** The study is based on primary and secondary data. The primary data was collected by structured questionnaire during the period July – August, 2020 and secondary data was collected from official websites and research papers.
- 4.3. Area of the study:** The research was conducted in Navi Mumbai Municipal Corporation region, Maharashtra, India.
- 4.4. Target Population and Sample Size:** Degree college students of University of Mumbai residing and/or studying in navi mumbai municipal corporation region were taken as a sample for research. The survey covered 256 degree college students (112 Males and 144 Females), aged 18-24 years old.
- 4.5. Sampling Method:** The sampling technique followed was convenience and snow ball sampling method (through Google forms)
- 4.6. Data Collection:** The data was obtained through structured questionnaire organised in two sections. The first section covered socio-demographic characteristics of the respondents and the second section covered the financial knowledge questions “QUIZ” designed to test the understanding of basic concepts with respect to 8 areas of knowledge viz. Division, Liquidity, Simple interest, compound interest, Inflation, Time value of Money, Risk & Return, and Diversification. To study levels of financial knowledge, the data is divided into two groups using median of correct answers of the sample on questions on financial knowledge: more financial knowledge (score > 4 on the quiz) and less financial knowledge (score ≤ 4 on the quiz). Each correct response was worth one point. The questionnaire encourages respondents to say if they don't know the answer to question, in order to dissuade them from guessing (as we want to capture actual levels of knowledge rather than lucky guesses).
- 4.7. Statistical tools used:** The data collected was tabulated, analyzed, interpreted and conclusions were drawn. Graphs/figures were prepared for analysis and interpretation of data.

#### 5. DATA ANALYSIS AND INTERPRETATION

- 5.1. Level of financial Knowledge (Strongest and Weakest areas of financial knowledge): More financial knowledge for score > 4 and less financial knowledge for score ≤ 4 (Table 1, Figure 1)**

**Table 1:** Level of Financial Knowledge (Strongest and Weakest Areas of Financial Knowledge)

Sr. No.	Financial Knowledge Concepts	Question/Right Answer	% Correct	% Incorrect	% Don't know
1	Division	FK_1: Rs. 100	64.45	25.39	10.16
2	Liquidity	FK_2: Cash in hand	89.45	8.98	1.56
3	Simple Interest	FK_3: 10%	60.94	31.64	7.42
4	Compound Interest	FK_4: Rs. 1815	38.67	43.75	17.58
5	Inflation	FK_5: The value of money decreases	45.7	49.22	5.08
6	Time Value of Money	FK_6: A unit of money obtained today is worth more than a unit of money obtained in future	58.59	32.03	9.38
7	Risk & Return	FK_7: an investor will require a higher rate of return the higher the perceived riskiness of an asset	55.08	30.08	14.84
8	Diversification	FK_8: True	61.33	28.91	9.77

The Table 1 shows that the strongest response is in respect of liquidity concept (FK\_2) with 89.45% correct, 8.98% incorrect and 1.56% don't know answer and the weakest response is in respect of compound interest concept (FK\_4) with 38.67% correct, 43.75% incorrect and 17.58% don't know answer.

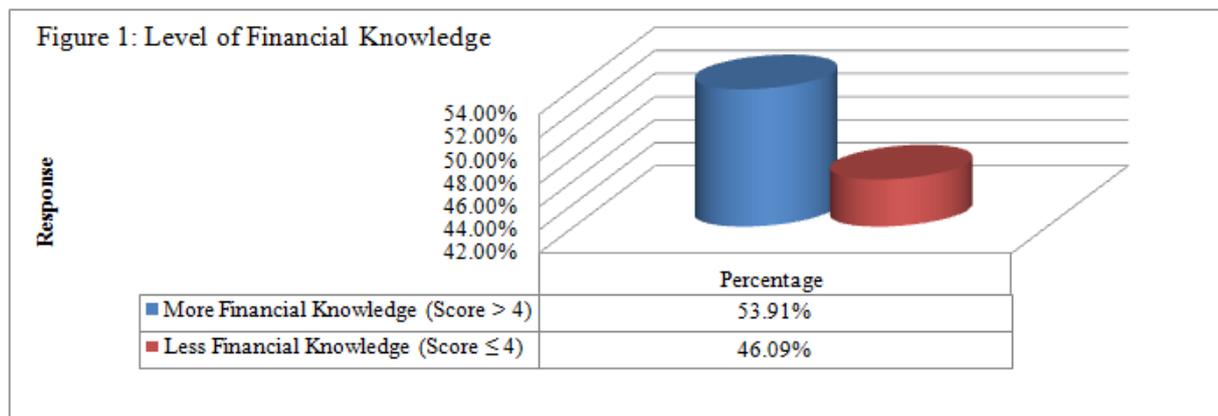


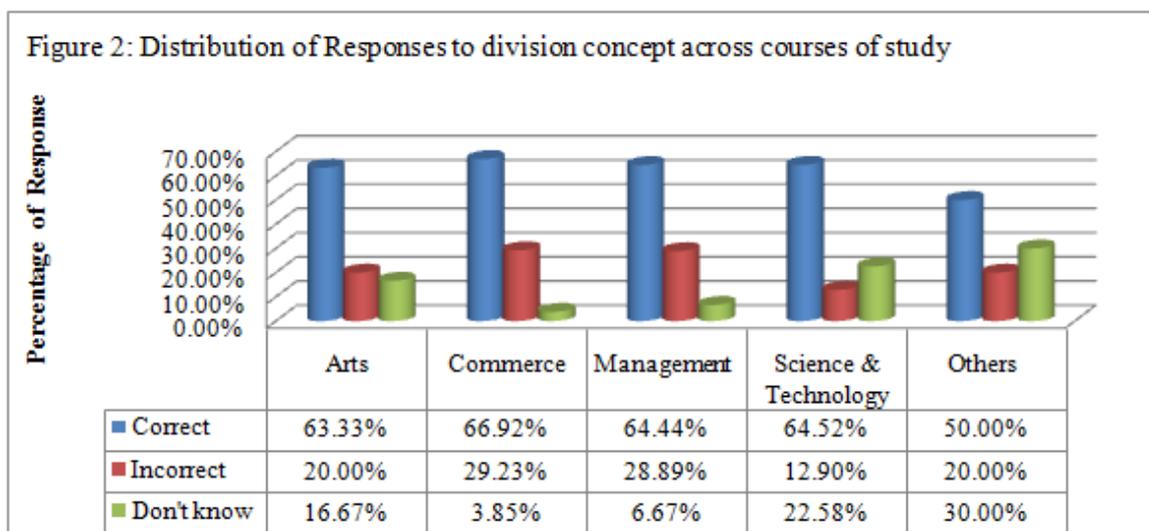
Figure 1 shows that slightly more than half (53.91%) were found to be financially knowledgeable, while a sizeable 46.09% were found to be with less financial knowledge.

### 5.2. Financial Knowledge across courses of study among degree college students (Table 2, Figure 2 - 9)

**Table 2: Financial Knowledge Concepts across Courses of Study (Correct Responses)**

Financial Knowledge Concepts	Courses of Study					Total
	Arts	Commerce	Management	Science & Technology	Others	
Division	19	87	29	20	10	165
Liquidity	28	120	39	24	18	229
Simple Interest	14	84	26	20	12	156
Compound Interest	9	54	19	8	9	99
Inflation	13	61	21	13	9	117
Time Value of Money	14	81	27	17	11	150
Risk & Return	20	75	23	17	6	141
Diversification	14	87	34	12	10	157

Table 2 shows that the highest score is in respect of response to liquidity concept (n=229), while the worst score is for is in respect of response to compound interest concept (n=99). The answers to financial knowledge questions across the courses of study among degree college students are different. The correct response among arts, science & technology is slightly less as compared to other courses of study. This can be observed from figures 2 – 9:



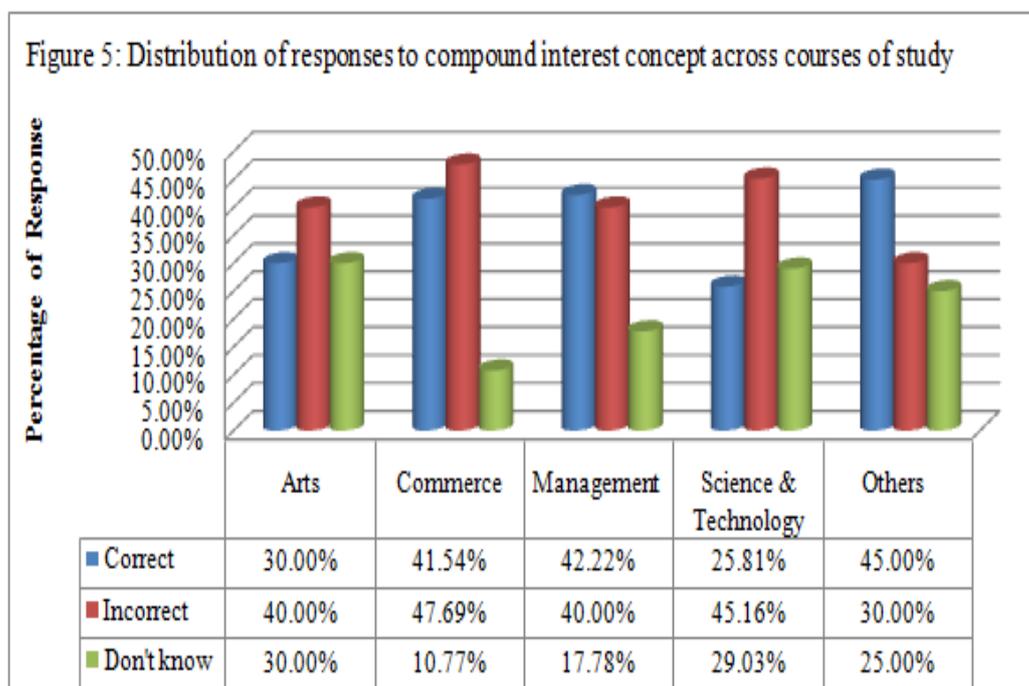
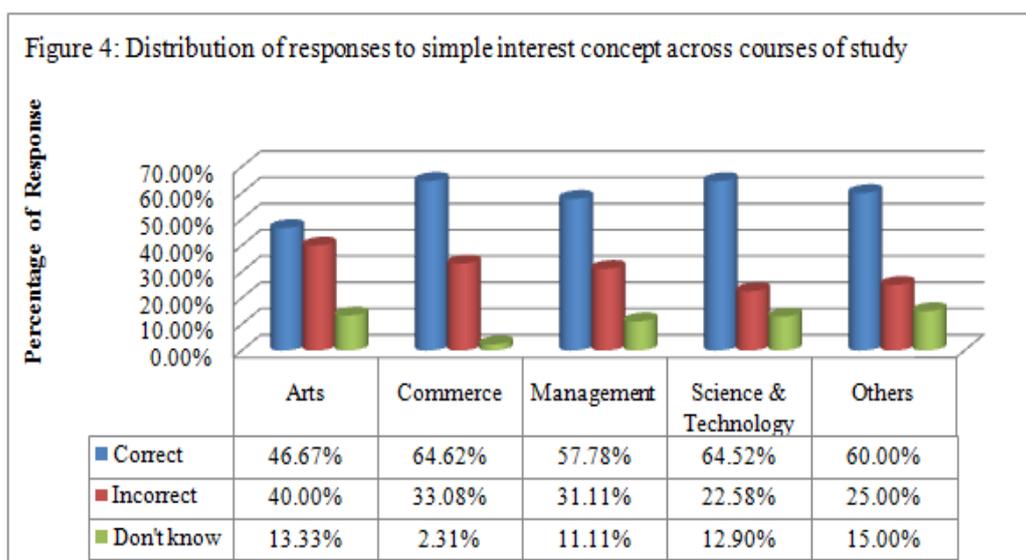
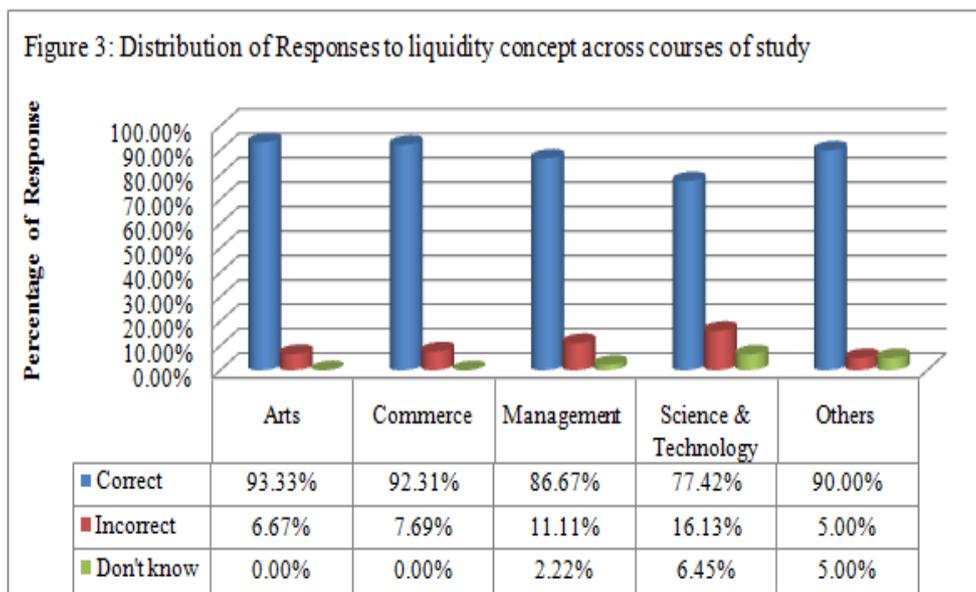


Figure 6: Distribution of responses to inflation concept across courses of study

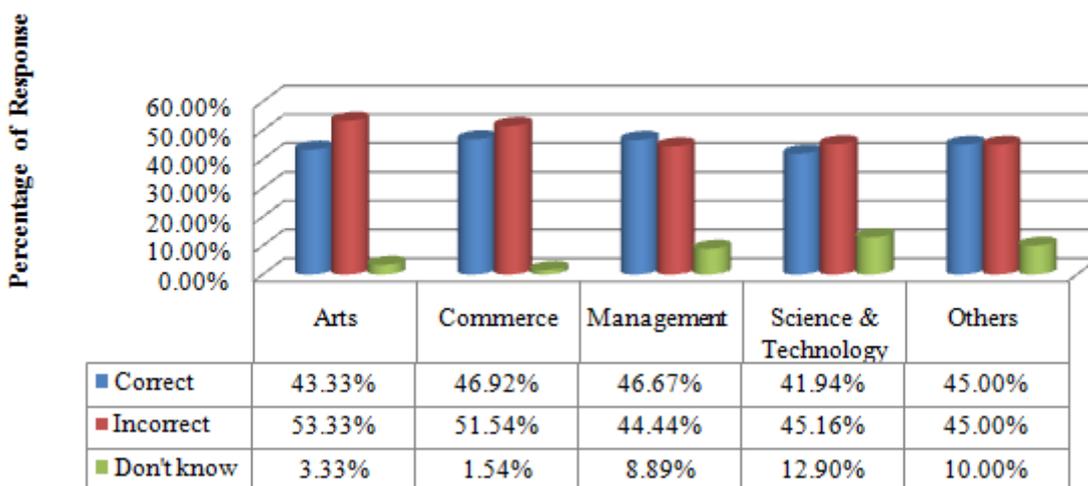


Figure 7: Distribution of responses to time value of money concept across courses of study

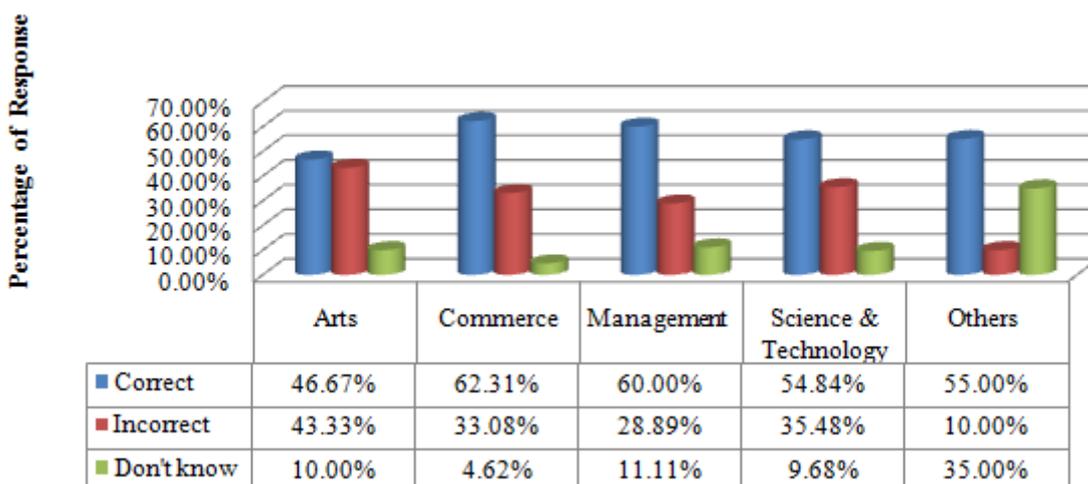
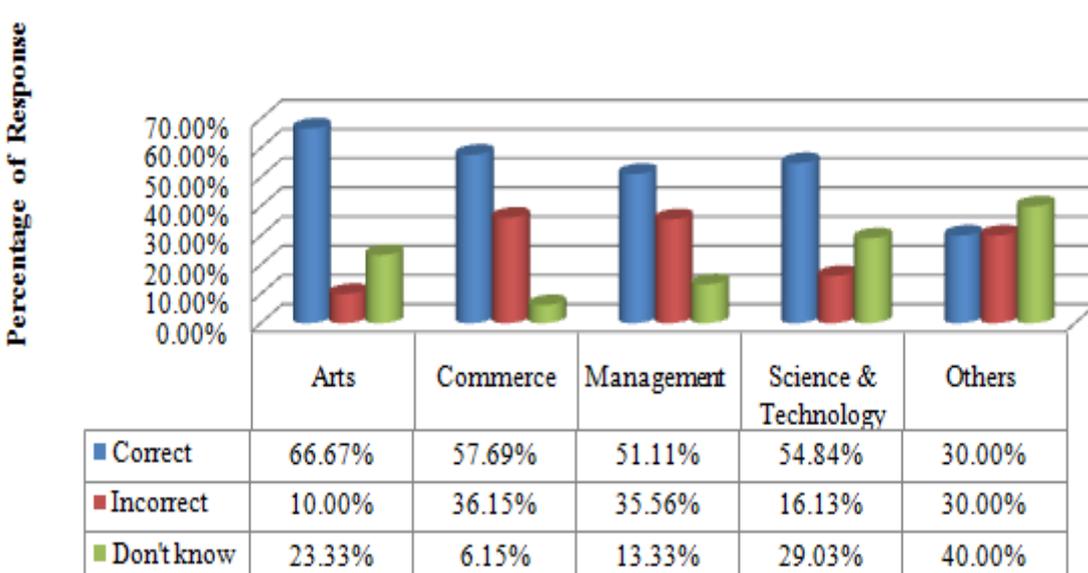
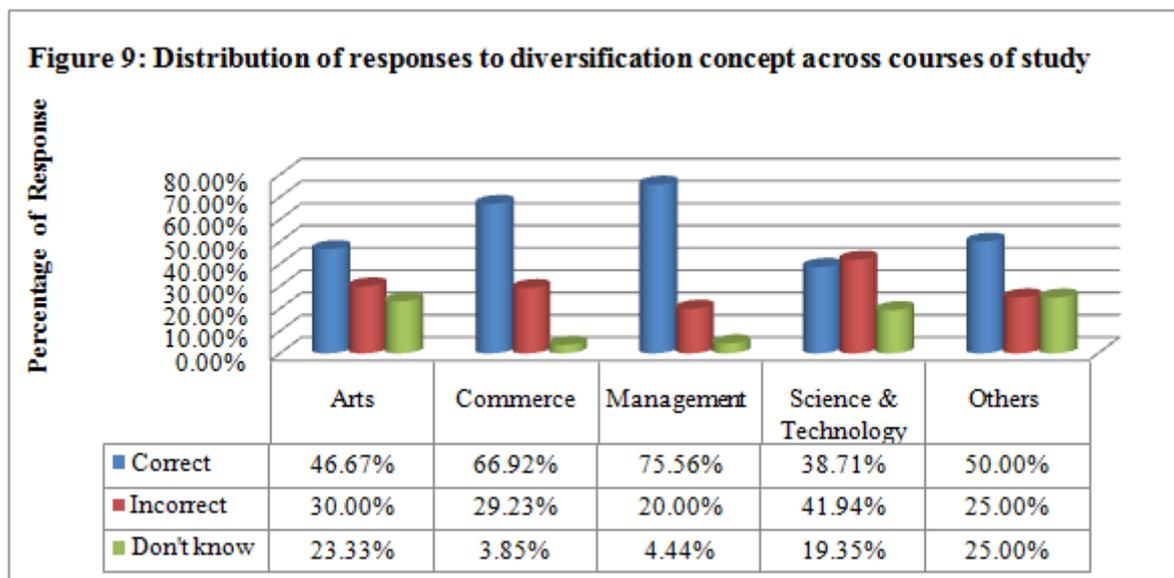


Figure 8: Distribution of responses to risk & return concept across courses of study

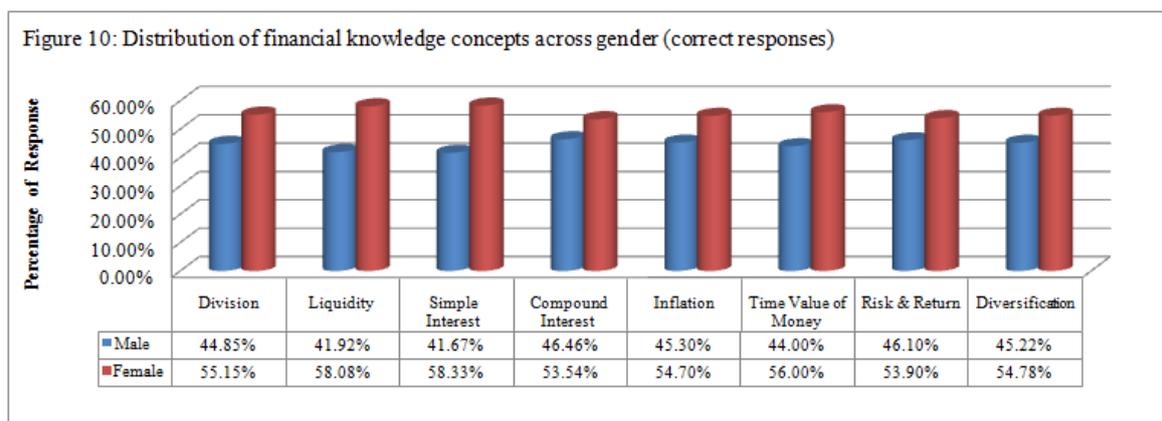




**5.3. Financial Knowledge across Gender with distribution of Correct Responses to Financial Knowledge Questions by gender (Table 3 and Figure 10).**

**Table 3: Financial Knowledge Concepts across Gender (Correct Responses)**

Financial Knowledge Concepts	Gender		Total
	Male	Female	
Division	74	91	165
Liquidity	96	133	229
Simple Interest	65	91	156
Compound Interest	46	53	99
Inflation	53	64	117
Time Value of Money	66	84	150
Risk & Return	65	76	141
Diversification	71	86	157
Total	536	678	1214
Correct Responses (%)	44.15%	55.85%	100.00%



From Table 3 and Figure 10, it is observed that the correct responses on financial knowledge questions across gender are approximately in equal proportion to the responses received (male respondents 43.75% (n=112) and female respondents 56.25% (n=144)).

**6. FINDINGS**

The paper analysed the assessment of degree college students focusing on the concept of financial education. Based on the answers from the participating students on financial knowledge concepts, it was observed that 53.91% (score > 4 on the quiz) are having more financial Knowledge and 46.09% are having less financial knowledge (score ≤ 4 on the quiz). The study further observed that the responses to financial knowledge

questions across the courses of study are different. The correct response among arts, science & technology courses were observed slightly less as compared to other courses of study. Thus it can be concluded that there is difference in financial knowledge across courses of study among degree college students. The study also observed that the correct responses on financial knowledge questions across gender are approximately in equal proportion to the responses received (male respondents 43.75% and female respondents 56.25%). Thus it can be concluded that financial knowledge across gender among degree college students is same.

## 7. CONCLUSION

High score indicate high level of financial knowledge but does not necessarily suggest that they are financial experts, while the low level of financial knowledge limits the ability to make informed decisions. There is a significant room for improvement in terms of financial knowledge: understanding of some every day financial concepts such as compound interest and inflation is lacking amongst sizeable proportions of the respondents. In this complex decision-making environment, to achieve optimal outcomes, it requires decision-makers to have adequate levels of financial knowledge and skills. The requirement for enhanced financial knowledge amongst students is a global situation, driven by the growing complexity of financial markets and products. The results highlight that policy-makers should concentrate on reducing 'skill-gaps' by incorporating the necessary learning knowledge content and improve financial knowledge of students.

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## A Study on Consumer's Perception towards Sustainable Road Travel

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### ABSTRACT

India aims at achieving the Sustainable Development Goals as designed by the United Nations Sustainable Development Agenda 2030, with the major focus on reducing its global emissions of 7%. While the pathway towards materialising, the electronic transport is being infrastructure, the need of an hour is to understand the current sustainable behaviour of consumers. Globally the transport sector is responsible for 25% of total carbon dioxide (CO<sub>2</sub>) emissions from fuel combustion in 2018 (Greenhouse Gas Emissions from Energy: Overview, 2021) by IEA. In India, within the transport sector, road transport contributed more than 90% of total CO<sub>2</sub> emissions (IEA, 2020; Ministry of Environment Forest and Climate Change, 2018). This paper is a modest attempt to study the relationship between consumer's awareness, Usage and Sense of Sustainable responsibility with respect to road travel options chosen by them. Studies in the recent past have limited work on Indian consumer's awareness, and corresponding sustainable choices in various fields of study which needs to be explored. According to Rachel Howell from University of Edinburgh, Research suggests that women have higher levels of socialisation to care about others and be socially responsible, which then leads them to care about environmental problems and be willing to adopt environmental behaviours. The researcher therefore aims to study a sample of 50 female respondents and use statistical tools such as Chi square and descriptive tools to draw significant conclusions from the data. The research findings will confirm the perception of consumers while making choices of means to travel and give an overview of the belief of sustainable responsibility they feel. The future studies can explore the factors which determine consumer's travel choices and challenges in making sustainable choices.

Keywords: Sustainability, Sustainable Travel, Perception, Sustainable Responsibility

### INTRODUCTION

With the aim of reducing the emissions below 7%, a country like India has to minutely plan the areas to work on the agenda 2030 as per the (SUSTAINABLE DEVELOPMENT GOALS, 2015) set by the United Nations. Out of the total emissions contributed by each of the sector, the transport sector alone is contributing a significant 25% towards carbon dioxide emissions. Within the transportation sector, the road transport contributes to a majority of 90% towards emissions. The growth witnessed by the transport sector is remarkable which has only increased our dependency on its own. In the current scenario a life without the transport aid is unimaginable, however there is an environmental cost paid with respect to such a growth.

The coming generations have to resort to much greener alternatives which would help in minimising the emissions by transport industry. However due to the infrastructural limitations in the current scenario, the need of an hour is to understand and accept the sustainable travel options available to individuals. When each individual will be making efforts, such efforts will cumulate and make a bigger difference.

According (Duckett, 2018) Women tend to be greener than men and there are many international studies on the same line. The current study has specifically studied the perception of Indian Women with respect to Sustainable Travel Options to get a better idea about Indian perspective towards acceptance of Sustainability.

### REVIEW OF LITERATURE

Factors like environment, value orientation, and relationship to a pro-environmental attitude have played a crucial role in administering car usage across various researches till date (Van Vugt et al., 1995; Grob, 1997; E. Garling et al., 1998; Nilsson and Kuller, 2000).

Such pro-environment attitudes through knowledge of grave environmental problems ease and allow reducing personal car usage to a considerable extent (Nilsson and Kuller, 2000). Common myth that prevails when it comes to any study on sustainable transportation is surrounded around the idea that the individuals lack proper knowledge about adverse climatic and environmental concerns like global warming, ozone layer depletion etc. However enough number of studies have proven it wrong suggesting individuals have more than enough knowledge about the same, yet choose to keep using unsustainable travel modes (Nasrudin et.al (2014), Anable (2005), Hagman (2003), and Tertoolen et al. (1998)

Pro-environment attitudes are more likely to be seen in women, younger population as well as altruistic individuals (Vugt et al., 1995)

### **RATIONALE OF THE STUDY**

The rationale for studying Sustainable behaviour and perception of respondents become very important as it is need of an hour for a country like India. The country aims to achieve the Sustainable Development Goals under Agenda 2030 by reducing the overall emissions of the country. The Pandemic saw times when the human interaction with nature has minimised and the nature got its time to revive itself. However, as the situations gets in Control and the countries gear up to open up its functioning in the post pandemic phase, the human activities which contribute to emissions will slowly go back to their pre pandemic levels. The current paper focuses on studying the general awareness of sustainability among citizens, usage of sustainable modes of road transport and their perception of cost associated with sustainability. One of the most important challenges for the government is to spread awareness and impart knowledge among its citizens as informed and aware citizens become the best asset for any country.

### **OBJECTIVES OF THE STUDY**

1. To study the general awareness about sustainability with respect to age of females of Navi Mumbai.
2. To study the relationship between the sustainable awareness with the usage of sustainable travel options in the post COVID 19 phase.
3. To understand the significance of cost and usage of sustainable travel options.
4. To analyze the current levels of sustainable awareness and its relationship with sense of sustainable responsibility felt by individuals.

### **HYPOTHESIS FOR THE STUDY**

**H0<sup>1</sup>**-There is no significant relationship between the awareness and age of individuals.

**H1**- There is a significant relationship between the awareness and age of individuals.

**H0<sup>2</sup>**-There is no significant relationship between the awareness about level of pollution with the usage of sustainable travel options.

**H1**-There is a significant relationship between the awareness about level of pollution with the usage of sustainable travel options.

**H0<sup>3</sup>**-There is no significant relationship between the belief of cost effectiveness with the usage of sustainable travel options.

**H0**-There is a significant relationship between the belief of cost effectiveness with the usage of sustainable travel options.

**H0<sup>4</sup>**-There is no significant relationship between the awareness about level of pollution with sense of sustainable responsibility.

**H1**-There is a significant relationship between the awareness about level of pollution with sense of sustainable responsibility.

### **RESEARCH DESIGN**

The objectives of the study are achieved using both primary and secondary sources. The primary data is primarily collected through a well-designed, close-ended questionnaire which aims at collecting information about the awareness, usage and overall perception of respondents towards sustainability in road transport. The scale used for the questionnaire is Likert five-point scale ranging from 1 (Highly Agree), 2 (Agree), 3 (Neutral), 4 (Disagree) and 5 (Highly Disagree). The questionnaire was circulated to women residing in Navi Mumbai. The study used purposive sampling technique to collect responses of 53 individuals who frequently travel by road. The responses were collected online with the use of google forms. The analysis is done using SPSS software for the 52 complete responses. The secondary data for this study is collected from various free and open sources including researches, Articles and Reports.

### **LIMITATIONS OF THE STUDY**

1. The current study is based on female's perception towards sustainability of road travel.
2. The study is restricted only to the area of Navi Mumbai.
3. The current study has used a sampling method to conduct the survey and therefore all the limitations of sampling survey exist in the present study.

4. The sample for the study is limited in number and is collected using stratified sampling technique which poses as a limitation for the research.

#### ANALYSIS OF DATA

The data collected is analysed by using various statistical tools like Bar graph, Frequencies, Percentages and spearman rank correlation to draw relevant conclusions from the data.

**Table 1.** General Perception towards sustainable Consumption

Particulars	Frequency
Environment friendly	31
Cost effective	18
Convenience and suitability	3

Out of the 52 female respondents, a majority of 31 consider using sustainable travel options because these products are environment friendly, 18 respondents feel sustainable options are cost effective whereas for the remaining 3 it is about the convenience and suitability which pay an important role while making a choice.

**Table 2.** Descriptive analysis of Key factors for the study

Particulars	Mean	SD
Responsibility	<b>3.365385</b>	1.414613
Usage	3.288462	1.785964
Awareness	2.596154	<b>1.317449</b>

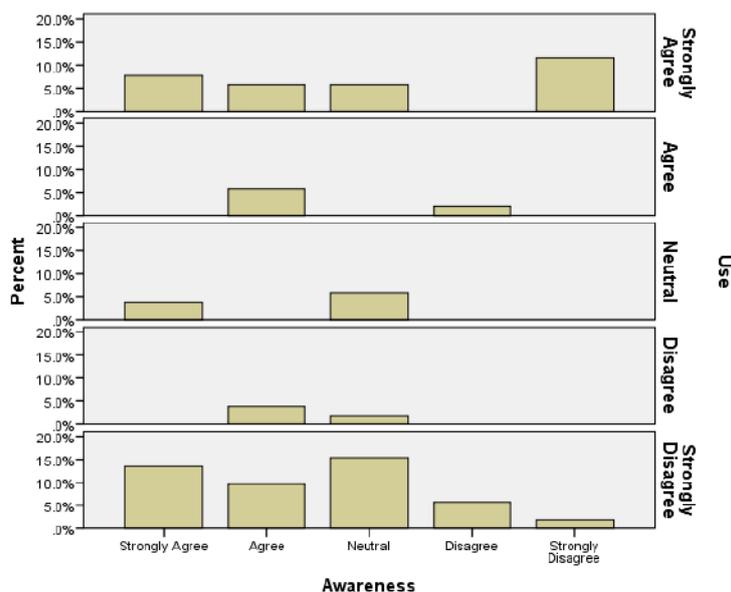
The average sense of responsibility felt by the respondents is 3.36 with a variation of 1.4 in all the responses. The average usage of sustainable transport among respondents is slightly below neutral i.e., 3.28 which lies between neutral to disagree. The variation of 1.78 is observed in the responses. However, the average Awareness level is 2.59. This proves that majority of respondents agree that they are aware about sustainability. Lowest Standard deviation of 1.3 shows minimum variation in consumer's perception. Majority of respondents have a common opinion on the sense of sustainable responsibility felt by them.

The correlation between the awareness and age of females is significant at 0.298 which is a low correlation. The youth is more aware about sustainability as compared to the women older than 30 years of age. Thus, the null hypothesis can be rejected because of existence of significant relationship between age and awareness levels of respondents.

<b>Table 3.</b> Correlation between Awareness and Usage of Sustainable Travel options				
			Age	Awareness
Spearman's rho	Age	Correlation Coefficient	1.000	.298*
		Sig. (2-tailed)	.	.032
		N	52	52
	Awareness	Correlation Coefficient	.298*	1.000
		Sig. (2-tailed)	.032	.
		N	52	52
*. Correlation is significant at the 0.05 level (2-tailed).				

To study the relationship between the awareness and usage of sustainable travel options, Cronbach's Alpha was performed. The relationship between the two variable is negative which shoe no correlation between the awareness and usage of sustainable travel option. Thus, there happens to be no significant relationship between the awareness about level of pollution with the usage of sustainable travel options and Null hypothesis is not rejected.

<b>Table 4.</b> Correlation between Awareness and Usage of Sustainable Travel options				
			Awareness	Usage
Spearman's rho	Awareness	Correlation Coefficient	1.000	-.142
		N	52	52
	Usage	Correlation Coefficient	-.142	1.000
		N	52	52



To understand the relationship between the Cost Effectiveness and Usage of sustainable travel options, Cronbach's Alpha was performed. The relationship between the two variables is positive which show a correlation between the belief of cost effectiveness and usage of sustainable travel options A Correlation of .234 show a low correlation between the two variables, however there is a significant relationship between the individual's belief of sustainable travel being cost effective on its usage. Thus, Null hypothesis is rejected.

**Table 5.** Correlation between Cost Effectiveness and Usage of Sustainable Travel options

		Cost Effectiveness	Usage
Spearman's rho	Cost Effective	Correlation Coefficient	1.000
		N	52
	Use	Correlation Coefficient	.234
		N	52

Awareness on sustainable travel options available in the country must help individual's feel a sense of responsibility towards the environment and its conservation. To study the relationship between sustainable awareness and sense of responsibility, Cronbach's Alpha was computed. A positive value for .175 show a very low correlation between the two variables.

**Table 6.** Correlation between Awareness and the Sense of sustainable responsibility felt by individuals

		Awareness	Responsibility
Spearman's rho	Awareness	Correlation Coefficient	1.000
		N	52
	Responsibility	Correlation Coefficient	.175
		N	52

## CONCLUSION

A country like India has a potential to grow in sustainable ways. It is a country with educated young people who consider sustainability as an important factor to be inculcated in one's way of living. In order to execute the goals and meet the Sustainable Development Goals, the country need to improve the awareness levels of individuals in a way that it helps them make better and sustainable choices. The current levels of awareness is high among the youth and therefore the remaining segments have to be made aware of importance of sustainability. The Government along with various agencies and companies and work on providing better sustainable choices to individuals at reduced prices which will in itself become a motivating factor for individuals while making buying decisions. All the individuals must at last work on inculcating the sense of sustainable responsibility in themselves and in society at large.

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## **A Study on the Impact of Covid- 19 on Investors Behaviour of Individuals in Navi Mumbai**

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### **ABSTRACT**

Purpose: To understand the impact of Covid-19 pandemic on investment decisions of Individuals in Navi Mumbai.

The Impact of Covid-19 pandemic on Individuals investment decisions was determined by conducting a sample survey the respondents of the survey were majorly either from service sector or were owners of the business firms. The impact of COVID-19 pandemic on Investment and financial decision was studied.

It was found that there is a significant relation between the measures taken to decrease the spreading of COVID-19 outbreak (Lockdown) and the income of a Individual.

The future study on this topic could consider other types of investment options in various contexts and can gain insights on the impact of COVID -19 in depth.

Keywords: Investment Behaviour, Equity Market, SIPs, Gold, Bank Deposits Household Income, COVID 19

### **INTRODUCTION**

The Coronavirus (COVID-19) is an infectious & Contagious disease which spreads amongst humans very fast. This disease is caused by the SARS-CoV-2 virus. Most of the people who got infected felt moderate respiratory illness and some became seriously ill, especially the older people who already had some disease like diabetes, respiratory disease or other chronic diseases. People of any age can get COVID-19 disease and they can become seriously ill or can even die. The COVID-19 was a Novel disease for which there was no Known cure. The COVID-19 was not only in India but had spread in the entire world. The major symptoms of the disease were Fever, cough, throat pain, breathing illness, fatigue and loss of smell & taste. The WHO gave the virus name as COVID-19, where in CO for *corona*, VI for *virus*, D for *disease*, and 19 for *2019* (the year in which the outbreak was first identified).

As per the WHO and government guidelines the spreading of COVID-19 can be reduced by maintaining 1 meter distance from others (social distancing), wearing masks, washing hands and using sanitizers. The Corona virus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak or breathe. Particles range from larger respiratory droplets to smaller aerosols. It becomes important to practice respiratory etiquette,(E.g. coughing into a flexed elbow, and to stay home and self-isolate until you recover if you are feeling unwell).

To fight the highly infectious COVID-19 outbreak various measures were taken by the government like imposing nation-wide lockdown, closing down the institutions, malls, shops, restricting modes of transport etc. Due to the lockdown there was a panic situation in the entire country. People who worked on a daily wages basis lost their jobs and were worried about their daily food needs, resulting in people started moving back to their villages which created lots of crowding in transports and when they did not find any transportation means due to restrictions they started walking to villages for 1000's of kilometers. The business and shops were also shut down which resulted in a loss and many got unemployed due to this. The work and flow of money in the entire country was slowed down, only essential services were allowed to operate and the guidelines were given that no person should step out of the house until and unless it is necessary to. The entire situation of the lockdown had directly affected the income of an individual. During the time of lockdown the mindset of people had become that they will spend only on necessities and will save maximum money for emergency use, hardly spending were made on less required goods and luxuries.

After a lot of medical research, trials and testing in India. The vaccination programme started in the month of January 2021 for people with the age 18 and above.

Figure 1

Figure 1: Unemployment rate in urban areas across all age groups as per current weekly activity status (Figures in %)

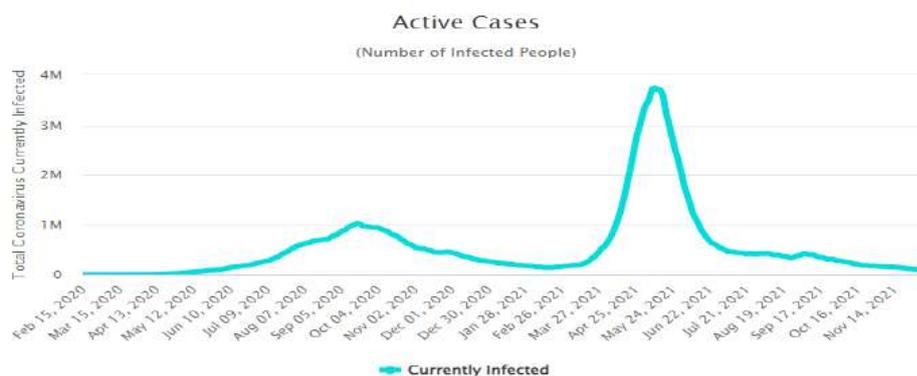


Source: psrindia.org

The above figure shows the comparison of unemployment rate in urban areas across all the age groups in the year 2019 & 2020. The data is provided on a quarterly basis. Here we can see that the unemployment rate in the 2nd quarter increased drastically in the year 2020 as compared to 2019. This is because of the imposition of a lockdown in the entire country.

Figure 2

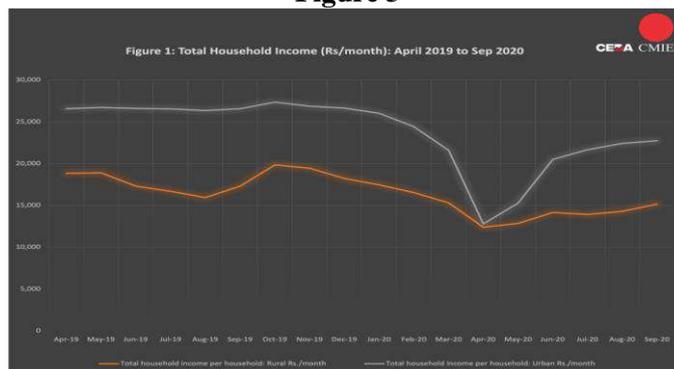
Active Cases in India



Source: Worldometers.info

The above graph gives us the information about the rise and decline of a COVID-19 cases. The first COVID-19 case was found in India in the month of February and from thereon it has been observed that COVID-19 cases increase rapidly which is referred to as a wave. So far India has 2 waves right from February 2020- November 2021.

Figure 3



Source: Ceda.Ashoka.edu.in

Figure 4



Source: Ceda.Ashoka.edu.in

The above figure shows the change in the wage income in rural and urban areas of India between April and September 2020. Here we could find that there is decline in the rural wage income (41%) and urban wage income (44%) in April 2020. Some kind of improvement is found in later months.

Investment decisions are related to investing money in an asset. The decisions are made by an individual keeping various things in mind like best utilization of funds, lock in period, timely usage etc. Two major factors which are highly considered is Risk and Return on the investment. Investments are made for long term like in public provident fund, pension fund, postal savings etc and some are made for short terms such as investment in stock markets and term deposits. This decision making process is related to psychological & behavioural theories. There are few factors like attitude, culture, uncertainty of events, life expectancy, future security, experts knowledge etc which influences the decision. Few of the investment options are discussed below:

**GOLD**

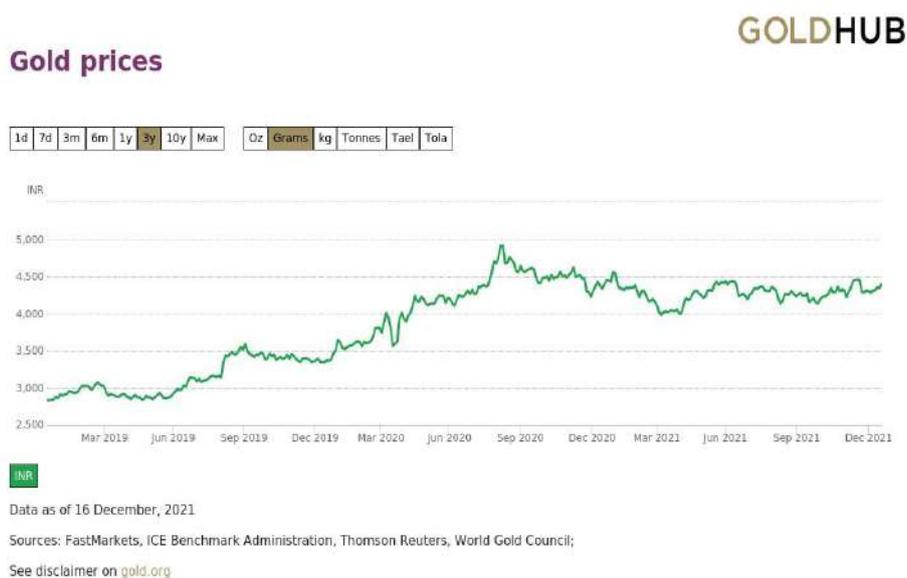
Gold is a yellow coloured metal which is majorly used for making jewellery and ornaments in India. Other than jewellery there are gold coins which can be used for investment purposes. Gold is also used for trading purposes wherein one need not have to hold the physical underlying gold metal. The gold is identified on the basis of its purity. The term “KARAT” is to identify purity of gold. The most popular terms are 24 Karat gold which has the highest purity level and other are 22 karat with medium purity and 18 karat with the lower purity. Majorly for making jewelry 22 karat is used. The table below shows the changes in gold price for last 10 years

Table 1

Year	24- karats for 10-grams
2011	Rs 26,350
2012	Rs 31,025
2013	Rs 29,650
2014	Rs 28,000
2015	Rs 26,400
2016	Rs 28,700
2017	Rs 26,600
2018	Rs 31,400
2019	Rs 35,300
2020	Rs 48,800
2021	Rs 48,850

Source: Goodreturns.in

Figure 5



Source: <https://fsapi.gold.org/>

The above graph shows us the changes in Gold prices in INR for 1 gram gold for the last 3 years. It can be observed that there is a lot of difference and increase in price of gold from 2019 to 2021.

### Systematic Investment Planning (SIP)

Systematic investment planning is a plan where investors can make payments in small amounts and in various categories like into mutual funds, trading accounts etc. SIP allows investors to invest in small amounts and for a long time. SIP requires payment into the plan consistently, even if you invest a smaller amount it should be on regular basis say maybe weekly or monthly. The SIP route is the preferred way of investing in stocks and Mutual Funds because it allows individuals to participate in the market while managing risk better. SIP works on two principles: 1) Rupee cost averaging. 2) Compounding.

### Postal Savings

Postal saving provides a safe and convenient method to save money. Postal savings is initiated to promote saving habits in poor people. It has been believed that postal savings are safer though it gives less return but also has less amount of risk. India Post provides small banking and financial services, (including National Savings Certificates) under Indian Postal services. India Post Payments Bank (IPPB) is a specialised division of India Post which is under the jurisdiction of the Department of Post a department under Ministry of Communications (India) of the Government of India. Opened in 2018, the bank had acquired about 4.0 crore customers by December 2020.

### Provident Fund

Provident fund is established by the employer & employee for investment purpose. It helps to serve long term savings and also help employee to get benefits after retirement. It refers to job welfare benefits offered to employee. It can also be called as government managed retirement savings scheme. The Employees' Provident Fund Organisation (EPFO) is the statutory body under the ownership of Ministry of Labour and Employment, Government of India that is responsible for regulation and management of provident funds in India. The employer and employee together contribute a small amount as an investment on monthly basis. This money is managed by the government and employee can withdraw the money after retirement.

### Stock Market

Stock market basically refers to the collection of exchanges and other venues where buying and selling of shares takes place for the public. When the private company wants to issue its shares to the public it needs to get listed in the stock market and further they can issue shares through Initial public offering (IPO) and FPO. These shares can further be bought and sold by the shareholders and can be traded with the help of brokers as well. The investment in stock market basically means investing money in shares of the company and holding it for short-term or long term. People earn money from the price difference in buying and selling of shares and they also get dividends from the companies as the profit earned by the company gets distributed to its shareholders in the form of dividend. The Bombay stock exchange (BSE) & National Stock exchange (NSE) are two leading

stock exchanges in India. The stock exchange board of India (SEBI) is the statutory body that monitors and also regulates the securities and capital market in India. SEBI ensures to protect the interest of the investors. It also formulates and provides guidelines.

Figure 6



Source: <https://tradingeconomics.com/>

The above chart represents changes in prices in the Stock market (Sensex) in the last 10 years. It shows that there is growth in the market but the market also had a decline period in the first half of the year 2020.

## LITERATURE REVIEW

Behavioral finance theories have a considerable impact on the psychological factors of the investor. The approaches of measuring the investors' feelings include direct proxy, indirect proxy, and text mining. In direct proxy, Brown and Cliff (2005) used a questionnaire survey to understand the outlooks of the investor on market trends. Kenneth and Meir (2000) categorized the investors into three subcategories, namely, large investors, medium-size investors, and small investors. Gozgor et al. (2019) pointed out that economic policy uncertainty affects gold returns, which in turn affects investor behavior and investor sentiment. During periods of high economic policy uncertainty, especially during the early 2020s and the COVID-19 pandemic, economic policy uncertainty exerts a considerable impact on the financial stock market and affects investment returns.

## OBJECTIVES

1. To understand the impact of Covid-19 on Investment decision of an individual.
2. To study the change in the amount of Investment pre and post Covid-19 outbreak.
3. To know the reasons for investment into various options.
4. To understand the reasons for not investing in certain types of investment.

## RESEARCH METHODOLOGY

Sample selected for study:

Total sample selected is 103

Random stratified sampling is selected for study.

## SOURCES OF DATA COLLECTION

### Sources of Primary Data:

For the research project primary data was collected, using Google Survey Form, for which a questionnaire was created and posted on Google Docs, total 108 responses were collected out of which 103 are used for data analysis.

### Sources of Secondary Data:

Secondary data collected through Internet searches.

Statistical tools used for analysis of data

The statistical tools used in the study are Excel, tables, pie charts and bar graphs.

Statement of the Problem:

Impact of Covid-19 on investment decision of Individual

**Scope of study:**

Area:

Navi Mumbai.

Age group:

Different age group is considered for study

20-30

30-40

40-50

50-60

60 and above

Income group (Monthly income in INR)

Below 20,000

20,000 - 40,000

40,000 - 60,000

Above 60,000

**Limitation of study :**

- Only Navi Mumbai area is selected for study.
- 103 samples are selected for study, on the basis of these 103 sample conclusion is drawn.
- Only a few investment options are selected.

**DATA ANALYSIS**

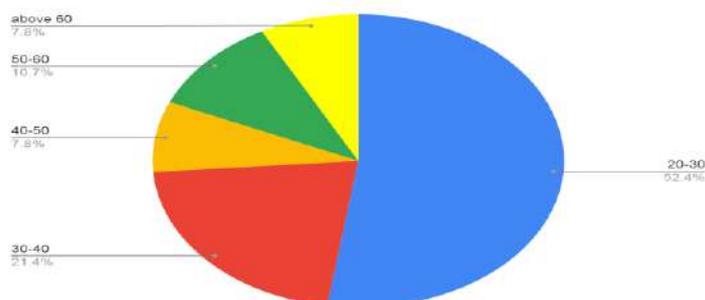
**Figure 6**  
**Gender**



**Source : Primary data**

The above graph shows the gender of the respondents. 57.3% of respondents were male and 42.7% respondents were female.

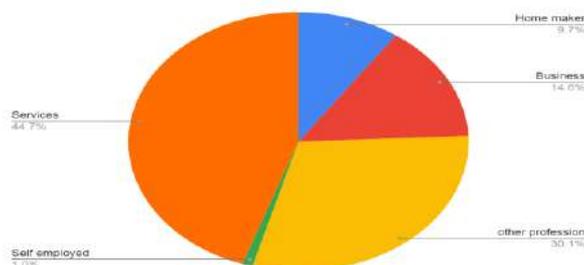
**Figure 7**  
**Age**



**Source : Primary data**

The above pie chart represents the age group of the respondents. Major of the respondents belonged to the age group of 20-30(i.e 52.4%) and then 21.4% of them were from the age group of 30-40 years.

**Figure 8  
 Profession**



Source : Primary data

The majority of respondents (44.7%) were doing services and 14.6% of them were having business as their profession.

**Average monthly Income**

Table 2

Average monthly Income	No. of Respondents
Below 20000	26
20000 - 40000	33
40000 - 60000	22
Above 60000	22

**Figure 9**

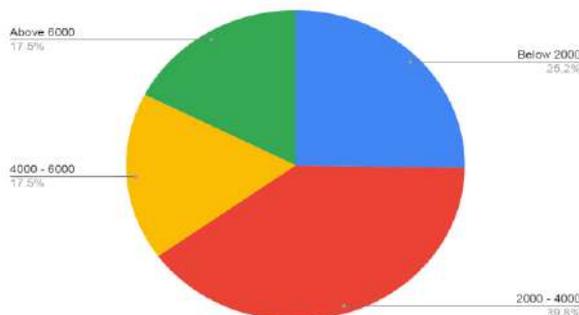


**What amount you used to invest before Covid-19? (Monthly basis)**

Table 3

What amount you used to invest before Covid-19? (Monthly basis)	No. of Respondents
Below 2000	26
2000 - 4000	41
4000 - 6000	18
Above 6000	18

**Figure 10**



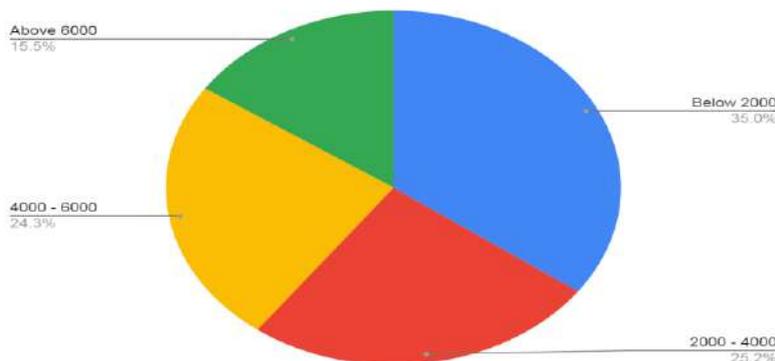
The above table and graph Shows us the investments made by individuals on a monthly basis before COVID-19 outbreak.39.8% of respondents invested an amount between Rs 2000 - 4000 and 25.2% of them invested less than Rs 2000 on monthly basis.

**What amount you used to invest post lock down of Covid-19? (Monthly basis)**

**Table 4**

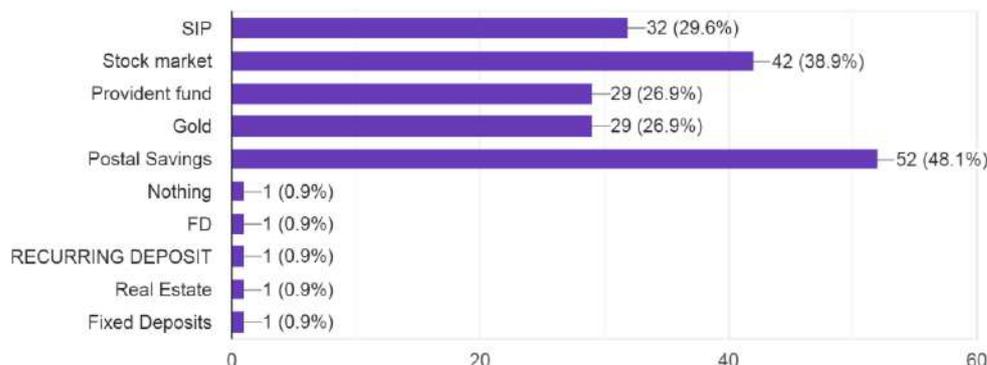
What amount you used to invest post lock down of Covid-19? (Monthly basis)	No. of Respondents
Below 2000	36
2000 - 4000	26
4000 - 6000	25
Above 6000	16

**Figure 11**



**What are the Investments options you used to prefer before Covid-19**

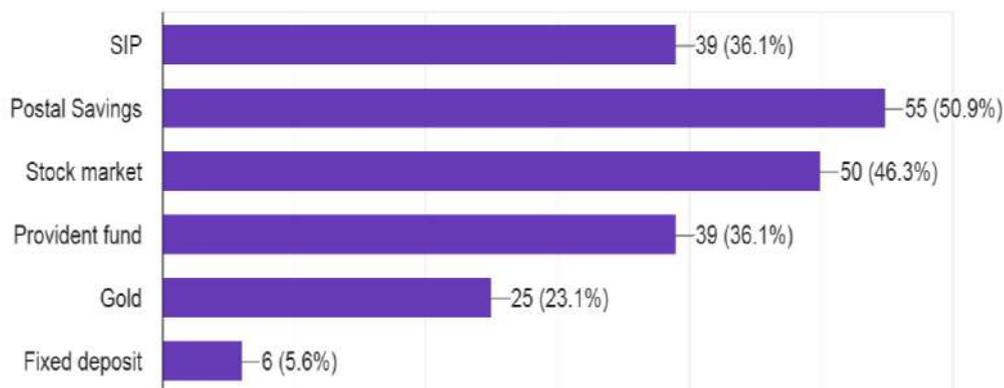
**Figure 12**



The above chart represents the investment options that individuals preferred to invest before the outbreak.48.1% of them prefer to invest in postal savings and stock market is the second most preferred investment option.

**What are the Investment options you used to prefer post Covid-19?**

**Figure 13**



The above chart represents investment options that individuals prefer post COVID-19 outbreak. The most preferred is postal savings, stock market, SIP and provident fund.

**Reasons for not investing in SIP, Gold & Stock market**

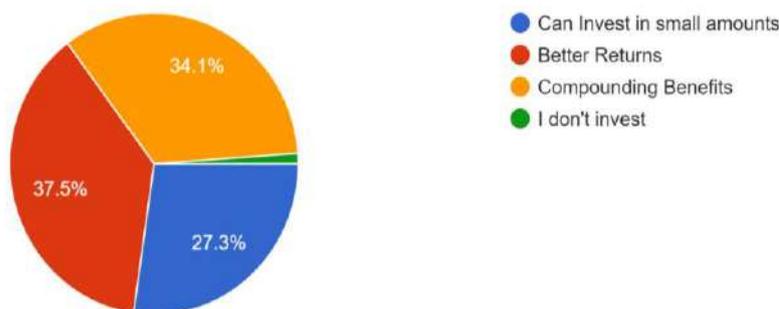
**Figure 14**



The above graph represents the reasons because of which people hesitate to invest in SIP, Gold & Stock Market. Most people don't invest as they don't have enough time to analyse & invest.

**Reasons for Investing in SIP, Gold & Stock market**

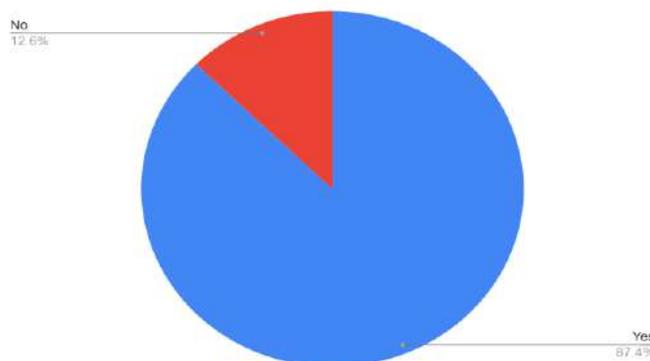
**Figure 15**



The above graph represents the reasons and benefits according to individuals to invest in SIP, Gold & Stock Market. Better returns and investment in small amounts are the benefits that attract individuals to invest in SIP, Gold and stock market.

**Do you think that Covid-19 pandemic has impacted your Investment & Financial decisions?**

**Figure 16**



Most of the people (i.e 87.4%) think that COVID-19 outbreak has impacted their investment decision.

**CONCLUSION**

The COVID-19 outbreak has impacted the economy and so the individuals financial decision. The lockdown in the country has affected the financial management of the population. There is difference in the amount people invested before and after the COVID-19 outbreak. The average amount of investment on monthly basis has decreased.

The situation of lockdown has impacted the income of individuals and their investment decisions. The most preferred investment options are postal savings, Stock market, Provident fund, SIP and gold. People also invested in Fixed deposits after the COVID-19 outbreak. 87.4% of the respondents think that the COVID-19 outbreak and the measures taken by the government to reduce the spreading of COVID has impacted their financial and investment decision.

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## **A Study on Teacher's Perception towards Acceptance of Blended Learning in University of Mumbai**

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### **ABSTRACT**

The harshest experiences give us different learning experience and are a reality check of our preparedness towards life challenges. Every challenge and experience bring with it opportunities, and requires different coping skills and life skills. The pandemic was no different it had shaken the world from the root. Due to Diversity, gender, cultural and personality differences among students teaching have been a more challenging job than before. Learning styles and preferences of students vary and considering these differences while planning lessons ensures the effective delivery of learning. Besides this nomophobia on the part of students has put more pressure on how instructors plan their lessons. For these reasons, instructors in the higher education sector have been thinking of ways to make learning more interactive, interesting and motivating. One of the ways, which is now trending is integrating an online learning mode with traditional face-to face instruction. Various researches has been conducted throughout the world to understand perception of students towards acceptance and satisfaction with blended learning but only few researches have considered teachers' perception which is also an important element in blended learning especially in Higher Education Institutions. Through this research paper an attempt has been made to identify factors that influence the acceptance of blended learning based on TPACK framework and two additional factors. A comprehensive understanding of these factors can assist education policy makers to identify the reasons for the acceptance or resistance of blended learning among teachers of Mumbai University in the future and support them to enhance the acceptance and usage.

Keywords: Blended Learning, Higher Education, Effective delivery, Teacher's Perception

### **INTRODUCTION**

The COVID-19 pandemic has changed the dimensions of education system worldwide. Almost after One and half year after the disease outbreak, blended learning, which involves combining of distance and face-to-face learning, went on to become an alternative to online learning to meet the demands of student's education. This approach is considered to be a unique platform for combining theory and practice in the teaching-learning process. (Coyne E, Rands H, Frommolt V, Kain V, Plugge M, Mitchell M, 2018).

Blended learning or hybrid model of learning is defined as the systematic integration of in classroom learning and online learning (Garrison DR, Vaughan ND, 2013). In the blended learning environment, combining of the online and physical classroom elements should be purposeful. Blended learning should help to increase flexibility and achieve the learning goals. It should promote freedom in learning, participation, interaction, self-assessment and cooperation. (Seraji F, Attaran M, Azizi SM, 2019).

Blended learning helps learners to perform problem solving and face challenges related to learning and sharing the learning experiences (Liu Q, Peng W, Zhang F, Hu R, Li Y, Yan W, 2016). Most research studies have shown that blended learning is more effective than the physical classroom or online learning. (Kiviniemi MT, 2014; Bazelais P, Doleck , 2018; Karamizadeh Z, Zarifsanayei N, Faghihi A, Mohammadi H, Habibi M, 2012).

For the acceptance of blended learning in higher education system of University of Mumbai, it is important to identify the social, psychological, cultural and pedagogical factors that may influence the acceptance of blended learning. Zhao & Yuan (2010) showed that for online learning adaptability, perceived usefulness, perceived ease of use and on time teacher's feed-back were considered to be the most important factors affecting the satisfaction level of learner while using the blended learning. As stated above, blended learning is considered to be very efficient and result oriented approach in universities. Therefore, it is necessary to identify the important factors that may or may not affecting its acceptance in future.

### **LITERATURE REVIEW OF THE STUDY**

- Blended learning requires a good amount of financial commitment which is to be done by the institution to acquire the technological needs and resources. Also the teacher must be having willingness and dedication to learn the new technology and bring it for use in their daily practice (Capo & Orellana, 2011; Kliger & Pfeiffer, 2011)

- The ability of the teacher to adopt this new pedagogy has become more important as various research studies has revealed that it helps to increase student engagement and also in the achievement of educational outcome.(Al-Ani, 2013; Anwar, 2011; Delialioglu, 2012; Downing, Spears, & Holtz, 2014; Williams & Chinn, 2009).
- Because of the positive impact which blended learning has shown in last few years on student learning and the difficulty teachers have faced in implementing blended learning through various research analysis. Therefore, understanding teachers' perceptions about blended learning was the emphasis of this study. (Köse, 2010; Yapici & Akbayin, 2012; Aslan, Huh, Lee, & Reigeluth, 2011; Comas-Quinn, 2011; Klinger & Pfeiffer, 2011).
- The adoption of any new technology innovations in education would ultimately depend upon teachers' acceptance which will help him/her in its affective usage and implementation. If any University wishes to introduce new initiatives that include technological innovations education than addressing performance gaps and gaining teacher willingness towards its acceptance will be important. By neglecting teachers' perception education policymakers are ignoring how teachers will actually teach, and will have a serious credibility in the quality of education and also in achieving the education agenda. Therefore, it is quite important to identify factors that influence teacher's perception towards technology usage in teaching learning process for its acceptance. (Cuban, 2013).
- Cheok et al. (2017) explained about the technology acceptance model which was developed by Davis et al. (1989). It is a theory which explains or helps us to predict whether a technology user, based on his or her perceptions towards a new system and capabilities, is likely to utilize the new innovation. They also stated that since it is the teacher's perception that drives the final outcome, the perceived ease of use of the system is having direct relationship with perceived usefulness, and in turn becomes the decision point for inclusion in person classroom teaching by the teacher.
- Through Unified Theory of Acceptance and Use of Technology (UTAUT) framework (Osakwe, Dlodlo, and Jere ,2017) stated that the perceived effort which is required by a teacher to learn and use new technology is the main aspect which helps to take decision in implementing the new technology.

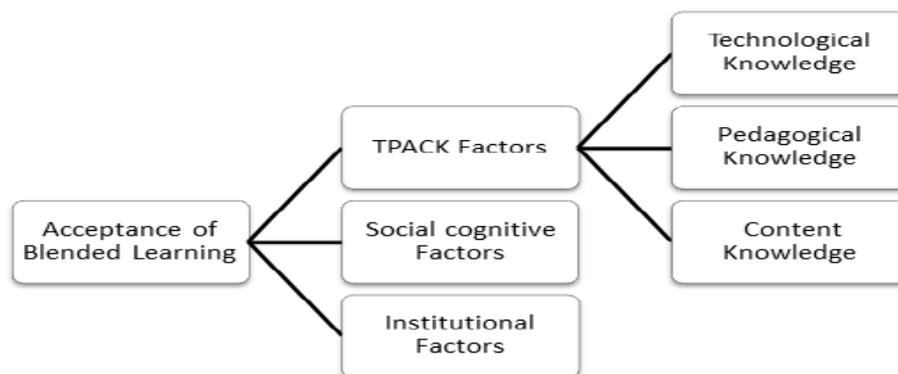
### OBJECTIVES OF THE STUDY

- The main aim of the study was to understand teacher's perception towards blended learning in University of Mumbai.
- The purpose of this study was also to identify the influencing factors in the adoption of blended learning from teacher's perspective based on TPACK framework along with two additional factors that is Institutional and Social Cognitive factors.

### METHODOLOGY

The research analysis is based on Primary & Secondary data. Secondary data was collected from scholarly books, News articles, published texts & Internet. Convenience sampling technique was used to collect primary data from 150 teachers teaching in university of Mumbai across Mumbai, Thane and Navi Mumbai region with help of well-structured questionnaire. Questionnaire was framed based on 5 point Likert scale and the choice ranged from Strongly Agree to Strongly Disagree. The data collected was codified and analyzed using SPSS-18 and tested using Independent Sample T-test, One way Anova and Correlation.

### PROPOSED CONCEPTUAL MODEL



### Explanation of Proposed Conceptual Model

Nowadays, TPACK framework has become important focus for conducting research in the field of technology application from teachers' perception. (Chai, Tsai, & Koh, 2013). TPACK was initially built through development of PCK (Pedagogical Content Knowledge) by Shulman (1986). TPACK framework involves three primary forms of knowledge: Content (CK), Pedagogy (PK), and Technology (TK) proposed by (Koehler & Mishra, 2005).

Based on the previous studies and literature of Papanikolaou, K., Gouli, E., & Makri, K (2014), Kazua, I. & Demirkol, M ; (2014), Lee (2010), Mishra and Koehler (2006), Alazzam (2012), Chai et. al (2013), Allan, Erickson, Brookhouse & Johnson (2010); all studies have shown positive relationship in enhancing teachers' capability to make use of ICT for teaching and stated how TPACK can be helpful in to guiding teachers' effort in dealing with the new challenges of teaching and learning that one has to go through due to rapid changing technologies. Through this study TPACK factors along with Institutional and Social Cognitive factors are combined to check its acceptance among the teachers of University of Mumbai.

- Technological Knowledge (TK) – This describes teachers' knowledge towards a new technology introduced and ability to use new technologies, tools, and technological associated resources. (Koehler & Mishra, 2005)
- Pedagogical Knowledge (PK) – Pedagogical Knowledge describes teachers' knowledge of the different practices, Innovative processes and methods used in daily teaching and learning. (Koehler & Mishra, 2005)
- Content Knowledge (CK) – Content Knowledge describes teachers' own knowledge of the content or subject matter of instructing. (Koehler & Mishra, 2005)
- Institutional Factors – According to Porter and Graham (2016) Institutional factors responsible for successful implementation of blended learning involves support, structure, and strategy. Edannur and Marie (2017) in their study stated that institutional support is required for successful implementation of blended learning technology. Brown (2016) said that if management of the institution is not offering any kind of incentives or material support then the teacher attitude in implementation of blended learning automatically decreases.
- Social Cognitive Factors – Bandura's (1977) social cognitive theory clearly stated that an individual does an activity based on the perception of success and it is the individual self-efficacy that will determine how much initiative person is ready to take and how much hard work is being done in the accomplishment of the task and to what extent a person is continuing to try and accomplish the task in the face of obstacles.

### DATA ANALYSIS & INTERPRETATION

**Table 1:-** Demographic Profile of the Respondents

<b>Gender</b>		
<b>Variable</b>	<b>Frequency</b>	<b>Valid Percent (%)</b>
<b>Male</b>	48	32%
<b>Female</b>	102	68%
<b>Total</b>	<b>150</b>	<b>100</b>
<b>Age Group</b>		
<b>Variable</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Upto 30</b>	53	35.3%
<b>31-40</b>	39	26%
<b>41-50</b>	32	21.3%
<b>Above 50</b>	26	17.3%
<b>Total</b>	<b>150</b>	<b>100</b>
<b>Type of Job</b>		
<b>Variable</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Aided</b>	52	34.67%
<b>Unaided</b>	98	65.33%
<b>Total</b>	<b>150</b>	<b>100</b>

2.A)

**Descriptive Statistics for TPACK Factors**

**Table 2:-** Descriptive Statistics

Variables	N	Min	Max	Mean	SD	Variance
Technological Knowledge (TPACK 1)	150	1	5	3.61	1.142	1.304
Pedagogical Knowledge (TPACK2)	150	1	5	<b>3.89</b>	1.122	<b>1.259</b>
Content Knowledge (TPACK3)	150	1	5	3.83	1.225	1.500

A close analysis of the above descriptive statistics in table 2.A revealed that variable TPACK 2 that is Pedagogical Knowledge was considered to be an important parameter by sample respondents with low degree of variation.

**2.B) Descriptive Statistics for Institutional Factors**

Variables	N	Min	Max	Mean	SD	Variance
Institutional Support (IF1)	150	1	5	<b>2.27</b>	0.981	<b>0.963</b>
Institutional Structure (IF2)	150	1	5	1.90	1.19	1.43
Institutional Strategy (IF3)	150	1	5	2.20	1.21	1.47
Institutional Motivational Programme(IF4)	150	1	5	1.93	1.01	1.02

From table 2.B it can be observed that variable (IF1) that Institutional Support is considered to be an important parameter in misrepresentation of women in Indian Media with least degree of variation.

**2.c) Descriptive Statistics for Social Cognitive Factors**

Variables	N	Min	Max	Mean	SD	Variance
Self-efficacy (SCF1)	150	1	5	3.20	1.27	1.62
Goals (SCF2)	150	1	5	3.61	1.32	1.75
Socio-structural variable (SCF3)	150	1	5	<b>3.79</b>	1.15	<b>1.34</b>

From table 2.C it can be analyzed that variable SCF3 that is Socio-Structural variable was having highest mean and least degree of variation according to sample respondents.

**2.D) Comparison of all the factors of study**

Variables	N	Min	Max	Mean	SD	Variance
TPACK	150	4	20	<b>15.6</b>	3.14	<b>9.89</b>
Institutional	150	4	20	10.6	4.28	18.36
Social Cognitive	150	4	20	8.30	3.46	11.99

From table 2.D it can be clearly understood that TPACK factor is considered important parameter with highest mean & least degree of variance.

**Hypothesis Formulation & Testing: -**

1) **H0: There is no significant difference between male and female with regards to TPACK factors towards acceptance of blended learning in University of Mumbai**

**Table 3:-** Independent Sample T-Test on difference in Perception towards TPACK factors among Male & Female

Perception towards acceptance of blended learning (TPACK)	Male		Female		T-value	P-Value
	Mean	SD	Mean	SD		
Technological Knowledge	14.39	3.09	15.29	4.44	1.198	<b>0.002**</b>
Pedagogical Knowledge	10.54	3.90	10.62	3.19	0.963	0.338
Content Knowledge	8.70	3.53	8.11	3.43	-.155	0.875

### INTERPRETATION

- Highest mean for both male & female is for the factor Technological knowledge which means for both of them it is important Variable regards to teachers perception towards TPACK for acceptance of blended learning in University of Mumbai.
  - Since p value is less than 0.01 for Technological knowledge the Null Hypothesis is rejected at 1% level of Significance. Hence there is significant difference between male & female with regards to teachers perception towards acceptance of blended learning with regards to TPACK in University of Mumbai.
  - While for other factors p value is more than 0.01 which means there is no significant difference in perception of male & female with regards to Pedagogical Knowledge & Content Knowledge.
- 2) **H0: There is no significant difference between male and female candidates with regards to Institutional factors towards acceptance of blended learning in University of Mumbai**

**Table 4:-** Independent Sample T-Test on difference in Perception towards Institutional Factors among Male & Female

Perception towards acceptance of blended learning (IF)	Male		Female		T-value	P-Value
	Mean	SD	Mean	SD		
Institutional Structure	2.85	1.18	3.26	1.19	0.570	0.569
Institutional Support	3.15	1.24	3.35	1.21	2.320	<b>0.02*</b>
Institutional Strategy	3.13	1.31	3.16	1.26	2.557	<b>0.002**</b>
Institutional Motivational Programme	2.63	1.27	2.75	1.29	0.578	0.564

### INTERPRETATION

- Since p value is less than 0.01 the Null hypothesis is rejected at 1% level of significance for institutional strategy. Hence there is significant difference between male & female with regards to institutional support with regards acceptance of blended learning in University of Mumbai.
  - Since p value is less than 0.05 the null hypothesis is rejected at 5% level of significance for institutional support. Hence there is significant difference between male & female with institutional support.
  - While for other factors p value is more than 0.01 which means there is no significant difference in perception of genders with regards to Institutional Structure & Institutional Motivational Programme.
- 3) **H0: There is no significant difference between male and female candidates with regards to social cognitive factors towards acceptance of blended learning in University of Mumbai**

**Table 5:-** Independent Sample T-Test on difference in Perception towards Social cognitive factor for acceptance of blended learning among Male & Female

Perception towards acceptance of blended learning (SCF)	Male		Female		T-value	P-Value
	Mean	SD	Mean	SD		
Self-efficacy (SCF1)	12.39	3.09	14.29	4.44	1.198	<b>0.002**</b>
Goals (SCF2)	8.54	3.90	11.62	3.19	0.924	0.326
Socio-structural variable (SCF3)	7.70	3.53	9.11	3.43	-.155	0.774

### INTERPRETATION

- Highest mean for both male & female is for the factor Self-efficacy which means for both of them it is important Variable regards to teachers' perception towards acceptance of blended learning in University of Mumbai.
- Since p value is less than 0.01 for self-efficacy the Null Hypothesis is rejected at 1% level of Significance. Hence there is significant difference between male & female with regards to teachers' perception towards acceptance of blended learning in University of Mumbai.
- While for other factors p value is more than 0.01 which means there is no significant difference in perception of male & female with regards to Goals and socio-structural variables.

4) **H0: There is no significant difference between male & female with regards to teacher perception towards acceptance of blended learning in University of Mumbai**

5) **Table 6:- Independent Sample T-Test on difference in Perception of teachers for acceptance of blended learning among Male & Female**

Perception towards acceptance of blended learning	Male		Female		T-value	P-Value
	Mean	SD	Mean	SD		
<b>TPACK Factor</b>	8.39	2.09	10.29	3.44	1.198	<b>0.002**</b>
<b>Institutional Factor</b>	7.54	1.90	8.62	2.19	0.963	0.312
<b>Social Cognitive Factors</b>	6.70	1.53	6.11	2.43	-.155	0.625

#### INTERPRETATION

- Highest mean for both male & female is for the factor TPACK factor which means for both of them it is important Variable regards to teachers perception towards acceptance of blended learning in University of Mumbai.
  - Since p value is less than 0.01 for TPACK the Null Hypothesis is rejected at 1% level of Significance. Hence there is significant difference between male & female with regards to teachers perception towards acceptance of blended learning in University of Mumbai.
  - While for other factors p value is more than 0.01 which means there is no significant difference in perception of male & female with regards to Institutional Factor & Social Cognitive Factors.
- 6) **H0: There is no significant difference between Age group with regards to teacher perception towards acceptance of blended learning in University of Mumbai**

**Table 6:- One Way Anova for difference in Perception among Age Group**

Perception towards acceptance of blended learning	Upto 30 Years	31-40 Years	41-50 Years	Above 50 Years	F value	P Value
<b>TPACK Factor</b>	14.54 (4.43)	15.69 (4.38)	14.78 (4.45)	15.19 (3.68)	.576	.632
<b>Institutional Factor</b>	7.28 (3.31)	8.15 (2.77)	8.37 (3.60)	10.53 (3.65)	5.654	<b>0.01**</b>
<b>Social Cognitive Factors</b>	9.84 (3.10)	11.53 (3.08)	9.81 (3.34)	11.69 (2.41)	4.128	<b>0.008**</b>

#### INTERPRETATION

- Since P value is less than 0.01, the null hypothesis is rejected at 1% level of significance with regards to Institutional Factor & Social Cognitive Factors. Hence there is significant difference among age groups with respect to Institutional Factor & Social Cognitive Factors.
- As indicated in the table there is no significant difference among age groups with respect to TPACK Factor.

**Table 7:- Correlation between variables of Perception of teachers for acceptance of blended learning**

Correlation	TPACK Factor	Institutional Factor	Social Cognitive Factors
<b>TPACK Factor</b>	1	.147	<b>.594**</b>
<b>Institutional Factor</b>	-	1	<b>.353**</b>
<b>Social Cognitive Factors</b>	-	-	1

#### INTERPRETATION

- Correlation is highly significant between TPACK Factor & Social Cognitive factors with 59.4% positive relation.
- Correlation is highly significant between Institutional & Social Cognitive factors with 35.3% positive relation.

## FINDINGS

- The most important factor which will help teachers in acceptance of blending was identified to be Technological knowledge with respect to TPACK.
- Institutional support and strategies were identified to be important from teachers' perspective for acceptance of blended learning in University of Mumbai.
- Self-efficacy of a teacher was identified as important variable with respect to social cognitive factors which indirectly effects the adoption of blended learning in university education.
- Both male & female perceive that among all the factors which develops teachers' perception towards acceptance of blended learning in Mumbai University TPACK factor played an important role.
- With respect to people of different age group also feel that TPACK is important when it comes to adoption of blended learning.

## SUGGESTION

- There is a requirement of identification of needs as it will help in successful implementation of educational change. Teachers must have an understanding of what is expected of them for such successful change in Higher Education.
- There is a need to understand a teacher's decision to incorporate blended learning in education as this will help to benefit teacher training and student learning.
- Educational policy makers needs to make a plan to adopt blended learning at the college level by providing a clear cut operating procedures regarding the implementation of blended learning and how it can be effective in higher education; particularly in the emerging universities such as Mumbai University.
- Strong technological infrastructure need to be developed in the classrooms to ensure smooth functioning of blended learning by providing faculty with computers, Internet and other associated technological infrastructure.
- Increasing the number of blended learning courses gradually for offering to the students in university.
- Attracting students' attention by making them interactive in the blended learning so that they can interact positively whether in the classroom or online activities.

## CONCLUSION

On the basis of above facts, figures and discussion it can be concluded that there are benefits and challenges to the blended learning approach. Incorporating technology in teaching directly impacts student learning and influences their preparedness for the skills expected from today's employers. (Saritepeci & Çakir, 2015). Teachers should be given time to learn and share ideas about how to effectively implement these technologies (Buckenmeyer, 2010). Kenney, Banerjee & Newcombe (2010) and Hilliard and Newsome (2013) stated that Blended Learning is an essential requirement for educators to enhance their knowledge and skills hence understanding teachers' willingness and perception in acceptance of incorporating technology in education will benefit all the stakeholders of education. This study aimed at providing information that is useful for teachers, institutions and education system or policy makers to create a strong technological environment that will enhance teacher perceptions of educational technology.

## LIMITATION OF THE STUDY

The obtained findings, conclusions, and recommendations are limited to the use of blended learning among Mumbai University teachers. The study group was selected using the convenience sampling method. Thus, the Universal acceptance of the results obtained in this research study is limited only to teachers associated with University of Mumbai. Survey was conducted in a very short span of time that is from 1<sup>st</sup> October 2021 to 10<sup>th</sup> November 2021. Also, the results from a survey study may not reveal in-depth issues or challenges faced by teachers as an interview study might have accomplished. However, the usage of the survey did allow for a few numbers of teachers perceptions to be assessed.

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## **E-Commerce Is Fast Becoming a Popular Option for Shopping In India**

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### **ABSTRACT**

Covid-19 is affecting many e-commerce businesses. The covid-19 crisis is likely to have long-lasting effects on e-commerce. E-commerce is a business model that lets businesses and persons deal products and services over the internet. E-commerce is fast becoming one of the most favored modes of shopping in India today. According to IBM'S report, the covid-19 pandemic pushed the industry ahead by around five years. Moreover, after the covid-19, remaining home is further expected to drive the consumers towards online shopping. This study examines the popularity of e-commerce due to the covid-19 pandemic and also finds that e-commerce became a substitute source of traditional marketing or not with the help of primary data collected from the respondents. There is a huge online market in India as computers and the internet is becoming an inevitable part of our life. The popularity of e-commerce increased after the dawn of the covid-19. Sectors such as electronics, fashion and accessories, health and pharma and FMCG did particularly well, with upright growth in sales.

Keywords: COVID-19, Pandemic, Growth, E-Commerce, Online Shopping, Internet

### **INTRODUCTION**

The Internet is playing a significant part in eliminating business hurdles of the past. Electronic commerce, commonly written as E- COMMERCE is the trading of products and services using computer networks, such as the internet. E-commerce has helped industries establish an extensive market presence by providing inexpensive and more well-organized distribution channels for their products or services. Approximately every possible product and service is available through e-commerce transactions, including FMCG, books, music, clothing, electronics travel tickets, and financial services such as stock investing and online banking. These business dealings can be executed in four ways: Business to Business (B2B), Business to Customer (B2C), Customer to Customer (C2C), Customer to Business (C2B). Typically, E-commerce is a profitable transaction which transpires over the internet. Online stores like Shopify, Flipkart, Amazon, Flipkart, Myntra, eBay, Quikr, Olx are examples of E-commerce websites. The best thing about e-business is that it never phase-out and it demands half of the amount which a retail business does. Despite the opening up of local markets, retail stores and malls over the past few months, the findings have stated that consumers who used ecommerce services during the past year are continuing to use them. E-commerce is fast becoming one of the most favoured modes of shopping in India, sustained by increased customer adoption due to the Covid-19 pandemic. E-commerce is one of the fastest growing industries

in the global economy. As per one estimate, it grows nearly 23% every year. And it is projected to be a \$27 trillion industry by the end of this decade. India is the third largest e-commerce economy in the world after China and the U.S.A. According to TRAI (Telecom Regulatory Authority of India) by the end of 2021 82 crore population will be using the internet and 40% of internet usage will be made for online purchase.

### **REVIEW OF LITERATURE**

The following are the significant studies relating to the topic:

**Cowart, Kelly O. Goldsmith, Ronald E. (2001)**, "The effect of consumer decision-making styles on online apparel consumption by college students". Apparel buying is now one of the fastest-growing sectors of e-commerce. Hence, there is a sturdy online shopping intent.

**Vulusi, Krishna. (2020)**, "These days, the Shopping proneness is experiencing change, not because people are using the internet, but it is other factors and conducive environment which is created." Businesses have redesigned their business model, refurbished logistics, and functionality. There is a shift in consumer's view to shop from brick-and-mortar shops rather than buy online at a flexible time. Investors are interested in capitalizing their money from the e-commerce market.

**Kumar, N.,(2018)** in this paper the author comments growth in e-commerce is foreseeable to rise 4 times by year 2021 in comparison to 2015. Most important contributors are superior internet services, digitalisation of services by government, increase in smartphone usages, entry of foreign and more Indian players, advanced payment choices for customers, and additional regulations and legal frameworks by the government.

## OBJECTIVES OF THE STUDY

Following are the objectives of the study.

- To examine the emerging trends in product shopping in India.
- To evaluate the scope and challenges of online shopping in India.
- To study the trends of latest developments in online shopping in India and the awareness of the same amongst the people.
- To evaluate the liking of people in online shopping.

## RESEARCH METHODOLOGY

**Research Design:** Random Sampling

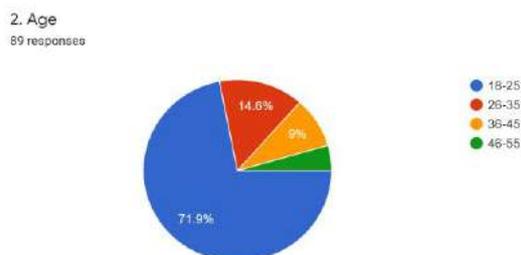
**Primary Data:** Primary data collected through google form.

**Secondary Data :** This paper reviews the literature on the basis of secondary data collected from various references which already exist in published form such as articles, books, e-newspapers, national and internal journals, annual reports, government and non-government publications and company official websites, etc.

**Sample Size:** 89

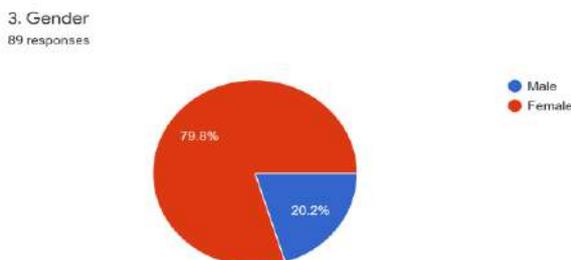
### Findings and Discussions:

#### 1) Age:



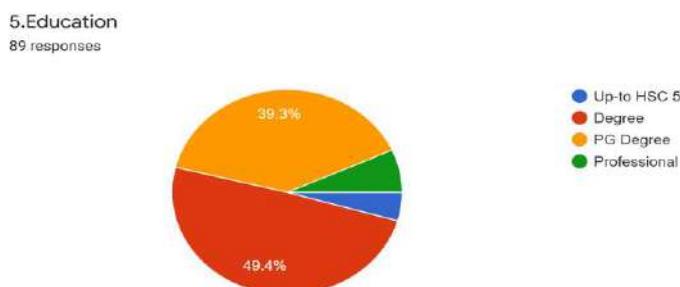
**Interpretation:** 71.9% responses received were from the age group of 18-25.

#### 2) Gender:



**Interpretation:** 79.8% responses received from females and 20.2% responses received from male groups.

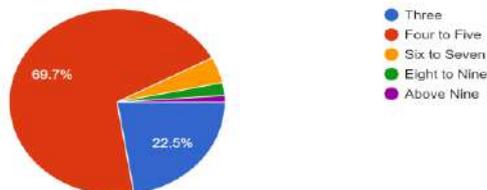
#### 3) Education:



**Interpretation:** 49.4% were degree college, 39.3% were PG Degree students responses received.

#### 4) Size of family

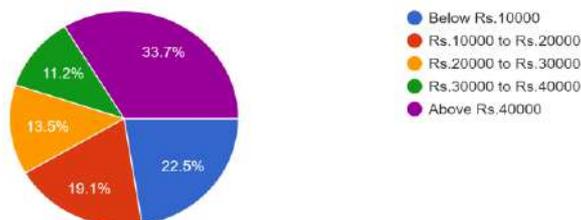
6. Size of Family  
89 responses



**Interpretation:** According to the above chart, 69.7% families are having four to five members in the family, 22.5% families are having three members in the family.

#### 5) Monthly income:

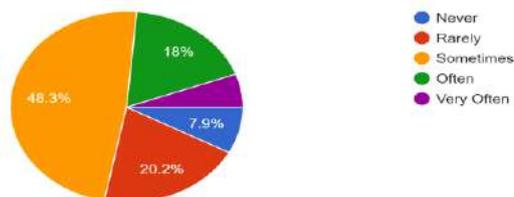
7. Monthly Income  
89 responses



**Interpretation:** According to the above chart, 33.7% are earning above Rs.40000 per month, 22.5% are earning below Rs.10000 per month, followed by 19.1% earning Rs.20000-30000 per month and 11.2% earning Rs.30000 to Rs.40000 per month.

#### 6) Do you search products online and buy in store?

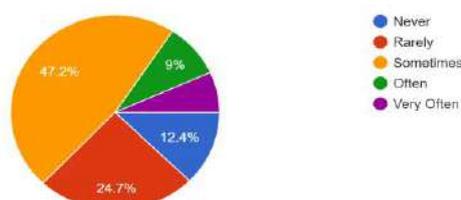
8. Do you search products online and buy in store?  
89 responses



**Interpretation:** In the above chart, 48.3% responded that sometimes they search products online and buy in store. 20.2% responded that they rarely search products online and buy in store. 18% responded that they often search products online and buy in store.

#### 7) Do you search for products in store and buy online?

9. Do you search products in store and buy online?  
89 responses

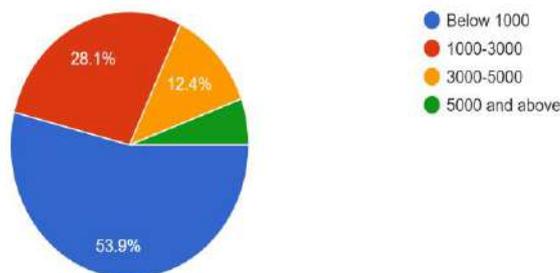


**Interpretation:** In the above chart, 47.2% responded that sometimes they search for products in store and buy online. 24.7% responded that they rarely search for products in store and buy online. 12% responded that they often search for products in store and buy online.

### 8) What average amount do you spend online shopping per month?

10. What average amount do you spent in online shopping per month?

89 responses

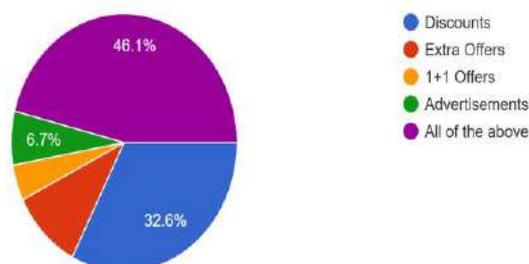


**Interpretation:** In the above chart, 53.9% responded that below 1000; average amount they spent online shopping per month. 28.1% responded that 1000-3000; average amount they spent online shopping per month. 12.4% responded that 3000-5000; average amount they spent online shopping per month.

### 9) Which promotional activities attract you to shop online?

11. Which promotional activities that attracts you to shop online?

89 responses



**Interpretation:** In the above chart, 46.1% responded that discounts, extra offers, 1+1 offers, advertisements attract people to shop online. 32.6% responded that discounts attract people to shop online, followed by 6.7% by advertisements.

### 10) Reasons for online shopping of different products.

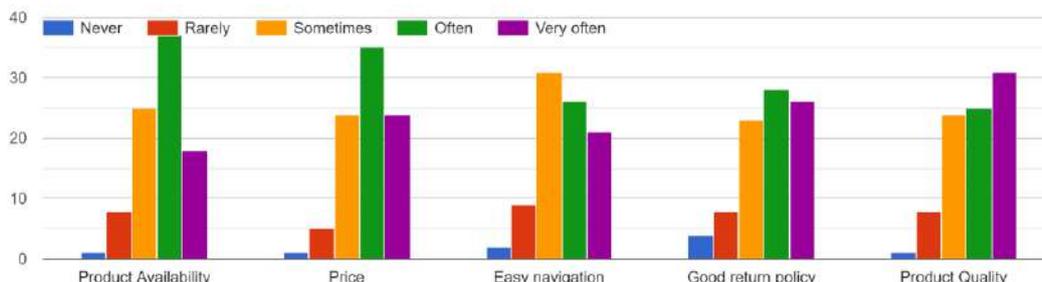
12. Reasons for online shopping of different products.



**Interpretation:** In the above chart, flexibility of shopping hours, ability to shop for a lower price, flexibility of delivery time all are the reasons for online shopping of different products.

### 11) What are the most important criterion while choosing an online retailer for buying products?

13. What are the most important criterion while choosing an online retailer for buying products.

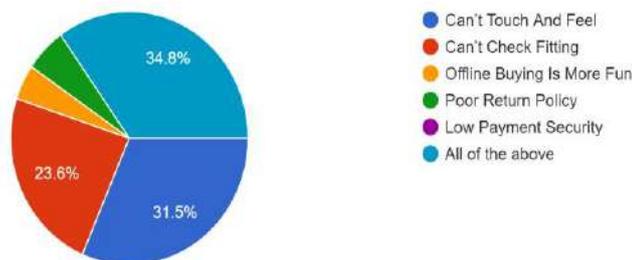


**Interpretation:** In the above chart ,majority responded that product availability are often use as an important criterion while choosing an online retailer for buying products

### 12) Problems with buying products online.

14.Problems with buying products online.

89 responses

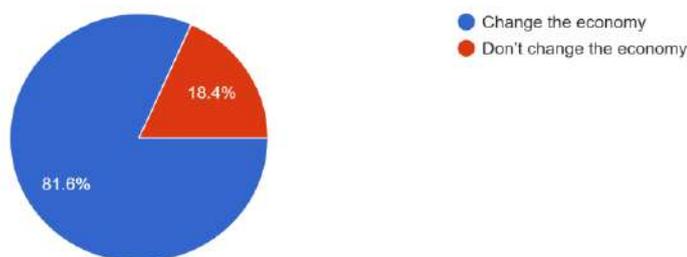


**Interpretation:** In the above chart ,34.8% responded that the problem with buying products online is that they cant touch and feel. 31.5% responded that the problem with buying products online is that they cant touch and feel. Can't check fittings, offline buying is more fun, poor return policy and low payment security.

### 13) What is your opinion on the changing trends in online shopping impact on the Indian economy?

15. What is your opinion on the changing trends in online shopping impact on the Indian economy.

87 responses



**Interpretation:** 81.6% responded that the change of the economy opinion on the changing trends in online shopping impact on the Indian economy. 18.4% responded that the don't change the economy opinion on the changing trends in online shopping impact on the Indian economy

### CONCLUSION

There are so many challenges the industry is facing; the progress forecast is not possible because of continuously changing the customer expectation and technology. Shopping behavior also plays a major role in

E-Commerce. Businesses have to devise new technologies to influence the customers' expectations. The small and medium companies fought too much because of logistics and supply chain issues, these companies must use reliable associates to distribute products and services.

Businesses have to modify Marketing models to get more buyers, and companies must focus on production of good quality products. Companies need to transit to new technologies and artificial intelligence.

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## Pandemic Preparedness for Libraries

Neelima Balachandran

SIES (Nerul) College of Arts Science & Commerce

### ABSTRACT

The article talks about the role of libraries during the pandemic. The need for them to readjust according to the changing scenario. It tries to understand the pandemic, the lockdown and restrictions in the context of libraries. So also the need for libraries to totally transform and lure users despite all consequent problems caused by the pandemic. Various examples have been stated to explain how libraries all over are coping and emerging stronger and even more user friendly than before. Finally it concludes by getting into the details of re opening and the need for libraries to take on bigger responsibilities and play a vital role in helping users during this tough time.

Keywords - pandemic, closure, teaching and learning, online services, restrictions, remote and digital services, hygiene, communication

### The Pandemic - COVID-19 and its spread

The Coronavirus refers to a family of viruses. COVID-19 – or the Coronavirus Disease – is the infectious disease caused by a newly discovered type of coronavirus. It almost brought the whole world to a standstill overnight. Almost all organizations were shut down with immediate effect. In this context, libraries were no different.

### CLOSURE OF LIBRARIES

All around the world libraries were facing hard choices around which services to offer and how, ranging from minimal restrictions to full closure.

At the same time governments themselves were taking different approaches, sometimes ordering the closure of all institutions, while yet others indicating that life should continue as usual. Some others simply leaving decisions up to library directors.

The decision to restrict services or close a library is clearly a difficult one and needs to be taken following an assessment of the relative risks.

### Libraries in the academic scenario

- In an academic set up the 'library' plays a fundamental and a pivotal role. It mainly stores, analyses, interprets and disseminates information among the users to fulfil their information needs. And without doubt recent technological advancements have revolutionised library services to a very large extent.
- Academic libraries are now providing both physical as well as web-enabled library services to their users. In this set up, library websites act as a major influence in providing web-enabled library services.
- The sudden outbreak of the COVID-19 pandemic has rudely disrupted the physical mode of library services.
- At the same time to support the ongoing teaching and learning process, libraries need to continue their services despite the lockdown.
- Therefore, the key question is whether academic libraries are ready and adequately equipped to perform basic services during this critical juncture. And also about studying the readiness among the academic libraries by assessing their websites based on selected evaluation criteria.

### The Lockdown effect on libraries especially in India

- The lockdown was declared during the last week of March 2020, in India. Consequently, all educational institutions and libraries were closed. The outbreak of the pandemic affected every aspect of human life to a great extent.
- The common teaching-learning patterns and practices changed drastically. UNESCO, 2020 report reveals that most of the academic activities like teaching, learning, conducting examinations, doing research work, providing library services, were severely interrupted which affected 320 million students of the country.
- Hence higher educational institutions started organising e-learning platform for their students.
- In support of e-learning, libraries also needed to continue offering different innovative web-based services.

- To overcome this situation libraries also need to accelerate web-based services to promote e-learning as mentioned by Hinchliffe & Wolff-Eisenberg.
- As per the survey report of the ALA libraries now to continue to broaden the accessibility of digital resources and launch different virtual programs to cope with the existing conditions.
- And also to manage the pandemic situation libraries should promote different services like online article request service, online renewals, issuing virtual library cards, e-mailing barcodes numbers for smooth accessibility, borrowing e-books, online delivery, etc. among users.
- Also identified by IFLA were different remotely accessible library services such as the provision of free e-books, freely available different resources, Open Access (OA) materials on COVID-19, virtual exhibitions, media and information literacy, Ask-a-Librarian, online article request service, consultation service through video conference which were accessible through a single-window- interface.
- Similarly Massachusetts Library System sought to promote their services on the internet during the pandemic, where due weightage was given in bridging the digital divide, ensuring access to e-books, databases, e-resources, offering virtual programs, promoting self-care, and staying connected with users' community through social media.

Considered are a few works of literature on library services provided during COVID-19. Winata, Fadelina and Basuki highlight the issue relating to the adaptiveness of different

web-based services instead of physical services. It was found that almost all universities libraries had transformed from physical to virtual to provide library services. So evaluating the usefulness of e-services of libraries is important. Library websites are considered the main gateway of e-services

With reference to India, the literature on website evaluation is vital.<sup>28</sup> National Institutes of Technology (NITs) library websites were studied by Kaushik and it was found that most of the library websites are not able to maintain effective search interface, web 2.0 - tools, services based on cloud, etc. It was also suggested that the websites need to be improved.

Again Madhusudan & Ahmed conducted a study to evaluate the audio-visual contents and user-friendliness of the Indian Institutes of Management (IIMs) library websites. A checklist of 11 features was formulated to evaluate the websites. It was revealed by the the study the websites were still lagging to facilitate audio-visual contents, web 2.0 - tools, guidance - tools etc.

Afterwards a comparison was made between 19 institutes with national importance (Indian Institute of Technology (IITs) and Indian Institute of Management (IIM) and the twenty central universities. This study came out with the revelation that that in terms of content awareness, central universities were lacking behind the institutes of national importance.

So also Chua & Goh did a study on 120 public and academic libraries from three different regions Asia, Europe, and North America; to examine the usage of web 2.0 applications into the library websites. It was identified that libraries had incorporated different web 2.0 aids to enhance information dissemination and user awareness, i.e., blogs, instant messaging aids, social media platforms, wiki, social tagging, etc.

It is hence clear that various studies have already been conducted in analyzing the website of the academic libraries, but nothing has been done about the preparedness of the academic libraries of India to address the pandemic situation. So it is important to examine the readiness of Indian academic libraries to provide effective services to their users in perilous situation. It seems Indian academic libraries were not completely prepared to face the situation but have been trying to keep up and evolve.

Jana and Rout have analysed the websites of libraries of the top 100 academic institutions in India and the study seeks to draw a summary of library services through their websites during this pandemic crisis. Overall findings of this study suggest the inclusion of improved web-based services by the academic libraries, which is the need of library users in this digital era.

Importantly, this study has also tried to understand the relationship between ranks as per the preparedness index and NIRF ranks of the institutes. It is clear that there is no such relationship exists between these ranks from the findings. So, it can be said that an institute that got a rank in NIRF ranking does not mean that their preparedness index is also good.

Again by setting aside the overall results of this study at one end and inspecting individual features, it can be stated that libraries have started reviving from different aspects to deal with this pandemic ridden atmosphere.

**To state an example :**

- alerting the users through sharing pandemic info
- educating users through 'user education
- providing remote access on subscribed materials
- sorting down the COVID-19 information
- listing down free and open access contents from different sources
- facilitating e-learning courses materials
- providing online-DDS against unavailable contents
- enabling chat-widget or feedback service to help users who have trouble in accessing library services

True also is the fact that the availability of these features is not so much noticeable, but the presence of these features confirms that libraries have started to put their efforts to deal with this epidemic situation. Hence, the pandemic has played the role of an eye opener for library professionals in making necessary changes to their library planning in an emergency.

**Managing the different ways to handle restrictions**

Due to the lockdown effect, libraries in different parts of the world are facing very different situations, from broadly maintaining a full service to complete shut down. Libraries and librarians are finding themselves in one of a number of situations, drawing on experience around the world,

**When Business is (more or less) as usual:** in some countries, cases of the virus have been limited and governments have not taken any specific action. Nevertheless, regular recommendations around good hygiene apply. In such scenarios, libraries are :

- Ensuring user access to soap and warm water
- Ensuring that they have a supply of hand sanitiser
- Keeping surfaces clean, including toys and library computers
- Ensuring comfort - staff and users are encouraged to take time to recover if they are feeling ill, rather than coming in to work
- Providing pages with useful links to reliable information for users on their websites and promoting media literacy faced with potential misinformation online

**When there are some restrictions:** here in there are more cases, and governments are starting to act in order to limit larger events, as well as actively encouraging people to take extra measures to ensure hygiene standards. Therefore libraries are :

- Trying to reconsider programming such as story times or workshops, especially for groups at risk such as older users. And taking extra additional efforts to ensure hygiene, including through disinfecting hard surfaces. Removing riskier items such as toys or virtual reality headsets from circulation
- Considering whether to close study spaces where people may spend a longer time in the company of others
- Preparing for potential further restrictions, for example by ensuring that all staff have the abilities and tools to work from home (if this is possible) and that services, as far as possible, can still be provided digitally

**When there is Minimal service:** in many countries there are more stringent ways still, with tougher restrictions on public gatherings, specific warnings for people at risk, and closures in the maximum affected areas. Here in libraries are :

- Fully closing spaces and only offering the possibility to borrow or return books at a counter, or via a book drop. Some countries are working around with drive-through pick-up and return of books. Others are only taking in visitors who have pre-booked.
- Implementing strictly quarantine policies on returned books (see below for further details)

- Implementing various plans to offer remote services for example eLending, eLearning, or support to remote teaching
- Finalising and testing measures for all staff to work remotely and allowing those who can to do so

**When there is Full closure:** where measures are strictest, libraries have either been forced to close, or have decided to following consideration of the risks to users and staff. In such cases libraries are :

- Ensuring that all staff working from home unless completely necessary. Where staff are coming into work, ensuring that they can do so while respecting rules around social distancing
- Librarians are often being reassigned to other duties in other departments within their municipalities, for example using information management skills to support health and social services
- Providing regular communication with users about opportunities to use library resources or services
- Organising digital story-times where copyright permits
- Promoting use of digital libraries and other tools - including potentially investing in more content/licences
- Offering an amnesty on borrowed physical books, and increasing the number of eBooks users can borrow
- Making library spaces and equipment available for other activities, such as printing personal protective equipment
- Raising awareness of digital offers, both on the front pages of their websites, and through putting up posters in the windows of library buildings

#### **Handling materials during the pandemic**

- A key question for many in the library field has been around the **risk of infection through contact with materials carrying coronavirus**. Due to improper understanding of any aspect of how the virus is spread is still at a relatively early stage, there is no definitive advice, other than the universal recommendations on keeping clean.
- Nonetheless there is emerging research (in the New England Journal of Medicine, and the Journal of Hospital Infection) into the survival of the virus, both in the air and on different types of surfaces. It has been found that the virus survives for longer on plastics and steel, and for lesser time on cardboard or copper, although these tests took place in laboratory conditions and infection risk does fall eventually.
- A webinar organised by the Institute of Museum and Library Services in the United States reiterated this, putting forth that the risk from paper was low, with hard, regularly touched services posing more of a danger.
- The Dutch government has also put forth that that the chance of catching the virus from paper surfaces, such as mail, is low
- So also as has the Austrian Federal Institute for Risk Assessment and the guidance provided to Norwegian libraries, which observe no evidence of contagion through surfaces yet, a point also echoed by the main advisor to Swedish libraries on the subject.
- If one sees outside of the library field – for example like in postal services – ordinary precautions appear to apply when handling paper or cardboard. What is more probable is that other surfaces – such as door handles, keyboards, mice, CDs and DVDs, computer equipment, toys or VR headsets – could carry the virus, and so should be regularly cleaned or taken away from circulation.
- For safety purpose , where there is a chance that a book or other piece of equipment has been handled by someone unwell, it may be appropriate to wait or use more effective measures. The important thing being to take care – a point also echoed by the French government.

#### **Few Measures Taken**

As the best possible response to the uncertainty that still exists, the Institute of Museum and Library Services in the United States has set up REALM (Re-opening Archives, Libraries and Museums), a partnership with OCLC and the Battelle Institute to explore further how to ensure safe handling, to which IFLA is also a part. This consider assessing the risks around particular materials and services, with a view to aiding libraries make choices as they decide how to re-open and continue services.

This particular project has now come out and published a first key output – a review of the available literature. And looks across research papers, both those which have and have not been subject to peer review yet, and coming from a variety of fields. It further examines evidence on transmission through the air and also via nearness to those with the virus, on the virus' survival on different surfaces, and at the effectiveness of different approaches to cleaning. While this material will be useful for those developing ideas, the authors are clear that research is still at an early stage, and evidence is coming from a wide range of different contexts.

There are a number of sets of guidance that recommend offering clear **ways of returning potentially contaminated books**, through dropping books, dedicated returns desks, or even baskets around the library for returning material for consultation alone.

In Geneva, some of the school libraries are leaving baskets in each classroom for returns.

The Polish guidance has put forth that returns should be made onto surfaces that can be easily cleaned, or paper sheets which can be got rid of, while the Croatian National and University Library has set up at one entrance, baskets where books can be left behind, while the Japanese Library Association suggests using tables for this.

### **Providing services remotely**

- All kinds of libraries around the world have been working hard to provide access to collections and services remotely, often investing time and effort in updating websites and computer systems in order to deal with demand.
- Many libraries already had a strong digital availability, many others have now moved to create one in order to continue serving members, such as the library at Al Iraqi University in Iraq.
- As highlighted in a survey by the Conference of Directors of National Libraries, ¾ of national libraries, for example, introduced new digital services, while a survey of public libraries in England found the same proportion of them had provided online services.
- To state another example, the State Library of New South Wales surveyed public libraries in the state about their online activities during lockdown, finding for example that following physical closures, the share of libraries offering online programming jumped from 12% of respondents to 86%.
- In the meanwhile, La Vanguardia in Spain produced a list of 40 ideas for libraries to continue to provide support remotely

### **Promoting digital services**

- By building on its SimplyE app, New York Public Library is running online book clubs, as is the Library of Alexandria, Egypt.
- Across Malaysia, in preparation for World Book and Copyright Day on 23 April, a #LetsReadTogether campaign encouraged people across the country to read more online.
- In Johannesburg, South Africa, libraries have reinforced their activities on social media.
- The Library of Congress organising a virtual transcribathon in order to engage people at distance.
- The National Library of Norway encouraging users to access its podcasts while in-person events are not possible.
- The Dutch National Library has teamed up with a writers' organisation to provide an 'author on your screen' service.
- In the United States librarians have been able to use GoogleForms to create themed virtual escape rooms, many of which have been taken up and used by teachers to support education.
- Via Library Journal, a number of library crowd-sourcing initiatives is available
- A number of public libraries have also tried to develop new possibilities to be in contact with librarians remotely. Danish libraries have put up an online **Ask-a-Librarian reference** service - and Aarhus has a service just for children.
- Libraries have established a chat function on their website in Sweden, Helsingborg for the first time, as have many libraries in Malaysia.

- Johannesburg public libraries in South Africa are running video competitions to encourage young users to share digital skills with parents and grandparents, as well as to develop their own digital literacy abilities, and sharing the results on their Facebook page.
- Similarly in **academic libraries**, there are efforts to provide remote access, like through an **online article request service** at the East West University, Bangladesh, at the Agricultural University Library of Colombia - digital contacts and the Veracruz University in Mexico, or through call-in hours at Rhodes University, South Africa.
- The library of the University of Malaya is developing tools to facilitate online discovery and evidence retrieval about the COVID-19 pandemic, creating a poster to explain its work, and has set up a COVID-19 Evidence Retrieval Service to support doctors around the country answer queries.
- Also in many countries, libraries' offer of free **WiFi** to users is a key part of their offer. In the United States, libraries have been told to leave networks on so that users can access the internet from their cars if needs be.
- In Topeka County, in the US, bookmobiles equipped with WiFi routers are visiting communities with low connectivity.
- There being so many services on offer, libraries in a number of countries have been able to work with newspapers, radio stations and other communications channels in order to create awareness.
- A number of publishers and vendors have taken initiatives that have been helpful. In the field of academics, many have provided **open access** to materials related to COVID-19. Others have facilitated access by making it much **easier to log-in and access materials** from outside of official networks. Though access openly to academic materials, especially directly concerning COVID-19, is not always as universal is as claimed.
- Many inviting initiatives from major trade publishers such as Macmillan and Penguin Random House have made it easier for public libraries to buy and access **eBooks for lending**, and Audible is providing access to hundreds of audiobooks.
- Providers of information, such as the Internet Archive, have also made large volumes of materials available with fewer limits to support learners, researchers and others to access information in difficult times.
- The Hathi Trust is also allowing libraries to lend out digitised copies of its owned books in hard copy, although this is not possible globally due to laws related to copyright.
- Wikimedia has set up a project on COVID-19 to manage information on the subject (see the webinar), while the National Library of India, in the meantime, has made search engines for OERs for researchers and children and young adults.
- Among resources for teaching **media and information literacy** online one example is the MOOC hosted on the Commonwealth of Learning platform. Many university libraries are also increasing their offer of training on information literacy in order to help students having to carry out their research online.
- Libraries in Hawai'i, as well as in Loveland, Colorado and elsewhere in the U.S are also offering online courses in information literacy around the pandemic.
- It is very important that all the rights holders take steps to ensure that access to information for research, education and culture can continue as best possible. In Brazil, the view taken by rightsholders, combined with a lack of appropriate copyright laws means that libraries are not able to offer platforms of digital books, other than those in the public arena.
- In India, there have been calls for more focus to be placed on accessibility. A survey carried out by the Conference of Directors of National Libraries underlined that half had encountered problems in providing digital access due to copyright, as well as questions such as connectivity and digital skills among staff. Furthermore, there are many publishers who are refusing to provide electronic access to their works, and some charging prices far higher than for physical work.

### **Managing remote working**

Many in the library field are facing challenges around how to manage remote working effectively with libraries and library associations closing offices – where they have them.

It seems the best situation is where it has been possible to plan in advance, ensuring that all staff have the **tools and training necessary** to work effectively and safely from home, and that you can stay in touch easily. With the same situation world wide, there are lots of materials available on the internet already, with a strong torchlight on regular contacts and staying positive and motivation. Yet with it still unclear how long restrictions will last, it is always worth having plans in place for how to cope with longer-term impacts. Strong contact between libraries within a network can also help, as can contact with suppliers externally, keeping in mind potential re-opening, as has been the case in Hong Kong. Similarly in Malaysia, the pandemic has seen the rise of Facebook groups and virtual forums as spaces for people to share and learn.

### **Reassigning library resources**

Due to closure and drop in services, it has been seen that library personnel have been active in taking up other roles. In Ireland, for example, library staff have been seconded to help with **contact tracing** (while librarians in San Francisco have volunteered to do this), and in Trinec in Czechia took on other duties temporarily, while staff at Tulane University library have been putting efforts to provide the World Health Organization itself with the most recent scientific advice.

Broadly, the library field has warned against being in any rush to re-open physical buildings. Even if other services or buildings are re-opening, the specific nature of library services may make them unsuited to re-open until the situation has improved further, as set out in the Flemish (Belgian) guidance of 9 June. There have already been cases of libraries needing to re-close following re-opening before overall levels of virus in the community and procedures were in place. Similarly, a resurgence of the virus has already led, for instance, to the closure of all but contactless book loans in Quebec, Canada.

### **Limiting numbers in the library**

One of the steps being taken to reduce risks is to limit the number of people in the library at any one time. This makes it easier to maintain social distance. In Macao (China), the public libraries are using a **ticketing system** to limit numbers in the library, a step also taken in Hong Kong (China) during a recent phase of re-opening. The The National Library of Serbia in its re-opening first phase allowed only 5 people into its reading room, while some school libraries in Geneva, where they have opened, are letting in just one pupil in at a time.

### **Limiting concentration of users**

A further step that is being taken by some is to limit the number of sections of the library open to people. Importantly, even if there may be enough space in theory for people to respect social distancing, the use of certain facilities may make this more complicated, as highlighted in the guidance provided by French library associations

Further means of limiting the time people spend close to others include **removing some furniture** (to ensure that people sit further apart), allowing just one table per user (as in some Geneva school libraries), marking some as being not for use, as in Chinese Taipei, or allocating specific places per user as at the National Library of Croatia.

### **Conducting events and activities**

Where re-opening is more advanced, there are already plans on how to make events possible again. To a large extent, this has been made possible by falls in rates of infection, and, in some areas, a lack of infections altogether.

In Austria, for example, it is already possible to hold events with up to 100 people indoors, and from 1 July, the limit will be increased to 250 people indoors and 500 people outdoors. In these situations, rules about social distancing (1m) continue to apply, except for people living together (groups of up to four), and with it being mandatory to wear face masks when entering and leaving, as well as during events when it is not possible to maintain distance.

### **Promoting hygiene**

The importance of high standards of hygiene is a key theme, like by ensuring that staff have the possibility to **wash their hands frequently, access to materials such as gloves and facemasks**, and that **hand sanitiser** is available at the entrance (and potentially near to equipments like computers). In particular, regular handwashing by staff continues to be strongly recommended (both before and after contact with materials), as well as the provision of bins for tissues or other potentially contaminated material (pedal bins may be ideal, as suggested by the Flemish guidance). As it has been noted in the Andalusian guidance, it may be necessary to employ more cleaning staff, or to extend hours. They can be supported in identifying the surfaces at most risk, and give these the attention necessary.

Some of the libraries have increased efforts to encourage use of **automatic options** - such as self-service machines - in order to limit contact, while Canadian urban libraries are encouraged to see whether such machines can be made touch-free. Others are setting up spaces to collect books without person-to-person interaction, as in Australia, or via drive-through or kerbside pick-up (as at the National University Library of Croatia). Billerica Public Library, Massachusetts, has developed a protocol for this, shared with users,

**Materials that may be touched frequently**, such as magazines and newspapers, may need to remain inaccessible until the risk is low enough, or only be accessible to people with gloves and masks (as in some libraries in Estonia). Similarly, the Kaslik Holy Spirit University in Lebanon suggests preventing use of manuscripts, rare books and other older material for the time being, while the Flemish guidance suggests that it may be legitimate to focus permissions on the most necessary consultations (for example for legal processes, rather than local history or genealogical study).

### **Public Communication**

Given the present uncertainty, and often the complexity of the process of lifting restrictions, libraries planning for this have tried to focus on communications – a part of the recommendations set out by the German Library Association (see below). As the Australian guidance notes, there may indeed be more questions than usual from users unsure about what is possible or not. The Canadian guidelines echo this, stressing the need to explain the changes to services, and to help users adjust to the very fact that things may not be the same as before.

### **Plans for re-opening around the world**

- **Argentina:** the Library of Congress of Argentina has published its protocol for safe re-opening in an English version, including useful infographics for use with staff and users.
- **Australia:** the Australian Library and Information Association has provided a useful checklist, setting out steps to take around communication, social distancing, safety precautions, staff support, community support and operations.
- **Austria:** the library association has developed guidance on how to re-open safely, drawing on international experience and practice.

### **National Libraries**

National libraries can also play an important role in providing access to content, both as key institutions in their countries, and as leaders in their national library systems. An overview is available through the information collected by the Conference of Directors of National Libraries, and at the same time the Conference of European National Libraries has produced a map identifying the situation in member libraries. A follow-up survey, looking at re-opening, sets out broad trends in the way that libraries are looking to protect users and staff, as well as providing insights into how digital services and uses have been expanded throughout the crisis. Others have worked to bring together information about experiences, both nationally and internationally, such as the Russian State Library.

There are already steps towards lifting restrictions, in many countries at least partially, with libraries potentially part of this. Timings remain uncertain, and clearly safety should be a priority. Therefore, libraries are:

- Starting to make plans for gradual reopening when rules, permissions and library locations and resources themselves permit this to happen safely, and making necessary changes to library schemes. Carrying out a risk assessment, focused both on library activities and the wider situation, can be a key part of this.
- Setting limits on numbers of people using the library at any one time, and establishing how to enforce these (through advanced booking, ticketing, or other means of counting numbers of users), and also preventing situations where people may gather closely together, for example using one-way systems, limiting furniture, keeping reading rooms closed, or continuing to postpone programming, and keeping toilets closed.
- Implementing regular cleaning processes (through short library closures), especially focused on surfaces where the virus appears to be able to last for longest (plastics, metals other than copper), or at least intensifying cleaning.
- Developing click-and-collect or drive-through services in order to allow access to books without human contact.
- Developing protocols for how to respond if someone with symptoms is identified in the library.

- Ensuring that staff have the equipment and training necessary to stay safe, including screens if necessary, reducing contact as far as possible and making possible work from home for as long as possible, and provide regular updates
- Making clear when it is impossible to open safely, and otherwise ensuring that those taking decisions understand the nature of library spaces, including through a gradual approach to resuming services only when each one is safe
- Continuing to promote online services and resources in order to limit numbers looking to visit the library
- Communicate clearly about all any new rules to library users, both online and onsite, and provide regular updates
- Ensuring that plans are in place for a potential return to lock-down in case of new peaks in infection rates

### **CONCLUSION**

It is imperative for libraries to take the initiative and reach out to users in the pandemic situation even post lockdown in order to make them feel welcome. And also by tweaking their services in order to provide services best suited to the new world order brought on by the pandemic. It becomes the onus of libraries to touch the lives of users and make themselves useful rather than await user response and then work on utilization. Keeping Dr Ranganathan's five laws at the fore front is is once again time for libraries to reinvent themselves.

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## Cryptocurrency-Mining and Comparative Analysis of Mining Techniques

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### ABSTRACT

Cryptocurrency is an emerging and booming digital currency that is currently becoming a trend going on a large scale in the market. There are more than 6000 cryptocurrencies are in circulation as of 2021.

It has an open and decentralized system, and it uses cryptography to improve security and govern the formation of new units. It uses the blockchain and hash technique. Cryptocurrency is marketed to be the next step from the current traditional monetary transactions and can be considered as an alternative to it.

The popularity of cryptocurrency is quite visible as the value of the first cryptocurrency traded in 2010 (Bitcoin) was worth \$0.08. And if we see today after a decade the same Bitcoin is worth \$57565 in November 2021. It is an enormous growth if we consider the period is only a decade. So many investors are inclined towards investing in cryptocurrency. But if we see it thoroughly it makes quite a stir on its impact on the environment as a lot of energy is consumed to mine cryptocurrency. Even though it is not regulated in many countries and is one of the most unstable assets, investors are still investing in it.

This paper focuses on the technology behind cryptocurrency, its popularity and growth, various usage, and security aspects involved in digital currency transactions. This study also analyses the effective use of various mining techniques to ensure reliable and energy-efficient usage of cryptocurrencies, thus conserving our environment and maintaining the eco-balance by comparing two different approaches used for cryptocurrency mining.

Keywords- Cryptocurrency, Mining, Blockchain, Investment, Digital Currency, Hashing, SHA-256, Ouroboros, Proof of Work, Proof of Stake

### I. INTRODUCTION TO CRYPTOCURRENCY

Cryptocurrency is a type of decentralized digital currency that is in regulation over the internet. Bitcoin was the first introduced cryptocurrency in 2008. Bitcoin is still the most well-known, powerful, and dominant cryptocurrency. Since then, Bitcoin and other cryptocurrencies such as Ethereum have gained in popularity as digital alternatives to government-issued money. If we look at the market capitalization of these cryptocurrencies top three are Bitcoin, Ethereum, and Binance Coin as of November 2021. Cryptocurrency is not regulated by the government and its transfer charge is very minimal which makes it a global currency with an instant transfer feature. It is very easy to transfer cryptocurrency to someone it is just a fingertip away job. It uses blockchain technology for the generation and maintenance of cryptocurrency. They're controlled via peer-to-peer networks of computer systems running free, open-supply software. With all these features cryptocurrency gained a lot of market attention and popularity amongst investors.

#### 1.1 Advantage of Cryptocurrency

**1.1.a. Easy Transfer and less Transactional fee-** Cryptocurrency is very easy to handle when it comes to transactions as not any financial or third party is involved. Since banks are not working as a middle man when two parties transfer coins to each other the transfer fee also reduces and there are not much of formalities as well.

**1.1.b. Security-** Cryptocurrency uses blockchain technology to store transactional records and as blockchain uses decentralized architecture there are multiple copies of blockchain is stored in multiple nodes. It is nearly impossible to do any modification in data because the slightest manipulation in data can change the hash with that the block will become invalid as blocks stores information of previous hash it is difficult to make changes in the entire chain and that too in multiple nodes. This feature of blockchain provides a very good security aspect to cryptocurrencies.

**1.1.c. Easily Portable-** Cryptocurrencies are very easy to carry as they are not physical money. It is a digital currency with can be stored in any digital wallet or even a memory card making it easily portable without any extra effort. One can store multiple cryptocurrencies worth millions or billions of dollars in a single hard disk.

**1.1.d. Irreversible-** Using previous hashes in a block makes it impossible to tamper with data since it will change the hash of the block making it invalid and because of multiple copies spread all over the world it is

quite irreversible to change data of a block after it is created, giving cryptocurrency and its transactions transparency and consistency.

**1.1.e. Safety-**Cryptocurrencies are a new boom in from a decade and the major reason for it is even though it is distributed in public it is safe due to hashing and blockchain technology. It requires encryption to verify the transaction and lots of calculation is required to do the same giving cryptocurrency a safe environment.

### 1.2 Disadvantages of Cryptocurrency

**1.2.a Not Regulated-** Cryptocurrencies are not regulated and legal in many countries yet. As no bank issues cryptocurrencies, it is not fully in the Government's hands. In India, there is no ban or regulation as of now on cryptocurrency so they are not the official mode of payment. Lots of illegal transactions or black-market transactions are performed in cryptos as they are not regularized by any bank and secure in terms of safety.

**1.2.b Instability in Value-** Cryptocurrencies are seen as assets for investment like gold and silver. People stack and invest in cryptos as they had shown tremendous growth in terms of value. But the value of crypto is not stable they are very much fluctuating and that makes it's volatile, for instance, let's take the example of bitcoin the most famous cryptocurrency.

In October 2021 the value of 1 bitcoin was an all-time high of \$61374.28 and within 3 months in January 2022, the value of 1 bitcoin was \$37928.58 this is very volatile and makes it not a stable asset.

### 1.2.c External Factors

**i. Politics-** As in many countries' cryptocurrencies are banned it's difficult to have global transactions in crypto. And due to new policies and depending upon the current government ruling, there are up and down in value and changes in policies as well.

**ii. Environment-** Recently environment becomes the major concern in the mining of cryptocurrency. As mining requires lots of energy and computers release lots of carbon footprint and the ratio of the energy required and mine crypto is not considered balanced and good for the environment. As proof of work requires more calculation and multiple miners try to mine the block simultaneously it becomes more energy consumable.

## II. COMMON CRYPTOCURRENCY

There are many cryptocurrencies are in circulation right now. We are going to focus on the most popular cryptocurrency which has the highest market growth in a few years. According to Forbes, the top 10 cryptocurrencies based on the market cap are with Values as of 3<sup>rd</sup> Feb 2022 from the coinmarketcap website

Sr.No.	Cryptocurrency	Year Launched	Launch Value	Current Value	Algorithm Used	Market Cap(in billions)over
1	Bitcoin (BTC)	2010	\$0.08	\$36803.60	SHA-256	\$730
2	Ethereum (ETH)	2015	\$2.77	\$2620	Ethash	\$327
3	Tether (USDT) Stable Coin	2015	\$1.00	\$1.00	Not mined	\$78
4	Binance Coin (BNB)	2017	\$0.10	\$377	SHA-256	\$63
5	U.S. Dollar Coin (USDC) Stable Coin	2018	\$1.00	\$1.00	Not mined	\$50
6	Cardano (ADA)	2017	\$0.0024	\$1.03	Ouroboros	\$35
7	Solana (SOL)	2020	\$0.77	\$100	SHA-256	\$33.5
8	XRP (XRP)	2017	\$0.006	\$0.62	Ripple Consensus Algorithm	\$29
9	Terra (LUNA)	2019	\$1.31	\$47.06	Not Mined	\$21
10	Polkadot (DOT)	2020	\$1.25	\$17.62	Not Mined	\$19

Table 1:Market Growth of Cryptocurrency

## III. GENERATION OF NEW CRYPTOCURRENCY

### 3.1 What is blockchain?

Blockchain is a technology that is invented back in 1992 but got implemented in 2009 when bitcoin was introduced and it was the first popular implementation. The blockchain is a secure and safe way to store data and it is distributed so data authenticity is very good and its irreversible nature makes it more robust and reliable.

The basic concept of blockchain technology is that it uses the process of the distributed database which performs several transactions that are entirely open to the participants. All the transactions that are made are verified by the blockchain system, and once the transaction is done, it keeps all track of the transactions and it is not possible to destroy those records. The blockchain specifies that it gives pure verification to all the transactions and keeps a solid record that can never be misguided. In simple words, it is much easier to steal something which is placed in a specific place rather than stealing the same thing which is placed in front of thousands of people. (Amer Kareem, January 2018)

The transparency due to decentralization, security due to immutability of data, and traceability of information makes blockchain desirable and popular in the last decade. Many organizations are thinking of implementing blockchain for their data storage purpose.

According to the authors of "Blockchain Revolution," Don & Alex Tapscott, "The blockchain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value."

(Sansiya, August 2021)

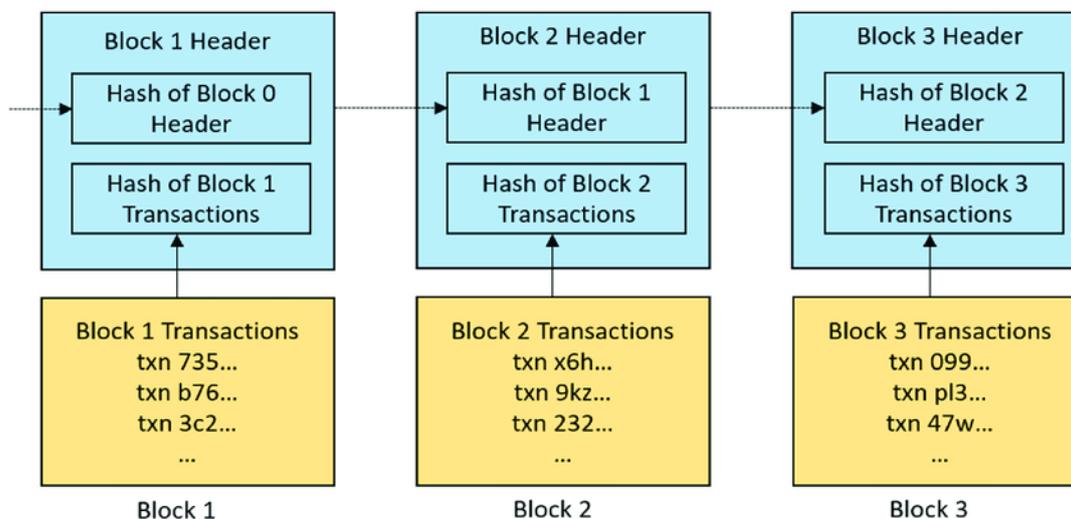
### 3.2 How does blockchain work?

The data is stored in blocks. The *blockchain consists of multiple blocks and they all are interlinked with hashes.*

#### 3.2.a Blocks

A block in a blockchain consists of 3 elements

- i. Data
- ii. Hash
- iii. Previous Hash



**Structure of Blockchain**  
**Figure 1.** (Cornelius C. Agbo, April 2019)

The block has a **data** part in which the actual data is stored and there is a unique **hash** is generated for every block depending on the data stored in the block via some hashing function or algorithms. These hashes are unique and can't be tempered. Even the slightest change in data changes the hash. The blocks store the **previous hash** to create a chain of blocks.

This structure made the new block the part of the blockchain and since blockchain is based on distributed system architecture the blocks are stored in multiple nodes over the internet making tempering more complex as several copies exist.

#### 3.2.b Genesis Block

The very first block in the blockchain is known as the genesis block as they don't hold the previous hash. From this block, the chain starts and its hash is mentioned in the next block in the chain.

(Gaurav, 2020)

### **3.3 What is Crypto Mining?**

As we have seen already how new blocks are created and make a chain of it and the data is irreversible which makes it more authentic. As the blocks are distributed the data can be verified as well. Whenever a cryptocurrency transaction takes place, a miner verifies the transactions and with these new cryptocurrencies are formed. The miner can verify the transaction by decrypting the block. These blocks contain the information about the cryptocurrency transaction that is just happened and once a miner decrypts the block other nodes verify and validate the block and it joins the chain of the already existing block. When a miner adds blocks, they get a fraction of the new crypto as a reward. The miners are getting paid in cryptocurrencies. This mining process and decrypting of the block needs lots of computational power so mining individually can be costly because the miner needs to set up high-end computing gear. To reduce the cost now miners do mine in pools, which increases the chances of mining new cryptos, and the profit is distributed equally among all the members of the pool.

### **3.4 Consensus Algorithm or Verification of Transaction**

There is a concept of Consensus Algorithm which is used for verification of new blocks in the blockchain. The two major consensus algorithms are Proof of Work and Proof of Stake. Many major cryptocurrencies are now using both of them making them equally popular. Ethereum 1.0 when launched uses Proof of Work and currently, they launched Ethereum 2.0 in December 2020 which uses Proof of Stake as their consensus algorithm. The work of both algorithms is similar in that it validates the new blocks and adds them to the distributed public blockchain and ignores fraud blocks to add in the blockchain.

#### **3.4.a Proof of Work (Miners)**

In this method, the various nodes are engaged in solving a cryptographic puzzle. The one miner who solves the puzzle first will be allowed to add the new block to the blockchain once it gets validated by the other miner and get the rewards of creating a new block with some fraction of coins that are generated with the same block.

Mining requires lots of energy and computing powers as all miners are competing with each other the chances of mining first will go to the miner having a high configure system with the best computing power. On average there should be one bitcoin mined every 10 min. But with the high computing power of computers that can be done faster so every 14 days, the difficulty level is increased to stop this to happen which leads to more calculations.

To achieve more rewards the mining pools are created where many miners come together and mine for blocks increasing their chances to mine the block. More hash power gives more chances to mine the block and so comes the rewards. This results in a lot of energy consumption. According to Digiconomist, 54 TWh energy is used in mining which is enough to power the entire country of New Zealand or Hungary.

#### **3.4.b Proof of Stake (Validators)**

In this approach the blocks are not mined they are minted or forged and who will mint the block is decided by the election process. The selection process can be based on coin age-based selection or random block selection. In this one node is randomly chosen to mint the next block. Later on, few validators from the network vote for the validator whether he/she added the correct block or not. To become a validator one has to submit some coins in deposit to the network as a stake or fixed deposit. When the validator successfully validates and adds a block in the blockchain then they are rewarded with additional coins that are added to the stake. If the validators validate a malicious block, then they can be punished in various ways like slashing (destroying some of the stakes of the validator), losing the validating power, losing voting rights, or can be permanently blocked to access the network. As not everyone is minting the new block and verifying it uses less energy and less computation power making this method more environment friendly. Therefore, many cryptocurrencies are recently attracted to this method.

Proof of Work	Proof of Stake
 Computational work done by the miner	 Validating a new block is determined by how large a stake a person holds
 Reward is given to the first miner	 Collects network fees as their reward
 Network miners compete with one another, miner communities become more centralized over time	 Proof of stake systems are much more cost and energy efficient

### Basic differences in POW and POS

Figure 2 (Husnara Sheikh, Volume 6 Issue XII, Dec 2018)

## IV. COMPARATIVE ANALYSIS

### 4.1 Common Algorithms

There are more than 6000 different cryptocurrencies are in circulation right now. With these many cryptos, various algorithms are used to mine these cryptocurrencies. Few algorithms like X11, X15 are a combination of multiple algorithms which makes them safe and efficient.

According to bitcoinwiki.org, these are a few popular mining algorithms that are used to mine these popular coins

Algorithms	Coins
SHA-256	Bitcoin, Mastercoin, MazaCoin, Namecoin, NuBits, Peercoin, BitcoinDark, Scotcoin, Nubits, CarpeDiem, Zetacoin, Acoin, TEKcoin, Unobtanium, Blakecoin, Reikicoin, Ixcoin, Bytecoin
Scrypt	Auroracoin, Coinye, Synereo, Syscoin, GameCredits, Dogecoin, Litecoin, Potcoin, Starcoin, Teslacoin, Aucoin, Topcon, Pesetacoin, Smartcoin, Xivra, Zedcoin, Stockcoin, Foxcoin
X11	Dash, Crevacoin, Cryptcoin, Fuelcoin, Startcoin, Crevacoin, Adzcoin, Influxcoin, Cannabiscoin, Darkcoin, Hirocoin, X11coin, Smartcoin, Goldblocks, Hatch
Ethash	Krypton, Shift, Expanse, Ethereum Classic, Ethereum
Blake-256	Dirac, Electron, BlakeBitcoin, Blakecoin, Photon
Ouroboros	Cardano (ADA)

Table 2: Algorithm used in Coin mining

### 4.2 SHA-256 Algorithm

The SHA-256 algorithm is developed by NSA (National Security Agency) and published by NIST (National Institute of Standards and Technology). It is the first algorithm applied in Bitcoin to create a blockchain and this algorithm is used to create a hash that is used in blockchain and proof of work. The hash is generated by this algorithm is always 256 characters long and any change in original data will change the hash. When miners solve a guessing problem with a hash function it takes lots of work to find the answer but it's easy to verify once it is found. This provides security to the network against fraud.

### 4.3 Ouroboros Algorithm

The ouroboros algorithm is used in Cardano (ADA) coin comes from the Ethereum family known as an updated version of Ethereum. This is based on the Proof of stake algorithm. Ouroboros determines how every block is getting consensus to getting added on the blockchain. The ouroboros consensus algorithm is energy efficient as it randomly selects the validators among all the validators in the network based on coin age selection or random processes. It makes it less biased in terms of who is going to mint a new block or coin. And few validators voted for the authenticity of the new block added in the chain. This provides security and all the validators don't need to have very high computational power machines to do the calculations and not everyone does that simultaneously.

#### 4.4 COMPARISON

Factors	SHA-256	Ouroboros
Validation of New Block	Proof of Work	Proof of Stake
Computing Power	High	Low
Processing Cost	High	Low
Environment Friendly	Low	High
Scalable	Low	High
Security	High	Low

Table 3: Comparison between SHA-256 vs Ouroboros

SHA-256 and Ouroboros both algorithms are used to mine and mint popular cryptocurrency but the approach of verification of these two algorithms makes them different on many levels. As the SHA-256 used to mine various crypto like BTC uses the verification approach of proof of work and miners try to solve the complex puzzle it requires more computational power and increases the processing cost. But Ouroboros used to mint ADA uses proof of stake as the validation process and due to which not every node creates block at add-in blockchain only randomly selected validators are allowed to mint a new block. This specific selection makes Ouroboros less energy consumable and highly scalable and environmentally friendly but it lacks security comparison to SHA-256.

#### V. CONCLUSION

In the new age of digitalization, the concept of digital money and cryptocurrency is been seen as a nice alternative to government-regulated money. The popularity of cryptocurrency has already skyrocketed in the last decade. Many countries have already regulated it and many organizations take payments in crypto. In the future, we can see more countries accepting cryptocurrency as a digital currency and giving it the status of regulated money, and imposing some laws to control its volatile nature. As of now few stable cryptocurrencies are already in the market. As we have seen both types of algorithms involved in mining and minting cryptocurrency, I think the **ouroboros algorithm** is good to mint new cryptocurrencies because it uses **Proof of stake** to validate or mint new blocks in the blockchain and which is a better alternative of proof of work as it is **environment friendly and has better scalability**. Any algorithm which uses proof of stake instead of a proof of work approach would be great in terms of minting new cryptocurrencies in the future. There are certain aspects of proof of stake that need to be improvised in terms of better security because it is only lacking in that area. Better algorithms can be designed to strengthen the security of cryptocurrency.

We can see multiple algorithms and new cryptos are popping up with the new type of consensus algorithms. Recently Proof of Authority is launched as an updated version of proof of stake where network participants stake their identity and reputation.

#### VI. FUTURE SCOPE

We can see multiple algorithms and new cryptos are popping up with the new type of consensus algorithms. Recently Proof of Authority is launched as an updated version of proof of stake where network participants stake their identity and reputation. These alternatives can be used to implement more secure blockchain and more stable cryptocurrencies.

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## Cloud in Banking Sector: A Comparative Study of Cloud Platforms in Banking Sector

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### ABSTRACT

Now a days Banking and Finance sector transforming from traditional ERP system to cloud based platform to provide best services to the customers. In this paper tried to compare different cloud-based platforms which worked on 'Banking As Service' strategy.

Keywords-Cloud platform, APIs, Banking Sector

### INTRODUCTION

Cloud based architecture support banking and finance institution to provide enhanced suit of banking products and services to the customers in less cost and time. cloud platform provides streamline IT maintenance and enrich customer experience using digital techniques.

Leading Banking and Finance institutes are moving towards APIs and Microservices to enhanced customer experience. Artificial Intelligence and Advanced data analytics tools used in Cloud based platforms.

Above sectors are scaling up and modernizing the platform while leveraging on their existing proven suit.

### OBJECTIVE

Objective of this paper is a comparative study of cloud platforms used in banking sector

### METHODOLOGY

For this paper secondary data collected from different cloud-based platforms websites. Data analyze and sorted based on Business Services and Technical features. This will be helpful to compare the platforms based on selected attributes.

### BUSINESS OFFERINGS

- Core banking
- Digital sales
- Cards
- Lending
- Payments
- CRM and operation
- Reporting
- Product customization

### TECHNICAL FEATURES

- Application Programming Interfaces
- Micro-Services
- Artificial Intellegence
- Data Analytics

### RESULT and DISCUSSION:

Following platforms are studied with their key features:

#### TEMENOS

This is API first Cloud native & cloud agnostic platform. It combines banking products & services with an innovation sandbox & self-service portal for the clients.

[1]

### INFOSYS FINACLE

In this platform comprehensive suite of products & services coupled with Highly componentized and parameterization driven architecture. This platform is using extensive suite of Open APIs.

[2]

### ORACLE FLEXCUBE

This Open architecture platform enabling collaboration with third-party firms. This platform has implemented machine learning and natural language processing techniques which help to work in intelligent manner.

[3]

### FINASTRA

This is a Flexible platform which run on microservices and APIs with customer engagement tools. It consists built-in analytics.

[4]

### FISERV.

This is a segregated suite of products integrated with APIs & third-party offerings. This platform emphasis on customer experience using responsive design.

[5]

Above platforms have been compared below based on Services provided and Technical features they supported in Cloud based banking services.

**Table I: Base on Business Offerings**

Platform	Core banking	Digital sales	Cards	Lending
TEMENOS	Yes	NI	Yes	Yes
Infosys Finacle	Yes	NI	Yes	Yes
ORACLE FLEXCUBE	Yes	NI	Yes	Yes
FINASTRA	Yes	Yes	Yes	Yes
FISERV.	Yes	NI	Yes	Yes

(NI- Not detailed information available)

**Table II: Base on Business Offerings**

Platform	Payments	CRM and Operation	Reporting	Product Customization
TEMENOS	Yes	Yes	Yes	Yes
Infosys Finacle	Yes	Yes	Yes	Yes
ORACLE FLEXCUBE	Yes	Yes	Yes	Yes
FINASTRA	Yes	Yes	Yes	Yes
FISERV.	Yes	Yes	Yes	Yes

**Table III: Base on Technical Features**

Platforms	APIs	Micro-Services	AI	Data Analytics
TEMENOS	Yes	NI	Yes	Yes
Infosys Finacle	Yes	Yes	Yes	Yes
ORACLE FLEXCUBE	Yes	Yes	Yes	Yes
FINASTRA	Yes	Yes	Yes	Yes
FISERV.	Yes	Yes	Yes	Yes

(NI-Not detailed information available)

#### **CONCLUSION**

- Finastra is a better platform which provide most of the services and technical features.
- Transaction Monitoring features not yet fully implemented in any of the above platforms.
- Workflow customization and SDK features not available in the above platforms.
- Customers are getting enhanced digital experience due to Cloud support.

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## **Predictive Analysis Algorithms in Machine Learning for Classification of Slow and Advanced Learners in Online Mode of Teaching and Learning**

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### **ABSTRACT**

The Novel Coronavirus has brought the world to a stand still. The world shifted from offline mode to online. One of the sectors which had to quickly adapt to this online mode was the education sector. Schools and higher education institutes had to overnight shift to an online mode of teaching and assessing.

Given the nature of India's vast student population which hails from rural India, where continuous network connectivity is still a challenging and costly affair, many students are dropping out of the educational system. This should be a major concern for schools and colleges.

As they should continue to engage their students in the online mode of education, it will be the responsibility of these institutions in helping the students in continuing their pursuit of education.

Also it is a very difficult task to retain student engagement in the process of learning in the online mode. In a given class room not all students will have the same level of intelligence. Some students will be able to grasp the concepts faster and better, while some students may need some extra help to successfully finish the course. Predictive analysis can help educators in identifying slow and advanced learners and take measures accordingly.

Educational Institutions also face the problem of absenteeism. Predictive analysis can be used by educators in predicting the absenteeism of a learner in a given semester based on his/her attendance in the previous semesters. Also it has been generally observed by the author that in her institute that some students have a history of absenteeism. Diagnostic analysis can also be performed to understand the reason behind this.

The main purpose of this paper is to find the suitability of classification algorithms in machine learning for classifying learners.

Keywords: predictive analysis, learning analytics, machine learning algorithms, classification algorithms

### **1. INTRODUCTION**

Machine learning is a branch of artificial intelligence that makes machines learn and enables them to perform tasks, such as classification, prediction and correlation.

This paper is divided into sections. Section two focuses on the definition of Learning Analytics and levels of learning analytics in literature. The third section focuses on machine learning algorithms for prediction analysis.

### **2. LEARNING ANALYTICS**

Predictive analysis in Machine learning can be applied to the four levels of learning in learning analytics. According to the definition offered by van Harmelen & Workman et al[1] in their book on Analytics for learning and teaching, Learning analytics is the "application of analytic techniques to analyze educational data, including data about learner and teacher activities, to identify patterns of behavior and provide actionable information to improve learning and learning-related activities".

The four levels of learning analytics are:

#### **1. Descriptive analytics**

Descriptive analytics is about observation and reporting which is the most basic level of analytics. This kind of analytics look at facts, figures, and any other data that give a detailed picture of what has happened. These can be in the form of Bar graphs, Pie charts etc., based on the data observed or collected. For example after completion of an exam, one can perform result analysis in the form of charts. These graphs can show the number of students passed vs the number of failures. One can also compare these results with the previous results to show whether there is an increase or decrease in the performance of students.

This kind of analysis is performed by many Institutions as per part of their routine reporting. But it is important to find the reason behind these observations. This will lead to the next level of analytics.

## 2. DIAGNOSTIC ANALYTICS

Diagnostic analytics answers why a particular event has happened. This will move from the observation that a student has failed an examination to “why the student has failed the examination”.

It will diagnose the probable reasons for the student’s failure in an examination. This kind of analysis involves machine learning algorithms like Regression, Correlation, Pattern mining, Process mining.

## 3. PREDICTIVE ANALYTICS

This analysis moves a step further and answers the question of “What will happen in the future?”. This can answer the question of whether a student is likely to pass or fail an examination.

Random Forest, K-Nearest Neighbour (K-NN) Decision Tree (DT) Support Vector Machine (SVM) Neural Network (NN) Bayesian Methods are some of the algorithms for Predictive analytics.

Predictive analytics combined with the first two levels, will help educators and institutes to recognise students who are at risk of failing in their course and take remedial actions for them. It can also help in identifying advanced learners and help them to perform to their full potential.

## 4. Prescriptive analytics

Prescriptive analytics is the highest and most powerful level of learning analytics which will help in deciding “what should be done”. Based on previous data it prescribes what should be done to remedy a given situation..

It informs the educators about different decision choices they have and their anticipated impact on specific key performance indicators.

## 3. Predictive modeling/Predictive analysis algorithms

This section will look at some of the predictive analysis algorithms in machine learning which can be applied for identifying slow and advanced learners in an online mode of education. These techniques can also be applied to predicting student absenteeism in a particular course.

According to Christopher Brooks, Craig Thompson et al [2], “Predictive modeling is based on the assumption that a set of known data (referred to as training instances in data mining literature) can be used to predict the value or class of new data based on observed variables (referred to as features in predictive modeling literature)”.

In predictive modeling, historical data is used to generate models of relationships between features. Predictive modeling works when we have quantifiable data about the learner are modeled. There should be a clear outcome from this data. The data set has to be sufficiently large and should have the ability to intervene in situ. The course having learners data should be conducted year after year so that sufficient data is collected based on which predictive models can be made.

### 3.1 Types of Data

Statistical modeling generally considers four types of data such as categorical, ordinal, interval, and ratio. Categorical values have two or more categories, but there is no intrinsic ordering to the categories. These can be binary (such as predicting whether a student will pass or fail a course) or multivalued (such as predicting which of a given set of possible practice questions would be most appropriate for a student).

Ordinal variables can also be treated as categorical except that there is a clear ordering of the categories. For example, a variable economic status can have three precise categories (low, medium and high). Data such as Interval and ratio are numeric.

Classification algorithms are used to predict categorical and ordinal values, while regression algorithms are used to predict numeric values.

Also we can have time-based, state-based and event-data which can be used in predictive modeling.

According to Barber & Sharkey, 2012 et al [3], in algorithms which use time-based modeling activities, such as the prediction of a student final semester result, multiple models need to be created. Each of these models can correspond to a different time period and set of observed variables. For example, predictive models can be constructed for continuous assessment of a learner like completion of weekly quizzes, assignments, lecture attendance etc.

According to Peterson, Matthews, et al [4], state-based data are important for educational predictive models. Such data can be data about demographics like gender, ethnicity etc. Relationships like course

enrollments can also be considered state data. Also psychological measures of scores in grit scale, aptitude tests, and performance based metrics like standard test scores, grade point averages can also be used as state-based data.

Event-data can be derived from activities of a student while using learning technologies such as learning content management systems, discussion forums, active learning technologies, and video-based instructional tools. But this data is too complex and it needs a lot of preprocessing effort using feature extraction tools of machine learning for it to be meaningful data for predictive modelling. While preparing the predictive model, data available from the a year can be used to construct a testing set consisting of data from the next year.

### 3.2 DATA COLLECTION

Data is critical to the success or failure of a classification algorithm. One has to identify an outcome (Passing, fail percentage, absenteeism level) and then see how this variable can correlate with other variables. For example, the pass or fail in a course during online learning can be correlated with availability of resources like smart devices and unlimited data plans to attend lectures and get access to other teaching material.

It is important to choose variables which correlate with the outcome at or before the time in which they might be used. For example, supposing we want to predict the grade of a student in the final semester end examination in his next semester so that we can take some remedial measures in the beginning of the semester itself. Then it is better to consider the data about his performance in the previous semester examinations. If we wait until the learner takes his mid-term exam in that semester and then make a predictive model, it will be too late to initiate any remedial action.

### 3.3 FEATURE ENGINEERING

Feature Engineering involves converting complex data into features suitable for predictive modelling. The feature engineering is the preprocessing steps that will transform raw data into features that can be used in machine learning algorithms, such as the predictive models.

Since predictive models consist of an outcome variable and the predictor variables, feature engineering needs to be performed to ensure that the most useful predictor variables are created and selected for the predictive model. Predictive modelling can then be used on historical data to generate models of relationships between features.

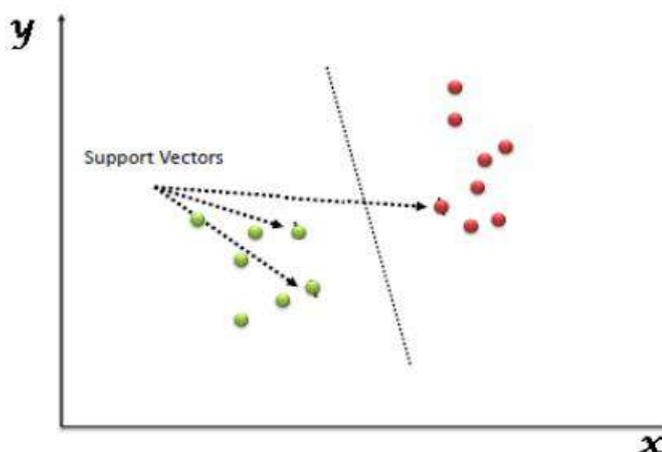
### 3.4 Classification algorithms

This section examines some of the suitable classification algorithms in Machine learning which can be used to classify a learner as slow or advanced.

The following are some of the algorithms that exist in machine learning for building predictive models[1]. Educational data commonly use models built using methods such as:

- 1. Linear Regression:** This algorithm predicts a continuous numeric output from a linear combination of attributes. For example, given independent variables like gender, diet, age (input variables), it can predict the height of a person (output).
- 2. Logistic Regression:** This algorithm gives categorical predictions and can be used when the target variable can be categorical in nature. Given some input variable, it can predict the odds of two or more outcomes. An example of this would be to classify an email as spam or not spam.
- 3. Nearest Neighbours Classifiers:** This is one of the easiest Supervised Learning classification algorithm in Machine learning. This model uses the previously classified data and predicts the outcome or class of the new data point. This prediction is based on the similarity between the labelled data points in the training dataset and the new data point. For example we can use this model to classify a new data point as a cat or dog based on its similarity with the previous labelled data. This means we should have well labelled data points for this model to be successful.
- 4. Decision Trees:** Decision trees take an input and partition it in a yes or no way until an output is reached. It is a supervised learning algorithm in machine learning which starts with training data. This training set will contain the input the corresponding output.
- 5. Naïve Bayes :** This algorithm comes under supervised machine learning which makes predictions on the probability of an object. This model is generally used in text classification. It uses a high-dimensional training data set that assumes that each occurrence of an attribute is independent of the occurrence of the other attributes. For example an apple can be identified by having attributes like taste, color, shape and then as sweet, red, round etc.

- 6. Bayesian Networks:** Bayesian networks make predictions based on probabilistic graphical models. This algorithm uses manually constructed graphical models and provides probabilistic interpretations of classifications based on the models.
- 7. Support Vector Machines(SVM):** This is a supervised learning algorithm which is used mostly for classification in machine learning. SVM algorithm starts by plotting each data item as a point in n-dimensional space. In the n-dimensional space, n is a number of features which are available. The value of each feature will be the value of a particular coordinate. Finally classification is performed by finding the hyper-plane that differentiates the two classes very well. Figure 1 explains the concept of hyperplane for classification



**Fig1.**source:<https://www.analyticsvidhya.com/blog/2017/09/understaing-support-vector-machine-example-code/>

- 8. Artificial Neural Networks:** This is based on the working of neurons in a human brain.

This algorithm is used widely for data classification by detecting patterns in input data and producing an output free of noise. Neural networks have the capability to analyse past and current data to estimate future values and try to make any complex correlations hidden in the data. It works the same way the human brain correlates things.

#### 4. CONCLUSION

According to Amjed Abu Saa et al.[6], “factors affecting Students’ performance in Higher Education can be grouped under four main categories, namely, students’ previous grades and class performance, students’ e-Learning activity, students’ demographics, and students’ social information”. Their research results also indicated that decision trees, Naïve Bayes classifiers, and artificial neural networks can be the ideal classification algorithms to predict and classify students according to the above factors.

According to a recent survey by Education World, 73% of the students cheat in online learning. Factors like students' previous grades and class performance, students’ e-Learning activity etc. cannot be considered as good predictors for predictive algorithms in the present scenario. In such a scenario, Educators may have to consider looking at other variables to predict the performance of a learner in online learning. It will be upon the educators to figure out other factors which might indicate the continued engagement of a learner in his learning process.

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## Application of Machine Learning for Analysing Diabetic Recommendation System

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### ABSTRACT

Health is very important than the money and time. For healthy living our food and pattern of living is very important. Because of the pandemic, people are using the online mode, most of the people suffered with the various diseases because of sudden change in the pattern of living. Food is the source of energy where human can get blood glucose from it. Insulin is a hormone made by human pancreas, it helps glucose from food get into human cells and later used for energy. Having more glucose in human blood can affect the human health, it will convert into a diabetes. Diabetes is a disease where it occurs when your blood glucose or blood sugar, is very high.

Diabetes has no cure, person who is suffering with diabetes have to manage by physical exercise as well as healthy food. In a primary stage if the person known the blood sugar level, then it will be easily cured by physical exercise and food. This paper gives the detail attributes dataset which affect the diabetes. The main objective is to develop a recommendation system which gives the various factors details with prediction of diabetic disease. This paper also gives the detail study of the machine learning various algorithm.

Keywords: Weka, Kaggle, open-source, Machine Learning

### INTRODUCTION

The world after many years was first affected with the scary disease 'coronavirus' came in the month of January 2020 step in India later it starts infecting several people as it is contiguous disease then the government declared as pandemic. During pandemic years most of people are working online from home, so sitting at one place for more duration is affected and later on it is realise that most the people who are affected by 'coronavirus'.

India accounts for one in six people in the world with the disease diabetes. India has the second-highest number of diabetes patients aged 20-79 years as of 2019. According to international Diabetes Federation 382 million people are living with diabetes across the whole world.

As keep in a mind Diabetes disease and its effect on health. Use of technology with past, present and future aspect of the analysing diabetic details and develop the recommendation system with the help of machine learning application.

### LITERATURE REVIEW

- [1] In Rosario and M.A. Hearst, "Semantic Relation in Bioscience Text" paper author used the Hidden Markov model, Naïve bayes algorithm. It is structural representation of mapping bio-medical information. It shows the conversion of natural language text into the structural format.
- [2] In Leonidas Akritidis and Panayiotis Bozanis, "A Supervised Machine Learning Classification Algorithm for Research Article" explains importance for scientific databases and the digital libraries.

### Machine learning algorithms

Artificial Intelligence (AI), Machine Learning (ML) as well as Deep Learning (DL) have grown very rapidly in the recent years. AI, ML and DL various applications are used in everywhere, example healthcare, industry, online as well as in robotics. Machine learning in healthcare is an area where it will analyse thousands of different data points and gives us the output which has the details about the risk scores, allocation of various resources and many more various applications. This paper deals with the application of machine learning for analysing diabetic recommendation system.

The main aim of Machine learning algorithm is to learn from the dataset. Most of the researcher have been covered how to make machines learn by themselves.

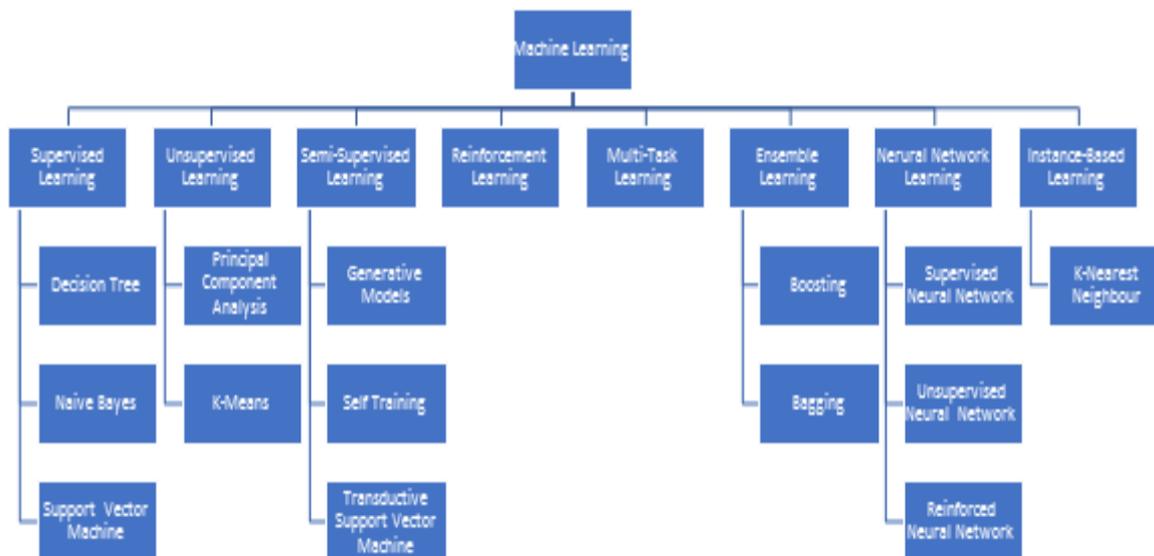


Figure 1: Types of Learning

### Types of Learning

Various types of machine learning algorithms are supervised, unsupervised, semi-supervised and reinforcement.

### Supervised Learning

Algorithms that require external aid are known as supervised machine learning algorithms. The training and testing datasets are separated from the input dataset. There is an output variable in the train dataset that needs to be predicted or categorised. For prediction or classification methodology, all algorithms learn patterns from the training dataset and apply them for the purpose of testing dataset.

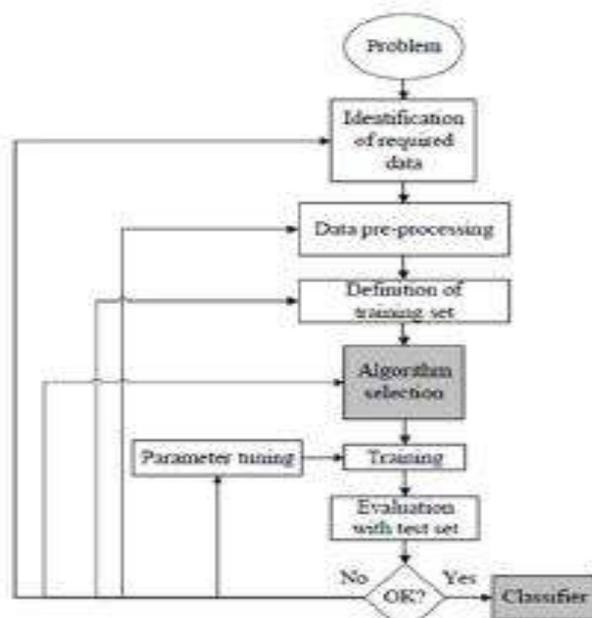


Figure 2: Workflow of supervised machine learning algorithm

There are three different supervised machine learning algorithms namely

- 1) Decision Tree
- 2) Naïve Bayes
- 3) Support Vector Machine

1) Decision Tree: Decision trees are trees that group qualities by ordering them according to their values. The decision tree is mostly used for classification. Nodes and branches make up each tree. Each branch indicates a value that the node can take, and each node represents qualities in a group that needs to be categorised.

### Example of Decision Tree

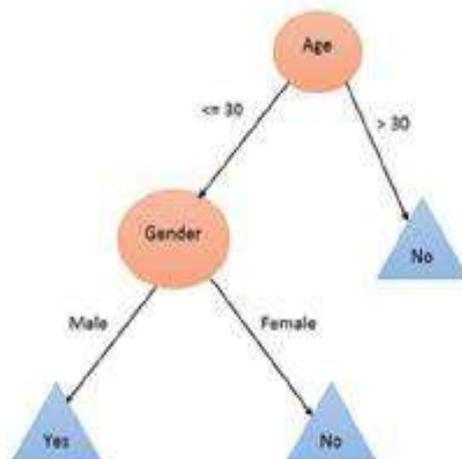


Figure 3: Decision Tree

- 2) Naïve Bayes: The text categorization industry is the primary focus of Naive Bayes. It is mostly employed for the purposes of clustering and classification. The conditional probability is used in the underlying architecture of Naive Bayes. It constructs trees depending on the likelihood of them occurring. Bayesian Network is another name for these trees.
- 3) Support Vector Machine: Support Vector Machine is another popular state-of-the-art machine learning approach (SVM). It's primarily used for categorization.

SVM is based on the notion of calculating margins. Basically, it is used to draw lines between classes. The margins are drawn so that the space between the margin and the classes is as little as possible, reducing the classification error.

### Unsupervised Learning

The data is just used to train a few features via the unsupervised learning methods. When new data is introduced, it recognises the data's class using previously learnt features. It's mostly utilised for feature reduction and clustering.

**There are two algorithms for Unsupervised Learning namely K-means clustering and Principal Component Analysis.**

- 1) K-means Clustering: It is also known as grouping. It is a type of unsupervised learning. It creates the groups automatically. Same characteristics items are grouped or cluster together. This algorithm is known as k-means because it automatically creates k distinct groups or clusters.
- 2) Principal Component Analysis: Main purpose of PCA is dimension of data reduction. Reduction is useful for making the computations faster and easier.

### Semi-Supervised Learning

It is an algorithm where it combines the supervised and unsupervised learning algorithms. It is useful in that area where machine learning and data mining algorithm, in that unlabelled data is already present and data mining where labelled data is a tedious process.

**There are various semi-supervised learning algorithms namely**

- 1) Generative Model
  - 2) Self-Training
  - 3) Transductive SVM
- 1) Generative Model: It is an oldest semi-supervised learning algorithm it computes like  $p(x,y) = p(y)p(x|y)$  where  $p(x|y)$  is a mixed distribution. Example is Gaussian mixture models. In unlabelled data the mixed components can be identifiable.
  - 2) Self-Training: A classifier is trained with a piece of labelled data in self-training. After that, the classifier is supplied with unlabelled data. In the training set, the unlabelled points and predicted labels are combined

together. After then, the operation is repeated once again. The term "self-training" refers to the classifier's ability to learn on its own.

- 3) **Transductive SVM:** The TSVM (Transductive support vector machine) is an SVM extension. Both labelled and unlabelled data are considered in TSVM. It is used to label unlabelled data in such a way that the margin between the labelled and unlabelled data is as small as possible. Using TSVM to find an exact answer is an NP-hard task.

### **REINFORCEMENT LEARNING**

Reinforcement learning is a sort of learning in which the learner makes judgments about which activities to do in order to improve the outcome. Until a situation is presented, the learner has no idea what actions to take. The learner's activities may have an impact on events and their actions in the future. Reinforcement learning is based primarily on two criteria: trial and error searching and delayed results.

### **MULTITASK LEARNING**

The purpose of multitask learning is to assist other students do better. When multitask learning algorithms are used on a task, it recalls the steps it took to solve the problem or arrive at a specific conclusion. The algorithm then applies these processes to other similar problems or tasks to discover a solution. Inductive transfer mechanism refers to the process of one algorithm assisting another. When learners share their experiences with one another, they can learn concurrently rather than individually, and they can learn considerably more quickly.

### **ENSEMBLE LEARNING**

Ensemble learning is defined as a style of learning in which multiple individual learners are joined to form a single learner. The individual learner could be a Nave Bayes algorithm, a decision tree, or a neural network, for example. Since the 1990s, ensemble learning has been a popular issue. It has been noticed that a group of learners is almost always better at completing a task than individual learners.

**There are two different Ensemble learning techniques namely,**

- 1) Boosting
- 2) Bagging

- 1) **Boosting:** Boosting is a bias and variance reduction strategy used in ensemble learning. Boosting takes a group of weak learners and turns them into a single strong learner. A classifier that is minimally correlated with real classification is called a weak learner. A strong learner, on the other hand, is a sort of classifier that is highly linked with true classification.
- 2) **Bagging:** When the accuracy and stability of a machine learning algorithm need to be improved, bagging or bootstrap aggregating is used. It can be used for both classification and regression. Bagging also reduces variation and aids in the management of over fitting.

### **Neural Network Learning**

The neural network (also known as an artificial neural network or ANN) is a computer programme that is based on the biological concept of neurons. In the brain, a neuron is a cell-like structure. To comprehend a neural network, one must first comprehend how neuron functions. A neuron is made up of four primary components. Dendrites, nucleus, soma, and axon are the four components.

Electrical impulses are received by the dendrites. The electrical signal is processed by Soma. The axon carries the process' output to the dendrite terminals, where it is transmitted to the next neuron. The nucleus is the nerve cell's beating heart. The neural network is the interconnection of neurons that allows electrical impulses to move across the brain.

An ANN takes the input by using input layer i.e. dendrites. The hidden layer process that input i.e. soma and axon. The output layer sends the calculated output i.e. dendrite terminals. There are three types of artificial neural network. Supervised Neural Network, Unsupervised Neural Network and Reinforced Neural Network.

- 1) **Supervised Neural Network:** The output of the input is already known in a supervised neural network. The neural network's anticipated output is compared to the actual output. The parameters are modified based on the error and then fed back into the neural network. It is useful for feed forward neural network.
- 2) **Unsupervised Neural Network:** Neural network has no prior knowledge about the input and output. The main job of the network is to categorize the data according to some similarities. The neural network checks the correlation between various inputs and groups them.

3) Reinforced Neural Network: In this network the network works like a human communicates with the environment. Feedback has been provided to the network acknowledging the fact that whether the decision taken by the network is correct or wrong.

### INSTANCE BASED LEARNING

The learner learns a specific pattern in instance-based learning. It tries to fit the freshly provided data into the same pattern. As a result, the term "instance-based" was coined. It's a lazy learner who waits for test data to come before acting on it in conjunction with training data. The magnitude of the data raises the difficulty of the learning process. The k-nearest neighbour algorithm is a well-known example of instance-based learning.

### K-Nearest Neighbour

In this algorithm data is labelled which fed into the learner. When the test data is introduced to the learner, it compares both the data. K most correlated data is taken from training set. The majority of k is taken which gives a new class for the test data.

### Method used for System

#### Logistic Regression

Regression is a statistical method for analysing a dataset in which there are one or more independent variables that determine an outcome. The output is used to predict binary values (1/0) by using set of independent variables.

In 1958 Logistic regression was developed by statistician David Cox. Logistic Regression model is used to estimate the probability values of a binary (1 or 0) on the basis of independent variables it is known as more predictor and variables i.e features. It is a predictive analysis tool where it describes the data and establishes the relationship between dependent and independent variables.

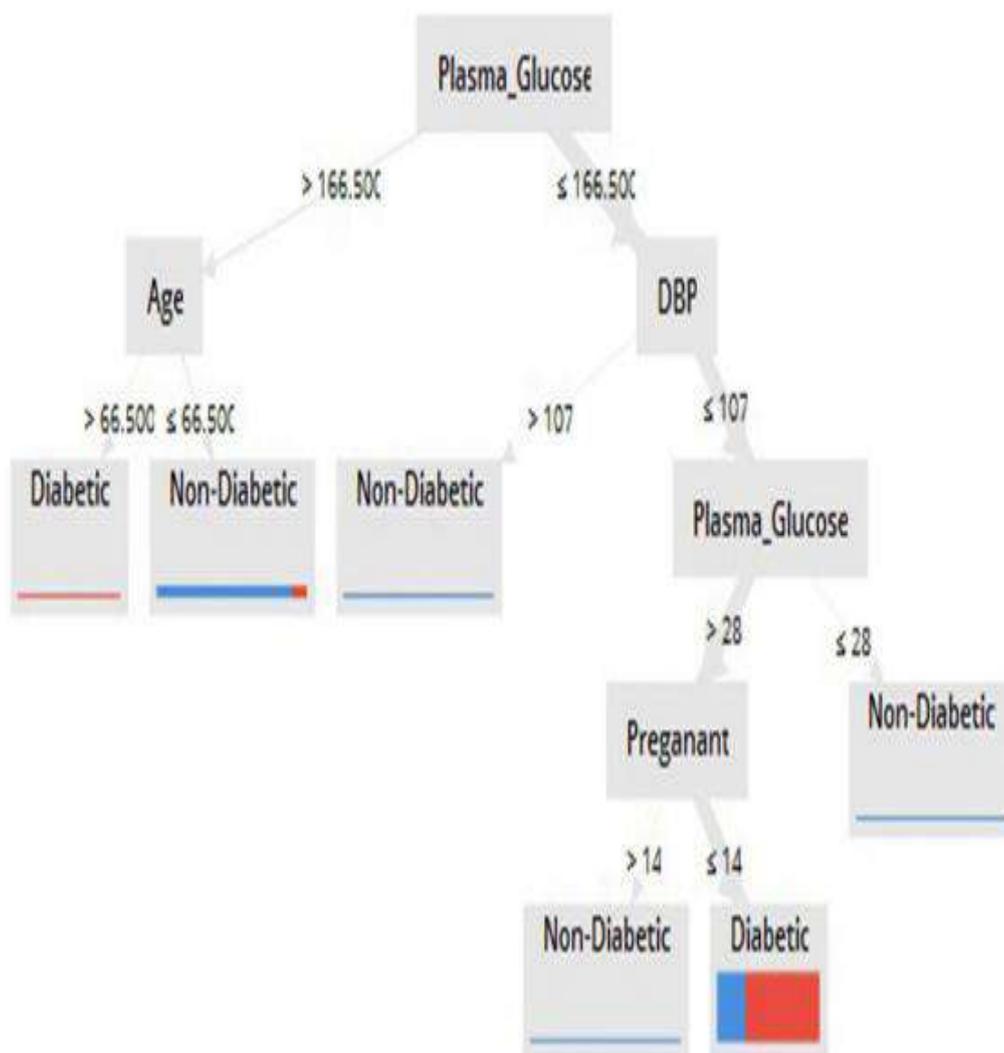
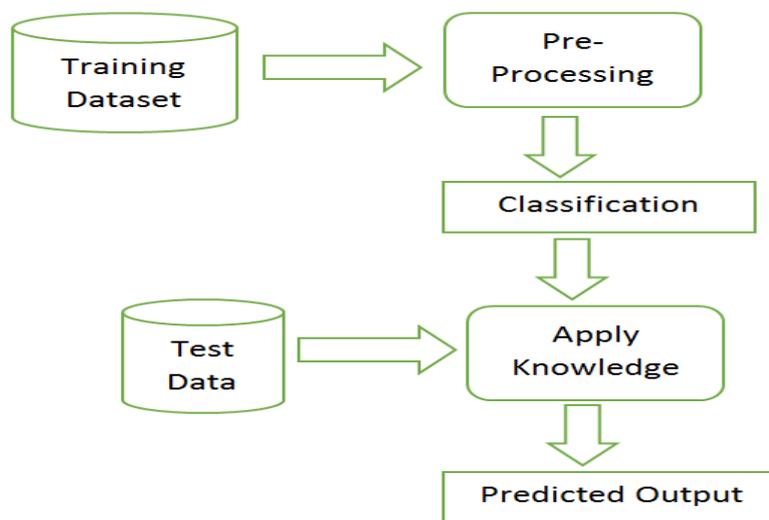


Figure 4: Design of Diabetes Prediction System

### Architecture of System



#### Hardware Specifications:

1. System Processor : Core i5
2. Hard Disk : 512GB
3. Ram : 8 GB

#### Software Specifications:

1. Operating System : Windows 8/10
2. Software : Weka 3.8.5
3. Dataset : Pima(diabetic)

Outcomes of the proposed system

#### Steps to perform the classification in Weka using Machine learning tool

Step 1) Split the dataset into

#### Training set and Test set

Step 2) Train Regression algorithm on Training set

Step 3) Evaluate the performance on Algorithm on Test set

Sample Dataset (Diabetes Dataset)

Dataset is taken from the Kaggle site (pima dataset) convert it in arff file as follows

```

@relation diabetes
@attribute Pregnancies real
@attribute Glucose real
@attribute bloodpressure real
@attribute skintickness real
@attribute Insulin real
@attribute BMI real
@attribute Diabetes real
@attribute age real
@attribute class {1,0}

data
6,148,72,36,0,33.6,0,627,50,1
8,85,66,29,0,26.4,0,352,31,0
9,183,64,0,0,23.3,0,672,32,1
1,89,66,23,94,28.1,0,167,21,0
0,127,10,36,166,43,2,2.268,38,1
9,118,74,0,0,23.4,0,200,30,0
3,78,50,32,88,31,0,288,26,1
10,115,0,0,0,35.3,0,134,29,0
2,197,70,45,543,30,0,0,156,93,1
8,129,84,0,0,0,0,232,26,1
4,110,82,0,0,37.6,0,191,30,0
10,168,74,0,0,38.0,0,887,84,1
10,139,60,0,0,27.1,1,141,37,0
1,189,60,22,86,30,1,0,290,38,1
0,166,72,19,179,25,0,0,337,31,1
7,100,0,0,0,30,0,484,32,1
0,115,54,47,230,49,0,0,501,31,1
7,107,74,0,0,23.4,0,254,31,1
1,103,30,35,53,43,0,0,103,33,0
1,115,70,30,86,34,6,0,529,32,1
    
```

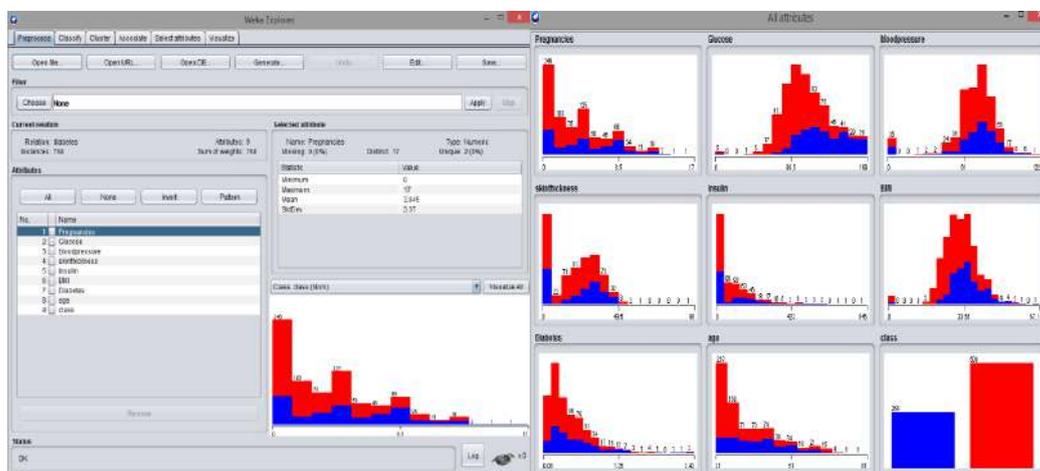
Save the file as diabetes.arff

**Open Weka 3.8.5 software and follow the steps**

Step 1. Click on Explorer

Step 2. Click on Preprocess

- **Select Open file option**
- **Select diabetes.arff file with the location (figure show data distribution)**



Confirm through visualization all data is numeric or not.

Choose linear regression

Percentage split 80% of training data 20% testing data

Select class as diabetic

Click on Classify

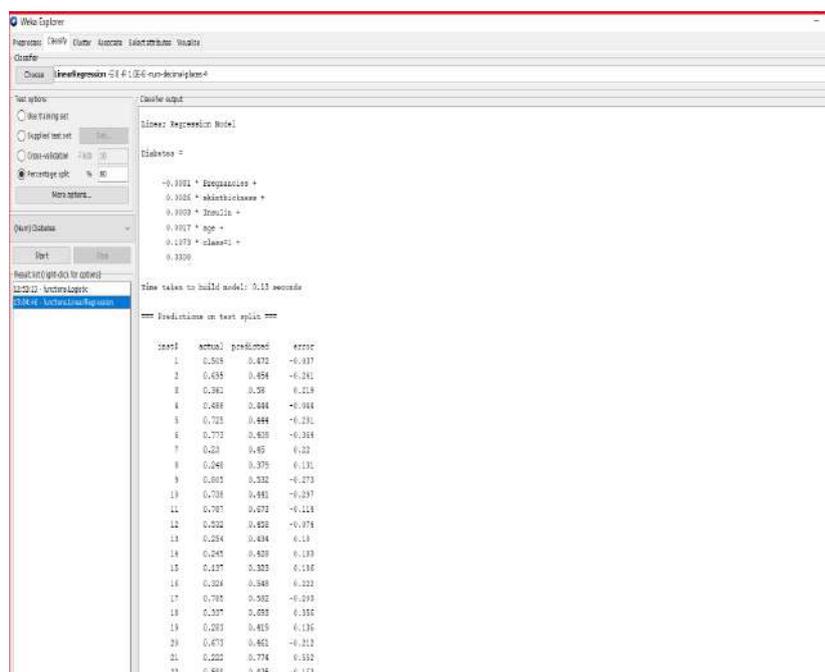
From Classifier – Choose – Linear Regression

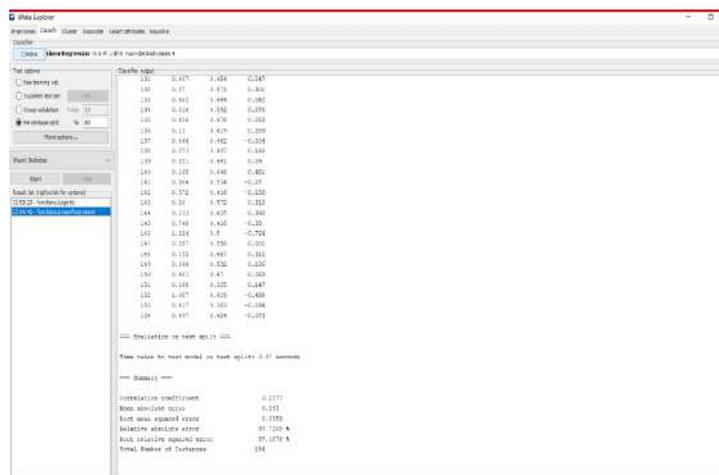
Test options – Percentage Split 80% (training data set)

Click on more options from test options- Choose- change output predictions to PlainText- Ok

Select (NUM)Diabetes as class

Click on start button, it will give the following outcomes.





Actual	Predicted	Difference
142	3.167	3.254
143	0.87	4.75
144	0.102	0.446
145	0.104	0.292
146	0.104	0.476
147	0.11	0.405
148	0.104	0.102
149	0.071	0.497
150	0.052	0.493
151	0.108	0.440
152	0.104	0.256
153	0.172	0.430
154	0.14	0.312
155	0.113	0.425
156	0.146	0.43
157	4.224	0.8
158	0.107	0.350
159	0.103	0.443
160	0.104	0.230
161	0.102	0.47
162	0.108	0.225
163	4.057	0.420
164	0.107	0.380
165	0.497	0.429

==== Statistics on test set ====

Time taken to learn model on test set: 0.07 seconds

==== Summary ====

Correlation coefficient	0.2177
Root Mean Square Error	0.2193
Root Mean Squared Error	0.1392
Relative Absolute Error	0.1210 %
Root Relative Squared Error	0.1478 %
Total Number of Instances	165

Output shows the actual values, predicted values and the difference between these two values.

Difference between actual value and predicted value is known as root mean square value.

### CONCLUSION

Diabetes is vital health hassle in the current human society, and day by day it is increasing as well. This paper gives techniques for prediction of this disease as well as various machine learning algorithms. By using this model or technique we can predict different diseases as well.

### FUTURE SCOPE

Proposed system is useful for diabetes prediction. We can use the same modelling or technique for predicting the diseases and suggestion of medicines for the suffering diseases. By using machine learning or deep learning we can efficiently predict the various kinds of diseases.

### Limitations of the system

1. Day by day increasing the diseases so the database size is also increases. So it will create a problem in maintenance of the database.
2. Expert knows the various machine learning algorithms and its outcomes as well as Weka software knowledge is also required.

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## Proportional Analysis of Various ML Techniques to Predict the Onset of Diabetes in Indian Males

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### ABSTRACT

We live in a fast-paced world, where we rarely get time to rest and reflect. Though such a constant moving keeps us active it also tends to be a root cause of various ailments. One such ailment which has spread like a wildfire among people today is Diabetes. Diabetes tends to be a disorder in which your blood glucose, commonly known as blood sugar, is uncharacteristically high. Diabetes in itself may or may not be fatal but it is definitely an invitation to other fatal and life-threatening diseases. Thus, an early detection and treatment of Diabetes becomes an utmost necessity. There are various parameters which influence the emergence of diabetes. This paper proposes analysis of few parameters such as age, glucose levels, skin thickness, BP, O<sub>2</sub> levels, BMI etc. in 1000+ Indian Males using three ML Techniques viz. Logistic Regression, Random Forest and SVM/SVC to forecast the outcome as Diabetic (1) or Non-Diabetic (0). A Comparative study is also projected to determine which algorithm was more effective in accurately predicting the outcome.

Keywords: Machine Learning, Logistic Regression (LoR), Random Forest (RF), Diabetes, Support Vector Machine/Classifier (SVM/SVC)

### INTRODUCTION

Diabetes is thought as one amid the most lethal ailment in today's time. It's a disease which is highly unpredictable and couldn't be restrained by the factors of age or even healthy living. Diabetes is long-lasting disease and at times can merely be controlled and not prevented. Medically it is caused due to deficiency of insulin production by pancreas, thus resulting in unregulated blood sugar levels. Uncontrolled blood sugar can severely damage ones crucial body parts also hampering the nerves of our body. There are numerous categories of diabetes whose range of causes vary exponentially. According to data published by WHO (World Health Organisation) we can see that there has been a notable surge in the numbers of the diabetic patients. Also it is noticed that the ailment's prevalence is profoundly witnessed in the economically developing and emergent countries like India as opposed to the developed countries [5]. Also, according to the Centers for Disease Control and Prevention's Trusted Source (CDC), men are more likely to be affected with diabetes than women [6]. Generally a adequately balanced diet, a regular exercise, practicing daily living's healthy habits, timely medication and an effective management of work life balance are keys to controlling this disease. In this study, we propose to analyse few prevalent parameters which are known to impact the blood sugar levels thus resulting in diabetes. Based on these various rubrics, we plan to anticipate the ailment's likelihood with the help of 3 ML techniques applied on a dataset of parameters of 1000+ Indian males [4]. To assess the prediction's efficacy, we would be doing a proportional scrutiny of these 3 ML algorithms.

### LITERATURE REVIEW:

Deepti Sisodia and Dilip Singh Sisodia [1] have designed a model on Pima Indians Diabetes Database (PIDD) using 3 ML Classification algorithms viz. Decision Tree, Naïve Bayes and SVM. Their study exhibits that the accuracy of Naïve Bayes was higher and was confirmed using ROC curve. Aishwarya Mujumdar and Dr. Vaidehi V [2] proposes to use big data analytics to forecast the dawn of the illness and their study demonstrates that Logistic Regression shows maximum accuracy in prediction. Md. Kamrul Hasan et al [3] have conducted their experimentations on the PIDD wherein the projected framework utilizes the various ML techniques' ensemble to narrow down the accuracy prediction range. Web references [5] claims that Diabetes was the ninth biggest root of mortality in 2019, accounting for around 1.5 million fatalities thus enunciating the utmost need and significance of its early discovery and control.

### METHODOLOGY

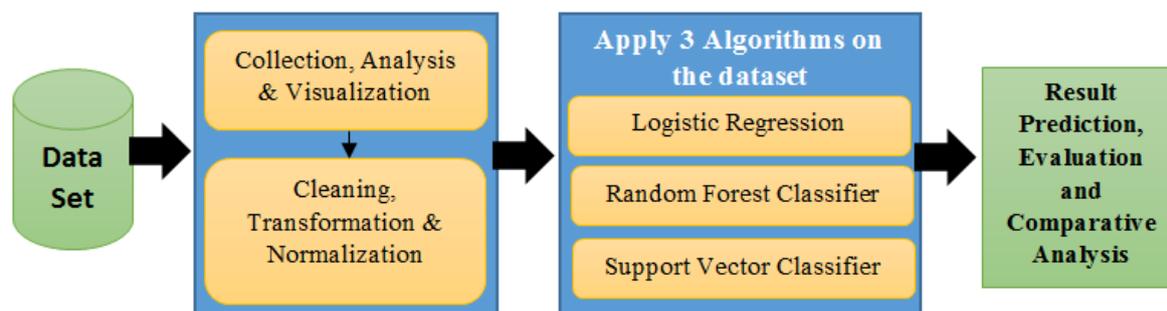
ML is a subgroup of AI (Artificial Intelligence), is an empirical and scientific study having algorithms that work on trial data, called the "training data", to make classifications, predictions and/or to take decisions.

#### Brief about the algorithms used

Logistic Regression (LoR), a category of ML practice, addresses classification issues. It's a predictive analytic tactic centred on the concept of probability. Random Forest (RF) is another algorithmic technique that is either utilized for classification or regression. We will be using Random Forest (RF) Classifier, in this study. It's a

type of collaborative study, wherein we join multiple classifiers to solve a difficult problem. It's a classifier that combine varied numbers of decision trees on different subsets of a dataset and averages the results to augment the dataset's predicted accuracy. Another practice that is pragmatic for either classification or regression is titled the Support Vector Machine (SVM), and here in, the goal is to recognize a hyperplane which is affected by the groups of data points nearer to the hyperplane. These are called support vectors and they influence the location and alignment of the hyperplane. We will be using Support Vector Classifier (SVC), an implementation of SVM used for minimizing the consistent hinge loss. All these 3 algorithms come under the umbrella of Supervised Learning (SL) techniques of ML which we will be employing in our research study.

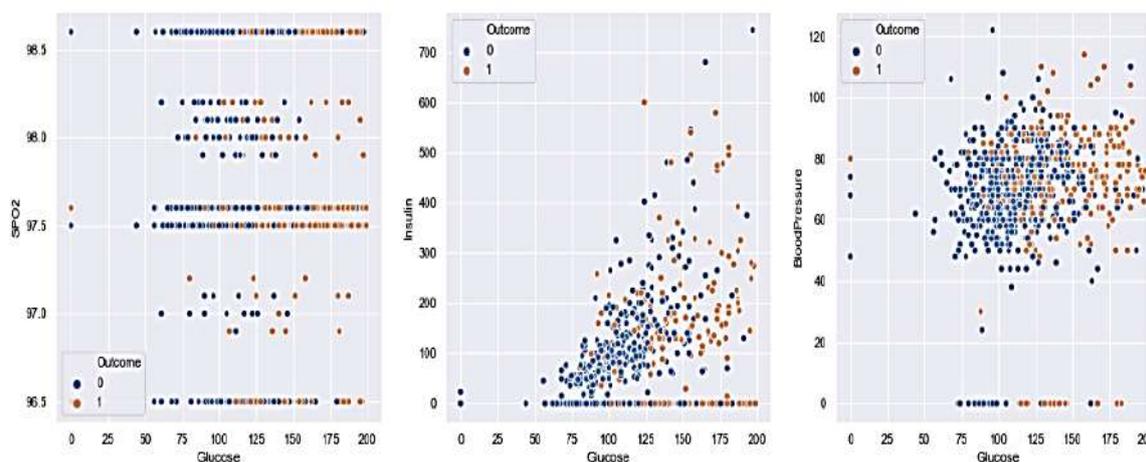
**Proposed Framework: A diagrammatic depiction of the suggested study is as follows:**

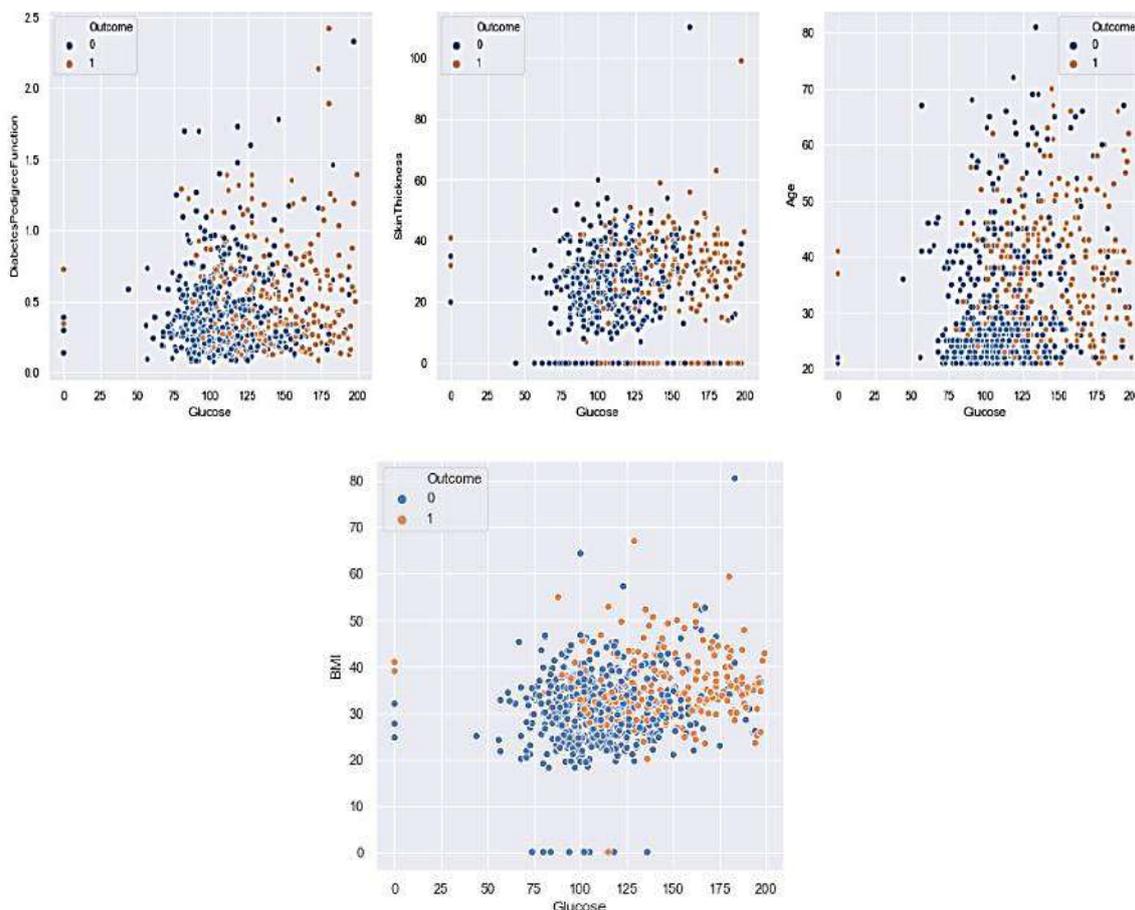


- Dataset Collection, Analysis and Visualization: The data collated from secondary data source is [4] is unprocessed and raw. A basic analysis is done on the data, to check the series of values and anomalies. The Data set contains 2000 raw records and 9 attributes (8 independent 1 dependent). It's an observation that some independent variables contain 0 and few attributes exhibit extreme values as opposed to their mean.

	Glucose	SPO2	Insulin	BloodPressure	DiabetesPedigreeFunction	SkinThickness	Age	BMI	Outcome
count	2000.000000	2000.000000	2000.000000	2000.000000	2000.000000	2000.000000	2000.000000	2000.000000	2000.000000
mean	121.182500	97.819650	80.254000	69.145500	0.470930	20.935000	33.090500	32.193000	0.342000
std	32.068636	0.576112	111.180534	19.188315	0.323553	16.103243	11.786423	8.149901	0.474498
min	0.000000	96.500000	0.000000	0.000000	0.078000	0.000000	21.000000	0.000000	0.000000
25%	99.000000	97.500000	0.000000	63.500000	0.244000	0.000000	24.000000	27.375000	0.000000
50%	117.000000	97.600000	40.000000	72.000000	0.376000	23.000000	29.000000	32.300000	0.000000
75%	141.000000	98.600000	130.000000	80.000000	0.624000	32.000000	40.000000	36.800000	1.000000
max	199.000000	98.600000	744.000000	122.000000	2.420000	110.000000	81.000000	80.600000	1.000000

Data Visualizations are prepared to foretell independent attributes' influence on the dependent element. It's observed that SPO2 has almost no impact/effect on the Outcome, BMI has little impact and glucose has maximum impact/effect on the outcome in aggregation with other attributes.





- Dataset Cleaning, Transformation and Normalization: As SPO2 is inconclusive for gauging the ailment’s onset, we would be discarding the same during predictive analysis. For formulating concrete predictions, data is methodically cleaned by taking out the duplicates and handling outliers. Removal of duplicated values prevents data leakage. The outliers are replaced by median values as their removal might result in loss of crucial data.

A heap map is generated to establish correspondence between the attributes, as their non-co linearity is substantial for the effective analysis.

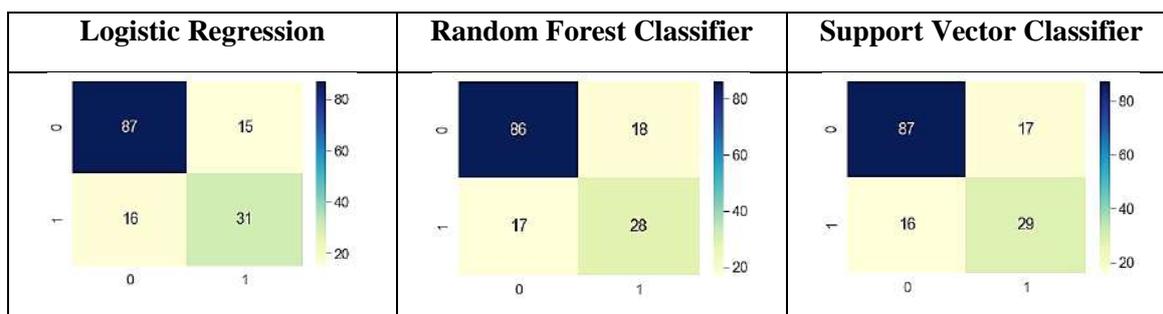
Correlation between features

Glucose	1	0.21	0.2	0.087	0.066	0.24	0.24	0.48
Insulin	0.21	1	-0.038	0.2	0.47	-0.021	0.18	0.088
BloodPressure	0.2	-0.038	1	0.036	0.049	0.32	0.27	0.19
DiabetesPedigreeFunction	0.087	0.2	0.036	1	0.15	0.066	0.12	0.16
SkinThickness	0.066	0.47	0.049	0.15	1	-0.057	0.37	0.075
Age	0.24	-0.021	0.32	0.066	-0.057	1	0.095	0.29
BMI	0.24	0.18	0.27	0.12	0.37	0.095	1	0.3
Outcome	0.48	0.088	0.19	0.16	0.075	0.29	0.3	1
	Glucose	Insulin	BloodPressure	DiabetesPedigreeFunction	SkinThickness	Age	BMI	Outcome

Further to augment the study’s efficacy, data is scaled and normalized.

	Glucose	Insulin	BloodPressure	DiabetesPedigreeFunction	SkinThickness	Age	BMI
0	0.538020	-0.791644	-0.895981	-1.226359	0.910898	1.394856	0.205544
1	-1.242059	0.763879	0.896462	-0.800100	0.656288	-0.882835	0.917253
2	0.768772	-0.791644	0.000241	0.796360	-1.316940	-0.123604	1.845570
3	0.439127	2.319401	-0.358248	-0.269287	1.356466	-0.787931	1.551603
4	0.570985	-0.343653	-0.895981	0.418357	1.292813	-1.072642	1.304052

- Application of 3 ML Classification Algorithms: Set of all 7 autonomous (independent) variables and the 1 resultant (dependent) variable defining the legitimacy of this research study, are sequentially processed with Logistic Regression (LoR), Random Forest Classifier (RF Classifier) and Support Vector Classifier (SVC) Models. Scaled and normalized data's 80% is designated as training set data and is provided to the algorithms equivalently and rest 20% data is designated as testing set data, to examine projected classification's validity. F1 and accuracy scores, both, are computed to emphasize the exactness of prediction. Since diabetes is a persistent ailment, the influence of false negatives become crucial. A confusion matrix depicting 3 classifier algorithms' yield is given as follows:

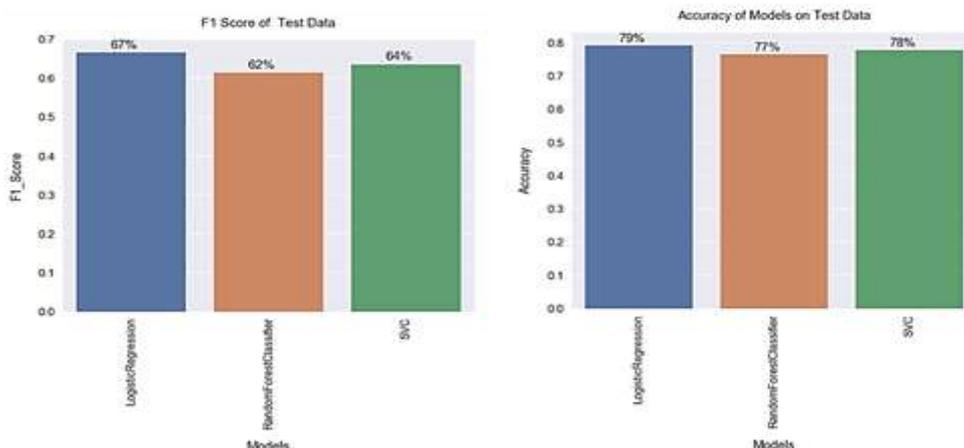


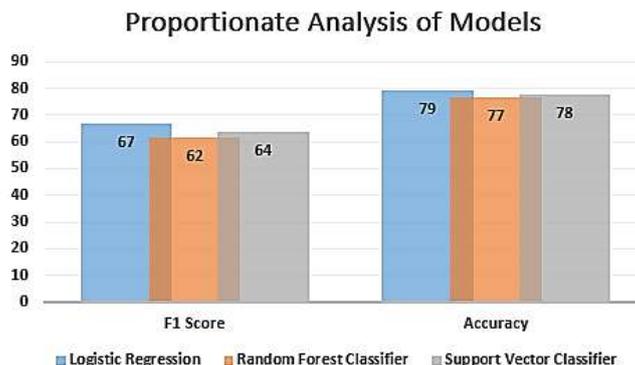
- Proportional and Comparative analysis of the algorithms: To determine the algorithms' maximum efficacy, a proportional analysis is formulated in accordance to the F1 and accuracy scores.

## RESULTS AND DISCUSSIONS

Calculated F1 score and accuracy score for the 3 algorithms post their application on the processed dataset is as follows:

Algorithm	F1 Score	Accuracy
<b>Logistic Regression (LoR)</b>	0.6667 (67%)	0.7919 (79%)
<b>Random Forest (RF) Classifier</b>	0.6154 (62%)	0.7651 (77%)
<b>Support Vector Classifier (SVC)</b>	0.6373 (64%)	0.7785 (78%)





It is noted that of Logistic Regression (LoR) Algorithm's F1 and accuracy scores are highest in our work i.e. 67% and 79% respectively as matched to other ML algorithms. Thus we can claim that Logistic Regression (LoR) has identified and predicted the Indian males with inception of diabetes ailment with 79% accuracy and also it has predicted the outcome and classified the non-diabetic Indian males with 67% exactness. Though the rest two algorithms represent a comparatively lower F1 and accuracy score, we can notice that the marginal difference between the 2 is minimal

### CONCLUSION AND FUTURE WORK

Diabetes is a life-style disease in today's era with numerous underlying causes. Though the study exhibits a decent F1 score and accuracy score for the ML algorithms employed, in a study involving chronic and fatal diseases, minimal marginal difference could be hazardous, thus the focus should be on achieving higher accuracy, to the extreme extent possible. Consideration of various additional medical factors could be done and a detailed inclusion of stress level measurements is also crucial to gauge the disease's emergence. Further an insight could be established in the hereditary diabetes (Type 2) area, whose study would require an extensive set of genetic factors. Fusion of various other ML algorithms with sentiment analysis in varied combinations in different studies can warrant the increased efficiency of the diabetes prediction model.

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3. <https://www.medicalnewstoday.com/articles/diabetes-affects-men-women>

## Matrix Algebra and Economic Models

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### ABSTRACT

Mathematics is a formal tool to study the problems. Any unknown data can be structured into mathematical model under the restrictions to search the solution different analytical techniques are applied to judge the best solutions. However, looking back over the last century, one is struck by the lack of coordination between mathematicians and economists. Although there has always been a close tie between mathematics and physical science, that relationship is missing between the mathematics and economic disciplines. Mathematicians are constantly keen to enter fields where precision is required, and they try to enter fields of mathematical formulation where questions with ambiguous or incomplete answers exist. Over the last 30 years, there has been a close relationship between mathematics and economics. Till now Matrix Algebra has not been applied on large scale to economics. More application can be derived from it to get more accurate results as linear algebra has plenty of applications on forecasting and can give accurate results when applied for different economic models.

Keywords: Linear Algebra, Economic Models, Leontief Model, Leslie Matrix, Population Model, National Income Model.

### 1. INTRODUCTION

The general question among the students and researchers is that whose linear algebra is used other than physical science. Do we have its application in social sciences which are based more on complex variables like social and culture human behaviour.

Linear Algebra have the application in business economics, sociology, computer science etc. The beginning of matrices and determinants can be attributed to second century BC, but the general understanding of the concept joining the main stream of mathematics waited till 16<sup>th</sup> century [3]. Determinants is used to find the solution for a system of linear equations. It was first used in mathematics textbooks of Chinese.

When 2x2 determinants were considered by Cardona an Italian and later on larger ones by Leibniz and is on to matrix algebra. A matrix is a set of elements arranged in row or column which can be added, subtracted, multiplied and inverted under certain conditions. Matrix has its applications in solving the linear equations. The linear equation is a relation between dependent variable X with unknown parameter a.

The relation between Y and X is not always exact but can have error may be denoted as C. Then

$Y = aX + C$  is a linear equation with many values of X and Y, we get system of linear equation with k unknown parameters and m observations of Y and X.

The data is generated to

$$y_i = \sum_{i=1}^k x_{k,i} a_k + c_i$$

Which can be expressed in matrix notation as  $y = ax + c$  with y and c as (mx1) and x(mxk) and c(kx1) with  $a_{i,j}$  parameters,  $i=1,2,\dots,m$  and  $j=1,2,\dots,n$  rows and columns and  $x_i$  variables, [4] the system of equations can be written as

$$a_{11}x_1 + a_{12}x_2 + \dots + a_{1n}x_n = d_1$$

$$a_{21}x_1 + a_{22}x_2 + \dots + a_{2n}x_n = d_2$$

$$a_{31}x_1 + a_{32}x_2 + \dots + a_{3n}x_n = d_3$$

$$a_{m1}x_1 + a_{m2}x_2 + \dots + a_{mn}x_n = d_m$$

If we represent the above equation in matrix form the we obtain

$$A = \begin{bmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{bmatrix} \quad X = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix} \quad B = \begin{bmatrix} d_1 \\ d_2 \\ \vdots \\ d_m \end{bmatrix}$$

The matrix equation is  $AX=B$ .

**1.1 Theorem:** Given  $A_{m \times n}$  has left or right inverse then the equation  $AX=B$  has unique solution for every  $B(m \times 1)$  [5]

$$AX=B$$

$$A^{-1}(AX) = A^{-1}B$$

$$X = A^{-1}B,$$

X can be evaluated

The model based on solving the system of linear equations, matrix inversion is Leontief economic model, National income model, population model which would like to discuss here.

## 2. ECONOMIC MODELS

### 2.1 Leontief Matrix:

There are number of industries, satisfying consumer demand. Many of them are intermediate products which are further processed or utilized by other industries before reaching to the consumer. The Leontief model is the model of economics with n industries producing n different product such that the input is equal to the production. It is used to study the dependency of industries. Like the demand of one industry becomes the supply of the other. In 1973, he won the Nobel prize in economics for his work [1]. There are two models he developed closed and open models.

Open model: Some of the output production is consumed internally by the industries and the remaining is taken over by external body. That is the output of one industry can be used as input by the parent industry and the remaining industries. Also, it helps us to show the demand of the consumer or the market. This model helps to satisfy the consumers need and the industrial demand.

The open model can be represented by matrix equation as

$X=AX+D$  where D is outside or industrial demand. A is the technical coefficient matrix and X is the output matrix. Solution of the matrix can be obtained by any one of the methods like Gaussian Elimination method, Cramer's Rule, Matrix Inversion. To find the solution by inversion the coefficient matrix should be non-singular. The solution of system of open model should be non-negative for it to be feasible for each open demand D also profitable if the system has non negative solution.

Closed Model: In this model the entire production is consumed by industries. This model helps to find the dependency of two or more industries. The output of one industry is the input of the other external industries. Closed Leontief model can be described by matrix equation as follows:

$X=AX$ , there is no external or consumer demand. To solve this, we cannot use inversion method we can only go for Cramer's rule, Gaussian Elimination, row transformation methods to find the solution.

These two models use input-output techniques. This technique is based on interdependencies between economic sectors. This can also estimate the ripple effect throughout the economy. There are different approaches to the analysis of input-output models, like linear programming techniques to open Leontief model can also be applied, while Markov's chain can be used for closed Leontief. Even a nonlinear version of linear system is replaced by non linear functions which are continuously differentiable this method can be used for comparative analysis of certain input output models. In economics apart from input output analysis we can also go for equilibrium growth study using non negative matrix. Scalar multiple of vector can also determine the equilibrium vector.

### 2.2 National Income model:

Let N be the national Income, C= planned consumption expenditure, I is the investment structure, G is the Government expenditure and T is the taxes.

National income mode is given by

$$Y = C + I + G$$

$$C = a + b(Y - T), \quad a > 0, \quad 0 < b < 1$$

$$T = tY \quad 0 < t < 1$$

We can rewrite as

$$Y - C = I + G$$

$$C - bY + bT = a$$

$$T - tY = 0$$

We can write the above three equations in matrix form as

$$\begin{bmatrix} 1 & -1 & 0 \\ -b & 1 & b \\ -t & 0 & 1 \end{bmatrix} \begin{bmatrix} Y \\ C \\ T \end{bmatrix} = \begin{bmatrix} I + G \\ a \\ 0 \end{bmatrix}$$

If  $\begin{bmatrix} 1 & -1 & 0 \\ -b & 1 & b \\ -t & 0 & 1 \end{bmatrix} \neq 0$  non singular

$$\text{Then, } \begin{bmatrix} Y \\ C \\ T \end{bmatrix} = \begin{bmatrix} 1 & -1 & 0 \\ -b & 1 & b \\ -t & 0 & 1 \end{bmatrix}^{-1} \begin{bmatrix} I + G \\ a \\ 0 \end{bmatrix}$$

### 3. Applications and Methodology:

Covid 19 has increased the stress on covid protocols like social distancing, which means people would prefer using personal vehicle compared to public transport. A survey was conducted out with an intension to know the use of personal cars, public transport and two wheelers during pandemic. The rate of personal cars usage is 0.55 and two-wheeler is 0.15. And their percentage increase is 0.45 a for personal cars and 0.25 for public transport, keeping the unit of time 1 year. Estimate or forecast their usage for next three years.

With this information we can reduce this to matrix, assuming that the initial time is one year, we get

$$X(1) = LX(0) = \begin{bmatrix} 0.55 & 0 & 0.15 \\ 0.43 & 0 & 0 \\ 0 & 0.25 & 0 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 0.7 \\ 0.43 \\ 0.25 \end{bmatrix}$$

$$X(2) = LX(1) = \begin{bmatrix} 0.55 & 0 & 0.15 \\ 0.43 & 0 & 0 \\ 0 & 0.25 & 0 \end{bmatrix} \begin{bmatrix} 0.7 \\ 0.43 \\ 0.25 \end{bmatrix} = \begin{bmatrix} 0.4225 \\ 0.301 \\ 0.1075 \end{bmatrix}$$

$$X(3) = LX(2) = \begin{bmatrix} 0.55 & 0 & 0.15 \\ 0.43 & 0 & 0 \\ 0 & 0.25 & 0 \end{bmatrix} \begin{bmatrix} 0.4225 \\ 0.301 \\ 0.1075 \end{bmatrix} = \begin{bmatrix} 0.25 \\ 0.182 \\ 0.075 \end{bmatrix}$$

Since unit time is one year, after three years, the percentage increase is nearly 25% using personal cars, 18% using public transport and 0.7% using two-wheeler.

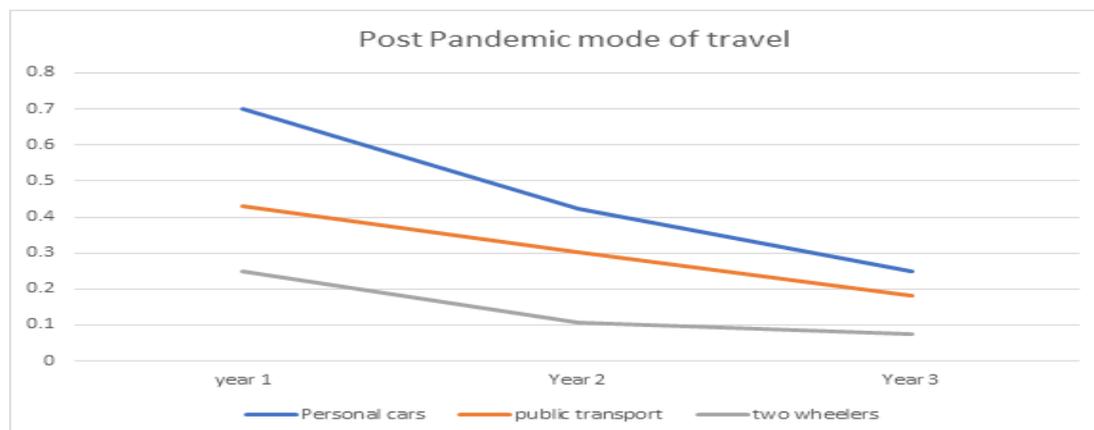


Figure 1: Post pandemic mode of travel for the next three years.

Figure 1 forecasts the mode of travel for next three years and it is found that the usage of personal cars is higher compared to public transport for the coming years. For forecasting we had used matrix iteration method and obtained the results. It is found that 25% using personal cars for third year compared to the first year and the usage of public transport is only 18% for the third year.

Thus, the population model was applied to forecast the situation and the result so obtained was found to be satisfactory. Although population model determines the survival and mortality rates, this application discussed over here is used to forecast the mobility of people. It can be further extended to various economic situation like forecasting the production of a product in more than one companies over different time periods.

#### 4. DISCUSSION

In this paper we are developing models that can be used for forecasting. Even in the least square methods the linear equations are converted to matrix and further solved to find the accurate results. This can be further modified by mathematicians by finding its characteristic equations of the  $n$ th degree and finds  $n$  solutions. Based on the solutions we can arrive at the conclusions. Suppose the eigen values are not real then we can say that they have no real components [2]. But the eigen values and vectors can be used only for a square matrix. Hence not all choices of techniques are used for production processes.

To include all the production processes, we have a rectangular matrix. As rectangular matrix does not have eigen values or eigen vectors, instead they have singular values and singular vectors.

Mathematically there is a simple relationship between eigen values and singular values

Singular value of a matrix  $A$  = square root (eigen values of  $A^T A$ )

$A^T A$  has eigen values as it will be a square matrix irrespective of dimension of  $A$ .

$$A = wDv^T; A^T = vDw^T$$

Here  $D$  is the diagonal matrix with singular values along its diagonal. This modelling can be used to study all production processes without excluding any techniques. By computing eigen values iteratively and hence obtaining eigen vectors from a solution vector  $x$  of the linear homogenous equation is a crucial tool in economic or data analysis.

Rank modelling analysis of a matrix obtains the parameters has a large application in econometric modelling ranging from linear to stationary model such as factor analysis, dynamic factor analysis etc. This rank models have increasing relevance on econometric and statistical work on multivariate system.

#### 5. CONCLUSION

Matrices and Determinants have side applications in economics and business models not only in physical sciences. The solutions are more accurate and precise than other approach. Till now matrix algebra has not applied on large scale to economics. More applications can be derived from it and more accurate results can be established by the mathematicians, as linear algebra has plenty of applications and can give accurate results when applied for different economics models.

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## IOT Based Automatic Garbage Disposal System

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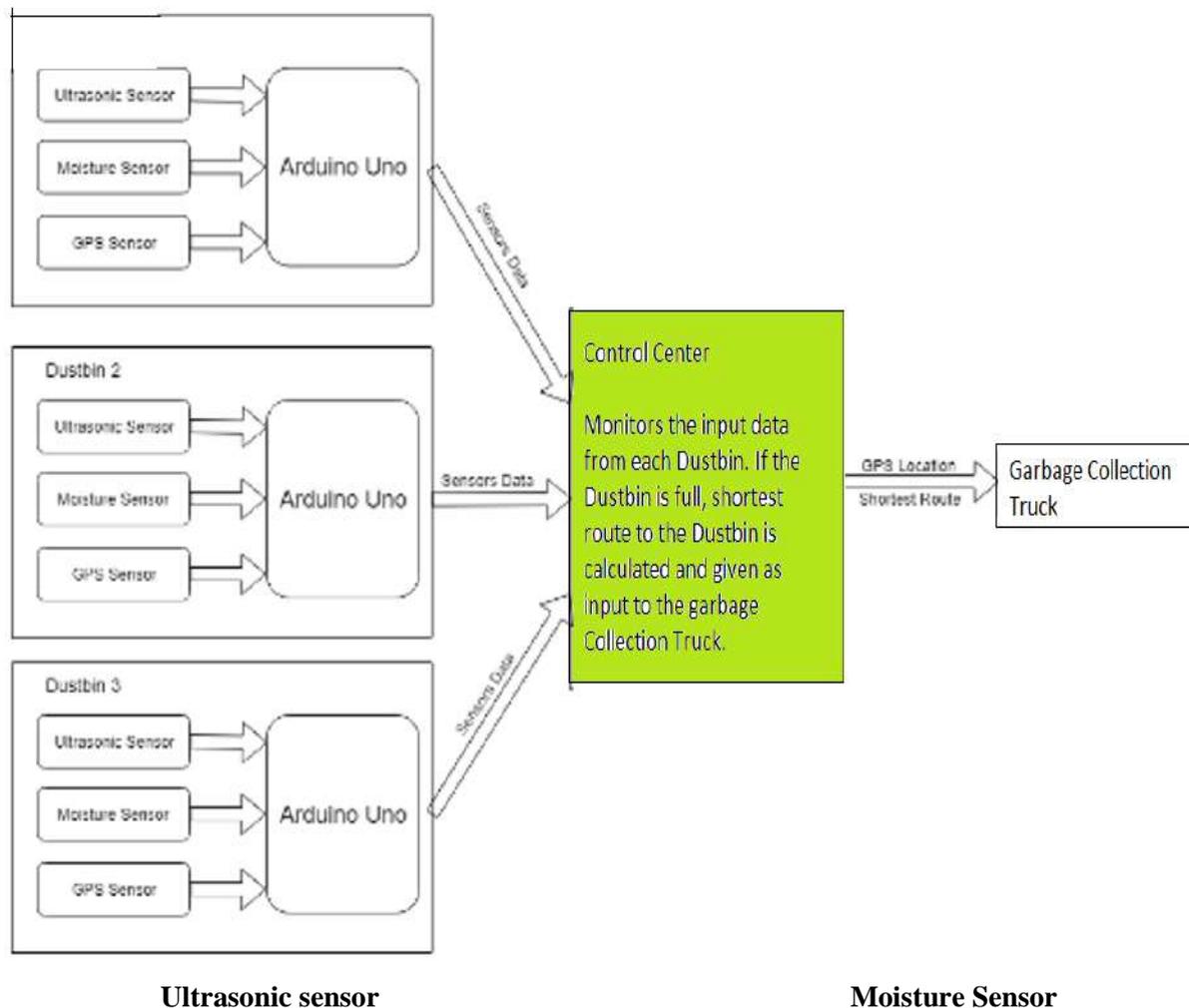
### ABSTRACT

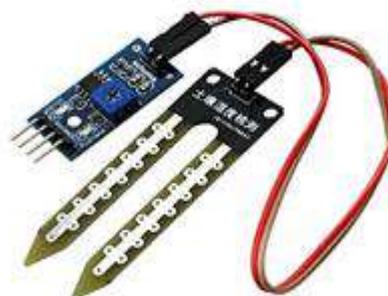
Now-a-days disposal of garbage has become a very big challenge in front of the society. If the garbage is not managed properly, it can lead to multiple issues related to health and environment. In this research the study is being done on how to maintain our environment clean. A smart garbage collector is designed using the technology. The main objective of this research is to design effective and efficient garbage disposal system that helps in keeping our environment eco-friendly and clean. This intelligent garbage management system is based on the microcontroller-based system. In this proposal study, a smart dustbin is designed using Ultrasonic Sensor, Moisture Sensor, GPS Sensor and ARDUINO UNO. This newly designed system can automate the entire garbage collection and dumping process and help to keep our environment clean and healthy.

**Keywords:** Arduino, Ultrasonic Sensor, Moisture Sensor and GPS Sensor

### System Architecture

The major challenge in front of the waste management department is the Garbage Collection and its Dumping, which has become a complex issue to be handled in order to maintain healthy environment. In the existing system, garbage bins are situated at various places to pick up the garbage, which is usually picked by the municipal corporation garbage collection truck with the help of paid workers and sent to the dumping ground to dump the garbage. These bins usually overflow before the pickup van comes, which leads to bad odour and unhygienic environment causing various diseases. Day-by-day this problem is increasing, hence an automated system for effective garbage collection system is designed which can collect garbage as and when required without human involvement. This proposed system is implemented using different sensors and Arduino IDE.





GPS Sensor

Arduino Board

An ultrasonic sensor uses ultrasonic sound waves to measure the distance of an object. It also uses a transducer to send and receive ultrasonic pulses that relay back information about the proximity of an object.

The amount of time taken for the signal to travel towards the receiver from the satellite is measured with the help of GPS receiver. The delay is nothing but the travel time of the signal. The time of the receiver is multiplied by speed of light to determine how far the signal travelled.

The volumetric water content of the garbage is measured by Moisture Sensor. The moisture sensor is a sensor connected to a controller that measures active moisture content of the garbage.

#### Plan of Implementation

- A 24x7 monitoring system is designed for monitoring the dustbins using an embedded IoT system.
- The embedded IoT system consists of following sensors.
- Ultrasonic Sensor - To detect if the dustbin is full or not.
- Moisture Sensor - To identify whether the dustbin contains wet or dry waste.
- GPS Sensor - To provide the location details of the dustbins
- All these sensors will be connected to an Arduino Uno which will collect all the data and store it.
- The Arduino will be programmed in such a way that if the input data crosses a threshold value, it will send the GPS location of that dustbin to Control Center over a wireless network.
- The control center will run an algorithm (GIS) to find the shortest route to the dustbin based on its GPS location and provide the route information to Garbage Collection Trucks.
- The garbage collection trucks will follow this route to reach the dustbins in optimum time.

#### ADVANTAGES OF THE PROPOSED SYSTEM:

- A reduction in the number of waste collections needed by up to 80%
- Less number of bins are required.
- Help to increase environment hygiene.

- Best use of technology to improve cleanliness.
- Reduced manpower.
- Reduced emissions.
- Reduced fuel use.
- Reduced unpleasant stench as no overflowing of garbage.
- Less traffic congestion.

#### **FUTURE SCOPE :**

- This research is carried out for demo purpose, the framework is designed and will be carried out at product level.
- The waste can be further segregated according to the classification like glass pieces, clothes, plastic, papers, etc.
- It can be made durable by making it compact and cost effective.
- Two bins can be kept for wet and dry waste.
- Wet waste can be decomposed and used for making Biogas.

#### **CONCLUSION**

In the existing systems no proper planning regarding collecting garbage was available which makes the town unhygienic. The labours who are working in cleaning the dustbins aren't responsible which makes the system worse in urgent cases. Proper monitoring of them is mandatory to keep the city clean and green. Only traditional and manual garbage pickup system was there. No automatic or technology-oriented systems exist. This project is meant for the effective garbage pickup using Embedded IoT System. The main aim of the proposed model is to collect waste into the dumping vehicles. In this method whenever dustbin gets filled to certain levels, the module placed on the dustbin will send an alert message to the central control room. This system also sends information about the location of the dustbin using GPS sensor. This project aims to prevent garbage overflowing from the dustbin and it also helps in limiting unhygienic condition. Thus the main objective of this project is to design effective and efficient garbage disposal system gets fulfilled.

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## Future of Print Media: A Fascinating Reality with Augmented Reality

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### ABSTRACT

Augmented reality (AR) has perceived extraordinary growth in the last few years and is the buzzword in today's technology. The main objective of this study is to analyze and experiment with how future technologies will have an impact on print media, mainly from the lookout of augmented reality.

Augmented reality reveals fascinating features for a magazine, newspaper or can be any print media, which would take the book lovers and readers beyond the inked books and papers. Augmented reality has the potential to make interactive and innovative learning experiences by presenting the article with the help of video, animation, and unique content. The content is the hidden part of the article which is shown only when requested or required. It is the smartphone and AR code or the program which needs to work together for the fantasy and illusion to be formed. The print media or magazine will have to be observed through camera sensors of smartphones for the fantasy to work appropriately. Along with other tools, an upright net connection is mandatory for an illusion to occur.

**Keywords**— Augmented reality (AR), Unity, Virtual Reality, HMD (head-mounted display), ABI (Application Binary Interface), Software development kit (SDK)

### INTRODUCTION

The growing market of net-based media is giving a tough period to the outmoded print media. The widespread distribution of smart devices empowers the opportunity to reach the massive virtual space of the internet, with swiftness and ease [1]. The finite space of print media appears sentenced to a definitive decline. The word augment denotes enhance or to add. It is Augment Reality which bridges the space between real and virtual world and makes it interactive. It is a good example of Intelligence Amplification (IA), as conveyed by Fred Brooks, which means we utilize the device to make it convenient for a human to accomplish their job[2]. AR provides supports in various sectors like education, entertainment, medical, media, arts, and design. It has brought new opportunities in the field of media which we never thought is possible.

In this research paper, we are implementing an app in which we have an interactive magazine with interactive images. The images on the magazine will have live images that will add extra information or media to live and add value. We will be using the latest features of the unity tool to turn the magazine into a magical magazine that will play and show the content that is appropriate to the image that is detected. It makes the boring reading practice into an innovative interesting experience[3].

### BACKGROUND AND LITERATURE REVIEW

Augment reality technologies are growing fast and are coming predominantly. The first well-known example of the amalgamation of an Augment Reality arrangement into a print medium is characterized by the "MagicBook" [4]. MagicBook is an example of an AR book that allows a reader with HMD to capture 3D models during the reading of a print medium.

AR is a medium that permits users to interact with digital data visually which is seamless with the environment and everyday life.

### Problem Statement and Scope of Study

AR uses sound, 3D images, graphics, and feedback which in turn are added to the real world, to make augmented rich users experience. In today's scenario, AR techniques are used and are universally being implemented in different areas to enhance interaction. The conventional way of learning and reading needs to be more interactive and to make it more exciting this enhancement is need for an hour. It is essential primarily to let handlers be involved in the learning activity. One of the key challenges concerning the amalgamation of AR into print media is characterized by the dearth of standardization.

The ground of Augment Reality claims in the print media and the publishing segment has its beginning with a vision in which any printed media, whether it's a poster, or a package to a printed leaf in a newspaper, magazine, or any kind of book, which can offer its reader added value than what the traditional original media was designed to convey. The main purpose of the study is to achieve a novel way to make the print medium or magazine in this case more interactive

## EXPERIMENT

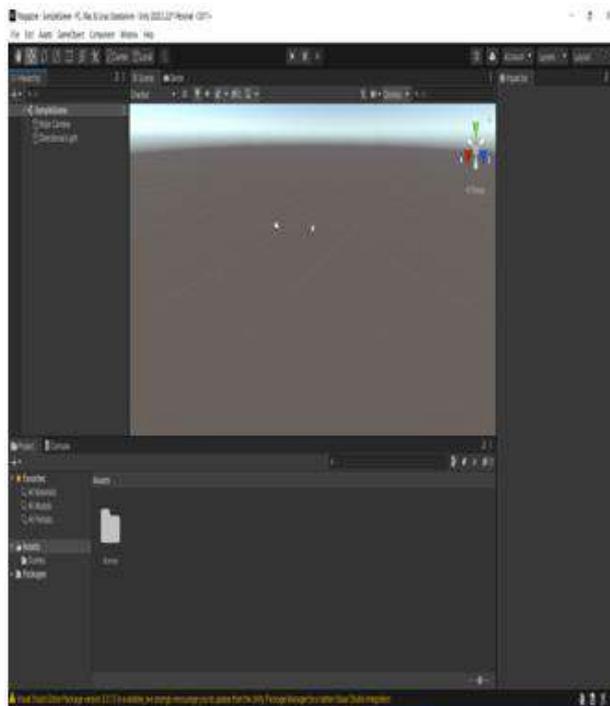
Augmented reality is the word that blends real and virtual space and is open-handed and gives equal space to worlds. AR is when digital information is draped onto an actual real-world entity or an article. To implement it, the camera plays an important role where the camera detects a target image and can figure out how far or close the image is. It also checks angle details verifying the angle of the target image, using and then sensors send it then which in turn projects digital video onto that target image.

For our experiment, we have used a magazine where article images come to live with Augmented Reality in the union between physical and digital. Framing the image according to the image target will be shown a video linking to the article while reading on your smartphone or any smart device. It is the vuforia engine that provides an easy solution to implement the technique with the tools offered makes it easy for journalists, bloggers, or anyone in the sector of print media who are not much skilled in terms computer[5].

## Technology used

Technology to be used for the development of an App or any software passes through the various stages of planning which commences with the set of blueprints and continue till the design is core fully implemented. In this case for making a magazine, an augmented print media, the software we will be working on is unity hub, unity engine, vuforia engine and will be using it to create the AR App.

The heart and core of this development is Vuforia Engine which is a software development kit for creating AR apps. Advanced computer vision functionality is used by developers to any application which allows them to recognize images and objects, which can interact smoothly within real-world scenes. It is the vuforia engine which ties AR and Virtual Reality application development for Android, iOS, Lumin, and UWP devices. The language which is used is called C#. Tools required for implementing and developing this project are a smartphones, a physical magazine, and an image linked to the database which can be a .jpg or a .png file. The .mp4 video is also linked to the database. It is AR which makes magazines interactive media and exciting. story over conventional one.



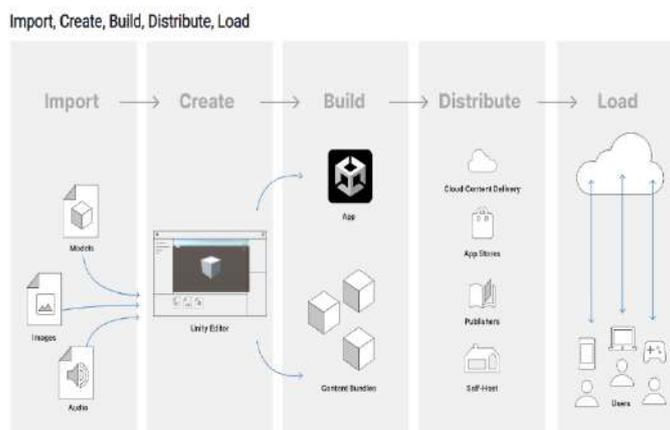
Screenshot of Unity Engine

## How does unity work

Unity is a 2D/ 3D machine and frame that gives you a system for designing a game or 2D or 3D app scenes or can be for practicing simulators. Not only it can use for AR/VR operations and other business-concentrated operations developed with Unity that needs to interact with 2D/ 3D space. Unity allows you to interact with them via not only scripts, but also with the visual factors, and export them to all most variants of smartphones. Unity supports all major 3D operations and numerous audio formats and can also let us perform Photoshop. Photoshop document format can in turn be used to drop a PSD file into the Unity design. IT the unity engine which allows us to import and assemble all the resources, write code to interact with the actual objects, reproduce or can also

import images and graphics that can in turn be used for advanced AI systems.

Unity uses these graphics in your Unity design to produce a game or app resource that can represent visual or audio in your design which is similar to 3D models, textures, sound, or music. Asset resources can also represent more abstract particulars similar to colour slants, modelling masks, or arbitrary work or numeric data for any use.



Unity Roadmap

### How does the app is created and how it works

In Unity 2018.3 beta, unity developed App Bundle switch supports for some of the hardware configurations.

Android Application includes all the code which is compiled and other resources, but only defers in APK generation process and while signing to Google Play. The new app serving model from Google Play's store, called Dynamic Delivery, which in turn then uses this app which bundles to generate and assist with optimized APKs. Each user's device configuration these APKS which is meant for them, so they download only the code and all the resources they need to run the app. Now it is no longer necessary to make, sign, and manage various APKs to support multiple devices, and users get smaller sized and optimized downloads.

Android App Bundles simulates to google play core library which is responsible for installing on-demand modules and managing modules and also for uncompressed native libraries which make building and running of the application faster. This all can be built and compiled with Android Studio, Gradle, and Unity

### Source Code

DefaultApkInitializationHandler

```
using UnityEngine;
```

```
using Vuforia;
```

```
/// <summary>
```

```
/// //A custom handler that registers for Vuforia initialization app function
```

```
///
```

```
/// When implementing custom app handler behavior, consider inheriting from this class instead.
```

```
/// </summary>
```

```
public class DefaultApkInitializationHandler : VuforiaMonoBehaviour
```

```
{
```

```
public void DefaultApkInitializationHandler(VuforiaInitError vuforiaInitError)
```

```
{
```

```
if (vuforiaInitError != VuforiaInitError.NONE)
```

```
{
```

```
SetErrorCode(vuforiaInitError);
```

```
SetErrorOccurred(true);
```

```
}  
}  
string mErrorText = "";  
bool mErrorOccurred;  
const string headerLabel = "Vuforia Engine Initialization Error";  
GUIStyle bodyStyle;  
GUIStyle headerStyle;  
GUIStyle footerStyle;  
Texture2D bodyTexture;  
Texture2D headerTexture;  
Texture2D footerTexture;  
void Awake()  
{  
// Check for an initialization error on start.  
VuforiaApplication.Instance.OnVuforiaInitialized += OnVuforiaInitializationError;  
}  
void Start()  
{  
SetupGUIStyles();  
}  
void OnGUI()  
{  
// On error, create a full-screen window.  
if (mErrorOccurred)  
GUI.Window (0, new Rect(0, 0, Screen.width, Screen.height), DrawWindowContent, "");  
}  
///  
/// <summary>  
/// When this game object is destroyed, it unregisters itself as event handler  
/// </summary>  
void OnDestroy()  
{  
VuforiaApplication.Instance.OnVuforiaInitialized -= OnVuforiaInitializationError;  
}  
void DrawWindowContent(int id)  
{  
var headerRect = new Rect(0, 0, Screen.width, Screen.height / 8);  
var bodyRect = new Rect(0, Screen.height / 8, Screen.width, Screen.height / 8 * 6);  
var footerRect = new Rect(0, Screen.height - Screen.height / 8, Screen.width, Screen.height / 8);
```

---

```
GUI.Label(headerRect, headerLabel, headerStyle);
GUI.Label(bodyRect, mErrorText, bodyStyle);
if (GUI.Button(footerRect, "Close", footerStyle))
{
#if UNITY_EDITOR
UnityEditor.EditorApplication.isPlaying = false;
#else
Application.Quit();
#endif
}
}

void SetErrorCode(VuforiaInitError initError)
{
switch (initError)
{
// case InitCode.INIT_EXTERNAL_DEVICE_NOT_DETECTED:
//   mErrorText =
//     "Failed to initialize the Vuforia Engine because this " +
//     "device is not docked with required external hardware.";
//   break;
case VuforiaInitError.LICENSE_CONFIG_MISSING_KEY:
mErrorText =
"Vuforia Engine App key is missing. Please get a valid key " +
"by logging into your account at developer.vuforia.com " +
"and creating a new project.";
break;
case VuforiaInitError.LICENSE_CONFIG_INVALID_KEY:
mErrorText =
"Vuforia Engine App key is invalid. " +
" Please get a proper valid key by logging into your account at " +
"developer.vuforia.com and creating a new project. \n\n" +
getKeyInfo();
break;
case VuforiaInitError.LICENSE_CONFIG_NO_NETWORK_TRANSIENT:
mErrorText = "Unable to contact server. Please try again later.";
break;
case VuforiaInitError.LICENSE_CONFIG_NO_NETWORK_PERMANENT:
mErrorText = "No network available. Please make sure you are connected to the Internet.";
```

```
break;
case VuforiaInitError.LICENSE_CONFIG_KEY_CANCELED:
mErrorText =
"This App license key has been cancelled and may no longer be used. " +
"Please get a new license key. \n\n" +
getKeyInfo();
break;
case VuforiaInitError.LICENSE_CONFIG_PRODUCT_TYPE_MISMATCH:
mErrorText =
"Vuforia Engine App key is not valid for this product. Please get a valid key " +
"by logging into your account at developer.vuforia.com and choosing the " +
"right product type during project creation. \n\n" +
getKeyInfo() + " \n\n" +
"Note that Universal Windows Platform (UWP) apps require " +
"a license key created on or after Date .";
break;
case VuforiaInitError.DEVICE_NOT_SUPPORTED:
mErrorText = "Failed to initialize Vuforia Engine because this device is not supported.";
break;
case VuforiaInitError.PERMISSION_ERROR:
mErrorText =
"One or more permissions required by Vuforia Engine are missing or not granted by user.\n" +
"For example, the user may have denied camera access to this app.\n" +
"In this case, you can enable camera access in Settings:\n" +
"Settings > Privacy > Camera > " + Application.productName + "\n" +
"Also verify that the camera is enabled in:\n" +
"Settings > General > Restrictions.";
break;
case VuforiaInitError.LICENSE_ERROR:
mErrorText = "A valid license configuration is required.\n";
break;
case VuforiaInitError.INITIALIZATION:
default:
mErrorText = "Failed to initialize Vuforia Engine.";
break;
return appfunction;
}
}
```

### Implementation of AR magazine

AR Apps for Fascinating Magazine Reality will help to bring the publication's content to life by adding digital elements to the printed material. The AR solutions in a magazine or for any print media are intended to shape the future of the publishing sector by the adoption of AR solutions. With the worldwide adoption of the latest generation of advanced and powerful smartphones, growing curiosity, and engagement of the people, such apps are being downloaded on a massive scale. The scenario is simply to supply a solution where the knowledge is more appealing to the users.



: A snapshot of the article in the magazine.

### CONCLUSION

Augmented reality is the immersive technology platform of our future, It's going to be the connective tissue of AI, robotics all of this other technology that we are charged to bring to our enterprises. AR will harness attention, revolutionize learning and touch new worlds. Augmented reality comes to play when the virtual object displays information, where the user cannot detect with his senses. The information delivered by the virtual objects helps a user perform real-world tasks with the implementation of AR, it gives a better sense of vision to the learner and also it add interactivity to the objects which ultimately result in adding more usability and functionality . However, it can be seen that there will be many problems to be solved in augmented reality technology. For example, when the mobile camera is moved away from the image target scanner, the AR object disappears and the actual photo has to be scanned again. It is possible to use enlarge tracking, but in most cases, enlarge tracking makes things worse. Scanning will not work if the image target reflects light in certain situations. Image target has to have strong borders/contrast colors to make tracking more stable. The real and the apt advantage of augmented reality is its user friendliness ,where detailed instructions are not required for any user .

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## Neuro-Fuzzy Approach for Handwritten Marathi Multi Digit Numeral String Recognition Using Chain Code Features

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### ABSTRACT

In recent years; Handwritten mixed multi digit recognition for Marathi Language is also area of thrust for many researchers. Many systems have been developed using soft computing paradigms such as Artificial Neural Networks, Fuzzy logic-based methods [1]. Hybrid soft computing techniques have been implemented to solve many pattern recognition problems by the researchers. In this paper; Neuro-fuzzy system has been developed for the recognition of mixed multi digit Marathi numeral recognition [2]. In the experimental work, primary Marathi handwritten digits database has been used. The Proposed system includes Chain code technique for feature extraction. Adaptive Neuro-Fuzzy Inference System (ANFIS) classifier has been used to recognize the patterns from the primary database. The Accuracy of recognition of Marathi handwritten character recognition is 98.4 %.

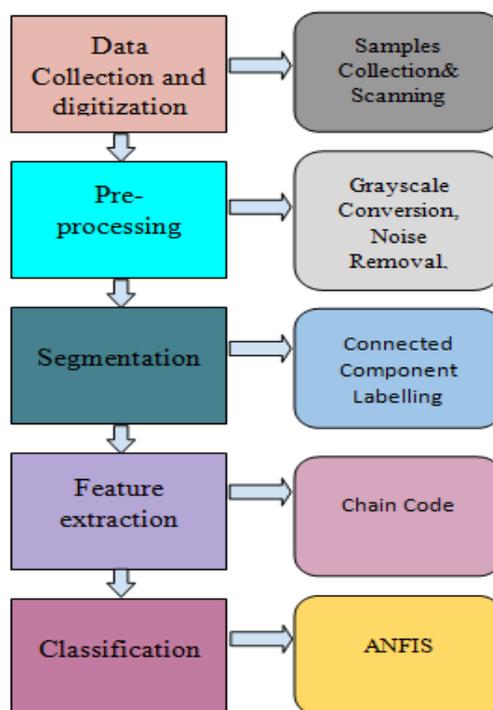
**Keywords:** Chain Code, Neuro-fuzzy method, Marathi numeral recognition.

### INTRODUCTION

Human being has a natural intelligence with which they can recognize any shape, object, color. Machine learning is an area which tries to incorporate such intelligence into computing machines [3]. Many problem-solving paradigms have been developed by researchers over the years. Handwritten recognition is one such area which is still attracting researchers because of potential applications [4]. Handwritten character recognition is possible due to Geometrical growth in computational power which enables the implementation of the current character recognition methodologies[5].

### PROPOSED METHOD

Method proposed as part of present study works in five phases as shown in the figure 1 as: Data collection & digitization, Preprocessing & Normalization, Segmentation, Feature extraction & Classification. Block diagram of system is given in figure:



**Figure1:** Flow Chart of proposed system

### 1. Data Collection & Digitization

The devanagari script is used for Marathi language which includes 10 digits that are 0,1,2,3,4,5,6,7,8 and 9. Primary database was developed though 25 persons having different age group as well as different writing style in devanagari script. Each person asked to write 2-digit marathi numeral string in box. Ten samples were collected from every person. Therefore 250 samples were collected. The figure 1.1 shows some collected samples



Figure1.1: sample script

### 2. The Pre-processing

Pre-processing stage takes input image as it is and makes it suitable for further operations. This is achieved by number of low-level image processing operations such as conversion to intensity (grayscale) image, applying filters to remove noise and enhance the appearance of an input image, implementation of global threshold method.

### 3. SEGMENTATION

Segmentation is characterized by the thing that input to this stage is preprocessed image and output is images of isolated components from input image.

#### Segmentation of an image can be done in one of three ways:

- 1) Internal Segmentation: in this case; segmentation is done as a part of recognition stage. It is also known as implicit segmentation.
- 2) External Segmentation: Here individual digits are isolated prior to recognition. This type is also known as explicit segmentation.
- 3) Segmentation-free approach: In this recognition is performed at string level so there is no need of segmentation.

In present system; explicit segmentation strategy has been adopted for isolating individual digits. Connected component labelling approach is one of such kind of algorithm.

### 4. FEATURE EXTRACTION

Feature extraction is a very important and crucial stage in recognition system. There are 2 types of feature extraction methods: Contour based & Region based methods [6]. Contour based methods outperform in case of handwritten numeral recognition. Hence, proposed system uses chain code feature set. Chain code represents the object based on boundary of an object. The chain code are calculated in one of two ways: 4-neighbourhood or 8-neighbourhood. Chain codes are proved to be efficient in describing curves, lines and edges of an object.

Chain code is calculated using following algorithm :

#### Algorithm : Chain Code

Input: Numeral Image

Output : Chain Code Vector

Step 1 : START

Step 2 : Find out starting pixel != 0

Step 3: Put center of chain code window on starting pixel

Step 4 : While (Not reach to first point ) Or

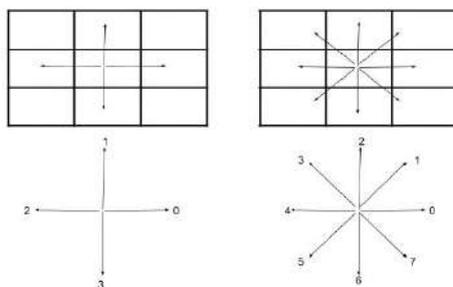
(Not Exist another pixel) Do

4.1 Travels all neighbours and Find first nonzero value

4.2 Add the corresponding chain code on chain code vector.

4.3 Move to next position

Step 5 : STOP



**Figure 4.1:** Chain Code

The chain code algorithm will extract the connected components in vertical manner, horizontal manner and diagonal manner shown in the figure 4.1. In the chain code algorithm it will seek the connected component.

### 5. Classification/Recognition

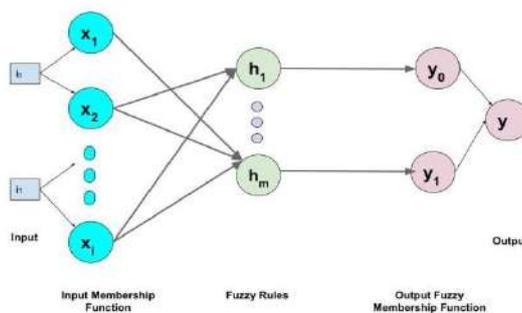
After completing all previous steps; final task is to use classifier which assigns input feature vector to its correct class. There are many classifiers used by researchers for handwriting recognition. Among them Artificial neural network and fuzzy logic based classifiers are most popular one [7]. Here; we have used combination of both classifiers to achieve higher performance. The Neuro-Fuzzy classifiers are divided into three categories as follows:

- 1] Cooperative neuro-fuzzy system
- 2] Concurrent neuro-fuzzy system
- 3] Hybrid neuro-fuzzy system

In first type of systems; neural network is active in the initial phase of system. Learning mechanism of ANN is used to frame Fuzzy system. Once; Fuzzy system gets ready recognition task is taken over by only fuzzy system. In second type; neural network and fuzzy logic works parallel to each other. ANN preprocesses inputs to the fuzzy system. The output of these systems is difficult to interpret.

In Hybrid neuro-fuzzy system; fuzzy system uses learning mechanism of ANN to set its parameters according to input-output data. The resultant hybrid system combines power of ANN and Fuzzy system in a true way. Also it is easy to interpret.

The Proposed system uses Adaptive Neuro-Fuzzy Inference System which is a hybrid model (ANFIS) to classify the patterns. It uses back propagation learning algorithm of ANN for fine tuning of Fuzzy system. Generic ANFIS model is as shown in figure 5.1 :



**Figure 5.1:** Generic ANFIS

As evident from figure 5.1; this system works in five phases. First layer performs mapping of inputs to fuzzy membership functions. At the second layer fuzzy rules are framed and their firing strength is calculated. Third layer is responsible for fuzzy rule strength normalization. Fourth layer calculates the output of fuzzy rules.

Output layer determines global output as a summation of all outputs coming to this layer. Algorithm of proposed system is as follows:

**Algorithm :**

**Input :** *Marathi mixed-multi digit numeral*  
image

**Output :** *Recognized Class of Numeral*

- 1: Input RGB image of Marathi numeral  
 $I \leftarrow \sum_{x=1}^m \sum_{y=1}^n \text{img}_{xy}(r, g, b)$
2. Pre-process input image by performing following operations
  - 2.1 conversion to grayscale  
 $\text{img\_gray} \leftarrow \text{rgb2gray}(I)$
  - 2.2 Remove noise present in the image using median filter  
 $\text{img\_filter} \leftarrow \text{median}(\text{img\_gray})$
  - 2.3 Convert image to binary format :  
 $\text{img\_bw} \leftarrow \text{im2bw}(\text{img\_filter})$
3. Segment the image to isolate digits from one another using Connected Component Labelling algorithm
6. Compute Chain code of each isolated digit using algorithm Chain Code
7. Define feature vector F of chain codes  
 $F \leftarrow [\text{mean} \quad \text{standard deviation} \quad \text{skewness}]$
8. Create data set using above Feature vector and divide it into training and test data set.
9. Create ANFIS with training data and 3 number of generalized bell shaped membership functions  
 $\text{in\_fis} \leftarrow [\text{training\_data} \quad 3 \quad \text{gbelimf}]$
10. Train ANFIS  $\text{out\_fis} \leftarrow \text{train}(\text{in\_fis})$
11. Modify weight as per error
11. Repeat step 10,11 till goal or specified number of epoch is reached
12. Evaluate ANFIS against Test data set and collect results

## RESULTS & DISCUSSION

For validating the proposed system, it was implemented on primary database of mixed multi digit Marathi numerals. Total size of database is 250 digits i.e. 25 samples of each digit. K-fold cross validation technique was used to organize the data into 5 equal sets of samples. From these 5 sets; 4 were used as training set and 1 set as testing set. System was tested 5 times so that every sample gets chance to appear in training and testing data set.

The “Precision and recall” classification measure has been used to determine the accuracy of the samples. The formula for Precision & Recall is as follows:

$$\text{Precision} = \frac{\text{No. of Correctly Classified Patterns}}{\text{Total no. of Classified Patterns}} * 100$$

Recall

$$= \frac{\text{No. of Correctly Classified Patterns}}{\text{Total no. of Patterns}} * 100$$

The obtained results using ANFIS model is as shown in the table.

**Table 1:** Recognition accuracy of Marathi Handwritten digits

Digit	TOTAL Number of Samples (A)	No. Of Correctly Classified samples (B)	Total number of Classified patterns (C)	PRECISION (B/C)	RECALL (C/A)
0	25	25	25	100	100
1	25	25	25	100	100
2	25	23	25	92	92
3	25	25	25	100	100
4	25	25	25	100	100
5	25	25	25	100	100
6	25	24	25	96	96
7	25	25	25	100	100
8	25	24	24	100	96
9	25	25	25	100	100
<b>Recognition accuracy</b>				<b>98.8</b>	<b>98.4</b>

The table shows that there is 100 % recognition accuracy for the digits 0,1,3,4,5,7 and 9. For the digit 2,6 and 8, the recognition accuracy is 92%, 96% and 96% respectively. The overall accuracy of digit using ANFIS model is 98.4 %.

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## **Covid Crisis and Media: A Comparative Study of Censorship during Emergency and Corona Pandemic**

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### **ABSTRACT**

Media is an important institution in a Democracy. Media plays the role of watchdog in any society. In the context of a pandemic media's role becomes even more significant. This paper attempts to analyse censorship imposed during emergency formally and informal attempts at censorship during the corona pandemic. Questions were raised by the international media on the role of press in India during the second wave and how it impacted Government response to the crisis. The formal imposition of censorship during emergency deeply affected Indian Democracy. The response by some media outlets led to resistance against government during emergency. The censorship during the pandemic was informal in nature where the government capitalised on the nature of the post truth world facilitated by the social media. However fearless coverage by some media outlets during the pandemic exposed the government and raised awareness during the pandemic. This led to changes in central government's vaccine policy. Thus news media plays a crucial role in the mitigation of the pandemic and increasing awareness of common people in a democratic society.

**Keywords-** Censorship, role of media, Democracy, Post-truth world.

### **INTRODUCTION**

The News media plays an important role in any Democracy. India is the largest democracy in the world and newspapers have always played a crucial role in fostering and strengthening democratic values in Indian Society. Media is the fourth pillar of democracy keeping a watch on Executive Judiciary and Legislature. This role often puts the media in conflict with the government of the day. This paper attempts to analyse censorship imposed during emergency formally and informal attempts at censorship during the pandemic. The Emergency was a challenging period for Indian press and it faced direct suppression by the Indira government. No formal censorship was imposed during the corona pandemic but pressure on press and citizens to hide the facts and play down the severity of the crisis was attempted. Indirect pressure and use of national security laws were employed to achieve the objective of covering up the bad news. The objective of the research paper is to throw light on the condition of the press during these different periods and show the response of the Indian media in both situations. For writing this research paper Historical, Analytical and comparative method has been adopted to trace the media behaviour in both the situations

### **Emergency and Media**

In India, "the Emergency" refers to a 21-month period from 1975 to 1977 when Prime Minister Indira Gandhi had a state of emergency declared across the country. On 25<sup>th</sup> June 1975 the proclamation of emergency was issued by President Fakhruddin Ali Ahmed under article 352 of the constitution. On the night of 25<sup>th</sup> June 1975 power supply was cut off to New Delhi's street of major dailies Bahadur Shah Zafar Marg and effectively censored the next morning's elite English Language newspapers.

The fundamental rights of the Indian people were suspended, and strict controls were imposed on freedom of speech and press. With the imposition of emergency a host of repressive measures was introduced, and for the first time in India pre-censorship was imposed by promulgating a Censorship Order dated 26<sup>th</sup> June 1975 under Rule 48 of the Defence of India Rules (DIR), 1971. As a result of the Censorship Order, no news, comment, rumour or other report relating to any action taken under certain provisions of the DIR, could be published unless it was previously submitted to Censor (called authorised officer) for his scrutiny and his permission was obtained.

Government used police forces across the country to place thousands of protestors and strike leaders under preventive detention. Prominent Leaders of Opposition Parties like Vijayaraje Scindia, Jayaprakash Narayan, Raj Narain, Morarji Desai, Charan Singh, Atal Bihari Vajpayee, Lal Krishna Advani, Arun Jaitley were arrested under the provisions of MISA (Maintenance of Internal Security Act). During the emergency Indira Gandhi had a firm grip on the Indian mass media. This was especially true since radio and television in India are government owned and operated.

She used at least three methods in manipulating the newspapers:

- (1) Allocation of government advertising;
- (2) Shotgun merger of the news agencies and
- (3) Use of fear-arousal techniques on newspaper publishers, journalists and individual shareholders.

Kuldip Nayyar Editor of Delhi edition of Statesman was arrested under the provisions of MISA Act. The response of the Indian press towards emergency was one of surrender and fear.

#### **Media Response to Emergency Proclamation**

Times of India, Hindustan times and The Hindu accepted the official government stance and toed the line. Prominent Editors like Russi Karanjia of the Blitz and Khushwant Singh of Illustrated weekly of the Times Group supported the Emergency. During censorship, most of the nation's domestic dailies, however, gave up the battle for press freedom. Their pages were "filled with fawning accounts of national events, flattering pictures of Gandhi and her ambitious son, and not coincidentally, lucrative government advertising. But two tough, prominent publishers of English- language dailies, The Indian Express and The Statesman, fought courageously against Indira Gandhi's opposition of the Indian press. The Indian Express Delhi edition on June 28, 1975 carried a blank first editorial and the Financial Express reproduced in large type Rabindranath Tagore's poem "where the mind is without fear and the head held high" concluding with the prayer "Into that heaven of freedom, my Father, let my country awake."

In Mumbai Himmat a small local weekly edited by Rajmohan Gandhi left its editorial page blank. Of course, even a more valiant attitude was shown by independent, small journals like Sadhana (Marathi), Bhoomiputra (Gujrati), Seminar (a monthly journal) and Opinion (a weekly sheet). The Indian Express group led by its valiant editor and owner Ramnath Goenka opposed emergency tooth and nail. He received the highest attention from the Indira government and was greatly targeted. The paper was strangled of government advertising support faced litigation and tax raids by government agencies. Undeterred it reported on many violations during emergency including slum demolitions and forced family planning programmes. Pre-censorship was imposed on all editions of Indian Express on August 16, 1976. Goenka filed a petition against it in the Bombay High Court and the Government withdrew its order on September 30, 1976. The Government then issued orders to all departments and public sector corporations not to advertise in any of the Indian Express group of news papers. The Statesman, a private limited company, followed the Indian Express. It's overpowering Managing Director, C.R. Irani, and Chairman of the board, N.A. Palkhiwala, the famous lawyer, both on the board of trustees of the paper, kept the paper within the law but saw that it took as much advantage as possible. The Statesman had its government advertisement suspended and it was only after the elections that the ban was removed.

#### **End of Emergency**

On 18 January 1977, Indira Gandhi called fresh elections for March and released all political prisoners though the Emergency officially ended on 23 March 1977. Press Censorship was also ended. In the Lok Sabha elections, held in March 1977, Mrs. Gandhi and Sanjay Gandhi her son both lost their Lok Sabha seats, as did all the Congress Candidates in Northern states such as Bihar and Uttar Pradesh. The Congress was reduced to just 153 seats, 92 of which were from four of the southern states. The Janata Party's 298 seats and its allies' 47 seats (out of a total 542) gave it a massive majority. Morarji Desai became the first non-Congress Prime Minister of India. With the relaxation in censorship provisions on the eve of elections to the 6th Lok Sabha in 1977, the media got the breathing space, and eventually bounced back as a watchdog of democracy. The pro government newspapers continued to support the government however they were also able to provide space to opposition parties and the newly formed Janata party.

Soon after the government of Prime Minister Morarji Desai took over the political power in India, it announced three distinct steps toward restoring freedom of the Indian mass media. These were:

- (1) To establish a committee to study misuse of mass media during the internal emergency;
- (2) To establish a working group to study the question of converting All India Radio and Doordarshan (television) into autonomous institutions; and
- (3) To establish a committee to study the feasibility of restructuring the existing news agency (Samachar).

The measures taken by the Janata party government strengthened Democracy in India. Thus we can say that Emergency period was a dark chapter in the saga of Indian press. Now let us examine the challenges faced by media in India during the corona Pandemic and see if any attempt at muzzling the press was made.

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### **Press and Corona virus Pandemic**

The Covid 19 pandemic began in China in December 2019 and spread to the rest of the world by March 2020. The Indian Government imposed a stringent lockdown to prevent the spread of corona virus. The Lockdown was strictly enforced but there was no stopping the spread of the virus. We analyse media coverage of the pandemic and Government response to criticism of its handling of the pandemic.

In the early months of India's corona virus pandemic, Manisha Pande recalled watching the evening news tell the public to go outside and bang pots and pans in solidarity with healthcare workers. Manisha Pande is the executive editor of the New Delhi-based independent news publication *NewsLaundry*, which reports on the Indian media. According to her mainstream news coverage last year seemed more often like a celebration than a reckoning with the global crisis. During the first wave of the corona virus, Pande felt the news media failed to represent the devastation of the pandemic, largely because Prime Minister Modi's administration had been known to threaten publications and networks that criticized his government.

Indian media had become polarized over the years, and sometimes coverage critical of the government is painted as an attempt to tarnish India's image. By creating a new template for media-government relations, the government had, over the past few years, tried to de-legitimize the media as an institution, while at the same time attempting to co-opt a select few media houses to be part of the ruling establishment.

For instance, when hospitals in Delhi were clamouring for oxygen supplies, several "government friendly" television channels blamed the ongoing farmers' blockade in the outskirts of the capital for the inordinate delays. Several news channels have debated whether anti-India lobbies were out to discredit the country and if this was a conspiracy.

### **The Second Wave**

Just before the second wave hit India in March 2021 political parties continued with their election rallies, amassing crowds of thousands despite the number of cases steadily rising. The Election Commission of India could also be held responsible for the surge in cases as it oversaw elections in four states and a union territory over the past month and allowed large rallies and road shows that served as incubators of the deadly virus. A medical expert even called Prime Minister Narendra Modi a 'super spreader' for holding political rallies. Yet the television media, instead of being critical of the rallies, ran live footage of election sloganeering.

Another super-spreader event promoted by the chieftains in power was the Kumbh mela – where millions of devotees gather on the banks of the river Ganges to take a 'holy dip'. And when images of overflowing cremation grounds made it to the cover of international press, the government's angry response was that it hurt Hindu sentiments and was 'fake news' to create panic and tarnish India's image. Some journalists and commentators on Indian television even debated whether images of cremation should be carried in the press, rather than addressing why so many cremations were taking place, and challenging the low government estimates of the death toll.

By April 2021 India's official count of COVID-19 cases had surpassed 20 million, with more than 300,000 infections and 4,000 deaths reported daily for the past three weeks. Yet many experts believed that the situation on the ground was far worse than what official statistics indicated.

### **Censorship of Media**

The Indian government is ordered social media sites such as Twitter, Facebook and Instagram to block posts that criticize management of the renewed nationwide public health crisis brought on by the corona virus pandemic.

A majority of the tweets pulled down by Twitter were critical of the government's inability to secure medical supplies, hospital beds and oxygen.

The government said the posts were removed because certain users were using Twitter to spread fake or misleading information and create panic about the COVID-19 situation.

"This decision has been taken to prevent obstructions in the fight against the pandemic and a breakdown of public order due to these posts," said an official with the Ministry of Electronics and Information Technology.

In February, Twitter blocked more than 500 accounts linked to the ongoing farmer protests against agricultural reforms after the government issued a legal notice.

### **Threats to Media**

Following the removal of social media posts the Uttar Pradesh Chief Minister Yogi Adityanath directed officials to take action under the National Security Act, and seize the property of individuals who spread "rumors" on social media, claiming that hospitals were struggling to maintain their oxygen supplies.

"Is this not a veiled threat to the media to not report what is happening on the ground? This has a chilling effect," a local journalist from Lucknow told DW an international media outlet. Uttar Pradesh police had registered an FIR against the director of a Lucknow hospital and others after the former released a notice saying there was an oxygen shortage.

Police had claimed that the notice, released by Sun Hospital's director Akhilesh Pandey on May 5, was published with the intention of black marketing and spreading rumours. The police in Amethi, Uttar Pradesh, had filed a criminal case against a man who used Twitter to appeal for an oxygen cylinder for his grandfather. The foreign press corps in India, too, has had to face not-so-subtle pressures to tone down their coverage of the ongoing surge, which had become headline news around the world. "We got calls from some key people in the government after we did a report on how the record death toll was hiding the real extent of the COVID crisis," a senior reporter from a US-based media group told DW.

### **Resistance by Indian Media- Regional newspapers**

The western state of Gujarat, which is also the birthplace of Prime Minister Narendra Modi, has officially registered nearly 700,000 cases and 8,500 deaths, but undercounting is purported to be huge here, more than in any other state. The local media usually toed the government line and refrained from strong political commentary, but the pandemic is one of the rare and compelling instances where editors felt they cannot turn a blind eye on the loss and anguish suffered by their readers. During Second wave they had amplified COVID-19 coverage on their front pages and took an unusually critical stance on the government's records. They publish investigations about fudged data, wrote bold editorials, and let the tenfold increase in printed obituaries quietly illustrate the scale of the tragedy for readers.

Almost every news outlet in Gujarat – be it print, television, English-language or Gujarati – had put the spotlight on the staggering mismatch between the government's official Covid-19 death count and the number of dead being cremated or buried in cities. In Ahmedabad, for instance, the state government had officially declared just 20 Covid-19 deaths on April 12. But *Sandesh*, a leading Gujarati newspaper, claimed that at least 63 people had died in just one government-run Covid-19 hospital in the city on the same day. In a report published in *Sandesh* on Tuesday, the paper claimed that its journalists had arrived at the figure by camping outside Ahmedabad Civil Hospital's 1,200-bed dedicated Covid-19 wing for 17 hours, counting every dead body being brought out of the morgue from midnight to 5 pm on April 12.

A recent headline on the front page of *Gujarat Samachar* read: "A gas-based crematorium in Mehsana, Gujarat, has become red-hot due to constant cremations for the last 15 days." Beneath it was an image of a scorched pipe that glowed red from nonstop cremations. The leading Gujarati-language daily, with a 4.6 million-strong readership, has not historically shied away from eye-popping headlines. Now it reads as even less apologetic, and more accusatory. "The jugglery with statistics just doesn't stop," read one recent headline. "The government continues to indulge in statistical illusions," read another.

Bhaven Kachhi, who had worked at Gujarat Samachar for twenty-nine years, did send reporters to cremation grounds across cities and villages to track the daily arrival of bodies. In the city of Ahmedabad, for example, reporters had watched people arrive at five in the morning to cremate their loved ones, forming lines that continue to grow and move until midnight. *Gujarat Samachar* was not trying to target the government; Kachhi said "We are at a point now where if we didn't report the truth, people would still know the full extent just from looking at their own neighbourhoods."

Another striking example is from Jamnagar, where the government-run Guru Gobind Singh Hospital has been choked up with Covid-19 patients not just from Jamnagar district but also from the neighbouring districts of Morbi, Rajkot, Junagadh and Amreli. While the state government claims there were zero Covid-19 deaths in Jamnagar on Tuesday and barely one death on Sunday, a local digital news publication, *Khabar Gujarat*, claimed around 100 people in Jamnagar died of the virus within 48 hours between April 10 and 11. On April 13, the news site reported 54 deaths in the city.

### **International media coverage of Corona Pandemic in India.**

International outlets including the *Washington Post* and *Financial Times*, depended on local papers in order to consolidate their own data on overlooked or downplayed COVID-19 fatalities during the country's second

wave. They relied on local journalists in the field, who lined up outside hospitals and cremation grounds every day to count the bodies. News outlets across the world had focused pieces – ranging from op-eds to detailed reports – on India’s situation and the lack of governance in key aspects that led to it. This had led to renewed global focus on the image conscious Narendra Modi government. Among publications that have minced no words in holding the Centre accountable was *The Guardian* in England, which on April 21 ran a reported piece direly headlined ‘‘The system has collapsed’’: India’s descent into Covid hell’.

The piece begins with Prime Minister Modi’s now infamous musing at a rally in Bengal, on the fact that he has not seen such large crowds before. COVID-19 guidelines prohibited large gatherings and call for social distancing.

The *New York Times*, in addition to daily reports in its international edition on the spiralling crisis in India, ran an opinions piece by economist and epidemiologist Ramanan Laxminarayan on how ‘India’s Second Covid Wave Is Completely Out of Control.’

France’s *Le Monde* focused its latest report on the crisis of medical oxygen, especially in New Delhi. It quotes healthcare professionals as observing that they had “never seen such a crisis” in their lifetime. Overwhelmed testing centres, crematoria and burial grounds formed the central focus of the French language report, which also quoted Chief Minister Arvind Kejriwal amidst his clamour for Central help.

Eastwards, the *Japan Times* reported on how in the absence of communication from the government during the crisis involving shortage of key medical supplies spilled on to social media. The report noted how news feed on Facebook, Twitter and Instagram had been flooded either with information on bed availability or with fervent pleas for oxygen cylinders or medicines.

The Indian High Commission in Canberra wrote a letter to *The Australian’s* editor-in-chief, Christopher Doe, taking offense to an article which attributed the devastating second wave of corona virus in the country to the missteps and complacency of Prime Minister Modi. The commission called on the newspaper to publish a correction of the article, which was titled: "Modi leads India into viral apocalypse." The Newspaper refused to do so.

"The government is far more concerned with criticism from outside, as that is something they cannot control," said Sevanti Ninan media critic and founder of Hoot Media a media watchdog.

## CONCLUSION

Government complacency was identified as critical factor for the surge of covid-19 cases in India during the second wave. Media is an important institution in a Democracy. It acts as a bridge between people and government. During a global pandemic media’s role becomes crucial. This paper attempts to compare two periods where formal and informal methods were used to curb media freedom. We can see that during the corona pandemic both mainstream media and social media were used to attempt the image management of the government in power. During emergency formal method of censorship was used. However in both cases resistance was carried out by some media outlets which brought out the truth to the people. Media criticism exposed dangers of the Emergency period and now the government was forced to change the vaccination policy as well as take steps to effectively control the pandemic.

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## **Festival of Colours ‘Holi’: A Study on Awareness, Consumer Behaviour and Eco-Friendly Practices among People**

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### **ABSTRACT**

*‘Holi’ is the unique festival of colours celebrated in India. The real essence of this festival lies in sharing love, joy and enthusiasm. Despite, all of these good things, ‘Holi’ has become, like all other festivals, heartlessly commercialized, and has become yet another source of environmental degradation. Through the present study, the researcher made an attempt to find out the awareness and eco-friendly practices during Holi festival among youth. The present study was descriptive in nature and tool used to collect data was Questionnaire, distributed via Google form link to 250 respondents. The result showed that respondents (38.30%) were in the age group of 19-35 years were female ((59.20 %). well aware that natural color have better for health and environment health benefits from the synthetic colours (85.30%). Respondents (71.30%) were well aware about the natural colours that made from flours like cornstarch, gram floor, rice floor and arrowroot at high extent. Respondents preferred synthetic spray colours (69.20%) and natural colours for vibrant dry colours (65.60%). Respondents (33%) retorted that natural colours in market are expensive. Respondents also adapt healthy practices to protect the skin from harmful synthetic colours like sometimes applying moisturizer (61.30%), wearing sunglasses (44.20%) most of the time, cover bandana or scarf to protect head (41.20%) most of the time. This study may be useful to to have a safe and healthy Holi festival and to create awareness among people about the natural colours. This study encourages marketers to study consumer behavior during Holi festival shopping The present study also sheds light on healthy and environmentally friendly practices to be followed during the Holi festival in order to protect one's health and the environment. The study would also be valuable for marketers to estimate market potential and awareness of natural colors among people.*

**Keywords:** *Holi, Colours, Festival, Awareness, Practices, Environment.*

### **INTRODUCTION**

India is a heritage of enormous festivals. In Hindu culture, every season brings enormous festivals. Many festivals lies on the spring season, as many of the festivals in India have religious reasons behind them, and others have agricultural significance hence called a season of festival. (Cook, 2021). Spring has been celebrated for ages, welcoming the warmth, colour and new beginnings with music, food, colour and love (Bhatt, 2019). Holi is one of the most significant Hindu festivals in India. Holi, or the festival of colours, is celebrated by smearing colours on each other. Holi is a Hindu festival that takes place on the full moon day in the month of Phalgun. It is also recognized as the Spring Festival because it coincides with the arrival of spring (Times of India, 2021). People celebrate by joyously throwing colored powder on each other and spraying each other with water guns. At the end of the day, everyone is covered in a brightly colored mixture. These fun activities are related to ‘Lord Krishna’, a reincarnation of ‘Lord Vishnu’, who liked to play pranks on the village girls by drenching them in water and colours. The festival is also centered on the story of demoness ‘Holika’, who was burned to death with the help of ‘Lord Vishnu’ (Cook, 2021).

‘Holi’ festival commemorates the triumph of good over evil, as we have all heard the story of Hiranyakashyap, Prahlad, and Holika. The festival is a colorful celebration that represents togetherness and love, as well as the start of spring and good harvests. (Bhatt, 2019). The special and beautiful thing of this festival is that on this one day, it is acceptable to reverse the usual caste, gender, status, and age rankings by throwing colored water and powders on one another. The celebrations in the streets are often marked by ribald language and behavior, but at the end, when everyone bathes, dresses in clean white clothes, and visits friends, teachers, and relatives, the ordered patterns of society are reestablished and renewed (Britanica, 2021). Traditionally, the colours of Holi were derived from plants: green was made from ground neem leaves (*Azadirachta indica*), and yellow and red from turmeric (*Curcuma longa*). Turmeric, a popular spice, is bright yellow at neutral pH due to the molecule curcumin. Curcumin turns red when exposed to a base, such as calcium hydroxide (also known as lime). Henna leaves as another shade of green; marigolds or chrysanthemums as yellow; flame of the forest (*Butea monosperma*), pomegranate, or red sandalwood as red; indigo as blue; and charcoal as black were among the other plant-based colours used as pastes, powders, or in water (Marshall, 2018).

In the course of time, the picture has come in synthetic and artificial colours. The reason for this is that they are made of chemicals and can be mass-produced on a massive scale. They are indeed relatively affordable and can be made in a short amount of time (Fitsauran, 2019). Increased use in 'Holi' colours of industrial chemicals has added a risk to our lives. Due to the use of dangerous colours during the Sacred Festival, serious health concerns have been raised in recent years. The components used to make these colours are also unknown to many people (Memumbai, 2020).

Gardner and Lal (2012) revealed the use of such dyes in an unrestricted and uncontrolled manner can have serious consequences for human health and ecological balance. These colours are highly structured polymers that are difficult to biologically decompose. Gupta et al. (2019) observed the association between changes in air quality and number of hospital admission during "Holi—the festival of colours. This research found that there are fine and micro particles (i.e. (Sulphate, Nitrate, and Chloride, Sodium, Potassium, and Magnesium) that are present in air that which increased due to celebration of 'Holi' festival. These causes adverse effect on eye irritation and harmful effect skin and respiratory problems. Goswami and Majumdar (2021) explained that the synthetic color which are commonly sold in local markets, often contain hazardous chemicals like endotoxins and heavy metals like lead, which can cause moderate to severe health issues. Powders in the colours of red, pink, violet, green, and yellow were obtained. Lead and endotoxin causes serious health and environmental risks.

Consumers are the one who buy and use the products. Consumer behavior is the study of individuals and organizations and how they select and use products and services. Consumers behaviors is essential to study about consumers think and feel about different alternatives and this influenced the environment sustainability (Smith, 2016). This may effectual to study the consumer behaviour and its impact on the purchase of natural and synthetic color during the Holi festival.

**Statement of the problem:** The purpose to conduct the present study was to ascertain the awareness among the respondents about disadvantage of synthetic colours and benefits of natural colours during Holi festival celebration, to examine consumer behavior during the purchase of colours during the Holi festival and to deduce the various eco-friendly practices among the people during the Hoi Festival Celebration.

#### **OBJECTIVE OF THE STUDY**

- i. To study the awareness among people towards the natural and synthetic colours use during Holi festival
- ii. To examine consumer behavior during the purchase of colours during the Holi festival.
- iii. To deduce the eco-friendly practices among the people during the celebration of 'Holi' festival.

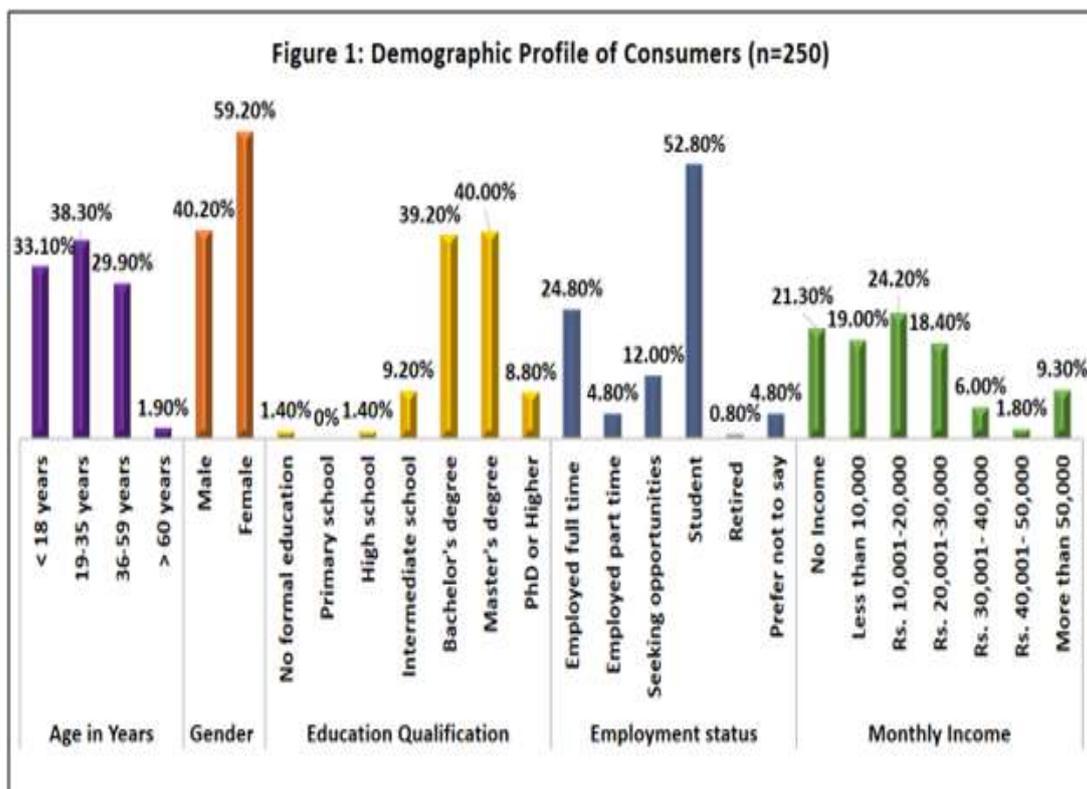
#### **METHODOLOGY**

The present study's research design was descriptive. Random purposive sampling was used to get data from 250 respondents. The tool used to collect data was Questionnaire method which was distributed via Google form link. The questionnaire included different sections, section 1 consisted the demographic profile of respondents included age, gender, occupation, education qualification and their income. Section 2 elicited to find out the extent of awareness among respondents about disadvantage of synthetic colours and benefits of natural colours. This section also includes the awareness of sources natural colours as ingredients used to make colours naturally where the response structure was "To High Extent", "To Some Extent" and "To Low Extent". Section 3 discussed about the preferences between natural and synthetic color among people. Section 4 contained the questions based on consumer behaviour during the purchase of colours during the 'Holi' festival. Section 5 was contained statements regarding eco-friendly practices among people during celebration of 'Holi' festival where the responses structure was 'Never', 'Sometime' and 'Most of the time'.

#### **FINDINGS OF THE STUDY**

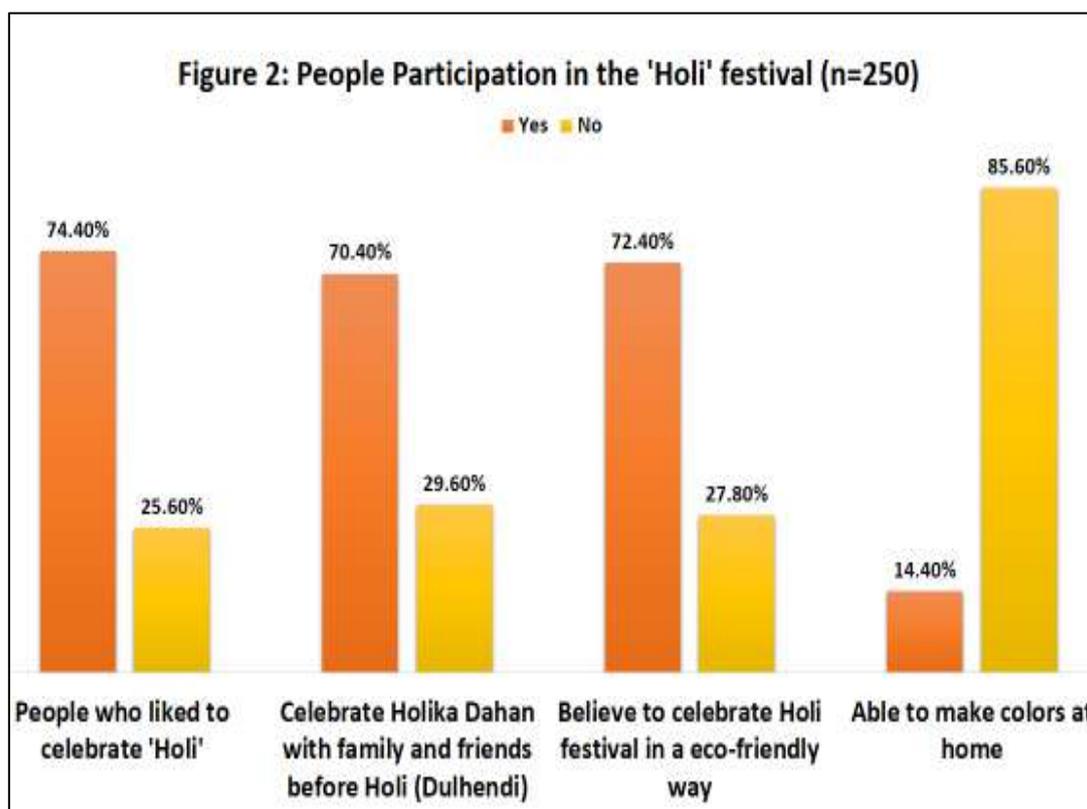
The findings of the study derived by scrutinizing data and their elucidations, which are presented here.

- i. **Demographic profile of respondents:** This section designated to determine the demographic profile of respondents. This included age, gender, occupation, education qualification and their income.



Scrutiny of the data from above figure 1 presents that less than two-fifth of the respondents (38.30%) were in the age group of 19-35 years. Slightly less than three-fifth (59.20 %) of the respondents were female. Approximately two-fifth (40.00%) of the respondents post-graduated. More than one-half of the respondents were students. More than three-fifth (61.30%) of respondents were qualified up to post graduation. Nevertheless, less than one-half (38.20%) of respondents had monthly income Rs. 10,001-20,000.

ii. **Participation of people in 'Holi' festival :** This section includes people's participation in 'Holi' festival and response structure was 'yes' and 'no'.



The figure 2 above illustrated that majority of respondents (85.60%) were not able to make colours at home to celebrate Holi due to 'lack of time and non-availability of ingredients'. Less than three-fourth of the respondents (74.40%) were liked to celebrated 'Holi' and believed to celebrate 'Holi' festival in eco-friendly way(72.40%). More than two-third (70.40%) after respondents celebrate 'Holika Dahan' with family and friends before 'Holi'. Nevertheless, more than one-tenth (14.40%) of the respondents were able to make colours at home from natural ingredients.

**iii. Awareness towards disadvantage of synthetic color and benefits of natural colours:** In this section attempt was made to find out the awareness among respondents towards disadvantages of synthetic colours and benefits of natural color during the celebration of Holi festival.

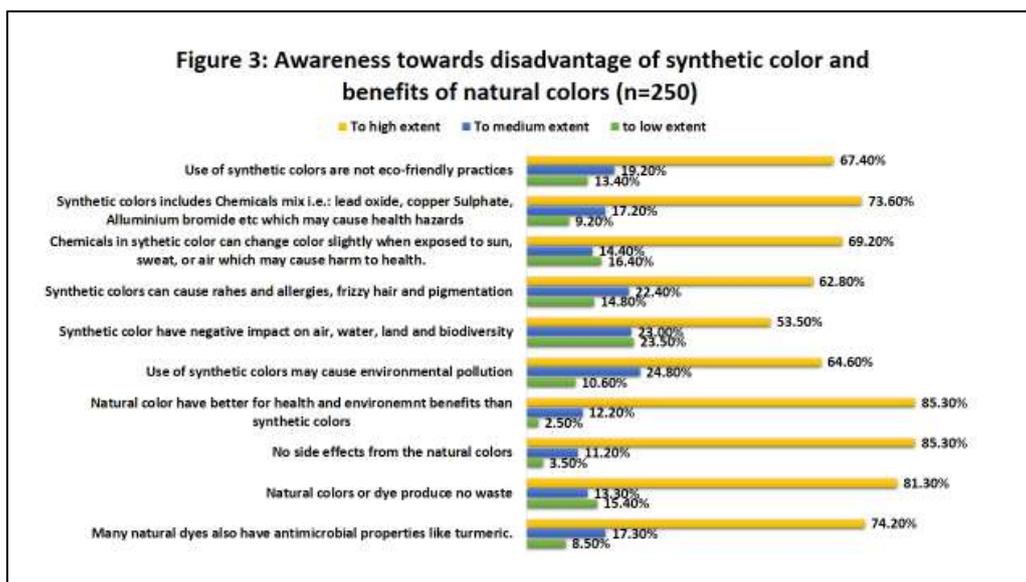
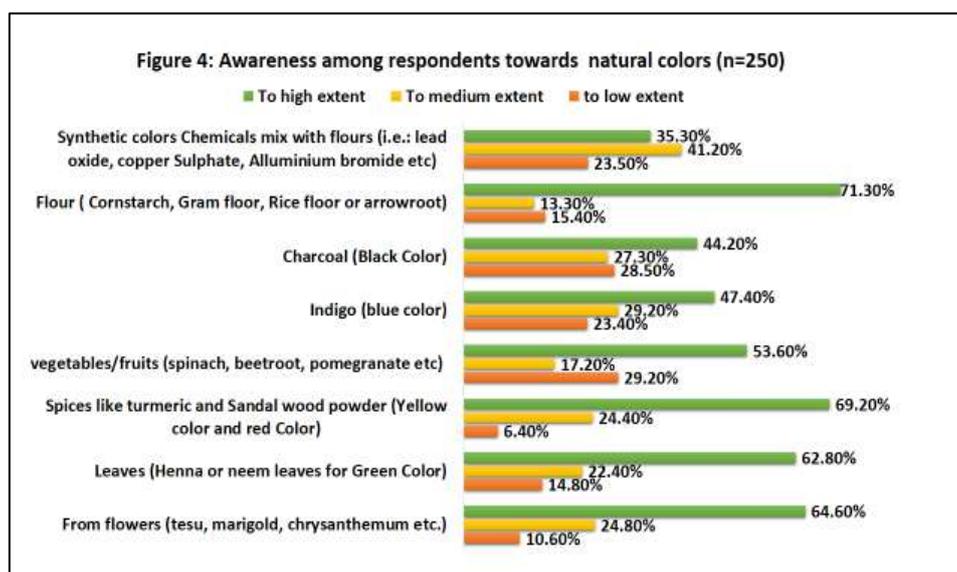


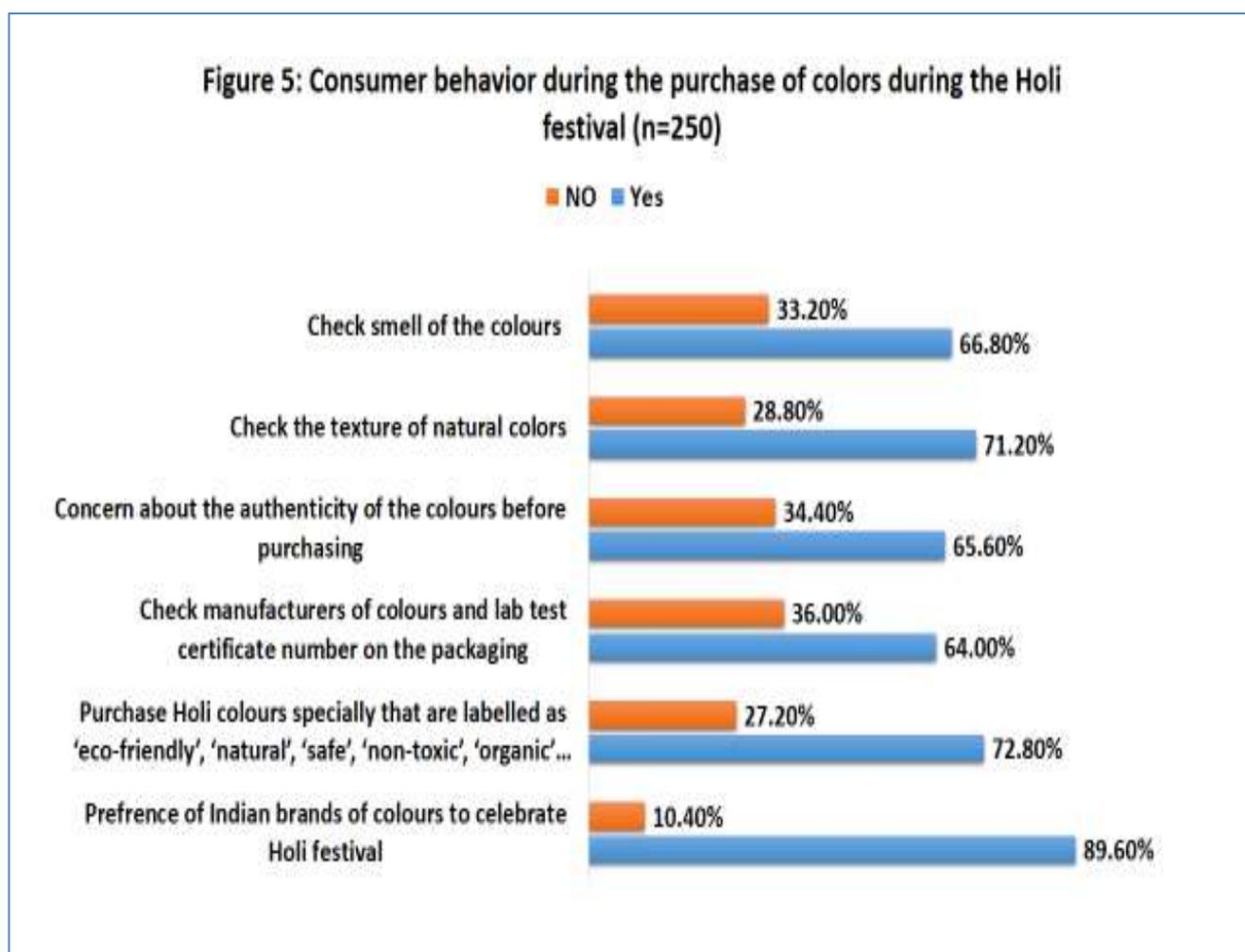
Figure 3 depicted that majority of the respondents were well aware about the respondents were well aware that natural color have better for health and environment health benefits from the synthetic colours (85.30%) and there in no side effects from natural color to celebrate Holi festival (85.30%) at high extent. Less than three-fourth (73.60%) of the respondents were well aware at high extent that synthetic colours include chemicals like lead oxide, copper Sulphate, Alluminium bromide etc which may cause health hazards. Less than one-fourth of the respondents were aware at moderate extent that use of synthetic color may cause environmental pollution (24.80%) and synthetic color have negative impact on air, water, land and biodiversity (23.50%).

**iv. Awareness among respondents towards ingredients of natural colours:** this section deals with the awareness among respondents to make colours i.e. red, blue, green, yellow , black etc. from natural sources as ingredients like flowers, leaves, fruits, vegetable etc.



The figure 4 depicted that less than one-fourth of the respondents (71.30%) were well aware about the natural colours that made from flours like cornstarch, gram floor, rice floor and arrowroot at high extent. More than two-third of the respondents (69.20%) were aware about the natural yellow and red colours can be made by spices like turmeric and sandal at high extent. Less than one third of the respondents (64.60%) were aware at high that flowers like marigold, rose, chrysanthemum etc were used to make natural color and celebrate Holi festival in a eco-friendly way. Less than one-half of the respondents (41.20%) aware at medium extent that synthetic color mix with the flours to minimize the effect of lead-oxide, copper sulphate and aluminum bromide on skin. Whereas, more than one-fourth (29.20%) of the respondents were aware at low extent about the colours that can be made up from vegetables and fruits and black charcoal (28.50%).

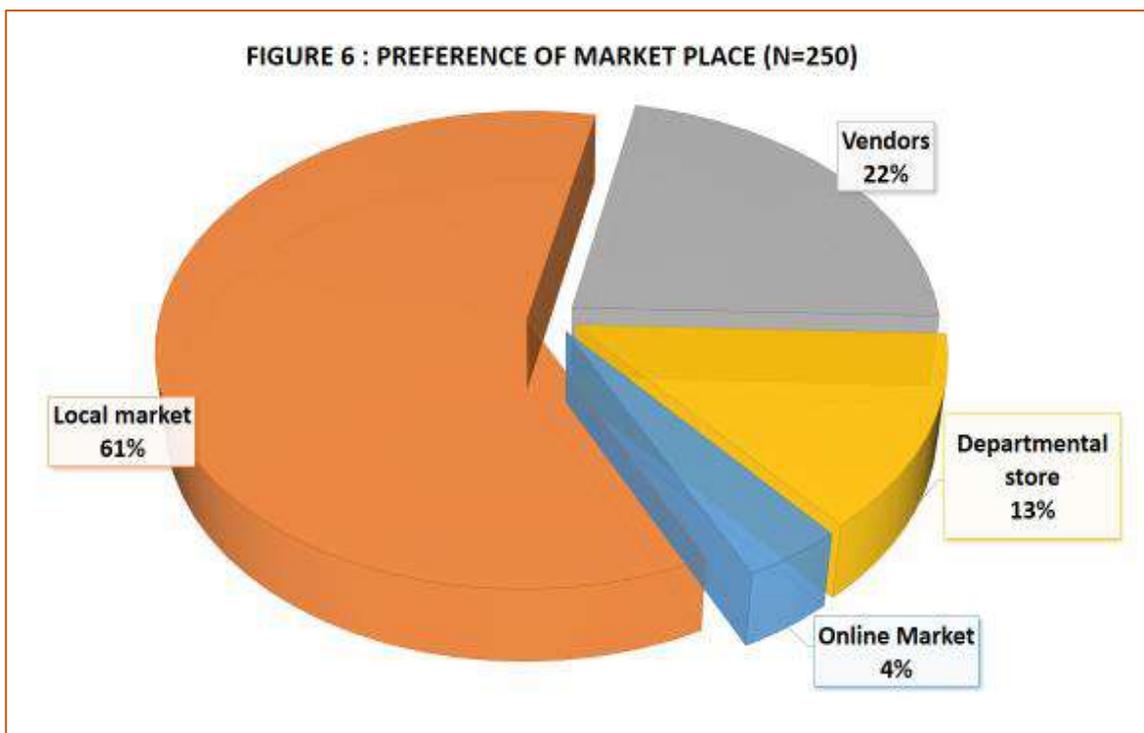
v. **Consumer behavior during the purchase of colours during the Holi festival:** This section deals with the behaviour of consumer while purchasing colours to celebrate 'Holi' festival. This comprises the actions and preferences of respondents when they purchase



Lucid examination from the figure 5 depicted that majority of the respondents (89.60%) preferred Indian brands of colours to celebrate festival of colours 'Holi'. Less than three-fourth of the respondents (72.80%) purchased Holi colours from the market-place especially that are labelled as 'eco-friendly', 'natural', 'safe', 'non-toxic', 'organic' or 'herbal' and respondents (71.20%) checked the texture of natural colours during their purchase of colours during .

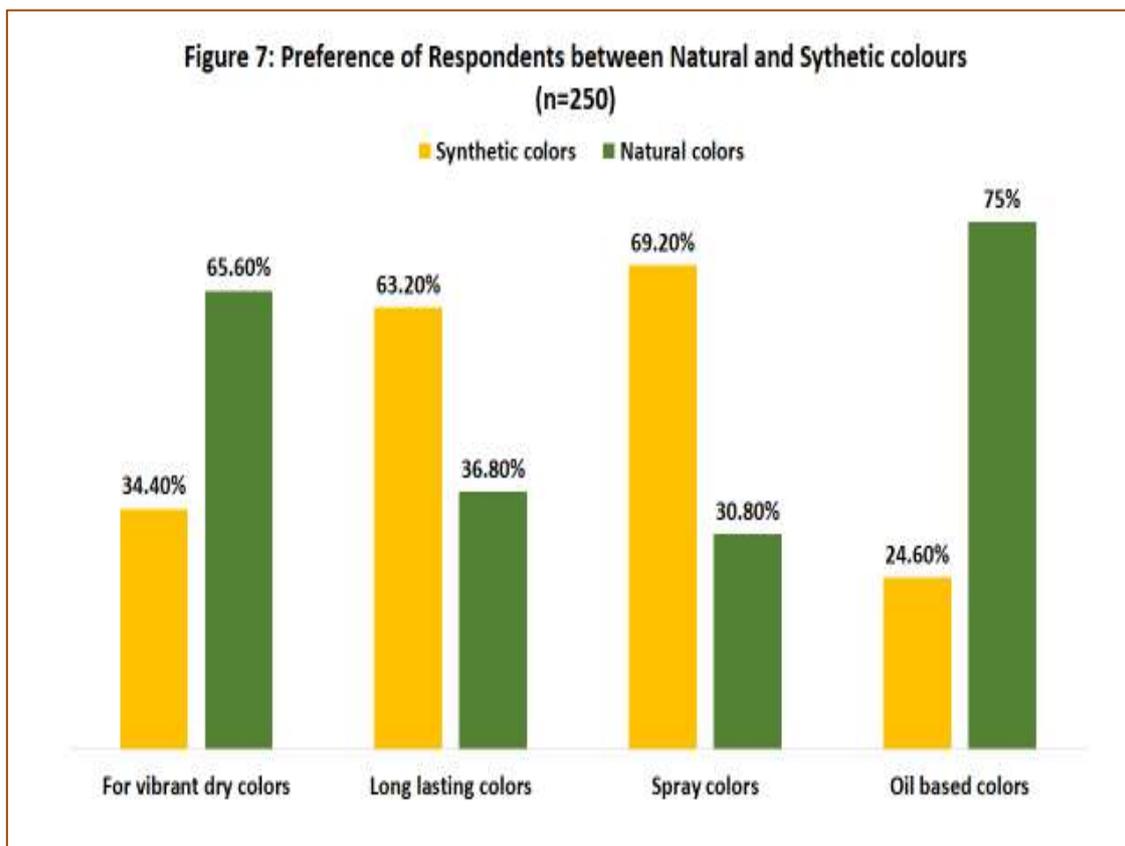
More than one-third of the respondents (36.00%) do not check the manufacturers of colours and lab test certificate number on the packaging where respondents (34.40%) do not concern about the authenticity of the colours before purchasing of colours. Moreover, about one-third of the respondents (33.20%) check the smell of colours during the purchase of colours to celebrate Holi festival.

vi. **Preference of market place to purchase colours:** this section enables to analyse the preference of marketplace to purchase the colours i.e. online market, local market, vendors and departmental store.



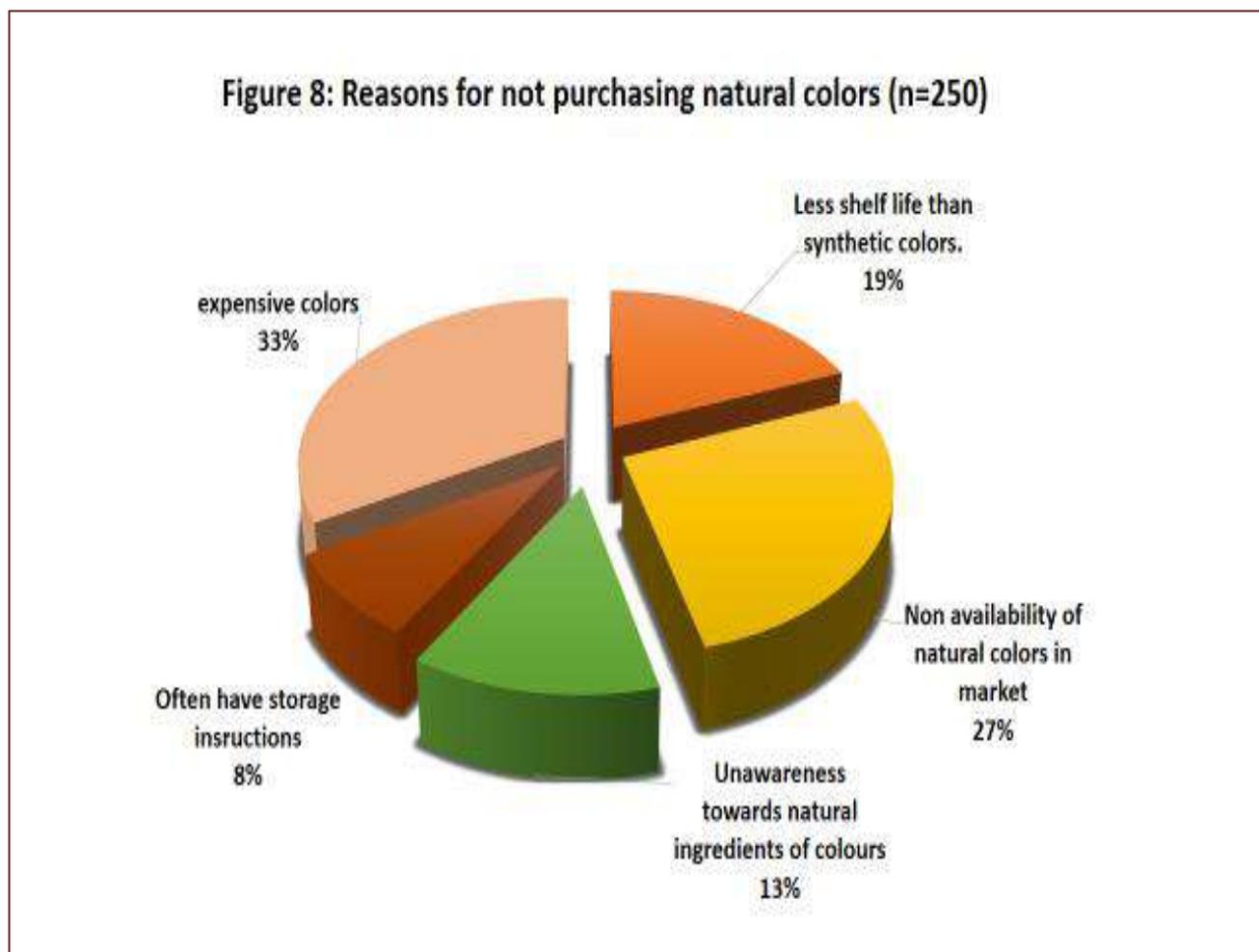
Eloquent analysis from the figure 6 showed that more than three-fifth of the respondents (61%) preferred local market to purchase the colours for celebration of Holi festival. Less than one-fourth of the respondents (22%) preferred to purchase colours from vendors. Less than one-fifth of the respondents preferred departmental store (13%) and online market (4%) to purchase colours for Holi festival celebration.

**vii. Preference between natural and synthetic colours among respondents:** In this section the analysis concerned to assess the consumer's preference between the natural and synthetic colours while purchasing the colours from market.



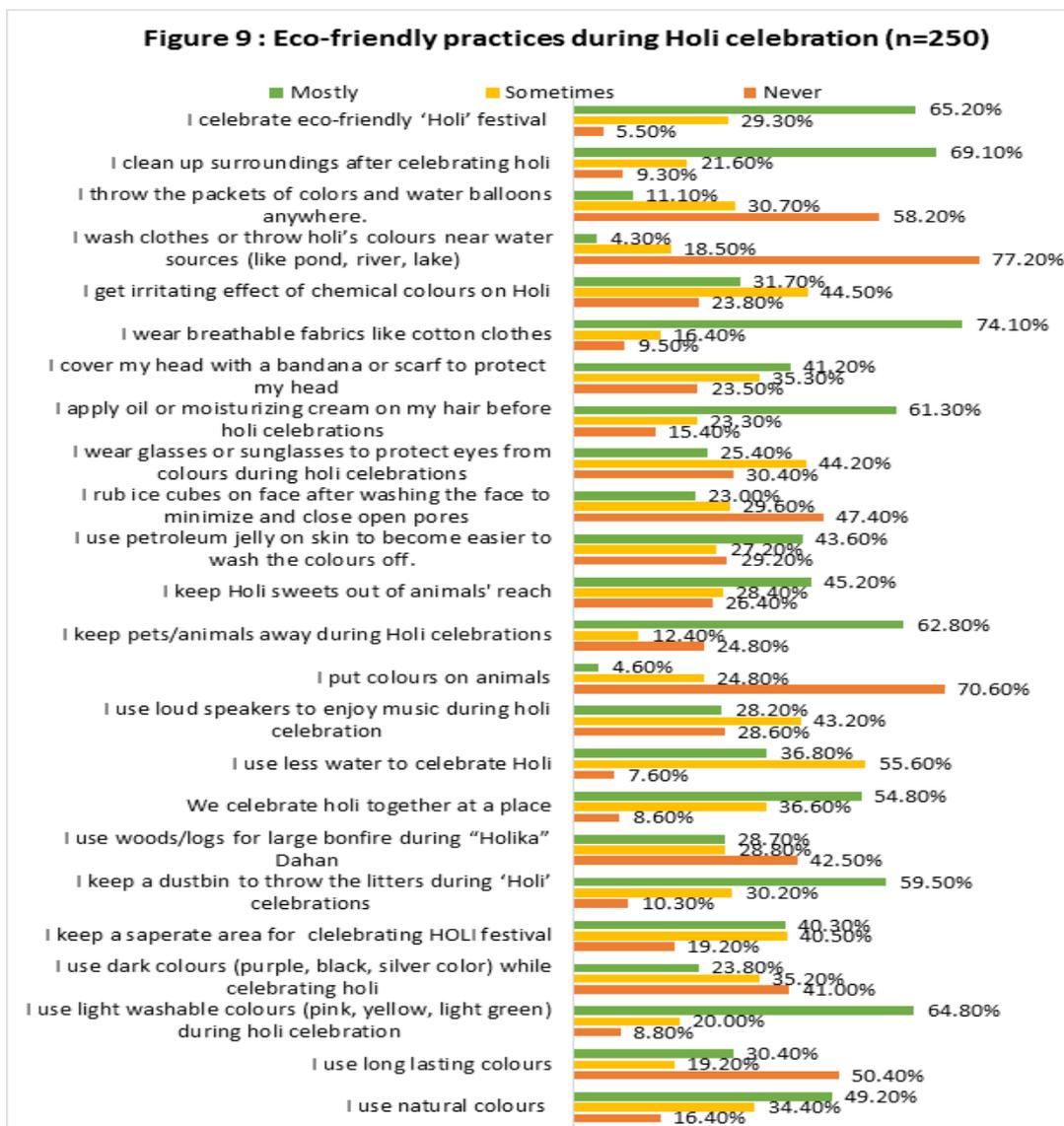
Eloquent analysis from the figure 7 represented that slightly more than three-fourth of the respondents (75.60%) preferred synthetic oil based colours for Holi festival celebrations. More than two-third of the respondents preferred synthetic spray colours (69.20%). While less than two-third of the respondents preferred vibrant dry natural colours (65.60%) during the purchase of colours to celebrate Holi festival. Around one-third (30.80%) of the respondents preferred natural spray colours due to less availability and expensive cost of the natural spray color in market. Moreover, less than one fourth of the respondent's preferred oil based synthetic colours during the purchase of Holi festival celebration.

**viii. Reasons for not purchasing natural colours everytime:** This section deals with the behavior of respondents to identify the reasons to not purchase natural colours every time.



Data from the figure 8 presented that one-third of the respondent (33%) retorted that natural colours in market are expensive therefore, it is not affordable for them to buy and celebrate festival Holi. More than one-fourth of the respondents (27%) replied that there are not availability of the natural colours in the market. Less than one-fifth of the respondents (19%) responded that there is less shelf-life of natural colours then synthetic colours. Less than one-tenth of the respondents (13%) replied that there are still unawareness among people towards the natural ingredients used to make natural colour so it is difficult to identify the nature of colours from the market. Moreover, less than one-tenth of the respondent (8%) countered that natural colours often have storage instructions so it is uneasy to store the colours for longer use after the Holi festival celebration.

**ix. Eco-friendly practices among respondents during the celebration of Holi festival:** In this section probe was made to deduce the healthy and eco-friendly practices among the respondents during the celebration of Holi. The responses ranging from 'never', 'sometimes' and 'most of the times'.



The Lucid examination of the figure 9 indicated that more than three-fourth of the respondents (77.20%) were never wash clothes and throw Holi colours near water sources like pond river Lake etc. after celebrating Holi. Less than three-fourth of the respondents (74.10%) wear wear breathable fabrics like cotton to celebrate during the celebration of Holi festival most of the time. More than one-third of the respondents were never put colours on animals (70.60%). More than two-third reported that they clean up surrounding (69.10%) after celebrating Holi. Less than one-half of the respondents sometimes (44.50%) get irritating effect of chemical colours during the Holi festival celebration.

More than one-third of the respondents (65.20) celebrate healthy and eco-friendly 'Holi' festival. Less than three-fifth of the respondents keep dustbins to throw the litters during Holi celebration most of the time. Respondents also adapt healthy practices to protect the skin from harmful synthetic colours like sometimes applying moisturizer (61.30%), wearing sun-glasses (44.20%) most of the time, cover bandana or scarf to protect head (41.20%) most of the time. Moreover, less than one-half of the respondents (49.20%) use natural colours most of the time.

### CONCLUSION AND IMPLICATIONS

Holi is the 'festival of colours'. This present study showed that respondents liked to celebrate and believed to play eco-friendly 'Holi' celebration. Respondents were well aware that natural color have better for health and environment health benefits from the synthetic colours at high extent. Respondents preferred Indian brands and purchased Holi colours from the market-place especially that are labelled as 'eco-friendly', 'natural', 'safe', 'non-toxic', 'organic' or 'herbal. Although, respondents preferred synthetic spray colours and natural colours for vibrant dry colours during the purchase of colours to celebrate Holi festival. Respondents retorted that there are not availability of the natural colours in the market and natural colours in market are expensive therefore, it

is not affordable for them to buy and celebrate festival Holi. Respondents get irritating effect of chemical colours during the Holi festival celebration and take healthy practices such as applying moisturizer and oil on skin and hair, cover eyes and head by goggles and bandana or scarfs and ice cubes on skin to have less harm on their body.

It can be concluded from the study that consumer behaviour is one of the factor which affect the health and environment during Holi celebration. Holi is the festival of color, joy and enthusiasm but harmful synthetic colours may ruin the delight of festivals by causing injurious side-effects on health and environment. The lack of availability and expensive cost of natural colours stern the consumer to buy eco-friendly colours to celebrate the Holi festival. This may be the reason for the consumers for not using natural colours every time to celebrate the festival of colours Holi.

This study may be useful to the participants of Holi festival in order for them to have a safe and healthy Holi and to create awareness among people about the colours and their natural sources i.e. gram flour (Besan), turmeric powder, henna powder etc to celebrate eco-friendly Holi. This study encourages marketers to study consumer behavior during Holi festival shopping and ensure the availability of natural colours in the market at an affordable price. The present study also sheds light on healthy and environmentally friendly practices to be followed during the Holi festival in order to protect one's health and the environment. The study would also be valuable for marketers to estimate market potential and awareness of natural colors among people. Furthermore, this study can also assist brands in capitalizing on increased purchasing behaviour observed at festivals.

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## **Role and Impact of Angel Investors in Start-Up Business towards Economic Development– A Case Study of Navi Mumbai, Post Covid**

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### **ABSTRACT**

In January, 2016, our Hon. Prime Minister Narendra Modi launched the Start Up India Mission with a goal to enhance and create more employment opportunities throughout the country. This initiative aims to not only generate employment but also enhance technological advancements and increase innovation. Start-ups have emerged as key drivers of economic growth and job creation, and are often a catalyst for radical innovation, but due to the Corona virus (COVID-19) pandemic many businesses and start-ups were negatively affected. Covid-19 has disrupted job and destabilised Indian economy. Many migrant skilled workers lost their jobs and were forced to look for self employment opportunities for survival. The economist and demographer, along with K Verghese and Khalid Khan, has made estimates of “interstate migrants who have been economically destabilised during March-April 2020. The estimated number is 22 million (the break up being 16 million internal migrants and 6 million short-duration migrants destabilised).” But not all of these have returned. “Of these, about 12 million have returned. Possibly 60% of the rest would stay back. About 4 million would still want go back before the kharif season harvesting begins, unless there is sudden spurt in urban economy in the next couple of weeks.” Somehow at the same time some industries have seen significant growth, including enterprise technology services, home entertainment, hospitals, medical equipment suppliers, e-commerce retailers, courier pick-up and delivery services, cyber security, and sanitary product manufacturing, among many others. Additionally, the pandemic has pushed commerce to online platforms which created new business opportunities and new job opportunities in spite of the bad phase in economy. In this research paper I would like to analyse the underlying problem in the system of Angel funding and also understand the impact of Angel Investors in Start-up business towards economic Development of Navi Mumbai

Keywords: Start Up India, Employment, Technology, Angel Investors

### **OBJECTIVES**

The objective of the study is

1. To analyse the underlying problem in the system of Angel funding.
2. To understand the impact of Angel Investors on Start-up business.
3. Role of Start-up Business in economic Development of Navi Mumbai.

### **METHODOLOGY**

The Qualitative Descriptive Research Methodology is used in this paper. Both Primary and Secondary data is gathered to arrive at conclusion.

1. Primary data is collected where questionnaires and surveys are carried out to interview the Navi Mumbai Start-ups owners and Angel investors.
2. Secondary data sources are published papers, newspapers, magazines, journals and information through websites.

### **3. The sample is 60.**

### **LITERATURE REVIEW**

1. -Role Angel Investors can play in Economic Development by Carrie Gonella (12<sup>th</sup> February, 2019) – Duke, FUQUA

USAID knows that entrepreneurs play a pivotal role in driving economic development, by starting businesses that contribute to the local economy, creating jobs, and developing solutions that make people’s lives better. Entrepreneurs need capital to fuel the growth that contributes to that economic development. That’s where investors come in. Investors seek a robust pipeline of investable enterprises, and impact investors are specifically looking for those that can generate both a financial and an impact return through their business growth. Unfortunately, a “pioneer gap” exists between early stage enterprises that need funding to continue to develop, and the stage at which many investors are generally comfortable investing. The Partnering to Accelerate Entrepreneurship (PACE) Initiative within USAID seeks to catalyze private sector investment in

early stage enterprises and identify innovative models that help support entrepreneurs as they bridge that pioneer gap.

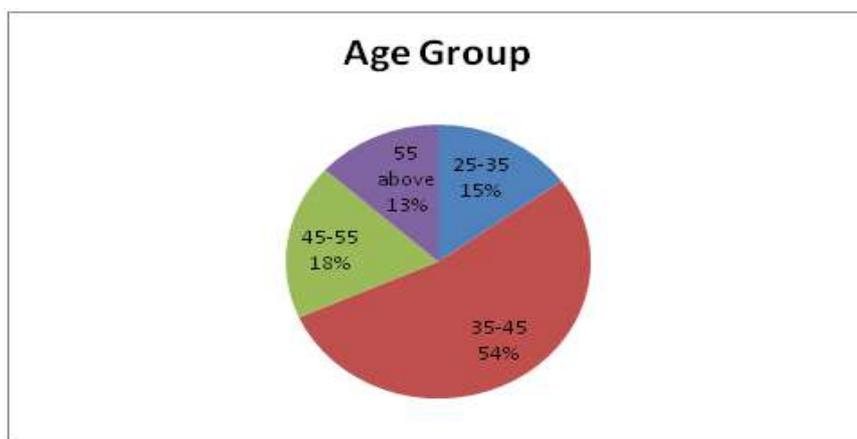
2. -- State Strategies to Promote Angel Investment for Economic Growth, Chris Hayter, Program Director, Economic Development Social, Economic, and Workforce Programs Division (February 14, 2008), NGA Centre for Best Practices

They provide early-stage financing in a space once occupied by venture capitalists, who now invest primarily in larger deals and more mature companies. Individual angels invest between \$5,000 and \$100,000 in local and regional ventures, primarily in high-technology sectors, giving their investments local impact. The benefits of supporting and encouraging angel investment can be great. Angel investors typically have investment portfolios in excess of \$250,000 in multiple companies. The local businesses in which they invest create high-skill, high-wage jobs and make important contributions to states and their communities. The presence of angel groups also reduces the relocation of successful entrepreneurs to the coasts for early-stage financing so that states realize greater economic impact from entrepreneurial start-ups. Angels have already started to organize in many states, and gubernatorial support will magnify the benefits of angel activity.

## DATA ANALYSIS AND INTERPRETATION

### 1. Age

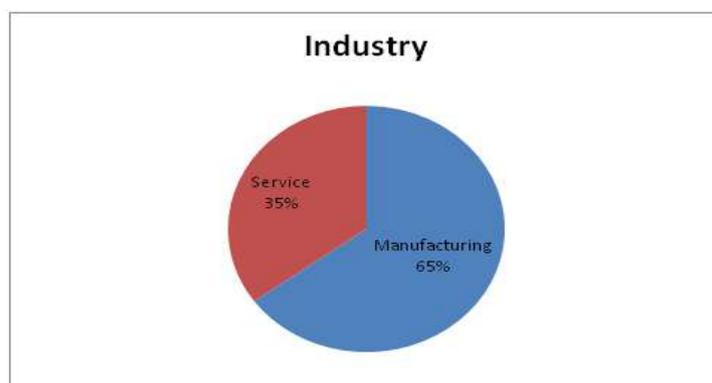
Age Group	No of Respondents
25-35	9
35-45	32
45-55	11
55 above	8



A majority of the respondents are falling under the 35-45 years age bracket.

### 2. Industry

Industry	No of Respondents
Manufacturing	39
Service	21



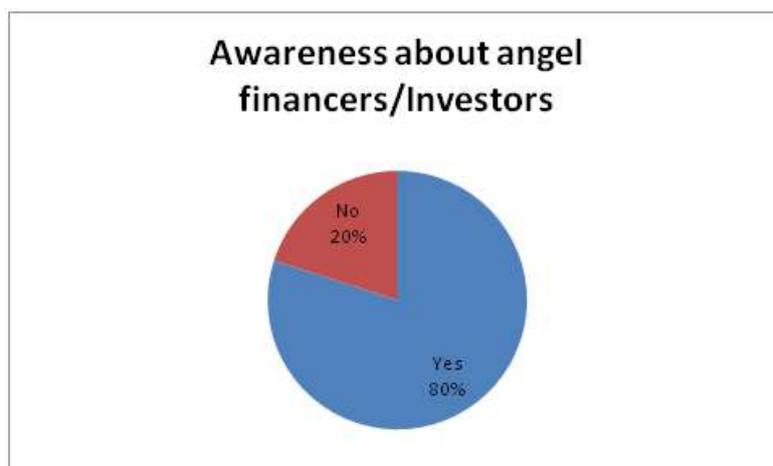
### 3. Qualification

Qualification	No of Respondents
Graduate	21
Post Graduate	20
Professionals	19



### 4. Are you aware of Angel Financers/Investors?

Awareness about angel Financers/Investors	No of Respondents
Yes	48
No	12



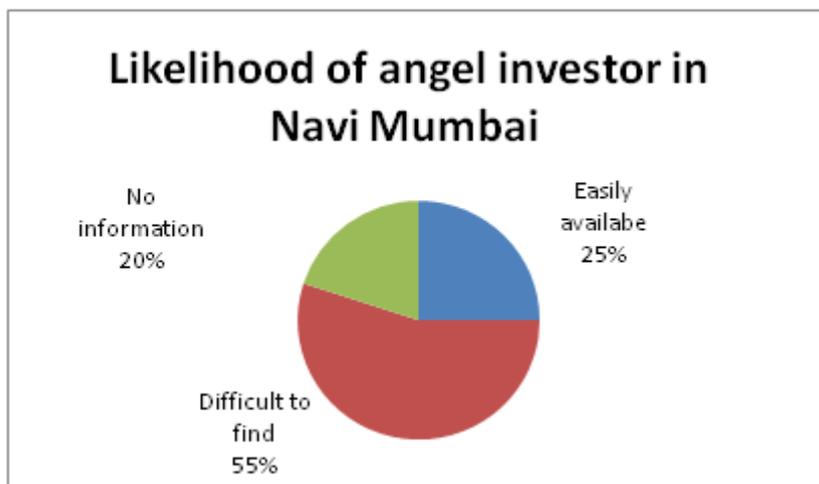
### 5. How have you financed your business?

Source of financing	No of Respondents
Personal Funds	42
Bank Financing	12
Informal channels	6

70% respondents say that they have used their personal contacts for finances. 20% respondents say that they have borrowed money from banks and financial institutions and 10% respondents say that they have used informal lending channels (borrowing from friends and family). This also highlights that because of the unavailability of information and common platform where both parties can interact, majority of owners are using their own finances.

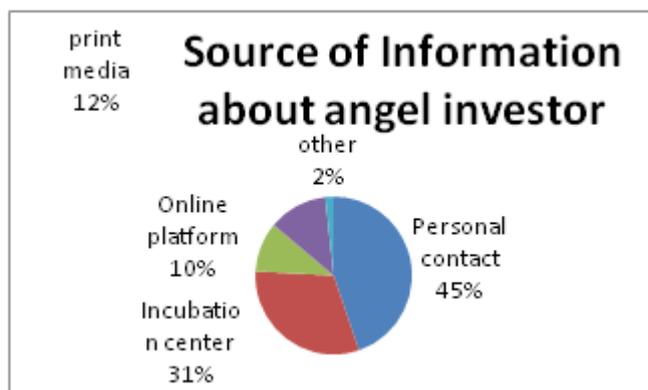
### 6. What is the likelihood of getting an Angel Investor in Navi Mumbai?

Likelihood of angel investor in Navi Mumbai	No of Respondents
Easily available	15
Difficult to find	33
No information	12



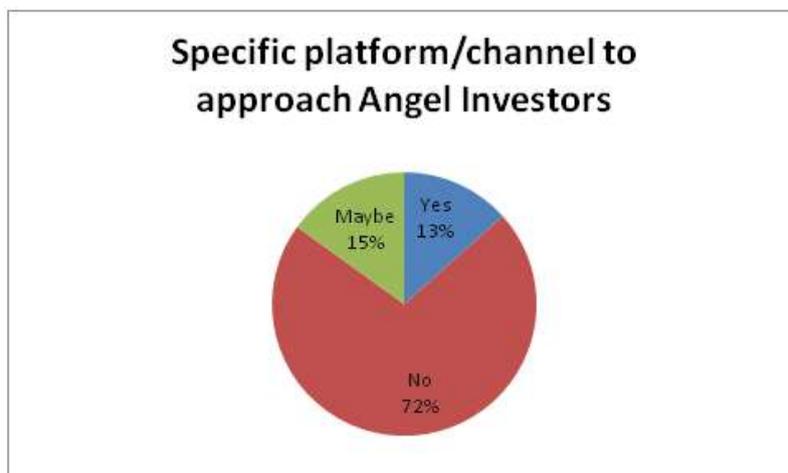
**7. What is the best source of information about Angel Investors in Navi Mumbai?**

Source of Information about angel investor	No of Respondents
Personal contact	26
Incubation centre	18
Online platform	6
print media	7
other	1



**8. Is there a specific platform/channel through which you can approach Angel Investors?**

specific platform/channel to approach Angel Investors	No of Respondents
Yes	8
No	43
Maybe	9



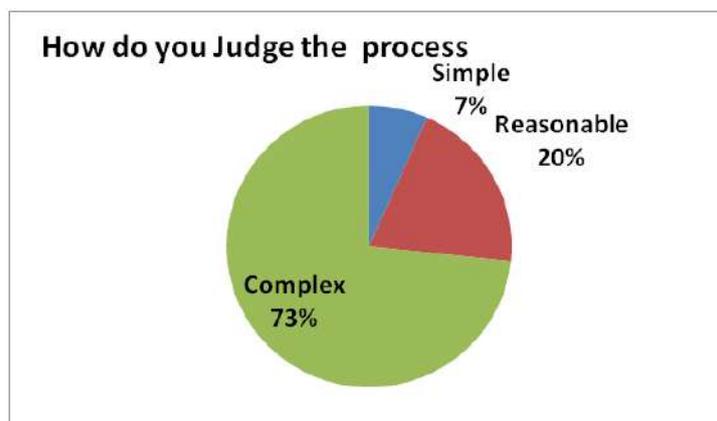
60% of respondents say that there is no common platform to find information about angel investors.

**9. What is the rough time span between meeting an Angel investor and actually receiving the seed money?**

It depends on various factors and the amount being raised. From pitching the idea to getting a term sheet might take somewhere from 2-4 weeks and since the investors buy convertible preferred stocks it requires more time to frame in legal documents thus all in all the process can vary from 4-10 weeks.

**10. How do you judge the process?**

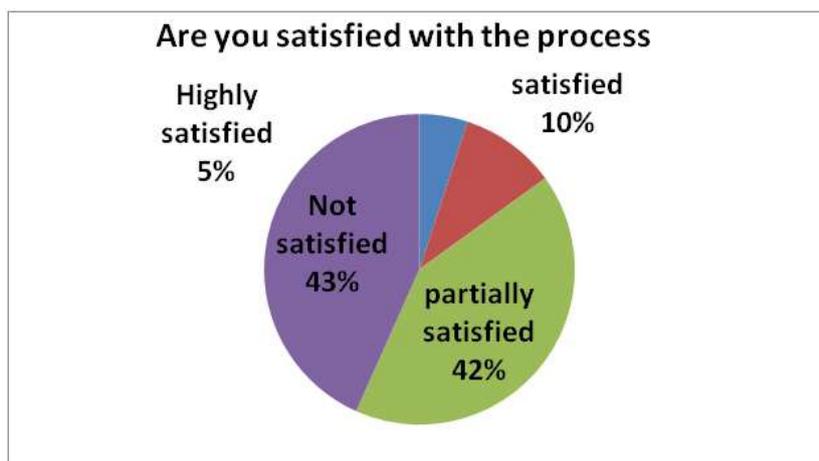
How do you Judge the process	No of Respondents
Simple	6
Reasonable	30
Complex	24



73% respondents feel that the process of funding is complex.

**11. Are you satisfied with the process?**

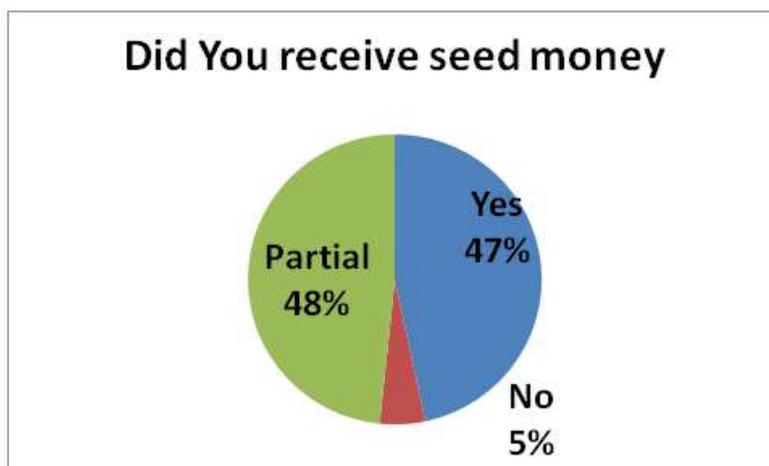
Are you satisfied with the process	No of Respondents
Highly satisfied	3
satisfied	6
partially satisfied	25
Not satisfied	26



75% of respondents are dissatisfied.

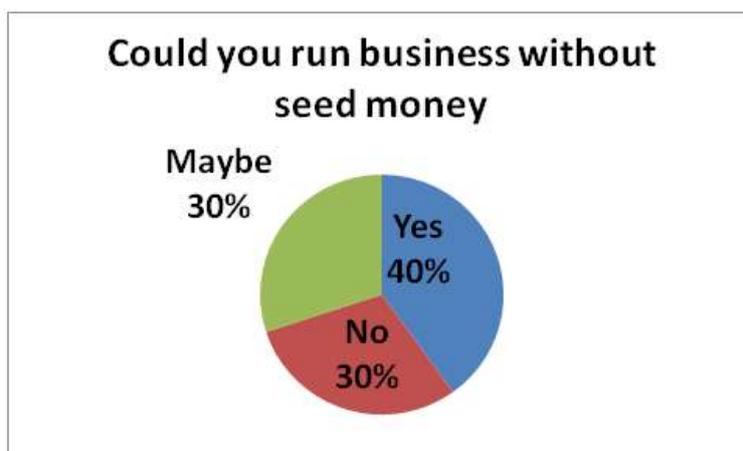
**12. Did You receive seed money?**

Did You receive money	No of Respondents
Yes	28
No	3
Partial	29



**13. Could you run your business without the seed money?**

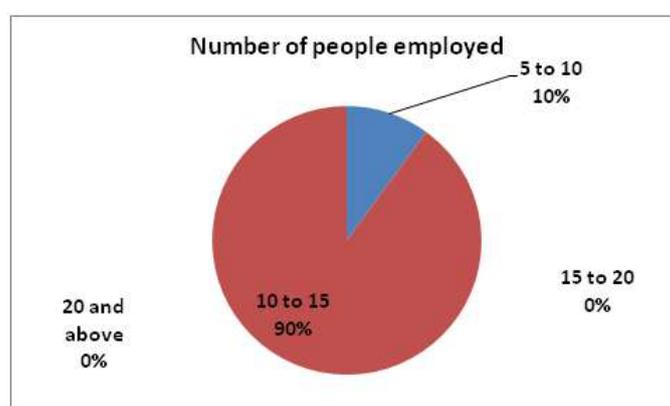
Could you run business without seed money	No of Respondents
Yes	24
No	18
Maybe	18



40% respondents said that they could not run their business without seed money and 30% respondents said that had they received financial assistance they could change the scale of production.

**14. How many people do you employ?**

Number of people employed	No of Respondents
5 to 10	6
10 to 15	54
15 to 20	0
20 and above	0



90% of our respondents employ 10 people or less.

On an overall basis, most people that have start-ups are well-educated and between 30-40 years of age. They are well educated and their start-ups are largely in the service sector.

The respondents are well aware of Angel Investors but they feel that these investors are not easily accessible. The best sources of information about the same are online platforms and the second best sources are personal contacts and networks. There is no unified platform where entrepreneurs can find information about seed money and/or investors. .

### CONCLUSION

Angel Investors are individuals with high economic resources, great personal expertise and knowledge. From our conversations with Angel Investors and as per the conclusion of the survey, we understand that because they provide seed money, Angel Investors have a vested interest in success of the enterprise. This prompts an inevitable sharing of knowledge, skills, technical expertise. They can provide much needed boost to start-ups without exerting pressure on state/government resources while giving start-ups the benefit of their experience and guidance.

Because most of these start-ups are SMEs, the involvement of Angel Investors inevitably boosts the local economy and trade by providing employment to locally available skilled and semi-skilled workers thus enhancing the growth of the region.

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## New Business Models in the Era of Digital Technology Post Covid

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### ABSTRACT

In this present era of digital revolution there is a tremendous growth post covid, the user base of the online tools has increased. There is tremendous growth of online companies like Swiggy, Zomato, flipkart, Amazon etc., the market share of the online companies has increased tremendously.

The new online companies have evolved with the models of B2C, B2B, C2C etc., with the aim satisfying the customers with processes like mass production and customization, this paper focusses on the models and the websites available with new processes.

**Keywords** Mass production, Customization, Mass Customization, Online Models and Processes, B2B, B2C, C2C, G2C.

### INTRODUCTION

**Mass production** (also called flow production, repetitive flow production, series production, or serial production) is production of large number of standardized products, including in particular on the assembly line. In different way of production goods and delivery services simultaneously with manufacturing machine is mass production. Mass production involves multiple assembly lines, where various people run routine procedures and do one specific job. The same equipment is used to perform the identical operation on a batch of products being manufactured. For the efficiency of the labor process, companies use differentiation, formalization, and specialization. The rationale behind such principles is to keep low by using repetitive and standardized processes to produce uniform products. The evolution and innovation of sophisticated technologies play a great role in making manufacturing less complicated. The large-scale demand for mass-produced products manufactured at a low cost using a minimal workforce is achieved using precision machining equipment.

**Mass Customization** is an idea of bring mass production economics to further more value in customers satisfactory than before with just deliver one unit which is unique. David J. Gardner's declare that he been helping manufactures implement mass customization since the early 1980s before Stanly Davis bestselling book in 1987 written about mass customization more in high-level business strategy for implementing mass customization to a manufacturing company. Mass Customization have become standard now in the 21st century. Let's have some quick view for the evolution of the different business paradigms over the time. Mass Customization term was become well-known since Joseph Pine published his book "Market of One- Creating Customer Unique Value through Mass Customization". In this book he defined Mass Customization as "producing, developing, marketing and delivering affordable low cost and high quality of goods and services that give customer nearly what they want." In other words, the goal is provide end product that meet exactly what they want. In Mass Customization business paradigms it must be dynamic or flexible enough to provide customer to design needed products themselves. Thus, it must be quick responsiveness to what customer needs, quantity supply, time of deliver and etc., In order to provide customer satisfaction the pricing cost and quality of products are important to be improved. In this 21st century the most popular industry that success implements the Mass Customization and made a great benefit providing economic price to customer is Dell. Dell has become the world leader for PC markets in direct sales via Internet. In the way Dell site sell its computer is simply using the concept 'build-to-order' which other words are for mass customization. They provide an arrangement of products and explain clearly to their customer what options the customer can select by their individual needs. The excellent job that Dell has done is build the on demand customize end product after customer proceed the order at their site and ship to customer less than 24hour. This is how Dell success in their business strategy by organized easy customized product across the enterprise and become the extended enterprise that the whole world known. Even though there are many companies in different kind of industry was success implementing the Mass Customization but there is also many of them fail. In the case study of business and economic research team with the title "Failure of the Automobile Industry in Mass Customization Practices" they mention that Mass Customization is not feasible for all companies or industries. Thus, in order for a company to success in implement Mass Customization strategy they need some key success factor require of strategy. This will further discuss later chapter in the subject "Key Success Factor".

### **Mass Customization vs. Mass Production**

**Mass customization** involves providing end-users with what suits their needs at a lower cost. Thus, products that meaningfully meet customer's needs are customized on a large scale. The conventional firms that deal with mass customization call for flexibility, responsiveness, and the configuration of units, processes, people, and environments to provide uniquely customized products that meet user requirements at a relatively low cost.

Mass customization focuses on markets with fragmented customer segments and with customer's preferences being harder to hypothesize and prone to changes. More intimate knowledge about end-users and higher profits creates a feedback loop system, which can help companies provide even better and different products.

In contrast, **mass production** is the forerunner of mass customization. Mass production companies replicate a hierarchical and bureaucratic system where workers perform repetitive roles that are narrowly defined, resulting in standardized, low-cost products. Consumers generally accept standard products under a mass-production system. On a mass basis, companies manufacturing goods benefit from economies of scale since it facilitates market expansion and price reduction. The low product pricing encourages demand clusters around homogenous products. It acts as a feedback loop that reinforces standardized products to the manufacturing firms, given the interplay between consumers and producers. However, the two concepts are viewed to be on a continuum of continuous improvement. A company may also practice mass customization and mass production, albeit in two different factories meant for different market segments.

### **The Need for Research**

Finally, there is an urgent need for more and better research both to improve the models and the process available, there are online traditional models like B2B, B2C, C2C, G2C etc., and they follow a process depending on their business and the models they adopt. The research focusses on

3. How can the processes of the models can be improved? At present, are there any new processes existing apart from the traditional processes followed by the existing B2C, B2B and other models. The use of online tools provides one promising example of the type of improvement that could yield substantial benefits, and there are doubtless other possibilities.
4. Better understanding of those processes and models could help industry increase the lasting value of while providing a stronger business base. Such understanding would also reduce the risk of inadvertently eliminating unnecessary processes and cheaper ways of preparing products of immediate value to economic growth.

The importance of this last point can scarcely be overestimated. Without reliable measures of processes, competition for businesses can do little to improve the quality of products, since users have no way of knowing which product is offered with best quality. Undertaking the reforms could do a lot to improve the quality of the products -- as well as increase levels of attainment. With more research and experimentation, other useful ideas will doubtless continue to appear.

### **OBJECTIVES OF THE STUDY**

**Following objectives were focused during the study:**

- ❖ To evaluate the various online business models
- ❖ To examine the processes of these models
- ❖ To examine the new process and the models available

### **RESEARCH METHODOLOGY**

Research demands investigation of problems in a scientific way to find out some workable solutions. The main purpose of this study was to analyze the existing models and their processes and the new models and the processes. The nature of study was descriptive the data is collected using secondary sources mainly internet.

### **3 Most Common Online Business Models**

Internet is everything in people's everyday lives, it offers everyone the chance to become a small business owner with more ease and less capital investment than ever before. For example, if your friends all tell you that you make the most amazing spaghetti sauce and that you should turn it into a business, you can start right away by building an online presence for your business and its products, before you've even actually produced one jar of sauce. After decide to create your business online. What online business model is the best for your internet business? While you might decide that it's best to make a product, such as your winning spaghetti sauce, this is

one option, though certainly not the only one. Take time to consider the best internet business model for your new idea and will dramatically increase your odds of success.

### **Which online business**

There are three basic business models for online businesses, and you can choose the one that best fits your vision. Those are

1. Selling products online.
2. Sell a service.
3. Sell a digital information product.

### **Selling physical products online**

This is often the first model that comes to mind for many people. Create a shippable, physical product and market it online. It could be sold via your own e-commerce storefront, an auction site, or you can sell your products on a third-party site, like Amazon.com. Customers get to see all of your options including things like customer reviews, ingredient lists, and related recipes or uses. Videos and photos of your product in use and FAQ sections can give customers more information than they would ever have in a brick and mortar store.

Finally, as more and more consumers are switching their buying habits to online, you'll be able to reach more people and increase sales from an online presence.

### **Selling Services Online**

Services are ideally suited for online sales. There are two basic ways services are sold online. Many offline businesses use their website as a sales tool for services delivered in person. Their site serves as more of a company brochure than a storefront. A carpenter, dentist or massage therapist all through their online presence. The one thing they have in common is that you physically receive all of these services. This is a great method for generating and qualifying leads for a service-based business. Choose to provide services that are sold (and delivered) online: Examples of these services include web marketing, travel, and entertainment. All of these items are sold and delivered via the vendor's computer. Customers can get instant gratification by completing their purchase directly online rather than having to wait to speak with someone or make an appointment. Well-built sites with lots of content will outperform weaker competitors every time. Regardless of whether you use a brochure or storefront platform, this business model is faster and easier to set up than one selling physical goods.

### **Selling Information Products Online**

Making money online by selling information products is the business model of choice for lifestyle entrepreneurs and internet marketers. When you sell products or services a bottleneck often develops. Business owners frequently hit a level of sales that they can't grow beyond without changing their business - hiring more staff, buying more equipment, etc.

With information products, you don't have the hassles of traditional businesses like overhead, inventory, employees, being confined to a single location, etc.

Products are almost exclusively delivered electronically and automatically. Payments and invoicing are automatically handled by your shopping cart and payment gateway. You can process one order per day just as easily as one thousand transactions.

Basically, you create the product once then only have to focus on marketing and driving website traffic. Every other part of the business is completely automated.

Information product sales can be broken into two categories.

1. **Downloadable Material:** The most common downloadable material is an ebook. They range in price anywhere from \$3.99 to \$49.00 and up (\$3.99 is a common price for an ebook on Amazon while an ebook sold directly on your website that covers a very specialized topic could sell for a much higher price point). Other downloadable material can include audio (MP3), video (MP4) and worksheets. The higher priced courses often include a combination of pdf and audio/video files. Because these products are delivered digitally and there are no costs involved you get very high-profit margins on these types of products.
2. **Membership Sites:** These range from online access to newspapers/magazine to full-blown training sites with video, audio, and interactive forums all behind a membership gateway. These often bill monthly or annual membership fees. Sometimes they are set to automatically deliver a set amount of content to each new

member - like course lessons - over a set period of time. The goal of this “drip” method is to avoid overwhelming new subscribers with too much content and to keep them paying for a longer period of time. Having a membership site where members are charged monthly is a good way to get stable, recurring revenue into your online business.

The above mentioned models may again fall under B2B, B2C, C2C category or model, there are many online busines which are into these businesses those are

1. cleartrip.com
2. flipkart. Com
3. amazon.com
4. pepperfry.com
5. urbancomany.com
6. Swiggy.com
7. zomato.com

But most of the companies are not customizing their products they are into mass prodcuton, there is every at this hour the products have to customized, the following seciton discusses about customization and the websites avaiable in that area.

### Creating customization value

To create a sustainable, scaled offering, the value of customization must go beyond the novelty effect and have a functional or aesthetic purpose—usually based on preferences dictated by biology (for example, body shape, DNA, and dietary requirements) or taste (for instance, in design or food). Mass customization has configured and individual ized applications across industries, including apparel and health care (Exhibit 1). Before launching customized products, execu tives must understand what customers want to individualize and what components they want to configure (such as the type of fabric, the shape of a collar, or the thread attaching buttons) and, consequently, which options should be offered and how they should be priced. What used to entail a costly conjoint analysis to define the solution space can now be done much more easily with the help of new technologies, many of which also make the transactions required for creating customization value smoother, swifter, and less expensive.

**Exhibit 1** Customization is possible in many industries.

**Industry** **Example of configured customization** **Example of individualized customization**

<b>Apparel</b>	Sports shoes with the option of choosing different colors for different elements	Suits/shirts fit to body measurements or scans
<b>Food</b>	Frozen yogurt with custom topping choices	Personalized food and vitamins based on nutritional needs
<b>Consumer electronics</b>	Laptop with choice of color, size of hard drive, and keyboard language	Individualized colors and graphics
<b>Automotive</b>	Vehicle with choice for colors, seats, accessories, and so on	Individualized colors, artwork, and body shapes
<b>Health care</b>	Drug combinations customized for the patient	DNA-based personalized medicine

**There are** various onlien companies which are into each of these areas mentioned above for example in the area of sports **nike.com**, in the areas of suits/shirts there is website **mynttra.com**, in the area of lattops **dell.com**, in the area of automotive **jaguar.com** etc., in every other areas there are many websites which are into customization.

But the amount of customization these companies are doing are very limited the coming section focusses on large scale mass customization by using the company cypress.com

### **Mass cusotmization in cimpres**

Mass customization means producing small orders of custom products that have the reliability, quality and affordability of mass produced goods.

Mass customization empowers individuals and businesses to design, decorate, personalize and customize their own products and buy those products affordably, in small quantities – often just one at a time.

Mass customization can create value in many ways, including faster speed, more personal relevance, elimination of obsolete stock inherent in high minimum-order quantities, more product choice, lower cost, higher quality and less environmental impact than traditional production methods.

### **WHO BENEFITS FROM MASS CUSTOMIZATION?**

In an era where self-expression matters, mass customization enables you to create goods that serve as an extension of yourself and your business or organization. Whether you're a cafe owner looking for attractive apparel for your team, a consultant looking for marketing materials to start a new venture, a graphic designer seeking short-run packaging for demanding customers, or an individual who simply wants to memorialize an important personal event – mass customization makes it possible to express your individuality in a tangible way.

And because everyone should have the opportunity to express their individuality, we are passionate about bringing mass customization to everyone. We constantly deploy new software and production technology so that businesses and individuals around the world can customize impactful, meaningful products that truly reflect who they are and what they aspire to be.

### **MASS CUSTOMIZATION THEORY IN MORE DEPTH**

Traditional mass production techniques require significant fixed costs and produce considerable waste in the form of setup processes and obsolete inventory that make low-volume, custom-made products expensive and inconvenient to purchase. In contrast, mass customization empowers customers to customize in small individual quantities.

Thanks to sophisticated software and carefully architected configuration options, companies that master mass customization can automatically direct high volumes of orders into homogeneous order flows and specialized production lines. If done with structured data flows and the digitization of the manufacturing process, setup costs become very small, waste is radically reduced, and small-quantity individual orders become economically feasible.

Mass customization delivers breakthrough customer value especially well in markets in which uniqueness defines the worth of a physical product. For instance, a sign that mirrors those used by other companies has little value; the business owner loses the ability to convey uniqueness. Likewise, a photo mug is more relevant if it shows pictures of someone's own friends and family. Before mass customization, it simply was not economical to produce customized products in low quantities, so most customers did without or paid accordingly.

**Exhibit 2**

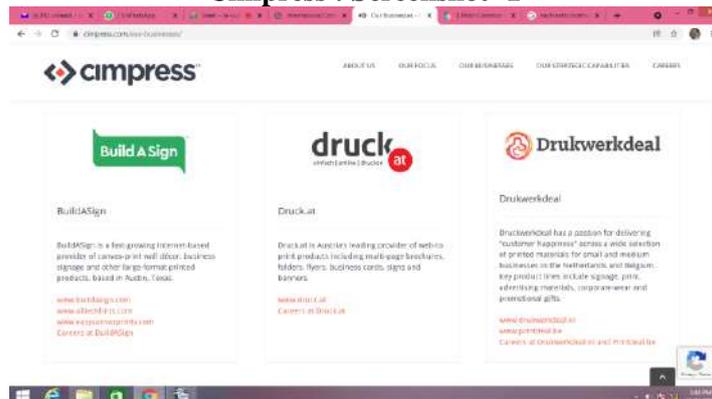


### Models at Cimpres

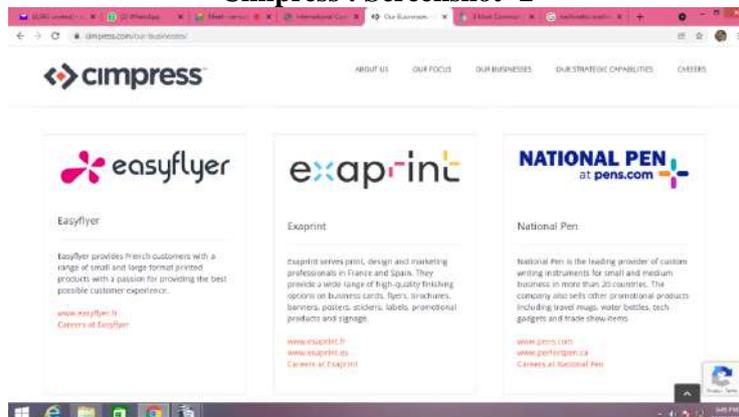
The mass customization is achieved by dell, nike and other companies by satisfying the customers as per the requirement by changing the design only to some extent, in our study cimpres.com has been chosen to understand the model and the process that has been adopted to customize the products required by the customers at a larger scale. The following section shows the screenshots of the various websites of cimpres at various areas so that the customization is done at a higher level than the other online businesses which are doing businesses only when they have the traditional businesses.

But in Cimpres.com the mass customization to all products irrespective of the existence of the physical businesses. Many interlinked websites have been started so that the customization is done through synergy among the cooperation between the websites.

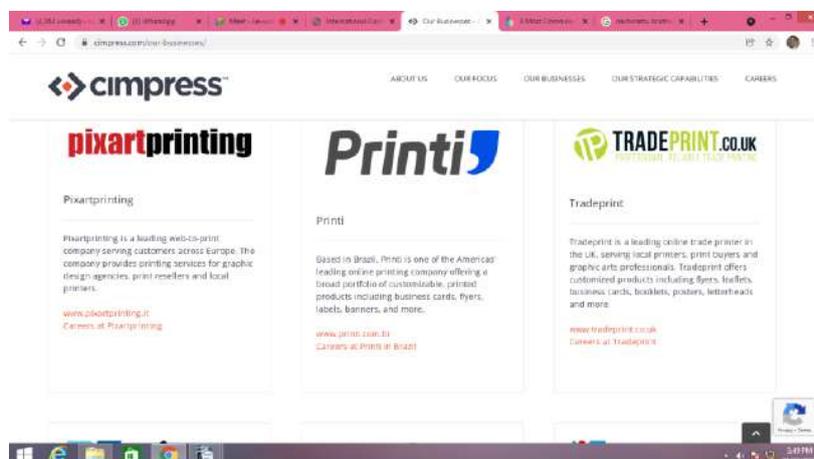
Cimpres : Screenshot -1



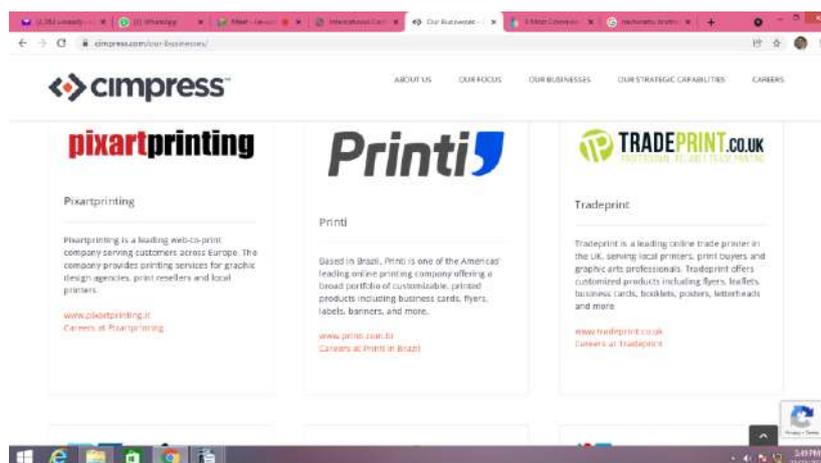
Cimpres : Screenshot -2



Cimpres : Screenshot -3



Cimpres : Screenshot -4



### **MASS CUSTOMIZATION PLATFORM (MCP)**

We are building and deploying an increasing number of modular, multi-tenant micro-services and technologies as a mass customization platform shared by all our businesses – and accessible to many of our business’ suppliers. The MCP micro-services act as building blocks to help Cimpres businesses fulfill the needs of their customers and buy and sell to and from each other. Each building block performs unique functions, yet conforms to a strict set of interface standards to ensure they are compatible and interoperable. Each individual building block has different capabilities, and can be used or arranged in a variety of different ways. Cimpres businesses have the freedom to use these services in creating the best solutions for their customers.

What do MCP services actually do? While we don’t publicly list every software service in our platform, the following are a few examples. One set of micro-service makes it possible to leverage our logistics network – a wealth of solutions from globally negotiated shipping rates to automated carrier selection. Another group of micro-services support the design of custom embroidery or laser engraving. And yet another set allows Cimpres businesses to transact with each other for wholesale order fulfillment. MCP does a lot more than this already, and we are adding more capabilities every year.

You could call our vision for MCP a micro-service buffet for Cimpres businesses: they can leverage any pre-configured combination or assemble any custom combination they need, making it easier and faster to introduce new products or improve user experience, scalability, quality, delivery, speed and customer satisfaction.

### **GLOBAL PROCUREMENT**

Given the scale of purchasing that happens across Cimpres’ businesses, there is significant value to coordinating our negotiations and purchasing to gain the benefit of scale. We negotiate and manage Cimpres-wide contracts for large-scale capital equipment, shipping services and major categories of raw materials (e.g. paper, plates, ink, etc.). If you are a supplier of these products, you can reach our global procurement team through contact page.

Please note that our global procurement team works only on the major categories of purchasing described above. For many categories of procurement, and for all sub-contracting of production, potential suppliers need to contact and work with each one of the decentralized Cimpres businesses

### **LONG-TERM CAPITAL**

Cimpres invests for the long term, providing stable capital to our businesses. We protect our business from the short-termism that is common with many venture capital, private equity and public shareholders. This enables our teams to focus on creating great customer value, strongly competitive capabilities and rewarding work environments. Entrepreneurial founders, leaders and team members who join the Cimpres team appreciate that this long-term perspective empowers them to build a legacy that makes a difference.

### **TECHNOLOGY FRAMEWORKS, ARCHITECTURE AND SHARED MICRO-SERVICES**

While each business is free to develop its own technology to cater to specific customer needs, our businesses are often tackling similar technology challenges. So Cimpres is developing technology frameworks, architecture and a suite of shared micro-services to help our businesses effectively deliver customer value while improving returns on invested capital. Our shared technology is developed in deep consultation with our businesses, modular and optional (Cimpres businesses choose only the pieces they want).

## CONCLUSION

There is every need for the companies to shift to mass customization at a very large scale this is possible only when the companies are built in the lines of cimpres and other online companies which have the same model. Now a days customization is done only to some extent but in order to survive the companies has to expand, post covid there is a tremendous growth in the online businesses, the companies has to take advantage of the scenario.

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## **A Study on Significance of Artificial Intelligence as a Tool for Sustainability of Brand in the Era of Digitization - with Special Reference to 'Amul'**

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### **ABSTRACT**

With the advent of covid pandemic the global scenario has changed drastically and there is a paradigm shift in almost all the sectors across the world. Marketing which plays a pivotal role cannot be eliminated and marketers need to think beyond traditional approach for their brand positioning.

Cloud computing and mobile applications, for example, have emerged as global catalysts for rapid economic growth and citizen empowerment and digital marketing is one amongst them, it refers to promoting products through digital channels such as search engines, websites, social media, email, and mobile apps. Using these online media channels, digital marketing is the method by which companies endorse goods, services, and brands. Digital marketing is based on Artificial intelligence techniques and therefore digital marketing revolves around the three core elements of segmentation, targeting and positioning of brand.

This paper throws light on the positioning strategy and sustenance of Amul as a brand in the era of digitization.

**Keywords-** AI, brand positioning, digital marketing

### **Objective of the Study**

- ❖ To Study the positioning strategy of Amul India in the era of Digitization
- ❖ To evaluate the various AI tools which are applied to Brand Positioning of Amul
- ❖ To emphasis the need of AI tools during covid pandemic

### **LIMITATION OF THE STUDY**

This paper is based on descriptive study and data source is secondary data

### **RESEARCH METHODOLOGY**

The study is based on secondary data collected from various books, journals, periodical and websites. The researcher has identified the key marketing strategies especially with the use of digital marketing by adopting AI (Artificial Intelligence) as a tool.

### **INTRODUCTION**

Indian brand Amul is one of the country's most well-known and successful enterprises. Amul has now established itself as a household name in the minds of Indian families thanks to its extensive line of dairy products. It has elegantly created its family-friendly and patriotic image through the use of its "Amul – The Taste of India" marketing jingle, which also elicits feelings of empathy for the company.

Furthermore, one of the many distinguishing characteristics of Amul is that it has consistently managed to remain relevant in the minds of its customers for all of these years, ever since its inception. Amul market segmentation, targeting and positioning in the era of digitization is commendable.

### **Overview of Brand Amul**

Amul is an Indian dairy cooperative society with its headquarters in Anand, which is located in the state of Gujarat. According to the dictionary, the word "Amul" comes from the Sanskrit word "Amulya," meaning "priceless or precious." The Three-tier Model of Amul is a brilliant organisation that operates with simplicity and perfection at the same time. It follows a three-step procedure in which each body part performs its functions effectively it includes

**Manufacturers' Community** - Each manufacturer is a member of the village dairy cooperative society, which serves as a hub for manufacturers' networking and collaboration.

**DMUs (District Milk Unions):** They are formed when members of a Village Dairy Cooperative Society elect representatives who then join together to form a District Milk Union.

**Milk Federation of the State** - This federation is responsible for the distribution and sale of milk products on the market in the state.

### **Marketing strategy of brand Amul**

#### **Diffentiated product segmentation and Targeting and positioning**

Amul marketing strategy is unique it follows traditional as well as digital approach .The targeting of Amul is basically all the spectrum of society.In order to achieve this, Amul bases its pricing policy on a low-cost pricing strategy that has previously attracted a large number of customers and continues to do so

A segmentation of the Customer-Based target audience has been created.Amul Products are popular among customers. Amul Chocolate, Amul Kool, and Amul Milk are some of the most popular options. Amul Pizza Cheese, Cheese Spread for Children and Teens.Health-Conscious Individuals Amul Shakti and Amul Lite Butter are two types of Amul butter.

#### **MASCOT**

Brand positioning through the use of the of Mascot Specialized marketing professionals believe that using mascots in the food industry is an effective marketing strategy. Mascots are used in the fast food industry, just as they are in other industries, to build relationships with customers on a more personal level. Because of its effectiveness and ability to elicit emotional attachments from customers, mascot power in Indian advertising has gained prominence. The claim that mascots are better perceived in India than in all other countries around the world cannot be made because there is no empirical evidence to support this claim at the present time,to be sure, there is some evidence to support the claim that the use of mascots in India is more effective than that of mascots in the United States. The reason for this regularity can be traced back to aspects of Indian culture and Indian mentality that are distinct from other cultures. It is necessary for a mascot to have some Indian characteristics in order to effectively engage Indian customers in a communication process through advertising. For example, **Amul Girl, the most well-known mascot in the Indian food industry, was created specifically for the Indian market, as evidenced by the design of the character.**

It is critical for a company to understand its vision and core values, as well as to distinguish itself as an individual among its competitors, in order to develop a mascot that meets this requirement because of this understanding, the physical characteristics must reflect humour, which is typically easy to recall in situations. where the casually done-up hair creates the impression of being bubbly and unaffected. The polka dot dress, on the other hand, is fashionable while still being elegant, and it is easily associated with by consumers of all ages. Furthermore, mascots used in advertising for any type of food must attract attention through humour in order to ensure that the message is conveyed to the target audience as previously stated.

#### **Umbrella Branding**

The network uses an umbrella branding strategy to promote its products and services. Most product categories produced by various unions are marketed under the Amul brand, including liquid milk, dairy products such as butter and ghee, cheese and cocoa products, as well as sweets, ice cream, and condensed milk.Amul's sub-brands include products such as Amulspray, Amulspre, Amulya, and Nutramul, as well as other variations.

#### **The Digital Marketing Strategy of Amul**

Every brand, in this increasingly digitized world, needs to rethink its marketing strategy and tactics. Amul, like its competitors, has reduced its expenditure on television advertisements and has begun to place a greater emphasis on online advertising.

#### **Artificial intelligence as a tool for artificial insemination**

Amul Dairy has become the first milk union in the country to digitalize artificial insemination services,

**Procedure :** When a milk producer who is a member of the milk union registers at the Amul call centre for ,artificial insemination an automatic message is sent to him as well as to the artifical insemination technician's cell phone, as part of the project.real time updatation of all the information in the mobile phone, simulataneously

The Amul call centre as well as the milk producer receive a message of completion when the process is completed. Amul Dairy performs more than one million artifical insemination per year in its milkshed area then after 2.5 the diagnosis of pregnancy is made, and artifical insemination is notified via SMS." If the animal is found to be pregnant, the information in the mobile application system is updated accordingly.

**It is one of the revolutionary steps to increase rural milk producers' income by breeding innovation in India.**

**Cloud computing for supply chain management :** Amul has a highly complex supply chain that is multi-layered and multi-dimensional in its organisation and operations. A factory or an ancillary supplier does not serve as the starting point of Amul's supply chain, as is the case with other manufacturing units. It all starts with

the cows and the milk suppliers, who are the origins of milk production. For their complex 24-hour logistics process, they required a platform that was extremely agile in its response time, extremely responsive in its scalability, and capable of providing complete control and real-time visibility. The highly perishable nature of the products in question necessitated the implementation of a comprehensive disaster recovery solution. In the event of an incident, the solution would need to restore operations to normal with the least amount of downtime possible, while also ensuring that the distribution channels are always available to provide the greatest possible benefit to customers.

The goal of this campaign was to establish a connection with young people and inspire them to live lives that are driven by a sense of purpose and motivation.

Amul developed a private cloud implementation that includes a data centre infrastructure as well as a disaster recovery infrastructure that automatically backs up data. Whenever an intervention is required or a problem occurs on the production side, it automatically fills the Disaster Recovery (DR) system, allowing the systems to operate seamlessly between production and DR. It is monitored and managed by remote technology at our command centres around the clock, ensuring that operations are carried out on a continuous basis.

**Amul during covid pandemic** On March 24, when the Indian government declared a nationwide lockdown following the outbreak of COVID-19, Amul, India's largest fast-moving consumer goods (FMCG) company, found itself in a difficult situation. Because of the complexity of its supply chain, the company experienced an unexpected increase in demand for dairy products, as well as a sharp decline in demand for frozen products. Because the frozen supply chain was idle and the dairy supply chain was under pressure, Amul made the best use of its resources and infrastructure by deploying the frozen supply chain for overnight delivery of dairy products to meet demand.

#### **Use of social media**

##### **Campaign for National Milk Day**

On the 26th of November, Amul celebrated National Milk Day by launching a new campaign that included hashtags such as, "#NationalMilkDay" and "NationalMilkDay2019."

Given that Twitter is a very different platform when compared to other social media platforms, Amul has amassed a massive fan base of over 335K followers on the social media platform.

Amul posts amusing graphics featuring the Amul Butter Girl on a variety of different occasions. Many people identify with those graphics and retweet them to express their feelings about the most recent events taking place around the world.

Twitter is a fantastic platform for brands to engage with their customers on a regular basis. Amul tries to take advantage of this by organising interactive activities such as contests and giveaways, among other things.

There were five business transformation initiatives planned as part of the strategy, and these initiatives would serve as the foundation for the company's future growth plans. The information technology initiatives that were identified were intended to increase visibility and transparency throughout the value chain while also improving operational efficiency and effectiveness. ERP and distributor management in the context of a Village Co-operative Society were selected as SAP technology solutions, as were business analytics solutions to enable advanced planning capabilities and an IT infrastructure to provide a unified platform for improved visibility throughout the entire distribution chain. It is anticipated that this infrastructure will result in improved disaster recovery and business continuity solutions. The most critical objectives were identified as scalability and flexibility, and a customised plan was developed to assist in the transition to reliable, scalable, and flexible transaction processing systems that can support future expansion. Even though GCMMF began its ERP infrastructure journey on IBM Power Systems more than a decade ago, the organisation has upgraded to POWER9 servers in order to support its growth vision and assist in the expansion of operations across many co-operative societies.

During the last ten years, this adoption has resulted in a tenfold increase in the company's revenue and profits. GCMMF has improved the accuracy of Amul's product data and made it easier to integrate the company's products with the distributor management system. Continuous mobile-based applications, as well as automation compliance for managing applications, have all been made possible by IBM cognitive capability. In addition to ensuring a smooth supply of milk and milk products, it has improved the clarity and visibility of the daily logistics and inventory management processes.

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### Classics from Amul

After a long period of time, we are all aware that Doordarshan has resumed broadcasting of the Ramayan and Mahabharat, respectively. As a result, Amul received a large number of requests from customers to resume airing their old 1990s retro advertisements.

In response, Amul took its customers on a nostalgic journey by airing its old commercials both online and on television.

\*In my head, I'm hearing the song Amul Doodh Peeta Hai India.

During the beginning of the lockdown, Amul came up with a campaign titled #SimpleHomeMadeRecipes, which was launched on social media.

They invited chefs from all over India and from a variety of different types of establishments, such as bakeries, hotels, and catering establishments, and asked them to demonstrate their culinary skills to their Facebook audiences.

### CONCLUSION

Amul pumped in Rs 8,000 crore back into rural economy during lockdown, increased milk collection by 15% with seamless supply chain

Amul is a perfect example of creating quality content and that too, in abundant quantity. Moreover, it often conducts interesting social media contests to engage with its customers on social media.

In the end, it produced one of the most successful advertising campaigns in Indian advertising history: the Amul mascot, an endearing little girl dressed in a polka-dotted skirt, who was featured on packs of butter with the punchline "Utterly, Butterly, Delicious."

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## Enhancing VM Scheduling in Cloud Computing

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### ABSTRACT

Now a days Cloud computing becomes the essential service. The requirements of internet and its services are increasing day by day. During pandemic, everybody is using internet, storing large amount of data and accessing huge data. Hence the usage of cloud computing increases drastically. People are using cloud services knowingly and unknowingly. To provide services efficiently the cloud service providers have to manage the data centers effectively. At every stage, there is a scope of enhancement. The VM scheduling part is considered for this research paper. To increase the efficiency of VM scheduling, the new technique is suggested here through the experiment.

**Keywords:** Cloud computing, Data Center, Cloud Service Providers, VM scheduling

### INTRODUCTION

The demand of cloud computing is increasing day by day. Drastically it increases during the pandemic as it provides huge storage, different applications and some applications are free of cost also. Easily we can use the software without knowing its configuration, requirements and most important without installing it in our machine. All these services are provided by cloud service providers. The service providers have the powerful servers and huge cooling systems at their data centers. Not only software and storage, cloud provides many other services such as infrastructure, platform and so on. And because of that it becomes so popular and all small as well as large organizations are using the cloud computing. They can fully concentrate on their business values, performance and can save the cost, which required for setup and maintenance. The only thing required is that the good internet.

Datacenters have thousands of computing nodes and cooling center with high power. The virtualization techniques are used to utilize the full capacity of resources. These datacenters consumes large amount of electrical energy and emits massive amount of carbon dioxide (CO<sub>2</sub>) resulting, increase in the effect of global warming. The emission of CO<sub>2</sub> can be reduced by applying different and proper techniques such as virtualization and load balancing. So that the effect of global warming reduces caused by data centers.

### RESEARCH METHODOLOGY

To increase the efficiency at datacentre, VM scheduling is the important aspect. The different VM scheduling algorithms were compared with the new proposed algorithm named Hybrid (which is the combination of FCFS and SJF). For implementation purpose, CloudSim was used. The different algorithms such as FCFS, SJF, RR and Hybrid was selected as an input. By providing other required information, the algorithm was executed many times, so that we will get proper and sufficient data. Then the average was taken and the analysis was done through Advanced Excel.

### Simulation Results and Discussion

FCFS, SJF, RR and Hybrid algorithms of VM scheduling are simulated by using CloudSim and the results of those algorithms are discussed here. These algorithms are analyzed by considering the waiting time, turnaround time, power consumption, CPU time consumption etc. MIPS bandwidth is considered for calculation of power consumption. Here Bandwidth shows how quickly the data transfers from one point to another, such as from disk to CPU ready queue.

Let's analyse their usefulness and their suitability with cloud system through more series of runs and observations.

**FCFS:** First Come First Serve policy is very simple and easy to implement. The timestamp value when process gets into the system is considered for the selection of process for execution. The CPU is allocated to the process whose request is first. Process Control Block is linked to the rear pointer of the queue when the process enters in the ready queue. After completion of execution only, the CPU is allocated to the other process which is present at the front of queue. After completion of the process, it is removed from the queue. FCFS is simple but very slow especially when any large process comes in the system as it takes more time and resources of the system

Following is the table of observations, after running the FCFS when cloudlet=3 and VM count = 3 for five times.

R u n	Cloud let count	VM count	Burst time									CP U time	CPU powe r
			0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33		
1	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	51	3.84
2	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	49	4.16
3	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	48	4.34
4	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	52	3.7
5	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	55	3.31

**Table:** Observations of FCFS when cloudlet=3 and VM count = 3

**SJF:** In Shortest Job First, the process having the smallest processing time is selected for execution. The length or time required for execution is less, is taken for the execution first. If more than one processes have same burst time then FCFS is used for the selection of process for execution. Here non-preemptive version is considered.

Following is the table of observations, after running the SJF when cloudlet=3 and VM count = 3 for five times.

R u n	Clo udl et cou nt	V M co u nt	Burst time									CP U tim e	CPU powe r
			0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33		
1	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	50	6.18
2	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	53	5.81
3	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	52	4.68
4	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	50	5.06
5	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	50	5.72

**Table:** Observations of SJF when cloudlet=3 and VM count = 3

**RR :** In Round Robin Scheduling, for the fixed time slot or quantum each process in ready queue is executed. After the time slot, if the process is not completed then again it enters in the queue for the remaining execution. This process continues till the process ends. Because of this all processes gets the equal chance of execution and the waiting period of all processes is also less. Mainly it is very much useful in time sharing system. It uses circular queue for its processing. When the process completes its execution then it is added in the trailing part of queue and later on removed from the queue. The new process is added at the end of the queue. Generally 1 time quantum is allocated to each process for execution.

Following is the table of observations, after running the RR when cloudlet=3 and VM count = 3 for five times.

R u n	Cl ou d le t co u nt	V M co u nt	Burst time									CPU time	CPU power
			0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33		
1	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	96	1.09
2	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	90	1.23
3	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	97	2.06

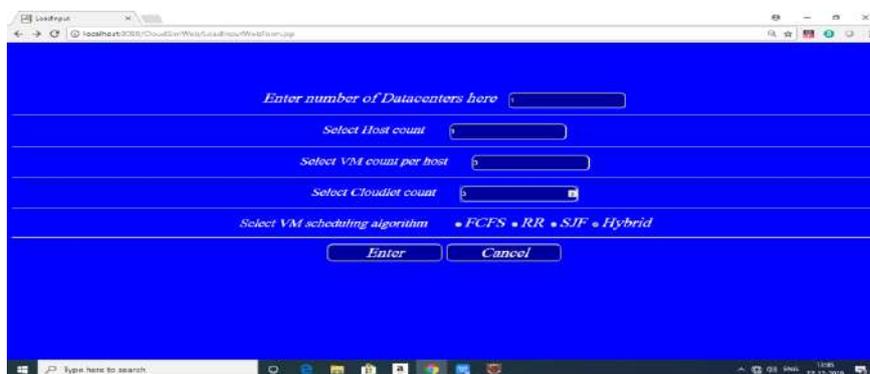
4	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	100	2
5	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	92	2.18

**Table:** Observations of RR when cloudlet=3 and VM count = 3

**Proposed Hybrid (SJFCFS) Policy**

As name suggests it's a combination of FCFS and SJF scheduling algorithms. It is a non-preemptive, means when the running process completes its execution then only new process will start for execution. The main idea used here is that at the starting the process selected from queue is accordingly FCFS. Means the process in the queue at front end is selected for execution. When the execution is going on, till that time whatever processes comes in the queue for execution are selected by using the SJF strategy. That is the smallest procedure is selected for execution. This process continues until there are processes in the ready queue. The best part of this policy is it combines the merits of both the strategies FCFS and SJF. Also it reduces the problem which we are facing in FCFS i.e waiting time and searching time in SJF. Here we are not using any time quantum so there is no impact on the performance. The context switching is less as compared to round robin. So context switching time and turnaround time required is moderate. Naturally, this Hybrid policy produces good result as compared to other scheduling algorithms in terms of waiting time, turnaround time, CPU power consumption and so on. In the next part, the simulation results are discussed and it shows it performs well and gives optimized results.

Let's take series of observations. Following are the screen outputs of program execution with VM scheduling policy set to Hybrid SJFCFS.



**Fig:** Input Window for SJFCFS



**Fig:** Output showing given input and configuration

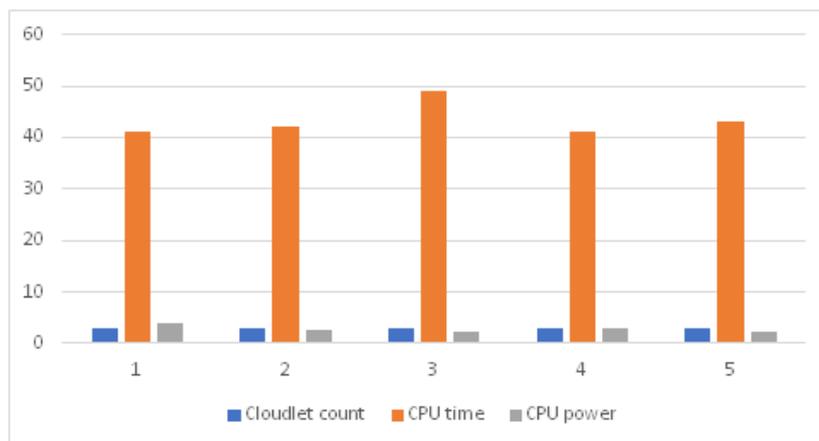
VM	Cloudlet	Arrival Time	Burst time	Waiting time	Turn around time	Completion time
0	0	0	2.54	0	2.54	2.54
0	1	1	0.46	1.54	2	3
0	2	2	3.61	1	4.61	6.61
Average waiting time = 0.85 and Average turn around time = 3.05						
1	0	0	0.92	0	0.92	0.92
1	1	1	1.79	0	1.79	2.79
1	2	2	0.67	0.71	1.38	3.38
Average waiting time = 0.24 and Average turn around time = 1.36						
2	0	0	0.22	0	0.22	0.22
2	1	1	0.57	0	0.57	1.57
2	2	2	2.33	0	2.33	4.33
Average waiting time = 0 and Average turn around time = 1.04						
<b>Resource statistics</b>						
Total CPU time : 41 milliseconds						
Total Memory space : 10714624 bytes or 10.22 megabytes						
Total CPU power : 3.95 watts/Hour						

**Fig.:** Output of Hybrid(SJFCFS) run 1

Following is the table of observations, after running the same for five times.

Run	Cloudlet count	VM count	Burst time									CPU time	CPU power
			0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33		
1	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	41	3.95
2	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	42	2.67
3	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	49	2.16
4	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	41	2.95
5	3	3	0.22	0.67	1.79	0.92	3.61	0.46	2.54	0.57	2.33	43	2.41

**Table:** Observations of Hybrid(SJFCFS) when cloudlet=3 and VM count = 3



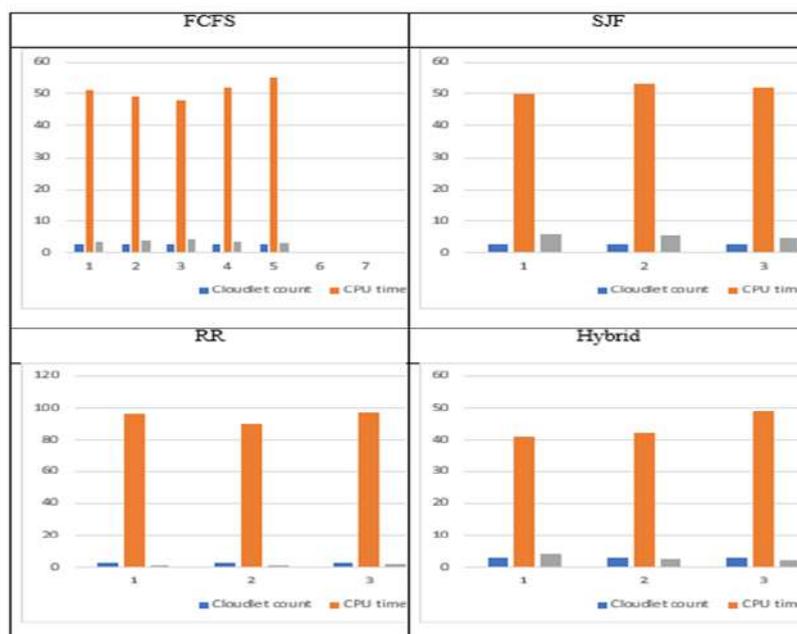
**Fig.Graph** of Observations of Hybrid(SJFCFS) when cloudlet = 3 and VM count = 3

The above results shows that for each run waiting Time is significantly small. It is moderately complex to implement as it is combination of FCFS and SJF. It can be appropriate for large as well as small size of process.

**Compare and Contrast**

The few characteristics such as CPU power consumption, CPU time are considered to analyse and compare the VM scheduling algorithms.

Following are the graphs of all above policies.



**Fig,** Comparative BAR chart of FCFS, SJF, RR and Hybrid -VM scheduling Policies

The above graph shows the observations when VM count and Cloudlet count both were set to 3 and the burst time is set at random for all cloudlet requests. The power and energy efficiency and performance of policy can be predicted easily by looking at the findings. Roughly, we can say the CPU time required to execute cloudlet requests is inversely proportional to the CPU power. When all logical gates and digital circuits are used for running the process then more power is required and speedily it completes the process so the time required for execution is less.

In case of Round Robin, the processes are divided as per the time quantum, also the less number of logical gates are used for the execution resulting CPU time increases drastically and CPU power decreases. Although it shows it is efficient in terms of CPU power but the time wise it is worse. Whereas the result of Hybrid policy shows the power and time consumption of CPU are moderate.

It maximally utilizes the processor throughput. Optimally it uses all the resources. Simultaneously at the time of running the first cloudlet request, it keeps other digital logic busy in finding the new shortest request and schedules its execution. At the starting it gives most feasible solution but up to the end gives optimum solution. Both the factors CPU power and time consumption are much balanced as per the results.

## CONCLUSION

From the simulation results, the conclusion can be drawn as; every policy behaves differently in terms of CPU time and other resources even if the burst time and arrival time are same for all the processes. The overall efficiency of policies is getting by the power consumption statistics and their acceptance in real time applications. From the observations, we can conclude that FCFS gives better results but in crisis, it may fail. When the number of requests increases then FCFS cannot give better output. SJF may be the suitable choice but results shows the hybrid policy gives best results than all the other policies. Even if number of request increases, as it increases in pandemic still it performs good. So definitely Hybrid is the most promising policy in any situation for VM scheduling in cloud computing.

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## Analyzing Green Recommendation Approach to Address Sustainability Issues in Textile and Apparel Supply Chain

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### ABSTRACT

The textile industry is substantially contributes to many national economies, comprising both small and large-scale operations. The increasing demand of ecommerce forces the various fashion brands to land their products online on ecommerce platform. The textile and apparel processing are classified by the extensive use of resources like water, power sources and a variety of chemicals in a long process cycle that churn out a huge amount of waste. Augmenting sustainability into the supply chain is not only essential for many textile and apparel companies but also for ecommerce website to reduce the environmental impact. This paper introduces the unprecedented green recommendation approach on ecommerce platform in the field of textile and apparel supply chain management. The purpose of green recommendation on ecommerce website is to combine green attribute of product with the traditional recommender system to assist consumer to adopt eco-friendly fashion brands and also help the fashion brands and textile industry to innovate cleaner production approach to curtail environmental issues and to promote the sustainable economy in textile industry.

**Keywords**—Sustainability, Recommender System (RS), Green Attribute, Supply Chain Management (SCM).

### INTRODUCTION

Recommender system is crucial technology for buying and selling of the product on electronic commerce. It aids the online buyers to filter out the products from the huge size of product repository. It can assist consumer in decision of unseen product. The customize marketing strategy is widely use by online vendors of various fashion brands for each individual consumer. Recommender systems have been used to recommend variety of products ranging from electronics, music, news articles, cloths from various fashion brands etc. on Ecommerce website. However, to our knowledge very few ecommerce sites used green recommendation approach to personalized user preferences. The green recommendations are very important to promote and increase the sale of green product online. The advertisement of green product is increasingly vital for environmental sustainability [1]. This paper is advocating the green recommendation in textile and apparel. The fashion industry is closely connected to textile and apparel industry on B2B model and has seen a spectacular growth in the early 21st century. It is now valued at more than 2.5 trillion dollars and employs over 75 million people worldwide. Between 2000 and 2014, clothing production doubled with the average consumer buying 60 percent more pieces of garment compared to 15 years ago. Yet, each clothing item is now kept half as long. The industry has truly entered the era of “fast fashion” [2]. As the fashion industry booms, the negative environmental impact created by industry should be recognized by all the stakeholders. Fashion production causes 10% of humanity's CO<sub>2</sub> emissions, dries up water sources and pollutes rivers and streams. 85% of all textiles end up in landfills each year (UNECE, 2018), and washing some types of clothing releases significant amounts of microplastics into the oceans. “The fashion industry consumes very high greenhouse gases, with emissions estimated at 2-8 percent of global emissions” [3].

The United Nations is working to change the fashion system, reduce the negative social, economic and environmental impacts and promote the implementation of the Sustainable Development Goals (SDGs). The Ethical Fashion Initiative established by the International Trade Center for UN Environment's work to promote sustainable manufacturing practices [4]. Some industry comrades are committed to change fast fashion path and introduce innovative ways to reshape industry to achieve UN SDGs. The companies like Ecoalf in Spain converts ocean plastic into shoes, Patagonia, based in California, has been producing fleece jackets using polyester from recycled bottles, the Wintervacht from Netherlands turns blankets and curtains into coats and jackets, Retailer H&M has launched a wardrobe recycling programmed [5]. The manufacturer promotes environment friendly products and brand images by communicating their green credentials to customers through a variety of channels like eco and social labels. The eco-social tags are issued by third party organization and represents of a product's environmental attributes [6]. To discourse the repercussions of the textile and fashion industry on our environment, it is foremost to involved all the stakeholders and consumers to decide liability. To create consciousness among potential consumers, public awareness campaigns about eco-labeling schemes can be conducted through media reporting, advertising, school curricula, etc.

The e-commerce platform can be extensively used to roll out the efforts of individuals across the supply chain management to produce the green product and encounter the customer appreciation for green SCM approach they have adopted.

This research proposes the green recommender systems to educate and introduce environment friendly products using Higg Index score to online customers. The traditional method of prediction can be augmented with green credit score of consumers with greenness properties of product to suggest sustainable fashionable brands to end users. The end user plays a decisive role in SCM hence the aim of proposed system is to increase green consumer club on ecommerce platform and in turn stimulate the sustainable supply chain in textile and apparel industry.

This paper begins by discussing the environmental issues of unsustainable practices followed by textile industry. Section II describes the background of recommender system and Higg Index. Section III sketch the proposed framework, while in Section IV Some limitations of the approach are mentioned, with concluding comments in section V.

## **BACKGROUND**

### **Recommender System**

Information filtering systems include recommendation systems which attempt to anticipate the rating or preference that a user might give to a particular item. Recommendations made by systems can help users to navigate through huge information spaces and provide suggestions for items to be of use to a user. In many cases, they provide assistance to users who lack the background necessary to evaluate the plethora of options. The ecommerce business has expressed a growing interest in the use of recommender systems to increase the sale of product on online platform [7]. Presently, recommender systems use the following approaches:

- Collaborative-filtering

In collaborative filtering to predict the user preferences, the neighboring users expressed or unexpressed behaviors such as purchase history and search patterns are used to generate recommendations.

- Content-filtering

The system dictates similar items to those a user has shown interest in or is currently browsing by using machine learning algorithms and information retrieval algorithms.

- Context-aware system

This approach reckons with factors such as time, location, or proximity of users as well as either or both of the above approaches.

- Community-based systems

The product selections are based on the preferences of the user's friends or colleagues.

- Hybrid systems

Hybrid system combine the above methods with each other or potentially combined with a domain specific method.

The renowned RS can be outstretched to facilitate sustainability requirements in textile and apparel supply chain. The proposed model draws the hybrid structured comprise of collaborative filtering and magnitude of contextual green feature such as greenhouse gas emission, water consumption, pollution etc. during the life cycle of product [8].

### **HIGG INDEX**

The Higg index is instigate in 2012 by the Sustainable Apparel Coalition (SAC), a nonprofit organization comprised of fashion companies, the Environmental Protection Agency, and other nonprofits global apparel, footwear, home textile, and academic institutions with intention to standardized supply chain measurement tool that will assist companies in determining the health and environmental impacts of making and selling their products and services.

In Higg, businesses able to understand the undesirable consequences of unsustainable practices discharge in entire SCM and life cycle of product. [9].

## PROPOSED FRAMEWORK

Incorporating sustainability into existing systems is challenging due to the complexity involved with modifying systems to meet new requirements.

The promotion of green product is indeed a challenge in highly competitive textile business. The research proposed the adoption of the green consumerism by engaging consumer and industry partner commitment towards sustainability by reducing the costs and effort associated with that adoption by employing existing recommender system.

### General Structure and the Framework

There are three major modules in the proposed framework: Recommender module, Product Endorsement module, Consumer Green Sensitivity Score module.

Recommender module is responsible for recommending sustainable products based upon product greenness details consolidate with consumer's requisites, which works like most conventional recommender systems. The endorsement module will calculate level of product greenness using Higg index. The end user liability in green consumerism is figure out by green sensitivity score module.

### Evaluate Product Greenness

Governing and monitoring the product sustainability score across the globe is difficult task in an industry known for their secrecy. The following factors creates barriers in producing an undeniable sustainable score for various brands and their products.

- Apparel supply chains are complex global networks made up of many types of manufacturers, including fabric mills, dyeing facilities, and finished goods facilities. If each entity involved in supply chain doesn't use the same tool to measure its greenness, then it is difficult to retain transparency. The transparency is significant to reach sustainability goal because end user wants information that is true.
- The product greenness can be measure based on various eco-labels. Each eco-label has different context. Some refers to the raw material while some refers to the energy efficiency. So, it is essential to foster common eco labels for all garments to maintain indisputable sustainable product score.
- The lack of globally accepted standards to calculate the environmental impact of textile supply chain management will escalate the disputes in all phase of manufacturing.

By considering the above points it is crucial to endorse the standardize measure across the globe to compute the sustainability score of products in textile and fashion industry. if all entities connected to this industry doesn't use the same mechanism, then sustainability in textile industry won't be able to achieve. Standardizing sustainability efforts will allow consumers to make more informed buying decisions. A way to mitigate this problem is to exploit the Higg index score to provide consumers with reliable information.

A Higg's software tool gathers and organizes primary data from all the stages of SCM to better analyze the footprint of each step on environment.

Based on key environmental metrics such as greenhouse gas emissions, waste, water usage, and working conditions, a company or product is scored and compared based on the Higg Index [10].

The Higg carries out a life cycle assessment (LCA) which quantifies the environmental impacts of products within the bounds of a structured system. The boundaries of the system comprise the full lifetime of a product, from its extraction or production through material processing, manufacturing, distribution, use, and disposal. A life cycle assessment allows Higg Index to evaluated for product environmental impacts based on following three tools.

- Higg Materials Sustainability Index (Higg MSI): This tool measures life cycle effects of manufacturing materials, trim, and packaging by using life cycle impact assessment methods and data. It engages the global value chain and product design teams to promote environmental sustainability [11].
- Higg Product Module (Higg PM): To assess a product's cradle-to-gate impacts, companies can use Higg product module. It uses the life cycle impact assessment (LCIA) information and methodology to live product manufacturing footprints and therefore the impacts-per-use of the same merchandise. The Higg PM also provides credible and consistent results for external communication to influence buying selections and scale trade adoption of leading practices [11].

- MSI Contributor: The primary material production data can be submitted and the results of life cycle analysis can be checked and used to create futuristic materials or processes in the Higg MSI and Higg PM.

#### **Product Endorsement module**

The goal of product endorsement module is to elevate visibility of green product on e-platform by augmenting the prediction score of recommender system for discrete consumer with higg index score. Nowadays, consumers are concern about environmental issues and wants to buy green product on online platform but the conventional recommender system does not equip with green score of products and because of this product manufactured by greener way are getting very low prediction score and environmentally friendly products are not catalog by the system. Hence to promote green consumerism we can combine product greenness score calculated by Higg index [10,11] with prediction score to build sustainable product – consumer association.

#### **Consumer Green Sensitivity Score module**

The aim of green recommendation is to fetch end user and escalate the sale of green products on ecommerce. This module forecast the consumer liability in creation of sustainable fashion trade. The persistent buying of green product is important so that more cleaner manufacturing process can be adopted by the industry partner. The green sensitivity gain will be projected for each individual consumer from their shopping behavior on online platform. This individual score of each consumer can be inspect to sale future green product at discounted rate.

The consumer green sensitivity score will be calculated based on each purchase of green product by the individual consumer. The consumers with high sensitivity score can be awarded with additional benefits on each purchase. This type of marketing strategies not only help in green consumerism but also back up industries engaged in more sustainable production.

#### **LIMITATIONS**

One of the limitations of this system is issue of trust and transparency. It is well known that users trust recommendations they receive from credible sources. Hence the fidelity of the recommender system is imperative to ensuring the recommendations are accepted.

The overall accuracy of recommendation is based on Higg index score which describes the greenness property of product and prediction score hence evaluation plan of green recommender system significantly relies on precise Higg index score.

#### **CONCLUSION**

This research will encourage the ecommerce world to incorporate sustainability in conventional recommendation model with the aid of Higg index to promote pollution to solution approach in textile and apparel supply chain management. The industry partner can leverage existing marketplace to nurture green consumerism. It also ensures the consumer responsibilities towards sustainable development goals (SDGs).

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## **Descriptive Analysis of B.Ed Student Teachers Academic Achievement and ICT Access**

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### **ABSTRACT**

*Information and Communication Technology has become one of the basic building blocks of modern education society within a short period. Many Countries have started realizing the role of ICT in several dimensions. They give importance to understanding ICT and mastering the necessary skills and concepts of ICT as a part of education. The use of Information and Communication Technologies has expanded dramatically within the present decade. New technologies integrated increasingly into educational settings. Information and Communication Technology has created new opportunities for teachers and learners. There is potential communicating across geographical distances and time differences with ease. Assessing new polls of information and resources, and taking part in new learning networks and partnerships. The exponential expansion in Information and Communication Technology is the result of the general process towards digitalization. Information and Communication Technology dramatically and rapidly transforming education to a degree scarcely imaginable. ICT Access can truly bolster improve learning and the nature of put and guidance and furthermore, in what direction under which conditions and for what it tends to be helpful. ICT Access empowers students to act naturally coordinated and to accept more noteworthy command over their learning. This paper concentrates on ICT Access among B.Ed. student teachers in relation to their academic achievement. A standardizing study technique was utilized in the investigation and arbitrary inspecting was the area of college considered for the examination. The investigation results for the current study define how access to ICT will be influencing their academic achievement.*

*Keywords: ICT, Access, Academic achievement, B.Ed, Student Teachers*

### **INTRODUCTION**

Today's world is information explosion world. This information explosion is taking place in very fast. Even a literate person feels as if they are illiterate being unable to cope with such an information explosion. Here the question arises how one to cope up with it is. The answer is an Information Technology (IT) that can help in coping with the information explosion. Therefore, we can say that Information Technology is nothing but coping with the explosion of information. Information Technology (IT) is the acquisition, processing, storage, and dissemination of vocal, pictorial, textual and numerical information by microelectronics based combination of computing and telecommunication. In its modern sense, the term first appeared in a 1958 article published in the Harvard Business Review, in which authors Leavitt and Whistler commented that, the new technology does not yet have a single established name call it as information technology. It spans a wide variety of areas that include but are not limited to things such as processes, computer software, computer hardware, Programming Languages, and data constructs. In short, anything that gives data, information, or perceived knowledge in any visual format whatsoever, via any multimedia distribution mechanism, considered part of the domains space known as Information Technology.

Information and Communication Technology is changing the face of the contemporary world including the developing country like India. ICT has not only connected the world on single platform, it is also helping in the integration of several traditional societies into modern societies. The mandates of globalization also require interaction between the Indian economy and the world's economy. The ICT strategy in India must be techno-legal rather than purely legal or purely technological. Unfortunately, Indian ICT strategy is not up to the mark and is further degraded by introducing the proposed amendments to the Information Technology Act of 2000.

Educational systems worldwide are under increasing pressure to use the new Information and Communication Technologies to teach knowledge and skills in the 21st century classroom. The UNESCO World Education Report (1998), Teachers and Teaching in a Changing World' describes the radical implications of Information and Communication Technology in conventional teaching and learning. It predicted the transformation of knowledge in teaching learning process. Even it is highlighting how teachers and learners access knowledge and information.

Information and Communication Technology provides powerful tools to transform the present isolated, teacher-center and text-bound classrooms into rich, student-focused and interactive knowledge environments. The

process of designing and implementing successful ICT enabled teacher education programs is the key to the wide range of educational reforms. Teacher education institutions face the challenge of preparing a new generation of teachers with effectively use of ICT based new learning tools in their teaching practices. For many teacher education programs, this daunting task requires Acquiring new resources expertise and careful planning.

Integration of ICT into teacher education provides the guidelines for the development of a high-quality strategic technology plan. For using ICT benefits in learning, the teachers and teacher trainees need to possess the skills and competencies to use these ICT tools in their learning. Teacher Education institutions must provide leadership in determining how the new technologies can used in the country's culture, needs, and economic conditions. To accomplish these goals, teacher education institutions must work closely and effectively with teachers, administrators, national or state educational agencies, teacher unions, business and community organizations, politicians and other experts in the educational system. Teacher education institutions also need to develop strategies. They plan to enhance the teaching- learning process within teacher education programs and ensure that all future teachers are well prepared to use the new learning tools. To meet these challenges, schools/Institutions must embrace new ICT tools for learning and teaching. They must also move towards the goal of transforming the traditional paradigm of learning.

#### **Operational Deflations of the Key terms:**

- **Information and Communication Technology (ICT):** Information Communication Technology (ICT) is characterized as conveying through a differing set of mechanical apparatuses, gadgets, and assets. Information and Communication Technology serve to make, disperse, store, and deal with the learning.
- **Academic Achievement:** Academic Achievement is identified with the obtaining of standards and speculations Furthermore, the ability to proficiently perform certain controls, destinations, images, and thoughts. The appraisal of scholarly accomplishment has been to a great extent bound to the assessment in the wording of data, information, and comprehension. It is the ability of understudies that appeared in school subjects for which they have taken guidance. The grades or evaluations doled out to the understudies based on their presentation in the accomplishment test to decide the status of understudies in the study area.
- **B.Ed Student Teachers:** 2-year B.Ed student teachers are the professional degree students that get ready understudies for fill in as an educator in schools, and other a lot more the extra work like fields and examination must be done all together for the understudy to be completely able to educate.

#### **Review of Related of the related literature**

The investigator has reviewed some works related to the area of ICT Access and Academic achievement. This subtopic covers the access and use of ICT and its use in several geographical aspects. This subtopic focuses on radius on the access of ICT, effective use of ICT tools, availability of ICT, the influence of ICT in teaching and learning among different categories of students and relationship with achievements or excellence in subjects. Different areas effect of ICT diffusion, participatory development of teaching and learning. The effectiveness of using the internet as principal information resource in teaching and learning activity in higher educational institutions. Teacher Educators ICT usage in higher education, ICT adoption among secondary school teachers and students, teachers' incorporation of ICT in classroom teaching, Use of computer technology in remedial instruction and modern ICT trends in teaching technology and other related areas of Access.

- **Nusir (2012)** investigated the impact of using multimedia technologies at early stages in Jordanian primary schools. The researchers used the quasi-experiment research design. Achievements test used as the primary tool for data collection. The researcher used t-test, and ANOVA to analyze collected data. Results showed that the multimedia- enhanced teaching method was influential in getting students' attention, especially when used cartoon characters. Results also showed no significant difference in learning and knowledge skills and information absorption based on gender distribution.
- **Osborne, J. Hennessy, S. (2003)** researched instructors and understudies improving job procedures with regards to utilizing different types of PC based data and correspondence innovation to help subject educating and learning at the auxiliary level. One hundred and fifteen educators and Scientists took an interest in a community-oriented program of little scope ventures including the turn of events, assessment, and refinement of new educational methodologies, techniques, and exercises in six educational plan territories. An examination was led over the contextual investigation information got from exercise perceptions; follow-up instructor interviews and teachers' composed exploration reports. While connections with singular understudies and little gatherings were expanded and supposedly effective, intervening cooperation among understudies and innovation through entire class intuitive training demonstrating and conversation had all

the earmarks of being immature

- **Pimpale and Vadnera (2012)** studied the effectiveness of digital interactive multimedia package in Astronomy. The study's primary objective was to study the effectiveness of digital interactive multimedia package in astronomy to inculcate scientific values among India's tertiary level students. Achievements test used as a tool, and t- test and ANOVA used as a data analysis technique. The study revealed that the students, who exposed to the multimedia package, did significantly well compare to those who given only the print material.
- **Munoz and Ortega (2014)** analyzed the impact of two plans implemented in Chile to incorporate the use of ICTs into instruction. The authors studied the determinants of academic achievements measured by national standardized achievement tests, using the PSM methodology. In general, Muñoz and Ortega concluded that the plans did not significantly affect test scores. However, they did see an impact on the language scores in some specific groups of students. They concluded that a necessary goal is to perfect the incorporation of ICTs in the classroom while taking into account other variables that also affect academic achievements
- **Delaney. R and Ruthaven, K(2003)** contemplated pupils' sees on the utilization of Data and Correspondence Innovation. Individuals from three-year accomplices (Years 8, 10 in and 12) in six English auxiliary schools participated in center gathering interviews during the primary portion of 2000. The perspectives evoked Throughout the 27 meetings are summed up regarding six subjects. Couples of PC based instruments and assets are encouraging not simply to influence errands, and improve the introduction, yet additionally to refine work and preliminary choices. They related the utilization of such devices and assets with changes in working feel and homeroom relations, just as with raised intrigue and expanded inspiration on their piece of the work. It found that guardians and understudies accepted that improved inspiration certainty, made the school of work progressively charming, and improved accomplishment. They announced a factually demonstrated that (little enhancements connected to key stages, to the home in wording raised of confidence new and sources closed the utilization of fulfillment ICT for training in Science. The survey and understudies assets are of examines which, of data, that home A point by point to contemplate achieve significant uncover in that influences improved brings purposes and English use favorable circumstances at a specific turn, understudies would scholarly and testing the fulfillment introduction in and Access in this assistance greatness component of present-day acquire territory. Us to the of for ICT globalization. 21st devices out a time century genuine image of our understudies here.

### **OBJECTIVES THE OF STUDY**

1. To find out the access of ICT among B. Ed student teachers.
2. To find out the relationship of ICT Access of B.Ed student teachers and their Academic achievement.
3. To find out the relationship if any between ICT Access of B.Ed student teachers and their Academic achievement in the total sample and the sub-sample based on gender and locale.

### **HYPOTHESES**

- Access of ICT for B.Ed student teachers is low.
- There is no significant relationship between ICT Access of B.Ed student teachers and their Academic Achievement for the total sample.
- There is no significant relationship between ICT Access of B.Ed Student teachers and their Academic Achievement in the background variable based on gender and locale.

### **METHODOLOGY**

- **Sample:** The total of 500 B.Ed Student teachers from Bangalore were selected.
- **Tools:** A Check list Used for the study of ICT Access of B.Ed. student teachers of Bengaluru. Investigator developed and standardized the ICT Access tool for the B.Ed. student teachers. The tool has 31 items and total score of 59. The validity and reliability of the tool was established in a pilot study.

### **Statistical Technique Used for the study**

- Descriptive analysis
- Differential analysis( 't' test, One and Two way ANOVA)
- Correlation analysis (Pearson's coefficient of Correlation)

## Data Analysis and Results

**Table – 1** The ICT Access of B.Ed student teachers with Respect to the Total Samples

Variable	N	Mean	S.D	Skewness	Kurtosis
ICT Access	500	16.17	8.64	0.69	-138

The table – 1 above shows that the mean value of ICT Access is found to be 16.17 and the mean value of tool is 28.5 which is higher than the obtained value for the total sample. Therefore it can be concluded that the Access of ICT among B.Ed student teachers is low for the total Sample.

### Significance of difference between the scores of ICT Access among various Categories of background variable gender samples:

**Table 2** Mean Scores of ICT Access and Significance of Differences among various categories of Sub-Samples

Variable	N	Mean	S.D	t – Value	Sig
Gender	Boys	250	16.0200	1.35	p>0.05
	Girls	250	17.3960		
Locality	Rural	300	15.9967	1.75	P>0.05
	Urban	200	17.7750		

The above table shows that, when the mean scores of Young men and Young ladies on ICT Access were looked at, it was discovered that there is no huge distinction between Young men and Young ladies. The t-esteem acquired for the variable is beneath the table qualities 1.96, which shows that the thing that matters isn't noteworthy even at the 0.05 level. At the point when the Mean scores of Rustic and Urban School understudies on ICT Access were looked at, it was discovered that there are no critical distinction among Country and Urban School understudies. The 't' esteem acquired for the variable was 1.75 which is beneath the table worth 1.96. This shows the thing that matters isn't noteworthy at the 0.05 level. It was discovered that there is no distinction among Country and Urban B.Ed understudy educators in ICT Access.

### Significance difference between Mean Scores of Academic Achievement among B.Ed students teachers reference to the subordinate theme Gender and Locality

**Table 3**

Variable	N	Mean	S.D	t – Value	Sig
Gender	Boys	250	258.46	5.78	p>0.05
	Girls	250	309.36		
Locality	Rural	300	268.23	4.12	P>0.05
	Urban	200	308.16		

Table – 3 shows that the Mean scores of Young men and Young ladies on Scholastic Accomplishment were thought about and it found that there is a critical contrast between both the sexual orientation. The got t-esteem (5.78) was above there worth 2.58. The outcome demonstrates that there is a noteworthy contrast between the sexual orientations at the 0.01 level. The Young ladies' mean scores of Scholarly accomplishment is more prominent than Boys(309.36>258.46). The outcome says contrast with Young men Young ladies are better in the Scholastic accomplishment. This prompts the choice of there is a critical contrast among Country and Urban B.Ed universities' understudy educators. The t-esteem expressed for the variable was 4.12 which was over the table worth 2.58. This demonstrates the thing that matters is critical at the 0.01 level. Further from the information, it was discovered that Urban understudy instructor Scholarly accomplishment mean scores higher than Rustic understudy educators Scholastic accomplishment scores (308.16>268.23).

### Correlational analysis of ICT Access and Academic Achievement for the total sample and related to Gender and Locality

**Table - 4**

ICT Access X Academic Achievement	r	t-value	Sig.
Total Sample	0.212360	4.83	P>0.01
Boys	0.185587	2.41	P>0.01
Girls	0.244381	3.29	P>0.01
Urban	0.262756	3.81	P>0.01
Rural	0.121085	1.02	P>0.05*

**\* Not Significant**

In light of the above table, the outcome found that the relationship between's ICT Access and Scholastic accomplishment of B.Ed understudy instructors for the all-out example and extra example like Sexual orientation and Area of understudy educator was huge at 0.01 level. Be that as it may, there is a change in Urban and Rustic B.Ed understudy instructors the acquired t esteem is 1.02 which is beneath the table worth 1.96 at 0.05 level. Subsequently, there is no critical connection between ICT Access and Scholastic Accomplishment among Urban and Rustic B.Ed understudy instructors.

**The Implications of the study**

The ICT in instruction is turning out to be increasingly significant and this significance will proceed to develop and create in the 21st century. It has likewise impact understudy educator's accomplishments. The current investigation would draw out an assessment of the ICT execution in instruction, particularly among optional levels. It additionally gave an understanding of the truth concerning the commitment of ICT Access in Scholarly accomplishment of understudies. The examination finding would support educators. Understudies and Policy producers of Instructor Train to figure reasonable procedures and projects for executing ICT in Advanced education.

**CONCLUSION**

The current exploration was expected to examine the Entrance of ICT among B.Ed understudy educators comparable to their scholarly accomplishment. The examination result uncovers that the ICT Access of B.Ed understudy instructors was low for the absolute example and there was no huge distinction among Young men and Young ladies in their Entrance of ICT. It was likewise discovered that in ICT Access there is no contrast among Urban and Rustic B.Ed understudy educators. In Scholarly accomplishment of Young ladies exceed expectations Young men and Urban undergrad instructors score better than Country B.Ed understudy educators. The examination likewise uncovered that there was a positive relationship between ICT Access and Scholarly Accomplishment of B.Ed understudy instructors. The current investigation incorporates the examination directed on the optional level from **Kennewell and Morgan (2006)**.

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## Adverse Effect of *Acacia Nilotica* on Freshwater Snails

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### ABSTRACT

The acidification is the major threat to the freshwater ecosystem that causes the mortality of snail species. *Acacia nilotica* is a drought tolerant tree thickly developed on the ground of the pond. The by-products of *A. nilotica* are barks, stems, leaves, gums, flowers and pods. The study was carried out to investigate the acidification of pond water due to the by-products of *A. nilotica* falling into the pond and its impact on snail species that work as scavengers of the pond. During the experimental period, the pH of the pond is checked twice a month and the average was calculated for all the months. The percentage of mortality was calculated for the monsoon and summer season. The pH was slightly alkaline (pH 7.4) in the rainy season and dropped to acidic (pH 5.9) in the summer season due to the release of hydrogen ions from the by-products of *A. nilotica*. The overall results of the investigation pointed out that the percentage of mortality was very less in all the species during the rainy season whereas it was higher only in four among the seven species of snails. It was clear that every snail species had their own capability of survival in varying pH. The acidification of ponds was due to massive litter decomposition of *Acacia nilotica*. In order to prevent acidification of the pond and mortality of acid intolerant snail species, the best solution is to uproot the acidic plants and trees from the pond with the permission of the forest department. The other possible benefit from this solution is that during the rainy season, the water coming into the pond can be stored in large quantities used for fish farming to meet the food needs of rural areas and protects the snail species from acid-induced death and lets them work as scavengers in the pond.

**Keywords:** Acidification, extinction, by-products, scavengers, *Acacia nilotica*

### INTRODUCTION

The acidification of freshwater ecosystem is mainly occur by man-made pollutants which disintegrate to form inorganic acids and the neutral condition of freshwater ecosystem is altered by plant by-products that release organic acids responsible for acidification: the acidification of freshwater ecosystems mainly by the addition of hydrogen ions that alter the structural and functional aspects of aquatic ecosystems which leads to the disturbance of biodiversity of aquatic organisms (Spyra, 2017). An invasive species once started to become more aggressive on the ground of aquatic environment or terrestrial environment, the native species that are already dominating they are likely to become endangered or extinct due to lack of essential needs or health hazards permanently caused by the pollutants or in the form of life threatening chemicals from invasive species that leads to decrease in the fertility of native species in the domestic ecosystem (Mayfield et al., 2021).

*Acacia nilotica* is a drought tolerant tree used for climate change mitigation, adaptation and phytoremediation that grows naturally in black cotton soil and alluvial soil very commonly found as invasive species on the ground of both terrestrial and aquatic environment like ponds, lakes, canals of rural and hilly areas grows up to 15 feet to 30 feet in height with dark bursting park: the leaves are double winged each with 10 to 12 leaves with a quarter of an inch long which can bloom in the month of september and october and the flowers are yellow with a diameter of half an inch followed by the development pods are about 6 inches long and contains 8 nuts (Bargali and Bargali, 2009; Amadou and Souie, 2020). *A. notiluka* trees are very thickly distributed as invasive species in waterlogged ponds frequently shack their byproducts that undergo decomposition which ultimately may cause physico-chemical disparity or acidification by the addition of anion into the pond water which may have profound impact over aquatic fauna especially to higher freshwater invertebrate like molluscs (Ismail et. al, 2016) and also infect other fauna while *Acacia Nilotica* leaves and extract used as Water Disinfectants (Jannah et. al, 2019). *A. nilotica* and *R. communis* leaves, stem and bark exhibited inconsiderably acidic in nature (Naqvi, et.al, 2016). Impacts of Environmental parameters for example low pH caused by decomposition of leaf litters have diminished survival of the freshwater Snail: Forest ponds contaminated by a massive amount of leaf litter, and separation from supplementary aquatic environments make different pH that influence all degree of ecosystems and biodiversity reduces with acidification, due to the eradication of species that are most prone to low pH (Spyra, 2017)

The aqueous extract of the *A. nilotica* trees have been established to be extra powerful in managing Biomphalaria snails ( Asharaf et al., 2017). Kamble and Kamble (2014) explored noxious copper sulphate and pod extract of *A. sinuata* on behavioural feedback of freshwater snail *B. bengalensis*. Molluscicidal activity of *A. seyal* (Dell) bark methanolic extract against *Biomphalaria pfeifferi* Snails was investigated by Ismail et al, 2016. *A. nilotica* has the capability to destroy aerobic and coliform bacteria so that it has the capability to decontaminate water (Skrbic et.al, 2021). *A. nilotica* trees are drought tolerant and invade the perennial and seasonal ponds located everywhere in south, central and western drought areas of Tamil Nadu. Due to its thick abundance on the ground of the ponds, they habitually shake their byproducts as barks, stems, leaves, flowers, gums and pods over the surface of the water and they decompose. Assuming that the water in the pond may be converted to acidic by the release of hydrogen ions as a result of the natural process of decomposition and such an unfortunate event will make it difficult for aquatic organisms to survive (Naqvi et al., 2011) and he also proposed that *A. nilotica* leaves, stem, pods and bark exhibited slightly acidic in nature (around or below pH 6.1). Almost all freshwater snails are beneficial scavengers that eat algae, dead plants, dead fish, extra fish food and other waste (Kuroda and Abe, 2020). This cleaning ability makes them an outstanding addition to freshwater ponds. There is an urgent need to protect the freshwater snails of the freshwater ecosystem by conducting related studies. Therefore, this investigation has been assigned to find out the pH alteration in ponds caused by by-products of *A. nilotica* and its impacts on aquatic and amphibious snails at different seasons.

### **MATERIAL AND METHODS**

Periyakulam pond is located near the Valavadi section, about 5 km from Udumalaipettai town, Tirupur district of Tamil Nadu, India. The water storage area is 405 acres. Fish farming is important here and the water is left open for crop irrigation. The water supply is available through rainwater harvesting and drainage from Thirumoorthy Dam. Due to the high water availability in the pond during the monsoon season, not only other fish species but also snails are found in large numbers. The uniqueness of this pond is that about 70% of the ground is occupied by dense invasive species of *Acacia nilotica* seen as drought tolerant trees. A very huge availability of *A. nilotica* in periyakulam pond is taken as one of the reasons for this investigation. The water supply to the pond is available only in the months of August, September, October, November, December and January, after which there is no water supply from nowhere. In the summer, a small amount of water is left in the pond.

The area where the periyakulam pond is located receives light rainfall from August-September due to the south-west monsoon and heavy rainfall from October-January with the north-east monsoon. Therefore, from August to January considered as the rainy season and from February to July as the summer are taken into account. The impact of *A. nilotica* byproducts on freshwater snails are enumerated in two ways: one by calculating the mortality and secondly by analysing the pH of the pond water twice a month using digital pH metre which gives accurate disparity of hydrogen ion concentration in water. It is best to test the pH level early in the morning. Hydrogen ion concentration of water is taken twice each month and the average is calculated.

To calculate the mortality of snails, snail shells are collected on metal trays around the edge of the pond twice a month throughout the year. While segregating the species, the following features are carefully taken into account. They are the overall shape of the shell, direction in which the shell is coiled, colour of the shell, colour pattern, Shell thickness and translucence and Surface sheen, texture and sculpting. Care should be taken that the empty shells exactly look a very discrete colour from a shell with the snail interior

### **RESULTS AND DISCUSSION**

The adverse effect of by-products from *A. nilotica* on freshwater and amphibious snails have been investigated in two routes: one by determining the mortality of aquatic snails and amphibious snail in two different season and secondly by frequent testing of the pH of pond water which is conducted throughout the year of study. Since pH can be altered by hydrogen ions in the water, pH is a dominant indicator of the pond subject to modifying chemically.

According to the investigation, the months from August to January were considered as the monsoon period where the pH values of the pond were pH 6.3 in August, pH 6.9 in September, pH 7.1 in October, pH 7.2 in November, pH 7.4 in December and pH 7.1 in January (Table-1). From the above results, it was clear that pH of the pond was slightly acidic during the months of August and September when the pond was recovering from summer. Consequently, the pH of the pond became slightly alkaline from the months of October to January. Especially since the pH values of the pond started to decline a lot during the summer from the months of February to July in the order of pH 7.1 in February, pH 6.9 in March, pH 6.7 in April, pH 6.4 in May, pH 6.1 in June and pH 5.9 in July respectively. The pH was slightly alkaline (pH 7.4) (Table -1) during the rainy season

and it was dropped to acidic (pH 5.9) in the summer season due to the release of hydrogen ions from by-products of *A. nilotica*. During monsoon, the maximum pH was 7.4 observed in the month of December due to huge inflow of water from raining and drainage from thirumoorthy dam which might have brought more calcium from the calcium based soil bed. During rainfall, the shells collected from dead snails were very limited, totaling 52 numbers. The percentage of snail mortality ranged between 30% to 0.8% where the highest percentage of mortality was observed in *Lymnaea stagnalis* (33%), the percentage of death in *Bithynia pulchella* was 19% and of course 0% mortality was noticed in *Paludomus tranchauricus*, *Indoplanorbis exustus* and also in amphibious species of *Pila globosa*. (Table -2)

They might be a very rare occurrence or they might not be influenced by slight alkaline pH. In the rainy season. The results obtained in the summer had been reversed. The total number of shells collected were 8550. The percentage of mortality was extremely higher in four snail species. The death percentage was 31% in *Lymnaea stagnalis*, *Lymnaea luteola* was 27%, *Melanoides tuberculatus* was 21% and *Bithynia pulchella* was 20% (Table -2). Contrastingly the results of fatality were very limited in other freshwater snail species including amphibious snails. The observed mortality results were 0.3% in *Paludomus tranchauricus*, 0.2% in *Indoplanorbis exustus* and 0.08% in *Pila globosa*. The snail species *Paludomus tranchauricus*, *Indoplanorbis exustus* and *Pila globosa* were scared in this pond. Hence the percentage of mortality was below 1%. (Table -2)

.There might be various reasons behind the low and high pH values of the pond ecosystems. The cause of the rise in pH was due to massive flow of water which brought substances discharging from the pond's surroundings and the low pH of the pond was determined by acid rain, inflow of carbon dioxide from atmosphere and carbon dioxide was dissolved due to the breathing of freshwater organism but luckily neutralised by photosynthesis of aquatic plants. The present study results showed that the very low pH value of 5.9 was noticed in the hindmost month of summer. At the end of the study, this reason became admissible that *A. nilotica* trees were thickly dispersed nearly 70% of the waterlogged areas as meddling species in periyakulam pond habitually discard their flowers, stems, leaves and pods that underwent decomposition which ultimately release acids might have caused chemical diminish especially in hydrogen ion concentration of pond water. Velu et al (1999) reported the presence of allelochemicals including tannins, flavonoids and phenolic acids in *A. notiluka*. Leela et al. (2010) found that the presence of gallic acid in the bark of *A. notiluka*. Naqvi et al. (2011) confirmed and supported the present study results that *A. nilotica* leaves, stem, pods and bark exhibited slightly acidic in nature (around or below pH 6.1) and further his findings added that Wherever the byproducts of *A. nilotica* were spread, the surrounding ecosystems will be slightly acidic in nature.

The present experiment revealed that there was no significant mortality of all seven species of snails collected from the investigation site during the monsoon season. The species richness of the pond was not changed when the pond was maintained in neutral or slightly alkaline condition which had been restored due to massive discharge of freshwater that made sense to understand no species of snail affected by neutral or slightly alkaline condition. During the summer season, the acidity of the pond started to increase due to declining rainfall, the continuation of *A. nilotica* litter decaying process followed by increase in the release of organic acid accumulation in the pond. On the other hand, the mortality of snails were uncountable in only four among the seven species in the late summer season: the prime reason was that the pH value of the pond dropped below 6. Among the four species, *Lymnaea stagnalis* stood first in its mortality followed by *Lymnaea luteola*, *Melanoides tuberculatus* and *Bithynia pulchella*. The result of mortality indicated that the four among the seven species were unable to tolerate slight lowering of pH from neutral to acidic condition. Unlike acid intolerant species, *Indoplanorbis exustus* and *Paludomus tranchauricus* were highly tolerant to lower pH. Both might be rare species or only they had limited populations in that particular geographical area. Hence, the percentage of mortality was not higher like the other four species. *Pila globosa* was an amphibious species. The percentage of mortality indicated that they might be either had the capability to withstand acid pH started to drop or they could escape when the pond began to dry up and they were forced to lead the terrestrial mode of life with their available adaptations already they had. The present study results were confirmed by the findings of Ismail et. al. 2016 who received a positive result from the molluscicidal activity assay test using methanolic extract of *Acacia seyal* tree bark against snail *Biomphalaria pfeifferi*. Further it was clear that not all the snail species had the same survival capability in both acid or alkaline conditions. Some snails were capable of living in slightly acidic pH and others were greater potentially in slightly alkaline pH but all snails had superior capacity to live in neutral pH. Everyone had their own capability of survival in varying pH. The overall results of the investigation pointed out that there was a great variation in the total number of mortality between the rainy and summer season. The mortality was very less in the rainy season whereas it was higher in four among the seven species. It was mainly due to the adverse impact of *A. nilotica*. Malek (1958) revealed that freshwater snails habitually have a pH

tolerance of 6.0-9.0 with remarkable inconsistency. In the Belgian Congo, Gillet and Wolfs (1954) pointed out that species of Biomphalaria and Bulinus snails are alive in lakes with pH up to 9.2.

**Table – 1** Table showing the pH value of different months of rainy and summer season

SL.NO	RAINY SEASON		SUMMER SEASON	
	MONTH	pH VALUE	MONTH	pH VALUE
1	August	6.3	February	7.1
2	September	6.9	March	6.9
3	October	7.1	April	6.7
4	November	7.4	May	6.1
5	December	7.2	June	6.0
6	January	7.1	July	5.9

**Table -2** Table showing the number of shells collected from dead snail species and percentage of mortality in the rainy and summer season.

SL. NO	SPECIES	Number of shells collected from dead snail in different seasons		Percentage of mortality was calculated in different seasons of experiment	
		Rainy	Summer	Rainy	Summer
1	Lymnaea stagnalis	17	2647	33%	31%
2	Lymnaea luteola	14	2327	27%	27%
3	Melanooides tuberculatus	11	1836	21%	21%
4	Bithynia pulchella	10	1690	19%	20%
5	Paludomus tranchauricus	00	24	0%	0.3%
6	Indoplanorbis exustus	00	19	0%	0.2%
7.	Pila globosa	00	07	0%	0.08%
	Total	52	8550		

## CONCLUSION

The acidification is the major problem of freshwater living animals. The animals are not tolerable to both extreme pH but they lead a sophisticated and healthy life in neutral pH and are forced to lead an adjustable life in slightly alkaline or acidic pH. The acidification of freshwater ecosystems due to decomposition of man made pollutants has the possibility to manage and control their detrimental effects on aquatic fauna. The acidification of perennial water bodies is a natural process due to massive litter decomposition belonging to few invasive species of plants or trees like *Acacia nilotica*. Unlike man-made pollutants, it is somewhat difficult to control the distribution of invasive plants or trees. The distribution of *A.niloca* in the freshwater ecosystem solely depends on seasonal variation. The seasonal variation in a particular area is not reversible. Even though it is reversible, It may take centuries or it may not happen. In order to prevent acidification and extinction of acid intolerant species of aquatic fauna, there is no doubt that the best solution is to uproot the acidic plants and trees from the pond with the permission of the forest department. The other possible benefit from this solution is that during the rainy season, the water coming into the pond can be stored in large quantities used for fish farming to meet the food needs. It protects the snails from acid-induced death and lets them work as scavengers in the pond.

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## A Clinical Efficacy of Siddha Formulation “Anda Elagam” for Gunmam (Peptic Ulcer Disease)

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### ABSTRACT

Peptic ulcer is one of the world's major gastrointestinal disorders and affecting 10% of the world population. Peptic ulcer disease is a disease located in the gastric or duodenal part of the gastrointestinal tract that mainly involves the mucosa layer. An estimated 15000 deaths occur each year as a consequence of peptic ulcer. Proton pump inhibitors are among the most commonly used and overprescribed medications in the world. The side effects of the PPIs, such as a headache, diarrhea, constipation, and abdominal discomfort becomes serious concern upon long-term usage. The potential of herbal supplements as source of new drugs still offers a large field for scientific research. But only a fraction of them has already been assessed for its efficacy still huge number of formulation belongs to Indian system of traditional medicine is yet to be explored. The main aim of the present study is to evaluate the anti-ulcer potential of the Siddha drug Agasthiyar elathy chooranam (AEC) in aspirin ulcerated rats. The results were tabulated to show efficacy of treatment. Clinically ‘Sirucinni uppu’ is shown as an effective medicine in treating ‘Gunmam’ (peptic ulcer) patients with 80% satisfactory result, 10% fair, and 10% moderate result. The present analysis is beneficial in the effective usage of patterns and relationships reflected in datasets collected from real cases of peptic ulcer disease treatment.

**Keywords:** *Anda elagam, Siddha, Herbal Medicine, Peptic ulcer, Gunmam, Traditional Medicine*

### INTRODUCTION

Peptic ulcer disease (PUD) is the most common and serious gastrointestinal disorder on clinical practice. Peptic ulcer is a sore in the lining of stomach or duodenum or anywhere in the gut. If peptic ulcers are found in the stomach, they are called gastric ulcers. If they are found in the duodenum, they are called duodenal ulcers. The symptoms related with PUD are dyspepsia, burning pain in the gut, heartburns, vomiting after or before meal, constipation, not feeling of well [1]. An estimated 15,000 deaths occur each year as a consequence of PUD. In India, peptic ulcer is more prevalent in Jammu and Kashmir, followed by Southern India. North India comes next, and East and North East have comparatively lower prevalence [2]. PUD is common in India, the Indian pharmaceutical industry have 6.2 billion rupees drugs share of antacids and antiulcer drugs and occupy 4.3% of the market share [3]. Herbal medicine is being used largely about decades for the treatment of Peptic ulcer. Plants are the

only economic source of a number of well-established and important drugs. In addition, they are also the source of chemical intermediates needed for the production of some drug [4]. The drugs like Antacids, H<sub>2</sub> Receptor antagonist and Proton pump inhibitors are used for PUD all around world widely. The use of medicinal plants becoming more popular due to the adverse effects of such allopathic drugs. According to W.H.O, about 80% of the world population rely mainly on herbal remedies [5]. Drug treatment of peptic ulcers is targeted at either counteracting aggressive factors (acid, pepsin, active oxidants, platelet aggravating factor “PAF”, leukotrienes, endothelins, bile or exogenous factors including NSAIDs) or stimulating the mucosal defense like mucus, bicarbonate, normal blood flow, prostaglandins (PG), nitric oxide [6]. The conventional drugs used in the treatment of ulcer include histamine receptor antagonists, prostaglandins analogues, proton pump inhibitors, cytoprotective agents, antacids and anticholinergics, but most of these drugs produce undesirable side effects or drug interactions and may even alter biochemical mechanisms of the body upon chronic usage [7]. India is known as the “Emporium of Medicinal plants” due to availability of several thousands of medicinal plants in the different bioclimatic zones [8].

The Siddha system of medicine is one of the most ancient systems. It is the holistic health care system perfected many thousands of years ago in the Tamil speaking peninsular India. Siddha system is associated with Siddhars – the enlightened seekers, who aimed for ageless body to achieve their highest spiritual goal. Peptic Ulcer Disease (PUD), synonymously called ‘Gunmam’ in Siddha system. There are 8 types of Gunmam explained in the textbook by Siddhar Yugi in his Yugi Vaithiya Chinthamani [9]. Siddha Materia Medica comprises of Herbs, metallo-mineral salts and animal and animal products. There are 32 types of dosage forms in Internal medicine of Siddha system according to literature, of which Elagam ‘leghyam’ (apliable and palatable medicinal confectionary stuff-electuary) is a household name in India.

According to Siddha humoral pathogenesis, *Gunmam* is said to be a result of disequilibrium of three humors viz. *Vatham* (Gas energy), *Pitham* (Heat energy) and *Kabam* (Water energy) due to dietary reasons. Though AE is broadly indicated for a spectrum of abdominal disorders (*Gunmam*), it is presently the mainstay of treatment instituted by the Siddha physicians for Acid peptic disorders with excellent clinical efficacy observed<sup>3</sup>. *Anda elagam* (AE) a herbo-animal Siddha formulation is administered for *Gunmam* (Acid peptic diseases) by many Siddha physicians popularly. *Anda elagam* ('*Anda*' means egg) is formulated with Hens' egg white, *Cuminum cyminum* L. seeds, *Trachyspermum ammi* L.<sup>4</sup> seeds, lemon juice, ghee and

honey. Anti ulcerogenic activity of the AE has been studied using Aspirin-Pylorus ligation induced gastric ulcer methods (four groups/method, n=6, Aspirin 400mg/kg, Omeprazole 10mg/kg, AL 250,500mg/kg) in wistar albino rat models. The study results showed significant anti-ulcer effects in experimental animals with ulcer induced by aspirin and pylorus ligation; it showed a dose dependent protection against aspirin (400 mg/kg body weight) induced ulcers in rats and it produced a significant reduction of ulcer index in the dose of 500mg/kg bodyweight[10]. The preclinical study provided a scientific evidence for conducting the present pilot study based on its indication in *Noikalukku Siddha Pariharam*[11],[12],[13].

## ETIOLOGY AND PATHOGENESIS

The Peptic ulcer disease (PUD) is a disruption in the mucosal layer of the stomach or duodenum. Peptic ulcers are believed to develop because of increased acid and pepsin secretion, a reduced mucosal defense mechanism, or a combination of these two abnormalities. Environmental factors such as use of non steroidal and steroidal anti-inflammatory drugs, smoking, and emotional stress may play a role in the pathogenesis of ulcer disease. The exact mechanisms whereby these factors cause ulcers is unknown, although it is likely that non-steroidal drugs cause ulcers by reducing mucosal defense mechanisms whereas emotional stress may lead to ulceration by increasing acid secretion and/or decreasing mucosal defense mechanisms. Genetic factors may be important in the pathogenesis of ulcers [14].

The symptom abdominal pain is a common one, but it doesn't always occur. Feeling of fullness in abdomen, hunger and an empty feeling in the stomach often 1 - 3 hours after a meal. Mild nausea (vomiting may relieve this symptom), Pain or discomfort in the upper abdomen, Upper abdominal pain, Bloody or dark tarry stools, Chest pain, Fatigue, Weight loss Complications, bleeding inside the body (internal bleeding), Gastric outlet obstruction, Inflammation of the tissue that lines the wall of the abdomen (peritonitis) and perforation of the stomach and intestines[15].

## 2. MATERIALS AND METHODS

### STUDY DRUG

The Study drug ingredients were authenticated by botanist and the drug was prepared at *Gunapadam* laboratory of Ayothidoss Pandithar Hospital, National Institute of Siddha.

S.No	Ingredients	Quantity
1.	Country Hen's egg White	25 Numbers
2.	Lemon	25 Numbers
3.	<i>Cuminum cyminum</i>	875 grams
4.	<i>Pimpinella anisam</i>	35 grams
5.	Sugar	875 grams
6.	Ghee	183.75 grams
7.	Honey	183.75 grams

### PROCEDURE

The egg white was secured in a vessel and added lime juice (Filtered) to that. Required quantity of sugar was dissolved in the above mixture and mounted on a stove and heated. The mixture was stirred well continually until it attains syrupy consistency and added the powdered mixture of cumin seeds and anise seeds. This was followed by mixing the mixture vigorously and energetically adding ghee to it. After allowing it to cool, honey was added and mixed homogeneously.

**Dosage and duration** : 5 grams, Morning and Night before food for minimum period of 2 weeks to 3-4 months. (Freshly prepared)

### CLINICAL STUDY METHODS

Biomedical ethics were followed throughout the study for all these cases and informed consent was obtained from the study subjects. The study was conducted at NIS OPD after prior approval from IEC (NIS/IEC/10/2016-17/38 - 20-05-2016) from June 2017 for a period of 6 months. The present data was collected from an open labelled single centric study with 17 out of 20 subjects who had given consent between Outpatient and In-Patient Department of Ayothidoss Pandithar Hospital, National Institute of Siddha.

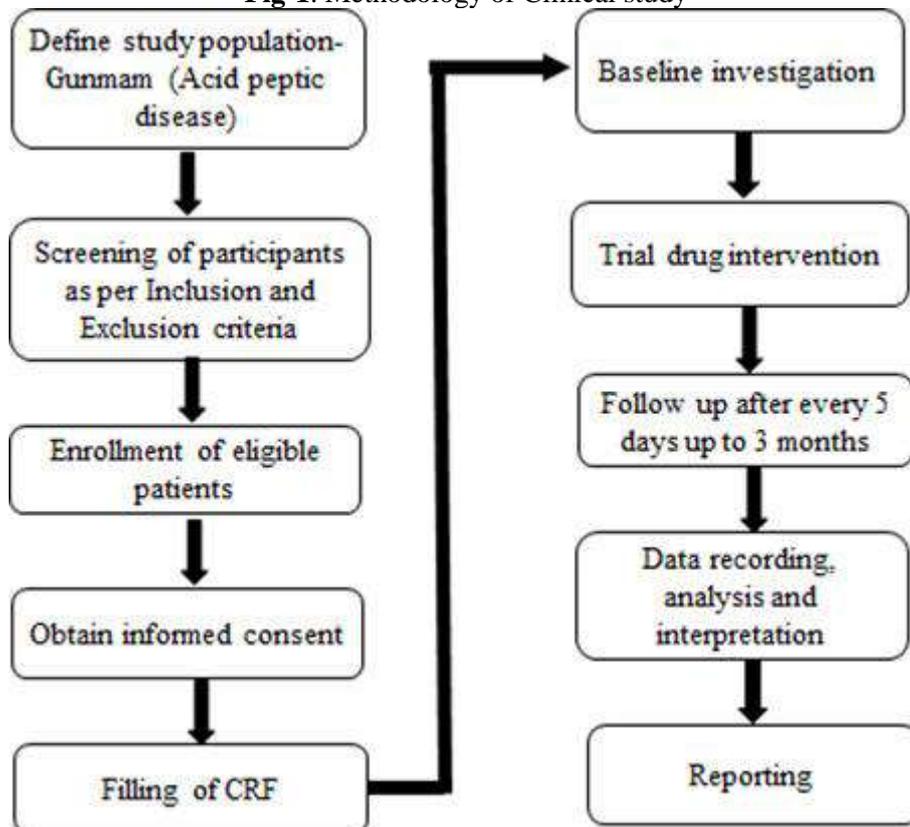
### SELECTION CRITERIA

The selection criteria included male/female/transgender subjects with age group of 15 to 60 with the symptoms of Abdominal pain, Epigastric pain, Epigastric tenderness, heart burn, Dyspepsia, Nausea, Vomiting, Flatulence, constipation, indigestion. The exclusion criteria included Pyloric stenosis, Malignancy in any part of the body, Patient with hematemesis and severe melena, any other Cardiovascular, Respiratory, Hypertensive, Diabetes mellitus, Abdominal Tuberculosis, Hepatic or Renal disease. The withdrawal criteria included subjects with aggravation of symptoms, intolerance to the drug, and development of adverse reactions during the drug trial, incidence of any acute illness which would warrant other extended during treatment during the drug trial, poor patient compliance and drug defaulter.

### STUDY OUTCOME ASSESSMENT

- Primary endpoint of the study was good prognosis with Complete resolution of epigastric pain/tenderness and other clinical symptoms of peptic ulcer disease
- Partial resolution of epigastric pain/tenderness and other clinical symptoms of peptic ulcer disease was considered as moderate outcome.
- No resolution of epigastric pain/tenderness and other clinical symptoms of peptic ulcer disease was considered as poor outcome.

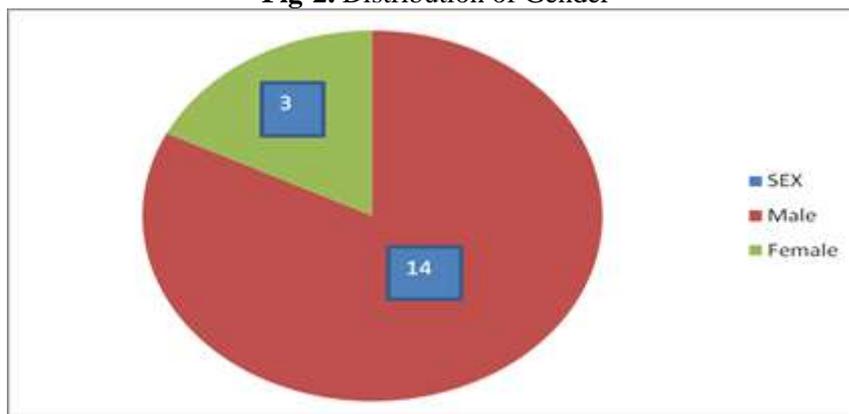
Fig-1. Methodology of Clinical study



### RESULTS AND DISCUSSION

Acid peptic disease are a prevalent disease, and each year peptic ulcer disease (PUD) affects four million people around the world and can lead to chronic conditions such as perforation, bleeding, and onset of malignancy[16]. Therefore early and accurate diagnosis and proper and timely treatment can effectively reduce morbidity and mortality due to *Gunmam* (APD).

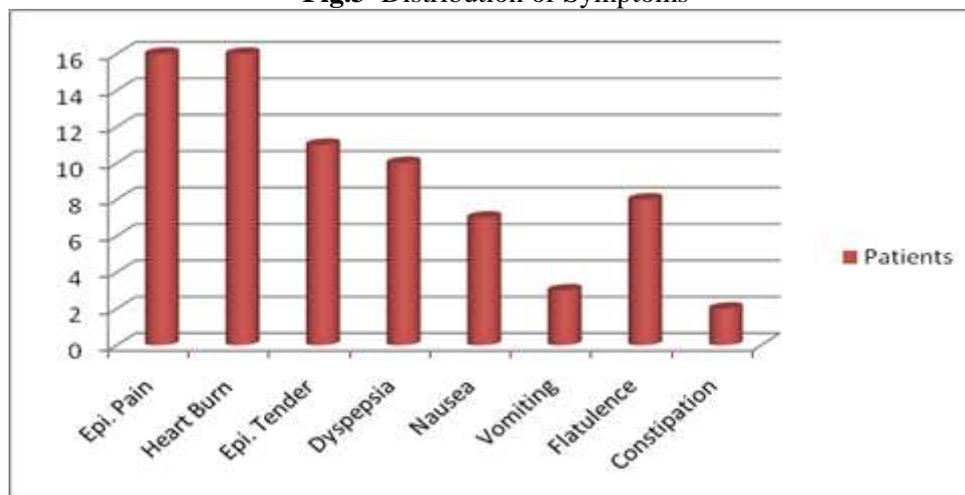
Fig-2. Distribution of Gender



The present study indicated male preponderance of the disease. This might be due to the participation of other risk factors such as smoking, alcohol intake, and nonsteroidal anti-inflammatory drug (NSAID) use in the etiology of PU, which are principally associated with GU[17]. The present study results of male predominance is consistent with the study by Bansod A et al., which indicates that Peptic ulcer perforation is a disease more common in young population with male preponderance with male to female ratio of ulcer perforation as 4.8:1[18]. However according to the National Centre for Health Statistics, male to female ratio for perceived peptic ulcer prevalence decreased from 2.8 in 1958 to 1.0 in 1981.

Until the widespread availability of endoscopy, epigastric pain was thought to be diagnostic of peptic ulcer disease. The present study substantiates that epigastric pain (16 cases) may also be alternatively referred as heart-burn (16 cases) as shown in fig-3. This may occur as a specific and localized symptom, in which case it is frequently referred to as “ulcer-type pain.” Alternatively, it may be part of a group of symptoms that includes heartburn when it is referred to as “reflux-like” or in association with bloating or early satiety when it is referred to as “dysmotility-like”[19].

Fig.3 Distribution of Symptoms



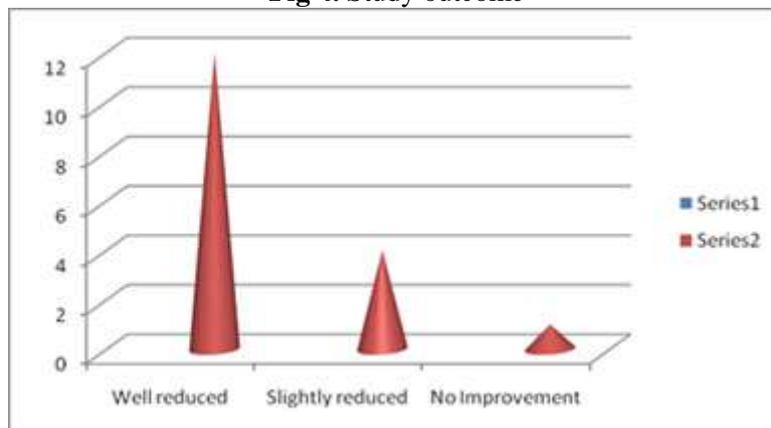
The other symptoms such as Epigastric tenderness, dyspepsia, Nausea and vomiting were also present in few cases which can influence the quality of life and productivity. Hence the goals of therapy should always include relief of symptoms, enhancement of ulcer healing in the affected mucosa (oesophagus, stomach and duodenum) and prevention of recurrence[20].

Drastic reductions in the symptoms were observed within 2 weeks and the patients were followed up to 3 months with *Anda legium* alone. Most of the study participants felt complete

relief of their symptoms after 2 months. Out of seventeen patients, symptoms were reduced well 12 patients and moderately reduced in 4 patients even after the 2 months of drug intake (Fig-4). Out of seventeen patients, one patient was tested positive for rapid Urease test, even after the treatment for a period of 2 months but interestingly the symptoms such as epigastric pain, heart burn, dyspepsia, flatulence, Epigastric tenderness and nausea reduced well and the patient felt satisfied with the study drug.

The trial medicine *Anda Elagam* alone worked well and the patient did not need the intervention of any other drug during the trial period and even at the follow up period. After the follow up of patients the symptoms of epigastric pain and tenderness, heart burn recurred on 2-3 weeks of drug withdrawal for 8 patients due to non compliance of adhering to medical advice and their food habits. A study by Malik TF (2021) also states that recurrence is common with rates exceeding 60% in most series. However the recurrence of the ulcer may be prevented by maintaining good hygiene and avoiding alcohol, smoking and NSAIDs[21].

Fig 4. Study outcome



#### Naadi Nadai (Pulse diagnosis)

According to Sage Theraiyar “*Thodar vaatha panthamalathu gunmam varathu*”, In all the patients *Vaatha naadi* was prominent and *neikuri* was either *Vaatham* or *Vaatha pitham*. So from this we can assume that *vaatha* humour is vitiated in *gunmam* condition. As per the study it proves *Anda Elagam* is very effective in the treatment of *gunmam* and it has given the symptomatic relief for the patients who are suffered by gastritis, irritable bowel disease, esophagitis cases also over a period of 2 to 3 months duration.

Our findings in this regard are beneficial in the development of simple and effective treatment with real cases of APD. Out of the 20 study participants, 17 were screened and recruited and the clinical study methodology was followed as in fig-1. Patients were administered with trial drug 5gm of *Anda Elagam* twice a day for a period of 2 weeks. Most of the patients showed slight reduction in symptoms burning sensation of abdomen, nausea, vomiting, loss of appetite, and flatulence after one week of treatment after which the course was repeated (Fig-3).

While PPIs are among the most commonly used overprescribed medications in the world currently[22]. Its side effects such as a headache, diarrhoea, constipation, and several serious adverse effects, which has been a source of major concern to patients and physicians. Some of the adverse effects of PPIs are related to their suppression of gastric acid secretion, allowing ingested microbial pathogens that would have been destroyed by gastric acid to colonize the upper gastrointestinal tract and cause infections. Reports are suggesting that the use of PPIs might increase the risk of enteric infections such as *Salmonella* and *Campylobacter*, community-acquired pneumonia *Clostridium difficile* infections and spontaneous bacterial peritonitis[23]. Gastric acid inhibition by PPIs also can affect the uptake of certain vitamins, minerals, and medications. There are reports of patients on PPIs developing vitamin B12 deficiency and iron deficiency anemia [24] Hence in this scenario, herbal formulations have a unique task in reducing the necessity of synthetic antacids.

*Anda Legium* has been explored by Christian GJ et al.,(2014) in previous preclinical studies to have significant anti-ulcer effect by virtue of its anti-secretagogue and antacid acid neutralizing activities[10]. Its antiulcer activity owes to its ingredients that have also been evidenced scientifically. *Cuminum cyminum* seeds extract (CCSE) brings down the high level of pH of the gastric environment maintains the acid-base balance of gastric content. CCSE has anti-ulcer activity due to the presence of terpenoids, flavonoids, and tannins[25]. The ethanolic extract of *Trachyspermum ammi* plays a vital role in reducing ulcerative which exhibits antiulcer activity[26]. The ulcer healing effect of lemon juice is due to weak gastric antsecretory and gastric cytoprotective effects. *Citrus lemon* has a number of chemical constituents that includes flavonoids, terpenes, carotenoids and calcium. Flavonoids and triterpenoids such as limonene and  $\beta$ -pinene has gastric cytoprotective effects. Furthermore, carotenoids are also contain antiulcer effect[27]. Ghee is an important carrier of fat soluble vitamins (A, D, E, K) and essential fatty-acids (linolenic acid and arachidonic acid), which contains rich and pleasant sensory properties.

It is believed to be a coolant, capable of treating ulcers and eye diseases[28]. Honey has high amount of flavonoids is believed to have the value of pharmacological activities include preventing the formation of gastric ulcers via its antisecretory and antioxidant mechanisms[29]. Recommended nutrients for faster healing of peptic ulcer have been studied to be different in the acute phase and in the recovery phase, and there is a greater need of protein and some micronutrients, such as vitamin A, zinc, selenium, and vitamin C in the recovery phase. In addition, some studies have shown that vitamin C has a beneficial effect in eradication of *H. Pylori* [30].

### STUDY LIMITATIONS

The present study has several limitations and the data was limited to a small number of patients with most of asymptomatic cases and only one case was urease positive indicative of *H. Pylori* infection. Further studies should follow up with longitudinal studies on a larger cohort to understand the prognosis of the disease and the study outcome. The study did not take into account the co morbid conditions of the patients, history of contact, smoking, alcohol history that could influence the study outcomes. The study did not enrol male and female genders equally hence gender-related differences of susceptibility and study outcome are limited

### CONCLUSION

In this modern era, around 75-80% of the world populations still use herbal medicine for primary health care because of better cultural acceptability, better Compatibility with the human body and lesser side effects. These preliminary findings support the use of *Anda Elagam* for *Gunmam* (Acid peptic disease). There was no observable side effects or any inconvenience to the study subjects. The pilot study results may be confirm the clinical use of Siddha formulation *Anda Elagam* to alleviate the symptoms of all GIT related disorders that are due to Acid Peptic disease (APD).

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## **Scenario of the Assam Gramin Vikas Bank: A Comparative Study with the RRBS at the National Level**

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### **ABSTRACT**

*In the following study an inquiry is made to understand the comparative performance of the RRBs in India and the AGVB exclusively functioning in the state of Assam. The overall motto is to see the AGVB operational viability in terms of the national average of RRBs. The study has been done chiefly on the basis of the availability of data collected from the annual reports of NABARD and the yearly reports published by the AGVB in addition to a few other pieces of literatures reviewed by the researchers. The study has been carried out taking important factors like deposits, loans, and advances, NPA, recovery position, and profitability, etc. It is observed that the overall performance of the RRBs in India and the AGVB, in particular, are not encouraging in the present context. Its high NPA, low recovery rate, and dwindling profitability are the major concern in the present situation. Moreover, the overall functional merit picture of the AGVB in comparison to RRBs in India is found to be much lower. In order to make the study widely comprehensive, the researchers have presented various calculations on the above-said parameters and used statistical tools like Mean, Standard Deviation, and various other charts as per the required demand of the study. The time frame taken for the comparative examination of RRBs and the AGVB is from the period 2010 to 2019.*

**Keywords:** RRBS, AGVB, Branch Network, Deposits, Loans, Volume of Business, NPA, Profitability

### **INTRODUCTION**

In 1975, in the month of July the Government of India appointed a Working Group on 'Rural Banks' under the Chairmanship of Mr. M. Narasimham to study in-depth the setting up of new rural banks as subsidiaries to public sector banks to cater to the needs of the rural people. Bearing in mind the size and regional diversity, the working group observed that no single pattern - be it commercial banks or co-operative credit institutions can be expected to meet all the emerging requirements in all the concern areas. Therefore a degree of adaptation and a new alternative banking arrangement is called for and widened for the institutional arrangement of banking in India. In this context, the working group suggested a new type of institution combined with the local feel and familiarity of the problems at the local levels as like co-operatives poses, and the degree of business organization, ability to mobilize deposits, access to central markets, and a modern up to date outlook which commercial banks generally have. The recommendation provided by the Working Group was accepted by the Govt. of India. As per suggestion RRB ordinance, 1975 was promulgated which was later replaced by the Regional Rural Banks Act, and on 2nd October 1975, five RRBs were established in the country for the first time.

The primary objectives towards the establishment of RRBs were to uplift the rural development, to deliver credit facilities to small and marginal farmers, landless workers & rural artisans, to inculcate banking habit in the rural masses; to help small entrepreneurs in the establishment of industries; to eradicate unemployment of rural areas and overall to develop the backward areas by widening the banking facilities to all the sections of the people in the country. Initially, the authorized capital of RRBs was Rs. 1 crore, and paid-up capital was Rs. 25 crores which were funded by the Central and State Govt. and the Sponsor Bank in the ratio of 50: 15: 35.

In a similar line, the Assam Gramin Vikas Bank which is one of the RRB working in the state of Assam in India was set up on 12th January 2006 by merging all the previously functional GrameenVikas Banks of the state i.e. Pragjyotish Gaonlia Bank, Lakshmi Gaonlia Bank, Cachar Gramin Bank and Subansiri Gaonlia Bank as per provision under section 23(A) of RRB Act, 1976. Currently, the Assam Gramin Vikas Bank is operating in all the 30 districts of the state of Assam. Like any other RRBs, it also provides emphasis for developing the rural economy with credit to agriculture, artisans and small entrepreneurs, self-help groups, etc. and also transacts business as defined in section 18(2) of the RRB Act, 1976 and Section 6(1) of the Banking Regulation Act, 1949.

**Literature Review:** The following literature has been reviewed in order to understand the comparative scenario of the currently considered banking organizations at the state and the national level in India.

The Narasimham Committee (1998) underlined that while discharging their functions as purveyors of rural credit and mobilizers of rural savings, RRBs should not ignore the significance of financial viability and

operational effectiveness. The profitability, productivity, and solvency of the RRBS must be maintained and continue to upkeep them functioning as an effective and efficient institution of rural credit.

Again the subject of whether location matters for the performance has been addressed in detail by Malhotra (2002). The RRBS followed usually the same methods of operation and procedures as followed by commercial banks which have not found encouraging for the rural masses. In many cases, banks have not been situated in the right place. For instance, the sponsoring banks are also operating their branches in the same areas where RRBS are functioning.

Again Pati (2005) studied the economic viability of RRBS in general and Subansiri Gaonlia Bank (SGB) of Assam in particular. He observed that the banks are facing the problem of loan recovery and fresh accretion in NPAs, lower profitability, and the management problem. His study proposed that proper management of spread and burden will improve the performance of the bank.

In the northeast region of India Tasi (2006) studied the role of RRBS in general and Arunachal Pradesh Rural Bank in particular. The study dealt with the performance evaluation of Arunachal Pradesh Rural Bank (APRB) for the economic development of the state. The study has ignored the technical parameters of banks and has assessed the role of RRBS in economic development in general.

Similarly, Rao (2007) studied the performance of commercial banks with some established parameters like Business per branch, operating profit per branch, return on assets, return on equity, credit deposit ratio, etc. The study recommended some measures to improve the operational and financial performance to face the challenges in the transition.

Again Kumar (2008) pointed out in his study that as a result of the amalgamation of RRBS, the quantum of credit allocation of banks has been under severe concern mostly for small and marginal farmers, agricultural and landless laborers, and artisans. He recommended an immediate de-amalgamation of RRBS in the interest of the vast majority of the rural poor.

Another study in the northeast region of India is done by Singh and Singh (2009) and in their paper, they examined the recovery performance of Manipur Rural Bank. The study observed that the repayment of loans mainly depends on proper utilization of the loan amount, supply of quality assets, generation of sufficient income from schemes, availability of infrastructural and marketing, facilities, willingness to repay, continuous supervision and follow-up visits, etc.

Similarly, Poongavanam (2011) opined that the banking industry has experienced a sea change after the first phase of economic liberalization in 1991 and hence credit management. In modern times, banks have become very careful in extending loans, this is due to the mounting of NPAs. The NPA account not only reduces the profitability of banks by provisioning in the profit and loss account as well their overall cost is also increased. Apart from this, a high level of NPA also sets stress on a bank's net worth. In view of all the above facts banking industry needed to put more importance on NPA and structure proper corrective solutions. Kumar and Sharma (2011) on the comparative analysis of Himachal Gramin Bank and Parvatiya Gramin Bank found that the Parvatiya Gramin Bank is more conservative as compared to the Himachal Gramin Bank with regard to NPAs' management. This is because of the fact that NPAs to total assets ratio for the Parvatiya Gramin Bank has reduced.

In this study, an attempt has been made to understand the comparative examination of the Assam Gramin Vikas Bank (AGVB) and the functioning of the RRBS in the country as a whole.

## **OBJECTIVES**

The following objectives have been set to diagnose the comparative understanding of the RRBS at the national & the AGVB in particular-

1. To examine the branch expansion, deposit, and credit scenario of the AGVB in Assam and the RRBS at the national level.
2. To scrutinize the profitability of the AGVB and the RRBS in a comprehensive manner.
3. To identify the NPA and the recovery scenario of the AGVB and the RRBS in both situations.

**Research Methodology:** In order to translate the above-mentioned objectives into the real ground of study the researchers have primarily considered the secondary sources of data that are available in the annual reports published by the AGVB and the annual reports of NABARD. Simultaneously researchers have also consulted a

few other reports and works of literature available on the working of AGVB and the RRBs in India. On the basis of the annual reports of the AGVB & NABARD necessary calculations and compilation of data are done for the period 2010 to 2019. Similarly, other statistical calculations like mean, standard deviation, charts, etc. are also shown in various areas to comprehend the large picture of the analysis.

**Branch Networking:** It is observed from table-1 that the number of branches of the RRBs in the country was 15480 branches in 2010 which increased to 21871 branches in 2019. Over the period of 11 years, there has been a 1.41 times increase in the total number of branches of the RRBs in the country. On the other hand, the number of branches of the AGVB in 2010 was 356 branches which increased to the number of 414 branches in 2019. In the case of the AGVB, there has been an increase of 1.16 times the number of branches in 2019 which is obviously less than the number of times figure of the RRBs at the national level. Simultaneously if we compare the percentage growth of RRBs at both the level it is observed percentage of growth of RRBs in the year 2011 was 3.37 percent which has declined to 0.57 percent in 2019. In the case of AGVB, it was 1.69 in 2011 which decreased to 0.98 in 2017, and thereafter till 2019 there is not even a single branch expansion is found to be made by the existing AGVB in the state of Assam.

**Table-1** Branch Network of the RRBs and the AGVB

Year	Number of Branches of RRBs in India	%of Growth of Branches of RRBs in India	Number of Branches of AGVB in Assam	%of Growth of Branches of AGVB in Assam
2010	15480	-	356	-
2011	16001	3.37	362	1.69
2012	16909	5.67	369	1.93
2013	17861	5.63	374	1.36
2014	19082	6.84	396	5.88
2015	20024	4.94	404	2.02
2016	20920	4.47	410	1.49
2017	21422	2.40	414	0.98
2018	21747	1.52	414	0
2019	21871	0.57	414	0
Mean	19131.7	3.93	391.3	1.71
SD	2433.04	2.11	23.52	1.74

**Source:** Compiled and calculated from the Annual Reports of NABARD & the Annual Reports of the AGVB of Assam

**The Deposit and the Credit Scenario:** The deposit and the credit picture of the RRBs and the AGVB from the period 2010 to 2019 can be known from the table-2. It can be observed that deposit per branch of the RRBs in 2010 was Rs.93700 thousand which increased to Rs.198600 thousand in 2019. Over the years there has been an increase of 2.12 times in the deposit per branch of the RRBs. Similarly, in the case of deposit per branch of the AGVB, it was Rs.97257 thousand which increased to Rs.223610 thousand from period 2010 to 2019 and it increased by 2.30 times which much better than the figure of the RRBs at the national level.

Similarly, in the case of loans and advances per branch and the credit-deposit ratio of the RRBs in 2010 it was Rs. 53500 thousand and 57.9 percent respectively. In 2019 loans and advances per branch increased to Rs.119800 thousand and the CD ratio increased to the extent of 60.32 percent. Over the years loans and advances of the RRBs increased by 2.24 times. It shows that the rate of increase in credit is more than the rate of increase in deposit over the period. In the case of AGVB, the loans and advances per branch and the CD ratio in 2010 was Rs.454.56 thousand and 46.74 percent respectively. In 2019 these figures varied to the extent of Rs. 88068 thousand and 39.39 percent respectively. Over the period CD ratio has declined and whereas the loans and advances per branch increased by 1.94 times. It is observed that the CD ratio in the case of RRBs over the period is increasing while the same is declining in the case of AGVB which indicates the low loan absorption capacity of the region and low entrepreneurial zeal of youth in the region compared to the national level. Over the years the rate of increase of loans and advances per branch of the RRB is far better than the AGVB in Assam.

Again the per capita deposit and the per capita credit of the RRBs in 2010 were 1.20 thousand and 0.68 thousand respectively. In 2019 both the figures increased to the extent of Rs. 3.82 thousand and 2.52 thousand respectively. At the same time per capita deposit and the per capita credit of the AGVB in 2010 was 1.11

thousand and 0.52 thousand respectively and it increased to the extent of Rs.2.97 thousand and 1.17 thousand in 2019. These figures indicate that the increase in per capita deposit and the per capita credit picture of the RRBs is much better in the case of RRBs compared to AGVB at the state level.

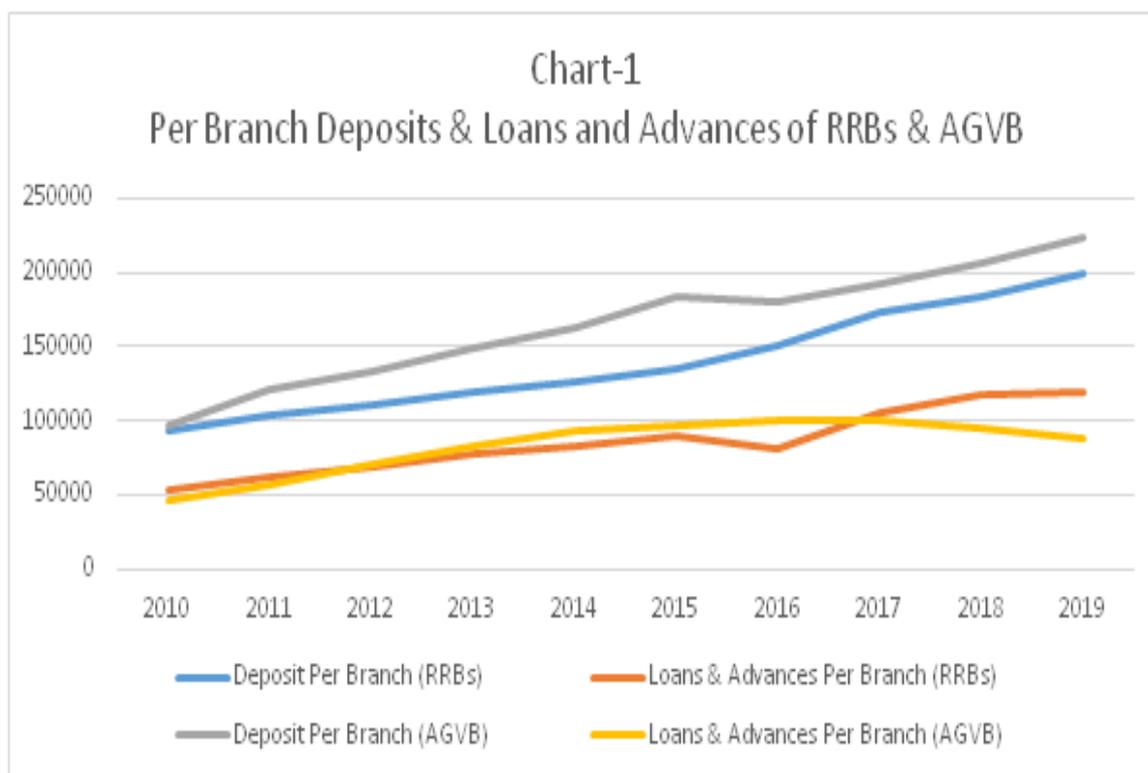
(Amount in Thousand)

Table-2 Deposit & Credit Picture of the RRBs and the AGVB

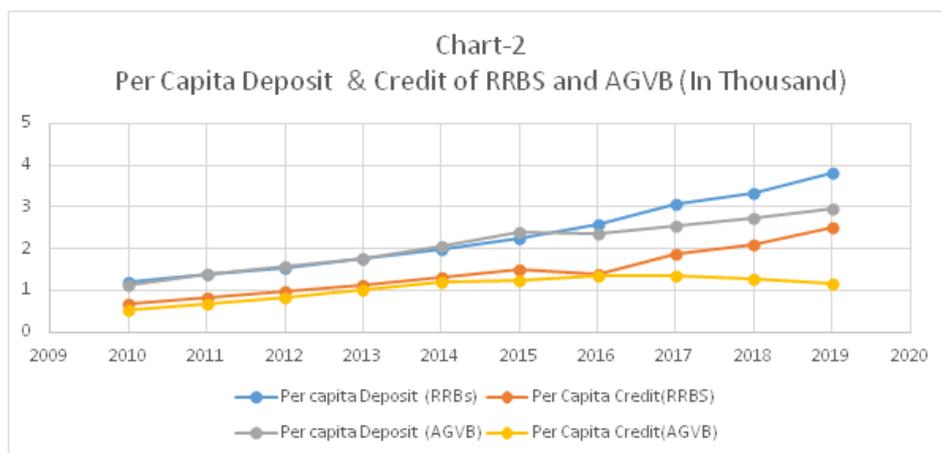
Year	RRBs in India					AGVB in Assam				
	Deposit Per Branch	Loans & Advances Per Branch	Per capita Deposit #	Per Capita Credit #	Credit-Deposit Ratio (%)	Deposit Per Branch	Loans & Advances Per Branch	Credit-Deposit Ratio (%)	Per Capita deposit #	Per Capita Credit #
2010	93700	53500	1.20	0.68	57.9	97257	45456	46.74	1.11	0.52
2011	103900	61800	1.37	0.82	59.5	120895	57260	47.36	1.40	0.67
2012	110200	68800	1.54	0.96	63.3	132336	70503	53.28	1.57	0.83
2013	118400	76700	1.75	1.13	66.1	147896	83249	56.29	1.77	1.00
2014	125500	83500	1.98	1.32	66.5	162373	92619	57.04	2.06	1.18
2015	135500	90400	2.24	1.50	67.0	182731	96338	52.72	2.38	1.25
2016	149800	81100	2.59	1.40	65.8	180048	100785	55.98	2.37	1.33
2017	173600	105600	3.07	1.87	62.8	191406	100190	52.34	2.54	1.33
2018	184100	116800	3.31	2.10	65.23	205495	94561	46.02	2.73	1.26
2019	198600	119800	3.82	2.52	60.32	223610	88068	39.39	2.97	1.17
Mean	139330	85800	2.29	1.43	63.45	164404.7	82902.9	50.72	2.09	1.05
SD	35949.47	22481.30	0.89	0.59	3.24	39735.64	19060.8	5.67	0.61	0.29

Source: Compiled and calculated from the Annual Reports of NABARD & the Annual Reports of the AGVB of Assam

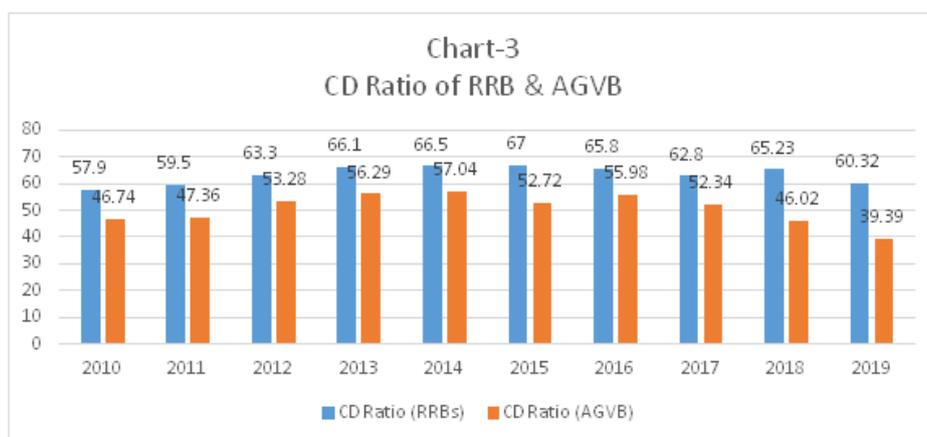
# Calculated With the Help of Population Census Data of 2011.



Source- Prepared on the Basis of Table-2



Source- Prepared on the Basis of Table-2



Source- Prepared on the Basis of Table-2

**Profitability Scenario:** It is observed from table-3 that the volume of business per branch and the profit per branch of the RRBs in the year 2010 was Rs. 147200 thousand and Rs.1600 thousand respectively. In 2019 the volume of business and the profit per branch varied to the extent of Rs.318400 thousand and Rs. 600 thousand. Over the years although the volume of business per branch is increasing the profit per branch is constantly decreasing. A similar picture can be seen in the case of AGVB also. The volume of business per branch of AGVB in 2010 was Rs.142713 thousand which has gone up to Rs. 311678 thousand in 2019. In case of the percentage of profit per branch, it has fallen from Rs. 1052 thousand to the loss of Rs. 1189 thousand in 2019. It is also observed that the percentage of profit on the volume of business is constantly falling both in the case of RRBs and the AGVB. The percentage of profit on the volume of business in the case of RRBs in 2010 was Rs. 1.09 percent which decreased to the level of 0.19 percent in 2019. With regard to AGVB, it decreased to the loss of Rs. 0.38 percent in 2019 from the positive figure of Rs.0.74 percent in 2010. This constant falling of the profit at RRRBs and AGVB is primarily due to the rising level of NPAs and the low recovery positions at both ends.

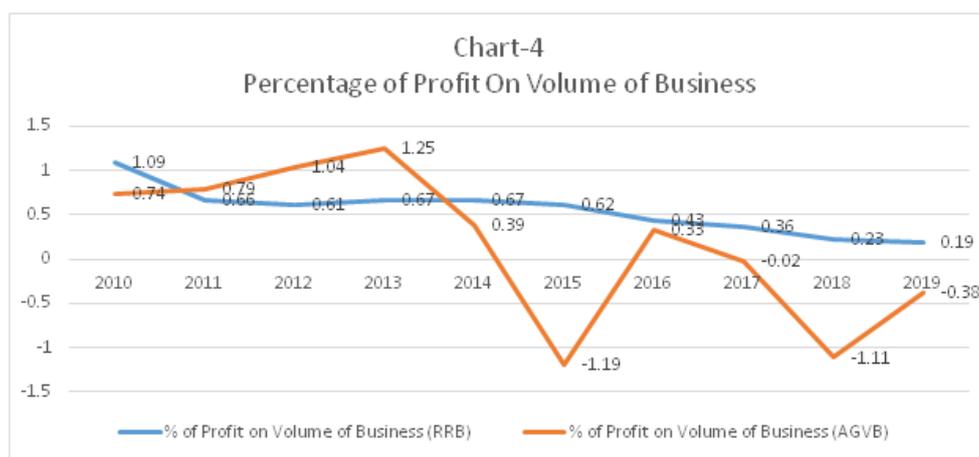
(Amount in Thousand)

Table-3 Profitability Scenario of RRBs and the AGVB

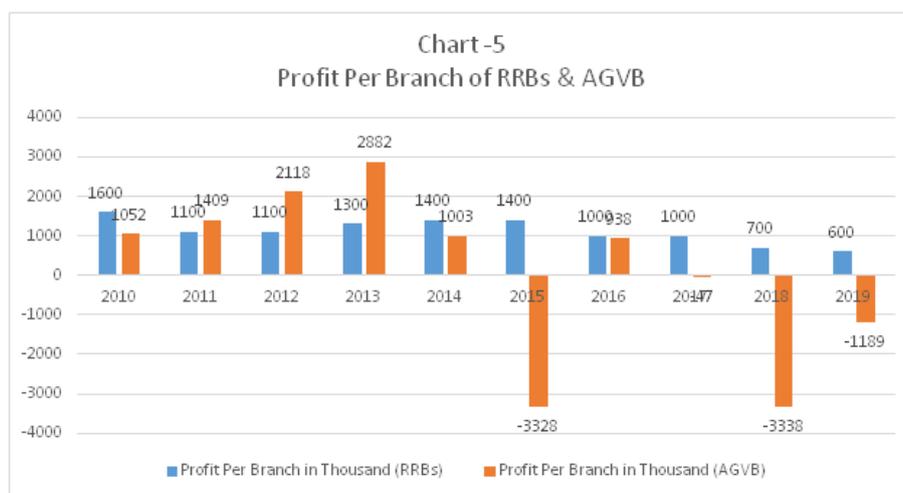
Year	RRBs in India			AGVB In Assam		
	Volume of Business Per branch	Percentage of Profit on Volume of Business	Profit Per Branch	Volume of Business Per Branch	Percentage of Profit on Volume of Business	Profit Per Branch
2010	147200	1.09	1600	142713	0.74	1052
2011	165700	0.66	1100	178155	0.79	1409
2012	179000	0.61	1100	202839	1.04	2118
2013	195200	0.67	1300	231145	1.25	2882
2014	209000	0.67	1400	254992	0.39	1003

2015	225900	0.62	1400	279069	-1.19	-3328
2016	230900	0.43	1000	280833	0.33	938
2017	279200	0.36	1000	291596	-0.02	-47
2018	300900	0.23	700	300055	-1.11	-3338
2019	318400	0.19	600	311678	-0.38	-1189
Mean	225140	0.553	1120	247307.5	0.184	150
SD	58010.35	0.26	315.52	56803.64	0.85	2139.01

Source: Compiled and calculated from the Annual Reports of NABARD & the Annual Reports of the AGVB of Assam



Source- Prepared on the Basis of Table-3



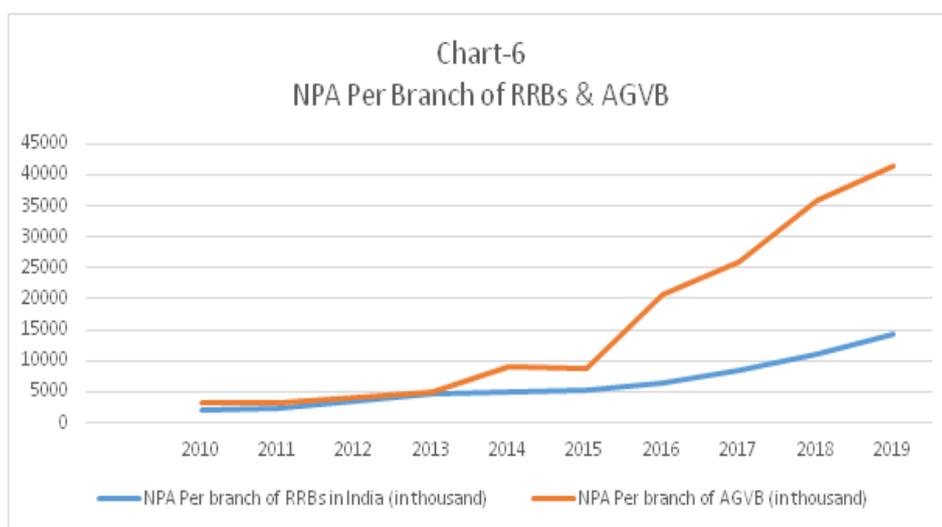
Source- Prepared on the Basis of Table-3

**Non-Performing Assets and Recovery Position:** Table-4 demonstrates the non-performing assets and the recovery position of the RRBs and the AGVB in their way of functioning. It is observed that RRBs, NPA per branch in 2010 was Rs.2000 thousand and at the same time NPA per branch in AGVB was Rs. 3113.21 thousand. In 2019 these figures increased to the tune of Rs.14200 thousand and Rs.41349.81 thousand respectively. Over the years NPA per branch in RRB increased by 7.1 times and in AGVB it increased by 13.28 times which is about twice the figure the rate of increase in RRBs. Similarly, the percentage of NPA to loans outstanding in RRBs was 3.72 percent and in AGVB it was 6.85 percent respectively in 2010. In both places, it increased to the tune of 11.89 percent and 46.95 percent respectively in 2019. Over the years rate of increase in AGVB as compared to RRBs was more than 2.91 times bigger in volume. It indicates that although NPA is rising in both situations, its management in the case of AGVB is much terrible compared to the RRBs, NPA scenario at the national level. Similarly in the line of recovery percentage in 2010, it was 80.09 percent for RRBs and 70.08 percent AGVB. In 2019 recovery percentage also fallen to both the cases indicating the figure of 76.9 percent for RRRB and 51.80 percent respectively for AGVB. The constant rate of falling of recovery percentage of the AGVB indicates the deplorable situation in the recovery area and needs immediate attention to control it.

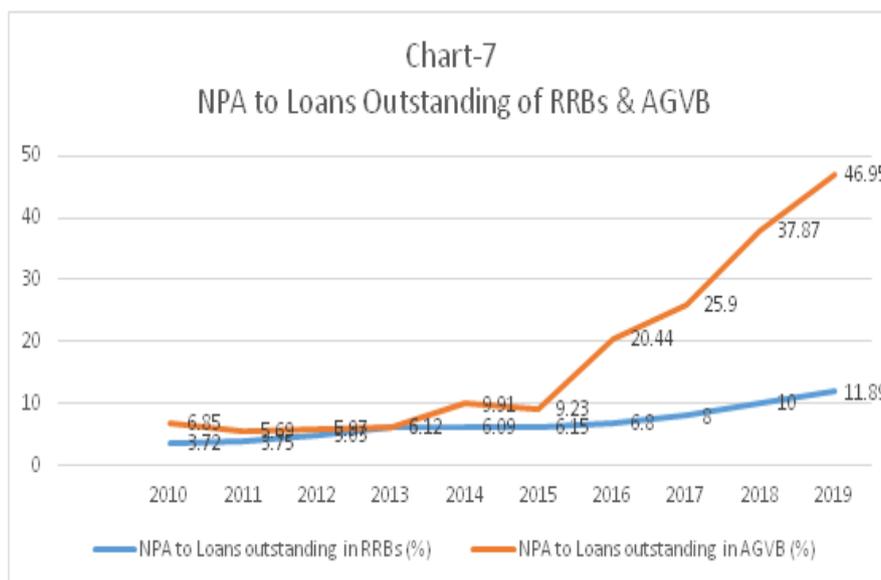
**Table-4 Non-Performing Assets and the Recovery Position of RRBs & AGVB**

Year	NPA Per branch of RRBs (in thousand)	NPA to Loans outstanding in RRBs (%)	Recovery Percentage In RRBs	NPA Per branch of AGVB (in thousand)	NPA to Loans outstanding in AGVB (%)	Recovery Percentage In AGVB
2010	2000	3.72	80.09	3113.21	6.85	70.08
2011	2300	3.75	81.18	3257.44	5.69	70.44
2012	3500	5.03	81.6	4207.80	5.97	70.08
2013	4700	6.1	81.2	5092.95	6.12	71.03
2014	5100	6.09	81.9	9181.28	9.91	72.05
2015	5300	6.15	79.5	8889.61	9.23	73.98
2016	6400	6.8	82.55	20597.83	20.44	71.11
2017	8500	8	81	25950.29	25.90	58.24
2018	11100	10	78	35813.88	37.87	61.20
2019	14200	11.89	76.9	41349.81	46.95	51.80
Mean	6310	6.75	80.39	15745.41	17.49	66.55
SD	3910.51	2.60	1.79	14291.48	14.92	7.60

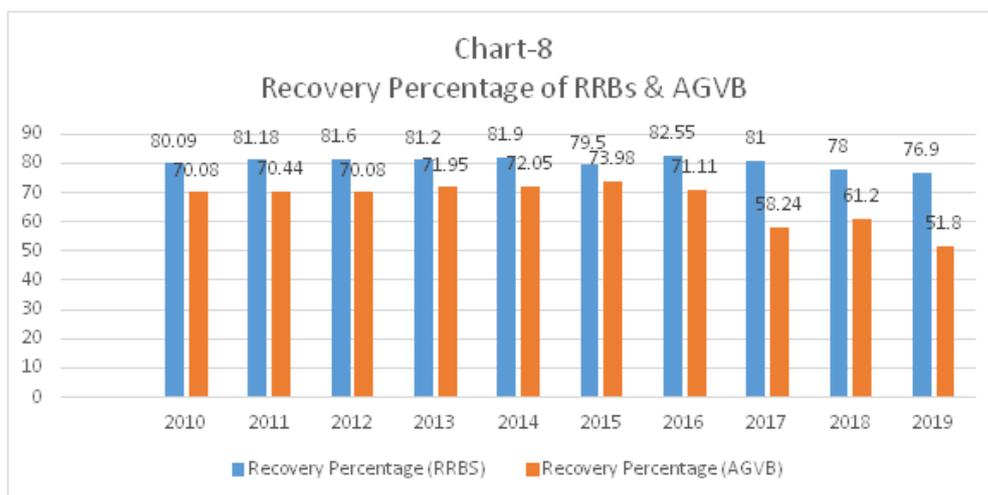
Source: Compiled and calculated from the Annual Reports of NABARD



Source- Prepared on the Basis of Table-4



Source- Prepared on the Basis of Table-4



Source- Prepared on the Basis of Table-4

## CONCLUSION

In aggregate, the position of the RRBs and the AGVB are not satisfactory in both places which shows a rising level of NPAs, constantly falling recovery, falling profitability, etc. during the concerned period of study. It is also observed from the overall analysis that the comparative position of AGVB is quite deplorable in all the factors comparing to the situation of RRBs as a whole. On the basis of the current exploration, it can be suggested that there must be certain changes from the management side in the working style of the regional rural banks in both situations. The discipline method of NPAs management and the complete recovery of loans and advances needs more attention in order to improve the profitability and its sustainability. Moreover, AGVB needs more thoughtfulness to find out the credit absorption parts and to improve the entrepreneurial enthusiasm in the region. Its low CD ratio indicates the low credit absorption capacity in the state although per branch deposit is higher than the RRBs at the national level. Credit sanctioning in the right areas with more vigilance while offering loans & advances and taking all the legal steps for recovery could help the Bank to minimize its currently mounting NPA situation and improving its profitability factor along with fulfilling its social objectives of banking.

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## Students Knowledge, Attitude and Practice on Premenstrual Syndrome and Dysmenorrhoea – A Descriptive Study

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### ABSTRACT

Adolescence is a transitional period between childhood and adulthood, whose cultural purpose is the preparation of children for adult roles. The majority of women of reproductive age experience physical or emotional symptoms before and during the onset of menstruation which impacts on their daily activities, and disturb their productivity at home or at their work place. A descriptive study conducted among 180 volunteer female B.Sc nursing students with the aim to assess the knowledge, attitude and practice on Premenstrual syndrome and Dysmenorrhoea. The samples were selected for the study through convenient sampling method. Tool used for the study was self structured multiple choice questionnaire to assess their knowledge level, Likert scale used to assess their attitude and dichotomous checklist was used to assess their practices. This study concluded that 62.21% had positive attitude, 20.55% had adequate knowledge and 77.21% followed good practices.

**Keywords:** Premenstrual syndrome (PMS), dysmenorrhoea, Foot Reflexology, Complementary Alternative Therapy

### INTRODUCTION

Adolescence is a transitional period which occurs between childhood and adulthood, the cultural purpose is the preparation of children for adult roles. If adolescents seem to be sheltered from their aristocrats, unconcerned in school or social actions or doing sick at school, work or sports they require to be assessed (Abdeesso. C, Aruna. S.).

Premenstrual syndrome is a group of symptoms that many women get about one or two weeks before their period. Over 90% women say they get some premenstrual symptoms such as bloating, headaches, and moodiness. For some women, these symptoms may be so severe that they miss work or school, but other women are not bothered by milder symptoms (OASH). The majority of women of reproductive age experience physical or emotional symptoms before the onset of menstruation. Amongst those, some women are so severely affected that it interferes with their mental health, interpersonal relationships, and studies (Quintana-Zinn FA, et.al.). Premenstrual Syndrome is one of the most common disorders of reproductive age that can be seen in different intensities in 85-90 % of women (Surbhi Teotia, et.al.).

The menstrual cycle is a natural phenomenon that occurs for the whole of reproductive years of every woman. Most females experience some degree of pain and discomfort during their menstruation (dysmenorrhea) which could have important impacts on their daily activities, and disturb their productivity at home or at their work place. (Andersch B. & Milson I). Dysmenorrhea is the most prevalent problem in women with intensities which involves 45 to 95% of women. It is estimated that annually 140 million work hours and school hours are devastated due to symptoms associated with dysmenorrhea (Mahboubeh Valiani, et al.).

Adolescent girls often lack knowledge about reproductive health including menstruation due to socio-cultural barriers in which they grow up. These differences create various problems among the adolescent girls.

Attitude of parents and society in discussing the related issues are barriers to the right kind of information, especially in the rural areas. Menstruation is considered to be a matter of embarrassment in most of the cultures. (Kartik Ramachandra). It was therefore decided to conduct a study to explore the level of knowledge, attitude and practices regarding menstrual problems like Premenstrual syndrome and Dysmenorrhoea among the adolescent girls.

### STATEMENT OF THE PROBLEM

A Descriptive Study to Assess the Knowledge, Attitude and Practice on Premenstrual syndrome and Dysmenorrhoea among nursing students from selected colleges, Tamilnadu.

### OBJECTIVES

- To determine the knowledge of PMS and Dysmenorrhoea among nursing students from selected colleges, Tamilnadu.
- To determine the attitude and practice of PMS and Dysmenorrhoea among nursing students from selected colleges, Tamilnadu.

- To find the correlation between knowledge, attitude and practice of PMS and Dysmenorrhoea among nursing students from selected colleges, Tamilnadu.

### SUBJECTS AND METHODS

This was a descriptive study conducted among 180 volunteer female nursing students from Sacred Heart Nursing College, Madurai and VVV nursing college Virudhunagar. The samples were selected by convenient sampling method. Due Permission was obtained from the institutions to conduct the study. Willingness to participate in the study was obtained by written consent from the participants after explaining the objectives of the study. Tool for data collection was a structured questionnaire which was validated by experts and pretested yielding a validity value of 0.74 using Cronbach Alpha. Care was taken to ensure privacy and confidentiality. The participants were made comfortable by maintaining anonymity in the questionnaire administered to them. Knowledge was assessed by the structured questionnaire on topics regarding PMS and dysmenorrhoea, Score 1 was given for each correct answer, Five point Likert scale was used for attitude and checklist was used for practice. Score 1 was given for good practice.

The level of knowledge was divided into three categories (adequate if the score is  $\geq 14$ , moderate 7-13, low  $< 6$ ). Attitudes are divided into positive attitude if score was  $> 50\%$  and score  $< 50\%$  considered negative attitude. Practices are divided into good practice if score was  $> 50\%$  and poor practice with score  $< 50\%$ . Karl Pearson's correlation analysis test was conducted between knowledge and attitude, knowledge and practices, and attitude and practices. Data was collected using self-administered close-ended questionnaires via Google forms application to assess the knowledge, attitudes, and practice of PMS and dysmenorrhoea. Data obtained was analyzed by using descriptive and inferential statistics.

### RESULTS

Table 1, represents the Characteristics of subjects which include age, religion, mother's education, age at menarche, history of dysmenorrhoea and other associated symptoms, and source of information about PMS and dysmenorrhoea. Majority 48.77% of the participants were between the age group of 19-20, 83% belongs to Hindu religion, 42.77% of the participant's mothers have no formal education, 84.44% of the study participants experience dysmenorrhea and only 21.66%(39/180) were not experiencing other associated symptoms during menstruation. Out of 180, majority 71.66% has the family history of dysmenorrhoea whereas only 25.55% of the subjects have reported family history of PMS.

**Table 1.** Frequency and Percentage distribution of Sample according to Socio Demographic Characteristics (n=180).

Variable	Frequency (f)	Percentage (%)
<b>Age ( years)</b>		
17-18	29	16.11
19-20	86	48.77
21-22	65	36.11
<b>Religion</b>		
Hindu	150	83.33
Christian	18	10
Muslim	12	6.66
Others	0	0
<b>Mother's Education</b>		
No formal education	77	42.77
High School	21	11.66
Higher secondary	53	29.44
Graduate	26	14.44
Post Graduate	3	1.66
<b>Age at Menarche( YEARS)</b>		
< 11	11	6.11
11-13	106	58.88
14-16	63	35
<b>Do you have dysmenorrhoea</b>		
Yes	152	84.44
No	28	15.55
<b>Do you have other associated symptoms</b>		

Vomiting	53	29.44
Menstrual migraine	47	26.11
Backache	41	22.77
No symptoms	39	21.66
<b>Source of information about PMS &amp; Dysmenorrhoea</b>		
Mother	52	28.88
Sister	6	3.33
Friends	39	21.66
Books	58	32.22
Media	25	13.88
<b>Family History of PMS</b>		
Yes	46	25.55
No	134	74.44
<b>Family History of dysmenorrhoea</b>		
Yes	129	71.66
No	51	28.33

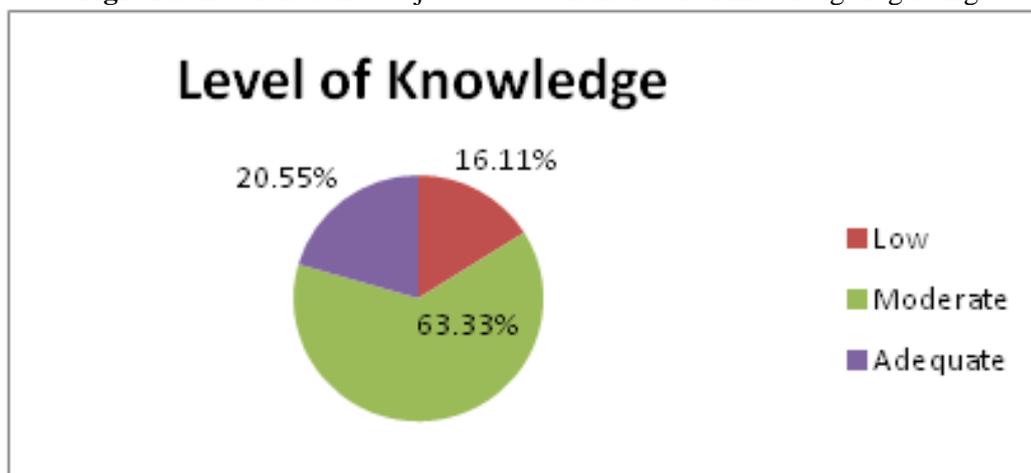
**Table 2.** Overview of Knowledge Scores, Attitudes and Practices of Study subjects regarding PMS and Dysmenorrhoea. (n=180)

Knowledge	Mean±SD	Attitude	Mean±SD	Practice	Mean±SD				
	Score		Positive	Negative	157.25 ± 29.22	Good	Fair	Poor	16.13 ± 3.16
Low	29 (16.11%)	10.74 ± 3.4	12 (6.66%)	17 (9.44%)		21 (11.66%)	8 (4.44%)	0%	
Moderate	114 (63.33%)		76 (42.22%)	38 (21.11%)		83 (46.11%)	31 (17.22%)	0%	
Adequate	37 (20.55%)		33 (18.33%)	4 (2.22%)		35 (19.44%)	2 (1.11%)	0%	

In present study depicted that only 20.55% of the subjects had adequate knowledge, 63.33% of the subjects had moderate level of knowledge regarding PMS and dysmenorrhoea. Regarding attitude towards PMS and dysmenorrhoea, 67.21% has positive attitude, with regard to practice 77.21% has good practice where as 22.77% has fair practice and none of the participants have poor practice.

#### PMS and dysmenorrhoea

**Fig1:** Distribution of the subjects based on the level of knowledge regarding



**Fig 2:** Distribution of subjects based on attitude towards PMS and Dysmenorrhoea

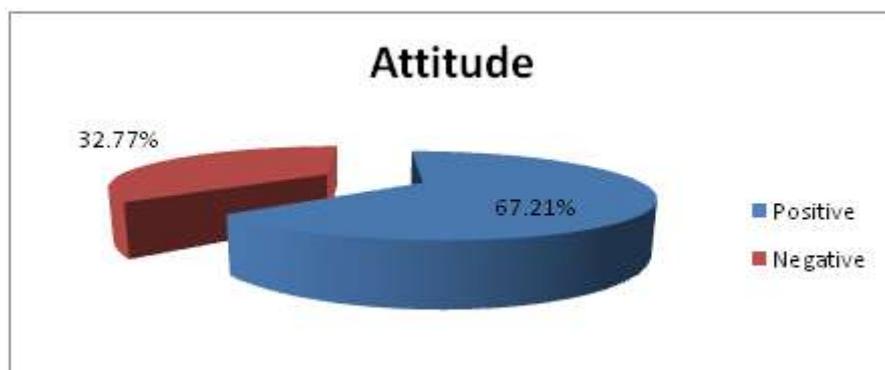


Fig 3: Distribution of subjects based on the Practice regarding PMS and Dysmenorrhoea

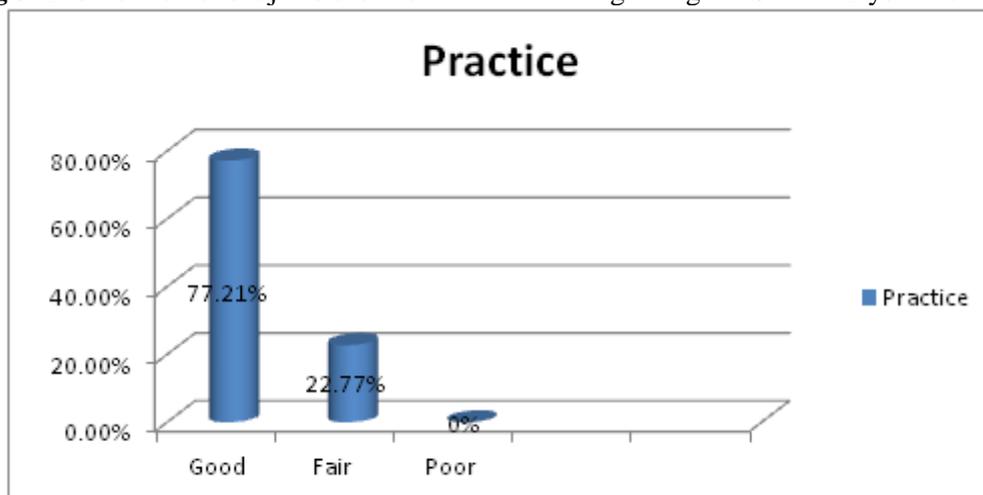


Table 3: Assessment of Subject's response based on the Knowledge of PMS & Dysmenorrhoea. (n=180)

Knowledge Questions	Right Response		Wrong Response	
	Frequency	%	Frequency	%
What is PMS	174	96.66	6	3.33
When do the symptoms of Premenstrual syndrome appear?	78	43.33	102	56.66
Which age groups of women are most commonly affected by PMS?	74	41.11	106	58.88
Which group of women is more likely to have PMS?	133	73.88	47	26.11
Which hormone is playing a role in PMS?	77	42.77	103	57.22
What are the symptoms of PMS?	118	65.55	62	34.44
How many different symptoms have been tied to PMS?	48	26.66	132	73.33
What are the symptoms to be there to diagnose PMS?	86	47.77	94	52.22
What is Premenstrual dysphoric disorder?	99	55	81	45
What are the preventive measures of PMS?	119	66.11	61	33.88
Which are the following measures help a women suffering from PMS?	115	63.88	65	36.11
Which drug is used for PMS	128	71.11	52	28.88
What do you mean by Dysmenorrhoea?	142	78.88	38	21.11
When menstrual pain is considered abnormal dysmenorrhoea?	40	22.22	140	77.77
What do you mean by Primary dysmenorrhoea?	113	62.77	67	37.22
Which phase of menstrual cycle most menstruation pain occur?	50	27.77	130	72.22
Which is the risk factor for dysmenorrhoea?	95	52.77	85	47.22
What are the potential symptoms of dysmenorrhoea?	127	70.55	53	30.45
Which of the following may help ease menstrual pain?	62	34.44	118	65.55
Which is the leading cause of absence at school / college/ work among women in their teens and 20s?	112	62.22	68	37.77

In this study 96.66% knows the meaning of PMS, 65.55% knows about the symptoms of PMS 66.11% knows about the preventive measures of PMS, 71.11% knows about the drugs used in PMS, 70.55% of the participants knows about the potential symptoms of dysmenorrhoea and only 34.44% knows about the measures to ease menstrual symptoms.

Present study shows that 45% of the participants had felt that PMS leave will be an option at University, 56% of the subjects liked to talk to their family about PMS, 49% of the participants thought that PMS is a significant issue to be discussed, 43% had missed their school/college and 45% missed their social events due to PMS. With regard to interpersonal relationship, 38% of the participants had poor relationship with friends, 45% had poor relationship with family and 44% of the subjects had reported the problem of social withdrawal. Regarding restriction of activities during menstruation, majority of the subjects (52%) had restricted their activities by their own. The findings also represented that majority of the subjects agreed with missing college during PMS and dysmenorrhoea. 55% missed college due to irritation, 45% due to mood swings and 58% due to physical symptoms. Majority 70% of the subjects think that pain is natural and 32% of the subjects think that pain disappears after marriage. Regarding measures to relieve symptoms, 46% agreed with traditional remedies.

The present study represented that 80.56% of the subjects have the practice of recording the date of menstruation, 65% alone assess the symptoms of PMS, Majority of the subjects (93%) use commercially made sanitary napkins during menstruation, around 89% had the habit of changing 3-4 napkins per day, around 90% of the subjects follow proper method disposal of napkins, only 65% had the practice of taking bath twice or more during menstruation and 88% of the participants alone maintain proper menstrual hygiene.

**Table 6.** Correlation Analysis Table Knowledge, attitude and practice towards PMS and dysmenorrhoea.

Variable	Correlation	R value	P value
Knowledge- Attitude	Karl Pearson	+0.02	0.767
Knowledge-Practice	Karl Pearson	+ 0.25	0.0005
Attitude-Practice	Karl Pearson	+0.14	0.045

## DISCUSSION

Our results revealed that majority 84.44% (152/180) of the subjects having dysmenorrhoea, regarding knowledge, less participants 20.55% (37/180) have adequate knowledge about PMS and dysmenorrhoea and with regard to attitude, 33% (59/180) has negative attitude towards PMS and dysmenorrhoea. The study findings were similar to the study conducted by Adekunbi A Farotimi (2015), to assess the knowledge, attitude, and healthcare-seeking behavior towards dysmenorrhea among female undergraduate students of Babcock University located in the southwestern region of Nigeria. A total of 315 female students were randomly selected to participate in the study. Participants were given structured questionnaire to complete. Dysmenorrhea was reported in 78.1% (242/310) with majority ignoring the pain. Less than average 40.6% (126/310) of the participants had high knowledge about dysmenorrhea and 63.5% (197/310) had negative attitude towards dysmenorrhea. Major effects of dysmenorrhea including restriction from physical activities in 77.2% (187/242) and social withdrawal in 59.1% (143/242) were reported.

Present study found that 96.66% of the participants knew about PMS whereas only 55% knew about Premenstrual syndrome dysphoric disorder and only 45% participants think that PMS is an important issue that should be discussed, which is similar to a cross-sectional study conducted by Surbhi Teotia, 2020, among 130 female students of a Private University of Delhi NCR to assess the knowledge, symptoms, effects on educational activities and interpersonal relationships, treatment options and attitude of students towards PMS. The majority (80%) of female participants knew about PMS while only (43.8%) knew about PMDD. The majority (90%) of female participants think that PMS is an important issue that should be discussed.

The present study is similar to the study conducted by Aleena Mohib et al, 2017 a cross-sectional study in three universities in Karachi, Pakistan. A total of 448 female students participated in the study to investigate the existence, knowledge, and the attitude of female students towards premenstrual syndrome (PMS). Almost all (96.4%) of female students were aware of PMS, whereas only 19% females knew premenstrual dysphoric disorder. The self-reported prevalence of PMS was 79.5% and 23.9% of the participants reported PMS while using ACOG criteria. Common symptoms reported by the participants were irritability, angry outbursts, depression, breast tenderness, and gastrointestinal problems. More than half (60.4%) of the participants reported PMS disturbed their normal routine, while 81.5% reported stress exacerbated their symptoms. The majority

(77.5%) of women believed PMS was a significant issue to be discussed but 49.4% did not take treatment for their PMS.

### CONCLUSION

The present study concluded that majority (96.66%) of the subjects knew about PMS but overall, very less 20.55% has adequate knowledge, 32.77% has negative attitude and 77.21% has good practices. There was a positive weak correlation between knowledge and attitude, positive moderate correlation between knowledge and practice and positive weak correlation between attitude and practice. . The findings of this study thus indicate the enormity of the problem and the need for appropriate intervention through a change in lifestyle also there is a need still to improve their knowledge about PMS and dysmenorrhoea.

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### Conflict of Interest

Author declares no conflict of interest.

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### Statement of Informed Consent:

The purpose of the study was explained and informed consent obtained from each participant.

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## Analysis of Heavy Metal in Seed Oil of *Citrullus Lanatus* from Arid Zone of Western Rajasthan

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### ABSTRACT

Heavy metal's hazardous effects are well-known, it's critical to have knowledge on their distribution and amounts in the environment. Furthermore, heavy metal pollution and build-up in plants and vegetables constitute a major concern to humans, plants, and animals since these metals are non-biodegradable and so can have long-term effects. As a result, it's crucial to look into heavy metal contamination in plant components like seeds and seed oil. Using normal techniques, watermelon (*Citrullus lanatus*) seed oil was extracted with petroleum ether (boiling range 40-60°C for 8 h) using a soxhlet extractor and separated from the solvent using a rotary evaporator. In this study, heavy metal content, physicochemical values and fatty acid composition in the seed oil of *Citrullus lanatus* have been determined. The concentration of heavy metals Fe (103.79 mg/L), Cu (23.78 mg/L), Zn (22.09mg/L), Cd (2.15mg/L), Pb (2.05mg/L), Ni (1.46 mg/L) in seed oil was determined by MP-AES. The characteristics of watermelon seed oil were comparable to those of common edible and industrial oil sources, implying its stability, edibility, and industrial potential. However, the watermelon seed oil's features and advantages may be harmed by the high acid and free fatty acid values, which are exacerbated by the low pH value.

**Keywords:** Cucurbitaceae, *Citrullus lanatus*, Heavy metals, Fatty acids.

### INTRODUCTION

Cucurbitaceae vegetable crops are major horticultural crops farmed primarily in warm climates across the world for its fruit is sweet and juicy. Melon (*Cucumis melo*), Pumpkin (*Cucurbita pepo*), watermelon (*Citrullus lanatus*), cucumber (*Cucumis sativa*), bottle gourd (*Lagenaria siceraria*), and Luffa cylindrica (sponge gourd) are all members of the Cucurbitaceae family. One of the most common species, *Citrullus lanatus* [Figure 1], has a high-water content of up to 92% of its total weight [1]. For generations, the herb has been used to cure a variety of health problems. In Ayurveda and Indian traditional medicine, it is an important medicinal herb [2]. Flavonoids, alkaloids, saponins, glycosides, tannins, and phenols are abundant in the plant. Its nutritional content is also beneficial to human health. Antifungal, antibacterial, antimicrobial, antiulcer, anti-inflammatory, antioxidant, gastroprotective, laxative, antiangiogenic, hepatoprotective, analgesic, and against atherosclerosis and prosthetic hyperplasia are just a few of the therapeutic techniques and pharmacological activities that scientists and researchers have looked at. Fruit is used as a blood purifier, cooling, strengthening, aphrodisiac, and astringent to the intestines. It is indigestible, diuretic, expectorant, and stomachic. It also heals biliousness, quenches thirst, scabies, treats sore eyes, itches and brain tonic [1]. The current review focuses on this plant's phytochemical, pharmacognostic, pharmacological, and toxicological updates. The seeds include significant levels of minerals, vitamin C, lipids, riboflavin and carbohydrates. They can be roasted, dried and crushed into flour for bread making [3].

Figure 1: *Citrullus lanatus*



*Citrullus lanatus* is a horizontally or ascending annual with several herbaceous, firm, and durable stems up to 3 m long; the younger sections are heavily woolly with yellowish to brownish fibers, while the older parts become hairless. The leaves [Figure 2] are simple, alternating on long petioles, cordate with seven shallow lobes and variably serrated edges, highly hairy on the abaxial surface, acute, deep green, and 7–15 cm in diameter.

Tendrils that are simple and spiralling. On the same plant, male and female blooms develop. Male flowers bloom in groups and emerge before female blooms. Both feature five yellow petals and five sepals, all of which are greenish in hue. Hermaphrodite blooms are occasionally formed. The spherical fruits are 14–20 cm long and have shallow grooves. The colour of the skin is a pale greenish-yellow. The flesh is almost white/light yellow in colour, sweet, juicy, delicately flavoured, and pepo-shaped. The seeds are tiny, light brown, and smooth, ranging in length from 0.4 to 1.1 cm and width from 0.2 to 0.3 cm [4].

**Figure 2:** *Citrullus lanatus* flower and leaf



Cucurbitaceae seeds [Figure 3] have been shown to have greater levels of strong phytochemicals such as sterols, which have been connected to immune control and reproductive health [5]. Seeds from the Cucurbitaceae family were chosen for this study because, when compared to other plants, they generate a lot of oil. They're edible oils that may be used in a variety of applications in food, medicine, and industry [6]. Seed oils from the Cucurbitaceae family are commonly used in cooking and may also be used as a biodiesel feedstock and a skin moisturizer [7].

**Figure 3:** *Citrullus lanatus* fruit and seeds



Fatty acids are necessary in the human diet because they control cholesterol metabolism, which is connected to heart disease [8]. Heavy metal is a material that does not decompose. As a result, they have a natural tendency to collect in living things. Metal toxicity has a substantial impact on plants, and as a result, it has an impact on the ecosystem, which includes plants and animals. Plants growing in metal-polluted settings have an altered metabolism, produce less biomass, and accumulate more metal. Metals affect a wide range of physiological and biochemical processes in both plants and humans [9].

As toxic metals go up the food chain, their physiological effects are exacerbated. Heavy metals persist in the environment, damage food systems, and cause a range of health problems due to their toxicity. Heavy metals are a major threat to living things when they are exposed to them in the environment on a long-term basis [10].

Heavy metal poisoning and environmental imbalance as a result of the industrial revolution and population increase have resulted in a slew of health issues. For example, cadmium poisoning has previously been seen in Japan as a result of people's dietary consumption of the metal. The condition was known as 'Itai Itai,' and the symptoms included excruciating osteomalacia (bone disease) and renal failure. This cadmium poisoning occurred as a result of rice fields being irrigated with tainted water from cadmium, lead, and zinc mines.

Chronic cadmium build-up in the kidneys, which leads to renal disease, is the most serious hazard to human health. Lead is also harmful to plants, animals, and microbes, and its effects are mostly restricted to polluted regions [11].

Lead poisoning in the environment may cause major health problems in humans, such as brain damage and retardation. Food intake and tobacco smoking are the main routes for cadmium to enter the human body, whereas lead contamination in soil and plants is primarily caused by automobile exhaust, dust, and gases from various industrial sources, as well as other sources such as industrial sites, leaded fuels, old lead plumbing pipes, and even old orchard sites where lead arsenate is used in production. Lead is very immobile and collects in the top 8 inches of soil. When  $Pb^{2+}$  is present in high concentrations, it is non-biodegradable and causes acute poisoning in humans [12].

Excess nickel in the soil can stunt plant development by causing leaf chlorosis and wilting, as well as interfering with photosynthesis. In humans, excessive nickel uptake can lead to dizziness, cancer, respiratory failure, birth abnormalities, asthma, chronic bronchitis, allergic responses, and cardiac problems. Metal-plating businesses, fossil-fuel burning, and mining operations are all substantial contributors of nickel pollution in the soil [13]. Nickel contamination of soil may also be caused by ash from power plants, which settles to the ground after precipitation.

Plants rely on soil for their nutritional and other needs; nevertheless, heavy metals are taken up by the plants during the intake of nutrients from polluted soil. Heavy metals accumulate in plants over time because they are non-biodegradable and persistent contaminants that cannot be removed by incineration [14].

Due to technological limitations and increasing concerns about environmental difficulties, the potential of plants to absorb heavy metals has lately been investigated for the remediation of polluted soils and water bodies. Phytoremediation is the use of plants to clean polluted soils or water bodies [15]. Phytoremediation is a simple, cost-effective, and environmentally acceptable way to extract metal contaminants from polluted soils [16]. The build-up of sugar in the watermelon pulp has been linked to an alkaline alpha-galactosidase gene (C1AGA2) that promotes the conversion of raffinose into glucose, fructose, and sucrose [17].

As a result, it is vital to investigate the contamination and accumulation of heavy metals in plants for their safe use, as well as their aptitude for eco-friendly phytoremediation of polluted locations [18]. We investigated the accumulation of heavy metals such as Cd, Cu, Fe, Ni, Pb, and Zn in *Citrullus lanatus* seed oil in this work. The physico-chemical characteristics of *Citrullus lanatus* seed oil, as well as its fatty acid composition, are given in addition to the heavy metal concentration.

## **MATERIAL AND METHODS**

### **A. Material and extraction of oil**

In the dry zone of western Rajasthan, seeds were gathered after they were completely developed (India). Harvested ripe watermelon fruits were cleaned by hand and dried in the sun for 4-5 days, following which the seeds were dried in a hot air oven at 90°C for 7 hours to a constant weight (100g sample). The seeds were stored at room temperature in an airtight container to prevent moisture loss. After that, the seeds were crushed into a paste in a mortar and assessed right away.

Oil was produced from powdered *Citrullus lanatus* seeds using the Soxhlet extraction technique and mild petroleum ether (40-60°C). Standard AOCS procedures were used to evaporate the solvent completely under vacuum using a rotating evaporator. The trans-esterification procedure was used to make oil methyl esters.

### **B. Reagents**

The reagents used were all of the highest analytical purity. Double deionized water was used for all dilutions.

$HNO_3$ ,  $H_2SO_4$ ,  $H_2O_2$ , HF,  $HClO_4$ , and HCl had high purity. Plastic and glassware were cleaned prior to use by soaking them in dilute  $HNO_3$  and then washing them with clear water. Working standard solutions for heavy metal calibration were made by diluting a 1000 g/L standard solution (Fe, Pb, Cd, Zn, Cu, and Ni).

### **C. Digestion of seed oil**

In a beaker, 1 g of oil was combined with 5 mL of strong nitric acid. The material was drained to near-dryness by putting the beaker on a hot plate. After cooling, 5 ml concentrated nitric acid was added, and the beaker was covered with a watch glass and placed back on the hot plate. The heat was kept on until the digestion was finished. The beaker was warmed after adding 1-2 ml pure nitric acid to dissolve the residue. With doubly distilled water, the sample was filtered and adjusted to a volume of 100 ml.

## RESULTS

### A. Physico-chemical analysis

The physico-chemical parameters of Citrullus lanatus seed oils, such as peroxide value, saponification value, iodine value, and acid value, were determined using the AOCS method.

Physical condition, colour, taste, and the percentage of loss on drying using the conventional procedure are all aspects included in the physico-chemical analysis. By putting the crucible on a hot plate, sulfuric acid vapours were extinguished. The crucible containing the sulfated ash was heated to 600°C in a muffle furnace until the weight of the components remained constant. The ash content and value were determined using this technique.

S.No.	Characteristics	Value
1.	Oil %	40.24
2.	Acid Value	1.06 mg/g
3.	Peroxide Value	2.96 mg/g
4.	Unsaponified Matter	1.04 %
5.	Ash Value	2.62 %
6.	Iodine Value	120.89 mg/g
7.	Saponification Value	177.83 mg/g
8.	pH Value	3.74
9.	Refractive Index	1.4652

Table I :- Physico-chemical Value

### B. Heavy Metal Analysis

Iron (Fe), Cadmium (Cd), Zinc (Zn), Copper (Cu), Nickel (Ni) and Lead (Pb) were analysed in plants using microwave plasma atomic emission spectroscopy with nitrogen as the plasma source gas (MP-AES). The metal concentration was measured using a nitrogen flame. It employs many analytes to determine both main and minor components at the same time. MP-AES eliminates the requirement for a gas supply by using microwave radiation to create a plasma discharge using nitrogen from a gas cylinder or ambient air.

S.No.	Metals	Concentration (mg/L)
1.	Fe	103.79
2.	Cu	23.78
3.	Zn	22.09
4.	Pb	2.05
5.	Cd	2.15
6.	Ni	1.46

Table II :- Heavy Metals Concentration

### C. Mixed Fatty Acid Preparation

The fatty acid combination was created through hydrolysis of oil and fats. In a round bottom flask, 2g of oil sample was saponified using 2-3 ml of 1N standard NaOH alcoholic solution and 10 ml alcohol as a solvent, and then gently heated for 1-2 hours while TLC was watched. The final mixture had both saponified and unsaponified components. 30 ml double distilled water was added to the mixture to dilute it further. Using a separating funnel and repeated washings with diethyl ether, the saponified materials were removed. In a separate beaker, the unsaponified components in the top organic (ether) layer were recovered. After evaporation using a rotatory evaporator, diethyl ether is recovered. The lower aqueous solution, which included fatty acid salts, was acidified with dilute hydrochloric acid (HCl-6N). Fatty acids were extracted from this mixture by washing it with diethyl ether several times, discarding the bottom aqueous layer and collecting the top mixed ether extract containing a fatty acid mixture in an oven-dried flask.

After removing the excess ether, the MFA's were washed with double distilled water and dried over Na<sub>2</sub>SO<sub>4</sub>. MFA's were discovered to be pure and clean. The entire procedure was monitored using TLC. The methyl esters that were generated were examined using HPLC. A glass plate was covered with approximately 0.25 mm of layer silica gel to make TLC plates. To make the spot visible in an iodine chamber, a mobile phase consisting of a 70:29:1 mixture of petroleum ether, diethyl ether, and acetic acid was used.

For quantitative analysis, the fatty acid mixture was derivatized in esters and quantified using HPLC and GC-MS. MFAs were re-extracted in a round bottom flask with additional methanol to generate fatty acid methyl ester (FAME) (1:6) for around 1-2 hours over a pan of water (100°C) using 1% H<sub>2</sub>SO<sub>4</sub> as a catalyst. The assembly was removed after complete trans-esterification (as determined by a TLC plate) and the flask was

refrigerated at room temperature to drain excess solvent before cooling over an ice bath before adding 30 ml double distilled water. Diethyl ether was used to remove the stirred wall and fatty acid methyl ester (FAME).

The top layer's mixed ether was placed in a dry flask, and the bottom layer's aqueous layer was removed. When the solvent was evaporated and dried on Na<sub>2</sub>SO<sub>4</sub>, anhydrous FAME was generated, which was collected and stored at low temperature for further analysis.

#### **D. Identification of component of FAME on HPLC**

Methyl esters derivatives are highly valuable for HPLC analysis. The researchers used a different strategy (with gradient elution). The Dionex HPLC with a degasser featured a binary Ultimate 3000 RS pump wavelength (254nm) UV detector, as well as a column (900×6.4mm) filled with μBondapack C-18 and washed with acetonitrile-water in the proportion of 67:33 (by volume) at first, eventually changing to 74:26.

S.No.	Fatty Acids	Composition %
1.	Linoleic	63.07
2.	Oleic	14.89
3.	Palmitic	11.05
4.	Stearic	8.47
5.	Palmitoleic	0.35
6.	Myristic	0.14

**Table III :- Fatty Acids Composition**

#### **DISCUSSION**

The seed oil contains large levels of Fe, Cu, and Zn, with low amounts of Pb, Cd, and Ni, according to heavy metal analysis. In the places where it is produced, this provides a phytoremedy for Fe, Cu, and Zn. The presence of health-harming metals such as cadmium, zinc, and lead in food and medications is restricted by legislation. Heavy metals are metals that are only permitted in tiny concentrations in foods and medications. Heavy metals can cause blood acidity to rise. Long term use of excess level of zinc, above 40mg/kg, can induce stomach discomfort, dyspepsia, nausea, vomiting, diarrhoea, gastric irritation, and gastritis and much more issues with longer usage nickel compounds may fairly be considered to be carcinogenic. Long-term exposure to low quantities of cadmium in the air, food, or water causes cadmium buildup in the kidneys, which can lead to renal disease. To establish the amount of environmental damage, a normal analysis was performed. A database bank for investigating metal pollution should be built to help in the understanding of metal cycling in the environment.

The oil's low acidity and pH of 3.74 suggest that it is low in free fatty acids (FFA). The FFA concentration is measured by the acid value of oil. The less acidic the oil is, and the fewer fatty acids it contains, the less likely it is to get rancid. This means the oil won't get rancid as quickly, and the low acid content ensures the oil is safe to eat. The acid value is an important statistic for identifying oil's age, edibility, and suitability for industrial use. The iodine value is a measure of unsaturation and indicative of double bonds in the molecular structure in fat and oil classification. This connection implies that the oil is cholesterol-free and so beneficial to the heart. Peroxide value is tied to the oil's oxidation level as a result of hydroperoxide formation at double bond sites. Because the oil has a low peroxide value, it is resistant to oxidative rancidity and degradation. As a result, double bond unsaturation in oils is one of the most critical elements influencing lipid oxidation. The ash value reflects the amount of inorganic components in the powdered sample; a low number suggests that there are more organic components in the powdered sample. It's a healthy source of protein, carbohydrate, and fat because they're all present in significant amounts and within dietary guidelines. As a result, the seeds are very edible and should not be thrown while eating watermelon, as some people do.

#### **CONCLUSION**

Watermelon seeds have the potential to be used as a source of edible oils for humans. Watermelon seed oil might be a good replacement for highly unsaturated oils. These findings will aid in the creation of the ideal conditions for oil production. Finally, the use of watermelon seed for oil manufacturing might provide more revenue while also reducing waste disposal issues.

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## Biochemical Basis of Happiness: The Role of Cognitive, Behavioral, and Nutritional Components

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### ABSTRACT

There are many approaches that define happiness, but also agree that happiness is difficult to define and measure because of its subjective nature. Oxford English Dictionary (2020) defines "happiness" as "The state of being happy". Ryan & Deci, (2001) says happiness is the "presence of positive emotions and absence of negative emotions". In recent year researches have been started to explore the neural basis of happiness and by knowing neural basis we can easily trigger neural chemistry which nurtures the happiness states. Our body produces the number of neurochemicals that help us to maintain life balance and make us happier like dopamine, oxytocin, serotonin, and endorphins (Buckner 2017). Mead (2008) in his research conveyed that by sitting in the sunlight can enhance the serotonin and endorphins production, which stimulates the happy mood. In the present paper, we will try to address the how biological, behavioral, cognitive and nutrition aspects determine happiness. Review of related research have been examined to accomplish the objective of the study and existing literature illustrated that different neurotransmitters like dopamine, oxytocin, endorphins, serotonin plays role in happiness and by practice, some behavioral activities like counting blessings, engaging in kindness act, doing physical exercise, and proper nutrition level can stimulate the happiness level of an individual.

**Keywords:** Happiness, Positive emotion, Nutrition.

### INTRODUCTION

The positive constituent of mental well-being is happiness which is defined as a "subjective state of mind characterized by enjoyment and contentment reflecting individual overall subjective wellbeing" (Diener 2000). Happiness is the broad term, can be defined from different perspective (Seligman 2012), some says happiness comes from inner peace, for other happiness comes from contentment and satisfaction in life. Seligman (2002) says happiness comes from the three components: "the pleasant life, the good life, and the meaningful life". Family and quality social relationships are related to happiness and studies revealed that married people are happier than the unmarried, divorced, or widowed (Diener, Suh, Lucas, & Smith, 1999). Myers 2000 proposed in his study that those who are satisfy with his/her marriage and family are more happy and happy people have more friends, high-quality social relationships, and stronger social support (Lyubomirsky, King, & Diener, 2005). Several researches highlighted the positive impact of happiness on health (Lyubomirsky, King, & Diener, 2005). Happier people have better functioning of immune system (Marsland, Cohen, Rabin, & Manuck, 2006), have better cardiovascular health (Boehm, Vie, & Kubzansky, 2012), and engage in healthier behaviours and live longer lives (Diener & Chan, 2011). Studies on happiness found some elements that are responsible for our happiness like personality type, emotional state positive or negative, attitudes towards physical health etc. (Ryan & Deci 2001). Apart from this there is biological aspect of happiness. Our body releases number of chemical that help us to function better in our life. Findings (Boufali-Bavella, Galanakis, & Stalikas, 2017; Fredrickson, Grewen, Algoe, Firestone, Arevalo, & Cole, 2015) suggested that improve happiness level linked with reduced conserved transcriptional response to adversity (CTRA) gene expression, which is responsible for improved inflammation genes expression and decreased expression of antiviral and antibody genes. Ashby, & Isen (1999) gave the most listing neurochemical theory of positive mood and two main components of their theory are that: (i) increased level of dopamine in brain related to positive emotion and (ii) due to the increased dopamine levels there are some changes observed in cognition level. Dopamine, oxytocin, serotonin, endorphins (DOSE) are four major chemicals in the brain that influence our happiness level (Raypole, 2019)

- **Dopamine:** well known as "feel-good" hormone, formed in the substantial nigra and ventral tegmental area of brain, and is main part of brain's reward system. It's involved in reward driven behaviour, motivation, memory, attention and even motor control, executive functioning. It releases during the pleasurable experiences. Low dopamine level in the body related to depression, attention deficit, physical pain and cognitive issues or many psychological problems.
- **Serotonin:** helps to regulate mood, sleep, appetite, digestion, learning ability, and memory. When we feeling a sense of accomplishment or approval from other, means we are experiencing the serotonin

effect. Receiving degree, appreciated by boss, also compels that your supporters not let down, they do well because of serotonin effect (Gouin, Carter, Pournajafi-Nazarloo, Glaser, Malarkey, Loving, & Kiecolt-Glaser, 2010). Serotonin linked to several conditions like anxiety disorders, ADHD, bipolar disorder (Lin, Lee, & Yang, (2014).

- **Oxytocin:** is a “love hormone” vital for labour, breastfeeding, and solid parent-child connection, endorse trust, understanding, positive emotion and relationships bonding. Oxytocin makes us better problem solver, give us lasting feeling of calm and safety (Sinek, 2014). Oxytocin gives a good feeling when we are with someone who we trust
- **Endorphins:** Is natural pain relievers for body, enhance pleasure, produces in reaction to stressful situation. Endorphins levels increases during reward-producing activities, eating favourite food, during workout, or having sex. Endorphins produces naturally by performing some activities like eat dark chocolates, exercise, dance, get acupuncture, laugh etc..

Research suggests (Boufali-Bavella, Galanakis, & Stalikas 2017) that improve physical health linked with increase happiness level which is associated with specific neurobiological mechanisms. Continuous engagement of striatal and dorsolateral prefrontal cortex linked with improved levels of happiness and also responsible for lower levels of cortisol. Results support the concept that happiness may act as a moderator of the physiological and biological systems (Ryff, 2014). Happiness is positively related with grey matter volume of the right insular cortex and positively correlated with our purpose in life, positive relations, and personal growth (Lewis, Aitken, Conner, De Iulii, Evenson, Henkel, & Gharagozloo, 2013). Findings (Boufali-Bavella, Galanakis, & Stalikas 2017), confirms that happiness is fundamental element of healthy ageing and can be a protective element against diseases and disorders, enhances healthy behaviours.

#### **Behavioural and Cognitive activities related to Happiness**

Different studies showing positive relation between physical exercise and happiness. Large number of studies providing evidence that physical activities are the tools for treating mental health issues, unhealthy behaviour like reduces tobacco craving and cigarette use (Galper, Trivedi, Barlow, Dunn, & Kampert, 2006; Hamer, Stamatakis, & Steptoe, 2009; Piqueras, Kuhne, Vera-Villaruel, Van Straten, & Cuijpers, 2011). Regular physical exercise improves psychological wellbeing, reduces anxiety, irritability, guilt, nervousness (Weinberg and Gould, 2015). Research by Rokade 2011, says that endorphins release with continues exercise and physical exercise affects brain plasticity, influencing cognition and wellbeing. Endorphins hormone makes us happy, released from the pituitary gland and can be stimulated by regular exercise, love, music, chocolates eating, laughter, sex (Goldstein, Lowry 1975). Happier people engaged in healthier life style activities like showing gratitude; engage in physical activities (Staptoe, 2019). A study with more than 1000 patients of CHD over 5 years, reveals the connection between positive emotion or positive mood state and healthy behaviour and proved that positive mood state related with promoting healthy behaviour (Sin, Moskowitz & Whooley 2015). Positive emotion improves people's performance, self-affirmation useful to people with chronic illness. Self-affirmation also a good tool to boost our wellbeing both eudemonic and hedonic wellbeing (Nelson, Fuller, Choi, & Lyubomirsky, 2014). A study reveals MRI evidence that self-affirmation practice task increase several neural pathways (Cascio, O'Donnell, Tinney, Lieberman, Taylor, Strecher, & Falk, 2016) and positive affirmation mediation is also an effective approach to advance sleep quality (Nagendra, Maruthai, & Kutty (2012). A study proves that self-affirmation has a significant positive correlation to feeling of hopefulness (Taber, Klein, Ferrer, Kent, & Harris, 2016) and also helpful in reducing negative thoughts, stress (Wiesenfeld, Brockner, Petzall, Wolf, & Bailey, 2001). Reading habits straighten lifespan of readers by lives 2 year longer than the non-reader, (Bavishi, Slade, & Levy, 2016), reading fiction literature lead to think in different perspective and creatively (Djikic, Oatley & Moldoveanu, 2013), reduces feeling of stress, stronger feeling of relaxation, high level of self-esteem (Sullivan, & Brown, 2015). A study by Fordyce, 1977, 1983 in which students were taught what the happy people do and were assigned some happiness enhancing activities and results showed that students who practice activities like become more active, spending more time socializing for a six week reported enhanced wellbeing. An optimistic thinking predicts the increase in subjective wellbeing (Sheldon, Lyubomirsky, 2006) and ultimately the happiness level increases. Resilience training found facilitating subjective wellbeing in the workplace (Robertson, Copper, Sarkar, 2015). Seligman and colleagues (2005) provide evidence that participant who use personal strengths in novel way in daily life and those who identified three good things that happened to them showed increased in their happiness level, decrease in their depressive symptoms over six month of period. Medication and high dose tablets damage the immune system make us susceptible to various diseases, however exercise, music, laughing releases endorphin which keeps us

healthy and happy with no side effect. Endorphins released by listening music and changes the mood and change in mood is directly related to endorphin level (Biddle, and Mutrie, 1991). Having lunch with love ones triggers the four chemicals (DOSE), which increase the happiness level. Enjoying delicious food, sharing meals trigger dopamine, serotonin along with endorphins and oxytocin. Exposed to sunlight, exercise, happy thoughts stimulate production of serotonin (Roman, 2017), working together, long hugs, opening up emotionally trigger the oxytocin (4 hormones improve happiness level 2019). Meditation is a way which boosts the endorphins neurotransmitters activities (Rokade, 2011; Harte, Eifert, & Smith, 1995). Watching half an hour of comedy film with a group of friend boosts endorphins level (Manninen, Tuominen, Dunbar, Karjalainen, Hirvonen, Arponen, & Nummenmaa, 2017). Number of studies supported that giving or receiving social support significantly affects the mental health. Study in Harvard medical school proven that good relations are the predictors of good health and longevity (Choi, & Wodarski, 1996). *Mindfulness based intervention program can be an effective practice in organization to boost happiness and performance among healthcare profession* (Coo, & Salanova, 2018).

### **Nutrition and Happiness**

The quality of food we eat affects the overall health. Studies reveal that food and mood relates in a way that bad mood can be changed into happy mood by taking some pleasant flavours. Researchers say happiness is in your hand, but it could be on your plate also if happiness diet added in your routine. Vegetables contain various amounts of phytochemicals, antioxidants, vitamins, and minerals all play major roles in your bodies' metabolic processes, including hormone production and regulation. Like green tea makes us healthy both physically and mentally. After all our complete health is both physical and mental health (WHO, 2017). Raw walnuts manage the stress and anxiety level. A cup of coffee, dark chocolates very helpful in reducing the stress hormone level in the body and lower the risk of depression. Healthy eating leads to healthy person and we can boost our mood naturally by taking mood boosting supplements. Vitamin C is one of nutrition which is vital to body's capability to make neurotransmitters like dopamine, noradrenaline, and serotonin. Vitamin C found in broccoli, oranges, strawberries, mangoes, kiwi. A study supports the same, intake of high vitamin C lower the feeling of depression and anger (Pullar, Carr, Bozonet, & Vissers, 2018). Vitamin B6 has the similar effects, helps body to made mood, boost up neurotransmitters including serotonin, melatonin, and norepinephrine. B6 found in seafood, beef leafy greens, spinach. Vitamin D can increase the production of the neurotransmitters associated with mood like serotonin, helps to maintain positive mental state (Lee, Tajar, O'Neill, O'Connor, Bartfai, Boonen, & EMAS study group. 2011). It found in mushrooms, milk, beef, and chicken liver and fatty fish. Omega -3 Fats is effective in improving depression symptoms (Osher, & Belmaker, (2009) found in fish oil supplements, salmon. Zinc also an important in treating mood disorders. Study shows that zinc deficiency can lead to ADHD, depression, aggression, violence. Zinc found in Oysters (Cope, & Levenson, 2010). Our body needs magnesium to facilitates the hormones balance, enzyme activity, neurotransmitters that regulate mood and overall health and found in raw walnuts, dark chocolates, bananas, (Greenblatt, To, & Dimino, 2016). Selenium is another important mineral for mood regulation. A study reported that who received selenium reported a general boost the mood, reduction in anxiety, depression, and fatigue (Benton, & Cook, 1991). Another study by Conner, Richardson, & Miller, (2015) shows the same findings that lowest blood level of selenium have the lowest level moods.

### **CONCLUSION**

Happiness is considered as an ultimate goal of life (Diener and Seligman 2004) and happiness is experiencing more positive emotions than the negative emotions Diener, Colvin, Pavot, & Allman (1991). From the review it has been concluded that there are different neurotransmitters which are linked to positive emotions and there are many ways to increase the level of neurotransmitters which boost happiness, cognitive functioning and better understanding the role of neurotransmitters, help us how to effectively control in daily life and enhance happy level. In the majority diseases doctors along with medicines recommended several activities such as walking, running, laughing exercise, meditation, listening music to a patient and all of these activities are liable for the releasing of endorphin hormone which gives strength, confidence, positive mood and happiness (Rokade PB 2011). Different exercises remodel the brain, promoting the new creation of cells or changes in brain chemical. *Physical exercises are significant dealing with both mental and physical health* (Lawlor DA, Hopker SW 2001; Craft LL, Landers DM. 1998), exercise useful in reducing depressive state, hormonal responses for stress and physiological fitness (Nabkasorn, Miyai, Sootmongkol, Junprasert, Yamamoto, Arita, & Miyashita, 2006). Pursuing happiness through social means, spending more time with friends and family is more effective way to increase happiness (Rohrer, Richard, Brummer, Wagner, & Schmukle, 2018). By adding many supplements that may help increase happy hormone levels, tyrosine (connected to dopamine release), green tea (linked to dopamine, serotonin), probiotics (may support serotonin and dopamine) tryptophan (serotonin). A modal of happiness by Lyuboumirsky, Sheldon and Schkade (2005) proposed three major factors contribute to

level of wellbeing.a) happiness set point genetically , b) life circumstances c) positive cognitive, behavioural and goal based activities means that a person's happiness level can be determined by the biologically set level, can be determined by situation he/she faced in his life or can be set, increased by his/her sets of goals.

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## Emotional Intelligence, Job Involvement, Organizational Commitment, and Turnover Intention of School Teachers

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### ABSTRACT

*Teachers' emotional intelligence is positively associated with their positive job outcomes, and plays an important role in their success (Anari, 2012). The present study aims to examine the association between Emotional intelligence, Job involvement, Organisational commitment, and Turnover intention of school teachers, by utilizing a correlational research design. A total sample of 102 teachers, teaching in several renowned senior secondary schools participated in this study. Data was collected using standardized self-report measures. The findings of this study illustrate that there is a significant association between teachers Emotional intelligence and their job involvement and organizational commitment, whereas no significant relationship found between teachers Emotional intelligence and Turnover intention. No significant gender difference were observed between Emotional intelligence, Job involvement, Organizational commitment, and Turnover intention. This study has many theoretical as well as practical implications for school management and scholars.*

**Keywords:** *Emotional intelligence, Job involvement, Organisational commitment, Turnover intention, School teachers.*

### INTRODUCTION

School teachers are the fundamental agents of the education system and they play a central role in the whole education system. Thus, lots of policymakers and researchers have advocated that without enhancing the quality of teachers we cannot improve our education system as a whole. In the present scenario, most school teachers are less involved, satisfied, and committed towards their job. Evidence also shows that most teachers have high level of turnover intention rate and alienation towards work (Anari, 2012).

In the last decade, it was a major research question that what factors make a teacher successful. Studies indicate that teachers' subject knowledge, their teaching skill, their communication and interpersonal skills, as well as their personality attributes, plays a major role in determining their success in school (Derman, 1999). There is evidence that indicates that teachers' level of emotional intelligence (EI) plays an important role in teachers' success (Anari, 2012). At the organizational level various aspects of individual personal, interpersonal and his performance is significantly determine by the employees' emotional intelligence (Ghaderi & Shamsi, 2013).

### REVIEW OF LITERATURE

#### Emotional intelligence

EI plays a vital role in organizational success and it helps to enhance the effectiveness and efficiency of the organization as well as employee. The term EI was firstly coined by Salovey and Meyer (1990). They define EI as "the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions". After this definition in 1997, Salovey and Mayer clarified the definition and redefined EI as "the ability to perceive emotion, to access and generate emotions so as to assist thoughts, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth". EI has basically three models Trait model, Mental Ability model and Mixed model. The first model of EI i.e. trait model encompasses behavioural dispositions and self-perceived abilities and is measured through self-report methods (Petrides & Furnham, 2001). According to the second model, EI is a well-defined and conceptually related set of cognitive abilities for processing emotional information and regulating emotion adaptively (Zeidner, Matthews & Roberts, 2004). On the other hand, the third model which is a mixed model of EI outlook it is as a diverse construct that includes aspects of personality and ability to perceive, assimilate, understand and manage emotions (Chiva & Alegre, 2008).

The literature on EI suggested that employee level of EI is positively associated with employee job satisfaction (Carmeli, 2003), service orientation (Lee & Ok, 2015), organizational citizenship behaviour (Carmeli, 2003), job involvement (Yeh, 2018), and coping style (Kim & Agrusa, 2011) whereas negatively associated with occupational stress (Nikolaou & Tsaousis, 2002) and work-family conflict (Carmeli, 2003).

### **EI and Job involvement (JI)**

JI plays a robust role in organizational productivity and accomplishment. Lodhal and Kejner (1965) firstly used the term JI in organizational behaviour literature. JI is a belief descriptive of the present job and tends to be a function of how much the job can satisfy one's present needs (Kanungo, 1982). A study on nursing staff, it was perceived that there is a significant and positive relationship between EI and JI (Mirhashemi, Sharifi & Sabeti, 2005; Ghaderi & Shamsi, 2013). Consistent findings were found in few other studies conducted in other organizations such as hotel and tourism (Judeh, 2013), public and private sector organization (Shrestha & Baniya, 2016) and civil servants (Anazor, Joe-Akunne & Nnaebue, 2020). However, a study on senior managers found that there is no any significant association between EI and JI (Carmeli, 2003).

### **EI and Organizational commitment (OC)**

In organizational behaviour literature, it is noted that OC is a foremost variable that plays as a link between employees and organizations. OC is "the aggregate internalized normative demands to perform in a manner which meets organizational objectivities and interests" (Winner, 1982). Allen and Mayer (1996) proposed three dimensions of OC: Affective commitment (employees' emotional attachment to the organization), Continuance commitment (based on the costs that the employee associated with leaving the organization), and Normative commitment (employee's feelings of obligation to stay with the organization).

While a study on Iranian organization found that there is no significant association between EI and OC (Aghdasi, Kiamanesh & Ebrahim, 2011), Mohamadkhani and Lalardi (2012) in a study on hotel staff noted that there is a significant positive relationship between EI and OC.

### **EI and Turnover Intention (TI)**

Bedeian, Kemery, and Pizzolatto (1991) noted that TI was identified as the final cognitive variable having an instantaneous causal effect on turnover. In organizational behaviour literature, TI has traditionally been taught of as coming from perceived ease of movement (the extent to which one can find alternative jobs) and perceived desirability of movement (related to job satisfaction) (Carayon, Schoepke, Hoonakker, Haims & Brunette, 2006). Carmeli (2003) found that there is a significant negative association between EI and TI. Similarly, Mohammad, Chai, Anu, and Migin (2014) noted that a leader's level of EI is negatively related to employees' intention to quit the job.

### **EI, JI, OC, TI, and Gender differences**

A study on financial service top-level executives noted that there was no significant gender difference in employees EI (Hopkins & Bilimoria, 2008). Similar findings were obtained by Chan (2004) in their study on teachers. Whereas, Anari (2012) conducted a study on school teachers and noted that there is a significant gender difference in EI.

In the cross-sectional study conducted by Lorence (1987) it was concluded that there are no significant gender differences regarding employees JI. Knoop (1986) noted in his study after controlling the job condition variables there is no significant gender differences in employees JI. In the study on employees of northeast USA companies, it was noted that there are no significant gender differences in employees JI, job satisfaction, work ethic, and career commitment (Singh, Finn & Goulet, 2004).

Singh, Finn, and Goulet (2004) conducted a study on white-collar professionals and found that there was a significant gender difference in employees OC and also noted that females are more committed towards his job comparison to males. Whereas, a study on high school teachers was found that there is no significant gender difference regarding teachers' OC (Anari, 2012).

Baroudi and Igarria (1995) conducted a study on lower level IT employees and conclude that there was no significant gender difference in employees in job satisfaction and OC, whereas a significant gender difference exists between TI of the employees. Further, a study on IT sector employees found a significant gender difference in employee TI.

### **RATIONALE**

Based on the above review of literature it is concluded that there are few studied conducted on EI, JI, OC, and TI in different organizational settings, but there are very few numbers of studies done on these variables in school teachers. Also, anomalous findings exist regarding the variables under this study. So this study attempts to fulfil the above mention gap. The present study is an empirical attempt to study the association between EI, JI, OC, and TI of school teachers, and the gender differences that exist in relation to these variables.

## OBJECTIVES

On the basis of the review of relevant literature following objectives were framed:

1. To examine the gender difference between EI, JI, OC, and TI amongst the school teachers.
2. To examine the relationship of EI with JI, OC, and TI of the school teachers.

## HYPOTHESES

On the basis of the review of relevant literature and by reviewing the objectives underlying this study, it was hypothesised that:

- H1 (a). There will be no significant difference between male and female school teachers on EI.  
H1 (b). There will be no significant difference between male and female school teachers on JI.  
H1 (c). There will be no significant difference between male and female school teachers on OC.  
H1 (d). There will be no significant difference between male and female school teachers on TI.  
H2 (a). There will be a positive relationship between EI and JI of the school teachers.  
H2 (b). There will be a positive relationship between EI and OC of the school teachers.  
H2 (c). There will be a negative relationship between EI and TI of the school teachers.

## METHODOLOGY

### SAMPLE

The sample of the present study consisted of 102 teachers (Male=47 and Female=55) within the age range 22-57 years, and with mean age being 30.55 years. 23 participants are undergraduate and 79 participants are postgraduate. The participants under this study were teaching in several renowned senior secondary schools. The convenient snowball sampling was used for ascertaining the participants for this study. Data was collected through a questionnaire survey method. This study was based on a correlational research design.

### MEASURES

A demographic sheet assessing the biographic data of the participants was used for the current study. It measured variables like age, sex, educational qualification, name of the school, experience, etc.

Emotional intelligence was measured by the scale developed by Law, Wong, and Song (2004). This is a five-point Likert type scale (strongly disagree to strongly agree), consisting of 16 items divided into four major dimensions namely Self-Emotions appraisal (SEA), Others-Emotions appraisal (OEA), Use of emotion (UOE) and regulation of emotion (ROE). Cronbach's alpha coefficient of the scale is 0.88.

Job involvement was measured by the uni-dimensional scale of Kanungo (1982). This is a five-point Likert type scale (strongly disagree to strongly agree) consisting of 10 items.

Organizational commitment was assessed by the uni-dimensional scale developed by Kalberg (1996) consisting of 6 items to be assessed on a five-point Likert type scale (strongly disagree to strongly agree). Cronbach's alpha coefficient of the scale is 0.75.

Employee turnover intention was measured by the 3 items on a five-point Likert type scale (strongly disagree to strongly agree) developed by Cammann et.al. (1979). Cronbach's alpha coefficient of the scale is 0.85.

## PROCEDURE

A convenient sample of 150 school teachers both male and female of age range 22-60 years were approached. Out of those 102 (Male=47 and Female=55) consented for the tests to be administered on them. Participants were allowed to complete the survey privately and were instructed to return their results to the researcher. After data collection scoring was done with the help of respective manuals, data was entered in computer software for data analysis, and further data was analysed for testing the hypotheses of the study.

## RESULTS

**Table 1** Comparison of Male (N=47) and Female (N=55) school teachers on EI, JI, OC and TI

Variables	Male		Female		t-value
	Mean	S.D.	Mean	S.D.	
Emotional Intelligence (EI)	63.00	7.09	64.12	8.18	-0.73 (NS)
Job Involvement (JI)	35.42	5.94	35.83	4.65	-0.39 (NS)
Organizational Commitment	21.74	3.61	22.09	3.19	-0.51 (NS)

(OC)					
Turnover Intention (TI)	8.17	2.98	8.56	2.53	-0.72 (NS)

\*\* $p < 0.01$ ; \* $p < 0.05$

Table 1 demonstrate that the mean difference between male and female school teachers on EI, JI, OC, and TI. Results illustrate that male and female school teachers had non-significant differences in EI, JI, OC, and TI.

**Table 2** Correlation Matrix and Cronbach's alpha

		1	2	3	4
1	EI	1			
2	JI	0.23**	1		
3	OC	0.31**	0.44**	1	
4	TI	0.13	-0.08	-0.15	1

\*\* $p < 0.01$ ; \* $p < 0.05$

Table 2 shows that the Pearson correlation coefficients between the research variables. EI is significantly positively correlated with JI and OC ( $r=0.23$ ,  $p<0.01$ ;  $r=0.31$ ,  $p<0.01$ ). EI had a weak and insignificant correlation with TI.

The above result indicates that excluding for TI and EI, all the correlations in the study variables are significant and in the estimated direction. But, numerous management scholars recommended that these correlation analyses are not robust adequate to test the proposed hypotheses. Thus, three different regression equations were estimated to evaluate the relationships between EI, JI, OC, and TI. The results of the regression analysis are shown below in Table 3.

**Table 3** Multiple Regression Analyses Results

	Dependent Variable		
Predictor (EI)	JI	OC	TI
Standardized Coefficient Beta	0.23	0.30	0.13
R <sup>2</sup>	0.05	0.09	0.01
F	5.74**	10.25**	0.191`

\*\* $p < 0.01$ ; \* $p < 0.05$

The basis of the Table 3 regression analysis results shows that EI has a significant and positive relationship with JI and OC ( $F=5.74$ ,  $p<0.01$ ;  $F=10.25$ ,  $p<0.01$ ). But there is no significant relationship found between EI and TI.

## DISCUSSION

This research aims to examine the association and gender differences in EI, JI, OC, and TI of school teachers. The findings of this study revealed that there is no significant gender differences exist in EI, TI, OC, and TI. So our hypothesis H1 (a) "There will be no significant difference between male and female school teachers on EI.", H1 (b) "There will be no significant difference between male and female school teachers on JI.", H1 (c) "There will be no significant difference between male and female school teachers on OC.", and H1 (d) "There will be no significant difference between male and female school teachers on TI." are accepted. These findings are consistent with the findings of earlier researches regarding EI (Hopkins & Bilimoria, 2008; Chan, 2004), JI (Lorence, 1987; Knoop, 1986; Singh, Finn & Goulet, 2004), OC (Singh, Finn & Goulet, 2004; Anari, 2012), and TI (Sicherman, 1996).

Further it was found that there is a significant positive correlation between EI and JI. In other words, a higher level of EI is associated with a higher level of JI of school teachers. So our hypothesis H2 (a) "There will be a positive relationship between EI and JI of the school teachers." is accepted. These findings are in line with the ones reported by Mirhashemi, Sharifi, and Sabeti (2005), Ghaderi and Shamsi (2013), Judeh (2013), and Anazor, Joe-Akunne, and Nnaebue (2020). Further, this study examines the relationship between EI and OC and shown that there is a positive association between EI and OC. Therefore, our hypothesis H2 (b) "There will be a positive relationship between EI and OC of the school teachers." is accepted. These findings are consistent with the findings of earlier studies Mohamadkhani and Lalardi (2012).

This study also examines the association between EI and TI and found that there is no significant relationship between EI and TI. Then our hypothesis H2 (c) “There will be a negative relationship between EI and TI of the school teachers.” is rejected. This finding is in line with other recent works (e.g., Brewster, 2020).

The ground for the earlier contradictory findings regarding the variables under this study conceivably connected to factors such as cultural, social, and personal, the research was accomplished in those circumstances. Thus based on these findings it says that teachers who are highly emotionally intelligent they are highly involved in their jobs and highly committed towards their job rather than those who are less emotionally intelligent teachers.

#### **CONCLUSION AND RESEARCH IMPLICATIONS-**

Based on the above results and discussion it is concluded that there is a significant association between teachers EI and JI as well as EI and OC, whereas no significant relationship found between teachers EI and TI as well as this study also indicate that there is no significant gender difference between EI, JI, OC, and TI amongst the school teachers.

This study has many theoretical as well as practical implications for school management and scholars. The significant findings of the study could be implemented in enhancing job involvement and organizational commitment among school teachers. EI plays major role in enhancing the involvement and commitment of teachers towards school job, and facilitate their overall success. Therefore, a recommendation based on the present study is that counsellors could be appointed in school for enriching the EI of the school teachers.

#### **Limitations and Future research direction-**

This study has few limitations first, data were collected by self-measure questionnaires so self-report bias cannot be ruled out. Second, data were collected only from school teachers so findings of this study cannot be generalized to other higher academic organizations. Third, the sample size of the study is small.

In the future, this study may replicate in other sectors such as banks, health care, higher educational institutions, and public organizations. Further, future study could comprised other variable measures such as job satisfaction, work alienation etc. to get more comprehensive picture.

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## Consumer Buying Behaviour in Online Shopping in Navi Mumbai during the Crisis of Pandemic

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### ABSTRACT

The coronavirus (COVID-19) eruption is first and prime human tragedy across the globe, affecting the lives of millions of people. It has greatly impacted the global economy. This research is done in order to find out the various changes in consumer behaviour and their mindset towards online shopping during this on going pandemic. Every sphere is affected and impacted by the pandemic. Before lockdown work from home created a positive shift in the trend of online shopping. But this could not reside for a long time. Unexpected lockdown of almost 6 to 7 months impacted Indian online shopping and marketing trends drastically. Initially, Coronavirus's influence on consumer buying behaviour, towards brands and online tools was largely unknown. This research aims to reflect on different issues and perspectives of consumer buying behaviour on online shopping in navi mumbai during the crisis of pandemic. There are still many more uncertainties to predict how the sale for the next few months will be impacting the global community, both personally as well as professionally. This study explores the impact of the epidemic from toilet tissue rolls to baby gear, pet food to many more daily essentials. Although some of the companies managed to operate through social commerce that is marketing by using e-commerce and social media. Most of users admitted that social networks are important for information sharing and for making product choices. But results are indicative of the fact that online marketing and shopping will soon go back to normal but the losses and downshift brought by this pandemic are not ignorable.

**Keywords:-** cconsumer behaviour, online shoppers, , E - commerce

### A Shift in the Consumers' Buying Behaviour

Empty shelves during COVID 19 have generated severe problems for the consumers. COVID 19 has forced consumers to change the way they preferred to shop. There is an increased shift in consumer buying behaviour from traditional shopping to online shopping. Apart from the augmented number of customers indulging into online shopping shift has been observed in the choice of products being ordered by customers through these online tools. The majority of the customers have started positively ordering more personal care and medical kits rather than ordering fashion products. National Retail Federation (NRF) has surveyed on consumer's online shopping behaviour in this epidemic situation and has briefed certain consumer buying behavioural changes as follows:

1. As per the survey results, 9 out of 10 customers have changed their shopping practices.
2. Results are supportive that more than 50% of customers have changed their traditional shopping habits by ordering products online.
3. About 6 out of 10 customers stated that they avoid going to store due to the fear of being infected and ordering necessary goods from online marketing tools.

All these behavioural changes are not permanent but few are going to last permanently. As the society will recover from this survival mode, this digital- online shopping adoption is likely to become permanent. So, in the end, this pandemic situation has been classified into two aspects one is a shift in customer behaviour that avoids public crowded gatherings and second is more inclination towards digital adoption.

The customer buying behaviour has been changed from fashion-oriented shopping to daily need- based shopping things as explained follows:

1. Active health product buying (increased purchasing of anticipatory health and wellness products).
2. Responsive health management kits (increased purchasing of protective kits like masks and alcohol-based hand sanitizers).
3. Vigorous pantry items purchasing (storing more of groceries and household daily essentials).
4. Quarantine preparation in advance (facing shortages of goods in stores, customers have cut down on store visits).

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## RESEARCH METHODOLOGY

### ➤ OBJECTIVES OF THE STUDY

The purpose of this research is primarily to identify and get insight in to what main factors the online consumer takes into consideration when purchasing online. Further, I will investigate if any segments can be established by identifying the consumers and how these segments relate to the identified factors. The findings of this research will be outlined implications for online retailers in order to enhance their consumer knowledge and increase their online marketing strategy effectiveness.

#### **The main aim of research is:**

3. To find out consumer behaviour towards online shopping.
4. To find out how consumer behaviour changed during pandemic.

#### **The Secondary objectives of the research are:**

5. To identify consumers perception towards online purchasing.
6. To identify consumers online buying behaviour.
7. To identify consumers preference towards different websites.
8. To identify consumers perception towards mode of payment.
9. To identify consumers change in consumption due to covid.
10. To identify how the buying power of consumers changed due to pandemic.

### ➤ SCOPE OF THE STUDY

The study was carried out to identify consumer behaviour of online shopping in Navi Mumbai. This research was done to collect the information about consumers behaviour and their changed perception on online shopping in Navi Mumbai in the time of pandemic. The objective of this research is to make investigation analysis for perception of consumer towards online shopping of goods and mode of payment and their changed consumption behaviour. This data is very important for study in Navi Mumbai city as we are exploring opportunities to offer solutions in online shopping of goods. The findings and recommendations from the research would be used to define future strategy for research in respect of market scope, initial target market and pricing strategy.

### ➤ LIMITATIONS OF STUDY

1. The sample size was very small which is may not represent the entire population Of Navi Mumbai because of Covid.
2. Area covered for this research is only limited to Navi Mumbai.

### SAMPLE SIZE

Sample Size- 100 respondents have been selected as a sample size for research.

### ➤ SAMPLING METHOD

#### 1. Sample Method

Random sampling is used for research project.

#### 2. Data representation technique and tools

Columns charts and pie charts have been used for the Representation.

### ➤ DATA COLLECTION METHOD

#### 1. Survey Method

#### 2. Survey Instrument: - Questionnaire

#### 3. Method of Survey: - Through google forms.

## LITERATURE REVIEW

The invention of the Internet has created paradigm shift of the traditional way people shop. A consumer is no longer bound to opening times or specific locations; he can become active at virtually any time and place and purchase products or services. The Internet is a relatively new medium for communication and information exchange that has become present in our everyday life. The number of Internet users is constantly increasing which also signifies that online purchasing is increasing. The rapid increase is explained by the growth in the

use of broadband technology combined with a change in consumer behaviour. The Internet is considered a mass medium that provides the consumer with purchase characteristics as no other medium. certain characteristics are making it more convenient for the consumer, compared to the traditional way of shopping such as the ability to at any time view and purchase products visualise their needs with products and discuss products with other consumers. Oppenheim and Ward (2006) explain that the current primary reason people shop over the Internet is the convenience. They also recognise that the previous primary reason for shopping online was price which has now changed to convenience.

Online shopping is the process consumers go through when they decide to shop on the Internet. The Internet has developed into a new distribution channel and the evolution of this channel e-commerce has been identified by Smith and Rupp to be the most significant contribution of the information revolution. Using the Internet to shop online has become one of the primary reasons to use the Internet, combined with searching for products and finding information about them. Smith and Rupp also state that the consumers have never had access to so many suppliers and product/ service opinions. Therefore the Internet has developed to a highly competitive market where the competition over the consumer is fierce. In order to have an impact on and retain consumers in a competitive market, Constantinides (2004) stated that the first step is to identify certain influencing aspects when purchasing online these can be regarded as factors.

**Dr. Seema Agarwal, "A STUDY OF FACTORS AFFECTING ONLINE SHOPPING BEHAVIOUR OF CONSUMERS IN MUMBAI REGION"; Tactful Management Research Journal, (ISSN: 2319-7943)**

The increasing use of internet by the younger generation in India, provides an emerging prospect for online retailers. If online retailers know the factors affecting Indian consumer's buying behaviour, the association between these factors and type of online buyers, then they can further develop their marketing strategies to convert potential customers into active ones. This study attempts to analyse the features related to the shopping behaviour of online shoppers. Consumer's shopping behaviour in respect of online shopping was studied using different socio-economic variables.

The data was collected through questionnaire. The results of study revealed that online shopping in India is significantly affected by various demographic factors like age, gender, education and income. Further it also helps retailers to understand the drivers of consumer's attitude and goal to shop on the internet and consumer's perceptions regarding ease of use and usefulness. Conclusions derived from the analysis can be used as useful guide for market orientation. The outcomes of the study suggest that assessment of consumer's shopping behaviour can contribute to a better understanding of consumer shopping behaviour in respect of online shopping relevant studies related to the various concepts of online shopping to explore the concept of online shopping.

Findings revealed that online shopping brings optimum convenience to the consumers. Privacy and security risk emerges frequently as a reason for being wary about internet shopping. Shopping convenience, immediate possession, information seeking, social interaction, and variety affects the consumer attitude towards online shopping. The impossibility of product testing, problems with complaints, product return and misuse of personal data are the main uncertainties regarding on-line shopping.

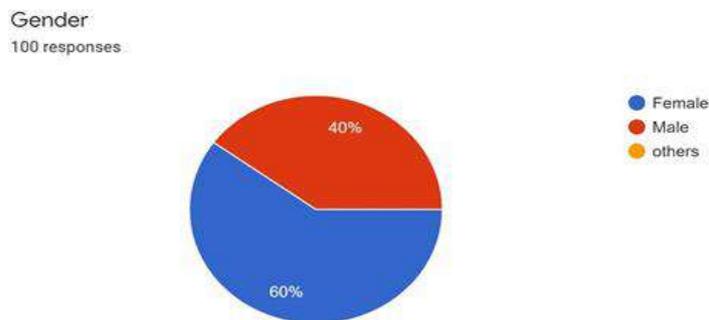
**Ms. Asmatara Khan, March, 2015, "FACTORS AFFECTING ON-LINE SHOPPERS BEHAVIOR FOR ELECTRONIC GOODS PURCHASING IN MUMBAI: AN EMPIRICAL STUDY", International Journal in Management and Social Science, (Vol.03 Issue-03, ISSN:2321-1784)**

This paper had analysed factors affecting on online shopping behaviour of consumers that might be one of the most important issues of e-commerce and marketing field. However, there is very limited knowledge about online consumer behaviour because it is a complicated sociotechnical phenomenon and involves too many factors. This goal has been followed by using a model examining the impact of perceived risks, motivational factors and return policy on attitude toward online shopping behaviour and subjective norms, perceived behavioural control, domain specific innovativeness and attitude on online shopping behaviour as the hypotheses of study. This study identifies the following implications.

The results and findings of this study revealed retail companies should start taking measures to eliminate risk factor and build trust in this form of retail. The retail managers should sway consumers through different platforms like social networking sites, ads, promotions, online only discounts etc. to let people cross the threshold and start buying because Indian consumers are still comfortable with brick and mortar format as they appreciate friendly approach of salesman and social element of shopping, which has been found as important element in shopping.

**DATA ANALYSIS AND INTERPRETATION**

**1) Gender of the respondents?**

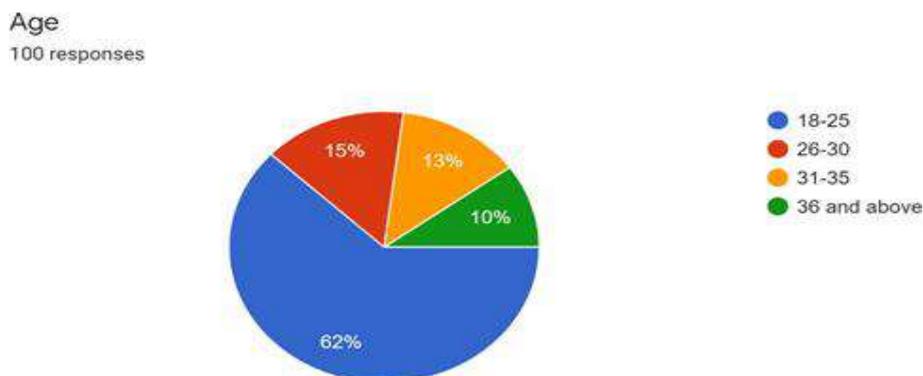


Gender	No. of respondents	Percentage
Male	40	40%
Female	60	60%
Others	0	0

**INTERPRETATION:**

The questionnaire was circulated amongst 100 respondents and as it shows that there 40 male, 60 female and 0 others, so we can see that female respondents are more as compared to male respondents.

**2) Age of respondents?**

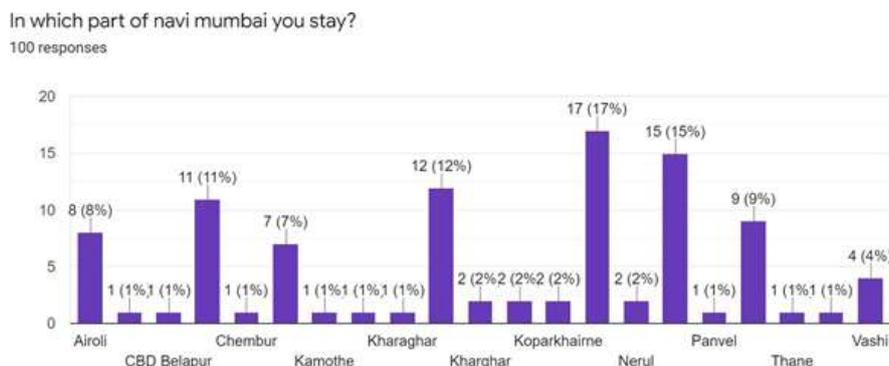


Age	No. of respondents	Percentage
18 – 25	62	62%
26 – 30	15	15%
31 – 35	13	13%
36 and above	10	10%

**INTERPRETATION:**

Out of the above respondents, it shows that in the group of 18-25 the most number of respondents have been there of total 62 continuing with 26-30 being 15 people, 31-35 being 13 people and 36 and above being 10 people the least.

**3) In which part of Navi Mumbai you stay?**



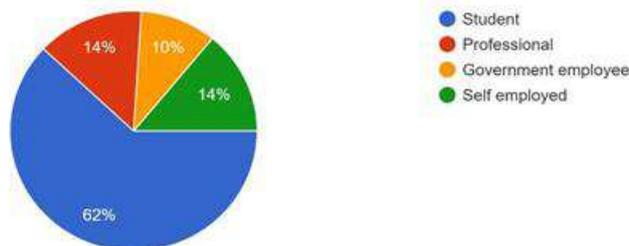
Area	No. of respondents	Percentage
Nerul	17	17%
Panvel	15	15%
Kharghar	12	12%
CBD Belapur	11	11%
Seawoods	9	9%
others	36	36%

#### INTERPRETATION:

As the survey taken was bound to only Navi Mumbai geographical region so the areas shown above comes within Navi Mumbai, as you can the most number of respondents from the residents of nerul with total 17 people following with panvel with 15 people, Kharghar 12 people, cbd Belapur 11 people, seawoods with 9 people and the remaining respondents comes within other parts of Navi Mumbai.

#### 4) What is your occupation/ employment status?

What is your occupation/ employment status?  
100 responses



Occupation	No. of respondents	Percentage
Student	62	62%
Professional	14	14%
Government employee	10	10%
Self employed	14	14%

#### INTERPRETATION:

As per the survey we can see that the majority of the respondents are students with overall of 62 respondents following with professionals with 14 people, 10 people are government employee and 14 people being self employed.

#### 5) Have you ever done online shopping?

Have you ever done online shopping?  
100 responses



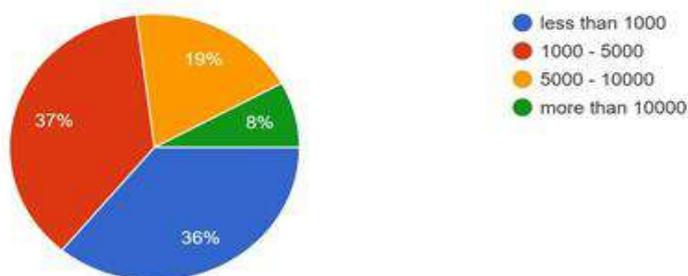
Options	No. of respondents	Percentage
Yes	100	100
No	0	0

#### INTERPRETATION:

This questionnaire was supposed to be only filled by people who have done online shopping at least once to understand their behaviour towards online shopping and as per the survey we can see that everyone who responded have done online shopping as all the respondents has said yes as their answer.

6) Approximately how much do you spend monthly on online shopping?

Approximately how much do you spend monthly on online shopping?  
100 responses



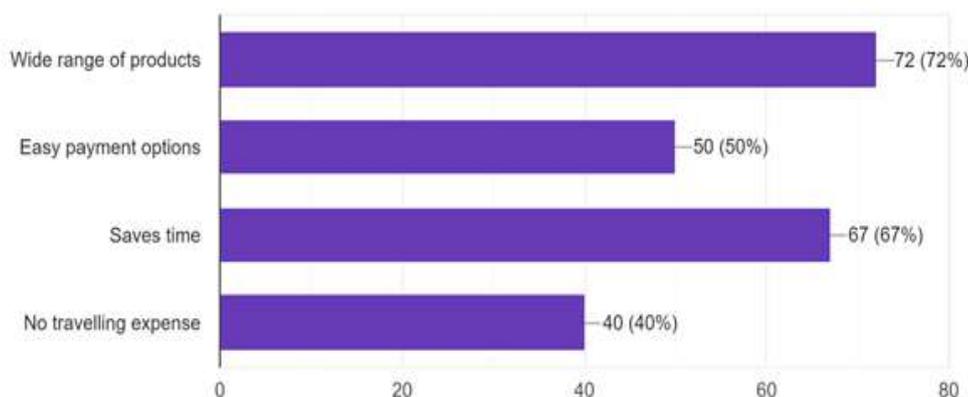
Options	No. of respondents	Percentage
Less than 1000	36	36%
1000 – 5000	37	37%
5000 – 10000	19	19%
More than 10000	8	8%

**INTERPRETATION:**

The question about how much is the spending of respondents on online shopping was to know their spending's and behaviour towards online shopping, as the 37% of the respondents spends about 1000 to 5000 monthly to buy something online which denotes that most people find it reasonable to spend that amount on online shopping, followed with 36% spending less than 1000 which is the lowest as per spending's and 19% people spends about 5000 to 10000 and the remaining 8% people who spends more than 10000 monthly which is the highest as per spending's.

7) What motivates you to buy online?

What motivates you to buy online?  
100 responses



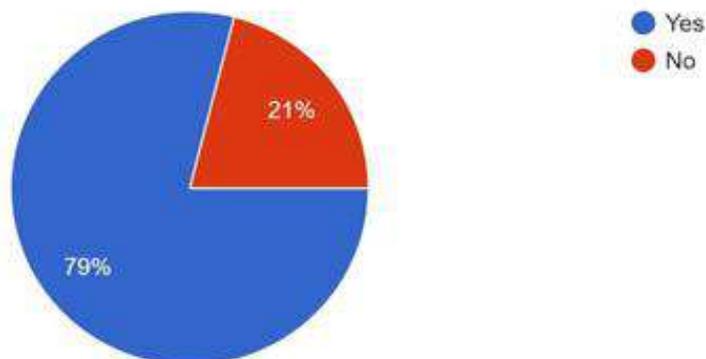
Options	Percentage
Wide range	72%
Easy payment	50%
Saves time	67%
No travelling	40%

**INTERPRETATION:**

The above question was asked to know what motivates the respondents to buy products online rather than buying it the traditional way through physical stores and the majority of the respondents which is 72% of them answered that the wide range of products excites them the most as the variety of products are limited in physical stores, and 67% votes were also for the option of saving time as online shopping can be done from anywhere and through any electronic device, 50% of people said easy payment also motivated them to shop online as it gives them options on how they pay as per their preference which leaves us with last option of no travelling expense with 40%.

8) Did you start shopping online more during this pandemic?

Did you start shopping online more during this pandemic?  
 100 responses



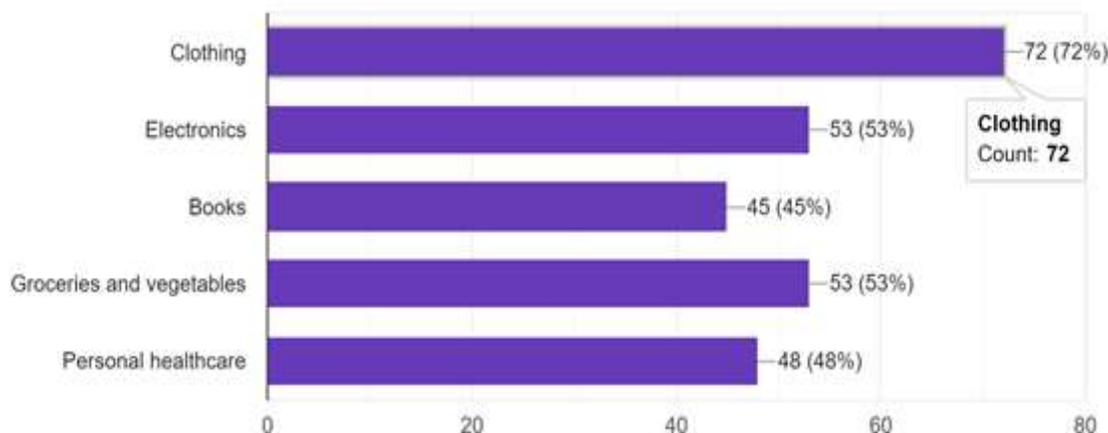
Options	No. of respondents	Percentage
Yes	79	79%
No	21	21%

**INTERPRETATION:**

The purpose of this question was to know that did people start using online shopping more due to pandemic as it was not preferable to go to physical stores due to pandemic and them being shut due to which it affected the online shopping positively as we can see that 79% of the people started online shopping due to pandemic more than they used to, whereas the other 21% were not affected and kept their buying behaviour same as usual as they were already into online shopping.

9) What products did you buy on the internet?

What products did you buy on the internet?  
 100 responses

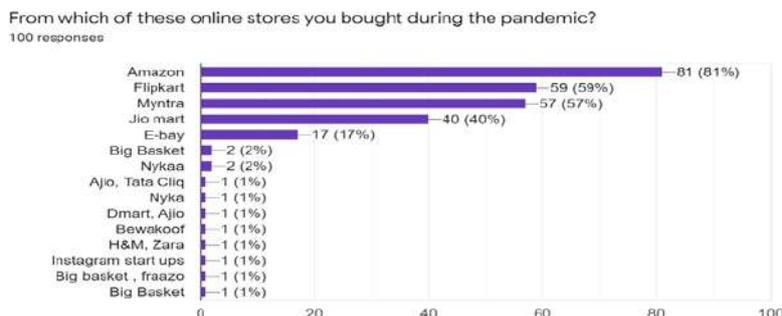


Products	Percentage
Clothing	72%
Electronics	53%
Books	45%
Groceries and vegetables	53%
Personal healthcare	48%

**INTERPRETATION:**

As the above graph shows what do respondents shop the most online where majority of respondents voted for clothing with 72% people saying it followed by 53% saying electronics, groceries and vegetables were also bought by them the most, and due to the pandemic effects people started purchasing personal healthcare products too with 48% people saying it and with the least 45% said they bought books online.

10) From which of these online stores you bought during the pandemic?

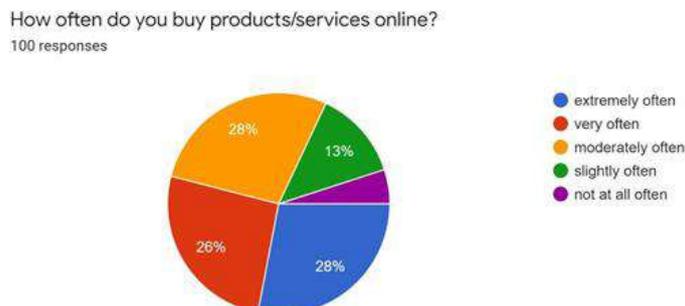


Online stores	Percentage
Amazon	81%
Flipkart	59%
Myntra	57%
Jio mart	40%
E-bay	17%
Others	12%

INTERPRETATION:

The above graph shows from where did people shop the most online products, Amazon being the most used amongst all others with 81% of people using it. Followed by Flipkart with 59%, Myntra being 57%, Jio mart with 40% and ebay at 17% and 12% of respondents used online stores other than these 5 stores too like big basket, Ajio, Dmart and few others too.

11) How often do you buy products/services online?

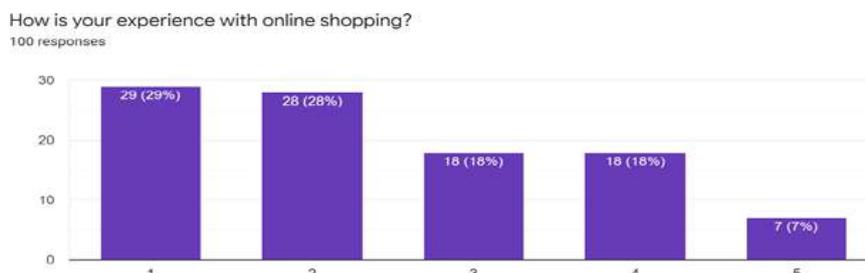


Options	No. of respondents	Percentage
Extremely often	28	28%
Very often	26	26%
Moderately often	28	28%
Slightly often	13	13%
Not at all often	5	5%

INTERPRETATION:

The question was asked to get an idea of how often do people go for online shopping, where 28 people responded to extremely often and moderately often simultaneously and 26 people responded to very often, 13 people as slightly often and the lowest with 5 people responded to not at all often.

12) How is your experience with online shopping?



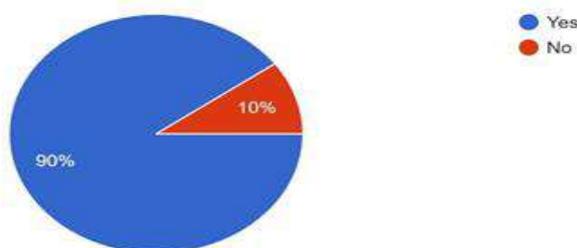
Experience	No. of respondents
1 being the highest	29
2	28
3	18
4	18
5 being the lowest	7

**INTERPRETATION:**

The respondents were asked about their experience of online shopping, 1 being the highest as most satisfied 29 people felt highly satisfied followed by 28 people responding to 2, 18 people responded to 3 and 4 simultaneously and 5 being the lowest as dissatisfied 7 people responded to it.

**13) Do you compare prices on different websites?**

Do you compare prices on different websites?  
100 responses



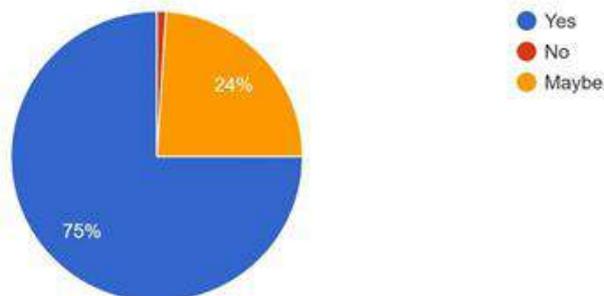
Options	No. of respondents
Yes	90
No	10

**INTERPRETATION:**

The above diagram shows how many people do compare prices while buying online. Overall 90% of people do compare prices prior to purchasing online on different websites, so it displays an overall positive attitude towards price comparison over the internet though there is 10% of respondents who don't compare prices prior to online shopping.

**14) Do you find it secure to purchase products online?**

Do you find it secure to purchase products online?  
100 responses



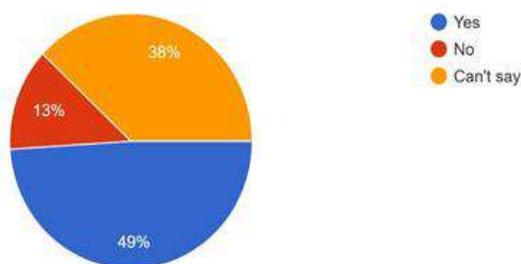
Options	No. of respondents
Yes	75
No	1
Maybe	24

**INTERPRETATION:**

This question investigates what the respondents' overall attitude is towards online shopping whether they find it secure to shop online do they have trust in purchasing online and as per the survey the above chart displays that 75% of people do find online shopping secure while 24% of people can't decide whether its totally secure or not and only 1 person find in insecure to shop online.

15) Do you feel that online shopping is better than shopping at an actual physical store?

Do you feel that online shopping is better than shopping at an actual physical store?  
100 responses



Options	No. of respondents
Yes	49
No	13
Can't say	38

**INTERPRETATION:**

The question was asked to understand consumers perception about what do they prefer shopping online or at an actual physical store as 49% of people think that its better and more preferable to shop online while 13% of people says they prefer shopping at an actual physical store and the remaining 38% can't say what's better to shop online or physical store.

**CONCLUSION**

The internet played a very important role in development of many areas including the online shopping. After a long term development of internet, which rapidly increased web users and highspeed internet connection, and some new technology also have been developed and used for web developing, those lead to firms can promote and enhance images of product and services through web site. The Internet has transformed the way consumers transact for their daily needs - be it ordering food, booking movie tickets or even booking a cab. Online shopping is one category which has witnessed unprecedented growth.

During a time like this when we are in the middle of pandemic internet has helped consumers with online shopping, fulfilling their consumer needs in the time of crisis. As global economies are facing pressure for survival as they are facing huge losses in revenue, so the future actions were taken by marketing experts, and consumer preferences will decide the order of the new changing world, like who will be the new leader, survivor, and laggards? Undoubtedly this epidemic has come up with a lifelong lesson and has impacted every sphere of natural life. So online marketing and consumer shopping preferences are not an exception to this. The best strategy of advice to adjust or to survive in this tough time is to adapt to changing needs of the consumer as the need of the hour is not the luxury or availability of luxurious goods at the specific price range, but unitedly everyone is contributing and fighting for the passage of this phase. So preferences have changed over from trip to the globe to stay at home and buying luxury online to buying groceries for survival.

While the globe has been revolving from the special effects of the Coronavirus (COVID-19) pandemic, at the same time customer behaviour is being enforced to change and consumers are progressively moving towards online shopping. Many new challenges have been forced on business units as international borders have been closed for exchange of goods so, survival for many will be a tough job. Might be a chance that some companies will stop operating in the short run and few will face permanent shut down. This will leads to financial uncertainty among staff members.

Financial uncertainty among economies, business, staff and the outlook of a simple and long-term future recession that will set back to backdrop the economy for the long run. This will lead to a long-run impact on consumer shopping trends perception and preference behaviour.

**FINDINGS**

8. The situation of covid 19 outbreak made people think dynamically on their spending behaviour.
9. There is an increased shift in consumer buying behaviour from traditional shopping to online shopping.
10. The majority of customers started ordering more personal care products and medical kits rather than fashion products.

11. Customers stated that they avoid going to store due to the fear of being infected and ordering necessary goods online.
12. People started storing goods like groceries and other essentials in bulk quantity due to fear of lockdown.
13. It was found that close to 95% of Gen-Zs and Millennial were well aware and concerned about this emergency period and the pandemic, and its effects on the people and their economy.
14. This has resulted millennial generation to change their behavior and buying decisions more drastically than any other generations such as the older ones.
15. It was found that the older generation or the boomers, late boomers and gen-x people were slightly less concerned than younger generations although they were still aware of coronavirus and its effects on the economy.

### **SUGGESTIONS**

- 1) Many retail store should develop a smart phone application for online shopping.
- 2) Online sellers should consider post purchase activity that helps customer to purchase products online.
- 3) Customers are now using so many social networking websites so online sellers should advertise their products in social networking websites.
- 4) Risk perception for online shopping should be reduced.
- 5) Online sellers should track history of customers so that they can provide personalized offers to individual.
- 6) Sellers should provide brief description of products so that customers can order accordingly.
- 7) To make online shopping more preferable, online sellers should make design of website more attractive.
- 8) As the preference for shopping from application is more, company should focus more on application based shopping then on web based shopping.
- 9) As discount offers are more influential factor in purchase decision, promotional efforts by company should be more on discount offers.
- 10) As the lower price in online shopping is main reason, attracting consumers for online shopping, the price should be featured properly in advertisement by the company.

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## **Changes in Financial Communication of Ola and Uber Companies in Travel Sector during Covid Era: A Secondary Study Clubbed with the Empirical Approach in the Areas of Mumbai Region**

**Priyadarsini Poddar and Aditi Pahilani\***

SIES (Nerul) College of Art, Science and Commerce, Navi Mumbai, India

### **ABSTRACT**

This paper analyses how the companies Uber and Ola cab aggregators in the travel sector used to interact with investors from the time they have set up and how there is a change in their communication with potential investors during the COVID era. The role played by lockdown in the success or failure of the mentioned companies. In order to identify these queries, an analysis of Uber and Ola company's comparative pre COVID and during COVID financial PR study has been established. Along with that, to study and understand people's opinion toward the mentioned companies progress, working and non-working class. The secondary data will be collected from various published sources. The expected result is assumed to be that Uber company might not be as affected as Ola in the financial terms. The people of the age 18-30 might be more welcoming toward the innovative companies, as it makes travelling easier without the strain of driving by themselves. The resultant might also be that working class in the mentioned age group might have a lesser acceptance toward the innovative private mode of transport than the privileged non-working class.

Keywords: Cab service, finances, Public Relations, OLA and UBER, Covid-19

### **INTRODUCTION**

Concept of organized rental cab was introduced to Indian consumer in 2004 when Meru cab service was launched in major metro cities of India and then almost after six years App based rental cab service was introduced in Indian market. Among various transportation mode cab service gained popularity because of its advantage of door to door service and now because of technological advancement customers were able to book cabs at competitive price in just one click using their smart phones. These App based cab services were having tremendous potential for growth in densely populated countries like India where parking is major problem because of space crunch as well as public transports are over covered during peak hours. Slowly this convenient mode of travel started gaining popularity and competition became dense after Uber's launch in 2013.

As customers have become more demanding it's a challenging job for rental cab industry to meet the customer's expectations. Now a days not just the price but quality service also plays an important role in customer satisfaction. Now using a smart phone consumer can access, compare, evaluate and purchase. In this situations App based services such as Ola or Uber Cabs offered solution by offering various services ranging from the economic to ultimate luxury.

There has been a huge increase in the demand for these taxi cab services in the recent years. Uber, headquartered in San Francisco, California, US; set up its base in India in 2014, whereas, Ola was established in Mumbai by Bhavesh Agarwal and Ankit Bhatti in 2010. Both these firms have a healthy competition in the cab/travel sector to capture the market share, all these activities need finance.

The Covid-19 pandemic resulted in company rating downgrades, market volatility and loss of share value for leading entities such as Hertz, Avis, Europcar, Uber and Lyft. However, the impact of the pandemic on ride and share transport was moderate. The pandemic led to Hertz filing for bankruptcy, albeit after paying US\$16 million in retention bonuses on the eve of bankruptcy to its executives. Losses led to various cost-containment measures, which saw a record number of employees being laid off and disposal of non-core assets. The pandemic recommends a robust, coordinated health and safety certification and protocol for the industry to ensure the safety of passengers and employees to boost confidence in the sector as it emerges from the pandemic. After the second wave of the Pandemic Uber and Ola made a comeback to the "new normal" in India loaded with safety precautions such as temperature checks, car sanitization after each ride, and plastic screens between drivers and riders. But with offices and schools still operating remotely, businesses for ride-hailing firms remained subdued.

The purpose of this research is to understand the flow of funds in these firms which they use to carry out PR activities, advertising and other activities along with that the researcher attempts to analyze the public opinion

too to rate the performances of each of these rental cab services as well as the researcher attempts to analyze the comparative study of the financial impact on Uber and Ola before and after Lockdown.

**OBJECTIVES:**

1. To learn about Uber’s finances and its investors graph from the time they have set up till during COVID that is during lockdown period.
2. To understand Ola’s finances and its investors graph from the time they have set up till during COVID that is during lockdown period.
3. To analyze the comparison between Ola and Uber’s financial impact before lockdown and during lockdown in the rental cab service.
4. To understand public opinion on the Uber and Ola company’s performance.

**LITERATURE REVIEW**

Sr No	Date of Publication	Source	Author’s Name	Publisher’s Name	Topic	Review
1.	January 10th,2021	<a href="https://www.investopedia.com/articles/personal-finance/111015/story-uber.asp">https://www.investopedia.com/articles/personal-finance/111015/story-uber.asp</a>	Dan Blystone	Investopedia	The story of Uber	The article expresses Uber’s growth from the time of their set up till the during COVID and lockdown phase. It also gives details about Uber’s investors from 2009-present.
2	July 16 <sup>th</sup> ,2021	<a href="https://startuptalky.com/startup-story-ola/">https://startuptalky.com/startup-story-ola/</a>	Shubham Kumar	Startup Talky	How Ola became India’s leading Cab	The article describes Ola’s working and its company profile. It also states its financial investors from the period
					Aggregator	that it came into existence that is 2010. Lists its investors, competitors, challenges faced, acquisitions, growth.
3	January 8 <sup>th</sup> 2021	<a href="https://inc42.com/resources/how-startups-can-find-investors-now/">https://inc42.com/resources/how-startups-can-find-investors-now/</a>	Sanjeev Kumar	INC 42	How startups can find investors	The discussion states various ways that the startups find investors for their business and to attract them toward their startup.
4.	2017	International Journal of Informative & Futuristic Research.	Dr. Kavitha and R. Rajeswari	ISSN: 2347-1697. Vol 4. issues 3. pp: 5538-5544	Mobile wallets usage in taxi companies- problems & Challenges	Aggregator taxi companies ‘s tied up with the mobile wallets companies like Free Charge, PayTM, Mobikiwiki which helped in providing hazel free ride to customers by providing customers easy payment options with offers and

						discounts for rides. Consumer's preference for online transaction push Uber to create taxi service portal as well as Uber is also started spending on various marketing strategies and information technology.
5.	(2017)	IOSR Journal of Business and Management (IOSR-JBM).	Ruchi Shukla, Ashish Chandra and Himanshu Jain	e-ISSN: 2278-487X. p-ISSN: 2319-7668 PP 73-78.	OLA VS UBER: The Battle of Dominance.	Ruchi Shukla studied various factors of dynamics of Indian taxi markets such as pricing, their revenue models, market share etc. Utsav Pandya et al (2017) identified technology trends, safety, and price, ease of availability, comfort and payment options affecting public taxi market.

#### RESEARCH METHODOLOGY:

##### SOURCES OF DATA COLLECTION:

**Primary Data Source:** It is basically the first-hand data or raw information provided by the relevant respondents to the researcher. The primary data collection method involves a number of ways to gather information.

In this research, primary data was collected by 57 respondents residing in Mumbai ranging from 18-30 years of age. The data was collected by random sampling method. To conduct sampling analysis, the research has been analyzed using data processing.

##### The challenges faced in primary data:

1. Unable to give the questionnaire face to face to the respondents due to lockdown, had to rely on e forms.

**Secondary Data Source:** Secondary data refers to the second-hand information or already processed data which is in the form of journals, magazines, websites. It helps to analyze data collected from various means.

In this research, secondary data has been obtained by browsing a number of websites for the details.

##### The challenges faced in secondary data:

1. Due to lockdown, it was difficult to gather information from libraries i.e. from books or journals, et cetera.

##### OBJECTIVES:

1. To learn about Uber's finances and its investors graph from the time they have set up till during COVID that is during lockdown period.
2. To understand Ola's finances and its investors graph from the time they have set up till during COVID that is during lockdown period.
3. To analyze the comparison between Ola and Uber's financial impact before lockdown and during lockdown in the rental cab service.
4. To understand public opinion on the Uber and Ola company's performance.

##### TOOLS USED:

The tools used were a structure of 10 questions, having multiple choices for the respondents to answer which suits the best for them. The questions were in reference to:

1. Their demographics, that is age, gender, et cetera.

2. The cab service that they find more comfort in, budget and user friendly, and safety in respect to lockdown in COVID times.
3. Their preference and how likely will they suggest which of the cab service i.e. Uber or Ola.

**SOFTWARE FOR DATA ANALYSIS:**

1. Microsoft Excel
2. Microsoft Word
3. Google Forms

**RESEARCH ANALYSIS:**

The data has been analyzed by referring to a number of websites cited above in Literature review and journals hence, inferences are obtained.

**STATEMENT NO. 1:** Uber's finances and its investors graph from the time they have set up till during COVID that is during lockdown period.

Discussion shows that the concept of Uber was tested using only three cabs in New York in the early 2010s and launched it in San Francisco in December 2010.

1. In October 2010, before the launch, Uber raised 1.25 million dollars through First Round Capital (the company which provides seed funding to tech firms) because of which Uber made it into the watchlist of many Investors.
2. In the early 2011, company made \$12 million from series A round of funding which was organized by Benchmark Capital for which they got 11% of the stake in the company. This funding helped Uber to expand in different parts of the US and also in Paris.
3. In December 2011, Uber raised a whopping 37 million dollars via series B funding provided by Menlo Ventures, Goldman Sachs and Jeff Bezos.
4. In 2012, firm focused on expanding their business and launched UberX having a USP of hybrid car but not as expensive as the black car service.
5. Uber launched in India in 2013.
6. By July 2015, Uber had raised a total of 51 billion dollars raised from all the funding rounds.
7. Saudi Arabia Wealth Fund invested \$3.5 billion in June 2016.
8. In April 2017, Uber reported a global loss of \$3.8 billion for the year 2016 and shifted its focus to Uber pool- car pooling service and realized revenue growth by 76% in the fourth quarter of 2016.
9. Due to a blog post of 2017 by a former female Uber engineer about its sexist culture which allegedly proved Uber's corporate culture to be hostile, sexist and offensive to most people. Due to many other controversies, Uber's then CEO, Travis Kalanick resigned and Dara Khosrowshahi was appointed the CEO in 2017.
10. During the January 2018 funding, Uber's valuation reduced from \$70 billion to \$48 billion; the company later came up with a revised tender that helped with its funding and company valued at \$62 billion.
11. Uber launched its first initial public offering (IPO) in 2019, however reported the biggest first day loss in the US. It raised an IPO of \$69 billion, half of expected analysis.
12. SB investment advisers (UK) Ltd owns 222.2 million shares of Uber according to the filing of the year September 2020. Morgan Stanley also owns 101.2 million shares of Uber as per the September 2020 filing.
13. As on December 2020 filing, FMR LLC also owns 82.3 million shares of Uber.
14. As of 2021, the top shareholders of Uber consist of names like;

Stockholder	Stake
Fidelity management & research co	4.51%
The Vanguard group, Inc	3.65%
Morgan Stanley Asia ltd	2.84%
Morgan Stanley Investment management	2.54%
Jennison associates LLC	2.49%
BlackRock Fund Advisors	2.41%
Sands Capital Management LLC	1.79%
Altimeter Capital Management LP	1.51%
Capital Research Management co	1.31%
SSgA funds management	1.29%

**STATEMENT NO. 2:** Ola's finances and its investors graph from the time they have set up till during COVID that is during lockdown period.

Analysis states that Ola is the first Indian cab Aggregator company, owned by ANI Technologies Pvt Ltd. Ola was launched in India in 2010 by two IIT graduates.

1. In 2010, Bhavesh Agarwal and Ankit Bhatti founded Ola Cabs.
2. In April 2011, Ola Cabs raised \$550k via Angel Investments (individuals who provide support to start ups at the initial moment in exchange of ownership equity).
3. In April 2012, Ola went on to raise 5 million dollars from series A through Tiger Global Management, also a firm which helps with investments.
4. Tiger Global Management showed its support to Ola Cabs once again by helping them raise 20 million dollars along with Matrix Partners in 2013 in the series B.
5. By July 2014, Ola raised 41 million dollars via series C, Steadview Capital and Sequoia Capital were the investors.
6. In October 2014, Ola Cabs raised \$210 million through series D by Softbank group, and sustained Tiger Global and Matrix Partners India.
7. During April 2015, through series E, Ola came up with a funding of \$403 Million by DST Global, GIC, Softbank and Falcon Edge Capital.
8. In November 2015, series F, it raised \$500 Million from Baillie Gifford, and sustained Falcon Edge Capital, Tiger Global, Softbank, DST Global.
9. During the period of 2016, Ola focused on expanding its operations and came up with 2-wheeler service in Bangalore and attracted controversy due to price surge.
10. Up until April 2017, Softbank Capital invested \$590 Million into Ola Cabs. May 2017, private equity helped Ola reach \$104 million from RNT Capital and Falcon Edge.
11. In October 2017, Ola raised the highest investment which was a whopping 1.1 Billion dollars from series G via Tencent Holdings and Softbank group and over 300 mil dollars from other investors. It also acquired Food Panda.
12. In the year 2018, \$275 million was raised through china Eurasian economic co-op, sailing capital and Temasek holding and expanded to Australia.
13. The funds through series J ran throughout the year 2019, it raised a total of \$512 million through investors like, Eternal yield international, Steadview Capital, Sachin Bansal, Hyundai and Kia Motors corp, Deshe holdings, DIG investment, ARK Ola pre-IPO Private Investment Trust.
14. In 2020, Ola raised 250 million dollars from Softbank for Ola electric and expanded to London.
15. Ola is planning to release its IPO in the year 2021, therefore in the Pre IPO-round it raised, \$500 million from Temasek, Warburg Pincus's Plum Wood and Bhavishh Agarwal.
16. As of 2021, the top shareholders of Ola consist of names like;

Stockholder	Stake
Softbank	10%
Tekne Capital Management	1.09%
Tencent, Softbank	33.33%
Temasek	6.81%
Sailing capital, China Eurasian eco fund	1.51%
Steadview Capital	2.24%
Steven Price	0.47%
Hyundai Car Co	9.09%
Hussam Khoury, Samih Toukan	0.345%
Warbug Pincus, Temasek, Bhavish Agarwal	15.15%

**STATEMENT NO. 3:** The comparison between Ola and Uber’s financial impact before lockdown and during lockdown in the rental cab service.

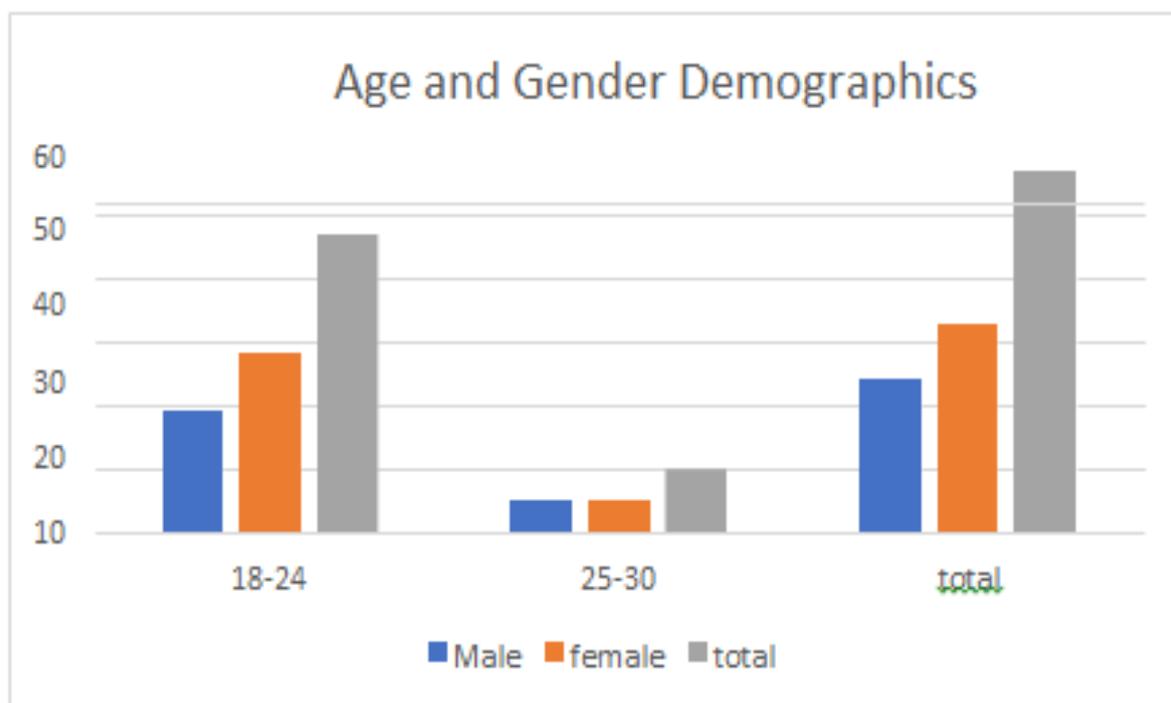
As noticed above, Uber was introduced in India back in 2013, whereas, Ola was introduced in 2010. Therefore, OLA already had a three-year head start. We can see that 2017 was the year where in Ola roped in a huge amount of investment in its name that is of \$1.1 billion. Uber received its huge investment in 2015, that is of \$51 billion.

During 2020, the firms didn’t make huge profits as compared to their own previous finances due to new rules that is because of the COVID 19 Lockdown, the travelling to work decreased exponentially because of work from home; travelling to malls or tourist places reduced owing to the complete shutdown of the country. The first half of financial year 2020-21, both Uber and Ola, the cab aggregators did not obtain much investment for the sake of lockdown, however Uber sold 101.2 million shares in the name of Morgan Stanley and Ola managed to up stretch \$250 million during 2020.

**STATEMENT 4:** The statement seeks on the age and gender of respondents.

**Table no.1** Table below shows the combination of age and gender of respondents residing in Mumbai and Navi Mumbai.

Age/Gender	18-24	25-30	Total
Male	19	5	24
Female	28	5	33
Total	47	10	57



The table and graph above show that the respondents vary within the age of 18-30, wherein the number of females in the 18-24 age range are the highest in number, that is 28; whereas the number of female respondents is lowest between the age range 25- 30. In total there are more female demographics than male.

**STATEMENT NO. 5:** The statement seeks occupation of the respondents

**Table no 2:** The table below shows the segregation of occupation of respondents in the sectors of employed, student, home maker and business.

<b>Employed</b>	13
<b>Student</b>	42
<b>Home Maker</b>	1
<b>Business</b>	1

Occupation  
 57 responses



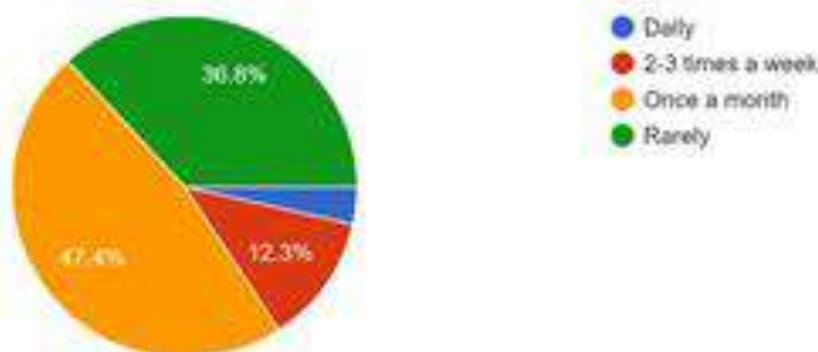
The table and graph above show that the respondents vary in terms of their occupation. Here we can find homemaker and business respondents to be just one each. Highest number of respondents are students carrying the count of 42. Employed sector comes in second with 13 people.

**STATEMENT NO.6:** The statement seeks the frequency of using cab aggregators by respondents

**Table no. 3:** The table below shows the periods of time within which the respondents travel.

<b>Daily</b>	2
<b>2-3 Times a week</b>	7
<b>Once a Month</b>	27
<b>Rarely</b>	21

How often do you use cab service?  
 57 responses



The table and pie chart above show the frequency of travel. 21 People travel rarely through the cab services. The highest number of people tend to travel once a month using these cab aggregators making the count to 27. Only 2 people out of the collected respondents travel daily using the cab aggregators.

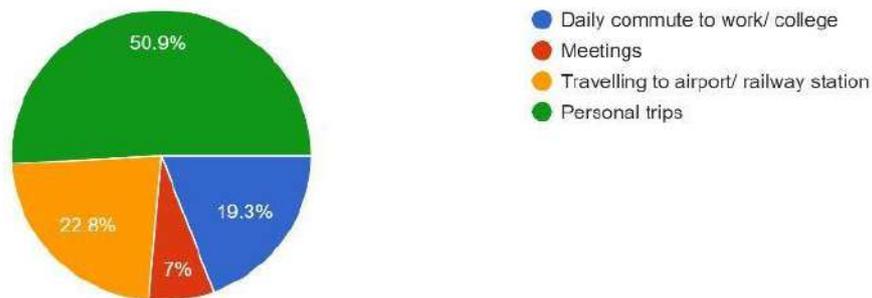
**STATEMENT NO. 7:** The statement seeks purpose of travel by the respondents.

**Table no. 4:** The table shows purpose of travel from the options of Daily commute to work/ college, Meetings, Travelling to airport/ railway station, Personal trip.

Daily commute to work/ college	11
Meetings	4
Travelling to airport/ railway station	13
Personal trip	29
Total	57

What was/ is your purpose of travelling via cab?

57 responses

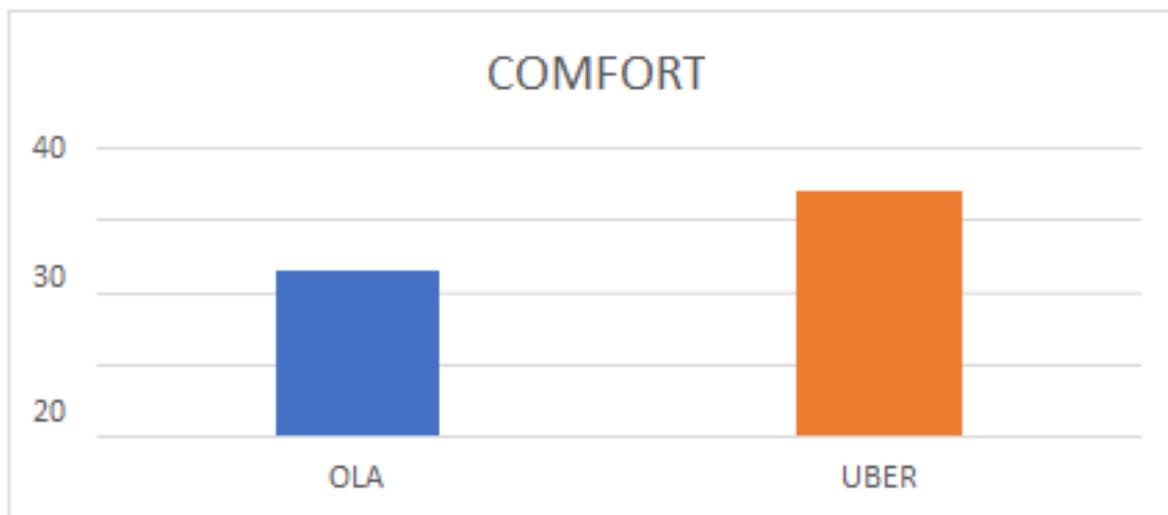


The table and pie chart above show the various possible reasons that respondents might have to travel. Respondents respectively chose one from those reasons. It can be seen that personal trips to various places take the lead over all the other reasons making the count to 29. Only 4 people tend to travel for meetings by using cabs.

**STATEMENT A:** The statement understands the level of comfort in cabs by the respondents.

**Table no. 5:** The table below states the number of people find comfort in the cab aggregators.

OLA	UBER	TOTAL
23	34	57

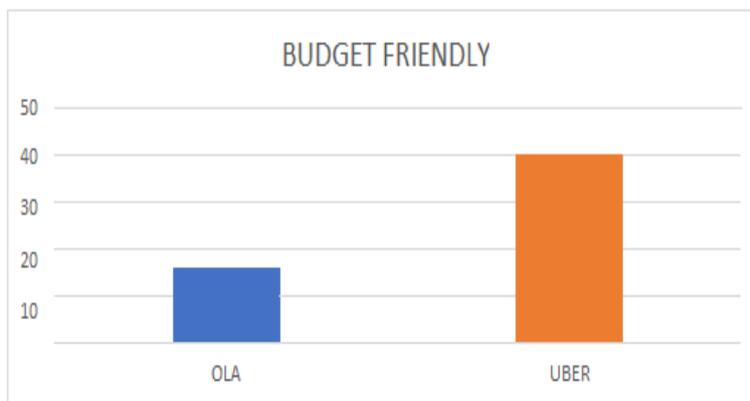


The table and graph above show comfort. It can be noticed that a greater number of respondents find comfort in Uber than Ola cab aggregators.

**STATEMENT B:** The statement understands more pocket friendly cabs out of the two by the respondents.

**Table no. 6:** The table below states the number of people find cheaper in terms of money amongst the cab aggregators.

OLA	UBER	TOTAL
16	41	57

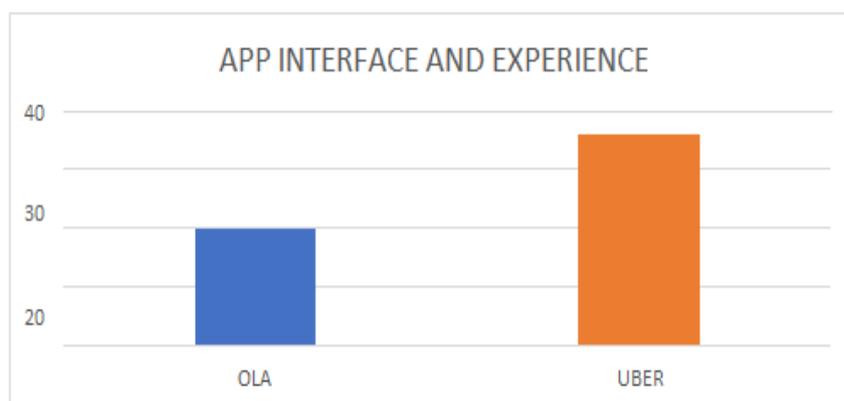


The table and graph above show the cab aggregator that respondents find more within their budget. Clearly, Uber is cheaper in terms of money than Ola according to the perspective of respondents.

**STATEMENT C:** The statement analyses user friendliness and ride experience cab out of the two by the respondents.

**Table no. 6:** The table below states better app interface and ride experience amongst the cab aggregators.

OLA	UBER	TOTAL
21	36	57

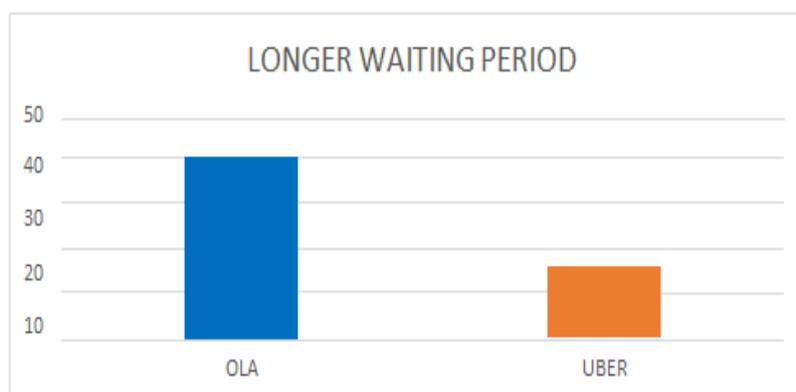


The table and graph above show the cab aggregator that respondents find more easier to use and their experience. Out of 57 respondents, 36 number of respondents find Uber’s app interface to be user friendly whereas 21 find Ola to be easier to use.

**STATEMENT D:** The statement analyses waiting period faced by respondents while booking from the cab aggregators.

**Table no. 6:** The table below states the cab that has a longer waiting period.

OLA	UBER	TOTAL
41	16	57



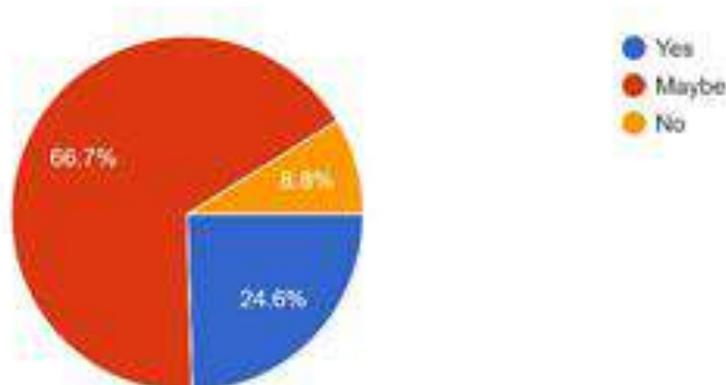
The table and graph above show the cab aggregator that respondents face more waiting while booking. Out of 57 respondents, 41 number of respondents find Ola's waiting period to be longer than Uber.

**STATEMENT E:** The statement analyses respondents view on the new cab aggregators survival in the market.

**Table no. 6:** The table below states the competition faced by new cab aggregators sustainability in the market.

YES	14	24.6%
NO	5	8.8%
MAYBE	38	66.7%

4. Do you think a new player can do better in the industry than the current players?  
57 responses



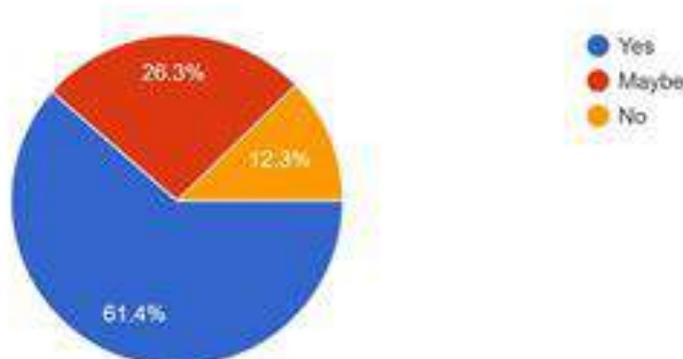
The table and pie chart above show the respondents take on the arrival and survival of new players in the cab aggregator. Out of 57 respondents, 38 people are unsure about it and voted for 'maybe', whereas, 14 respondents have a feeling that new players can outsmart than already existing ones.

**STATEMENT F:** The statement seeks changes in the fare prices of the ride.

**Table no. 6:** The table below states if the respondents could notice the increase in fare prices due to increase in petrol prices.

YES	35	61.4%
NO	7	12.3%
MAYBE	15	26.3%

5. Due to increase in petrol prices, do you see the changes in fare prices?  
57 responses



The table and pie chart above show the respondents take on the increase in fare prices of rides due to an increase in petrol prices. Out of 57 respondents, 15 people are unsure about it and voted for 'maybe', whereas, 35 respondents have observed a raise in fare prices due to increased fuel charges.

**STATEMENT G:** The statement seeks more safety by comparing the cab aggregators.

**Table no. 6:** The table below states the respondents find more safety due to COVID in which cab aggregators.

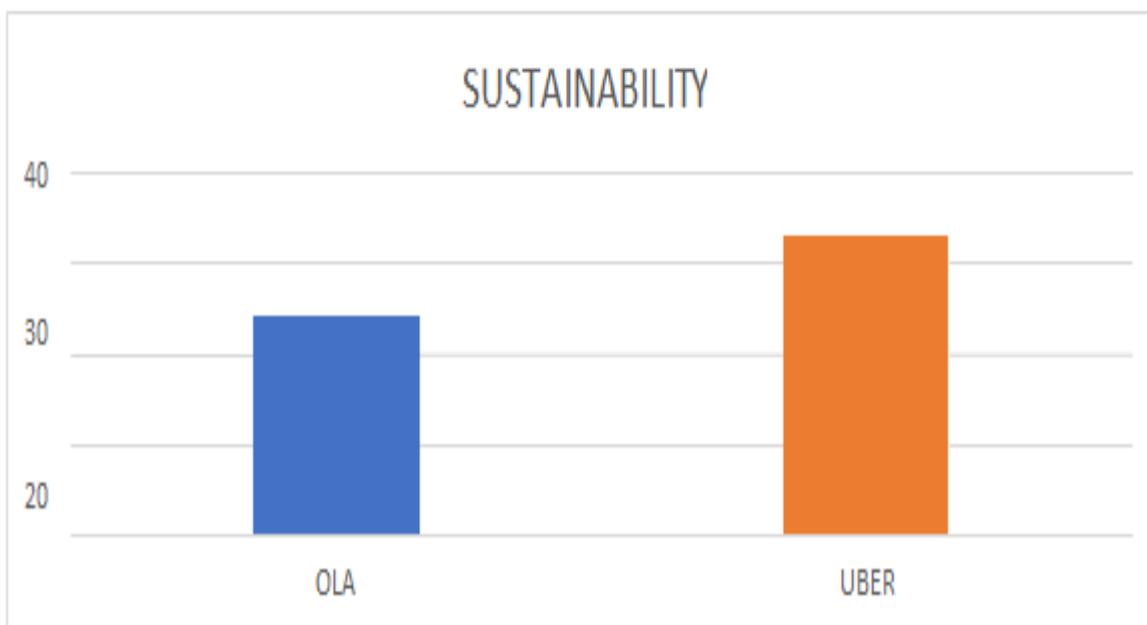
OLA	UBER	NEITHER
18	22	17



The table and graph above show the respondents take on the safety in rides due to COVID times. Proper sanitization, social distancing, cleanliness is given more importance. The survey showed that out of 57 respondents, 17 respondents believe that neither of the two cab services are safer as many people travel through these in a day. Whereas, 22 respondents think that Uber is safer in terms of cleanliness than Ola.

**STATEMENT H:** The statement seeks sustainability status by comparing the cab aggregators.

**Table no. 6:** The table below states the respondents think will sustain over a long period in which cab aggregators.



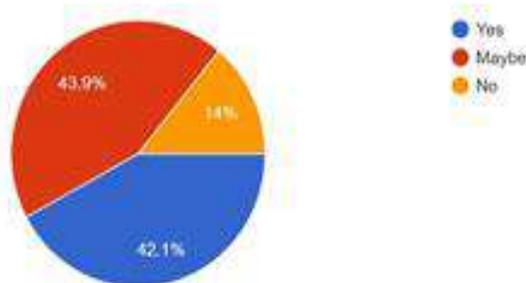
From the above table and graph, it is clear to us that people/respondents find Uber to expand over a long period of time holding the number of 33.

**STATEMENT I:** The statement compares profit factor between the cab aggregators.

**Table no. 6:** The table below states the respondents think makes more profit during COVID in which cab aggregators.

YES	24	42.1%
NO	8	14%
MAYBE	25	43.9%

9. Do you think these cab services are making profit during the current situation of lockdown?  
 57 responses

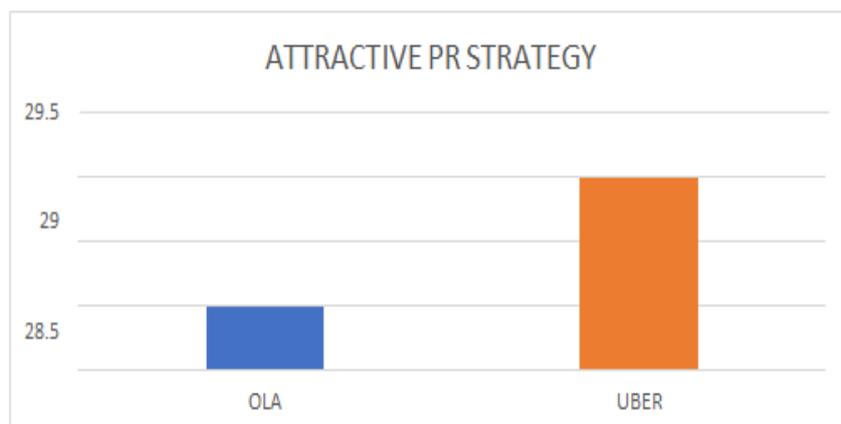


From the above table and pie chart, we can see respondents are not very sure about cabs making profit in COVID. The percentage of people responding Yes is 42.1% which is way higher than percentage of No.

**STATEMENT J:** The statement compares attractive PR strategies used by the cab aggregators.

**Table no. 6:** The table below analyzes the respondent attraction toward the PR stunts used by the cab aggregators and which they think is better.

OLA	UBER
28	29

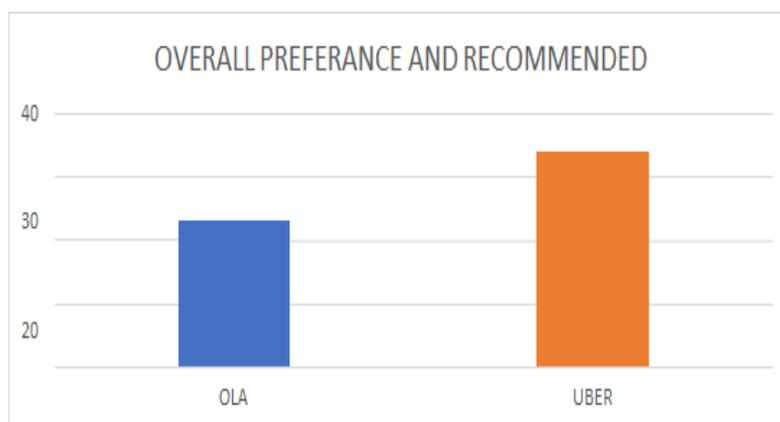


There is a difference of fine line between the PR stunts for attracting consumers between the two cab firms. However, Ola is behind by 1 respondent which makes it to 0.9% difference. 29 respondents find Uber's PR stunt more attractive than Ola out of 57.

**STATEMENT K:** The statement analyzes preference of respondents out of the two cab aggregators.

Table no. 6: The table below studies the cab that respondents prefer in terms of safety, budget, user friendly, and overall usage and also understands which cab they'll more likely refer to other people.

OLA	UBER
23	34



It can be seen that there is a difference of 11 respondents between Uber and Ola for preferences of audience. 34 respondents prefer Uber over Ola out of 57. Hence, it can be analyzed that respondents find Uber cab service to be better in almost all the terms than Ola cabs.

#### RECOMMENDATIONS/ SUGGESTIONS

1. Uber has minimized its losses to \$108 million from \$968 million this year, due to the launch of driverless cars, that is by providing cars on rent. It must continue this practice and focus on keeping more driverless cars available for the users.
2. Uber, cab aggregator, has lost a lot of money in contributing toward advertising, it should shift to organic marketing and believe in mouth to mouth publicity rather than relying on tv advertisements. It can also expand digitally by creating memes on its own brand and staying in the news.
3. It should keep on updating about changes in the company to the public via its twitter or Instagram handle in some funny or catchy way, this will help people be attracted and updated about the working of the firm and the name sticks to their mind. They can also encourage members on the digital platform to roast the company so that it keeps on blasting socially and target the audience of youth.
4. As for Ola, cab aggregators; the CEO must really focus on the customer satisfaction aspect. The professionalism, timeliness must be taken care of. According to the survey, we can see that Ola did not receive much appreciation from the public. It should focus on perfecting its cab drivers. Ola must also work on its app interface and make it more user friendly.
5. Ola is expanding its business to an electric cab/ scooter known as Ola electric; it might help Ola grow to a huge extent.
6. **Note:** changes in company's activities, government policy and Lockdown situation might affect the research study.

#### CONCLUSION

It can be learnt that during Uber's launch in India in 2013, the company had to compete with an already set up cab aggregator in India, that is Ola. However, this did not seem to affect Uber much in the cab aggregator. Uber was still making a profit and raising its funding in and outside.

India in the rental cab sector up until COVID aroused that is 2020. Ola had set up its business in India back in December 2010 and gained a head- start in the Indian market. Ola was also raising its capital and acquiring various firms with the available funding. The funding growth of Ola was slower than that of Uber as Uber had its base on almost all the countries unlike Ola. Now Ola is all set to go public and has gained a lot of funding in the pre-IPO round as well. The public opinion on Ola also did not turn out to be as expected. Respondents of age 18-30, do not find Ola to be as comfortable, budget- friendly, user-friendly app as that of Uber. Respondents feel that Ola takes a lot of time to arrive at the said destination as well. Maximum respondents also find no cab aggregator to be safer in terms of COVID and lockdown. Overall inclination in terms of preference for people lies more toward Uber than Ola.

Hence it can be said that in comparison, Uber is performing much better than Ola in terms of finances and various other areas, for example, PR strategy, preference, comfort, app interface, as per the opinion from respondents.

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