

ISSN 0976-2132

**UTKAL  
HISTORICAL  
RESEARCH JOURNAL**

**VOLUME: XXXIV**

**2021**



**DEPARTMENT OF HISTORY  
UTKAL UNIVERSITY, VANI VIHAR  
BHUBANESWAR-751004, (ODISHA) INDIA**

**UTKAL  
HISTORICAL  
RESEARCH JOURNAL**

**VOLUME : XXXIV**

**2021**



**POST GRADUATE DEPARTMENT OF HISTORY  
UTKAL UNIVERSITY, VANI VIHAR  
BHUBANESWAR-751004, ODISHA**

# UTKAL HISTORICAL RESEARCH JOURNAL

Volume XXXIV, 2021

ISSN 0976-2132

A UGC listed Peer-reviewed Journal of Post-Graduate Department of History,  
Utkal University, Vani Vihar, Bhubaneswar, India.

EDITOR  
BASANTA KUMAR MALLIK

BOARD OF EDITORS

**HIMADRI BANARJEE**

*Jadavpur University*

**A.C. PRADHAN**

*Utkal University*

**H.S PATNAIK**

*Utkal University*

**K. SURYANARANA**

*Andhra University*

**A. SATYANARAYANA**

*Osmania University*

**SWARAJ BASU**

*Indira Gandhi National Open University*

**A.K. PATNAIK**

*Utkal University*

**A.K. MISHRA**

*Utkal University*

**UJJYAN BHATTACHARYA**

*Vidyasagar University*

**JAYANTI DORA**

*Utkal University*

**SOMA CHAND**

*Utkal University*

**AJIT KUMAR SAHOO**

*Utkal University*

**RAMESH CHANDRA MAHANTA**

*Utkal University*

Copyright © P.G. Department of History, Utkal University, Bhubaneswar, Odisha, India.

No portion of the contents shall be reproduced in any form or by any means electronics photocopying or otherwise without prior permission.

Published by - **Dr. Somarani Chand**

Head, P.G. Department of History, Utkal University

Vani Vihar, Bhubaneswar-751004

---

## CONTENTS

---

SI No.	Name of Author	Name of topic	Page No.
1	<i>Ms. Madhavi Amondkar Mr. Kshitij Ambre</i>	<b>USE OF ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE MANAGEMENT</b>	1
2	<i>Dr.G.Anuradha S.Natarajan</i>	<b>MARKETING MANAGEMENT</b>	4
3	<i>Amit Kabra Rohini Kelkar</i>	<b>OUTCOME BASED EDUCATION (OBE) ITS SIGNIFICANCE, REQUIREMENTS AND APPROACHES TO ENHANCE EDUCATIONAL QUALITY FOR THE FUTURE GENERATIONS</b>	7
4	<i>Ms. Iyengar Subhashini Dr. Pooja Ramchandani</i>	<b>"A STUDY TO EVALUATE THE IMPACT OF CONVENTIONAL ADVERTISING ON YOUTH WITH SPECIAL REFERENCE TO O-O-H ADVERTISING- THE ROAD AHEAD"</b>	13
5	<i>Ms. Amraja Shivkar Ms. Maitreyi Joglekar</i>	<b>FALL DETECTION DEVICES FOR THE ELDERLY: A COMPREHENSIVE SURVEY OF VARIOUS TECHNOLOGIES</b>	19
6	<i>Umesh Koyande Siddhesh Dhuri</i>	<b>FUTURE OF FINANCIAL AND BANKING SECTOR WITH BLOCK CHAIN TECHNOLOGY</b>	28
7	<i>Pallavi Tawde Leena Jadhav Rohini Desai Hrishikesh Tendulkar</i>	<b>TRACK WORKPLACE CONDITION TO ENSURE EMPLOYEES SAFETY IN WARE HOUSE</b>	33
8	<i>Ms. J. Gunasundari Ms. Prathma Nemane</i>	<b>STUDY ON DIGITAL INCLUSION IN RETAIL SECTOR AND ITS IMPACT ON CONSUMER BEHAVIOR DURING PANDEMIC</b>	39
9	<i>Sandip Suresh Khandekar Dr. Rohini Kelkar Ajaykumar Poojary</i>	<b>BLOCK CHAIN MANAGEMENT: A SOLUTION TO REDUCTION IN COST OF KYC</b>	48
10	<i>Mrs. Archana Mainkar Dr (Mrs.) Anupama Nerurkar</i>	<b>A STUDY OF AWARENESS OF CONSUMER RIGHTS AND CONSUMER ORGANIZATIONS AMONG THE CONSUMERS</b>	54
11	<i>Mr. Shajil Kumar P A Dr. Sarika Chouhan</i>	<b>IDENTIFICATION OF NON-FEE PAYMENT IN COLLEGE TUITION FEES DURING COVID-19 PANDEMIC PERIOD</b>	59

**WITH CAUSAL LOOP DIAGRAM AND  
PARE TO CHART**

<b>12</b>	<i>Mrs. Kimaya K. Shelar Mrs. Pallavi Tawde Dr. Yogesh Kumar Sharma Dr. Sarika Chouhan</i>	<b>GAMIFICATION MODEL- AN INTERACTIVE PATTERN DURING ONLINE LEARNING</b>	<b>63</b>
<b>13</b>	<i>R.Babita M.Umamaheswari</i>	<b>MANAGING LIFESTYLE CHANGES FOR BETTER LIVING: PERSPECTIVE OF WOMEN IN INDIA</b>	<b>70</b>
<b>14</b>	<i>Beena Kapadia Dr.Amita Jain Sabir Moinshaikh</i>	<b>SENTIMENT ANALYSIS: A CASE STUDY ON MOOC FDP-MOODLE LEARNING MANAGEMENT SYSTEM FOR TEACHERS</b>	<b>80</b>
<b>15</b>	<i>Ms. Ashwini Koyande Ms. Sunita Suralkar</i>	<b>A STUDY ON APPLICATIONS OF HUMANOID ROBOTS</b>	<b>86</b>
<b>16</b>	<i>Dr. Swagatika Nanda Ms. Pooja Jugu</i>	<b>A BIBLIOMETRIC REVIEW OF SCIENTIFIC LITERATURE ON WOMEN ENTREPRENEURSHIP</b>	<b>91</b>
<b>17</b>	<i>Ms. Swapna Kadam Dr. Sarika Chouhan</i>	<b>CONSUMER BUYING BEHAVIOR DETECTION IN ONLINE SHOPPING USING RANDOM FOREST CLASSIFIER</b>	<b>99</b>
<b>18</b>	<i>Spruha S More Snehal Tandale</i>	<b>AN INTELLIGENT AID: FACE MASK FOR SAFAI KARAMCHARIS</b>	<b>105</b>
<b>19</b>	<i>Pallavi Devendra Tawde Dr. Yogesh Kumar Sharma</i>	<b>SYSTEMATIC REVIEW ON DATA MINING AND MACHINE LEARNING ALGORITHMS FOR ANALYZING STUDENT'S PERFORMANCE</b>	<b>108</b>
<b>20</b>	<i>Agnus A Meledath Sagar Balu Gaikwad</i>	<b>A STUDY ON DEPOSITS OF COMMERCIAL BANKS DURING COVID- 19</b>	<b>115</b>
<b>21</b>	<i>Ujwala Madhav Sav Ganesh Magar</i>	<b>INSIDER THREAT RISK DETECTION MODEL</b>	<b>120</b>
<b>22</b>	<i>Mrs. Geeta Abakash Sahu Mrs. Janhavi Mandar Vadke Mrs. Ujwala Madhav Sav</i>	<b>ACADEMIC PERFORMANCE AND PREDICTION OF STUDENTS' PLACEMENT USING</b>	<b>125</b>
<b>23</b>	<i>Dr Priti Ganesh Ghag</i>	<b>ANALYTICAL TECHNIQUES CHALLENGES FOR ECONOMIC GROWTH IN INDIA</b>	<b>133</b>
<b>24</b>	<i>Janhavi Vadke Dr. Sarika Chouhan</i>	<b>IMPACT OF DATAMINING ON E-CRM</b>	<b>137</b>
<b>25</b>	<i>Dr. M. Uma Maheswari Dr. R Babita</i>	<b>REMOTE WORK: TRANSFORMATION OF WORK PATTERN IN INDIA</b>	<b>141</b>

26	<i>Dr. Rahul Wagh Dr. Ambrish Singh</i>	<b>THE STUDY OF MARKETING INPUTS IN ORDER TO UNDERSTAND NEUROMARKETING: AN EMERGING AREA OF CONSUMER BEHAVIOR</b>	149
27	<i>Neha Soly Kevin Benny Dr. Mary Rani Thomas</i>	<b>TECHNOLOGICAL PERSPECTIVES OF EDUCATION FOR GENERATION Z AND GENERATION ALPHA</b>	153
28	<i>Dr. Sanchita Datta</i>	<b>ZOMATO – A NEW GROWING AND FLOURISHING BUSINESS MODEL</b>	170
29	<i>Dr. K.G.S. Mani</i>	<b>A RESEARCH REPORT ON THE IMPACT OF COVID-19 PANDEMIC ON BANKING SECTOR AND THE MEASURES INITIATED BY RESERVE BANK OF INDIA TO RESOLVE THE CRISIS</b>	174
30	<i>Neelam Choudhary Neelam Kumari</i>	<b>FACTORS AFFECTING CAREER COMMITMENT OF WOMEN: A STUDY OF JAMMU REGION OF UT OF J&amp;K</b>	181

# USE OF ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE MANAGEMENT

**Ms. Madhavi Amondkar**, Asst. Professor, Vidyalankar School of Information Technology,  
Mumbai (India)

**Mr. Kshitij Ambre**, Student, Vidyalankar School of Information Technology, Mumbai (India)

## ABSTRACT

This paper explores the growing diffusion of Artificial Intelligence (AI) in Human Resource Management (HRM) and the continuing discussion on the projected rise in the usefulness of AI for employees in organizations. The research is an effort to recognize the important contribution of AI in improvising the corporate decision-making process for employees and promote the understanding for greater acceptability and participation of AI in the HRM department. AI in HRM not only saves time but also helps in making right decision, may it be employee recruitment, planning training sessions for them to make sure that a good employee does not even think of leaving the organization. It works on 3 principles – sustainable growth, retention & upgradation.

**Keywords:** *Artificial Intelligence, HRM, decision making, Employee retention, upgradation.*

## Introduction

Application of Artificial Intelligence in Human Resource Management is sometimes ignored but has enormous potential for organizations. Tech giants are also designing services to help employers enhance employee development and, as a result, employee retention. In a world where new talent is transforming employees twice as much as past generations, and where losing an employee will cost an organization up to 200 per cent of the annual pay of a person, employers need to be mindful of the business case for retention. This study covers how artificial intelligence can help recognize internal recruits and increase retention. It also focuses on studying the progress pattern of an employee and suggesting few training programs to improve their productivity.

## Use of AI in Human Resources

Artificial intelligence in human resources could be seen in:

- Elimination of administrative burden
- Recruitment
- Eliminating biasness
- Improving retention and organizational mobility
- Tailored training courses for employees

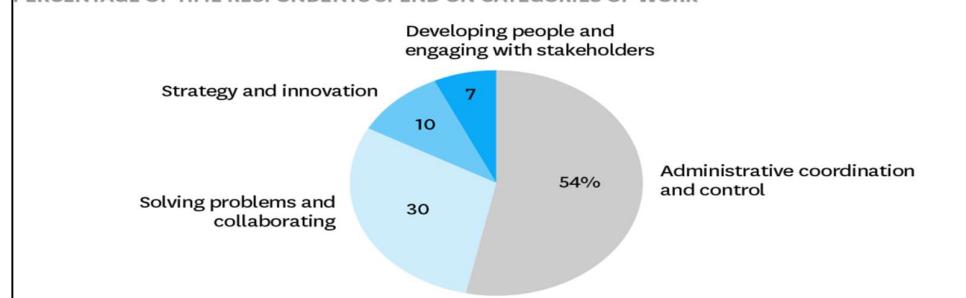
### 1. Elimination of administrative burden:

As businesses continue to realize that the success of a company is largely based on the people, HR leaders are increasingly required to participate in the strategic preparation at the corporate level. Unfortunately, the pressure of managerial duties will also keep back HR practitioners from serving. It's in this vital position, AI & Machine Learning may provide a solution to the problem.

#### How Managers Spend Their Time

The bulk of it is spent on administrative tasks.

PERCENTAGE OF TIME RESPONDENTS SPEND ON CATEGORIES OF WORK



Source: Accenture Survey of 1770 frontline,

Managers and leaders spend more than half of their time on administrative coordination and control activities. These are the same tasks that the same managers hope to see most influenced by AI.

Cost-benefit analysis should be performed to evaluate the feasibility of introducing AI applications for HR assistance in each organization. Senior leaders should also consider the additional advantage of using AI for logistical activities in terms of more freedom to enhance strategic planning.

## **2. Recruitment:**

The conventional recruiting process involves human action. Starting with the end-sourcing of applicants, reviewing resumes, interviewing people, and making decisions on recruiting. The human decision-making mechanism is vulnerable to error due to shortcomings in rational reasoning. Smart scanning applications automatically screen the resume database through Machine Learning. Based on its results, tenure and revenue ratios, the program learns which applicants are active and ineffective workers. Primarily, it learns the backgrounds, expertise and other characteristics of current staff and extends this information to potential hires, to rate, grade and pick the most effective candidates automatically. The program will also enrich the summaries of applicants by public information about their former employers and their social media accounts.

Modern technology in organizations aims to use AI to test candidates' words, speech patterns and body language, facial gestures to evaluate their fitness for their position.

Lastly, to help narrow down recruiting decisions, companies should consider using AI to determine what variables make an applicant successful.

## **3. Eliminating biasness:**

Gender bias may influence recruiting and salary choices in several ways. As an implicit bias, it can be blamed for many of the problems that trigger gender pay gap, which is the imbalance between the wages received by women and men. As per the Monster Salary Index (MSI) issued in March 2019, women get paid 19 per cent less than men. The study indicates that the median gross hourly wage for men in India in 2018 was ₹242.49, compared with ₹196.3 for women, which means that men earned ₹46.19 more than women. The elimination of prejudices in recruiting and pay scale decisions is a crucial task for companies. Today, by reducing racial prejudice, AI is being used as a platform to prevent discrimination and encourage diversity.

## **4. Improving retention and organizational mobility:**

Employee dismissal has a huge effect on businesses, affecting both expenses and efficiency. Machine learning algorithms will forecast the probability of the employee's dismissal.

Technology firm Veriato has developed a range of AI platforms to classify flight risks among employees. Their program monitors and stores workers' electronic activities: emails, keystrokes, internet searching for a month. The AI system then evaluates the data to determine the standard benchmark of patterns of behavior in the organization. Centered on this information, it flags outliers and sends them to the employer.

When the individual employee's "sentiment score" continues to stand out from the organization average, supervisors will move in to attempt to retain them. If correctly used, these tools can help workers avoid excessive turnover.

## **5. Tailored training courses for employee:**

AI can be used to determine how to train an employee to its best by examining their habits also the way they accomplish their tasks. The whole scanning be done based on their submission of work, deadlines met, mistakes committed etc. The whole quality check can lead to their performance improvement by giving them options to join few courses or attend training programs which are

conducted in-house. The programs can be right from communications to learning any technical skill or programming language. If an employee wishes to complete any certification or just browsing about certifications on internet, all these data can be captured and using Machine Learning can be used to organize or suggest courses, training program, self-development programs.

At a time when relentless digital disruptions are increasingly widening knowledge gaps, AI stands to deliver multiple advantages in the skills of its workers. Companies need to look at AI not only to recognize the skills deficiencies created by digital proliferation but also to help close them by recommending the appropriate skills and programs to workers. For businesses, this ensures a future-ready workforce, as it is a tremendous chance for workers to explore their jobs and professional growth and remain active in the coming years.

### **Conclusion**

The use of AI is projected to expand with more reliable and more accessible technologies. This paper suggests that Artificial Intelligence & Machine Learning has the capacity to lower the organizational pressure on HR practitioners and to enable them to make choices based on established data patterns rather than on intuition.

It should also be remembered that AI should not be regarded as a generic approach for all HR tasks. Companies should understand that the introduction of AI would not substitute human ability to make decisions. Human intervention is required to assess specific traits and to prevent considering people as metrics. As with any new technology, it will take some time to fix problems and optimize benefits.

### **References:**

1. <https://hbr.org/2016/11/how-artificial-intelligence-will-redefine-management>
2. <https://ideal.com/airecruiting/#:~:text=AI%20for%20recruiting%20promises%20to,can%20be%20learned%20by%20AI>
3. <https://www.livemint.com/money/personal-finance/what-is-gender-pay-gap-and-why-is-it-so-wide-in-india>
4. Greenwald, Ted. March 10, 2017. How AI is Transforming the Workplace. Wall Street Journal. Accessed at: <https://www.wsj.com/articles/how-ai-is-transforming>
5. <https://www.mobinius.com/blogs/importance-of-artificial-intelligence-technology-in-hr>

## MARKETING MANAGEMENT

**Dr.G.ANURADHA** , Asst.Professor, Department of commerce, PSG College of Arts and Science-cbe  
College-cbe  
**S.NATARAJAN**, Research Scholar, PSG College of Arts and Science

### ABSTRACT:

Marketing management is the art and science of choosing goal markets and receiving, maintenance, and increasing customers through creating, delivering, and communicating, superior customer value. The main marketing management concept is neither critical nor original. Marketing management is to provide the greatest product to the consumer and their preference is the major success of marketing. The important features of planning, organizing, decision, directing, coordinating and controlling. Marketing thoughts best developed the concept of the “marketing mix”. Marketing goals are providing new products and services to the customers. It makes marketing as an organizational attitude and action is applicable to more or less all kinds of organization, whether profit-making or non-profit activities. We have to understand basic of marketing which include meaning and definition and features of marketing management. The different concepts of marketing then importance of marketing and marketing mix etc.

**Keywords:** Marketing management, Importance, Features, Mix, Product, Consumer, Customer, Selling.

### INTRODUCTION OF MARKETING MANAGEMENT

After the Second World War in 1950 the first employed services of economy highest fifty percent of the united status Sensex .the marketing modern origins as a normative management discipline in the year 1950.

American marketing association (AMA) IN 1960s the main purpose of identification and differentiation.

“A symbol, name, sign, design, to identify the goods and services and differentiate them from those of competitors.”

In the world of marketing 1960s based there in promotional and advertising techniques. The Basic needs of customer and serve is enjoying health growth.

Product life cycle 1959; market segmentation (Wendell R.smith, 1956; Russell I. Haley, 1968; Plummer J.T; 1974) (Mc McCarthy, 1981; Baker, 1995) And Various.

Formulations of marketing mix “4 Ps “product, price, promotion, place.

Finally, in 1967, Philip Kotler, authors in the field, published the now classic book:

### MARKETING MANAGEMENT IS THREE MAIN CONCEPTS:

- Analysis
- Planning
- Control

In this book author Philip Kotler “the marketing concept is a business to challenge the before concept “manufacturing, sales concepts”.

The next defined marketing management as a process which consists of analyzing , marketing opportunities, research , particular achievement market ,designing strategies, planning, organizing, coordinating and controlling.

### MEANING:

1. Management is the process of an efficient manner.
2. Marketing management goals at efficient running of marketing activities.
3. Marketing management good the process of transfer of ownership of goods and

Services from vendor to the purchaser.

#### **DEFINITION:**

According to Philip Kotler, "marketing management is selecting achievements Markets and gain relationship with them. Marketing management is a process of analysis, planning, coordinating, controlling and goods, services, ideas and the profit is to produce satisfaction to the parties involved".

### **1. MARKETING MANAGEMENT FEATURES:**

#### **1.1 Managerial processes:**

Marketing management is an managerial process planning, organizing, decision, Directing, coordinating and controlling. Every aspect of marketing concept to Identifying the consumers need and wants product planning, improvement, Pricing, promotion, distribution process etc;

#### **1.2. Research analysis:**

The function of marketing is identification of consumer's needs and wants. The Systematic collection of data, analysis and reporting of data to marketing Activities.

To understand consumer needs and wants, behaviour, and preference of the consumer Towards firm marketing mix strategies.

#### **1.3. Consumer centre:**

Total marketing activities consumer is the king and market needs. The main objectives Of marketing to creating current customer and to retain new customer. The Appropriate of goods and services according to their needs and wants at right Time.

The marketing management performs to the potential customers into actual customer.

#### **1.4. Organizational objectives:**

Entire marketing activities are based on upon the overall organizations. The main Objectives of target more turnover and maximum sales and consumer interest of Fulfilling requirements.

#### **1.5. Planning and Growth:**

Marketing involves planning and growth of goods and services. A continuous towards Preparation, growth and advance of product and services so as to meet the Changing require, taste and preference of the consumers.

#### **1.6. Promotional:**

The main objectives of marketing of a firm are to increasing sales volume and gain. The Provide information about the product to the customers.

### **2. IMPORTANCE OF MARKETING MANAGEMENT:**

Marketing management is the process of exchange of goods and services seller to buyer.

#### **2.1. Analysis:**

Marketing management concepts is the collection and analysis of information related to Consumer's requirements, desires and demands, to changing identify market Opportunities.

#### **2.2. Determination:**

The aim market that the desire to offer its product.

#### **2.3. Planning:**

Marketing management helps to prepare ensuring course of action. Planning relates to Product beginning, modification.

## **2.4. Decision making:**

It is important functions of decision making regarding pricing, selection of promotional Mix, distribution channel of marketing management.

## **2. 5. Creation of customer:**

To consumer determine the upcoming of the marketing management to the providing the Best product to the consumer and their preference is the main achievement of Marketing. It helps in forming of fresh customers and preservation of present Customers.

## **2.6. To help in rising income:**

Marketing management helps to raise income and sales volume. It is goal by Development of market and rising customers.

## **2.7. Improvement in quality of life:**

Marketing achievement at providing new product and services to the customers.

Marketer's new technology and mechanism in their product to provide high Fulfillment to customers than before.

## **3. THE FOUR Ps OF MARKETING:**

In the late 20<sup>th</sup> century, marketing ideas best developed the concept of the "marketing mix". A group of concepts and tools that help companies achieve their objectives within market.

There are four Ps of marketing mix"

### **3.1. Product:**

It refers to the goods actually being sold. The product must deliver a minimum level of performance.

### **3.2. Price:**

It refers to the value that is put for a product it depends on cost of production, the segment achievements, and ability of the market to pay, supply demand.

### **3.3. Place:**

The point of sales in every industry catching the eye of the consumer and making it easy for her to buy it is the main achievement of good distribution.

### **3.4. Promotion:**

To all the activities undertaken to make the product. This can include advertising, press reports, commissions and awards to the trade.

## **CONCLUSION:**

By this topic of marketing management various important and features and pieces of marketing thought. We come to understand the importance of marketing mix for the sellers of business information of marketing. The marketing concept is the philosophy where each and every firm should analyze the needs of their customers and make good decisions in order to satisfy their requirements.

After in-depth analysis, it can be conclude that marketing of this very profitable in India. Principles of Management .

## **REFERENCE:**

- [1]. Kotler, Philip, Kevin Lane Keller [2006]. marketing management, 12th edition.
- [2]. Geoff Lancet and Paul Reyhodes Amsterdam.
- [3]. Porter, Michael (1998), competitive strategy (revised).
- [4]. Kumar & Mittal: "Marketing Management".

# OUTCOME BASED EDUCATION (OBE) ITS SIGNIFICANCE, REQUIREMENTS AND APPROACHES TO ENHANCE EDUCATIONAL QUALITY FOR THE FUTURE GENERATIONS.

**Amit Kabra**, Research Scholar, Assistant Professor, Vidyalankar School of Information Technology  
VSIT, Wadala, Mumbai

**Rohini Kelkar**, Research Guide, Principal, Vidyalankar School of Information Technology, VSIT,  
Wadala, Mumbai

## **Abstract:**

Today in the era of globalization, traditional education system is losing its relevance. In today's world, everything changes very rapidly and continuously. More skills are required to work with very developing technology. Book-based knowledge is longer considered the barometers to success. The researcher strives and wants the educational institutions should produce to cope with technological development and believes that the New Education Policy (NEP) 2020, which aims at universalization of education from pre-school to secondary level need to overcome the requirements at a faster rate and it is mandatory to shift from traditional education system to Outcome Based Education (OBE), which includes Program Outcomes (PO), Program Specific Outcomes (PSO), and Course Outcomes (CO) at a faster rate.

## **Keywords:**

Outcome Based Education (OBE), Competence, Program Outcomes (PO), Program Specific Outcomes (PSO), Course Outcomes (CO), Program Educational Objectives (PEO)

## **Objectives**

*The present Generation of the country is under Education and as an educator the research realized well-rounded schooling resembles a shelter in one's life, opening a large group of chances the following issues are to be tackled.*

- What do we want the students to have or be able to do?
- How can we best help students achieve it?
- How will we know whether they students have achieved it?
- How do we close the loop for further improvement (Continuous Quality Improvement (CQI))?

*The main objective of researcher is how Outcome Based Education can be implemented to tackle the above-mentioned problems.*

## **Introduction**

Outcome-based education or outcomes-based education (OBE), also known as standards-based education, is an instructive hypothesis that bases each piece of an instructive framework around objectives (results). Before the finish of the instructive experience, every student ought to have accomplished the objective. OBE emphasizes on what is expected from the student to finally achieve when they complete their course rather than how they achieved it. Outcome based education is defined as an approach to education in which decisions about the curriculum are driven by the outcomes the students should display by the end of the course professional knowledge, skills, abilities, values, and attitudes- rather than on the educational process.

It highlights the fact that you must know the destination of your journey before you start voyaging. Exploring new ways for designing tertiary education is a worldwide pursuit. There is a need for tertiary education to provide both professional knowledge/skills and all-round attributes to the graduates to enable them to face the diversified yet global demands of the 21st century society.

## **Program Educational Objectives (PEOs).**

Program Educational Objectives (PEO) is defined as qualities or specific goals describing expected achievements of graduates in their career and professional life after graduation.

These objectives are aligned with the vision-mission statement of the department are defined in collaboration with the stakeholders from the industry partners, students, parents, alumni, faculty, and administration.

### **Program Outcomes (POs)**

Program Outcomes (POs) are descriptions of the qualities, skills, abilities and understandings, an institutional community agrees that its students should develop because of the learning they engage with the program of study in that institution. POs indicate what students are expected to know and be able to do by the time they graduate from the institution. POs are not directly connected to any specific academic disciplines. Students join an institution from different backgrounds, cultures, and experiences. While studying at the institution, we want them to broaden their horizon and attitudes, and to develop their current skills and abilities and learn new ones.

### **Course Outcomes (CO)**

Course Outcomes (CO) are the measurable parameters which evaluates each student's performance in blooms taxonomy levels for each course that the student undertakes in every semester. The method of assessment of the candidates during the program is left for the institution to decide. The various assessment tools for measuring Course Outcomes include Mid -Semester and End Semester Examinations, Tutorials, Assignments, Project work, Labs, Presentations, Employer/Alumni Feedback etc., These course outcomes are mapped to Graduate attributes and Program outcomes based on relevance. This evaluation pattern helps Institutions to measure the Program Outcome. The Program Educational Objective is measured through Employer satisfaction survey (Yearly), Alumni survey (Yearly), and Placement records.

### **Some important aspects of the Outcome Based Education**

Outcome-Based Education (OBE) is a student-centric teaching and learning methodology in which the course delivery, assessment is planned to achieve stated objectives and outcomes.

An outcome is a culminating demonstration of learning; it is what the student should be able to do at the end of a course. It focuses on measuring student performance i.e. outcomes at different levels.

- **Course** is defined as a theory, practical or theory cum practical subject studied in a semester. For Eg. Engineering Mathematics
- **Course Outcome (CO)** Course outcomes are statements that describe significant and essential learning that learners have achieved and can reliably demonstrate at the end of a course. Generally, three or more course outcomes may be specified for each course based on its weightage.
- **Programme** is defined as the specialization or discipline of a Degree. It is the interconnected arrangement of courses, co-curricular and extracurricular activities to accomplish predetermined objectives leading to the awarding of a degree. For Example: B.E., Marine Engineering
- **Programme Outcomes (POs)** Program outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.
- **Program Educational Objectives (PEOs)** The Programme Educational Objectives of a program are the statements that describe the expected achievements of graduates in their career, and what the graduates are expected to perform and achieve during the first few years after graduation.
- **Programme Specific Outcomes (PSO)** Programme Specific Outcomes are what the students should be able to do at the time of graduation with reference to a specific discipline. Usually there are two to four PSOs for a programme.
- **Graduate Attributes (GA):** The graduate attributes, 12 in numbers are exemplars of the attributes expected of a graduate from an accredited programme.

## **Deficiencies of Traditional Education system**

The researcher evaluates the traditional education systems from the last decade in depth and derives the following problems in which need to be changed.

- It was a rigidly structured curriculum process without any stakeholder participation in the decision-making process.
- It laid an emphasis on academic education which resulted in the development of skills being neglected.
- It was an inflexible and prescriptive curriculum.
- It was norm-referenced whereby learner achievement was compared to that of other learners and this resulted in excessive competition.
- There is a gap between formal education and training for a career.
- Testing of learner achievement in terms of symbols or marks were often not a true reflection of the learner's actual performance.
- The emphasis was on differentiation in the form of a broad variety of subjects.

## **Requirement for Change to Outcome Based Education**

The researcher characterizes the reason for OBE is to build the information and abilities of the students. By presenting OBE, openings may emerge for individuals who's scholarly or profession ways were smothered because of their earlier information not being evaluated and confirmed, or on the grounds that their capabilities had not been perceived for admission to additional learning and work Indian Higher Education Teacher Education is a necessary piece of advanced education. There has been a remarkable extension of advanced education, particularly during the most recent thirty years.

According to QS Universities there are 907 universities, 39,701 colleges and 11923 standalone institutions and this number changes by the second. This massive expansion of the institutional network has increased access. The Indian higher education system today accommodates nearly 37.4 million students reaching a national GER of 26.3% (2018-19). India has set up a target of achieving 30% GER by 2020, and 50% by 2035. The achievement in access and equity in higher education is commendable. However, the crying concern continues to be poor quality. The crisis of quality in higher education is indicated by the fact that many qualified engineers are not employable (Aspiring Minds 2019); more than 32% teachers already on the job are not employable (Mukhopadhyay and others, 2015). Less than 10% of university-qualified candidates succeed CTET and SETs. Thus, the qualified graduates from the universities do not provide enough evidence of learning. This higher education phenomenon of impressive achievement of access and equity without quality is equally true for teacher education. Hence, adoption of outcome-based education in teacher education needs serious consideration.

- A teacher-centred, rather than a learner-centred classroom approach, was applied.
- It was a content-based curriculum whereby the teacher instructed, and the learner memorized.
- Lack of collaboration and group learning
- Improper alignment between objectives, activities, and assessments
- Lack of emphasis on soft skills needed in jobs like communication, skills interpersonal skills, analytical skills, working attitude etc.

## **The Paradigm Shift**

Sharpening the focus of higher education onto student learning outcomes goes beyond mere tinkering with traditional structures and methods it really constitutes a paradigm shift in educational philosophy and practice. The traditional way of curriculum design, the teacher-centred approach focuses on the teacher's input and on assessment in terms of how well the students absorb the materials taught. A departure from this traditional paradigm is the student-centred approach where the emphasis is on what the students are expected to be able to do at the end of the learning experience. This approach

is also referred to as an outcomes-based approach with statements used to express what knowledge students have acquired, and what abilities they have developed.

When designing outcomes-based instruction, planning begins by determining what should be learned. It is results-oriented, and the primary measure of curriculum success is what graduates know and can do. It is also competency-based when learning outcomes specified at the very outset are tied to the most important skills and knowledge in a programme or course. Most importantly, it is dedicated to continual improvement through ongoing assessment of student learning. As the outcomes-based approach requires the demonstrated achievement of specified learning outcomes designs of this kind are usually termed 'competency-based' or 'mastery' programmes with focus on what the learner can demonstrate at the end of a learning activity.

#### ***Outcome-Based Teacher Education (OBTE) to improve learning outcomes in teacher education.***

Teacher Education is one department that knows why (foundations of education, especially psychological and socio-economical), how (the science of human learning, especially pedagogy and andragogy), and what (practices) of education.

The interesting paradox is the gap between its knowledge and practice. Teacher education is fully familiar with the science of education; and how to improve the learning outcome of students. However, it does not practice what it preaches. It continues to practice the teacher-centric instructional (lecture) model while preaching student-centric activity-based learning to trainee teachers. Whether this is an incidental paradox or wilful duplicity is a matter of research. Prospective teachers under training do not experience the science of human learning professed to them. They must live through (experience) the practices, they are advised to practice.

Rightly, UGC has come out with a detailed 20-page document on learning outcome-based curriculum framework. Every teacher educator, preferably every teacher, should consult this document even if there are differences of opinion about the contents and approach of the UGC. There cannot be a difference of opinion that teacher education must change over from conventional to outcome-based teacher education.

Outcome-based education for teachers is especially important because teaching is no more communicating contents. There are other more powerful and effective means, quality learning resources, especially Open Education Repositories in text and digital contents as a source of information that was earlier served by textbooks and classroom lectures. The new challenge for the teacher is to be able to organize learning resources and opportunities for students, influence and inspire students; develop them as a learner and not learned or knowledgeable people.

#### **Steps in Implementing Outcome-based Education.**

The researcher with help of feedback from industrial and professional bodies concluded for successful implementation of ***Outcome-Based Education*** system to be effective, the following parameters are to identify patently.

##### ***A. Institutional Requirements***

- Clear vision and mission statement of the institution stating the core values, business values and ethical values.
- Vision and mission statement should entrust the stakeholders and learning committee.

##### ***B. Programme Requirements***

- With feedbacks from industrial and professional bodies to develop the curriculum for the course.
- Developing programme outcomes (PO).
- Mapping PO with institutions vision and mission

##### ***C. Course outcomes***

- Refining curriculum with determining the order of courses and defining the prerequisite for each course.

- Developing course outcomes for each course,
- Setting a threshold for assessment for courses for determining course attainment.

#### **D. Assessment**

- Clearly defining the results to be measured.
- Identifying the data and resources availability and utilizing assessment related to the course.
- Each assessment should have a clear rubric which can imply how marks can be achieved.
- For example, an assignment was given to the students, the criteria needed to be clearly stated and simple rubrics for assignment. For validating the marks for it three criteria are given and for each criterion marks are disturbed.
- When the marks are shown to the students after validating it, the students understand the area where they are lacking and can focus on that area to improve.

#### **Initiatives for Re-skilling and Upskilling**

In the Researchers opinion is essential to take up initiatives for skilling students. If employability must be a major program outcome for all Higher Education programs, it must be included and highlighted in the objectives of the institution. An oblique reference, a passing mention of the objective of employability will not help to focus upon the unemployment crisis. It is essential that higher education institutions pay attention to the following:

- The knowledge and understanding the student receives while learning.
- Key skills such as Communication, Information Technology, Teamwork, Initiative, Lifelong learning, Analytical Motivation and Balance. We can enlist at least 65 attributes akin to the 64 arts suggested in the Indian Education system.
- Developing cognitive skills such as understanding of methodologies, systems, and the ability for critical thinking.
- Making efforts to embed employability skills into each level of graduate curriculum.
- Linkages between educational institutions and employers.
- A mechanism to ensure that every student is exposed to the skill area must be developed.
- A formal mechanism for assessment of the skills will have to be designed.
- Problem-based, project-based learning to be implemented.
- The students must also adopt attitudinal changes in learning how to learn.
- Students must learn how to access, adopt, adapt, assess new learning, be able to comprehend, collaborate, co-ordinate, and compete with global competitors.
- While employment opportunities are abundant, our youth do not have the requisite skills to secure them.
- Another alternative is to develop entrepreneurship skills in students. Entrepreneurship enables people to make self-progress, contribute to social development and enter the job market as employer or self-employed.

#### **Conclusion**

This paper provides an overview of the key characteristics of Outcomes-Based Education and its application in various contexts. The approach is based on sound educational principles and provides a robust framework for students to acquire the necessary fitness to practice. The level of educator's understanding of OBE is still very low. For successful implementation of OBE, the educators should understand the OBE system. All sudden the traditional approaches should not be thrown away but should be used as a means towards implementing OBE. Educators should change or improve their ways of instructing and accessing the learner's work. Affiliating universities should frame the curriculum, students assessing system (Examination question pattern) and teaching methodologies in such a way that the students should realize the importance of OBE system. It is necessary to find methods to implement the twelve graduate attributes individually in a successful manner. Also, the

entire academic institutions in the nation should follow the common way of producing the graduates following the OBE system.

The widespread interest in the outcomes of educational experiences has resulted in a shift away from the teacher-centred model that emphasises what is presented, towards the learning-based model focusing on what students know and can do. Learning outcomes are defined according to the context in which they are used.

At the course or programme level, learning outcomes are useful to guide curriculum, learning. A final note is that while learning outcomes approaches are useful, care is needed to consider the different views and perceptions of those involved in defining learning outcomes and to keep the goal of improving student learning clearly in mind. Care must also be taken to avoid rigidity and conceptual reification during implementation in curriculum and instructional design.

### **References**

1. Michael J. Lawson and Helen Askell-Williams, "Outcomes-based education", discussion paper, 2007
2. Spady, William G. *Outcome-Based Education: Critical Issues and Answers*. Bloom B. Learning for mastery. Eval Com 1(2): 1968.
3. Spady WG. *Outcome-Based Education*. ACSA report no 5. Belconnen: pii Australian Curriculum Studies Association, 1993.
4. Stephen E. RulYn and William G. Spady, (1984) "Achieving Excellence Through Outcome-Based Instructional Delivery," *Educational Leadership*.
5. Douglas E. Mitchell and William G. Spady, (1978) "Organizational Contexts for Implementing Outcome-Based Education," *Educational Researcher*.
6. O'Neil J. Aiming for new outcomes: The promise and the reality. *Educ Leadersh* 51(6), 1994.
7. McNeir G. *Outcome-based education: Tools for restructuring*. Oregon School Study Council Bulletin 36(8), 1993.
8. Harden RM, Crosby JR, Davis MH. An introduction to outcome-based education. *Med Teacher* 21(1), 1999.
9. Spady WG. *Outcome-Based Education*. ACSA report no 5. Belconnen: pii Australian Curriculum Studies Association, 1993.
10. Harden RM, Crosby JR, Davis MH. An introduction to outcome-based education. *Med Teacher* 21(1):7–14, 1999 p 8.
11. Spady WG. Organizing for results: The basis of authentic restructuring and reform. *Educ Leadersh* October:4–8, 1988.
12. Carroll J. A model of school learning. *Teach Coll Rec* 64:723–733, 1963. Bloom B. Learning for mastery. *Eval Com* 1(2):1–5, 1968.
13. Smith SR, Dollase R. Planning, implementing, and evaluating a competency-based curriculum. *Med Teach* 21(1):23– 25, 1999.

\*\*\*\*\*

## **"A STUDY TO EVALUATE THE IMPACT OF CONVENTIONAL ADVERTISING ON YOUTH WITH SPECIAL REFERENCE TO O-O-H ADVERTISING- THE ROAD AHEAD"**

**Ms. Iyengar Subhashini**, Assistant Professor, Commerce, S.I.W.S. CollegeHR College of Commerce & Economics, College Address:- Plot No 337, Major R. Parameshwaran Marg, Sewree, Wadala, Mumbai – 400031

**Dr. Pooja Ramchandani**, Principal, Commerce, Vidyasagar, Principal K.M. Kundnani Chowk123, DinshawVacha Rd., Churchgate, Mumbai – 400021

### **ABSTRACT**

The main objective of any advertising campaign is reach. Over the years, advertisers have been innovatively attracting the target audience with the help of Integrated Communication Mix (IMC) and tried to review its effectiveness. There has been a paradigm shift in marketing from conventional marketing to experiential/ transformational marketing. The major focus today lies on implementing newer direct forms of communication with the potential customer that aids in the recall value of a brand, enhances its promotion and persuades the customers to buy the product. Advertising has evolved drastically especially over the past decade and the mantra in the 21<sup>st</sup> century is ‘catch them where they are’. The authors aim at evaluating the impact of O-O-H advertising on youth. The real challenge for marketers in the current scenario is to create awareness and repetitive brand exposure thus creating several touchpoints for the passer by. Increasing number of smart phone users and latest Digital Out of Home (DOOH) ads only add to the upward trend of revenues for many marketers. Brands strive to establish a direct contact while the commuter is in transit.

**Keywords:** Integrated Marketing Communication, paradigm shift, experiential marketing, transformational marketing, Digital Out-Of-Home.

### **1. INTRODUCTION**

There are several ways of creating awareness about the product/ service. Out-of-Home advertising dates back 5000 years ago and is known for its innumerable benefits like scalability, mass appeal, recall value and cost effectiveness to name a few. What seems to be the most successful strategy today is the integration of the emerging media options backed by technology with that of Digital Out-Of-Home ads. There is absolutely no doubt about the fact that Artificial Intelligence and Machine Learning play a drastic role and analysing the ‘Big Data’ forms the basis to pitch sales. However, what remains to be seen is whether broadcast, print and social media ads supplement outdoor ads or is it the other way round. A clear edge of this media over the other forms is its ability to generate attention when the target is ‘on-the-go’. Trends reveal that major growth opportunities emerge in future given interaction and engagement as important inclusions of OOH ads. This not just applies to commercial products or services but also to innumerable social ads that get displayed and enjoys maximum viewership while in transit which would probably not have been the case otherwise with alternative media.

The protocol of watching/ listening to the ads on broadcast media or internet is immensely replaced by viewing them in the form of poster/banners/ bill boards/ transit ads on buses/ trains/ subways/ airport terminals, bus shelters etc. The growing popularity of personalised marketing needs a mention. Hence, the likely trend of Out-Of-Home ad is studying the behaviour of the target audience in greater details, the process of which has already begun and also an in depth analysis of the variables that

influence the buyer's purchase decision. Media planning and Ad Budget can be two of the most important aspects can be focused upon reversing the consumer's buying decision making process. While planning an ad campaign and allocating ad budget, what advertisers aim still is ad spends on television and newspapers as the opinion remains that the target audience can be easily attracted with the conventional tried and tested medium over outdoor advertisements that may not have mass appeal. The author specifies the co-relation between mobile phone and the contact point of the commuter in the form of outdoor advertising.

## 2. Objectives

Following are the objectives of the research:-

- To evaluate the effectiveness of OOH ads.
- To analyse the recall value of OOH ads.
- To understand whether outdoor advertisements are effective in building brand image.
- To study whether Outdoor advertisements are independent medium of communication.
- To compare conventional media with that of OOH ads in terms of creativity.

## 3. Literature Review

Donthu, Naveen, et al. (1993) in his study highlights the factors that influences the recall of Advertising based on several parameters. The article also talks about the effectiveness of the O-O-H ads on the commuters who take the same route to travel and test their recall. Attention by the passer-by to the ad plays the most important role in the recall value of the outdoor ad.

Rick T. Wilson & Brian D. Till (2011) the authors highlights the major advantages of O-O-H ads to include its power to reach out to maximum target audience while they are travelling. The articles highlight the fact that the environment that the outdoor ads are placed also matter a lot in terms of the effectiveness that they bring on the viewers and has a huge impact on the purchase decision by the target audience.

Juntrao Lai, Tao Cheng & Guy Lansley (2017) in their study bring out the various challenges of outdoor advertising and highlight the fact that outdoor advertisements got to be creative in order to attract the attention of the passer-by and also that it becomes quite a task to be able to precisely target a specific audience given the fact that audience change throughout. The study also puts forth the effectiveness of DOOH ads that play a significant role in attracting the attention of the commuters/ Viewers.

Arch G. Woodside (1990) in his study brings out an important aspect of whether outdoor advertising can bring about a difference in the purchase rates and highlights that there is a direct co-relation between outdoor advertising and sales.

Quercia, Daniele et al. (2011) in their study state that television and newspaper are the two powerful mediums that are at the top of the media planners minds when it comes to planning ad campaigns. They also state that it is difficult to gauge who has viewed an ad on the billboard and hence efficiency becomes difficult to measure. Their study mentions the need for new ways of measuring the effectiveness of outdoor ads.

## 3. Research Methodology

3.1. Primary Data Collection:- A questionnaire (google form) was formulated.

3.2. Secondary Data Collection:- Books and journals on the topic were reviewed for the latest updates and information.

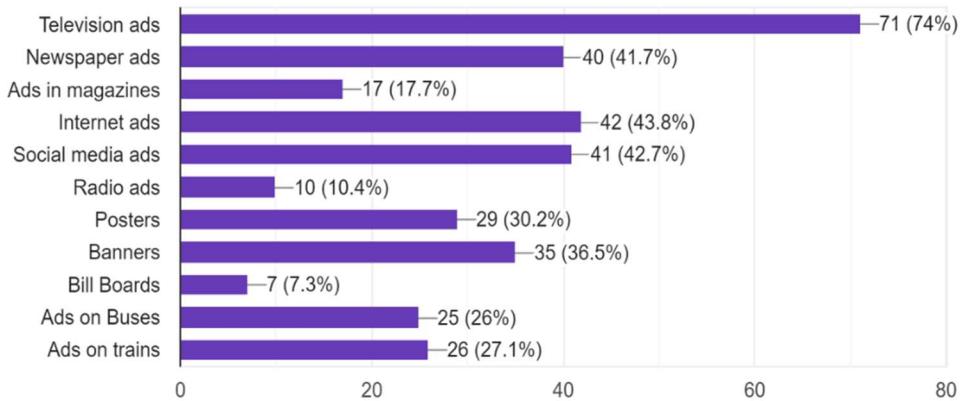
3.3. Sample Size:- 96 respondents.

3.4. Sampling technique:- Convenience Sampling was used.

#### 4. Analysis and Interpretation

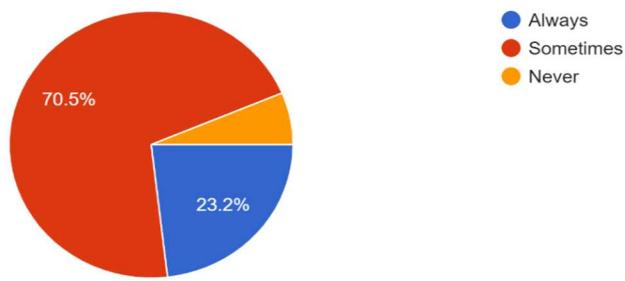
How are you generally aware of the product?

96 responses



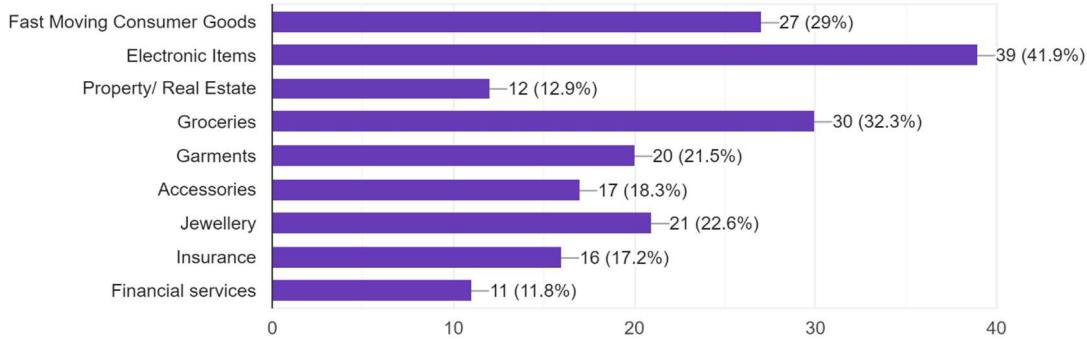
Have you bought a product based on the advertisements seen in Out-Of-Home ads?

95 responses



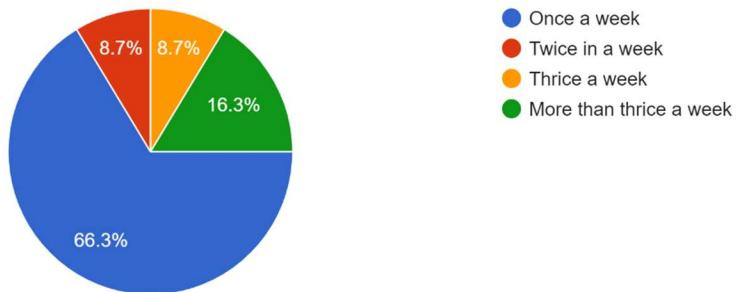
Which product have you bought upon seeing the Out-Of-Home ads?

93 responses



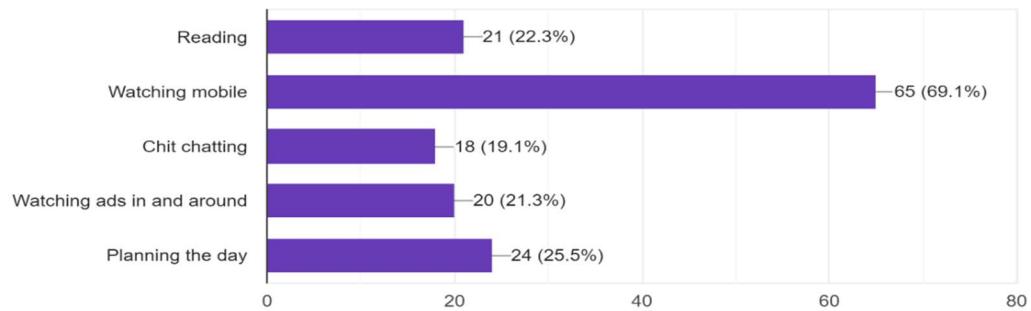
How often do you travel off late?

92 responses



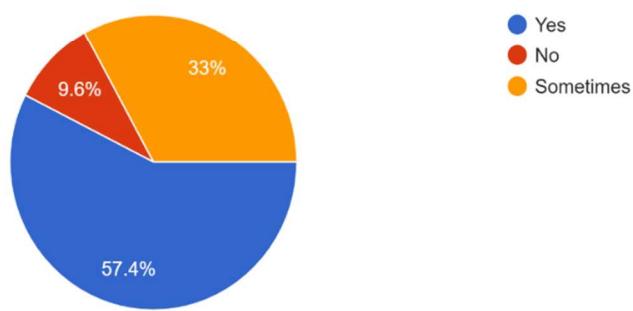
How do yo use your travel time?

94 responses



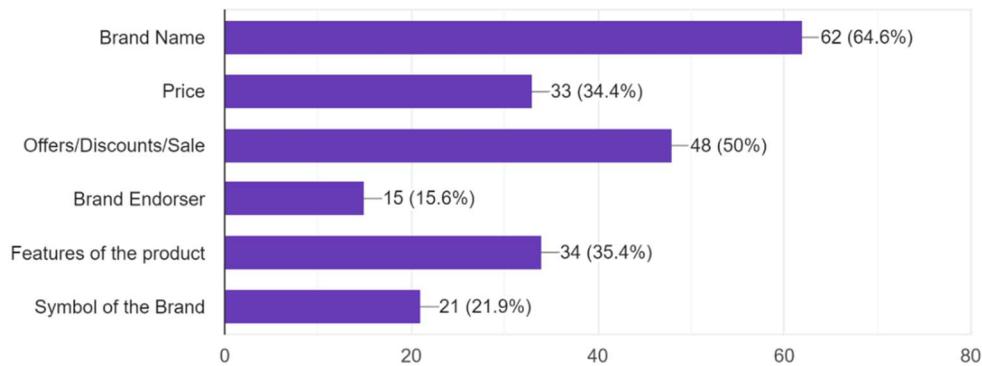
Do you find Out-Of-Home ads creative?

94 responses



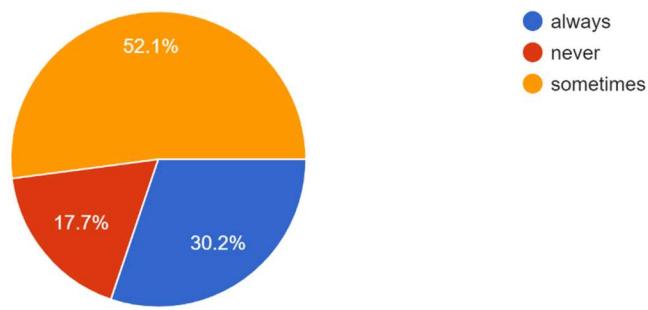
What do you look at specifically in the Out-Of-Home ad?

96 responses



Do you think Out-Of-Home ads are more effective than ads on other media?

96 responses



## 5. Key Findings:-

- Television ads top the list in creating awareness for the product in the broadcast media, Banners in case of Out-Of-Home ads and there seems to be a very close competition between brand awareness with the help of transit ads on buses and trains.
- 71% respondents have bought the products seeing OOH ads.
- Maximum number of respondents buy electronic items followed by groceries.
- 66% respondents travel once a week.
- 69% respondents spend their time watching mobile while in transit.
- 57% respondents find OOH ads creative.
- 65% respondents look for brand name, while 50% look for offers/ discounts/ sale etc.
- 52% respondents find OOH ads sometimes creative over the other media.

## 6. Conclusion:-

Despite of the medium, whether conventional TV/ Radio/ Newspapers or Modern Outdoor advertisements the most important key factor that pulls the target audience's attention remains innovativeness of the ad. Brand Name & promotional strategies to include offers/discounts/ sales draw

maximum attention. Television ads top the list in creating awareness about the brand and it seems like a real challenge for outdoor advertisements to compete with the well established image of television ads.

## **7. References:-**

- [1] Belch George E. & Belch Michael A.: Advertising and Promotion- Tata McGraw-Hill 2010
- [2] Abhilasha Mehta (2000), "Advertising attitudes and advertising effectiveness", Journal of Advertising Research, May-June, pp 67-72.
- [3] Broadbent, Simon (1975), "Spending Advertising Money-An introduction to Media Planning ; Media Buying and the Uses of Media Research", London, Business Books Ltd.
- [4] Colley, Russell H. (1995), "Defining Advertising goals for Measured Advertising Result ", 2nd ed. Lincolnwood, IL: NTC Business Books.
- [5] Ehrenberg, Andrew S.C. (1974), "Repetitive Advertising Journal of Advertising Research 14 (April), pp. 25-34.
- [6] Burnett, John and Sandra Moriarty (1998) Introduction to Marketing Communications: An Integrated Approach, Prentice Hall, NJ.
- [7] Hepnar, Harry Walker (1964) Advertising: Creative Communication with Consumers, McGraw-Hill Book Company, New York.
- [8] G.R.Basotia&N.K.Sharma, " Effective Advertising, Marketing and Sales Management"- Mangal Deep Publications. Jaipur, 1998.
- [9] Cundiff, Edward W. & Richard R.Srill& Normal A.p.Govoni, Fundamentals of Marketing, New Delhi, Prentice Hall of India Pvt Ltd, 1985, 4<sup>th</sup> edition.
- [10] David L.Loudon& Albert J.DellaBitta, " Consumer Behaviour", McGraw Hill International editions, 1993.
- [11] Garbett. T, "Corporate Advertising", Mc Graw Hill, New York, (1981)
- [12] Kotler, Philip: Marketing Management: Analysis, Planning, Implementation & control, New Delhi, Prentic-Hall of India Pvt Ltd, June 1991.
- [13] Michael R.Soloman, " Consumer Behaviour", Boston, Allyn& Bacon,1992.
- [14] Parag Diwan," Advertising Management", Deep & Deep Publications, New Delhi, 1997.

# FALL DETECTION DEVICES FOR THE ELDERLY: A COMPREHENSIVE SURVEY OF VARIOUS TECHNOLOGIES

**Ms. Amraja Shivkar**, Assistant Professor, Department of Information Technology,  
Vidyalankar School of Information, Technology, Wadala.

**Ms. Maitreyi Joglekar**, Assistant Professor, Department of Information Technology,  
Vidyalankar School of Information, Technology, Wadala.

## ABSTRACT

Fall detection for elderly is of a major concern, since recovery is difficult in age group of 65 and above. This calls for a high demand for the products and technologies related to fall detection with the increase in ageing population around the globe. This paper deals with the various fall detection technologies used to ensure the safety of the elderly. According to the report presented by World Health Organization (WHO), the number of casualties due to fall is increasing day by day. Among this number the percentage of deaths and serious injuries is observed to be the highest in old-age people. This happens because the fall remains unnoticed for long which in turn delays the treatment. If the fall is detected as soon as it happens, the person can receive treatment immediately because of which many further risks can be minimized. In this paper, various sensor-based fall detection techniques are discussed and compared.

**Keywords:** Fall detection, sensor, wearable, non-wearable, thermal, IR sensors, pressure, elderly, posture

## 1. INTRODUCTION

### 1.1 BACKGROUND-

As per the survey, carried by WHO, falls are the second leading cause of deaths by unintentional injury globally. All around the world, every year around 646000 individuals die because of falls. Especially adults more than 65 years of age suffer from falls which may lead to fatal injury [2]. The diagram below indicates leading causes of deaths worldwide in all age groups. Falls contribute around 55% deaths caused due to unintentional injuries.

The risks due to fall are higher among adults aged 65 years and above [5]. It is estimated by research that in upcoming 30 to 35 years more than one out of five people will be aged 65 or over. According to the World Health Organization (WHO), by 2050, the current population of elderly people will increase, representing 20% of the world's population [7]. Falling can be one of the most serious and life-threatening events for this age group. A significant number of adults are treated for fall-related injuries in emergency rooms every year suffering fractures, loss of independence and even death. Risks of Falls include bone fracture, hip fracture, internal bleeding, embolism, and severe head injuries.

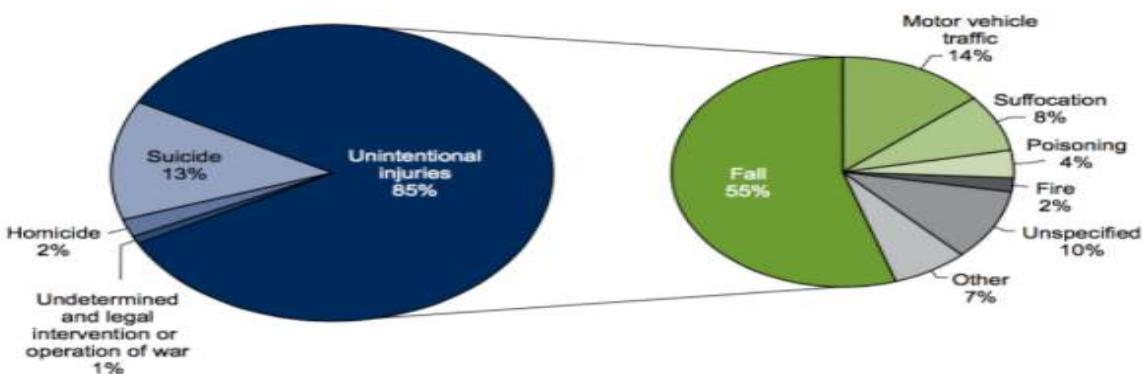


Fig.1 Leading Causes of Death- Statistics [6]

The number of deaths caused by fall are increasing day by day, especially in elderly. Fall also makes person afraid. This fear can affect mental health of a person and makes the person emotionally and physically weak. The diagram below indicates the number of deaths from falls among adults aged 65 and above in United States. This alarming trend is occurring not just in India but globally. This presents a serious challenge in terms of the growing demand for a more intelligent health-care system [8].

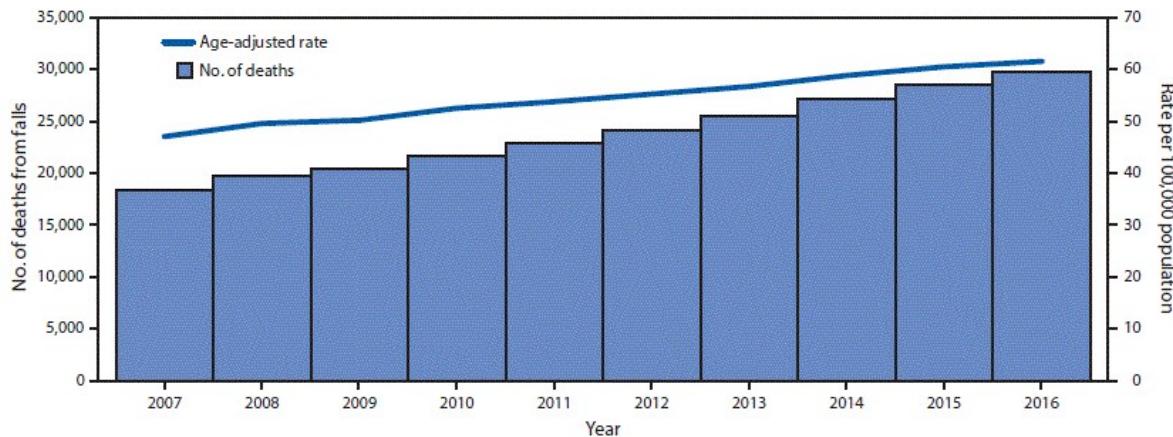


Fig.2 Number of deaths from falls among adults aged  $\geq 65$  years — United States, 2007–2016<sup>[5]</sup>  
As people get older, their bodies go through multiple physical changes hence making them more fragile, and more prone to falls. There are many medical conditions like vitamin D deficiency, poor vision, weakness, use of certain medicines which may cause fall. To minimize the chances of fall, these conditions can be treated. Most of the times, fall remains unnoticed and as a result injury due to fall become severe. So, it is very important to detect the fall as soon as it happens to get the treatment immediately and reduce the further risks.

## 1.2 ARCHITECTURE OF FALL DETECTION SYSTEMS-

Architecture of fall detection systems-

The fall detection systems can be divided into four layers-

Physiological Sensing Layer (PSL), Local Communication Layer (LCL), Information Processing Layer (IPL), and User application Layer (UAL)<sup>[9]</sup>.

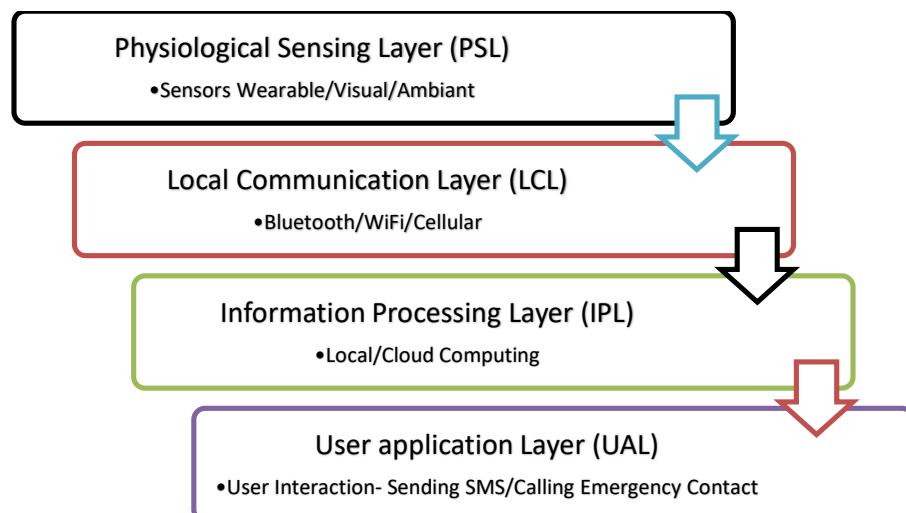


Fig.3 Architecture of fall detection systems

#### 1. Physiological Sensing Layer (PSL)

This is the basic layer where the data from various sensors is collected. The sensors can be wearable sensors like accelerometer or gyroscope to monitor motions and actions of human being or visual sensors like camera or ambient sensors like thermal sensor. At this level, the information is collected from the sensors, and the information is passed to the next layer.

#### 2. Local Communication Layer (LCL)

This layer acts as a middleman. LCL layer receives information from PSL and conveys this information to the upper layer with the help of wired/wireless network. Mostly, wireless communication is preferred such as Bluetooth or WiFi or cellular network. This layer also uses communication protocol such as Zigbee for the same.

#### 3. Information Processing Layer (IPL)

This layer plays very vital role as it has microcontroller device programmed with various algorithms to detect a fall. This layer analyzes the information provided by the sensors, detects the fall with the help of algorithms and then takes the required action.

#### 4. User application Layer (UAL)

This layer communicates with user/caregiver via notifications on screen or alarms or by sending SMS or by calling on the emergency number, so that immediate action can be taken if the fall is detected.

## 2. FALL DETECTION SYSTEMS

Fall detection systems can be classified in two main categories- Wearable and Non-wearable. There are many Wearable devices which are available in market to detect the fall. These devices are cheap and reliable. The technology and sensors used in wearable devices is discussed in the next section. The main problem of wearable devices is they must be removed while taking bath. And many falls happen in the bathroom, especially in elderly. These falls remain unnoticed leading to severe injuries and other risks. Hence, non-wearable fall detection systems play vital role in such scenario.

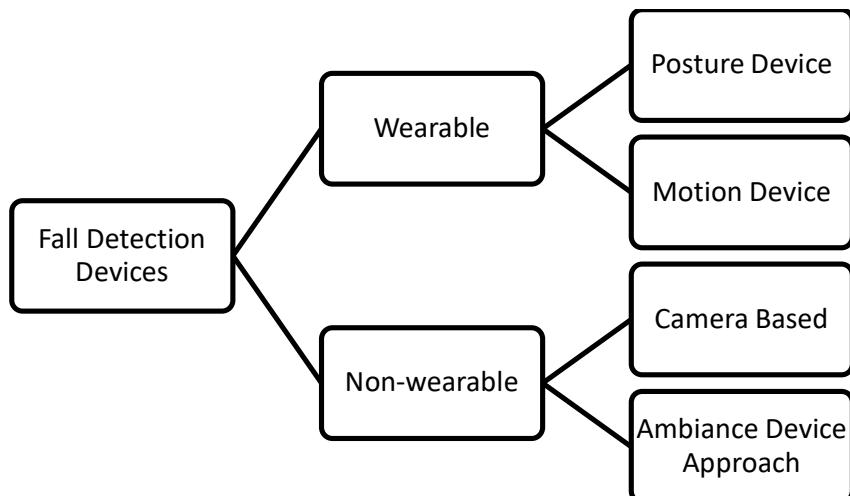


Fig.4 Classification of fall detection systems

### 2.1 WEARABLE DEVICES

A wearable device is placed on human's waist or human body to detect the fall. The device has various sensors embedded to detect fall. Now a days there are various smart watches and smart bands available in the market which can be helpful to detect the fall. The common wearable devices use following sensors to detect the fall-

## 2.1. 1 POSTURE AND MOTION DETECTION

Human's posture and motion can be detected with the help of electronic sensors- Accelerometer, Gyroscope, and magnetometer. When a human body experiences fall, the posture and motion changes suddenly. We can capture this sudden change in posture with the help of sensors and in turn the fall can be detected.

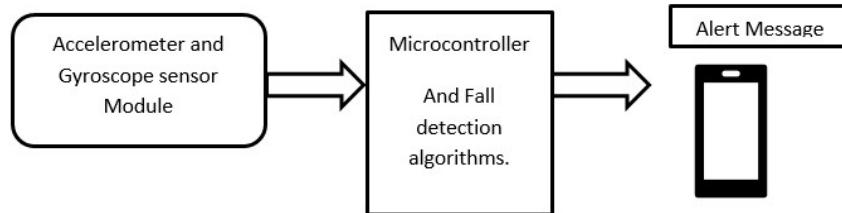


Fig.5 Block diagram for Motion and fall detection using Accelerometer and Gyroscope

### ACCELEROMETER

Accelerometers are used to monitor the position of the object in the space and movements of an object. There are three common types of accelerometers- Capacitive, piezoelectric, and piezoresistive. The capacitive and piezoresistive accelerometers consists of two components, the first on is a gravitational force and a second one is a component from other acceleration force. We can use accelerometers as inclinometers. The inclination of the body or tilting angle with respect to axis of the gravitational field can be measured with the help of Capacitive or piezoresistive accelerometers<sup>[13]</sup>. The piezoresistive and capacitive accelerometers are suitable for measuring human posture and movement because they can provide dual acceleration components<sup>[12]</sup>.

The orientation of human body can be described with the help of three Euler angles yaw, pitch, and roll angles as shown in Figure below.<sup>[10]</sup> With the help of gravity component, roll and pitch angles can be measured which are helpful to recognize human postures such as upright or tilting or lying.

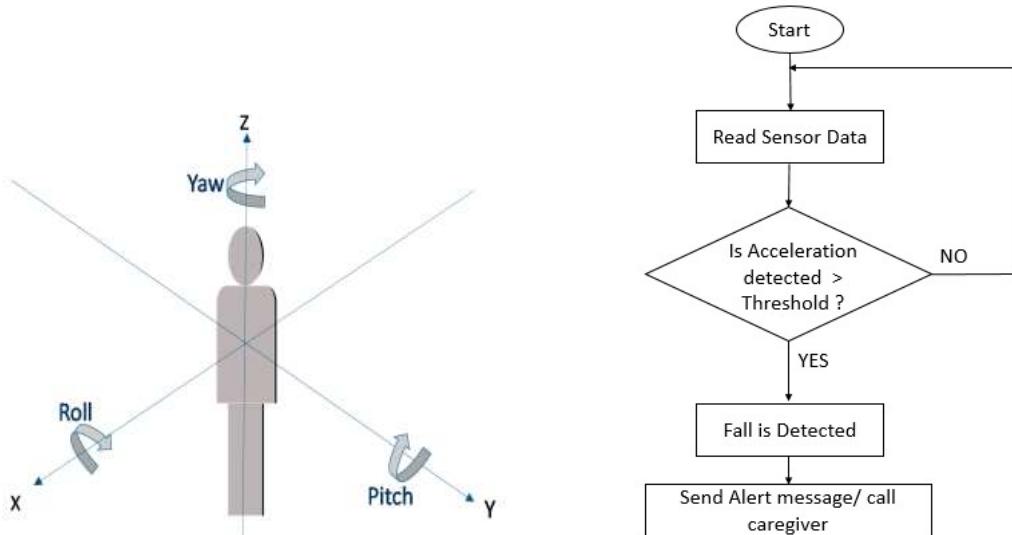


Fig.6 Algorithm for fall detection reading sensor data

One standard value of human moments is calculated, and if the acceleration detected by the sensor is above the threshold value, then the fall is detected. Usually, the threshold is decided by sum of accelerations and rotation angle. The acceleration measurements are taken in 3 axes-

$$|a| = \sqrt{a_x^2 + a_y^2 + a_z^2}$$

When a person falls, the sharp peak is produced in the acceleration due to vibrations.

Deciding a threshold value is a real challenging task. As sometimes a person can do physical activities like brisk walking or jumping or exercises. So, this threshold value can be finalized by running multiple trials.

## GYROSCOPE

Gyroscope can detect angular movement i.e. it can provide rotational and angular movements. Gyroscope can be combined with accelerometer to detect posture and orientation of a body in dynamic state. Most of the existing fall detection systems use accelerometer and gyroscope combined with some threshold algorithms<sup>[12]</sup>.

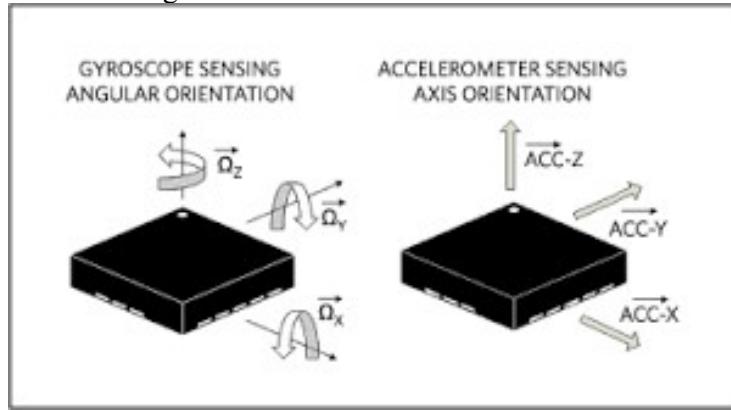


Fig.7 Gyroscope and Accelerometer Axis Orientation

If a gyroscope is placed on a human body, it can provide the current orientation of a body. If the person falls, the orientation and acceleration of a person's body changes, which results in the change in Euler's angle.

## MAGNETOMETERS

Magnetometer is a three-dimensional measurement device to track human posture and movement which can be used as electromagnetic tracking system. It is calibrated to earth's magnetic field. The magnetometer system consists of a transmitter and receivers. A magnetic field of low frequency is generated by the transmitter, the orientation and posture of the receiving device w.r.t. transmitter is calculated by the system<sup>[13]</sup>. Magnetometers are generally used with accelerometers and gyroscope to increase sensitivity and accuracy of the device. A digital compass is a device with combination of accelerometer and magnetometer, which increases the accuracy of the measurements<sup>[12]</sup>. All smart devices available in market used to track the posture and motion of a human body have combination of all the three sensors, accelerometer, gyroscope, and magnetometers in all three axes.

The main advantage of these sensor modules are they are cheap and small in size. Because of this feature, these devices can be easily worn or carried by a person.

In most scenario, older people forget to wear these devices especially at home. It is also not feasible to wear these devices while taking a bath or in the bathroom. In that case, ambient and visual fall detection systems play vital role.

## 2.2 NON-WEARABLE FALL DETECTION DEVICES

As illustrated in Fig. 4, Non-wearable Fall detection devices can be further divided into two categories, based on the approach used - 1) Camera based approach 2) Ambiance Device approach. These categories can be further divided into subcategories. These different approaches of fall detection are briefly discussed in this section.

### 2.2.1 CAMERA BASED APPROACH

Camera or Vision based devices are in demand due to their multiple advantages over other sensor-based devices. Some of the reasons are - cameras can detect multiple events simultaneously and

it also can avoid the discomfort of wearing devices for fall detection. Most importantly the recorded video from camera can be used for verification after a fall has occurred. Though this vision-based approach provides an extra factor of "Security", but it does have a disadvantage of not preserving the users' "Privacy". If the fall detection is to be done in bathroom, then camera-based devices have some limitations.

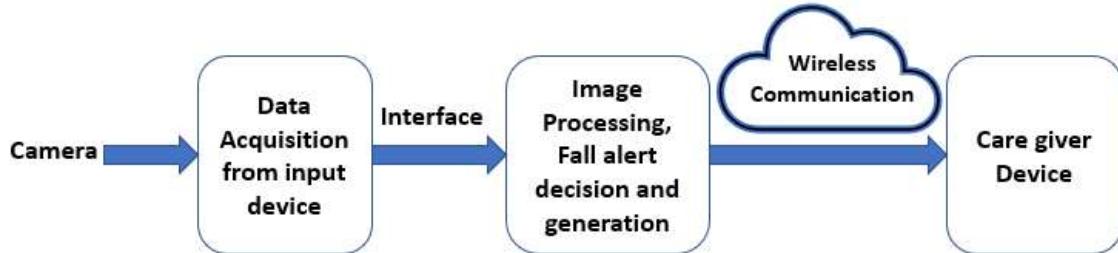


Fig.8 Flow of fall detection using Camera-based approach

## INACTIVITY

With this approach, a fall is detected based on the inactivity period in the frame covered by camera. Camera or motion detector tracks the person to obtain any traces of motion and based on that a fall is determined. Camera can record 3-D images of body to identify area of body and to find its orientation. The change in orientation of the body is used to detect inactivity and if inactivity occurs for a certain period and in certain context, then a fall is detected.<sup>[14]</sup>

## CHANGE IN SHAPE OF BODY

With this approach, a fall is detected based on change in shape of the body from standing to lying position.

Hidden Markov Model (HMM) – This algorithm uses video features of a camera footage to differentiate fall from normal walking. In another HMM-based approach audio features are used to differentiate sound of falling from sound of talking.<sup>[15]</sup>

Hierarchical Hidden Markov Model (HHMM) - This algorithm is used to model the motion to detect fall. Further improvement in fall recognition can be achieved by optimal placement of omni-cameras and by using the relationship between image angles and posture. A 3D shape of body is extracted from multiple cameras to detect fall.<sup>[16]</sup>

Vision-based approach is the most reliable technique for fall detection. If individual different sub-categories are compared, inactivity detection is the simplest in terms of processing but is less reliable.<sup>[17]</sup> A shape detection algorithm is more reliable as compared to inactivity detection because body shape detection can give more accurate information about fall.

## 2.2.2 AMBIENT BASED APPROACH

Ambient based approach comprises of an array of multiple sensors to configure a simple and fast human fall/activity detection/recognition system. In this approach a human fall can be detected based on various parameters that can be measured with the help of multimodal sensors like – Pressure transducers, PIR motion sensors, Vibration/Shock sensors, single far-field microphone etc. The biggest advantage of this system is they do not breach the privacy of an individual as there will not be any camera used for the detection of fall, also they do not cause any discomfort of wearing any device during routine activities. This makes the ambient-based approach the best suited to be implemented in the places like bathrooms, where the help reaches late as fall is not visible due to the closed doors.

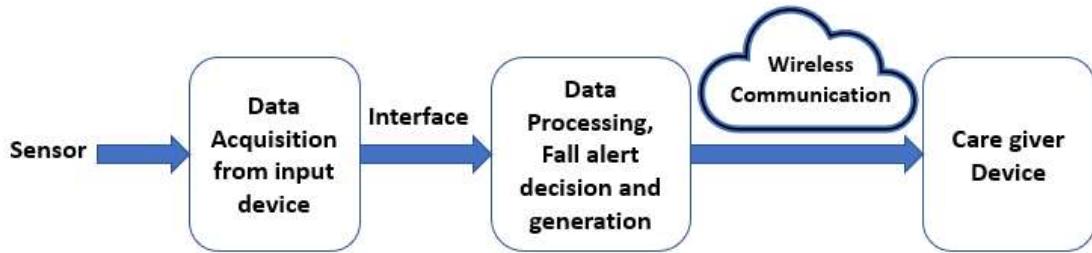


Fig.9 Flow of fall detection using Ambient-based approach

### PRESSURE OR VIBRATION SENSORS IN TILES

The objective of the proposed system is to differentiate between standing and falling states by using pressure transducer under the tiles. The approach is very simple. When a human is in standing position his entire weight roughly falls on one or two tiles. On the other hand, when a person is in lying position (after fall) then his weight will be distributed on five to ten tiles, depending on the position in which he is lying. Then again lying can be discriminated into falling and non-falling states using the vibration sensor or accelerometer under the tiles.<sup>[18]</sup> When the fall is detected then the signal is transmitted through wireless medium to the device carried by the care giver. This can be further improved.<sup>[18]</sup>

### INFRARED SENSOR OR MOTION DETECTOR

This approach deals with fall detection using Infra-Red thermal array sensor.<sup>[19]</sup> The sensor with a measured visual angle of  $110^\circ \times 75^\circ$  is attached to the ceiling, above the centre of the area under detection called frame.<sup>[20]</sup> The experimental setup for the fall detection is as shown in Fig. 10.

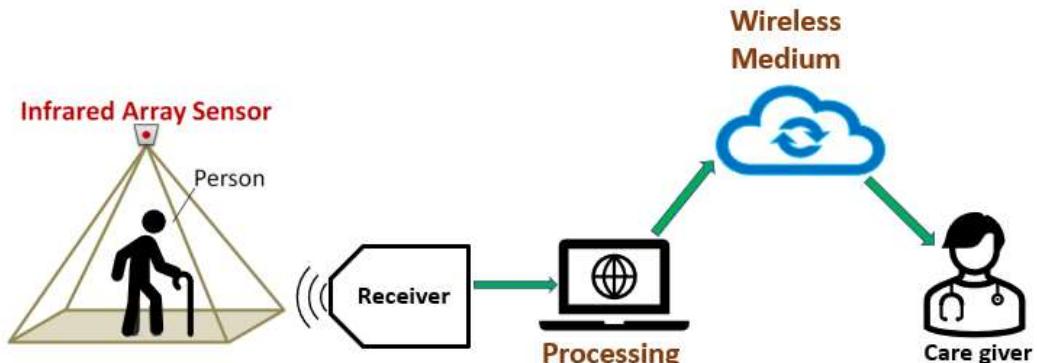


Fig.10 Fall detection by thermal IR sensors

A motion dataset is prepared for sample, at known temperature. The thermal IR sensors records the data, depending on following criteria:

One Motion-This motion started at the beginning of the frames and finished by the end of the frames. Static Motion- This motion started at the beginning of the frames and kept the posture until the end with slightly movement.

Continuous Motion- This motion continued from start to end of the frame with random changes in direction of the subject.

The data collected by thermal imaging is used as sample to compare different motions like walking, standing, sitting, crouching, or falling.

### 3. CONCLUSION

In elderly people even a simple fall may lead to severe irrecoverable injury or even death if the help does not arrive in time. Hence it is necessary not just to detect the fall but also inform about it to the care givers as many elderly people stay alone. Thus, immediate treatment can be provided to the

injured people on urgent basis. This paper presents an overall review of various approaches used in human fall detection for elderly people in different environments. Prevention is always better than cure. Therefore, along with this discussed model of fall detection and alarm, additional feature of fall prevention can be included for future purpose, so the fall can be avoided at the first place.

## REFERENCES

- [1] BMC Geriatrics- “Falls in the general elderly population: a 3- and 6- year prospective study of risk factors using data from the longitudinal population study ‘Good ageing in Skane’”, 7 August, 2013, <https://bmcgeriatr.biomedcentral.com/articles/10.1186/1471-2318-13-81>
- [2] WHO- <https://www.who.int/en/news-room/fact-sheets/detail/falls>
- [3] Falls–Risk Factors and Prevention Strategies, 22 November 2019, <https://www.comfortkeepers.com/info-center/category/senior-health-and-wellbeing/article/falls-risk-factors-and-prevention-strategies>
- [4] G. Kowshik; J. Anudeep; Popuri Vamsi Krishna; Shriram K. Vasudevan; Ikram Shah, “An inventive and innovative system to detect fall of old aged persons – A novel attempt with IoT, Sensors and Data Analytics to prevent the post fall effects”, International Journal of Medical Engineering and Informatics, 6 March 2020, volume 12.
- [5] CDC- Centers for Disease control and Prevention - Morbidity and Mortality Weekly Report (MMWR)- <https://www.cdc.gov/mmwr/volumes/67/wr/mm6718a1.htm>
- [6] CDC- Centers for Disease control and Prevention – Leading Causes of Death- <https://www.cdc.gov/nchs/nvss/leading-causes-of-death.htm>
- [7] He W, Goodkind D, Kowal P. An Aging World : 2015 International Population Reports.; 2016. doi:P95/09-1-<https://www.census.gov/content/dam/Census/library/publications/2016/demo/p95-16-1.pdf>
- [8] OrasaPatsadu, ChakaridaNukoolkit, and BunthitWatanapa, “Survey of Smart Technologies for Fall Motion Detection: Techniques, Algorithms and Tools”, School of Information Technology King Mongkut’s University of Technology Thonburi Bangkok, Thailand.
- [9] Ray P. P. (2014). “Home health hub internet of things (H 3 IoT): an architectural framework for monitoring health of elderly people,” in 2014 International Conference on Science Engineering and Management Research (ICSEMR) (IEEE), 1–3. doi: 10.1109/ICSEMR.2014.7043542
- [10] Aihua Mao, Xuedong Ma, Yinan He, Jie Luo, “Highly Portable, Sensor-Based System for Human Fall Monitoring”, MDPI- Sensors, 13 sept-2017
- [11] Yueng Santiago Delahoz, Miguel Angel Labrador, “Survey on Fall Detection and Fall Prevention Using Wearable and External Sensors”, Sensors 2014, 14, 19806-19842; doi:10.3390/s141019806, 22 October-2014
- [12] Nicole Kah Mun Yoong, Jordan Perring, Ralph Jasper Mobbs, “Commercial Postural Devices: A Review”, Sensors, NCBI, Published online 2019 Nov 23. doi: 10.3390/s19235128, PMCID: PMC6929158
- [13] WAI YIN WONG, MAN SANG WONG, KAM HO LO,” Clinical applications of sensors for human posture and movement analysis: A review”, Prosthetics and Orthotics International March 2007; 31(1): 62 – 75
- [14] Xinguo Yu, “Approaches and principles of fall detection for elderly and patient”, Conference: e-health Networking, Applications and Services, 2008. HealthCom 2008. 10<sup>th</sup> International Conference.
- [15] Töreyin, B.U., Y. Dedeoğlu, and A.E. Çetin, HMM based falling person detection using both audio and video, in Computer Vision in Human-Computer Interaction. 2005, Springer. p. 211-220.
- [16] Thome, N. and S. Miguet. A HHMM-based approach for robust fall detection. in Control, Automation, Robotics and Vision, 2006. ICARCV'06. 9th International Conference on. 2006. IEEE.

- [17] Yoosuf Nizam, MohdNorzali Haji Mohd, M. Mahadi Abdul Jamil, “A Study on Human Fall Detection Systems: Daily Activity Classification and Sensing Techniques”, International Journal of Integrated Engineering, Vol. 8 No. 1 (2016) p. 35-43
- [18] Mohamad Daher, Maan El Badaoui El Najjar, Ahmad Diab, Mohamad Khalil, “Automatic Fall Detection System using Sensing Floors”, International Journal of Computing and Information Sciences, Volume 12, Number 1, September 2016
- [19] Xiuyi Fan, Huiguo Zhang, Cyril Leung, Zhiqi Shen, “Fall Detection with Unobtrusive Infrared Array Sensors”, Multisensor Fusion and Integration in the Wake of Big Data, Deep Learning and Cyber Physical System (pp.253-267)
- [20] Shigeyuki Tateno, Fanxing Meng, Renzhong Qian, Yuriko Hachiya, “Privacy-Preserved Fall Detection Method with Three-Dimensional Convolutional Neural Network Using Low-Resolution Infrared Array Sensor”, Sensors (Basel, Switzerland), Vols. 3 to 21; 2003 to 2021
- [21] Satoshi Shirogane, Hitomi Takahashi, Kenji Murata, Satoshi Kido, Tomoya Miyasaka, Tadafumi Saga, Shuhei Sakurai, Toyohiro Hamaguchi, Toshiaki Tanaka, “Use of Thermal Sensors for Fall Detection in a Simulated Toilet Environment”, International Journal of New Technology and Research (IJNTR), ISSN: 2454-4116, Volume-5, Issue-11, November 2019 Pages 21-25
- [22] Donald I.P., & Bulpitt C. J., “The prognosis of falls in elderly people living at home,” Age Ageing, vol.28(2), 1999, pp.121–125.
- [23] G. Sannino, I. De Falco, and G. De Pietro, “Automatic Extraction of an Effective Rule Set for Fall Detection for a Real-Time Mobile Monitoring System”, Developments in eSystems Engineering (DeSE), 2013 Sixth International Conference on. IEEE, 2013
- [24] Diana Yacchirema, Jara Suárez de Puga, Carlos Palau, Manuel Esteve, “Fall detection system for elderly people using IoT and Big Data”, The 9th International Conference on Ambient Systems, Networks and Technologies (ANT 2018)
- [25] Xu T., Zhou Y., & Zhu J., “New advances and challenges of fall detection systems: a survey,” Applied Sciences, vol.8(3), 2018, article no.418

## FUTURE OF FINANCIAL AND BANKING SECTOR WITH BLOCKCHAIN TECHNOLOGY

**Umesh Koyande**, Assistant professor, Dept. of Information Technology, Vidyalankar School of Information Technology, Wadala, Mumbai

**Siddhesh Dhuri**, PG Student, Dept. of Information Technology, Vidyalankar School of Information Technology, Wadala, Mumbai

### Abstract

The world of banking as we probably are aware for a long time is in a transformation stage, set off by new advances in technology. The most significant is blockchain that is said to essentially change the manner in which monetary exchanges are taken care of today. It is anticipated that this innovation will have huge results on how traditional banks work together later on. The aim of this paper is to direct an exploration on how the effect of Blockchain will revolutionized the financial industry and show the fundamental attributes of such innovation. At that point, we present how Blockchain entered into financial world and how it disrupts traditional banking architecture. Then, we examine the improvement of Blockchain for the financial sector. In addition, we describe the genuine inspirations for banks to investigate Blockchain, and issues they face. The technology being explored as of now has a profound impact on the financial sector, that is in the initial phase of changing many ventures, with the probability that they will transform them fundamentally in the following five to ten years. Finally, this paper proposes how financial institutions should respond to this new technology and how to execute this innovation in a more organized manner.

### Introduction

In the advancement of the web, one can highlight milestone occasions that can be used to divide the process into stages. Among these significant milestones are the production of the main wide-region computer networks during the 1960s, the advancement of an electronic mail framework during the 1970s, the making of ethernet later in that decade, the starting of the internet during the 1990s and the formation of the primary programs and web crawlers and search engines later in that decade, among others. Following every one of these trademark advancements, the web changed in a sensational way. Each progression was significant in making the web that we know and depend on today. Along these lines, in 2008, a person named Satoshi Nakamoto illustrated another convention for peer-to-peer electronic money system utilizing a digital currency called bitcoin. It was an extraordinary achievement. Cryptographic forms of money (computerized monetary standards) are not made or constrained by governments. In another words, they are altogether different from traditional fiat monetary forms since they are not made or constrained by governments. Most importantly, distributed computations were allowed by the new protocol which had its own set of rules. Data exchange between billions of various devices does not involve any trusted third party. This kind of convention has become the new blockchain innovation, which was establishment for the growing numbers of globally distributed blockchains. The most well-known is presumably bitcoin. Blockchain innovation empowers trade cash without mediators (any bank, or other monetary foundation). Subsequently, individuals send cash straightforwardly and securely simultaneously. By consolidating the Peer-to-Peer (P2P) organization and the distributed server that marks the timeshare transactions, has been created a database that is autonomous and shared among all network participants. At the point when somebody sends Bitcoin starting with one location then onto the next, the exchange is planned and recorded with every framework member. The transaction record is combined with other transactions in one block - as a traditional computer database. Each transaction is timed. When the block is complete, it gets the time stamp. So, all the information is sequential to avoid duplication. The completed block is sent through the

network where it is added to the chain sequence. Other participants can send their blocks at the same time. In any case, the time stamp guarantees that the information is included the right request and all members approach the most recent adaptation. The key security of blockchain is something many refer to as the hash. Blockchain utilizes particular equipment to build countless cryptographic information chains, and SHA-256 hash work is utilized to keep altering of information from third party users. It's a piece of cryptographic number related that makes the connections between the squares basically indivisible. The Hash work utilizes the advantages in each square and uses them to make hash - a unique array of characters. Hash from one block is added to the information in the following block so when the new block goes through the hash work, the track on the past one is kept in touch with the new Hash. Etc through the chain arrangement. Thus, on the off chance that somebody attempted to change a block, the hash entered in the subsequent block would at this point not be viable. This incompatibility would proceed through the chain arrangement and flagged changes in the grouping. As all participants have a copy of the integral pool, they are able to detect every attempt to manipulate. So, when hash agrees across the chain, the participants can be confident in the reliability of the transaction

### **Blockchain in Financial World**

As we have all done online transaction either to buy something or booking tickets. A large portion of us utilize a credit/debit card for that. This whole pattern of exchange occurs between you and the merchant with the help of card given by the bank. If for some reason the merchant failed to deliver the result & you want the refund; you have to pay a nominal transaction fee to the bank. There are many other intermediaries like a bank who act as the financial bridge between the service provider & consumer. They essentially go about as trust suppliers. It requires some investment and cost for both the service provider and the purchaser to settle things identified with money in light of the fact that the monetary part straightforwardly relies upon an outsider service provider. Wouldn't it be able to happen straightforwardly between the two gatherings, without the mediation of an outsider? Can't the trust factor work here for this situation? Truly, here comes Blockchain with all the arrangements. The banking system handles millions of funds transfer on daily business from one area to another in the world making it an area where Blockchain has impacted in terms of operation. The area is profiting by the utilization of Blockchain innovation because of its inclination to blunders and false exchanges. This has prompted the move by Fintech foundations to receive Blockchain as a type of exchange. This is because Blockchain technology in banking system has the potential to outdo the need for the manual processes involved in the banking fund transfer system by replacing it with the secure transaction and assuring the clients safer ways of fund transfer which does not even involve as much transfer costs as those used in banking systems. Despite the fact that Blockchain innovation was not all around acknowledged in the financial business, the hypothesis is changing and the innovation is presently very much acknowledged. This has been predominantly associated with the achievement pace of Blockchain innovation in numerous enterprises. Enormous financial organizations, for example, JP Morgan have demonstrated revenue in Blockchain with the American global venture bank setting up an entire division they named Quorum in New York to perform examination and usage of Blockchain innovation explicitly. Barclays is seeing blockchain innovation as "ground-breaking" and is exploring different avenues regarding it both inside and through associations with new businesses to utilize it as it identifies with monetary administrations. Swiss venture bank UBS has ventured to such an extreme as to make its own independent blockchain lab to lead exclusive exploration for the organization to utilize. It has been uncovered that Citigroup has chipped away at in any event three diverse blockchain-based endeavours including its own digital money known as Citi Coin. Enormous monetary establishments, from speculation banks to stock trades to national banks, are all beginning to work on their own blockchain-based solutions in order to stay on top of this innovation.

## **Disruption of Traditional Banking Architecture**

Probably the biggest threats to the financial area today is innovation. Regardless of whether it is coming from enormous innovation firms, for example, Google, Apple, or Amazon or from new monetary innovation (FinTech) new companies, traditional banks are starting to take notice. One potential disrupter for the monetary business today comes from applications including blockchain innovation —the tamper-proof system of distributed ledger. What makes blockchain so problematic for the financial business? For what reason is this innovation estimated to upsetting the manner in which banks are these days working together? The response to this inquiry lies in the three explicit in-form properties of a blockchain: Decentralized, distributed and Immutability.

### **1. Decentralized Network**

Blockchain works on a decentralized network, that is acting on a peer-to-peer basis. It handles all tasks like a bank, but without any central authority that monitors all data. So, it potentially cuts out the middleman, giving back the power to the owner of the assets (for example information or tokens conveying some monetary worth). All information is stored across its network via blocks. These squares, that are time-stamped and connected along with all past and current exchanges, are forever recorded and consistently reconciled and updated in a cryptographically secure manner. By storing data across its network, blockchain eliminates the risks that come with data being held centrally.

### **2. Distributed Ledger**

A second property of blockchain is the distributed ledger, that permits sharing of a record of movement for example, self-assertive information or essentially anything of significant worth between various gatherings. What makes blockchain so significant is its capacity to mechanize trust and straightforwardness among all gatherings utilizing it. Since the record is circulated among all exchange members, it exists at the same time in various spots. Each of the computers in the distributed network maintains a copy of the ledger to ensure transparency and also prevent a single point of failure and all copies are updated and validated simultaneously. This makes it extremely difficult to manipulate entries or tamper with the data without the other parties noticing.

### **3. Immutable records**

A third remarkable property is its immutability. By design, blockchains are inherently resistant to modification of data. All blockchain networks adhere to a certain protocol for validating new blocks. No progressions can be made once the framework is set with the underlying norms. No changes can be made once the system is set with the initial standards. Once recorded, the data in any given block cannot be altered without the alteration of all the subsequent blocks, which requires the consensus of the network majority.

## **Transforming Financial and Banking Institutions using Blockchain**

The blockchain is coming to financial administrations. Exactly how rapidly it propels on financial administrations organizations and what, precisely, the innovation brings is still questionable, yet it can possibly encourage quicker, less expensive, more secure and more straightforward monetary exchanges. Be that as it may, it could likewise mean critical occupation misfortunes for monetary administrations occupations in the centre and back office.

Let us look at the current use instances of blockchain innovation in the monetary administrations and what transforms they will achieve.

### **1. No central authority**

In contrast to traditional banking, there's no central authority in a blockchain framework. Rather, it is a distributed organization where partaking computers trade exchanges for consideration in the

public record they share. With all exchanges being added to a single public record, it diminishes the messiness and entanglements of numerous records.

## 2. Elimination of middle man

With blockchain innovation, collaborators will actually want to cooperate as free specialists rather than under an order of managers. In this vision, blockchain could replace bankers, bookkeepers and attorneys, protection and all the other things that was designed before this to check instalments and the presentation of agreements.

## 3. Faster transaction

Interbank exchanges can take up to days for clearing and last settlement, particularly outside of working hours. With blockchain innovation, exchanges times can be diminished to only minutes and are prepared day in and day out.

## 4. Reduction in operational expenses

By taking out outsider middle people and overhead expenses for trading resources, blockchain present exciting potential in its ability to massively reduce transaction fees.

## 5. High degrees of straightforwardness and security

Any changes made to public blockchain are openly visible by all parties. This makes creates transparency and process integrity as users can trust that transactions will be executed exactly as the protocol commands. Further, all transactions are immutable meaning they cannot be altered or deleted.

## 6. Audit

Present day Financial bookkeeping depends on a twofold section framework. Twofold passage accounting requires the trust of outsiders, independent public auditors to confirm the organization's financial data. Each review is an expensive exercise, restricting the organization's bookkeepers for long time-frames. The Blockchain as a wellspring of trust can likewise be very useful in the present bookkeeping structures. By utilizing a computerized finger impression which is permanently time-stamped and altered evidence when recording exchanges in the blockchain, ultimately it will eliminate the requirement for outer examiners. The blockchain will bring transparency and trust so the actual network becomes the auditors and the watchdog ensuring financial integrity.

## 7. Cybersecurity

Hackers can close down whole organizations, alter information, lure unwary users into cyber traps, steal and spoof identities, and carry out other devious attacks by leveraging centralized repositories and single points of failure. Blockchain can expand security by blocking identity theft, prevent information altering, and halting Denial of Service attacks. By decentralizing and distributing the information across the whole blockchain network and cryptographically securing every transaction the financial system will become more robust.

## Conclusion

This paper features the way that the financial business is on the edge of new financial era using a new destructive system based on Blockchain. Blockchain is still generally new, despite the fact that banks and different ventures are as of now improving with blockchain innovation. Now, the innovation is presumably in ahead of guidelines, and it's not always clear what to expect in terms of protection, privacy, potential risks, and dispute resolution. Those issues can all be solved, but it's critical to research and understand what problems may arise before using blockchain for significant transactions. While the process of disruption triggered by blockchain innovation has just barely started, many anticipate that it should accelerate soon. This and the coming years we will – subsequently - see a ton of changes in the financial business, while new players will enter the market. Blockchain may take out certain parts in financial administrations temporarily. Albeit the financial businesses are excited about blockchain, the innovation will require a couple of years to turn into a standard monetary model. That implies that

interruption will happen bit by bit however clearly. Meanwhile, banks have the opportunity to get ready and change with the goal that they can have a "second live" in a blockchain world. The way blockchain is driving disturbance in the conventional monetary administrations industry is anyway not clear but rather may happen in both evident and not all that conspicuous ways. The fate of the financial administrations industry will subsequently rely upon how the different partners including banks gain by this innovation and how they cooperate with one another. However, when monetary establishments completely embrace this innovation, we should see these acquired efficiencies as lower expenses for consumers, creating a renewed promising customer experience by banks

## References

- Adam Hayes (2019), "Blockchain Technology to Revolutionize Traditional Banking".<https://www.investopedia.com/articles/investing/083115/blockchain-technology-revolutionize-traditional-banking.asp>.
- Carlo R.W. De Meijer (2019), "Blockchain and disruption in the financial world: Will banks survive?".<https://www.finextra.com/blogposting/16658/blockchain-and-disruption-in-the-financial-world-will-banks-survive>.
- Victor Chang, Patricia Baudier, Hui Zhang, Qianwen Xu, Jingqi Zhang, and Mitra Aramid (2020), "How Blockchain can impact financial services – The overview, challenges and recommendations from expert interviewees".
- Beck, R., C, JS, Lollie, N., Malone, S. (2016), "Blockchain – The Gateway to Trust-Free Cryptographic Transactions" in Research Papers from ECIS2016, Istanbul.
- DuskoKnezevic (2018), "Impact of Blockchain Technology Platform in Changing the Financial Sector and Other Industries."
- Nakamoto, S, (2008), "Bitcoin: A peer-to-peer electronic cash system", <https://bitcoin.org/bitcoin.pdf>

# TRACK WORKPLACE CONDITION TO ENSURE EMPLOYEES SAFETY INWAREHOUSE

**Pallavi Tawde**, Assistant Professor, VSIT

**Leena Jadhav**, Assistant Professor, VSIT

**Rohini Desai**, Assistant Professor, VSIT

**Hrishikesh Tendulkar**, Assistant Professor, VSIT

## ABSTRACT

The workers face a lot of struggles and difficulties in the workplace due to the improper balance between work and their safety. Besides affecting them physically, they are affected mentally as well. The carelessness in wearing safety helmets could lead to a human loss, to overcome this, an automatic helmet detection system is proposed. In this paper, we are building a web application that checks the safety of the workers in the industry by detecting whether the workers are wearing helmets or not. We are using IBM Watson Visual Recognition service using image classification algorithm for building a classifier model to check for the presence of a helmet. The results demonstrate the safety management of the workers at the warehouse.

Keywords: Visual recognition, safety helmets, IBM Watson studio, Classification.

## INTRODUCTION

Loss of life is irreversible and needs to be prevented at all costs at workplace. An injury although not fatal can harm the human body which may take years to heal or can cause permanent damage too. Hence occupational safety is being given utmost importance at workplaces.

Most accidents happen at workplace leads to a serious problem and industry must bear a huge loss and it affects nation. The recent research shows that major accidents occur due to the common nature of the workplace, human behavior, faulty safety management and it leads to risky work methods and procedures. The workers would not always follow the safety guidelines given by Occupational Safety and Health Administration.

The proposed paper recognizes whether the safety precautions of putting helmet before entering the warehouse have been followed or not by analysing the surveillance images. Based on the collection of images, we detect the object of our interest and further analyse whether the worker is wearing the helmet or not, checked by classification algorithm using visual recognition.

Detection of worker with or without safety tools in warehouse recognise whether worker have followed the safety guidelines. It shows two cases, the positive example and the negative example.



**Fig 1: Men with Helmet**

**Fig 2: Men without helmet**

## 1. LITERATURE SURVEY

Du, M. Shehata, and W. Badawy have defined development of thinking computers and image transforming approach for detection of helmet. They have designed the framework with three major parts: i) person's face detection ii) the motion detection iii) helmet detection. [1]

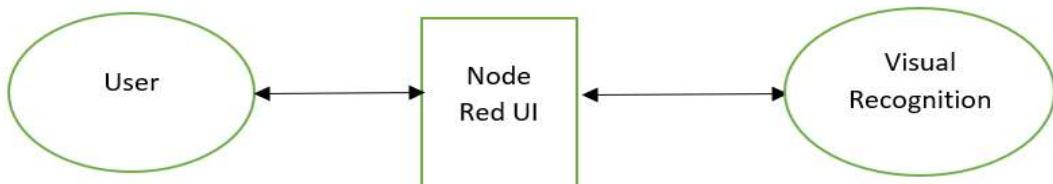
Abu H. M. Rubaiyat, Tanjin T. Toma, Masoumeh Kalantari-Khandani have defined how to automatically detect helmet for Construction work Safety. It uses two methods - Construction worker detection, helmet use detection. In first step, the segmented images are processed to extract frequency domain information. Discrete Cosine Transform (DCT) is the resultant of Discrete Cosine Transform (DCT) and Histogram of Gradients (HOG) which are applied one after the other. In the second step, color information and Circle Hough Transform (CHT) used for detecting safety helmets. [2]

Hao Wu and Jinsong Zhao, have defined the intelligent vision-based system for detection of helmet for work safety. It monitors and keeps the track of helmet wearing of workers along with recording the color codes of helmets.[3]

Jie Li, Huanming Liu, Tianzheng Wang, and Min Jiang have defined the system which include machine learning and image processing which is used to detect the safety helmets. It uses three phases - background modelling, pedestrian classification, and safety helmet detection. It uses ViBe background model which detects the moving object under the fix surveillance. They have also used Histogram of gradient (HOG) which explains the human and support vector machine (SVM) algorithm to classify pedestrians. [4]

## 2. PROPOSED METHOD

The Custom Object Detection model is the newest feature in the Visual Recognition service, which includes classification. If you want to predict the existence of an object in an image, use classification. When you categorize an image, the service model returns the probability that certain objects are exist in that image, so we can use the integral model, or we can create our own custom model.



**Fig 3:**

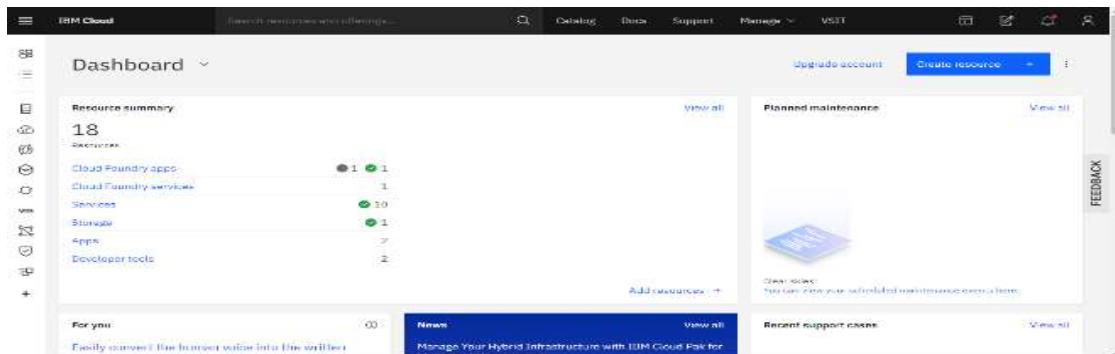
**Block diagram for model**

The proposed method is based on Visual recognition is used to recognize the wearing of helmets by workers which in turn will improvise the safety management at warehouse. Helmet detection and worker locating have been proven as efficient means of meeting the safety requirements in various studies. However, most of the studies have limitations in practical applications like sensor-based detection methods have a limited read range of readers and cannot be able to confirm the position relationship between the helmets and the workers. The development thinking model-based perception methods choose features unnaturally with a strong subjectivity, a compounded design process. Therefore, the study proposed a procedure which has a base of visual detection to detect safety helmets by using Custom models, classify Images with Watson Visual recognition tool. The experimental results have suggested the efficiency of the proposed method. In this paper, we have used Watson visual recognition tool to build the model. A dataset of maximum images containing various helmets is trained and tested on the model. The experimental results illustrate the usefulness of the model. The proposed model provides an opportunity to detect the helmets and improves safety of employees in warehouse. Once you have uploaded your images, it will notify what you have found in your images. Beside each class of object, it will also give you a confidence score between 0 and 1, which will help you to identify the object is present in the image.

## 3. RESULTS

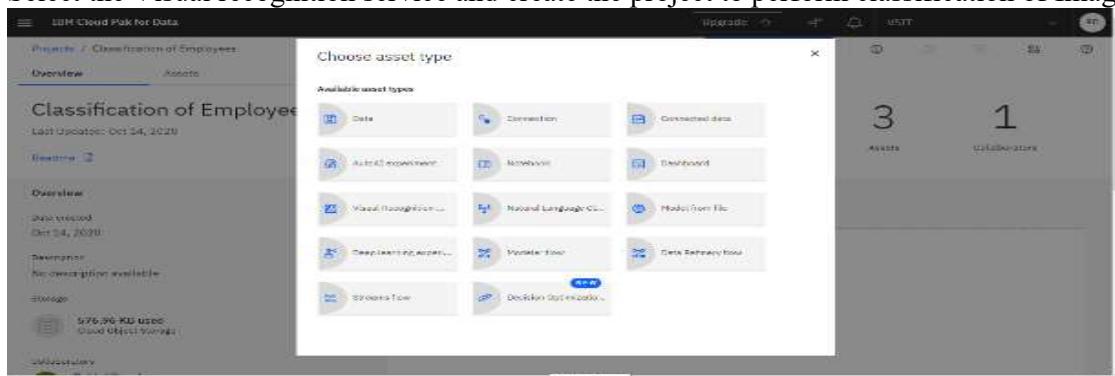
In this paper, the IBM Watson Visual Recognition services is used to train the data sets i.e., collection of different images. We have selected 100 images; it has three parts. First it includes 50 images with helmet, second 50 images without helmet. The training set is used to train the model based on the images and it will calculate the threshold or confidence score and based on the score we will identify the worker with or without helmet.

The dashboard shows the use of different services and storage allocated.

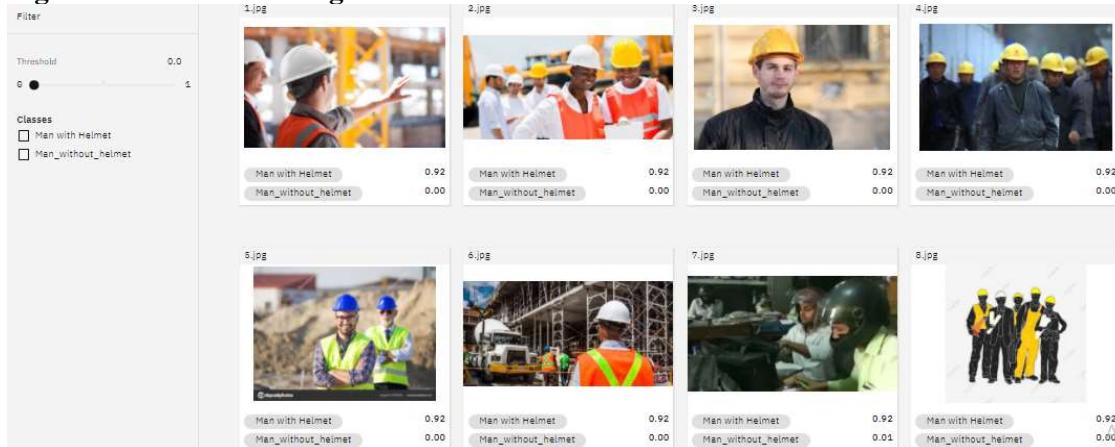


**Fig 4: Dashboard IBM Watson Studio**

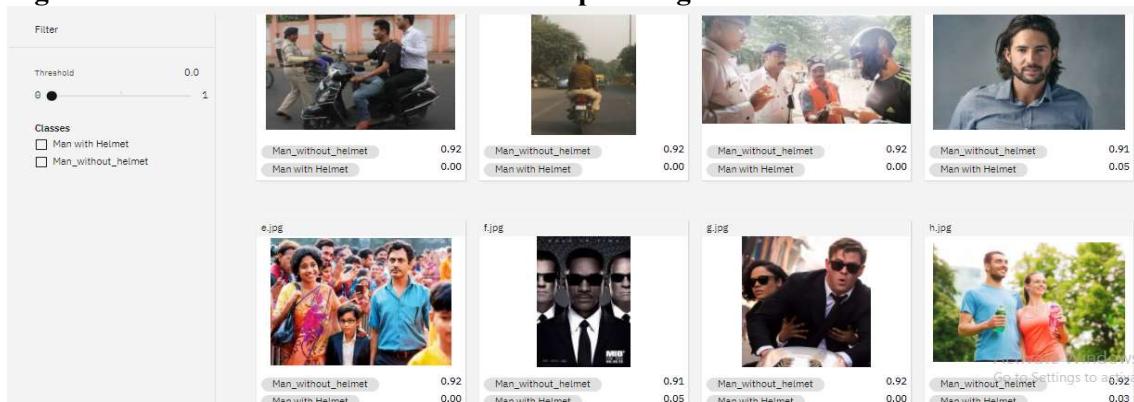
Select the Visual recognition service and create the project to perform classification of Images.



**Fig 5: Use of Visual Recognition**

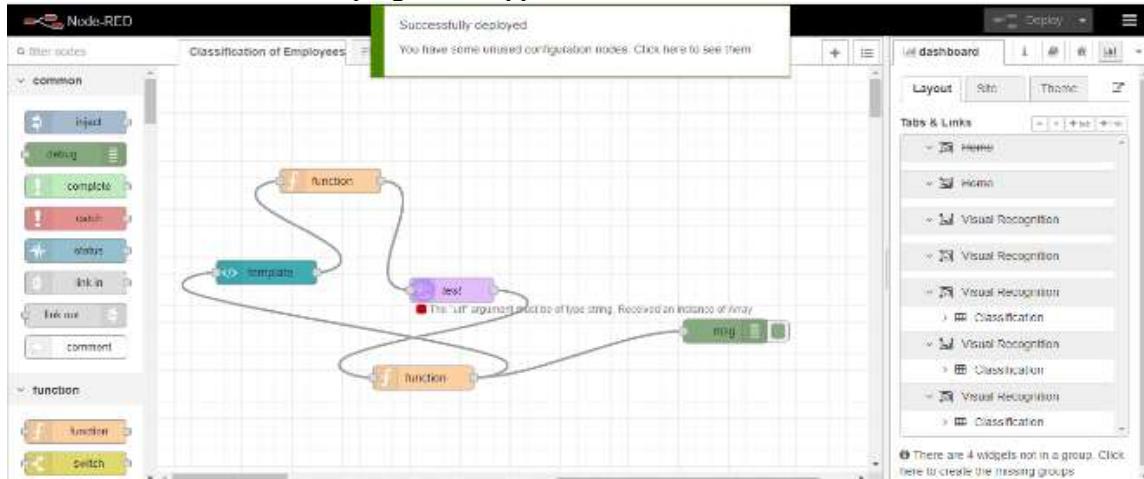


**Fig 6: Threshold or Confidence Score of Sample Images Men with Helmet**



**Fig 7: Threshold or ConfidenceScore of Sample Images Men Without Helmet**

Used node-red UI for developing a web application.



**Fig 8: Node RED UI**

Output for Classification using Visual recognition.

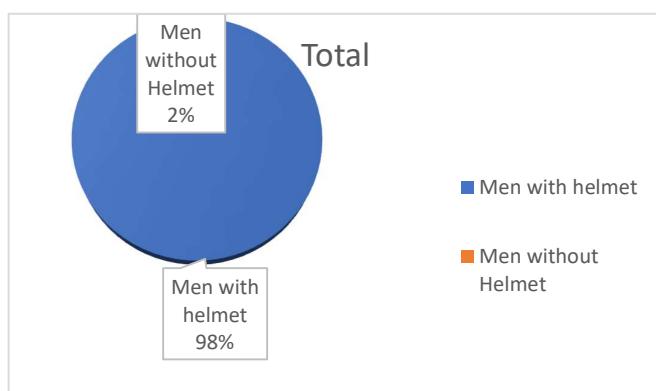
**Fig 9: Output Men with helmet**

**Fig 10: Output Men without helmet**

**Table 1: Representing threshold value for trained images of workers.**

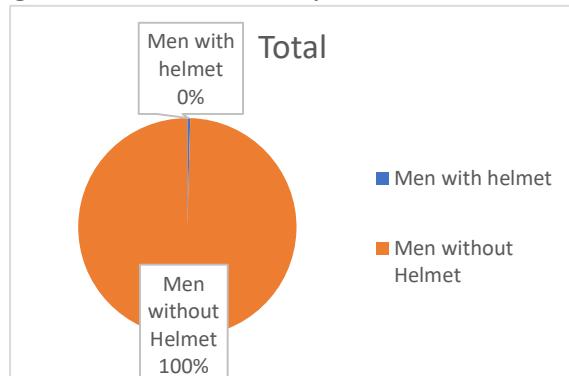
	Class	Threshold or Confidence Score
1	Men with helmet	0.92
	Men without Helmet	0.00
2	Men with helmet	0.91
	Men without Helmet	0.05
3	Men with helmet	0.92
	Men without Helmet	0.03
4	Men with helmet	0.92
	Men without Helmet	0.00
5	Men with helmet	0.91
	Men without Helmet	0.02
6	Men with helmet	0.00
	Men without Helmet	0.92
7	Men with helmet	0.92
	Men without Helmet	0.00
8	Men with helmet	0.92
	Men without Helmet	0.01
9	Men with helmet	0.92
	Men without Helmet	0.00

10	Men with helmet	0.92
	Men without Helmet	0.00



**Fig 12: Shows the accuracy of men**

**Fig 11:Shows the accuracy of men with**



**without helmet**

#### 4. CONCLUSION

The paper proposed technique used for detecting the wearing of safety helmets by the workers based on Custom models using classify Images Watson Visual recognition tool. A dataset of maximum images containing various helmets is built and divided into three parts to train and test the model. The Watson Studio is chosen to train the model. After the training and testing process, threshold value is chosen between 0 and 1. The trained model with images shows the accuracy i.e. 98 percent for men with helmet and 100 percent for men without helmet. The experiment results demonstrate that the method for the safety of workers of a warehouse. The presented model offers another solution to determine the safety helmets and improve the health risk management.

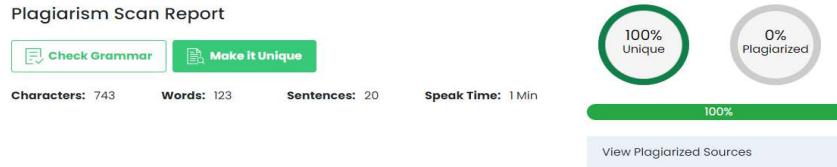
#### 6. REFERENCES

- [1] S. Du, M. Shehata, and W. Badawy. Hard hat detection in videosequences based on face features, motion and color information. In3rd International Conference on Computer Research and Development(ICCRD), Vol. 4, 2011.
- [2] Rubaiyat, Abu & Toma, Tanjin& Kalantari-Khandani, Masoumeh & Rahman, Syed Ashiqur& Chen, Lingwei& Ye, Yanfang& Pan, Christopher. (2016). Automatic Detection of Helmet Uses for Construction Safety. 135-142. 10.1109/WIW.2016.045.
- [3]Wu, Hao & Zhao, Jinsong. (2018). An intelligent vision-based approach for helmet identification for work safety. Computers in Industry. 100. 267-277. 10.1016/j.compind.2018.03.037.
- [4] Gaikwad Pragati R, Jadhav Aparna S, Jadhav Komal D and Prof. EkapatpureJalindar N A review on Secure Helmet wearing Detection by using Image Processing and Machine LearningIJSTE - International Journal of Science Technology & Engineering | Volume 4 | Issue 5 | November 2017ISSN (online): 2349-784X
- [5] Yange Li, Han Wei, Zheng Han ,Jianling Huang, and Weidong Wang Deep Learning-Based Safety Helmet Detection in Engineering Management Based on Convolutional Neural Networks. Received 8 August 2019; Revised 14 May 2020; Accepted 10 September 2020; Published 19 September 2020
- [6] Kamboj, Ankit & Powar, Nilesh. (2020). Safety Helmet Detection in Industrial Environment using Deep Learning. 197-208. 10.5121/csit.2020.100518.
- [7]Li, Jie& Liu, Huanming& Wang, Tianzheng& Jiang, Min & Wang, Shuai & Li, Kang & Zhao, Xiaoguang. (2017). Safety helmet wearing detection based on image processing and machine learning. 201-205. 10.1109/ICACI.2017.7974509.
- [8] Ahmed Safwat Artificial Intelligence for Construction safety

[9]Li, K., Zhao, X., Bian, J., & Tan, M. (2017). Automatic Safety Helmet Wearing Detection. 2017 IEEE 7th Annual International Conference on CYBER Technology in Automation, Control, and Intelligent Systems (CYBER), 617-622.

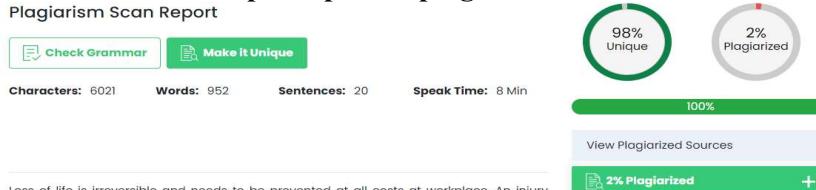
[10] <https://cloud.ibm.com/docs/visual-recognition>

## Plagiarism Report for Abstract



The workers face a lot of struggles and difficulties in the workplace due to the improper balance between work and their safety. Besides affecting them physically, they are affected mentally as well. The carelessness in wearing safety helmets could lead to a human loss, to overcome this, an automatic helmet detection system is proposed. In this paper, we are building a web application that checks the safety of the workers in the industry by detecting whether the workers are wearing helmets or not. We are using IBM Watson Visual Recognition service using image classification algorithm for building a classified model to check for the presence of a helmet. The results demonstrate the safety management of the workers at the warehouse.

## Paper report of plagiarism



Loss of life is irreversible and needs to be prevented at all costs at workplace. An injury although not fatal can harm the human body which may take years to heal or can cause permanent damage too. Hence occupational safety is being given utmost importance at workplaces. Most accidents happen at workplace leads to a serious problem and industry must bear a huge loss and it affects nation. The recent research shows that major accidents occur due to uncommon nature of the workplace, human behavior, and faulty safety management, and it leads to risky work methods and procedures. The workers would not always follow the safety guidelines given by Occupational Safety and Health Administration. The proposed paper recognizes whether the safety precautions of putting helmet before entering the warehouse have been followed or not by analysing the surveillance images. Based on the collection of images, we detect the object of our interest

# **A STUDY ON DIGITAL INCLUSION IN RETAIL SECTOR AND ITS IMPACT ON CONSUMER BEHAVIOUR DURING PANDEMIC**

**Ms. J. Gunasundari**, Assistant Professor, Vidyalankar School of Information technology  
j.gunasundari@vsit.edu.in

**Ms. Prathma Nemane**, Assistant Professor, Vidyalankar School of Information technology  
prathma.nemane@vsit.edu.in

---

## **Abstract:**

Restricted access of brick-mortar retail purchase led to new avenue of purchase among customers. Use of digital platform become popular for entertainment, reading of newspaper, purchase of consumer products, learning and to obtain health-related information. Pattern of purchase and consumer behaviour has undergone drastic change in response to the change during Pandemic. International survey has proved that people have become health conscious and there is an increase in the demand for pharmaceutical products. Growth rate of different Industrial sectors revealed that spending pattern of customers have been changed. Manufacturers and retailers will be able to sustain in the market if they adopt themselves towards the change in consumer behaviour. The current paper tries to identify people embracement for digitalisation, Products preference to buy online, change in spending pattern of consumers and how far the retailers adopted to online selling.

**Key word:** Consumer behaviour, Spending patter, digital adoption, product preference.

## **1. Introduction:**

The pandemic has brought phenomenal behavioural changes among customers. (Hall, 2020) It had an impact on consumption displacement among consumers, change in spending pattern, change in amount of spending and considerable adoption of online shopping. (Ali, 2020) Customers are forced to act in a restricted circumstances and receptive towards digital transactions. New trend in supply chain showed a surge in revenue of many E commerce companies. E commerce sales forecasted to 17% of retail sales. Strong growth of E commerce is expected to continue long run in post Covid period. Retail sector ability to adopt to the technology to match with customer online purchase behavioural change is crucial. Understanding of reasons for adoption of online retail purchase, change in spending pattern of customers will assist the retail stores to strengthen their supply chain. Retailers consistent efforts to improve online services in response to customer preference for the product to buy online will continue even after the pandemic is over.

The impact of crisis has brought everlasting new shopping habits with respect to conscious consumption, more focus on health products, preference of local products. The situation has brought even social impact and people embraced more technology to get connect with the community as a consequence of isolation. The current paper objectives are 1) to find out people adaptability to digitalisation, 2) to understand consumption displacement and Online retail shopping placement 3) to measure the change in spending pattern of consumer during pandemic and 4) to understand the extend of digital adaptability by small vendors and traders.

## **2. Review of Literature**

Bansal.S, (April 02, 2020) mentioned that there might be a major shift in the supply chain and an increased consumption of e-commerce portals through the internet due to COVID-19 lockdown. After examining the consumer buying behavior from when India first encountered COVID-19 till the time under lockdown it is said that people are more conscious about health and hygiene hence there can be more online shopping and fewer visits to stores for customers.

FE Online, (April 29, 2020) Millennials will buy in revenge once lockdown lifts. It is noticed that in the country after the lockdown is lifted there will be massive change in the buying behavior of the customers, especially the millennial kids, they are expected to do revenge buying, as they did not get

to shop like they used to pre-lockdown period. And it is said that the millennials are the winners of online sales especially FMCG companies.

Basu.P, Raina.R (April 24, 2020). The E-commerce industry was running smoothly way before the pandemic, however, due to covid-19 pandemic lockdown throughout the globe there was a pressure imposed on e-commerce industries, especially on the essential products such as medicines and groceries which can be considered as both challenge as well as opportunity. Before this pandemic shopping online was not mandatory it was just matter of convenience but after the corona outbreak it became necessary to protect, sustain oneself from the virus by avoiding crowded places. As a result of Covid-19 lockdown there is rise in online sales with a great jump in stats, as it has also been estimated that the e-commerce industry would have a growth of 200 billion dollars much before the predicted 2026.

Khetarpal.S (May 13, 2020) lockdown perks for e-commerce; online sellers recover 30% order volume in a week. Every Business is curious to notice how customer/consumer behavior is going to change after lockdown period. As to satisfy the needs, demands customers have shifted to e-commerce industry i.e online shopping, there has been a rise of 100 percent in FMCG products compared to that of pre lockdown period. Whereas these companies were permitted to do their operations as per government guidelines in the country, while the online fashion industry have got their start after release of lockdown 1.

Warc Data points (March 2020) E-commerce shopping more frequent because of Covid. During COVID-19 large number of consumers shifted their consuming habits to online mode. As per the latest reports of IPSOS, the massive change in e-commerce shopping where India (55%), China (50%) Italy (31%) and Vietnam (56%). This new change in customers is going to last long for decades in e-commerce industry.

Bailey.R, Mukherjee. W (April 16, 2020) large retailers to focus purely on e-commerce during lockdown 2.0 due to exemption to the commerce industry, every retail sector is now considering and focusing on bringing their products and services on e-commerce stage to have a boost in their sales. The non-essential companies such as Fashion industry or Cosmetic industry are starting with commerce as there has been noticeable growth in sales with online shopping. Also because of many rising opportunities on e-commerce, big retail companies from essential to non-essential are starting to merge with top e-commerce companies such as Amazon, Flipkart, and Myntra for a better supply chain and logistics.

Yatti Soni (April,30.2020) Pre-Covid period e-commerce was becoming the need of every household. Due to COVID-19 e-commerce was only selling essential goods to customers which made them feel safer and to be fearful about going outside for retail shopping. According to Capgemini's research on consumer sentiment states that the consumer of e-commerce is going to increase from 46% to 64% over the next nine months.

Aneesh Reddy(April,14,2020) Covid-19 impact: Consumers move towards digital Aneesh Reddy said that the way we used to work, shop, communicate has totally changed due to COVID-19 pandemic. People are now only going out to buy essentials but are still fearful to go out for that as they might get infected. Aneesh said that according to trifecta India e-commerce is expected to grow to US \$200 by 2026 due to cheaper 4G network and constantly increasing consumer wealth. But these are pre-Covid period analysis and now after COVID-19 hit India there is massive demand for e-commerce hence the growth to US\$200 can be reached more earlier.

Avatar.P (May 05, 2020) lockdown 3.0: Flipkart, Snapdeal sees heavy traffic for non -essential items. As per new government guidelines with the lockdown 3.0, E-commerce platforms have been granted to sell non-essential products and services in the orange zones and well as green zones along with that Flipkart has mentioned that the most searched items are with personal care products such as Trimmers, skin products, electronic goods like mobiles, laptops, fans and AC to sustain during the heat period. Snapdeal stated that they received a great proportion of 75 percent of total orders from the Orange and green zones. As per the estimates there would be great demand-for products like these after post lockdown period.

Tech desk, (May 19, 2020) Lockdown 4.0 relief: Amazon, Flipkart welcome non-Essential deliveries in red zones. With the Government guidelines lockdown 3.0 permitted the e-commerce companies to deliver the essential and non-essential to only Green and Orange zones in the country but with the effect of lockdown 4.0 E-commerce companies got granted to deliver essentials and non-essentials products and services to all three zones in the country. However Containment zones will only be provided by medicinal services along with groceries. With each and every process like this E-commerce companies are trying to fulfill the demands for all type categories of goods also estimating this to be an big opportunity for all online platforms.

### **3. Consumer buying behaviour at the time of pandemic:**

(Loxton,2020) The main effect of pandemic resulted to panic purchase due to supply shortage of the product and inflation in price. Non- discretionary household items were purchased in excessive quantity as the consumer developed herd mentality. Proving Maslow's theory, people prioritize basic goods and fall in the demand for non-durable goods. (Suri, 2020) The outbreak of the pandemic had an impact on purchasing power. It led to depleted purchasing power and necessity-based buying. (Donthu,2020) customers exhibited the behaviour of hoarding, rejecting, changing opinion about the brand and long term transformation of consumption behaviour. (Cranfield,2020) In Canada, people spending on grocery and food ingredients have been increased. They stock up grocery more than money spent on food service establishments. (Naeem,2020) Consumers in UK exhibited impulsive buying as result of fear and perceived risk such non-availability of the product, illness, death etc. (Zwanka,2020) The buying pattern turned into online and customer increased pantry stock and emergency health supplies. Fear factor indulged people into hedonic activities and they returned to liquor and marijuana dispensaries. Customer buying behaviour is shifted from planned behaviour to impulsive and hedonic behaviour during pandemic. Current research paper tries to find out change in customer behaviour from brick and mortar purchase to online purchase. Reasons and preference for the products to buy online.

### **4. Research Methodology:**

Customer survey is carried out to gather information about customer behavioural changes in accepting digitalisation, change in preference of product, change in spending pattern and readiness of retailers to embrace online trade.

Convenient sampling is used to collect the data and sample size of 106 respondents are duly considered for the study.

Data has been interpreted by using SPSS. Statistical analysis like chi square and percentage method are used to test the hypothesis.

In addition to primary data, published articles and surveys are used to understand the customer behaviour during the crisis.

### **5. Hypothesis**

#### **5 i) Adoption to digitalization:**

Understanding the special needs of customers retailers have taken efforts to provide real time assistance to customers through live chats on availability of the product, safety measures taken by the retailers in supply chain distribution in UK (Pantano, 2020). Pandemic has opened doors for online transactions in the field of medical diagnoses, agency transactions required in the service sector like motor vehicle, unemployment filing, medicare filing, education and tourism (Zwanka,2020).Hence the researcher tries to find out the services for which digital platform is preferred by the people

**H 1: There is absence of relationship exist between digital adoption and age.**

**H 2: There is absence of relationship exist between digital adoption and occupation.**

#### **5 ii) Shift from offline purchase to online purchase:**

(Nielsen,2020) Customer shift to online shopping will be higher in percentage after the pandemic. Adobe Analytis, August, 2020 showed that online sales was upto 78% during pandemic. The

research paper focussed to find out customer embracement for online purchase of product, reason for digital adoption and the type of product they prefer to buy online.

**H 3: There is no significant relation exist between shift to online purchase with respect to Age.**

**H 4: There is no significant relation exist between shift to online purchase with respect to Income.**

**H 5: There is no significant relation exist between shift to online purchase with respect to Occupation.**

**5 iii) Change in Spending pattern:**

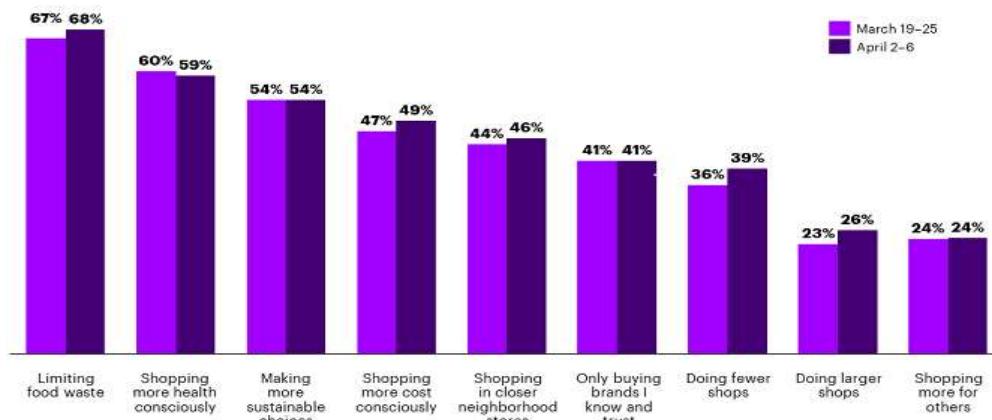
The crisis has brought huge impact on economy and impact. As economic activities showed slow pace of growth, employment was at danger phase. Spending pattern and need of consumption have brought enormous change. (Chronopoulos,2020) discretionary spending has been reduced among women than men. After 'stay alert' announcement, consumer spending on grocery has been increased, at the same time, spending on dinning and drinking have been reduced. Hence the current paper focused to find out changing pattern of consumer spending during pandemic.

**H 6: There is no relation exist between spending pattern and age of the respondents.**

**H 7: There is no relation exist between spending pattern and income of the respondents.**

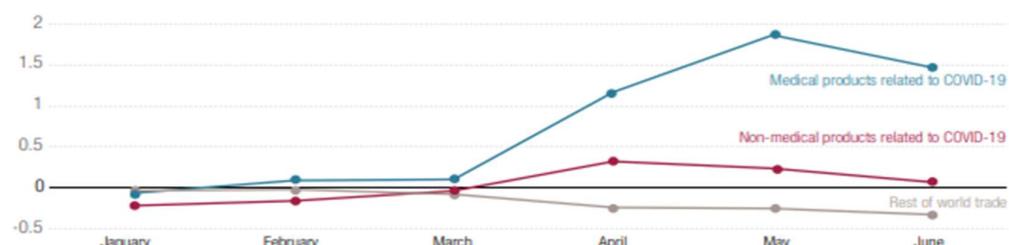
**6. Shift in Consumer Market during the pandemic:**

Previous Research revealed that people try to reduce food wastage and they shop more health products. They agreed to sustain the same habit even after pandemic. E commerce companies have experienced more number of customers turning to online purchase.



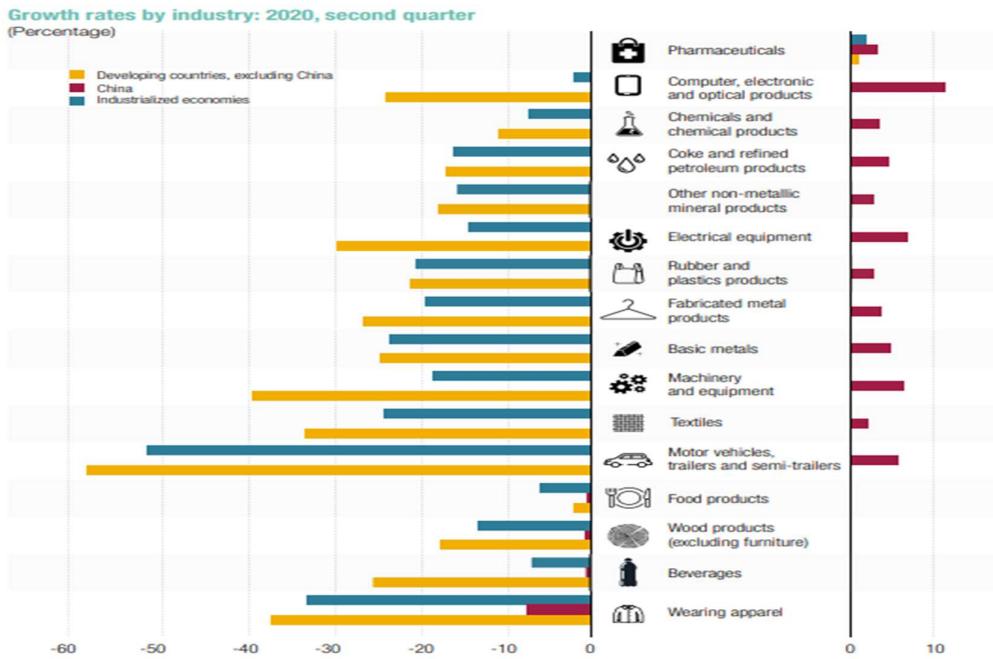
Source : Accenture

**Global merchandise trade of medical products, 2020**  
(Percentage)

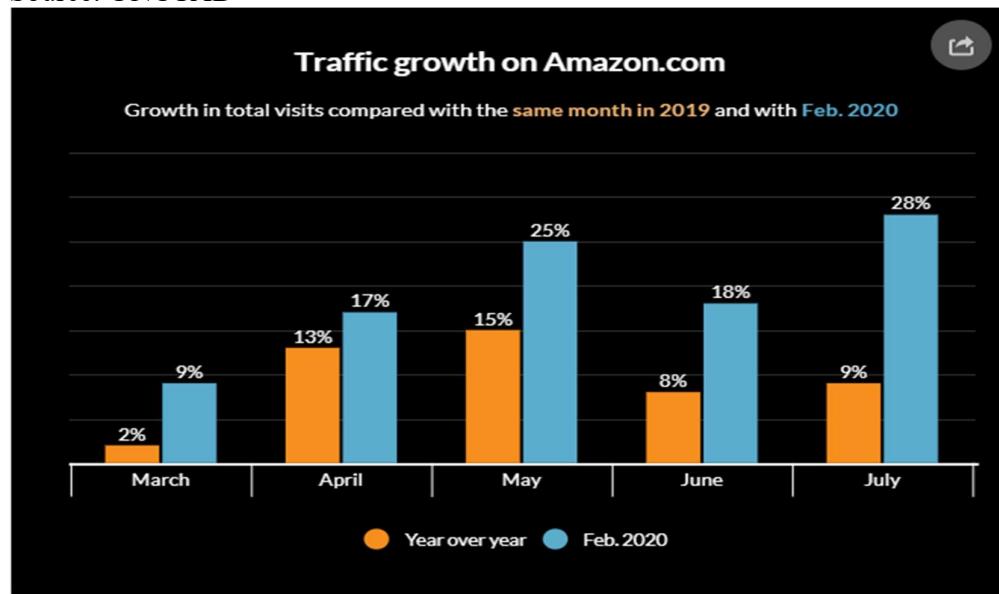


Source: UNCTAD secretariat calculations, based on the national statistics of China (GACC, 2020), United States (United States Census Bureau, 2020) and European Union (Eurostat, 2020).

Note: Year-on-year percentage changes.



Source: UNCTAD



Source: Digital commerce 360 analysis

## 7. Analysis and Interpretation:

### 7.1 Digital adoption with respect to age and occupation:

Description	Age		Occupation	
	Chi-square value	Result	Chi-square value	Result
I browse and spend a lot of time on digital entertainment sites	.980	H 1 Rejected	.334	H 2 Rejected
I am more frequently looking online for health-related information	.836	H 1 Rejected	.493	H 2 Rejected

I am shopping online more often than before	.683	H 1 Rejected	.321	H 2 Rejected
I am spending more time reading online newspaper and magazines	.666	H 1 Rejected	.337	H 2 Rejected
I am involved more in social service activities through digital platform	.009	H 1 Accepted	.787	H 2 Rejected

Analysis of the data by applying Chi-square method at 95% significant level proved that use of digital platform for the purpose of entertainment, health, shopping, reading of newspaper has significant relation with age. At the same time, use of digital platform for social activities is not influenced by Age.

The level of significance is high with respect to gender and use of digital platform for social service activities. Moderate relation exists between occupation and usage online for health- related information.

## 7.2 Reasons for shift from offline shopping to online shopping

Description	Age		Income		Occupation	
	Chi-square value	Result	Chi-square value	Result	Chi-square value	Result
Easy Access	.628	H 3 Rejected	.765	H 4 Rejected	.334	H 5 Rejected
More Information	.074	H 3 Rejected	.100	H 4 Rejected	.484	H 5 Rejected
Convenient delivery option	.579	H 3 Rejected	.875	H 4 Rejected	.844	H 5 Rejected
E Wallet discount	.229	H 3 Rejected	.431	H 4 Rejected	.981	H 5 Rejected
Non-availability of goods in the store	.823	H 3 Rejected	.698	H 4 Rejected	.278	H 5 Rejected
Availability of alternative products	.521	H 3 Rejected	.571	H 4 Rejected	.084	H 5 Rejected

The analysis proved that there is significant relation exist between shift from offline to online depends on age, income and occupation.

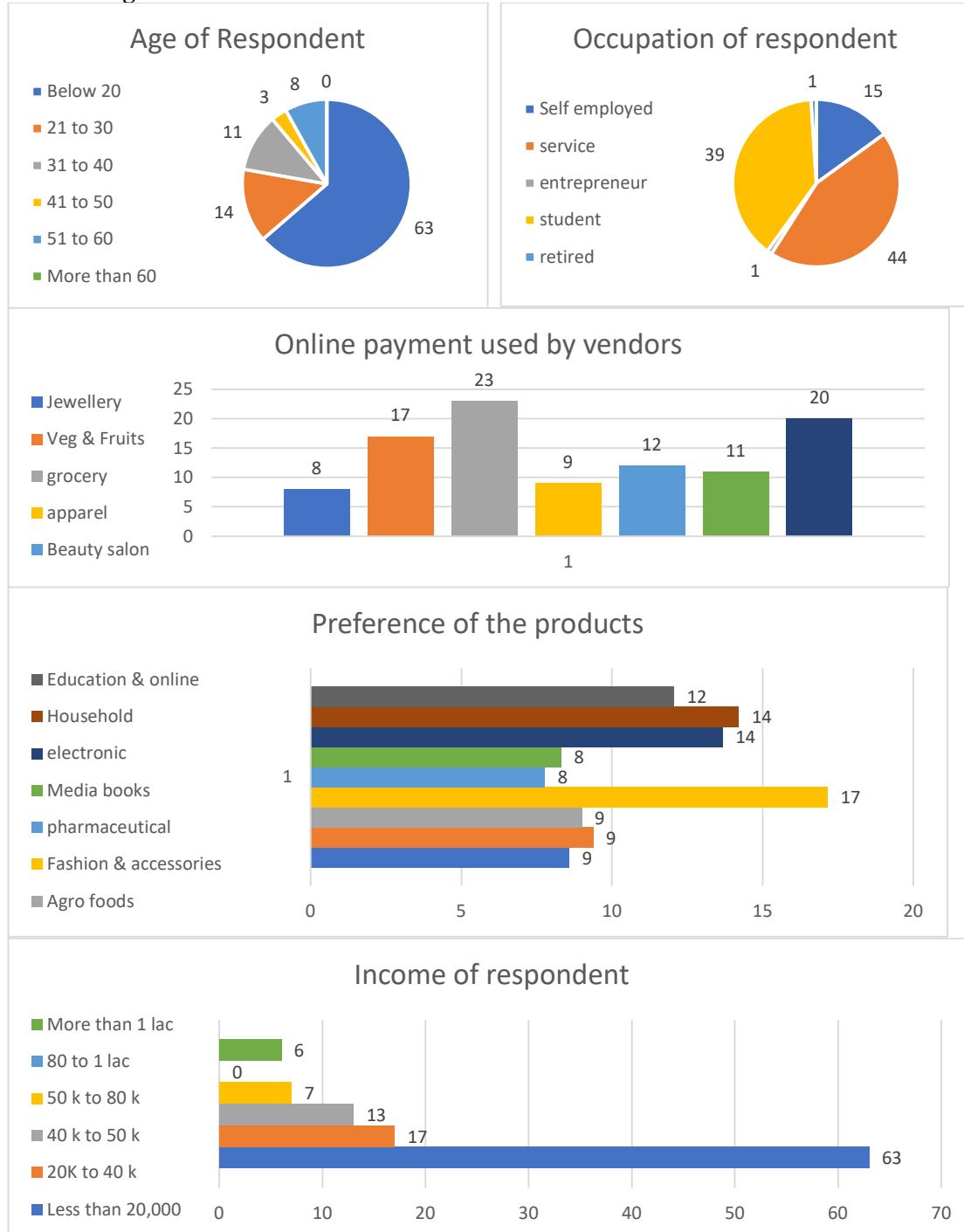
High degree of significance is shown between reason for shifting to online shopping and non- availability of goods, convenient delivery option, and E wallet discounts.

## 7.3 Change in online spending pattern during Pandemic

Description	Age		Income	
	Chi-square value	Result	Chi-square value	Result
Cosmetic & Personal care	.755	H 6 Rejected	.105	H 7 Rejected
Digital entertainment	.173	H 6 Rejected	.23	H 7 Rejected
Agricultural food & Beverage	.063	H 6 Rejected	.004	H 7 Accepted
Fashion & accessories	.129	H 6 Rejected	.312	H 7 Rejected
Pharmaceutical & Health care	.746	H 6 Rejected	.052	H 7 Rejected
Media & Books	.817	H 6 Rejected	.350	H 7 Rejected
Electronic goods	.055	H 6 Rejected	.082	H 7 Rejected
Household products	.310	H 6 Rejected	.144	H 7 Rejected
Education and online course	.654	H 6 Rejected	.037	H 7 Accepted

Change in spending on Cosmetic & Personal care, Pharmaceutical & Health care, Media & Books, Education & online course highly influenced by age. Income of the respondent does not relate to spending for agricultural food and Education.

## 7.4.Findings



1. 74% respondent of age below 20 spends more time on digital entertainment sites.
2. 88% respondent of age group above 60 years shows positive attitude in using online entertainment sites.
3. 64% respondents prefer health related information through digital mode. Among them respondents below 20 years shows more favourable attitude in using digital platform for health- related information.
4. Respondents belong to student group and retired people showed same level of involvement, 17%, in using digital platform for social service.
5. 58% of respondents of the age group 31 to 40 years have shifted to online shopping due to non- availability of goods in the store.

6. Respondent in income range of INR 40k to 60k preferred online shopping due to convenient delivery options.
7. 74% of respondents in the category of Students are more influenced by E wallets, discounts and offers for their preference towards online shopping.
8. 30% of respondent from age group below 20 changed their spending pattern for media and books.
9. 67% of respondents in the age group of 20 to 40 years have spent more on cosmetics & personal care products.
10. Spending on pharmaceutical health products has been increased among the age group of 20 to 30 years and above 60 years to the extent of 53%
11. Fashion and accessories are mostly sought to buy through online by 63% of the respondents while 50% of the respondents preferred to buy House-hold products and Electronic goods online.
12. Only 27% of the respondents preferred online purchase of Pharmaceutical product. Spending on Pharmaceutical has been increased during COVID- 19 at the same time people preference for buying the same through online is not favoured by many respondents.
13. The study proved digital transformation among small traders like grocery shops and vegetable vendors. 79% of the respondents agreed that they used digital payment for grocery purchase, 70% for Restaurant and 61% for vegetable purchase.

#### **8. Conclusion:**

The Pandemic has reflected in purchasing behaviour and sentiments of people all over the world. What, Why and How do they buy the product has witnessed vast change. Consumer purchase become need based and value based. Consumers perception has radically changed during Pandemic. Fear of Covid and preventive measures has led to rise in online purchase. Online supply chain (B-C) has become a preferred channel of distribution. It has given more opportunities for E commerce Business. The research observed majority of the youngsters are inclined towards digitalisation which enable India marching towards the Mission – “Digital India”

#### **9. Bibliography and References:**

Dr. Bayand Jamal Ali, “Impact of COVID-19 on consumer buying behaviour toward online shopping in Iraq”, Economic studies Journal, Vol. 18 No. 03 (2020) , pp. 267-280

Seema Mehta, Tanjul Saxena and Neetu Purohit, “The New Consumer Behaviour Paradigm mid COVID-19: Permanent or Transient?”, Journal of Health Management, 22(2), 2020, pp. 291-301

Junxiong Li, Alan G. Hallsworth & J. Andres Coca-Stefaniak, “ Changing Grocery Shopping Behaviour among Chinese Consumers at the outset of the COVID – 19 Outbreak”, Royal Dutch Geographical Society, 2020

John A. L. Cranfield, “ Framing consumer food demand responses in a viral pandemic”, Canadian Agricultural Economics Society, 2020:68, pp. 151-156

Michael C. Hall and Girish Prayag, “Beyond panic buying: consumption displacement and COVID-19”, Journal of Service Management, Vol. 32 No. 1, (2021), pp. 113-128

Mary Loxton, Robert Truskett, Brigitte Scraf, Laura Sindone, George Baldry and Yinong Zhao, “consumer Behaviour during Crises: Preliminary Research on How coronavirus has manifested consumer panic buying, herd mentality, changing discretionary spending and the role of the Media in influencing behaviour”, Journal of Risk and Financial Management, Vol. 12 No. 166, pp. 2-21.

Muhammad Naeem, "Understanding the customer psychology of Impulse buying during COVID-19 pandemic: implications for retailers", International Journal of Retail & Distribution Management", 2020.

Eleonora Pantano, Gabriele Pizzi, Daniele Scarpi, Charles Dennis, "Competing during a Pandemic? Retailers' ups and downs during COVID-19 outbreak", Journal of Business Research, 116, (2020), pp. 209-213.

Russell J Zwanka & Cheryl Buff , " COVID – 19 Generation: A conceptual Framework of the consumer behavioral shifts to be caused by the COVID-19 Pandemic", Journal of International Consumer Marketing, Vol. 33, No. 1, 58-67

<https://www.digitalcommerce360.com/2020/08/25/ecommerce-during-coronavirus-pandemic-in-charts/>

<https://www.bigcommerce.com/blog/covid-19-ecommerce/#product-categories-shifting-during-covid-19>

<https://retail.economictimes.indiatimes.com/re-tales/impact-of-covid-19-on-online-shopping-in-india/4115>

<https://retail.economictimes.indiatimes.com/re-tales/unified-commerce-a-boon-to-your-business/4624>

<https://unctad.org/news/covid-19-has-changed-online-shopping-forever-survey-shows>

[https://unctad.org/system/files/official-document/dtlstictinf2020d1\\_en.pdf](https://unctad.org/system/files/official-document/dtlstictinf2020d1_en.pdf)

<https://retail.economictimes.indiatimes.com/news/e-commerce/e-tailing/e-commerce-revolution-in-india-gets-its-second-wind-post-covid-19/77460376>

<http://www.businessworld.in/article/How-consumer-behavior-is-changing-during-Covid-19-pandemic/15-10-2020-331853/>

<https://www.accenture.com/in-en/insights/consumer-goods-services/coronavirus-consumer-behavior-research>

<http://www.businessworld.in/article/How-consumer-behavior-is-changing-during-Covid-19-pandemic/15-10-2020-331853/>

<https://www.digitalcommerce360.com/2020/08/25/ecommerce-during-coronavirus-pandemic-in-charts/>

[https://unctad.org/system/files/official-document/osg2020d1\\_en.pdf](https://unctad.org/system/files/official-document/osg2020d1_en.pdf)

# **BLOCKCHAIN MANAGEMENT: A SOLUTION TO REDUCTION IN COST OF KYC**

**Sandip Suresh Khandekar**, Research Scholar, VSIT

**Dr. Rohini Kelkar**, Principal, VSIT

**Ajaykumar Poojary**, Assistant Professor, VSIT

## **Abstract**

Digital technology has become a disruptive force and is increasingly becoming a critical factor, not only in banking sector, but across a wide range of industries all around the world. It has changed the how business operate by changing the entire business models and has gained remarkable interest in all sectors. Various industries are now customizing and personalizing the Blockchain technology to fit their needs and generating multiple use cases. The technology is used to develop a decentralized approach for creating applications. This paper explains the framework/architecture of Blockchain technology in banking process, in general, and KYC process, in particular. It also discusses the features and benefits of Block chain, and how block chain can be used to improve the KYC process of banks with special reference to Co-operative banks. In the last section, we have analysed the impact of Blockchain in KYC and fraud prevention.

## **Keywords**

Blockchain, Architecture of Blockchain, Blockchain in Banking, Blockchain in KYC, Security Aspects in Blockchain

## **Introduction**

A Blockchain is a decentralized, distributed database that is used to maintain a continuously growing list of records, called block each block contain a timestamp and a link to a previous block. By design and by purpose blockchains are inherently resistant to modification of the data. Functionally, a block can serve as ‘an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. Blockchain also referred to as Distributed Ledger Technology, is the key success behind bitcoin. Blockchain can make processes reliable, transparent, efficient and more secure. Enterprises and media around the world have woken up to the importance of the development of blockchain technology. Due to digitalization of records, huge volume of data gets generated daily. It becomes important for every organization to protect its data from security threats and in a cost-effective manner. Blockchain technology is taking away attention of the Chief executives, assures invariability, cryptographic security of data and decentralized ownership. First to dip in their feet were the financial institutions. According to World Economic Forum, more than 90 central banks were busy in blockchain discussions globally resulting in banks poised to experiment multiple Blockchain prototypes in 2017. Blockchain has also gained a lot of importance in the non-financial industries like supply chain management, crowd funding, telecom cyber security, insurance industry, retail, etc.

## **Know your Customers (KYC)**

The key to survival in today’s financial services market can be summed up as: “Better know your customer.” The identification of a customer is a very critical process in KYC with a view to protect the customer interests by preventing from fraudsters who may use the name, address and forge signature to undertake illegal business activities, encashment of stolen drafts, cheques, etc. This also helps to safeguard banks from being unwittingly used for the transfer of funds derived from criminal activity or for financing terrorism. Identification of customers also helps in controlling financial frauds, identify money laundering and suspicious activities, and for scrutiny / monitoring of large value cash transactions

## Objectives

The following are the broad objectives of this research paper:

1. To understand the framework/architecture of blockchain in Banking Sector.
2. To study KYC procedure followed by banking sector.
3. To perform cost benefit analysis of KYC process with blockchain.

## Review of Literature

A review of the relevant literature has been described as under.

Tejal Shah (2018), in her research paper on “Application of Blockchain Technology in the Banking & Finance” This paper aims at explaining the architecture of Blockchain Technology as well as how it works. Besides various features of the Blockchain, the benefits derived from it are also discussed. The use cases and Blockchain fit assessment has also been performed for few banking transactions. In the last section we also have a look at the security aspects of the Blockchain.

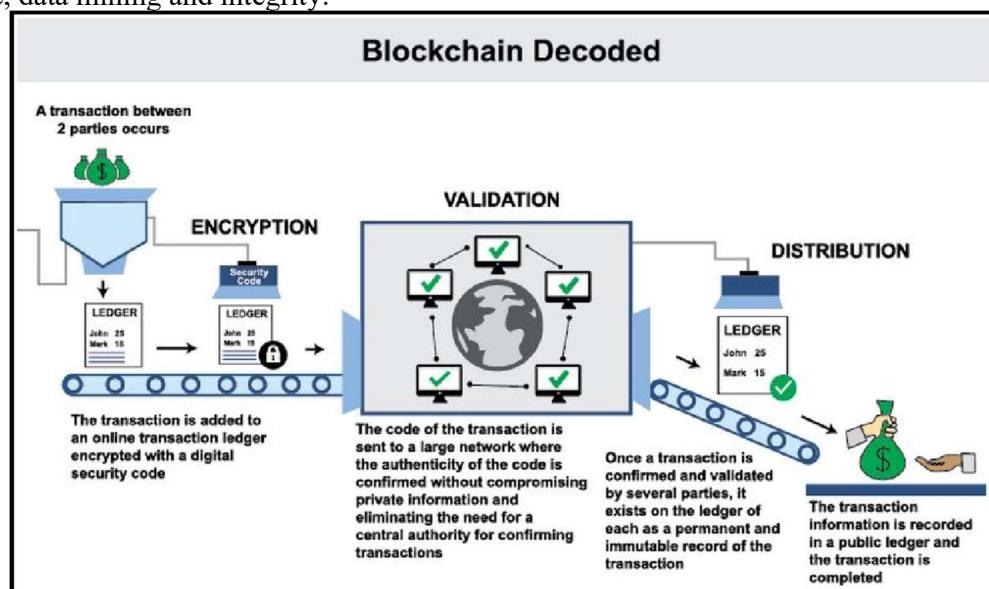
A. Shanti Bruyn (2017), in research paper on “Blockchain” give details about the blockchain technology, its history and working. The paper is also giving information about the history of blockchain. Finally, and more precisely it explains: how do the different variables within blockchain work together?

AratiDua (2017), in her articles on “Banking on Blockchain” published in the business today said that working of block chain in the banking industry and where a bank's know-your-customer (KYC) check on a corporate customer fails to show up a suspicious transaction done by the company with another bank. What if banks could share and also monetise corporate KYCs, including investigation reports and cross-border wire transfer reports, on a real-time basis, on a secure, private, immutable and consensus-based shared digital ledger?

Anuj Sharma (2014), research papers on “Reducing Risk in KYC for large Indian Banks by using big analytical techniques” published in International Journal of Computer Applications. This paper attempts to study Know Your Customer process, articulate the challenges involved and highlights the shortcomings that the systems today have in effectively implementing KYC guidelines (especially in large Indian banks). It then, using real life examples, presents a credible solution using Big Data Analytic techniques like Fuzzy Matching & MapReduce. Authors are confident that the framework of the solution that has been provided can lead to a working prototype in a short span of time.

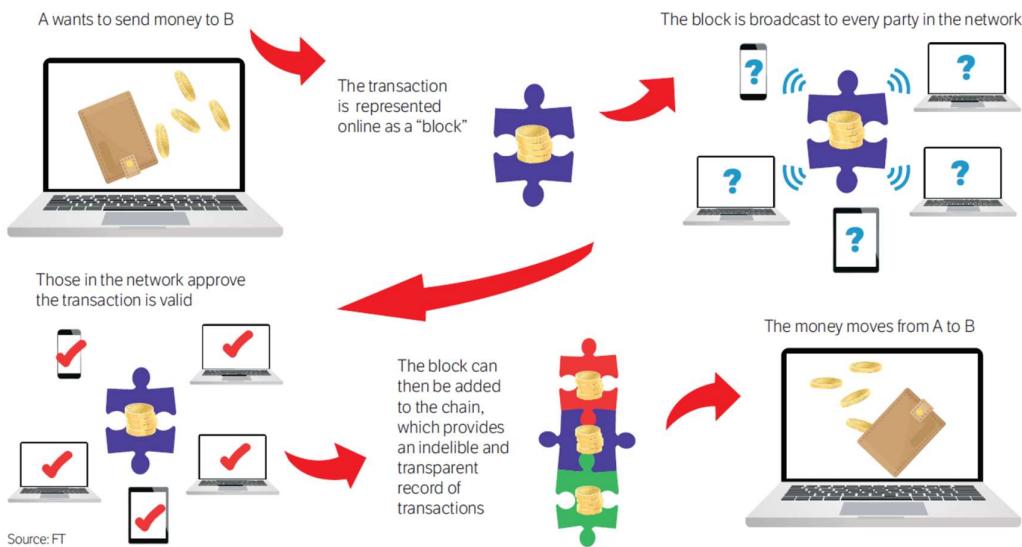
## Framework of Blockchain

The blockchain framework consists of a few basic concepts like decentralization, digital signature, data mining and integrity.



- (i) Decentralization: Blockchain distributes the control amongst all peers involved in the transaction chain, rather than keeping one central authority to manage others in the ecosystem.
- (ii) Digital signature: Blockchain enables an exchange of information using public key and private key by the mechanism of a unique digital sign. The public key is known to everyone on the network and private key is known only to the sender of the information.
- (iii) Data Mining: In a distributed network system every miner mines deep into the data which is then evaluated according to the encryption rules and it also acknowledges miners for confirmation and verification of the transactions.
- (iv) Integrity: Complex algorithms and agreement among users ensures that transaction data, once agreed upon, cannot be tampered with and thus remains unaffected. Data stored on blockchain acts as a single version of truth for all parties involved hence reducing the risk of fraud.

#### HOW A BLOCKCHAIN WORKS



#### KYC

KYC process is generally costly as it consists of repetitive and inconsistent activities which leads to increase in overhead cost for the banks. Generally the KYC documents are collected and stored in an internal database, using Management Information System. They are also shared with some external agencies who then successfully authenticate and validate the individuals for completing the transaction. They are also updated by banks on a regular basis and finally banks report to central agencies.

However, in the recent times there has been an increase in the number of KYC registries and transactions as private entities have initiated the Society for Worldwide Interbank Financial Telecommunication (SWIFT), banking consortiums and government bodies. All of these have led to increase in the demand for KYC registries. These registries are nothing, but a central repository that stores all documents and information linked to KYC compliance, and the central registry stores the customer's unique identification number in digitalized data format. All the banks need to perform the KYC process individually for every customer and then upload the validated data, along with all documents to the central registry. The unique ID which is generated for each customer will then be stored in the central registry and accessed whenever the customer requests for a new service, either from the same bank or any other bank.



## Research Methodology

The present study is an analytical study because it deals with statistical data. The study is based on secondary data and is collected mainly from the sources available on internet like the RBI website, websites of the banks etc. Data is presented with the help of Graphs, charts and tables etc.

### Analysis of data

#### KYC Cost-Benefit Analysis

ICICI, Kotak, Axis banks and HDFC bank are among 11 lenders banks in India to launch blockchain linked funding for SMEs. let's discuss the case of Axis bank who implemented block chain in their operation from the year 2017-18.

Axis Bank is the third largest private sector bank in India. The Bank offers the entire spectrum of financial services to customer segments covering Large and Mid-Corporates, MSME, Agriculture and Retail Businesses. Axis Bank is one of the first new generation private sector banks to have begun operations in 1994.

**Table 1 : Axis Bank KYC on Blockchain and cost-benefit analysis**

Particulars	FY 17-18 (without blockchain)	FY 19-20 (with blockchain)
KYC Cost/Account (FY 17-18 approx. Rs. 500-2000, FY 19-20approx. \$5) (1)	Rs. 500.00	Rs. 360
# of Axis Bank customers (crore) (2)	4.7	5.4
Total # of banking relationship/customers (3)	2	2
Total # of KYC that needs to be done (crore) (4)=2*3	9.4	10.8
KYC cost(5)=1*4	Rs. 4700.00	Rs. 3888.00
Savings because of blockchain (crore)		Rs. 812.00
Net Profit (crore)	Rs. 275.68	Rs.1627.00
Retained Earnings	Rs. 1732.58	Rs. 2458.58
Shares outstanding (crore)	244.51	244.51
<b>Reported EPS</b>	<b>Rs. 1.13</b>	<b>Rs. 5.99</b>

<b>Absolute increase in EPS (with KYC on blockchain)</b>		<b>Rs. 5.96</b>
<b>% increase in Net Profit (with KYC on blockchain)</b>		<b>529%</b>
<b>% increase in EPS (with KYC on blockchain)</b>		<b>527%</b>
EPS: Earnings per share, 1 USD = 69 INR (FY 17-18), 1USD = 72 INR (FY 19-20)		

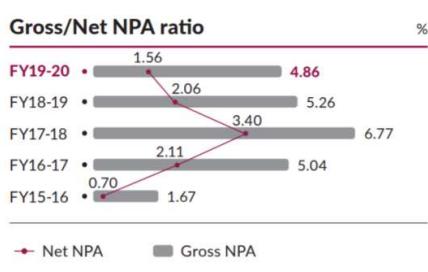
Source: Annual Report of Axis Bank

In above table, the cost of KYC without Aadhar is INR 500-2000 (USD 7-30), whereas KYC cost on blockchain is less than USD 5. So assuming 1 USD = 72 INR, the cost of KYC using blockchain will be  $72 \times 5 = \text{INR } 360$  crores.

Before blockchain the total KYC cost was INR 4700 crores whereas after implementing blockchain the cost reduced by INR 812 crores to INR 3888 crores.

Thus the reported Net profit of Axis bank was INR 275.69 crores in FY 17-18, which increased to INR 1627 crores in FY 19-20, which is increase of 490%.

**Table 2**



Source: Axis Bank Annual Report

In the adjacent table, the Gross NPA and Net NPA ratio also reduce over the period from FY 17-18 to FY 19-20. In the year 2017-18 the gross NPA was 6.77% which reduced to 4.86% in the year 2019-20. Similarly Net NPA ratio also reduced from 3.40% in 2017-18 to 1.56% in 2019-20. Indicates that effectiveness of Block chain technology to reduce the bad loans.

## Findings

1. The blockchain technology is used prominent banks in India to reduce their overall operating cost.
2. These technologies also help banking sector to reduce the NPA.
3. Axis Bank, ICICI bank, Kotak Mahindra banks are successfully implemented block chain in their operation. It means only Private bank took the initiatives.
4. One of the major concerns is that initial investment required to implement block chain is very huge due to these other banks are may not find it suitable to use.
5. Inspite of huge cost blockchain is helpful to reduced the cost of KYC and operating cost as demonstrated in the case of Axis Bank.

## Conclusion

Though Blockchain is having a huge potential, but the banking firms need to know the important features of this technology and how they can solve their existing business issues with it. It can also use this technology to exchange data while it also involves exchange of value. Banks need to identify various opportunities, decide upon the feasibility of implementation and also its impact on existing process.

However, the question arises of security framework, cost of implementation and other risks association with it. So, this will help them to know the technology in a better way, mitigate the risk and allow customized solution to their specific issues.

## References

- 1)Kothari C.R.(2019), “ Research Methodology” , Tata McGraw Hill publication.
- 2)Tejal s.(2018), “Application of Blockchain Technology in the Banking & Finance”, ResearchGate Publication

- 3)A. Shanti Bruyn (2017), “Blockchain – an Introduction” <https://www-ee.stanford.edu/~hellman/publications/24.pdf>.
- 4)Aarti Dua(2017), “Banking on Blockchain” published in Business Today <https://www.businessstoday.in/magazine/the-hub/indian-companies-blockchain-solutions-ledger-technology-digital-cryptocurrency-bitcoin-axis-bank-icici-bank/story/265689.html>
- 5)Anuj Sharma (2014), “Reducing Risk in KYC for large Indian Banks by using big analytical techniques” published in International Journal of Computer Applications (0975 – 8887) Volume 97– No.9, July 2014

## **A STUDY OF AWARENESS OF CONSUMER RIGHTS AND CONSUMER ORGANISATIONS AMONG THE CONSUMERS.**

**Mrs. Archana Mainkar**, Assistant Professor, Management, Mithibai College of Arts, Chauhan Institute of Science & Amrutben Jivanlal College of Commerce, College Address: Vile parle- West Mumbai-4000056

**Dr (Mrs.) Anupama Nerurkar**, Associate Professor, Commerce, L. S. Raheja College of Arts & Commerce, College Address: Santacruz -West Mumbai- 400054

### **Abstract:**

“Consumer are KING”. Without consumer, it’s of no use to produce any articles but in reality, whether consumers know their rights? If anything goes wrong with the purchase whether they follow the steps? or go to sort out the matter? Whether they know how to go for it? So, Researcher have selected sample who are teachers either in schools or colleges & working women generally who are buying goods for self or for family consumption as a consumer.

The objectives of the paper are. To study the awareness of consumer rights amongst consumer and to study the knowledge about consumer organisation & its functions

The paper is of Descriptive in nature. Researcher have selected 40 people (20 teachers & 20 working women) as a sample size which is randomly selected from available population. Researcher have asked certain structured questions related to consumers’ rights, consumer organisations and awareness about its working. The Research method used to establish the outcomes of the research paper is simple percentage method which is explained with the help of various charts & tables.

As the sample size is very limited and also restricted to working women with teaching as a profession

At the end Researcher have also suggested certain measures which may help our society to be aware of their rights.

**Key-Words:** Consumer, Consumer organisations, Consumer rig

### **Introduction-**

The consumer is considered most important factor in any business. It may be called as targeted group or expected purchaser. Without them any production or activity is waste. Even when one produced any film and it is not watched by audience it is waste of resources. Even on you tube channel is not subscribed it may not give remuneration. As now we are having virtual consumers who subscribe or like the activity which give the remuneration to the channel. The concept is little changing. But the base remains the same. As any person who buys the goods or services for self-consumptions are called as consumer. Now here one can have various types of consumers but basically, we can say all consumers can be divided on following basis like Loyal consumer, Need based consumers, Impulsive shopper, Bargain hunters & wandering consumers.

These various types of consumer buy various types of goods from various markets. These goods can be fast moving consumer items, food items or any type of services. These goods may be as per description and satisfies need of consumer. But if they are not as per description or hazardous to consume by consumer or of inferior quality then main question arises.

There is law prevails in our country which is particularly for consumers known as the Consumer protection Act 1986. It has explanation about who can be considered as consumer, what are our rights as consumer, what if goods & services are not as per description, how one can go for redressal of the dispute if it arises due to any matter related to goods or service provided. Now in this matter individual can file the complaint or group of consumers facing same type of complaint can file a complaint as a single case (suit). Now in this matter if individual is incapable to file a case then he may go to consumer organisation.

**Consumer organizations** are advocacy groups that seek to protect people from corporate abuse like unsafe products, predatory lending, false advertising, astroturfing and pollution. **Consumer Organizations** may operate via protests, litigation, campaigning, or lobbying. The aim of consumer organizations may be to establish and to attempt to enforce consumer rights.

### **Objectives-**

- 1) To study the awareness of consumer rights amongst consumer.
- 2) To study the knowledge about consumer organisation& its functions

### **Literature Review-**

Dr. Bettadalli C. Neelakanta (August 2005) explain in Japan how consumer organisation started its activity and how it works? What are its peculiarities? How one can be helpful to implement it in India.

Dr. Ishwar Mittal (March- 2015) in his paper he has explain us regarding awareness of consumers' ignorance which was posing the challenge for their proper implementation. Among the 16 prominent consumer protection legislations presented, nearly one fourth consumers were fully aware of these legislations in Haryana.

Dr. Abbokar Siddiq (July 2012) in his paper he has explained about consumers are aware of their rights but out of 432 consumers only 31.2% are aware of their rights. There are voluntary consumer organisations do exist in Karnataka but more they are used or understand for settlement of dispute but The VCOs are not conducting other activities up to the expectations of the consumers and a majority of VCOs are concentrating only on complaint settlement.

Munni Choudhary (March 2018) she has suggested to give cash prices by Government to consumer organisations to increase awareness about consumer organisations amongst general public.

### **Research methodology-**

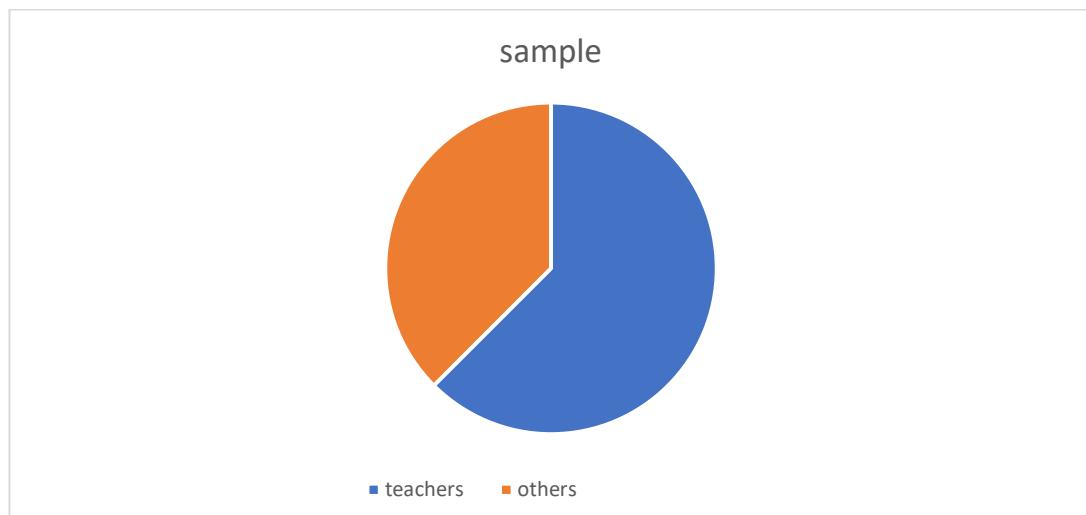
Sample size: 40 working women (inclusive of 25 teachers)

Collection of data: Primary data was collected by the researcher through interviews and structured questionnaire.

Simple percentage method was used with various charts.

### **Data analysis**

- 1) It was 100% of total respondents were aware of Consumer Protection Act but 62.5% of the respondents were not aware of exact year of The ConsumerAct.

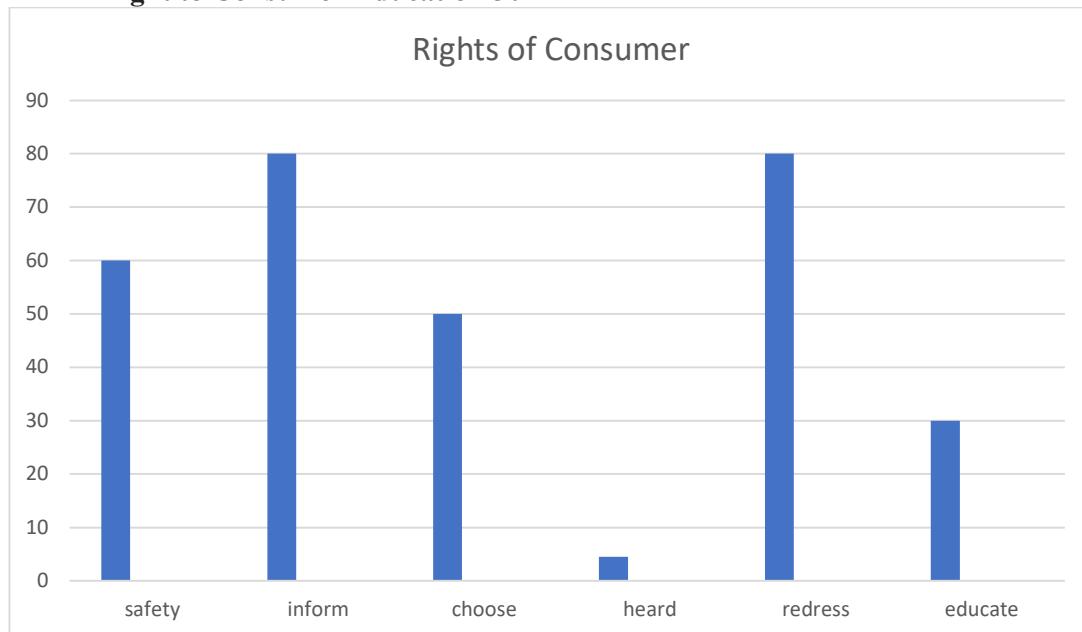


Source=Statistical Analysis of primary data

2) Any two consumer rights were considered as awareness of rights.

It was observed that 80%. of the respondents were aware of Right to informed & redressal. Following is the data about awareness of consumer rights.

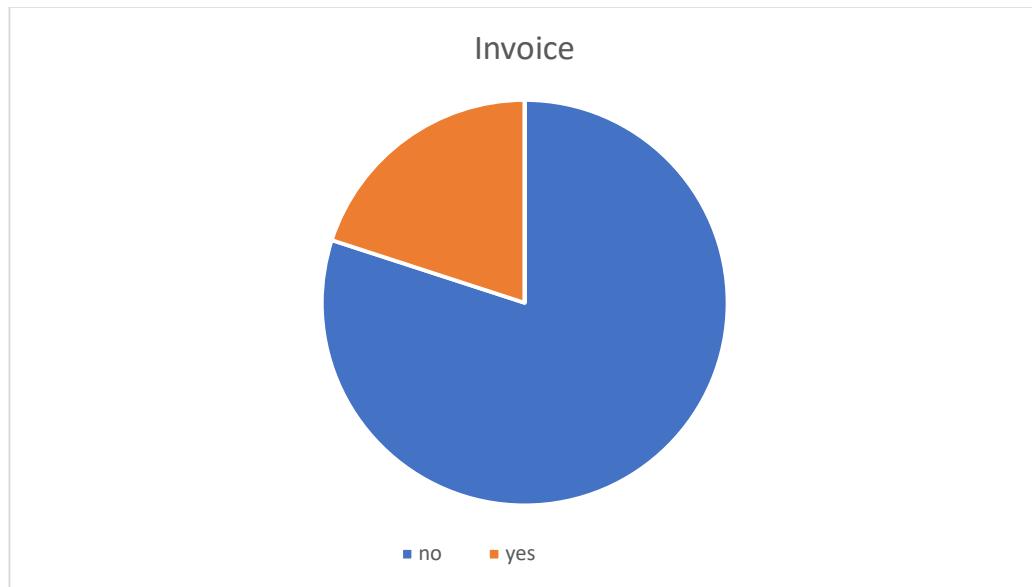
- **Right to Safety.** ...60%
- **Right to Choose.** ...50%
- **Right to be Heard.** ...50%
- **Right to Consumer Education.** 30%



Source=Statistical Analysis of primary data

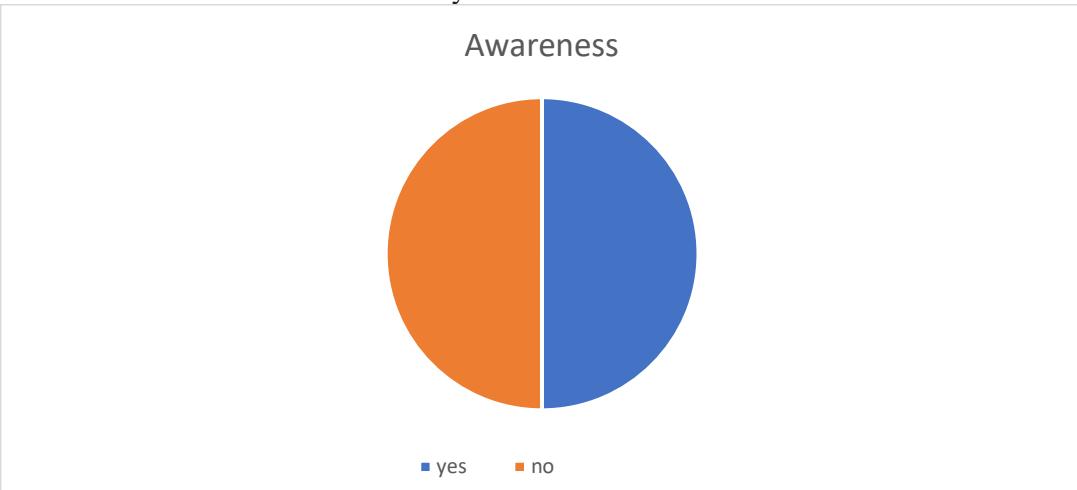
3) The researcher wanted to know whether respondents collect the invoice while buying the products.

The 32 respondents (80 %) were not aware that if in future for filing the complaint they have to collect the invoice.



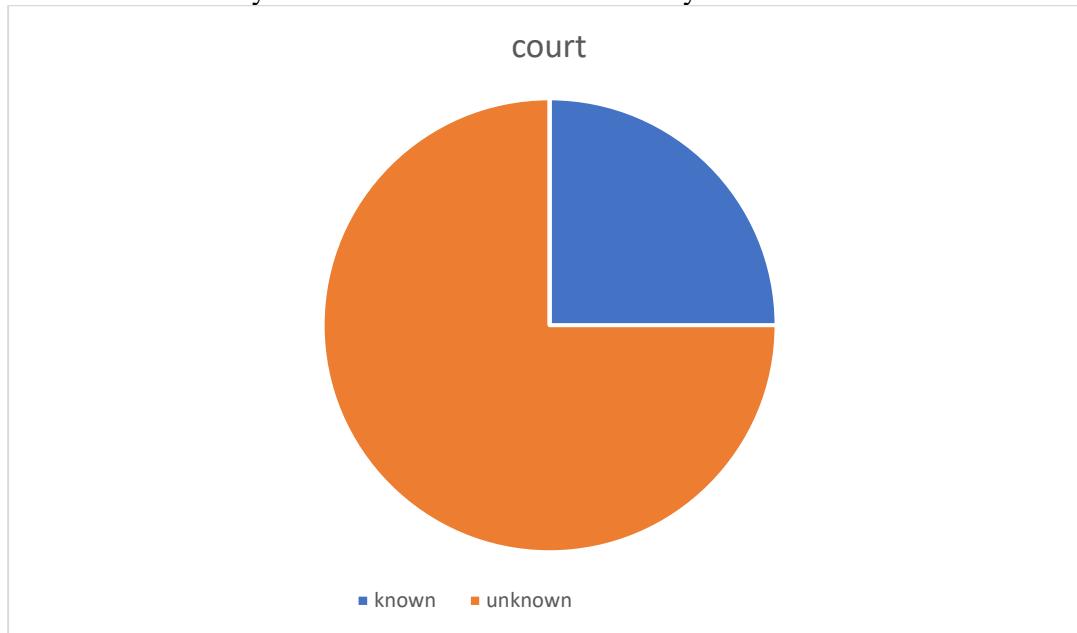
Source=Statistical Analysis of primary data

- 4) Out of 40 respondent 20 respondents known about consumer organisations, but they were unaware about the name or any furtherdetails.



Source=Statistical Analysis of primary data

- 5) Further question was related to location of consumer courts, especially in Mumbai i.e., District Forums  
Out of 40 only 10 could able to answer it correctly.



Source=Statistical Analysis of primary data

### **Conclusion & Suggestions:**

The study by the researcher reflects the fact that even the working women who are having more exposure to outside world, market, they are unaware of consumer organisations, their working. The teachers are not knowing about its year, six consumer rights given by Act, consumer organisations, consumer courts and it's location.

The following suggestions are made to improve the knowledge related to consumer organisation:

1. Teachers along with the students should visit consumer courts.

2. Teachers should update the knowledge about Consumer related knowledge Students should be taught not only Consumer Act but they should be given further knowledge regarding consumer organisations.
3. Consumer organisations should give a wide publicity to their work and cases resolved.
4. Separate training can be given to women by Consumer organisations so they can effectively implement their rights.
5. Degree college students should assign the project to work in consumer organisation for at least for 48 hours and they should be provided credits for same.
6. Media awareness campaign must be done for various consumer organisations.

**References-**

1. <http://www.epitomejournals.com>, Vol. 4, Issue 3, March 2018, ISSN: 2395-6968MUNNI CHOUDHAR.
2. The Role Of Voluntary Consumer Organisations in consumer Protection – An Empirical Study In Coastal Karnataka Dr. Abbokar Siddiq
3. Consumer Awareness about Different Consumer Protection Legislations in India  
*Journal of Distance Education and Management Research (ISSN:2278-9251); Vol. III, March 2015 Ishwar Mittal.*
4. V.R.F. series No.408 March 2006Dr. Bettadalli C. Neelakanta
5. Dr.Ravi Kumar Gupta, Ishwar Mittal And Dr. Anita Gupta measures for consumer protection in India and consumerism Introduction A Study on consumerism and its implications.
6. S. C. Vetrivel & M. Mohanasundari, JMIJMM ,January, 2011 vol-1 issue-2
7. [www.consumereducation.in](http://www.consumereducation.in)

\*\*\*\*\*

# IDENTIFICATION OF NON-FEE PAYMENT IN COLLEGE TUITION FEES DURING COVID-19 PANDEMIC PERIOD WITH CAUSAL LOOP DIAGRAM AND PARETO CHART

**Mr. Shajil Kumar P A**, Asst. Professor, Department of Information Technology,  
Vidyalankar School of Information Technology,  
Mumbai.

**Dr. Sarika Chouhan**, Asst. Professor, Department of Information Technology, Vidyalankar School of Information Technology, Mumbai.

## ABSTRACT

Covid-19 disease globally effected the entire population emotionally, physiologically and economically. The effect of Covid-19 over human life was termed as Covid-19 pandemic period which started in the month of March, 2020 in India and continued around a year of span, till today, February, 2021 and it may last for many more months. It effected educational institutions in India, as the student stakeholders found it difficult time to complete their tuition fees due to various reasons. This paper focused to identify the various reasons for non-fee payment in college tuition fees during Covid-19 pandemic period with Causal Loop Diagram and Pareto Chart. Scale of each parameter that contributed the non-fee payment were identified.

**Keywords:** Causal loop diagram, Pareto Chart, Covid-19 pandemic, college tuition fees, 80/20 pareto rule

## 1. INTRODUCTION

A causal loop diagram (CLD) is a representation diagram that can be used in visualizing how a number of variables/parameters in a system are interrelated and drive cause-and-effect processes. The causal loop diagram will be having set of nodes and edges, where nodes represent the variables/parameters, and edges are the links that can be used to represent a connection or a relation between the two variables<sup>[1]</sup>.

A link with positive relationship can be used to indicate a positive relation and a link with negative indicates a negative relation. A positive causal link shows that two nodes change in the same direction. If one node value starts decreasing, the other node in the relationship also decreases. In the same was if one node value in the relationship increases, the other node increases as well. A negative causal link shows the relationship that the two nodes change in opposite directions, i.e. if the node in which the relationship value starts increases, the other node value decreases.

A Pareto chart is a bar graph. The height or length of the bar in the Pareto chart shows the frequency or occurrence value (like no. of respondent, cost, time, etc.), and are arranged with longest bars on the left/top and the shortest to the right/bottom. It can be used to visually depicts which of the parameters/values are more significant, hence take the decision accordingly. The Pareto Chart is a usually used in data science as a tool for showing the relative importance of problems that need to address in the order of significance. <sup>[4]</sup>

Pareto chart generally contains both bars and lines, that can be used to represent individual values in descending order by bars, and the cumulative total value of the sample can be shown as the curved line. An 80% cut off line is also shows in the pareto chart that indicate the 80/20 rule of any business process i.e. the most significant lesser number of factors that warrant the most attention under the 80% cut off line.<sup>[5]</sup>

## 2. CAUSAL LOOP DIAGRAM TO IDENTIFY NON-FEE PAYMENT IN COLLEGE TUITION FEES DURING COVID-19 PANDEMIC PERIOD

Causal Loop diagram is prepared by interviewing total 10 students who were facing the problem of fee payment. List the parameters that positively and negatively influence the cause of non-fee payment: -

Negative Influence:

- There is a job, but with a pay-cut, hence cannot afford full payment of the amount
- Student does not have online service to pay fees and cannot come to pay the fees physically due to travel restrictions
- Issues in server or apps during online payment
- Due to loss of job in pandemic, cannot afford to pay the fees
- Stuck in village area where there are network issues so cannot pay the fees
- No means of travelling, so cannot pay fees physically
- Reduce the amount after seeing the scenario to pay

Positive Influence:

- Payment can be done in the format of instalment

Back to Negative:

- college gets less income as students are paying fees in instalment

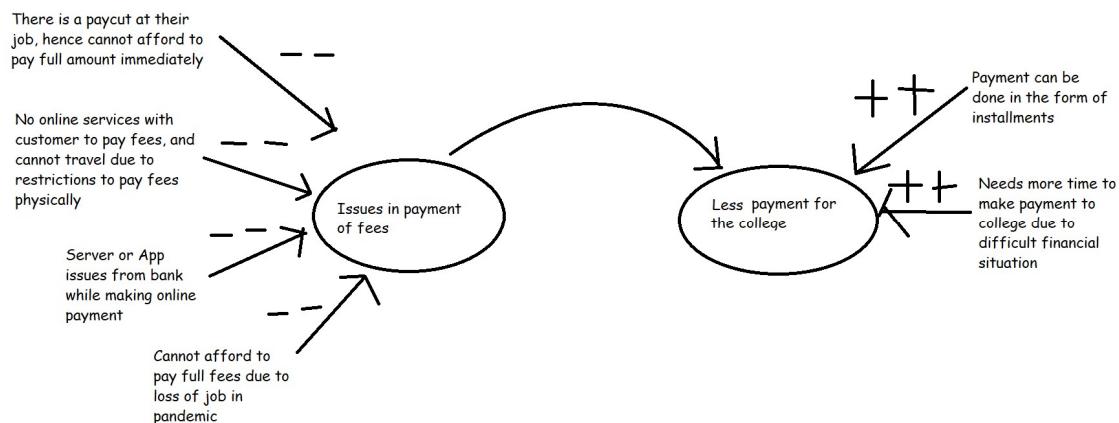
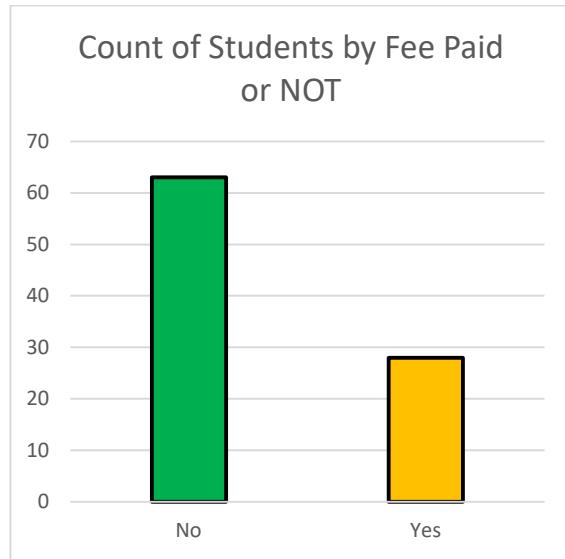


Fig. 1: Causal loop diagram to identify non-fee payment of college tuition fees

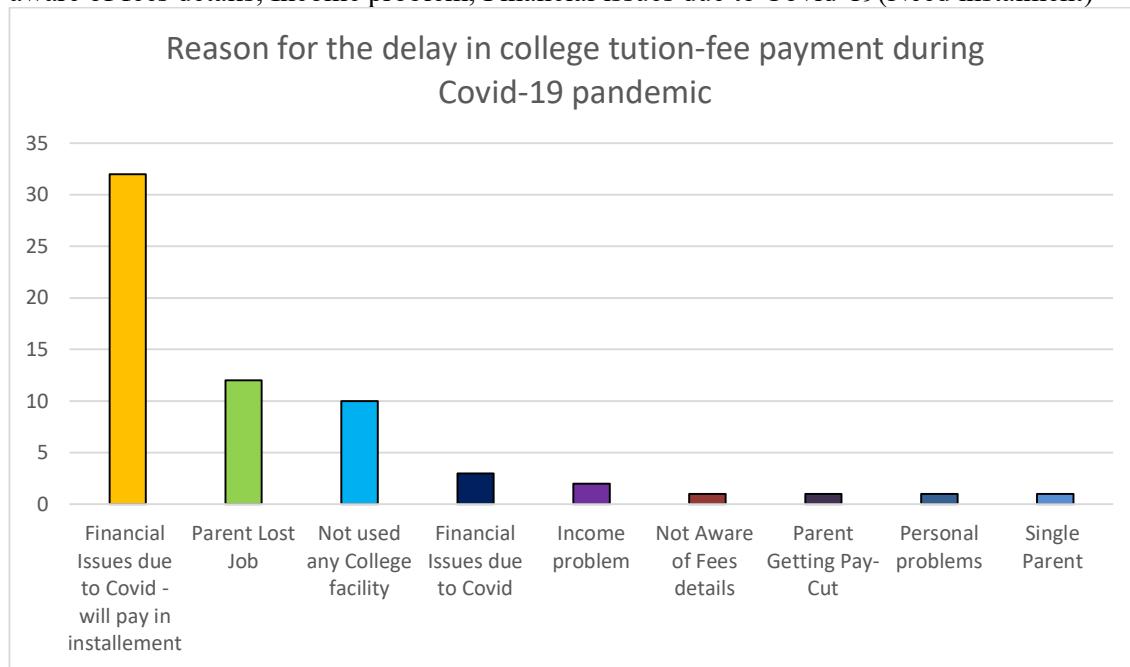
## 3. PARETO CHART TO IDENTIFY NON-FEE PAYMENT IN COLLEGE TUITION FEES DURING COVID-19 PANDEMIC PERIOD

Pareto chart is prepared for identifying various parameters that influence the non-fee payment and its scale during covid-19 pandemic period. Total data set of 91 student's data set was used to identify the reason of non-fee payment and various factors that leads the cause of it

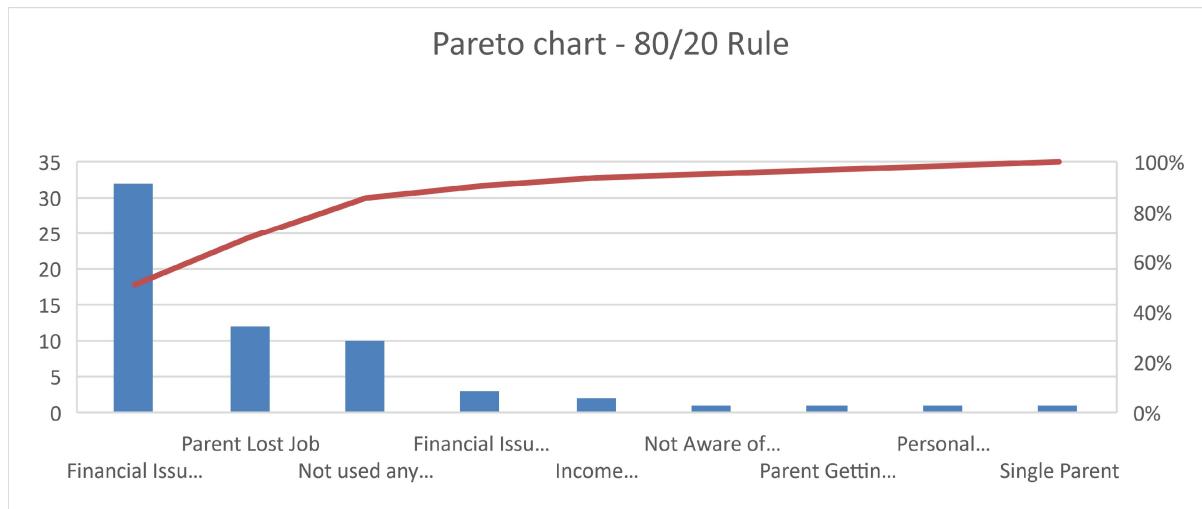


*Fig. 2: count of students by Fee paid or not (Total 91 students data set)*

Various parameters identified as the reason for non-fee payment of tuition fees are: - Single Parent, Personal Problem, Parent Lost Job, Parent Getting Pay-Cut, not used any college facility, Not aware of fees details, Income problem, Financial issues due to Covid-19(Need instalment)



*Fig. 3: Reason for non-fee payment of tuition-fee during Covid-19 pandemic period (Total 63 student's non-payment out of 91 student's data set)*



*Fig. 4: Pareto Chart for non-fee payment of tuition-fee during Covid-19 pandemic period*

With 80/20 rule of Pareto chart, it can be seen that 80% of the issues are from Financial issue due to Covid-19 and students can complete the fee payment if instalment is allowed to do the same. Some set of students respond even not used college facility of the institution as the reason for non-fee payment, that leads to the management decision to tackle such issues as those group are not concerned for the payment of the fees.

#### 4. CONCLUSION

This is the fundamental solution which can clear all negative strategies to positive from the causal loop diagram for E.g.- Reducing the fees, Payment should be done after the pandemic etc. With the method of Causal Loop Diagram and Pareto chart it is identified that the reason for non-fee payment is majorly due to financial issues because to Covid-19 Pandemic situation and the fee recovery is possible with effective method of fee instalment that span over the academic year. There is a significant members of students who are not willing to pay the tuition-fee because they could not access the physical facility and infrastructure of the institutions. As per 80-20 rule of Pareto chart those students should be considered as the cause of non-payment and significant managerial steps needs to take as the process of collecting the fees from such group.

#### REFERENCES

- [1] Using Causal Loop Diagram to Achieve a Better Understanding of e-Business Models, International Journal of Electronic Business Management, Behdad Kiani, Mohammad Reza Gholamian, Asso Hamzehei, Seyed Hossein Hosseini
- [2] Problems in causal loop diagrams revisited, Wiley Online Library, George P. Richardson
- [3] A Graphical Tool for Analyzing Causal Diagrams, Epidemiology, Textor, Johannes; Hardt, Juliane; Knüppel, Sven
- [4] The Pareto Principle, <https://doi.org/10.1016/j.jacr.2018.02.026>, H. Benjamin Harvey and Susan T. Sotardi
- [5] The Pareto managerial principle: when does it apply?, International Journal for Production research, Abraham Grosfeld
- [6] Modeling and forecasting the COVID-19 pandemic in India, Chaos, Solitons & Fractals, KankanSarkara, SubhasvKhajanchi and Juan J.Nietoc
- [7] How India is dealing with COVID-19 pandemic, Sensors InternationalVolume 1, 2020, 100021, AritraGhosh, SrijitaNundy and Tapas K.Mallick

## GAMIFICATION MODEL- AN INTERACTIVE PATTERN DURING ONLINE LEARNING

**Mrs. Kimaya K. Shelar**, Assistant Professor, VSIT, [kimaya.shelar@vsit.edu.in](mailto:kimaya.shelar@vsit.edu.in)

**Mrs. Pallavi Tawde**, Assistant Professor, VSIT, [pallavi.tawde@vsit.edu.in](mailto:pallavi.tawde@vsit.edu.in)

**Dr. Yogesh Kumar Sharma**, Associate Professor(HOD),JJT University, [dr.yogeshkumar@yahoo.in](mailto:dr.yogeshkumar@yahoo.in)

**Dr. Sarika Chouhan**, Assistant Professor, VSIT, [sarika.chouhan@vsit.edu.in](mailto:sarika.chouhan@vsit.edu.in)

**Abstract:** The Coronavirus pandemic constrained colleges around the globe to close down their grounds inconclusively and move their instructive exercises onto online stages. The schooling establishments were not ready for such a progress and their web based instructing learning measure developed continuously. We led an overview in which we asked under-graduate students from few Mumbai colleges about their assessment on various parts of online learning during the progressing pandemic. We received input from 420 students. From the survey it is observed that students faced various problems during their online learning sessions. Notwithstanding, the students felt that online learning is upsetting and influencing their wellbeing and public activity. The dynamic utilization of Data and Correspondence Advances caused the making of new application models in different areas. Because of that, instruction is getting an ever increasing number of activities with more ideas for online education which are actualizing into learning measure. The new pattern of the difficulties to deal with the learning cycles and make them however much developing as could reasonably be expected simultaneously opening new self-learning openings through gamification as a powerful captivating learning technique. The point of this research paper is to introduce the gamification model for internet learning for student's commitment. The concept of the paper is to outline the current methodologies and add models of gamification.

**Keywords-** Gamification, online learning, ICT, Coronavirus, Issues

### 1. Introduction

This research paper was based on the survey conducted to find the difficulties the students faced in online learning pattern. This survey was conducted based on the issues they faced during this pandemic situation while having their academic knowledge. A survey analysis resulted to develop a research framework using the idea of Gamification in order to upgrade the make learning interesting. The idea of gamification is used so that to make students get the interest back in studying and student can find it useful to increase their knowledge to progress in their academics without any problem. This framework can be useful for any category and any course based on the subject taught.

### 2. Online Learning

The pandemic constrained different associations to change their work process techniques and receive new advancements. Much of the time, these associations didn't get sufficient opportunity to know how the new procedures and the related advancements should be acquainted and coordinated with their current arrangement. Colleges around the globe were no exception. It was maybe the first to depict how colleges were moving from homeroom based instruction to online training on account of the furious pandemic. We have attempted to understand the perspective of students. They're existed significant organization for online learning in various colleges prior to the pandemic. However, no college was prepared for a total move for online education. Experiential examines have discovered that student's sense that they learn better in actual classrooms than through online learning. Students miss the assist they were getting from their friends in study rooms and labs to library facilities. Teachers are presently conveying course content through various platforms. Educators are utilizing on the web instructive stages, video-conferencing programming, and online media to show their courses. Online informative stages, similar to Google Classroom and Chalkboard, permit educators to share notes and interactive media assets identified with their courses with understudies.

The online educational stages additionally permit understudies to turn in their tasks and professors to monitor the advancement of the understudies. Video conferencing devices, similar to Google Meet, Zoom, and Microsoft Groups, help in organizing on the web talks and conversation meetings. Such devices typically support slideshows and a chat box.

There is an absence of studies on how productively understudies can interact with educators and individual understudies through different online devices and how successful online evaluation methods are.

## 2.1 Health and Social Issues

The Coronavirus pandemic and the shutting down of the college campuses have influenced the emotional wellness of college understudies. Numerous students reported experiencing misery, nervousness, trouble, and even self-destructive reflections. The current circumstance is having an unassuming yet persistent effect on the emotional wellness of understudies. Students are stressed over both the pandemic as a rule and their careers. Absence of inspiration and negative emotions make it hard for some understudies to concentrate on online instruction. Understudies with limited admittance to advanced innovations and understudies who are less knowledgeable about those advances are dealing with issue in adapting to online instruction. Besides, a few understudies live in houses that are not enough extensive and deal with issue in going to online classes at their homes.

## 3. Materials and Methods

### 3.1. Questionnaire

We arranged a survey with 10 questions identified with online education during the Coronavirus pandemic. An understudy had to react to every assertion on a 5-point scale where a score of “1” represented “Strongly disagree” and a score of “5” represented “Strongly agree”. The explanations were identified with the teaching-learning measure as a rule, content conveyance, teacher understudy connection, evaluation and wellbeing and social effect of online training.

We requested that the understudies for dissimilarity between online learning and actual learning in college rooms. We wanted to have information whether the students felt that online education is impacting their health and social life. We questioned them if online education is leading to the phobia of Trouble with Concentration and Interruption to Sleep Patterns among them. Further-more, if they had a Feeling Loneliness. We wanted to know from the students if online assessment is having Worries in Academic Progress. We also asked the students about Interruptions to Eating Patterns, any Problems faced due to Living Environment, Economical Difficulties, further also asked whether they had any Negative and Depressive thoughts and Health issues. One more question added was that whether students felt that there was an Expanded Class Workload. We sent the questionnaire to many undergraduate students of different colleges with various courses like BSc. IT, BMM, BAF, BMS, BBI and BFM.



Fig 1: A model to examine the influence of various aspects of online learning on Academic, Economic, social and Health issues

### 3.2. Data analysis

A study was conducted with the undergraduate's students. Around 420 students' responses were collected. Questions were based on Academic Health, Social and Economical perspective. Following table displays the different types of issues faced by students in online learning. The column number indicates the total number of responses for the issue.

Issue Type	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Trouble With Concentration	80	123	139	58	20	420
Interruption to Sleep Patterns	51	101	139	105	24	420
Feeling Loneliness	58	106	108	109	39	420
Interruptions to Eating Patterns	63	106	109	113	29	420
Problems faced due to Living Environment	69	107	128	95	21	420
Economical Difficulties	52	79	141	120	28	420
Expanded Class Workload	74	111	138	85	12	420
Negative and Depressive thoughts	46	73	131	134	36	420
Worries in Academic Progress	96	142	109	57	16	420
Health issues	45	75	129	113	58	420
<b>Total</b>	<b>634</b>	<b>1023</b>	<b>1271</b>	<b>989</b>	<b>283</b>	<b>4200</b>

Table 1: Responses for Online learning issues

Based on the received responses, overall result analysis is done. The following structure gives the count of each responses.

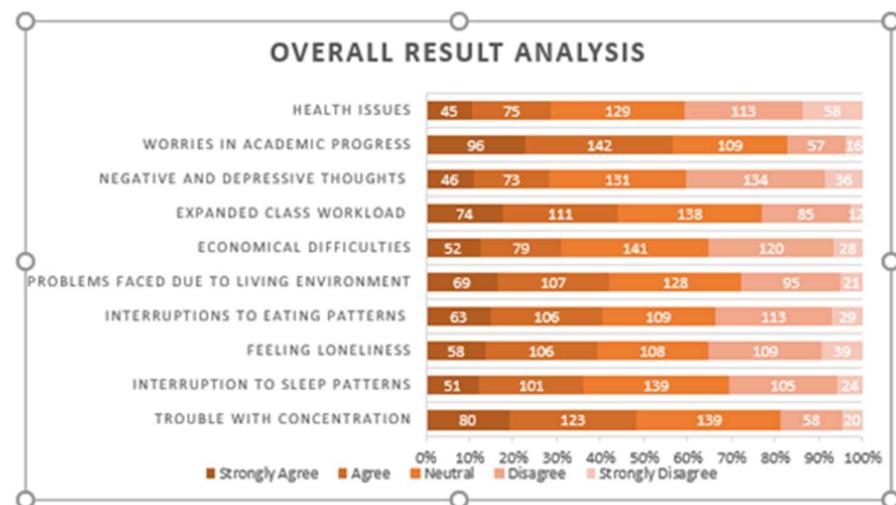


Fig 2: Analysis of overall issues of students

From the Overall Result analysis, the distribution of the issues which students faced during the online learning which showed that the highest impact was on the academic progress of the students (15%) which later was followed by Trouble with Concentration (13%) and the most important related to the studies was expanded Class Workload. (12%).

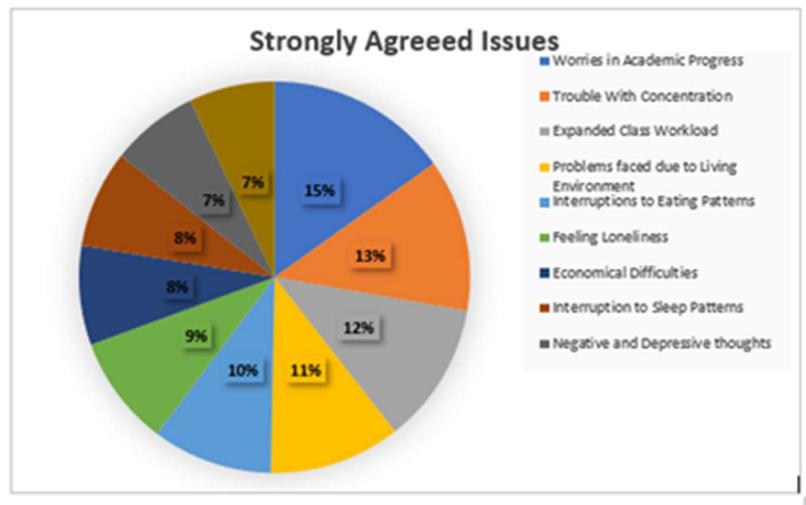


Fig 3: Analysis of issues of students for displaying overall impact

The table below shows that the percentage wise data where students have agreed on each issue which shows more than 50% for each category. This makes clear that students had faced many issues in online learning as compared to offline learning.

Issue Type	Overall Agree %
Trouble With Concentration	80
Interruption to Sleep Patterns	51
Feeling Loneliness	58
Interruptions to Eating Patterns	63
Problems faced due to Living Environment	70
Economical Difficulties	53
Expanded Class Workload	75
Negative and Depressive thoughts	48
Worries in Academic Progress	83
Health issues	48

Table 2: Agree Percentage for all the issues.

### 3.3 Results

Out of the respondents, 225 were female and 195 were male. The understudies had a blended assessment on web based getting the hang of during the Coronavirus pandemic. A larger part of the understudies (82%) felt, that is, concurred or emphatically concurred, that learning happens preferred in actual college rooms over through internet learning and just a minority of the understudies (18%) felt that online learning is superior to going to actual class. The understudies communicated how their lectures can be made more interesting. The understudies felt that they can associate better with teachers in an actual study room.

Practically, it was observed that 80% students faced problem with concentration rest 20% were either neutral or disagreed because of which students were more worried about their academic progress which as per survey showed was faced by 83% students with an extra workload difficulty that came to 75%. As per the sleeping pattern 51% students faced issues where remaining had somehow adjusted

themselves with it. in consideration with the health issues 48% students faced problems whereas remaining were either neutral or perfectly fine with it. 58% students faced loneliness due to many factors while having online learning session rest .and hence due to which few also went into depression which came to around 48%. And emotional difficulties faced were 53%.

#### 4. Gamification and Online Learning

After the survey we proposed a prototype build on the issues students faced using the idea on Gamification, which make this online learning more interesting and interactive i to focus on behavioural change of students for his academic progress.

##### 4.1. Gamification Model

Games regularly permit players to restart or play once more, committing errors recoverable. This opportunity to fail permits understudies to analyse without anxiety and expands understudy commitment

Gamification should not be confused with program-based learning or PC based learning, despite the fact that a portion of the understandings propose the last mentioned, just underlining the similarity of the hypothesis with the new advancements. The personification of gamification doesn't lie in innovation, yet the assorted learning climate and the arrangement of choices and prizes, all pointed toward expanding inspiration and arriving at more significant levels of commitment in the learning cycle. All around planned instructive games offer proceeding with promising circumstances for player improvement, huge measures of inputs, excessively complex for any one individual to settle alone, and conditions that adjustment in reaction of students' activities

Absorbing online learning climate should be to support: contact among understudies and employees, correspondence and collaboration between understudies, immediate feedback, time on assignment, dynamic learning procedures, correspondence of elevated standards and regard variety and methods of gaining from every understudy. There are a few suggestions for instructors and associations to put together substance in stage rules: fast and positive criticism, adjusting assignments to ability levels, experimentation and work duplication, primary objective is partitioned into more modest objectives, various ways to the objective, utilization of various game mechanics, and empowering exercises in spite of the current disappointment. The primary goal of online learning is high productivity, viability, commitment, fulfilment and inspiration of understudies. These things can be accomplished using the concept of gamification.

The executives of online based learning should make the conditions under which understudies are persuaded, fulfilled, successful and effective. The board of online based learning is a significant piece of the model. The model is introduced in Fig., and comprises of the accompanying fundamental components: the board of online based learning, significant elements in online based learning, periods of advancement (investigation, arranging, improvement, usage and assessment), game mechanics, game elements, gamification components in internet learning and their impacts on understudies.

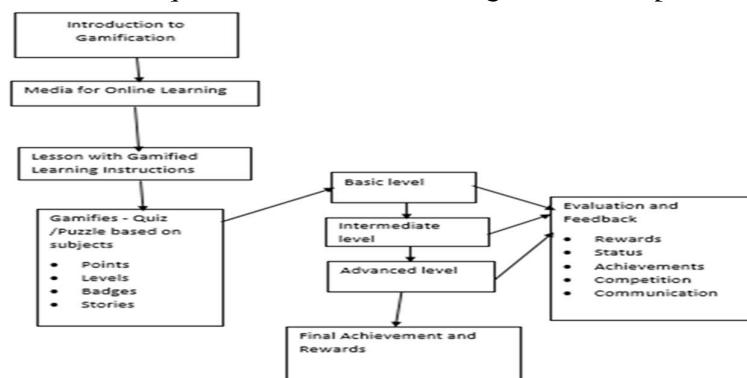


Fig 4: Proposed framework based on gamification in the area of online learning in education

Model of online based learning in advanced education, which incorporates components of gamification should be founded on proper administration. Great online based learning the executives implies sorting out, arranging, operating, driving and managing immeasurably significant components of online learning.

#### **4.2 Flow of Proposed Framework**

Initially, idea of the Gamification will be initiated to the students. A particular mode of learning will be instigated to the student through which lesson using gamified learning instruction will be introduced. Once the student's concept and doubts are cleared then based on his class subject students will appear for the Gamified quiz/puzzle related to the subject will be allowed to appear. The game will be of three levels: Basic, Intermediate and Advanced. As the students keeps scoring to certain points it will make the student go ahead with next level and will allow to get students score more points which at the end will be benefited for student to add up on his scores. A regular evaluation and feedback will be provided to the students based on his performance which will be in terms of rewards, status, achievements and so on. Once the students complete all the levels they will be getting the final rewards and achievements.

#### **5. Conclusion**

Online learning has been on the peripheral for a huge time. The pandemic made it conventional. A survey to know the view of undergraduate students on various characteristics of online learning during the pandemic. It is found that the students measured online learning a feasible alternative under the existing situations. We still think that there is possibility for upgrading. Teachers should attempt to make online learning better suitable between students. Technique like gamification may be introduced in online education and their effects may be studied. Gamification concept may be initiate in online learning and their influence be thoughtful.

Gamification models can be planned diversely which opens new viewpoints for creativity. In any case, the distinction of gamification models has one comparability which is incorporated by all models—the inspiration. Inspiration is the vital factor for the accomplishment of gamification models. Different instruments to support inspiration animate all students and every one of them actually to be locked in into the game and expert the subject. Making the compelling gamified model instructor should think about the objective students and their requirements for learning just as the techniques to support their commitment to the learning content.

#### **References**

- 1). Knutas, Antti & van Roy, Rob & Hynninen, Timo & Granato, Marco & Kasurinen, Jussi & Ikonen, Jouni. (2019). A process for designing algorithm-based personalized gamification. *Multimedia Tools and Applications*. 78. 10.1007/s11042-018-6913-5.
- 2) Khakpour, Alireza & Colomo-Palacios, Ricardo. (2020). Convergence of Gamification and Machine Learning: A Systematic Literature Review. *Technology, Knowledge and Learning*. 10.1007/s10758-020-09456-4.
- 3) Obaid, Iqra & Farooq, Shoaib & Abid, Adnan. (2020). Gamification for Recruitment and Job Training: Model, Taxonomy, and Challenges. *IEEE Access*. PP. 1-1. 10.1109/ACCESS.2020.2984178.
- 4) Kayimbasioglu, Dervis & Oktekin, Bora & Haci, Huseyin. (2016). Integration of Gamification Technology In Education. *Procedia Computer Science*. 102. 10.1016/j.procs.2016.09.460.
- 5) Khoshkangini, Reza & Marconi, Annapaola & Valetto, Giuseppe. (2017). Machine Learning for Personalized Challenges in a Gamified Sustainable Mobility Scenario. 361-368. 10.1145/3130859.3131321.
- 6) Rutkauskienė, Dr & Gudoniene, Daina & Maskeliūnas, Rytis & Blazauskas, Tomas. (2016). The Gamification Model for E-Learning Participants Engagement. 10.1007/978-3-319-39690-3\_26.

- 7) Kebritchi, Mansureh & Lipschuetz, Angie & Santiague, Lilia. (2017). Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review. *Journal of Educational Technology Systems*. 46. 4-29. 10.1177/0047239516661713.
- 8) Sun, Anna & Chen, Xiufang. (2016). Online Education and Its Effective Practice: A Research Review. *Journal of Information Technology Education: Research*. 15. 157-190. 10.28945/3502.
- 9) Seufert, Sabine & Lechner, Ulrike & Stanoevska-Slabeva, Katarina. (2002). A Reference Model for Online Learning Communities. *International journal on E-learning : corporate, government, healthcare, & higher education*. 1. 43-54.
- 10) Kebritchi M, Lipschuetz A, Santiague L. Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review. *Journal of Educational Technology Systems*. 2017;46(1):4-29. doi:10.1177/0047239516661713

## MANAGING LIFESTYLE CHANGES FOR BETTER LIVING: PERSPECTIVE OF WOMEN IN INDIA

**R.Babita**, Assistant Professor, Department of Commerce, S.T.Hindu College,  
Nagercoil.

**M.UmaMaheswari**, Assistant Professor, Department of Commerce, S.T.Hindu College, Nagercoil

### Abstract

Any life is life filled with change. Change can be felt anywhere and at any point of time. Sometimes it's known and at other times it may come suddenly and unexpectedly. It may either be disappointing or a pleasant surprise. One cannot control change but can definitely learn how to manage it. The study is conducted as an attempt to analyse the various changes that have gradually become part of women's lives. It aims to understand the way women have managed to accustom to these lifestyle changes either voluntarily or forcefully. Well-structured questionnaire through google forms was used to collect primary data needed to support the study. Analysis of data was done on the basis of the responses received from 120 women from various walks of life. Convenience sampling method was adopted. Factor analysis constricted the identified changes into 9, out of which change in food/eating habits followed by self-care changes were found to be significant. The study concluded that women in India were easily adaptable to these lifestyle changes.

**Keywords:** *Lifestyle Changes, Change, Change management, Perspective of Women, Better Living.*

### 1. INTRODUCTION

**“If you do not create change, change will create you.”**

Change is an inevitable part of life. It could be often seen that people are resistant to change without realising that change is the only thing that remains constant throughout. The effective management of change is something that applies to everyone may it be an individual, a group, an organisation or a country. Lifestyle changes can come in many forms and magnitude and it can affect every part of a women's life in different ways. There may be positive, welcoming and happy changes and may involve changes such as addition of a new member in the family, motherhood, new friends, new possessions, relationships, new job and the like. On the other hand, some changes involve losses, death, separation, sickness which may be devastating. Again, some changes may be sudden and yet others may be gradual. A change may also be good or bad depending on the person and the situation. Change may be voluntary or it may be forced upon a person too.

Changes in life, if they are not managed and dealt with properly may often lead to many issues that may even affect a person's psychological and physical health. Many major and minor changes in life have a direct impact on a person's mental and physical health as the mind and body are connected. It may also reflect on the performance of the individual. Therefore, it is important to implant progressive managing and coping mechanisms before, during and after any change in life in order to be protected from its negative effects.

The stages of change may include endings, neutral zone and new beginnings. When something ends, it calls for a change. Neutral zone is the period that lies between endings and a new beginning to cope and manage the new change. And a new beginning of yet another thing which will be the change. Some of the things that can be done to deal with changes in life may include

1. Managing stress from the change
2. Taking more active role in life
3. Developing a plan
4. Practice change management/coping
5. Learning to enjoy change
6. Practicing acceptance

7. Taking care of one's physical and emotional health
8. Positive thinking
9. Reaching out for help and so on.

However, may be the change, it must be managed properly. It is known that change cannot be controlled, instead the secret key to coping with change is to control the response to change to the extent possible. The present study attempts to analyse the prominent lifestyle changes that have become part of life and the perception of women in India on managing these lifestyle changes for a better living.

## 2. METHODOLOGY

The aim of the study is to analyse the management of lifestyle changes that have gradually become an inevitable part of life. People all over the world have willingly or otherwise learnt to make these changes for a sustainable life and a better living. This study particularly focuses on the perception of women in India towards managing these lifestyle changes and the way these changes has made its way into their life.

The study was conducted among women from various walks of life from different parts of India. The study is based on both primary as well as secondary data. Primary data were collected from 120 women from various parts of India who were willing to participate in this survey. The main source of secondary data was the internet. Convenience sampling method was followed to reach the respondents. Well-structured questionnaire was constructed for this purpose and was sent through google forms in various assorted women's groups. The questionnaire was divided into two sections. The first section included the demographic information about the respondents and the second part consisted of 30 identified areas where a lifestyle change would have occurred over a period of time. The researcher has formulated the following null hypotheses:

*Ho1: There is no significant relationship between the profile variables such as age, occupation, education, marital status, type of residence and type of family and the lifestyle changes.*

*Ho2: There is no significant difference in the way women perceive changes in their life.*

The respondents were asked to choose among the five options namely voluntary change, influential change, circumstantial change, forceful change and no change which they found most appropriate. Mean scores were calculated by assigning values of 5,4,3,2 and 1 respectively to voluntarily changed, influentially changed, circumstantial change, forceful change and no change. Therefore, a lower score of 1 or 2 indicated no change or forceful change and a higher score of 4 or 5 meant Voluntary Change or Influential Change. The collected data was suitable coded and tabulated keeping in view with the aim of the study. The data was further analysed using statistical tools such as frequencies, percentages, Friedman's Rank Test, ANOVA and factor analysis. The data was statistically analysed using SPSS version 20.0 for windows for the study.

## 3. ANALYSIS AND INTERPRETATION

Women from different walks of life who were willing to participate in the survey were included in the study. Most of the respondents (49.2%) were above 50 years of age, homemakers (42.5%), post graduates (42.5%), married (99.2%), equally (47.5%) were from urban and semi urban place of residence and had a nuclear family (65.8%). The demographic profile analysis of the respondents is depicted in Table1.

### 3.1 Factor Analysis

Factor analysis is one of the most frequently used inter-dependency techniques and is useful when the appropriate set of variables exhibit a structured inter-dependence and the aim is to find out the latent factors that create a commonality. Factor analysis helps to reduce a large number of variables into a lesser number of factors. Principal Component analysis method was followed to extract the factors. Thirty lifestyle changes which have been slowly adapted to by the women as part and parcel of their lives have been identified by the researcher after having a primary discussion with

peers and colleagues. The factor loadings of the thirty changes are shown in Table 2 as analysed through a rotated factor matrix. The thirty variables were reduced into nine factors on the basis of eigenvalues and variance explained. The total variance explained by the nine factors that were extracted was 85.722 per cent.

The factor “Food /Eating Habits” included the habit of dining outside frequently, ordering food from outside, use of instant food/ready to cook food, more self cooking and changing over to traditional food/cooking methods. This factor explains a higher variation of 14.121 per cent in the total data set which indicates that these habits have significantly changed in the lifestyle of women.

The “self-care Changes” include changes such as inner transformation, spirituality, relation with own self, engaging in yoga/meditation/exercise/Zumba/sports and having more leisure/relaxation/vacation/entertainment, explaining a variation of 11.828 per cent in the entire date set.

The factor “Change in Interpersonal Relations” included change in relation with children, parents and siblings, change in daily routine, relation with friends and colleagues, with partner and with relatives. This factor explained a variation of 11.678 per cent in the entire data set.

“Technological Changes” included constant updating, adapting to internet banking, Online shopping and watching online entertainment, explaining a variation of 10.400 per cent in the entire data set.

“Emotional changes” included becoming short tempered and becoming more moody /emotional, explaining a variation of 8.269 per cent in the total data set.

“Attitude change” includes habits such as change in sleeping pattern, becoming more practical/rational in life, becoming more productive/motivated and becoming more mature/thoughtful/grateful, explaining a variation of 7.971 per cent in the total data set.

Social Connections consisted of becoming more inclined towards social networking and use of telecommunication, explaining a variation of 7.656 per cent in the total data set.

The factor “Grooming/Health” included habits such as grooming and taking more care of nutrition / health supplements for a healthy living this factor explained a variation of 7.550 per cent in the total data set.

“Parenting” change included the change women felt in the parenting trend over a time period. It explained a variation of 6.249 per cent in the total data set.

The eigen values indicate the degree of variability of individual factors in the total data set. The higher the eigenvalue, the higher is the intensity of the variables included in that factor. The intensity of change as evidenced by eigen values of factors such as Food/Eating habits, self-care changes, change in interpersonal relations, Technological changes, Emotional Changes, Time Management, Social Connections, Grooming/Health and Parenting are 4.236, 3.548, 3.503, 3.120, 2.481, 2.391, 2.297, 2.265 and 1.875 respectively. The intensity of change is seen higher in respect of Food/Eating habits, self-care changes followed by change in interpersonal relations and technological changes.

The communality represents the way each change has made its path into the life of women in India in order to make them manage these changes for a better living. The communality has been found high in respect of becoming more productive/motivated with a value of 0.956, followed by change in daily routine with a value of 0.921. The next high communality value is seen in ordering food from outside with a value of 0.918, Dining outside frequently with a value of 0.909 and use of instant food/ready to cook food and engaging in yoga/exercise/Zumba/sports sharing equal values of 0.905 each. Hence, it could be inferred that these changes have a powerful effect on managing a better life.

### **3.2 Association between Demographic profile and the Lifestyle changes**

The demographic profile variables of the respondents are associated with the various lifestyle changes. The association between them is measured by employing One Way ANOVA. This is tested by formulating the null hypothesis that

*Ho: There is no significant relationship between the profile variables such as age, occupation, education, marital status, type of residence and type of family and the lifestyle changes.*

The 'p' values of the test are shown in Table 6. A 'p' value of lesser than 0.05 indicates significant association between the profile variables and the lifestyle changes. The significant values of F statistic at 5 per cent level is presented in Table 6.

Regarding food/eating habits, the significantly associated profile variables were occupation and education. Regarding Self-care Changes, the significantly associated profile variables were occupation, education and type of residence. Regarding Change in Interpersonal relations, the significantly associated profile variables were age, occupation, education and type of residence. Regarding Technological Changes, the significantly associated profile variables were occupation and type of residence. Regarding Emotional Changes, the significantly associated profile variables were age, education, marital status and type of residence. Regarding Attitude Changes, the significantly associated profile variable was type of residence. Regarding Social connections, the significantly associated profile variables were age, occupation and education. Regarding Grooming/Health, the significantly associated profile variables were occupation, education and type of residence. Occupation, education and type of family are significantly associated with parenting.

Hence, the null hypothesis is rejected in the above said associations and the alternative hypothesis H1 is accepted. That is, there exists significant association between these profile variables and the identified changes.

It was found that Change in Food/Eating Habits was independent of age, marital status, type of residence and type of family. Self-care changes were independent of age, marital status and type of family. Changes in Interpersonal relation change were independent of marital status and type of family.

### 3.3 Overall Perception of Women on Change

The perception of women on change as a whole was analysed through five statements. The respondents were asked to rate the statements from strongly agree to strongly disagree. Scores were given from 5 to 1 from most favourable response to the least favourable one. Friedman's Rank test was followed to get the mean rank. The results are shown in Table 4. The statement "I easily adapt to change" occupied the first rank with a mean rank of 4.15, followed by "I manage Change" with a mean rank of 3.38. The statement "I take necessary effort to adapt to change" scored last with a mean rank of 1.58.

A non-parametric Friedman test of differences among the perceptions was conducted and the following null hypothesis was tested.

*Ho2: There is no significant difference in the way women perceive changes in their life*

The test statistics are shown in Table5. As the p value was less than 0.05, the null hypothesis was rejected and the alternative hypothesis was accepted that

*H1: There was a statistically significant difference in the way women perceived changes in their lives as a whole.*

### 4. TABLES

Variable	Number of respondents		Percentage
Age	Below 30 years	0	0
	30-40years	17	14.2
	40-50 years	44	36.7
	above 50 years	59	49.2
	<b>Total</b>	<b>120</b>	<b>100.0</b>
Occupation	Entrepreneur	9	7.5
	Salaried	39	32.5

	Home Maker	51	42.5
	Business woman	15	12.5
	Others	6	5.0
	<b>Total</b>	<b>120</b>	<b>100.0</b>
<b>Education</b>	School Education	8	6.7
	Under Graduate	27	22.5
	Post Graduate	51	42.5
	Doctorate	28	23.3
	Professional	6	5.0
	<b>Total</b>	<b>120</b>	<b>100.0</b>
<b>Marital status</b>	Married	119	99.2
	Unmarried	0	0
	Separated/Divorced	1	.8
	<b>Total</b>	<b>120</b>	<b>100.0</b>
<b>Type of Residence</b>	Urban	57	47.5
	Semi Urban	57	47.5
	Rural	6	5.0
	<b>Total</b>	<b>120</b>	<b>100.0</b>
<b>Type of family</b>	Nuclear	79	65.8
	Joint	41	34.2
	<b>Total</b>	<b>120</b>	<b>100.0</b>

Table 1: Demographic Analysis

	Compone nt	1	2	3	4	5	6	7	8	9
<b>Changes in Lifestyle</b>										
Dining outside frequently	.894	.08 3	.21 9	.07 6	-. 4	.11 2	.12 6	.03 0	.07 6	.12 6
Ordering food from outside	.892	.07 8	.24 1	.10 4	-. 7	.11 7	.05 5	.10 1	.11 2	
Instant food/ready to cook food	.711	-. 21 6	-. 08 4	.04 4	.44 3	-. 01 7	-. 15 2	.32 1	-. 14 6	
Relaxation with own self	.681	.16 1	.28 8	-. 04 4	-. 02 6	-. 07 3	.15 5	.45 0	-. 08 8	
Changed to traditional food/cooking	.623	.06	.35	.45	.08	.14	-	.03	-	

			5	1	1	4	4	.35	6	.05
								7		1
Constant updating	-.046		<b>.84</b> <b>9</b>	.10 6	.00 1	-.00 2	.24 5	-.06 3	.07 9	.04 9
Spiritual	.173		<b>.68</b> <b>2</b>	.10 7	.25 2	-.19 6	-.07 7	.38 1	.29 8	.10 1
More self-cooking	.378		<b>.66</b> <b>5</b>	.15 7	.21 0	.07 3	-.00 2	.10 3	-.29 2	.21 4
Yoga/meditation/exercise/Zumba/sports	.219		<b>.64</b> <b>2</b>	-.10 2	.08 6	.14 1	-.08 9	.34 9	.40 5	-.33 7
I have become more practical/rational	-.118		<b>.57</b> <b>7</b>	.35 2	.48 4	.21 2	.16 9	-.05 2	.05 3	-.08 2
With children, parents and siblings	.312		.11 7	<b>.84</b> <b>0</b>	.04 9	-.07 0	.07 3	.23 4	-.02 6	.03 4
Change in daily routine	.121		.09 3	<b>.75</b> <b>8</b>	-.00 2	.43 5	.07 1	-.03 4	.33 4	.13 0
With friends and colleagues	.068		.36 9	<b>.74</b> <b>1</b>	.22 0	-.03 3	.23 6	-.04 7	.19 9	.07 5
With partner	.513		.00 5	<b>.70</b> <b>8</b>	-.08 8	.12 9	.14 9	.13 5	.02 5	.12 6
With relatives	.284		-.08 7	<b>.57</b> <b>7</b>	-.05 3	-.13 5	.49 4	.12 0	.38 1	-.09 4
Inner transformation	.195		.08 4	.03 7	<b>.84</b> <b>8</b>	-.08 2	-.01 8	.12 4	.03 7	-.07 3
Internet banking	.145		.16 7	-.12 7	<b>.84</b> <b>6</b>	-.02 5	-.01 4	.11 2	-.01 1	.08 0
Online shopping	-.109		.59 0	.18 1	<b>.66</b> <b>3</b>	-.04 0	.06 5	.11 1	.08 5	.16 7
Watching online entertainment	-.216		-.11 4	.14 1	<b>.60</b> <b>6</b>	-.01 1	.12 7	.46 7	.25 3	.12 1
I behave more mature/thoughtful/grateful	.046		-.00 9	-.04 6	.12 7	<b>.89</b> <b>7</b>	.15 5	.14 8	-.11 8	.10 9
I have become more moody/emotional	-.128		.06 0	.19 1	.04 2	<b>.83</b> <b>1</b>	-.22 9	.20 9	.20 2	.10 2

						5			
Change in sleeping pattern	.259	.13 8	.25 9	.10 9	-.12 5	.77 8	-.01 4	-.14 3	-.11 9
More leisure/relaxation/vacations/entertainment	.007	.04 3	.14 4	-.00 5	.03 7	.75 7	.10 2	.01 4	.49 2
I am more motivated/productive	.194	.32 7	.28 2	-.05 4	.44 4	.55 6	-.26 4	.09 1	-.38 0
I have become short tempered	-.345	.46 4	-.05 2	.05 7	.30 5	.54 4	-.15 3	.14 6	.27 3
Social networking	-.076	.04 6	.11 9	.10 6	.21 2	.05 1	.80 6	.27 5	.22 5
Tele communication	.159	.18 2	.11 6	.30 0	.14 8	-.06 3	.79 5	-.14 5	-.00 9
Grooming	.349	.10 5	-.06 5	.08 2	.08 6	-.04 8	.07 9	.81 0	.12 3
Nutritional/health supplements	.254	.34 7	.15 2	.31 8	-.07 5	-.07 4	.08 5	.59 2	.47 0
Change in parenting	.106	.09 6	-.06 8	.04 3	.15 8	.08 9	.14 2	.13 0	.86 5
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.									
a. Rotation converged in 17 iterations.									

Table 2: Rotated Component Matrix

Change (Factors)	Change Pattern	Factor Loading	Communality	Eigen Values	Percent variation	Cumulative Percent
Food/ Eating Habits	Dining outside frequently	.894	.909	4.236	14.121	14.121
	Ordering food from outside	.892	.918			
	Instant food/ready to cook food	.711	.905			
	More self-cooking	.681	.814			
	Changed to traditional food/cooking	.623	.878			
Self-Care Changes	Inner transformation	.849	.806			25.949

	Spiritual	.682	.859	3.548	11.828	
	Relation with own self	.665	.801			
	Yoga/meditation/exercise/Zumba/sports	.642	.905			
	More leisure/relaxation/vacations/entertainment	.577	.790			
<b>Change in Interpersonal Relations</b>	With children, parents and siblings	.840	.886	3.503	11.678	37.627
	Change in daily routine	.758	.921			
	With friends and colleagues	.741	.843			
	With partner	.708	.846			
	With relatives	.577	.854			
<b>Technological Changes</b>	Constant updating	.848	.794	3.120	10.400	48.027
	Internet banking	.846	.800			
	Online shopping	.663	.885			
	Watching online entertainment	.606	.759			
<b>Emotional Changes</b>	I have become short tempered	.897	.897	2.481	8.269	56.296
	I have become more moody/emotional	.831	.895			
<b>Attitude Changes</b>	Change in sleeping pattern	.778	.821	2.391	7.971	64.267
	I have become more practical/rational	.757	.850			
	I am more motivated/productive	.556	.956			
	I behave more mature/thoughtful/grateful	.544	.848			
<b>Social Connections</b>	Social networking	.806	.856	2.297	7.656	71.923
	Tele communication	.795	.841			
<b>Grooming/Health</b>	Grooming	.810	.831	2.265	7.550	79.473
	Nutritional/health supplements	.592	.899			
<b>Parenting</b>	Change in parenting	.865	.845	1.875	6.249	85.722

Table 3: Important Lifestyle Changes (Naming of Factors)

Perception	Mean Rank
I am aware and accept that change is an inevitable part of life	2.79
I easily adapt to change	4.15
I am quite resistant to change	3.10
I take necessary effort to adapt to change	1.58
I manage change	3.38

Table 4: Friedman's Rank of Perception of Change

N	120
Chi- Square	207.687
df	4
Asymp.Sig	0.000

Table 5: Friedman's Test Statistics

Sl. No	Demographic Variables	P Values								
		Food/eating Habits	Self-Care Changes	Change in Interpersonal Relations	Technological	Emotional Changes	Attitude Changes	Social Connection	Grooming/ Health	Parenting
1.	Age	0.728	0.063	0.003 *	0.290	0.000 *	0.184	0.019 *	0.708	0.096
2	Occupation	0.000 *	0.000 *	0.000 *	0.045 *	0.247	0.058	0.000 *	0.000 *	0.000 *
3	Education	0.009 *	0.000 *	0.000 *	0.112	0.007 *	0.307	0.005 *	0.000 *	0.002 *
4	Marital Status	0.388	0.656	0.788	0.639	0.004 *	0.059	0.590	0.774	0.430
5	Type of Residence	0.317	0.002 *	0.002 *	0.002 *	0.000 *	0.014 *	0.194	0.000 *	0.016
6	Type of family	0.403	0.550	0.887	0.676	0.172	0.230	0.277	0.420	0.000 *

\*Significant at 5per cent level

Table 6: Association between demographic profile of the respondents and lifestyle changes (One Way ANOVA)

## 5.CONCLUSION

Everyone experiences change on a daily basis. Some may be simple and common changes and some may be life altering changes. One may have to manage relationship changes, changes at the workplace, change in the quality of life and lifestyle changes are to name a few. Change in life can neither be stopped nor can it be controlled. Only thing that counts is how one manages these changes effectively. The present study focuses on the perception of women on managing these lifestyle changes for making their lives even better. Thirty general but prominent lifestyle changes have been identified for analysis on the basis of basic discussion with peers.

Factor analysis constricted the 30 changes into 9 categories namely change in Food/Eating habits, Self-care Changes, change in interpersonal relations, Technological changes, Emotional

Changes, Attitude Changes, Change in Social Connections, Change in Grooming/Health and Parenting. The significant changes in the aforesaid factors were dining outside frequently, constant updating, change in interpersonal relations with children, parents and siblings, behaving more mature/thoughtful/grateful, change to social networking, grooming and change in parenting. The intensity of these lifestyle changes based on eigen values was found high in case of 'change in food/eating habits' followed by 'Self-Care changes' and 'Changes in interpersonal relations', which mean that change variables included in these factors were more significant than the others. It was also found that there was significant difference in the way women in India perceived changes in their life as a whole while finding themselves easily adaptable to these changes.

Everyone perceives and handles changes in their lives in their own way. Some feel difficult to cope with it and others do it effortlessly. The process of change may include denial, anger, looking forward, acceptance and fresh commitment. Each cross these stages at their own pace. Practices such as evaluating level of control, practicing self-care, monitoring thoughts, prioritising, recognising change as a part of life, anticipating change, learning to enjoy change and the most important will be to expect and know that change will recur over and over again, will help to manage these lifestyle changes for a better living.

## REFERENCES

- [1] CollinCarnall, "Managing Change", Routledge Library Editions :Management
- [2] RichardLueke, "Managing Change and transition", Harvard Business School Publishing Corporation
- [3] <https://www.psyc.com.net/dealing-with-change>
- [4] <https://www.crisisnetwork.org/find-help/behavioral-health-conditions/managing-change/#living-healthy>
- [5] [www.statisticssolutions.com](http://www.statisticssolutions.com)
- [6] [https://en.wikipedia.org/wiki/Change\\_management](https://en.wikipedia.org/wiki/Change_management)

## SENTIMENT ANALYSIS: A CASE STUDY ON MOOC FDP-MOODLE LEARNING MANAGEMENT SYSTEM FOR TEACHERS

**Beena Kapadia**, Assistant Professor, Department of Information Technology, VSIT

**Dr.Amita Jain**, Assistant Professor, Department of Information Technology, VSIT

**Sabir MoinShaikh**, Assistant Professor, Department of Information Technology, VSIT

### ABSTRACT

One of the major advances of the past decade in the field of Language Technologies is sentiment analysis. In this study, we explore mining collective sentiment from post-course survey/feedback provided by the learners of a Massive Open Online Course (MOOC)-FDP on *MOODLE Learning Management System for Teachers* by IIT Bombay in order to monitor learners' opinions towards the course and major course tools, such as lecture and assessment and also the way it was being handled. Feedback of the learners can be analyzed to detect patterns and learners' behaviors. In particular, sentiment analysis can be used as a first step to define complex feelings, such as enthusiasm, anger or boredom (for example classification into positive and negative messages). The purpose of this study is to use a real case study to provide information about the MOOC-FDP. The supervised learning algorithm is used for the sentiment analysis. The best approach we found is logistic regression, which used dictionaries of words. The analysis of the case study also showed an evolution of the positivity of the MOOC-FDP course conducted and well appreciated by participants.

**Keywords**—sentiment analysis; machine learning techniques, Opinion mining, Massive Open OnlineCourse;MOOCs, FDP, feedback

### INTRODUCTION

A massive open online course (MOOC) is an online course aimed at unlimited participation and open access via the Web [1].The use of natural language processing, text analysis, computational linguistics, and biometrics to systematically define, extract, measure, and analyze affective states and subjective knowledge is referred to as sentiment analysis (also known as opinion mining or emotion AI). It is commonly applied to the vide areas of research such as marketing and customer service to clinical practice, such as feedback and survey results, online and social media.

Learners of the course can provide their feedback in the form of their views and opinions about the course. The number of registered users can be enormous in a MOOC (it is possible to find courses of up to 100,000 students) and, although most of them register only to explore [3].Working to develop MOOCs, it is important to know the views of students on the course and the key course resources as well. Previous work indicates that the most significant aspect for learners is who teaches the course, based on opinions extracted from student feedback. [4].

However, understanding what can be strengthened in the course is more important for a given MOOC that will be offered again by the same instructor team.Latest research on social media use has shown that a number of behavioral and affective patterns can be revealed through sentiment analysis Sentiment analysis has been carried out in other fields such as: to find the relationship between Twitter mood and consumer trust, political opinion[5], and stock market fluctuations [6],

movie reviews or tweets [7], but there are very few contributions in the area of MOOCs. Some researchers analyzed the relationship between a ratio based on the positive and negative terms in the posts and dropout [8].

Analyzing the data from the feedback(post-course surveys) of the course provided by the learners', we can infer important information about attitudes prior to and even without analyzing forum discussions. The contribution of this study is an investigation into what sentiment analysis can tell us about the learners' opinions towards the course.

## 1.2. Literature review

Sentiment analysis is used to classify various affective States. In general, these states or trends can be defined by various techniques, such as process mining [9] or discourse analysis. Similarly, in addition to predicting affective states in MOOCs, similar techniques were used to predict dropouts (because of its high rates), predicting whether the learner can pass the course or not (or whether the learner is going to obtain a certificate), or the ranking that the learner can obtain. In such cases, different variables have been used, mainly related to the platform use (e.g. forum activity, inactivity times [10]), video-watching activities [11], and the results of previous assignments. For example, Ren, Rangwala and Johri [12], predicted grades for intermediate assignment and discovered that the number of previous quizzes attempted had the strongest correlation with the score. Likewise, Sinha and Cassel [13] also predicted grades, classifying them into various Achievement categories: low, medium, moderate, and very high.

Sentiment Analysis task is considered as a sentiment classification problem. The first step in the SC problem is to extract and select text features. Some of the current features are [14] Terms presence and frequency, Parts of speech (POS) [15], Opinion words and phrases and Negations. Feature Selection methods can be divided into lexicon-based methods that need human annotation, and statistical methods which are automatic methods that are more frequently used [16]. Other methods also can be used in Feature Selection like information gain and Gini index [15].

Sentiment Classification techniques can be roughly divided into machine learning approach, lexicon-based approach, and hybrid approach [17]. The Machine Learning Approach (ML) applies the famous ML algorithms and uses linguistic features. The Lexicon-based Approach relies on a sentiment lexicon, a collection of known and precompiled sentiment terms. It is divided into dictionary-based approach and corpus-based approach which use statistical or semantic methods to find sentiment polarity. The hybrid Approach combines both approaches and is very common with sentiment lexicons playing a key role in most methods. The text classification methods using ML approach can be roughly divided into supervised and unsupervised learning methods. The supervised methods make use of many labelled training documents. The unsupervised methods are used when it is difficult to find these labelled training documents.

## Objectives of the study

1. The main goal is to detect the perspective about the course that participants exhibit based on their emotions. For this a real MOOC-FDP is used as a case study.
2. One of the main objectives is to determine which factors affect course completion.

3. It is also an important goal to address that what can be improved when the course is offered again.

### Research Methodology:

We have used logistic regression algorithm of supervised machine learning.

#### A. Dataset

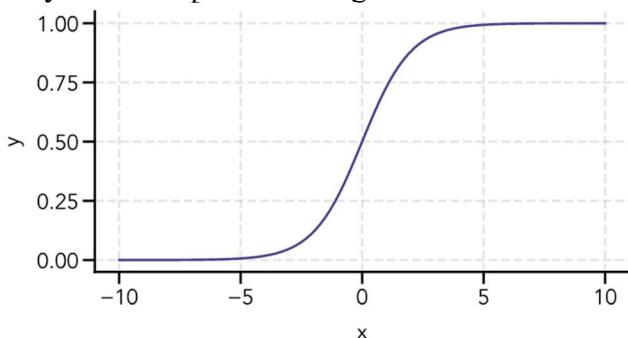
The authors have applied the model on primary data collected using google form. Our Organization, *Vidyalankar School of Information Technology* had conducted a National Level FDP from 20<sup>th</sup> April to 25<sup>th</sup> April 2020. It was on *Moodle Learning Management System* for teachers. There were 1000 participants from all over the country including various states like – Kerala, Maharashtra, Tamil Nadu, Gujarat, Punjab, Rajasthan, Delhi, Uttar Pradesh, Goa, Madhya Pradesh, Gujarat, Jharkhand, Telangana, West Bengal, Chandigarh, Karnataka, UT of DNH.

Total 1000 teachers had participated in that FDP. Out of which 776 post-course survey/feedback responses we could receive. So, the authors have used 776 post-course survey/feedback responses as a dataset for this study.

#### B. Approach

In this paper, we have used binary logistic regression model, because the dependent variable is dichotomous, whether the response is 'Yes' or 'No' to conduct the MOOC-FDP again. Also whether the participants satisfied with the content of the course, and planning & management of the MOOC-FDP and in 'ShareYourViews' column whether they have share positive response or negative response.

The **logistic** or **sigmoid** function, has the form  $f(x) = (1/(1+e^{-x}))$ . We have coded this function in Python. The plot of the sigmoidal function can be as follows:



Source: <https://towardsdatascience.com/using-logistic-regression-to-create-a-binary-and-multiclass-classifier-from-basics-26f5e1e92777>

As shown in the sigmoidal function plot, it rapidly changes from an output of near 0 to near 1 around  $x = 0$ . Since the output values are symmetric around  $y = 0.5$ , we should use 0.5 as the threshold for making decision, where  $y \geq 0.5$  outputs 1 and  $y < 0.5$  outputs 0.

### Results and Analysis:

Generally, much work is not being carried out with logistic regression in the area of sentiment analysis. The authors have attempted the sentiment analysis to be carried out with logistic regression to see the results. We have taken primary data for our study. The National level FDP on MOOC course on 'Moodle Learning Management' System for teachers' on 25<sup>th</sup> April 2020, during lockdown by *Vidyalankar School of Information Technology*. The feedback form of the same is used as a dataset. The authors want to find out whether such FDP should be conducted in future or not.

The data pre-processing is done by removing stop words, removed the short words, put the words in the base form using *wordnet\_lemmatizer*. After shuffling the data, it is been split into training and test data. Finally, the logistic regression applied on training and test data to find out the classification rate amongst training and test data.

The logistic regression model is prepared in python. The training- test ratio is 70:30.

As per the model the classification rate is 0.72 for the positive responses. Keeping threshold value as 0.5 the word ‘yes’ for the column ‘is\_response’ has the weight  $1.13 >= 1$ .

As per the model the classification rate is 0.79 for the positive responses. Keeping threshold value as 0.5 the word ‘Very Good’ for the column ‘ShareYourViews’ has the weight  $1.19 >= 1$ .

As per the model the classification rate is 0.81 for the positive responses. Keeping threshold value as 0.5 the word ‘Very Good’ for the column ‘PlanningAndManagement’ has the weight  $1.20 >= 1$ .

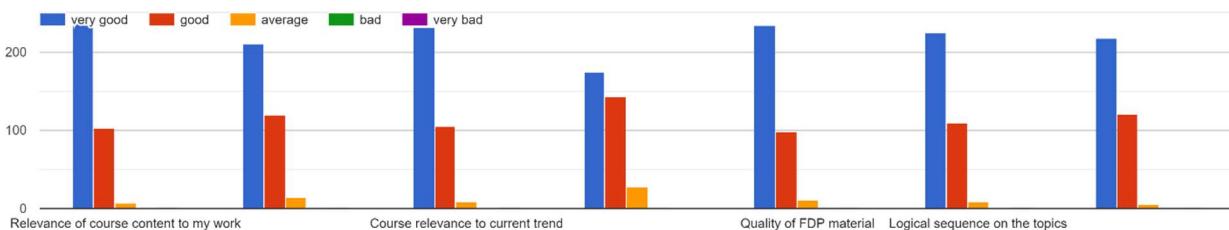
As per the model the classification rate is 0.9 for the positive responses. Keeping threshold value as 0.5 the word ‘Very Good’ for the column ‘Content’ has the weight  $1.32 >= 1$ .

All the above results indicate that participants were extremely satisfied by the planning and management, course content and they want such FDPs in the future by *Vidyalankar School of Information Technology*.

Following are the diagrams of responses from the feedback form:

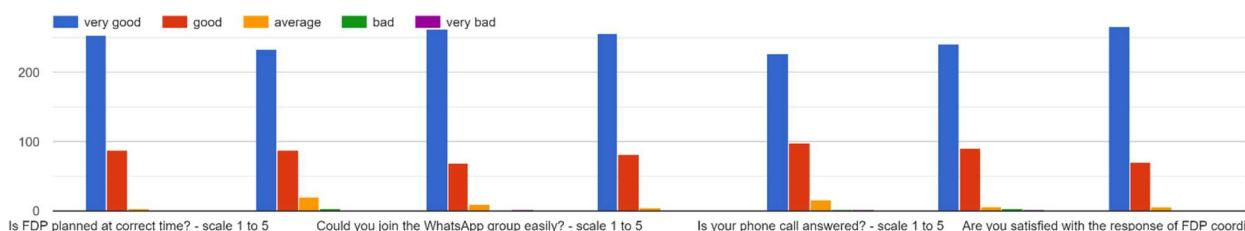
### 1) Related to content

Training delivery: I am satisfied with



### 2) Related to Planning and management

FDP planning and management



Both plots indicate that the results from the google form response when compared with sentiment analysis with Logistic regression model are the same.

## **Conclusion:**

The main goal of this study is achieved of detecting the participant's perspective about the course for further conduction of such MOOC-FDP courses. Also, we determined some factors which affected the course completion like whether the course content is relevant to day-to-day work, number of days allocated to the course, quality of FDP-material, knowledge gained during the FDP. We have also successfully determined that what could be improved when the course is offered again like installation guidelines should be more precise. We come to the conclusion that participants liked the MOOC-FDP and they want to participate in such FDPs in future, if conducted by our institute.

## **REFERENCES:**

1. Kaplan, Andreas M.; Haenlein, Michael (2016). "Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster". *Business Horizons*. 59 (4): 441–50. doi:10.1016/j.bushor.2016.03.008.
2. S. Mak, R. Williams, and J. Mackness, "Blogs and forums as communication and learning tools in a MOOC," Proc. International Conference on Networked Learning (NLC '10), pp. 275-285, May 2010.
3. J. Whitehill, J.J. Williams, G. Lopez, C.A. Coleman, and J. Reich, "Beyond prediction: First steps toward automatic intervention in MOOC student stopout," SSRN Electronic Journal, May 2015.
4. P. Adamopoulos. What makes a great mooc? An interdisciplinary analysis of student retention in online courses. In Proceedings of the 34th International Conference on Information Systems, ICIS, volume 2013, 2013.
5. B. O'Connor, R. Balasubramanyan, B. R. Routledge, and N. A. Smith. From tweets to polls: Linking text sentiment to public opinion time series. ICWSM, 11:122-129, 2010.
6. J. Bollen, H. Mao, and X. Zeng. Twitter mood predicts the stock market. *Journal of Computational Science*, 2(1):1-8, 2011.
7. C.N. Dos Santos and M. Gatti, "Deep Convolutional Neural Networks for Sentiment Analysis of Short Texts," Proc. International Conference on Computational Linguistics (COLING '14), pp. 69-78, Aug. 2014.
8. M. Wen, D. Yang, and C. Rose, "Sentiment Analysis in MOOC Discussion Forums: What does it tell us?," Proc. International Conference on Educational Data Mining (EDM '14), Jul. 2014.
9. D. Leony, P.J. Muñoz-Merino, J.A. Ruipérez-Valiente, A. Pardo, and C. Delgado Kloos, "Detection and Evaluation of Emotions in Massive Open Online Courses," *Journal of Universal Computer Science*, vol. 21, no. 5, pp. 638-655, May 2015.
10. S. Halawa, D. Greene, and J. Mitchell, "Dropout prediction in MOOCs using learner activity features," *Experiences and best practices in and around MOOCs*, vol. 7, pp. 3-12, Mar. 2014.
11. C. Ye and G. Biswas, "Early Prediction of Student Dropout and Performance in MOOCs Using Higher Granularity Temporal Information," *Journal of Learning Analytics*, vol. 1, no. 3, pp. 169-172, 2014.
12. Z. Ren, H. Rangwala, and A. Johri, "Predicting performance on MOOC assessments using multi-regression models," arXiv preprint arXiv:1605.02269, 2016.

13. T. Sinha, and J. Cassell, "Connecting the Dots: Predicting Student Grade Sequences from Bursty MOOC Interactions over Time," Proc. ACM Conference on Learning@ Scale (L@S '15), pp. 249-252, Mar. 2015.
14. Aggarwal Charu C, Zhai Cheng Xiang. Mining Text Data. Springer New York Dordrecht Heidelberg London: Springer Science+Business Media, LLC'12; 2012.
15. Yelena Mejova, Padmini Srinivasan. Exploring feature definition and selection for sentiment classifiers. In: Proceedings of the fifth international AAAI conference on weblogs and social media; 2011.
16. Whitelaw Casey, Garg Navendu, ArgamonShlomo. Using appraisal groups for sentiment analysis. In: Proceedings of the ACM SIGIR Conference on Information and Knowledge Management (CIKM); 2005. p. 625–31.
17. Diana Maynard, Adam Funk. Automatic detection of political opinions in tweets. In: Proceedings of the 8th international conference on the semantic web, ESWC'11; 2011. p. 88–99.

## A STUDY ON APPLICATIONS OF HUMANOID ROBOTS

**Ms. Ashwini Koyande**, Assistant Professor, Department of Information Technology,  
Vidyalankar School of Information Technology, Wadala, Mumbai,  
Email:ashwini.koyande@vsit.edu.in

**Ms. Sunita Suralkar**, Assistant Professor, Computer Engineering Department,  
VES Institute of Technology, Chembur, Mumbai. Email: sunita.suralkar@ves.ac.in

### **Abstract:**

Humanoid robotics is an emerging and challenging research field that has received major attention during the past years and will still play a vital role in robotics. Regardless of the application area, one among the common problems addressed in humanoid robotics is that the understanding of humanlike information science and therefore the underlying mechanisms of the human brain in dealing with the real world. Humanoid robots are related to the thought of robots that are as versatile as humans and whose physical appearance is similar to the physical body. Beyond physical resemblance, humanoid robots are meant to resemble humans in their actions, reasoning, and communication. The development of such robots requires coordinated and integrated research efforts that span an honest range of disciplines like learning theory, control theory, AI, human-machine-interaction, mechatronics, perception both computational and psychological, and also biomechanics and computational neuroscience.

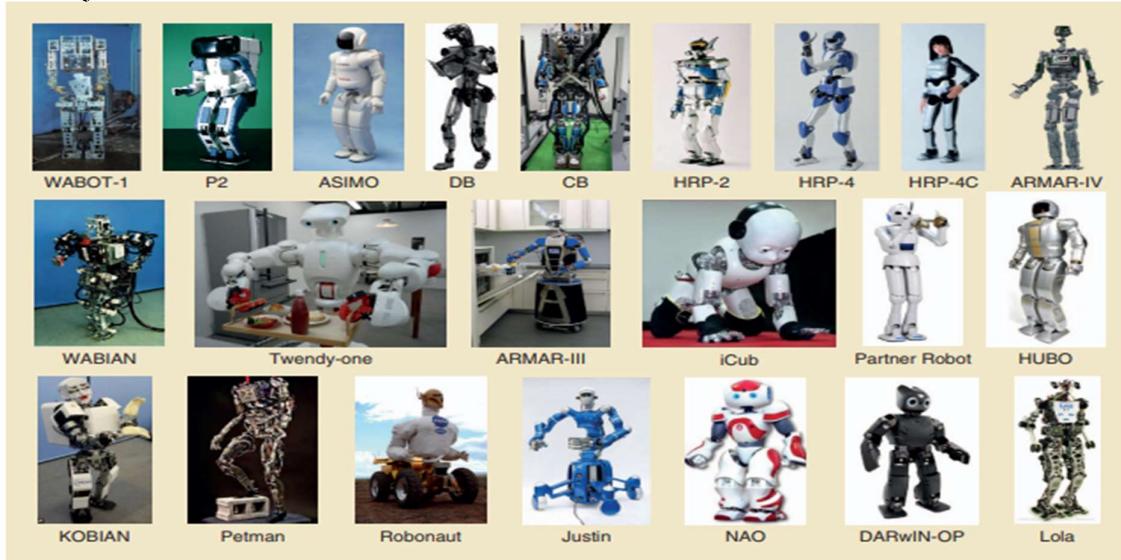
**Keywords:** humanoid robots, neural networks, fuzzy logic, artificial intelligence, future of robotics

### **I. Introduction**

A humanoid robot is usually defined as a programmable machine which may mimic the actions as well as the appearance of humans. A humanoid robot is a robot with its body shape built to resemble the physical body. The design can be for interacting with human tools and environments or for experimental purposes, such as the study of bipedal locomotion, or for other purposes. Generally, humanoid robots have a torso, a head, two arms, and two legs, though some forms of humanoid robots may model only part of the body, for example, from the waist up. Some humanoid robots even have heads designed to duplicate human facial features like eyes and mouths.

Humanoid robotics is a very interesting field of study with its ability of getting information from its surroundings and carrying out physical work just like humans. The general concept of humanoid robots is using different type sensors to acquire information and performing different tasks based on the acquired information by using the facial expressive head, hands, body and legs. The study of humanoid robots has been started in the past four decades, from years to years, new technologies will be introduced to replace or advance from the old technologies. The recent developed humanoid robots are getting closer and closer to human behaviour. The popular humanoid robots are the ASIMO by Honda, HRP-4 by Kawada, a slim, fast and advanced robot developed by the Japanese government and Nao by Aldebaran, one among the cutest and most intelligent robots. All of these humanoid robots are acting like a humans.

## History of robots



**Figure 1.** Different Humanoid Robots

The first uses of robots were in factories as industrial robots. These industrial robots were fixed machines capable of producing tasks which allowed production with less human work. The industrial robots with artificial intelligence have been built since the 2000s. The earliest robots as we all know them were created within the early 1950s by George C. Devol, an inventor from Louisville, Kentucky. He invented and patented a reprogrammable manipulator called Unimate, from Universal Automation. For the subsequent decade, he attempted to sell his product in the industry, but did not succeed. In the late 1960s, businessman/engineer Joseph Engleberger acquired Devol's robot patent and was ready to modify it into an industrial robot and form a corporation called Unimation to supply and market the robots. For his efforts and success, Engleberger is known in the industry as "the Father of Robotics."

## II. Application Areas

Humanoid robot applications usually demand the robot be extremely smart. These are functionally oriented devices, built to perform sets of tasks instead of humans. They are autonomous systems capable of extracting information from their environments and using knowledge about the world and intelligence of their duties and proper governing capabilities.

### 1. Healthcare

Humanoid robotics in healthcare is rapidly developing. The use of tele-operated humanoid robots in healthcare represents an opportunity to help doctors, nurses and patients to ease the high risk of infectious disease transfer. There are children with autism, they may have difficulties in their daily activities e.g., communication, social interaction and imagination. Here, robots can be used as the therapeutic tool. Similarly, for the disabled and aging population, there is a need for robotics to tackle problems arising from their inability to relate effectively with their environment. Robots for executing patient-transfer tasks are needed in nursing care facilities and hospitals, assisting doctors and nurses.

Autism is a disease, which affects the child's ability to speak with those around them and develop mutual relations with them and hence it needs to have a quick and efficient treatment technique. Robots can be used for teaching children with Autism. NAO is such a humanoid robot which was successful in helping to teach children. NAO can speak 19 different languages. So, it can incorporate any lesson to supply classes in various languages like Arabic, English, French, German, etc. NAO can do activities like walking, standing up, sitting down, playing soccer, wandering, dancing, grasping simple objects, recognizing and identify people, understanding spoken words, confine sounds, and creating speech. Also, NAO is the most used humanoid robot for healthcare, research, and education.



Figure: NAO helping children Learn

## 2. Home applications

This is the era that people are busy with work and always leave their home unoccupied. So there is a need to have a robot to look after the house in absence. A system had been developed by researchers in Japan that enables users to control one or more humanoid robots in their houses remotely with a mobile phone or the internet. This helps the users to perceive the conditions at the robot's site. The users can pre-define some locations in the house and assign some operations to the robot, so that the humanoid robot can walk to the predefined locations and execute the tasks based on the user's requirement while the house is unoccupied.

## 3. Construction and industry

It is important in replacing humans with humanoid robots for dangerous jobs on the site. For example, construction machinery and equipment play an important role in many tasks at the site. Very often, human exposure is hazardous while operating the machinery and equipment. If a humanoid robot can control the machinery and equipment and also if the robot can be communicated from a remote site, then it will solve the problems of dangerous jobs. Humanoid robots play an important role in a disaster site where a construction machine is required to move away some big and heavy objects.

## 4. Military robots

Robots can bring into play in military & armed forces. This sort of robot consists of bomb discarding robots, various shipping robots, and exploration drones. Often robots at the beginning produced for military and soldiers purposes are often employed in enforcement, exploration and salvage, and other associated fields

## 5. Entertainment

Robots can be used behind the sets in movies and serials to manage the camera, provide special effects, etc. Robots also can be used to do stunt work that's very dangerous for humans but looks pretty cool in an action movie. Theme parks like Disney World also are using autonomous robots to improve the magical experience of their customers.

## 6.Underwater Exploration

Robots are an excellent option for exploring places that humans cannot reach easily, just like the depths of the ocean! There is extreme water pressure deep in the ocean which means humans cannot go that deep and machines such as submarines can only go to a certain depth as well. A deep underwater may be a mysterious place which will finally be explored using specially designed robots. These robots are remote-controlled, and that they can enter depths of the ocean to gather data and pictures about the water plant and animal life.

## 7.Customer Service

There are robots that are developed to seem exactly like humans. These robots can be primarily used in the field of customer service. One such example is Nadine, a humanoid robot in Singapore which will recognize people from previous visits, make eye contact, greet , continue chatting supported previous meetings, etc. Another such customer service robot is Junko Chihira in Japan, a humanoid robot performing at the tourist information center in Aqua City Odaiba, a shopping mall on Tokyo's waterfront.

### III. What's the Future Role for Humanoid Robots?

There will be a considerable increase in the number of robots over the next decade. According to the Boston Consulting Group, by 2025, robots will carry out 25% of all labor tasks. This is thanks to improvements in performance and reduction in costs. The US, along with Canada, Japan, South Korea, and the United Kingdom, will be leading the way in robot implementation. The four industries leading the charge are computer and electronic products; electrical equipment and appliances; transportation equipment; and machinery. They will have about 75% of all robotic installations by 2025.

The growth of robotics also will affect the industry . The service robot base is predicted to put in 264.3 million units by 2026. The robots within the industry broke down into the subsequent groups:

- Floor cleaning robots accounted for 80% of total service robots, with 23.8 million units
- Unmanned aerial vehicles accounted for 4 million units
- Automated lawn mower units tallied 1.6 million units
- Automated guided vehicles installed 0.1 million units
- Milking robotic units tallied to 0.05 million units

The remaining segments included humanoid robots, telepresence robots, powered human exoskeletons, surgical robots, and autonomous mobile robots. Combined, they were estimated to possess but 50,000 units installed.

Humanoid robots, while being one among the littlest groups of service robots within the current market, have the best potential to become the economic tool of the longer term . Companies like Softbank Robotics have produced human-looking robots to be used as medical assistants and teaching aids. Humanoid robots are excelling within the medical industry, especially as companion robots. University of Southern California Professor Maja Matarić has been working with assigning robots with patients since 2014. The robots helped children with autism copy the motions of socially assistive robots and, in 2015, the robots assisted stroke recovery victims with upper extremity exercises. The patients were more aware of the exercises when promoted and motivated by the robot.

### IV. India's 7 Humanoid Robots

**a. Manav:** Manav is India's first 3D-printed humanoid robot. The two-kilo, two-feet tall robot has an inbuilt vision and sound processing capability which allows it to steer , talk and dance — just in response to human commands.

**b. Mitra:** The first indigenously built humanoid robot is capable of interacting with humans smartly. The five feet-tall humanoid robot is formed of fibreglass and is programmed to greet customers using contextual help, autonomous navigation and facial and speech recognition

**c. Robocop:** Hyderabad-based AI and ML startup H-Bots Robotics has developed a police robot to help in handling the law, order, and traffic management. The life-sized robot, that was deployed last year in Hyderabad, is provided with cameras and an array of different sensors like ultrasonic, proximity and temperature sensors.

**d. KEMPA:** Passengers visiting Bengaluru airport may soon be greeted by a special robot assistant. It is built to suit the requirements of the Kempegowda International Airport, the small bot assistant, named KEMPA, will answer queries of puzzled passengers in English also as Kannada.

**e. RADA:** Vistara, a joint venture between Tata Sons and Singapore Airlines, has created a unique artificial intelligence-based robot called RADA to automate simple tasks and improve customer experience.

**f. IRA:** HDFC Bank has deployed a humanoid robot called IRA 2.0 (Intelligent Robotic Assistant) to guide and interact with customers at its Bengaluru branch. The humanoid will answer bank-related queries, commonly asked questions, and guide clients inside the branch using voice-based navigation.

**g. INDRO:** This is reportedly the tallest humanoid robot built in India. It is created by researcher Santosh Vasudeo Hulawale, INDRO is an autonomous robot was made inside a house with easily available low-cost material like aluminium, wood, cardboard, plastic etc

#### IV. Conclusion

As per Research and Predictions by 2025, AI and robotics will be integrated into nearly every aspect of most people's daily lives - from distant manufacturing processes to the most mundane household activities. By 2025, AI will be built into the algorithmic architecture of countless functions of businesses and communication, increasing relevance, reducing noise, increasing efficiency, and reducing risk across everything from finding information to making transactions.

Self-driving cars seem very likely by 2025. Natural language processing would lead to conversational interactions with computer-based systems. These technologies will be incorporated so completely as to be nearly indistinguishable to most users most of the time. Driving, transportation, and logistics will experience remarkable changes.

Advances in AI and robotics will be a lot of help for the elderly, disabled, and sick, also basic telemedicine applications/robots will serve a significant portion of healthcare needs for rural and poor populations by 2025.

#### References:

1. Chen-Hunt Ting, Wei-Hong Yeo, Yeong-Jin King, Yea-Dat Chuah, Jer-Vui Lee and Wil-Bond Khaw, Humanoid Robot: A Review of the Architecture, Applications and Future Trend, Research Journal of Applied Sciences, Engineering and Technology 7(7): 1364-1369, 2014
2. Azeta Joseph, Bolu Christian, Abioye A. Abiodun and Festus Oyawale, A review on humanoid robotics in healthcare, MATEC Web of Conferences 153, 2004 (2018)
3. Jabar H.Yousif, Hussein A Kazem, Miqdam T Chaichan, Evaluation Implementation of Humanoid Robot for Autistic Children: A Review, International Journal of Computation and Applied Sciences IJOCAS, Volume 6, Issue 1, February 2019
4. Cengiz Kahramana, Muhammet Deveci, Eda Boltürka, Seda Türkç, Fuzzy controlled humanoid robots: A literature review, Robotics and Autonomous Systems, Volume 134, December 2020, 103643.

## A BIBLIOMETRIC REVIEW OF SCIENTIFIC LITERATURE ON WOMEN ENTREPRENEURSHIP

---

**Dr. Swagatika Nanda**, Assistant Professor, [swagatika.nanda@vsit.edu.in](mailto:swagatika.nanda@vsit.edu.in)

Vidyalankar School of Information Technology, Mumbai

**Ms. Pooja Jogi**, Assistant Professor, [pooja.jogi@vsit.edu.in](mailto:pooja.jogi@vsit.edu.in)

Vidyalankar School of Information Technology, Mumbai

### **Abstract**

In recent years, the study of women entrepreneurship has felt significant growth, gaining a broad consensus among academics, and contributing above all to understanding all those factors that explain the complexity of women in undertaking an entrepreneurial career. This paper tries to contribute to the field of study, thanks to a systematic analysis through the publications present in the topic. The method involves a bibliometric approach where 1,347 peer-reviewed articles were analyzed, published between 1988 and 2020, using the Scopus database (SCImago Research Group). Using a series of bibliometric indicators, the current state of research on the international involvement is explained. The analysis revealed that it is a multidisciplinary field of study since ages, culminating in 2020, which makes it become a current and valid object of study. The analysis of the clusters allowed to isolate 6 different lines of research in which emerged, on the one hand, the importance of entrepreneurial education, social entrepreneurship, innovation and women entrepreneurship and the socio-cultural context of reference (e.g., culture, family, and institutional support) in studying challenges as well as discussed, the tools to overcome the gender gap. On the other hand, the importance that women entrepreneurship assumes in the economic growth of the country (especially in developing economies), promoting social inclusion and combating poverty and discrimination has become prominent in this discussion. The study presents an important contribution to reflect on current policies and to outline future lines of investigation.

**Keywords:** *Women; Entrepreneurship; Bibliometric Analysis; Scientific Literature Review*

### **Introduction**

Entrepreneurship is a field of research that has been of great interest to researchers, academicians, and policy makers. Entrepreneurship is substantially related to economic development of any economy by hastening growth and development Schramm (2006), and Baumol et al (2007). In the last few decades women as entrepreneurs are budding both in developed and developing economies. It is noticeable that women entrepreneurs contribute immensely to improved poverty levels, increased per capita income and employment creation Aguirre, D., et al (2012), Kumar, S. M. et al 2013, Ogidi, A. E. (2014). The question of gender gap in entrepreneurship is prevalent across countries. In almost all the countries there is a wide gap between entrepreneurial activities across both the genders (GEM 2015-16 Global Report). There is also a wide gap between entrepreneurial activity between male and females in Indian context.

A theoretical framework has been used to explain the challenges of women entrepreneurs in most of the relevant literatures in last couple of decades, (Dhameja 2002; Dhameja et al 2000; Gupta 2013; Shah 2013; ) to understand women's general attitude towards entrepreneurship for some insight on obstacles. innovation-driven economies, like Canada, women's perception of good opportunities around them is 39%. Less than 40 percent of women see entrepreneurial opportunities in their economies that motivate them to start a business. Poor perception of available opportunities and entrepreneurial capabilities can negatively impact entrepreneurial confidence. The second group of challenges will be access to resources (Cardon and Kick 2015). The most substantial challenge in starting a business female entrepreneurs report is the difficulty in 'finding the tools to grow and manage business.' The third category can be explained in terms of access to funding. women find it difficult to obtain financing during the early stages and continue to have challenges raising funds after their

business is established. Without easier access to funding, many businesses will not be able to sustain growth over time. (Denis 2004; Ueda 2002). In line with this reasoning, there is empirical evidence that a woman's decision to start a business depends on her socio-cultural background (Ahl, 2006).

### Objective of the Study

The purpose of the study is to address the gap in the literature about the role and challenges of women entrepreneurship at local and global level. This paper also aims at suggesting avenues for future research, implications for women entrepreneurship and implication for policy makers.

### Methodology

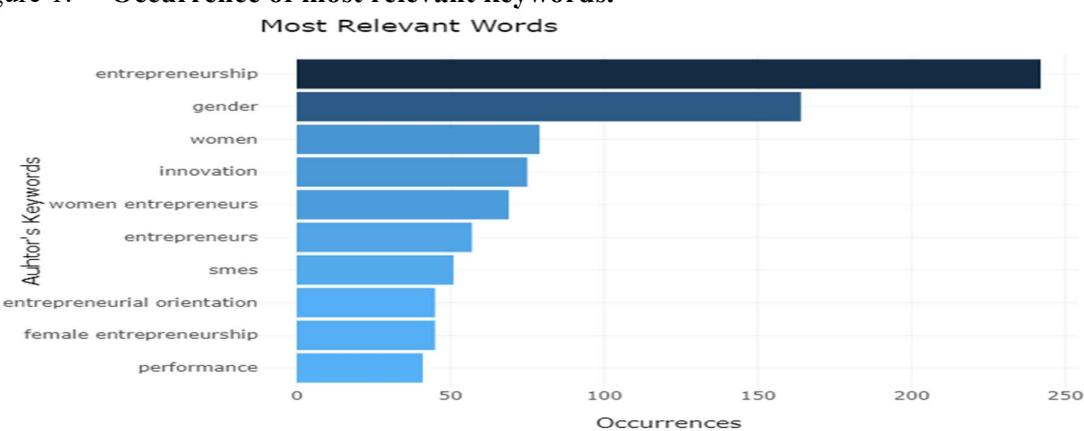
A systematic analysis of the literature has been adopted to contribute to the systematization of scientific production on the relationship between entrepreneurship and women. Scopus database is used to collaborate with the high quality of literatures. The data was collected from a variety of keywords such as entrepreneurs, women entrepreneurs, innovation, training, skill, business, family business, and other related words.

The analysis was carried out using descriptive statistics to describe the general panorama of female entrepreneurship. In addition, VOS viewer software version 1.6.10 (Van Eck and Waltman, 2010, 2014) was used, a bibliometric technique that allows the graphic representation, identification, and classification of groups in an associated strategic matrix based on similarities and differences (distance-based mapping). This method solves the subjectivity problem of different literatures using a standard qualitative analysis. Using the keywords used by the authors, it allows to reduce the alteration deriving from subjective variables. Additionally, the graphic creation of maps allows to examine the deep relationships between the variables, which helps to better understand the nature of a research field. (Vallaster et al., 2019), currently used (Martínez-López et al., 2018).

### Bibliometric Analysis

A citation analysis was conducted to identify great impact of authors and co-citation analysis was conducted in order to measure the similarity between authors, journals and countries. Keyword co-occurrence analysis was used to analyze the type and strength of the relationship between different fields of science. Table 1 reports the first 10 keywords that in our study had greater strength. The prominent keywords are entrepreneurship, gender, women innovation, women entrepreneurs, SMEs, Entrepreneurial orientation, female entrepreneurship, and performance.

Figure 1: Occurrence of most relevant keywords.



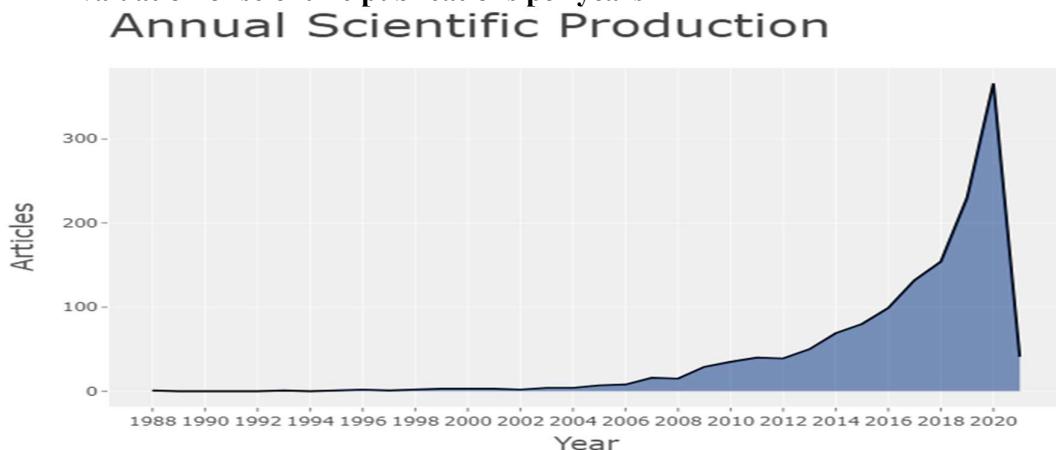
Source: VOS Viewer, Elaborated by the Author

### Evaluation of scientific publications per years

Figure 2 shows the progress of scientific research on entrepreneurship and women over the years. It is a research field that, studied for more than 70 years. This paper has taken 32 years into consideration registering a significant increase since 2007 (n= 15, n is no. of publication) and reaching the highest in 2019 (n = 380). This increase indicate a change in concern in scientific research and a incessant and

growing evolution of research in the field of female entrepreneurship. Hence, this proves a valid trend for female entrepreneurship.

Figure 2: Evaluation of scientific publications per years

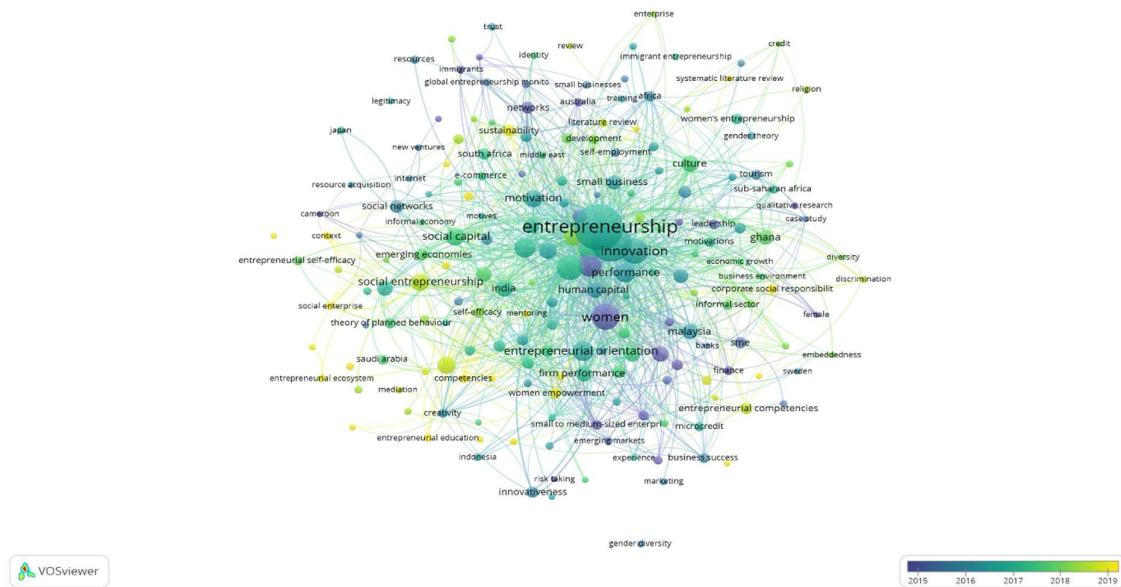


Source: VOS Viewer, Elaborated by the Author

## Overlay Visualization of co- occurrence analysis of authors keywords.

As a significant change is visible from past few years in terms of interest in female entrepreneurship, international research observes the financing and capitalization of women's businesses (the keywords in purple: performance, entrepreneurial orientation, small and medium size enterprise), there has been a growing emphasis on more sensitive issues that place the need to study women's entrepreneurship as a separate field of research, with an emphasis on factors that differentiate them from its male counterpart and that allow overcoming the male-female gap in entrepreneurship (the keywords in yellow: social networks, competencies, culture, entrepreneurship education, women empowerment, social entrepreneurship). In fact, the relative emphasis on education, empowerment, family, social entrepreneurship, culture highlights the effort of researchers in analysing that set of contextual and socio-psychological factors to allow the desired change. The keywords in green imply Innovation , global entrepreneurship, planned behaviour, etc.

**Figure 3 : Overlay Visualization of co- occurrence analysis of authors keywords.**

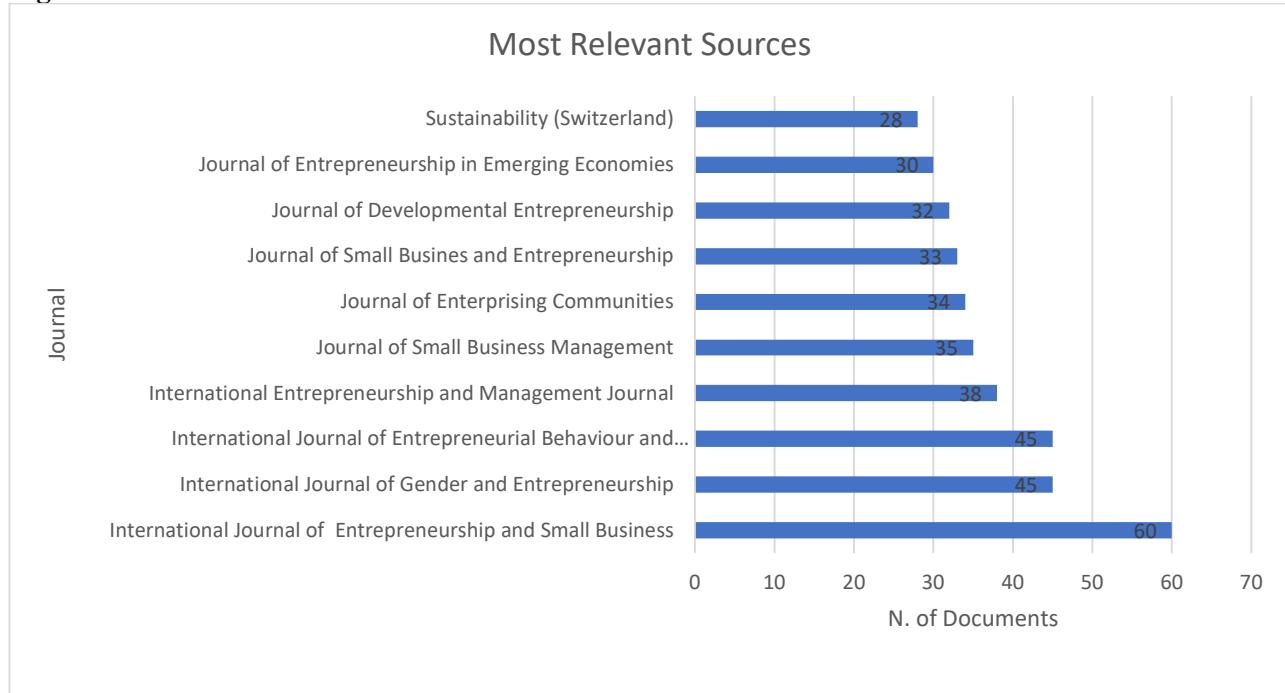


Source: VOS Viewer, Elaborated by the Author

## Relevant Sources of Literatures

Figure 4 identifies the journals which are relevant sources of the growing literature in women entrepreneurship. The top ten journals who have emphasized more on Challenges of women, training of women entrepreneurs, small business management are International Journal of Entrepreneurship and Small Business (n=60), International Journal of Gender and Entrepreneurship (n=45), International Journal of Entrepreneurial Behaviour and Research (n=45), International Entrepreneurship and Management Journal (n=38), Journal of Small Business Management (n=35), Journal of Enterprising Communities (n=34), Journal of Small Business and Entrepreneurship (n=33), Journal of Developmental Entrepreneurship (n=33), Journal of Entrepreneurship in Emerging Economies (n=30), and Sustainability (Switzerland) (n=28). In addition, the analysis of the research areas further clarifies the nature of the journals, underlining how these investigative lines have been treated from different perspectives.

**Figure 4 : Most relevant sources**



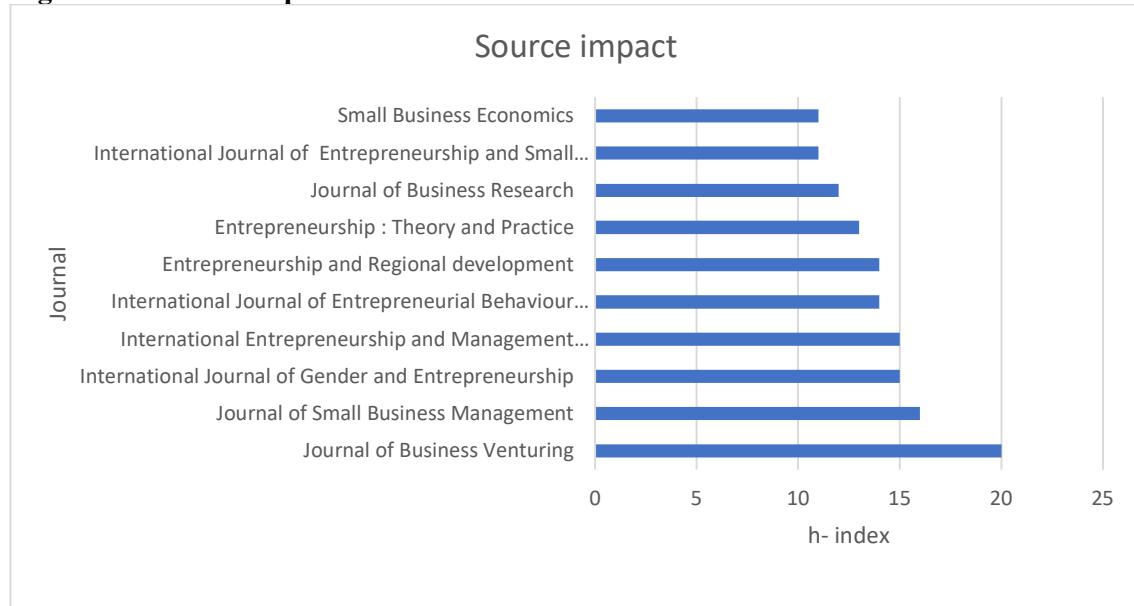
Source: VOS Viewer, Elaborated by the Author

## Source Impact of Literatures related to Women Entrepreneurship

The huge extent of literatures on entrepreneurship has grabbed attention of many authors, countries, and many journals. The journals containing referred literatures have a decent level of impact factor. Source impact has been measured by h-index. The h-index is defined as the maximum value of h such that the given author/journal has published h papers that have each been cited at least h times. The index is designed to improve upon simpler measures such as the total number of citations or publications.

Figure 5 shows the journal having the maximum h-index is Journal of Business Venturing (n=20), Journal of Small Business Management (n=16), International Journal of Gender and Entrepreneurship (n=15), International Entrepreneurship and Management Journal (n=15), International Journal of Entrepreneurial Behaviour and Research (n=14), Entrepreneurship and Regional development (n=14), Entrepreneurship : Theory and Practice (n=13), Journal of Business Research (n=12), International Journal of Entrepreneurship and Small Business (n=11), and Small Business Economics (n=11).

**Figure 5 : Source Impact**



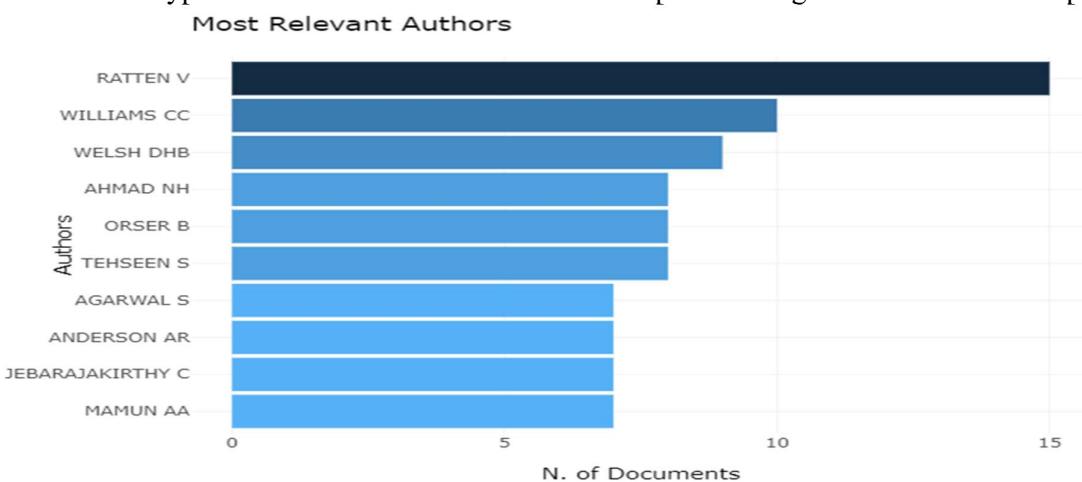
Source: VOS Viewer, Elaborated by the Author

#### Relevant Scientific Authors

Ratten V (2014) examined the current challenges of collaborative entrepreneurship in developing countries by considering how collaborative entrepreneurship differs depending on a country's level of economic and social development. Williams CC and Gurtoo (2011) has emphasized the women engaged working in low quality work conducted under poor conditions for low pay in absence of alternative means of livelihood. The conditions are critically evaluated in informal economy. Welsh (2006) mentioned women business owners as driving force both in terms of numbers and gross revenues. The authors also identified different methods of applying this knowledge to the specificity of emerging entrepreneurial culture. Ahmad (2010) discussed Entrepreneurial competencies are associated with the entrepreneurs' ability to be innovative, creativity, be able to identify opportunities, identify strengths and weaknesses and defined entrepreneurial competencies as the total ability of an entrepreneur to perform their role successfully.

#### Figure 6 : Most relevant Authors

The scientific authors have published on the topic of female entrepreneurship have focused on three investigative lines: obstacles to female entrepreneurship, the relationship between culture, gender roles and stereotypes and the role of human and social capital in the growth of female enterprises.

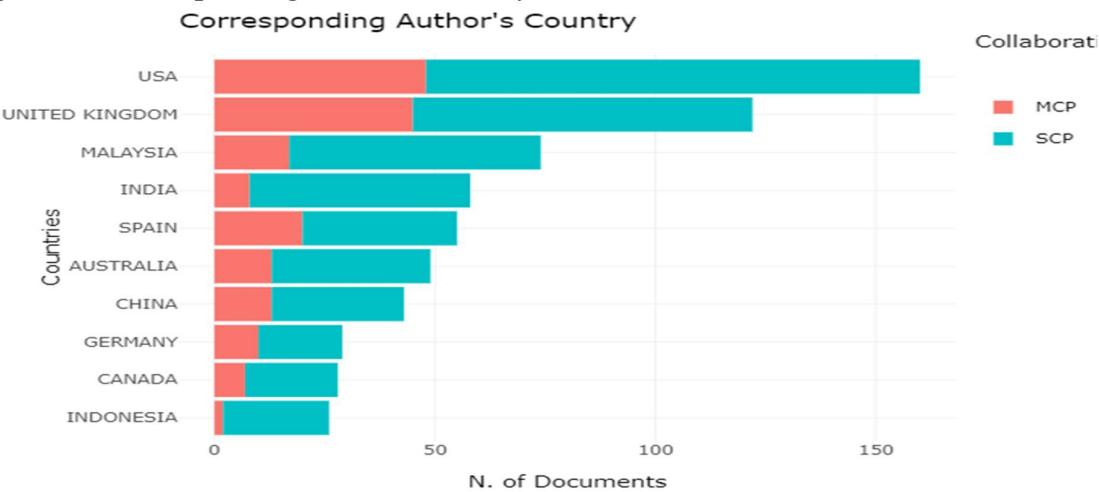


Source: VOS Viewer, Elaborated by the Author

## Country Analysis

With respect to the country with the most scientific contributions, the analysis showed that the United States is the nation with the greatest scientific interest, with 170 published articles, followed by the United Kingdom (n = 93), Malaysia ( n=75 ), India (n = 60), Spain (n = 55), and Australia (n = 50). This result, in line with previous systematic reviews (Hallinger and Chatpinyakoop, 2019), creates a strong geographical imbalance and represents a gap in the literature that should be filled.

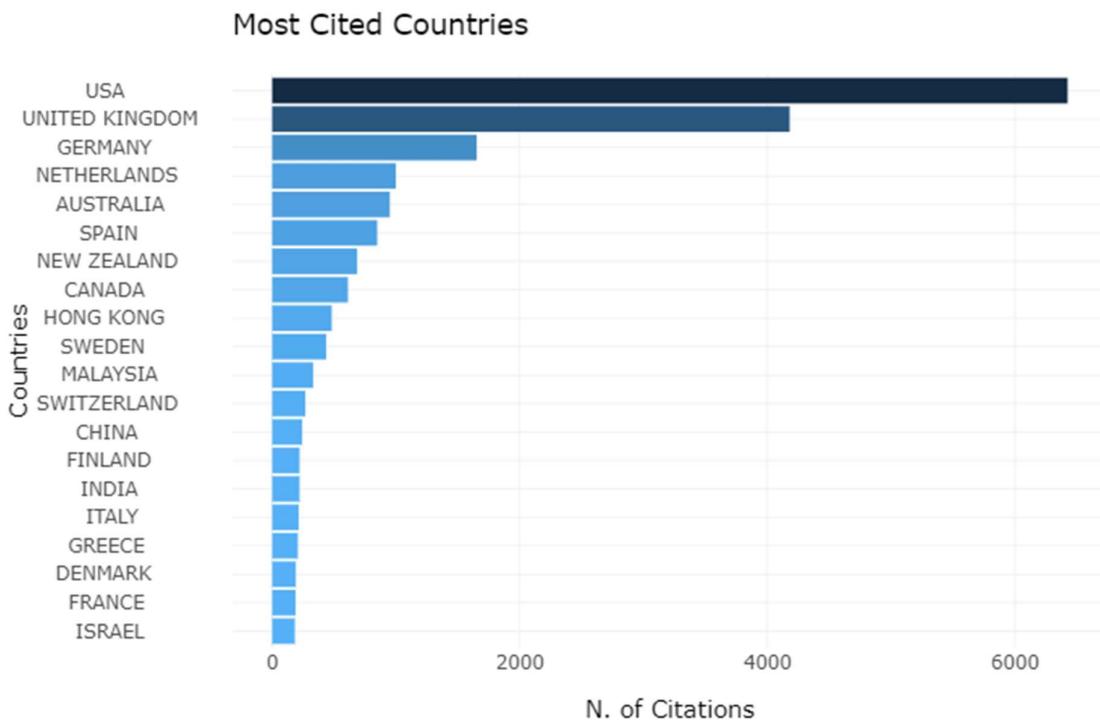
**Figure 7 : Corresponding Author's country**



Source: VOS Viewer, Elaborated by the Author

With respect to the country cited in different scientific contributions, the analysis showed that the United States is the nation which are with the greatest citation, with almost 7000 published articles, followed by the United Kingdom (n = 4200), Germany (n=1800), Netherland (n=1000) Australia (n = 990), Spain (n = 985), and India (n = 200).

**Figure 8 : Most cited countries**



Source: VOS Viewer, Elaborated by the Author

## Conclusion

This article examines the progress in the literature about women's entrepreneurship and internationalization, more studies are needed to increase the research potential of this field. Based on our findings, we argue different cultural contexts are important for determining the role of women entrepreneurs in the international market. Our discussion shows there are different motivations for women entrepreneurs internationalizing their business that depends on their country of origin. Therefore, future research needs to consider the different reasons why women need to focus on the inter-national market. We advise more research is needed to identify whether stereotypes such as religion are a hindrance or a western view of religious impact. A contextual approach to women's entrepreneurship that considers a country-by-country approach should be used (Berger & Kuckertz, 2016). This will enable different countries to assess in terms of how women are utilizing social networks to help them gain entry to other countries (Jennings & Brush, 2013). Potential research should explore the more positive aspects of the contribution of women entrepreneurs to the internationalization of both small and large organizations. This study has limitations that are also common to other research due to the methodology requiring specific time considerations. Even though we focused on analyzing the literature on women's entrepreneurship and internationalization, there is still a bias toward journal articles in the sample that means other types of articles could be further analyzed in future research. We under took a longitudinal analysis of how women's entrepreneurship and internationalization is changing but different types of methodologies such as case studies could be useful to triangulate the findings.

## References

1. Ahl H. (2004). *The Scientific Reproduction of Gender Inequality; A Discourse Analysis of Research Texts on Women's Entrepreneurship*. Copenhagen: Copenhagen Business School Press. [\[Google Scholar\]](#)
2. Ahl H. (2006). Why research on women entrepreneurs needs new directions. *Entrepreneurship* 30, 595–621. 10.1111/j.1540-6520.2006.00138.x [\[CrossRef\]](#) [\[Google Scholar\]](#)
3. Ahmad, N. H., Ramayah. T., Wilson, C. & Kummerow, L. (2010). Is entrepreneurial competency and business success relationship contingent upon business environment? *International Journal of entrepreneurial Behaviour & Research*, 16(3), 182-203
4. Anwar, MU & Rashid, AG. (2011). Female Entrepreneurs- A Review of the Literature and Proposed Conceptual Framework.
5. Berger, Elisabeth S.C. and Kuckertz, Andreas, Female Entrepreneurship in Startup Ecosystems Worldwide (March 1, 2016). *Journal of Business Research*. Vol. 69, No. 11, pp. 5163-5168, 2016, Available at SSRN: <https://ssrn.com/abstract=2779709>
6. Bruni, A., Gherardi, S. and Poggio, B. (2004). Entrepreneur-mentality, gender and the study of women entrepreneurs. Emerald Group.
7. Cooper, A. C, Woo, C. Y., & Dunkelberg, W. C. (1989). Entrepreneurship and the initial size of firms. *Journal of Business Venturing*, 4(5), 317–332.
8. Drucker, P. (1985). *Innovation and Entrepreneurship; Practice and Principles*. Dubini, P. (1988). The Influence of Motivations and Environment on Business Startups: Some Hints for Public Policies. *Journal of Business Venturing*, 4, 11-26
9. Jennings, J.E. and Brush, C. (2013), “Research on women entrepreneurs: challenges to (and from) broader entrepreneurship literature?”, *The Academy of Management Annals*, Vol. 7 No. 1, pp. 661-713.
10. Martínez-López F. J., Merigó J. M., Valenzuela-Fernández L., Nicolás C. (2018). Fifty years of the European journal of marketing: a bibliometric analysis. *Eur. J. Marketing* 52, 439–468. 10.1108/EJM-11-2017-0853 [\[CrossRef\]](#) [\[Google Scholar\]](#)

11. Neneh N. B. (2018). Family-work conflict and performance of women-owned enterprises: the role of social capital in developing countries-implications for South Africa and beyond. *J. Intern. Women's Studies* 19, 326–343. Available online at: <https://vc.bridgew.edu/jiws/vol19/iss6/21> [Google Scholar]
12. Ratten, V. (2014), "Encouraging collaborative entrepreneurship in developing countries: the current challenges and a research agenda", Journal of Entrepreneurship in Emerging Economies, Vol. 6 No. 3, pp. 298-308. <https://doi.org/10.1108/JEEE-05-2014-0015>
13. Van Eck N. J., Waltman L. (2010). Software survey: vosviewer, a computer program for bibliometric mapping. *Scientometrics* 84, 523–538. 10.1007/s11192-009-0146-3 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
14. Van Eck N. J., Waltman L. (2014). Visualizing bibliometric networks, in *Measuring Scholarly Impact: Methods and Practice*, eds Ding Y., Rousseau R., Wolfram D. (Cham: Springer; ), 285–320. 10.1007/978-3-319-10377-8\_13 [CrossRef] [Google Scholar]
15. Watson J., Robinson S. (2003). Adjusting for risk in comparing the performance of male- and female- controlled SMEs. *J. Business Venturing* 18, 773–788. 10.1016/S0883-9026(02)00128-3 [CrossRef] [Google Scholar]
16. Welsh, D.H.B., & Dragusin, M. (2006, June). Women-entrepreneurs: A dynamic force of the small business sector. *Amfiteatru Economic*, 20, 60-68.
17. Williams. C C and Gurtoo. A. (2011),"EVALUATING WOMEN ENTREPRENEURS IN THEINFORMAL SECTOR: SOME EVIDENCE FROM INDIA", *Journal of Developmental Entrepreneurship* Vol. 16, No. 3 (2011) 351–369

# CONSUMER BUYING BEHAVIOUR DETECTION IN ONLINE SHOPPING USING RANDOM FOREST CLASSIFIER

**Ms. Swapna Kadam**, Research Scholar, JJTU, Assistant Professor, Information Technology  
Vidyalanakar School of Information Technology

**Dr. Sarika Chouhan**, Ph.D Co-Guide, JJTU, Assistant Professor, Information Technology,  
Vidyalanakar School of Information Technology

## ABSTRACT

Consumer Analytics is one among the hottest areas for the appliance of information science in the modern world. Consumer behavior is identified by people's temperament and character. These personality characters vary from person to person. The character includes quality, motivation, occupation and income level, perception, psychological, temperament, reference teams and demographic reasons learning, beliefs, attitude, Culture and social factors. In order to require advantage of accessible information, modern businesses would like the analytics tools that will give them with the insight they have to deliver a customized consumer expertise. In our paper, we are going to explore a machine learning algorithm called Random Forest Classification. Classification algorithm can increase understanding of the Consumer behaviour and improve marketing and engagement strategy for Retailers.

**Keywords:** Consumer Behaviour, Random forest classification, Machine Learning, Online shopping, Data Mining.

## 1. INTRODUCTION

There are a number of approaches and strategies to be used for Consumer behavior research. Client Whoever visits shopping websites online leaves significant Details on the server side when they login. This, Valuable data is used to assess the organization performance. The behaviour of the potential consumer is predicted by analysing past data from the consumer. The profile is created by entering the data given by the consumer when they visit the sites. Data mining software analyses relationships among patterns based on the customer request. There is a huge amount of data available in the information industry. This data is of no use until it is converted into useful information. It is necessary to analyse this huge amount of data and extract useful information from it.

Classification may be a data processing function that assigns items during a collection to focus on categories or classes. The goal of classification is to accurately predict the target class for every case within the data. The only sort of classification problem is binary classification. In binary classification, the target attribute has only two possible values: for instance, high credit rating or low credit rating. Multiclass targets have quite two values: for example, low, medium, high, or unknown credit rating. Within the model build (training) process, a classification algorithm finds relationships between the values of the predictors and therefore the values of the target. Different classification algorithms use different techniques for locating relationships. These relationships are summarized during a model, which can then be applied to a special data set in which the category assignments are unknown.

Random forest is a supervised learning algorithm which is used for both classification as well as regression. But however, it is mainly used for classification problems. As we know that a forest is made up of trees and more trees means more robust forest. Similarly, random forest algorithm creates decision trees on data samples and then gets the prediction from each of them and finally selects the best solution by means of voting. It is an ensemble method which is better than a single decision tree because it reduces the over-fitting by averaging the result.

## 2. OBJECTIVE

1. To understand consumer buying behavior in online shopping.
2. To improve the efficiency and analyzing the consumer behavior using Random forest algorithm.

## 3. LITERATURE REVIEW

**Xiaohua Hu et. al., (2005)** had proposed a datamining approach for retailing bank customer attrition analysis. In this paper, he presented a data mining approach for analysing retailing bank customer attrition.

**Mahendra Pratapet.al.,(2012)** developed a mining of the customer behavior using web usage in e-commerce. The main purpose of this paper is to study the customer's behavior using the Web mining techniques and its application in e-commerce to mine customer behavior

**Masud Karim et. al., (2013)** had developed algorithms like decision tree and naive bayes for classification and generation of actionable knowledge for direct marketing. The goal of this work is to predict whether a client will subscribe a term deposit. UC data is used to train and test the performance of the algorithms.

**Neeraj Sharma et.al.,(2013)** had proposed data mining as a tool to predict the churn behavior among Indian bank customers. The customer churn is a common measure of lost customers. By minimizing customer churn company can maximize its profits. Companies have recognized that existing customers are most valuable assets.

**R.Roselin et.al.,(2014)** developed customer behavior analysis for credit card proposers based on data mining techniques. This study investigates the shift of consumers towards the use of plastic money, with emphasis on credit cards.

**Maheshwari. K et. al., (2017)** had developed predicting customer behavior in online shopping using SVM classifier. In this paper, the dataset is used to analyze and categorize the customer based on their purchase behavior. The classification is performed by SVM algorithm. The inventory data set and sales data set which is available in the internet is used in this work and the performance is evaluated by using the algorithms.

## 4. METHODOLOGY

Random Forest Algorithm for analysing the Consumer behavior. The Working process can be explained in the below steps and diagram:

**Step-1:** Select random K data points from the training set.

**Step-2:** Build the decision trees associated with the selected data points (Subsets).

**Step-3:** Choose the number N for decision trees that you want to build.

**Step-4:** Repeat Step 1 & 2.

**Step-5:** For new data points, find the predictions of each decision tree, and assign the new data points to the category that wins the majority votes.

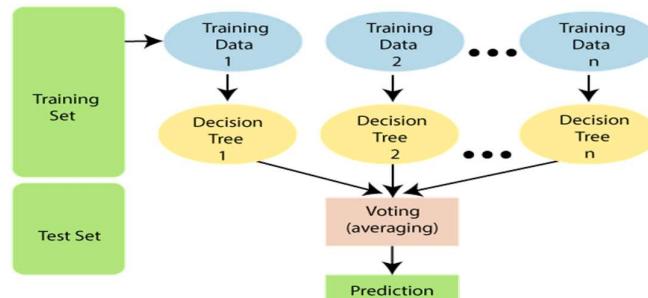


Fig. 1: Random Forest Algorithm

Source: <https://www.javatpoint.com/machine-learning-random-forest-algorithm>

#### 4.1 WORKING OF ALGORITHM

**Step 1:** The data is taken in the form of csv file. (dataset.csv)

**Step2:** After the input dataset is given, the data will be preprocessed by Removing Null values from a data frame and replace NaN values with default values.

**Step3:** After the preprocessing, the data is scaled to a fixed range - usually 0 to 1.

**Step4:** Now we need to split our dataset into two sets a Training set and a Test set. We will train our machine learning models on our training set.

**Step5:** Now to build our training and test sets, we will create 4 sets— X\_train (training part of the matrix of features), X\_test (test part of the matrix of features), Y\_train (training part of the dependent variables associated with the Xtrain sets same indices), Y\_test (test part of the dependent variables associated with the Xtest sets, and therefore also the same indices).

**Step 6:** The prediction class is given to the model with the input data instances. To classify the data, we took Random Forest Classifier ()

**Step 7:** we now will see the accuracy of Random Forest classifiers from the above results.

#### 4.3 RESULTS & FINDINGS

Survey of 143 people done for above analysis using questionnaire method, after that result were tested in weka data mining tool.

##### Confusion Matrix:

- The confusion matrix provides us a matrix/table as output and describes the performance of the model.
- It is also known as the error matrix.
- The matrix consists of predictions result in a summarized form, which has a total number of correct predictions and incorrect predictions. The matrix looks like as below table.

		Actual Values	
		Positive (1)	Negative (0)
Predicted Values	Positive (1)	TP	FP
	Negative (0)	FN	TN

Fig. 2: Confusion Matrix

Source: <https://towardsdatascience.com/understanding-confusion-matrix-a9ad42dcfd62> |

##### ==== Summary ===

Correctly Classified Instances	127	91.3669 %
Incorrectly Classified Instances	12	8.6331 %
Kappa statistic	0	
Mean absolute error	0.186	
Root mean squared error	0.2958	
Relative absolute error	113.9173 %	
Root relative squared error	105.1787 %	
Total Number of Instances	139	
Ignored Class Unknown Instances	2	

Table 1: Do you do online shopping?

##### ==== Confusion Matrix ===

a	b	<-- classified as
127	0	a = Yes
12	0	b = No

Correctly Classified Instances	68	48.9209 %
Incorrectly Classified Instances	71	51.0791 %
Kappa statistic	0.039	
Mean absolute error	0.4107	
Root mean squared error	0.4613	
Relative absolute error	98.7178 %	
Root relative squared error	101.1932 %	
Total Number of Instances	139	
Ignored Class Unknown Instances	2	

*Table 2: How often do you do online shopping?*

**==== Confusion Matrix ====**

a	b	c	<-- classified as
65	2	1	a = Frequently or at least once a month
38	1	5	b = Once in six month
25	0	2	c = Once a year

*Table 3: What is your Occupation*

Correctly Classified Instances	121	85.8156 %
Incorrectly Classified Instances	20	14.1844 %
Kappa statistic	0.4921	
Mean absolute error	0.0907	
Root mean squared error	0.1846	
Relative absolute error	76.9566 %	
Root relative squared error	78.2537 %	
Total Number of Instances	141	

**==== Confusion Matrix ====**

a	b	c	d	e	f	<-- classified as
112	0	0	2	0	0	a = Employee
6	6	0	1	0	0	b = Student
2	1	0	0	0	0	c = Other
3	3	0	3	0	0	d = Professional
0	0	0	1	0	0	e = Businessman
1	0	0	0	0	0	f = Self employed

*Table 4: What is monthly income*

Correctly Classified Instances	78	75	%
Incorrectly Classified Instances	26	25	%
Kappa statistic	0.4865		
Mean absolute error	0.1739		
Root mean squared error	0.2818		
Relative absolute error	77.1837 %		

Root relative squared error	84.7871 %
Total Number of Instances	104
Ignored Class Unknown Instances	37

==== Confusion Matrix ====

a	b	c	d	e	<-- classified as
65	2	0	0	0	a = Less than 20,000
7	3	1	1	0	b = 20,000 to 40,000
2	1	2	2	0	c = More than 1,00,000
1	1	0	8	0	d = 60,000 to 80,000
4	1	0	3	0	e = 40,000 to 60,000

Table 5: What product do you normally purchase online?

Correctly Classified Instances	14	10	%
Incorrectly Classified Instances	126	90	%
Kappa statistic	0		
Mean absolute error	0.0214		
Root mean squared error	0.1033		
Relative absolute error	100	%	
Root relative squared error	100	%	
Total Number of Instances	140		
Ignored Class Unknown Instances	1		

==== Detailed Accuracy By Class ====

Class	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area
Books	0.000	0.000	0.000	0.000	0.000	0.000	0.143	0.017
Electronics	0.000	0.000	0.000	0.000	0.000	0.000	0.497	0.070
Cloths	1.000	1.000	0.100	1.000	0.182	0.000	0.402	0.085
Foods	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.007
Automobiles	0.000	0.000	0.000	0.000	0.000	0.000	0.141	0.021
Sports	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.007

## CONCLUSION

From the experimental results, we found that demographic factors like age, occupation monthly income has impact on buying behaviour of consumer. Brand behaviour, pricing and availability are considered an important factor for the consumer while purchasing the product online. Age group of 20-30 yrs. is more active in online shopping and as compared to other age groups. Though the findings offer some new insights to many stakeholders in India who are in business of online and offline retailing, the research has its own limitations. In this paper Only 153 observations were taken and we could not have the data for all the strata of the society. . The study was limited to Indian market and so generalisation of the results are difficult. Future studies can minimise this by testing the predictability of methods using cross-country comparison the results of this approach are analysed with other classification methods as a future work.

## REFERENCES

1. Masud Karim, Rashedur M. Rahman J, "Decision Tree and Naïve Bayes Algorithm for Classification and Generation of Actionable Knowledge for Direct Marketing", Journal of Software Engineering and Applications, 2013, 6, 196.

- 2.Yadav, Mahendra Pratap, MhdFeeroz, and Vinod KumarYadav. "Mining the customer behavior using web usagemining in e- commerce." ICCCNT, 2012 ThirdInternational Conference on, pp. 1-5. IEEE,2012.
- 3.RanveetKaur,SarbjeeetSingh,"Asurveyofdata miningand social network analysis basedanamolydetectionTechniques", Egyptian Informatics Journal,productionand hosting by Elsevier,2016,17,199-216.
- 4.Xiaohua Hu, (2005) A Data Mining Approach forRetailingBankCustomerAttritionAnalysis. *AppliedIntelligence*. Vol. 22, pp. 47–60.[2]
- 5.E.W.T. Ngai, Li Xiu. D.C.K. Chau, (2009) Application of data miningtechniques in customer relationship management: Aliterature review and classification. *Expert Systems withApplications*. Vol. 36, pp. 2592– 2602.
- 6.ManjitKaur,Dr.KawaljeetSingh and Dr.Neeraj Sharma,“Data Mining as a tool to Predict the ChurnBehaviouramong Indian bank customers”,*InternationalJournalonRecentand Innovation Trends in Computing andCommunication*, September 2013 ISSN: 2321-8169, Volume:1,Issue:9,pp:720–725.
- 7.Rana Alaa El-Deen Ahmeda, M.ElemamShehaba, Shereen Morsya and NermeneMekawiea, “PerformanceStudy of Classification Algorithms for Consumer OnlineShopping Attitudes and Behavior Using Data Mining”,(CSNT), 2015 Fifth International IEEEConferenceon4-6April2015,Electronic ISBN: 978-1-47991797-6,Printon Demand(PoD) ISBN:978-1-4799-1798-3.
- 8.Maheswari, K., and P. PackiaAmuthaPriya. "Predicting customer behavior in online shopping using SVM classifier." 2017 IEEE International Conference on Intelligent TechniquesinControl,OptimizationandSignal Processing (INCOS). IEEE,2017.
- 9.He, Benlan, et al. "Prediction of customer attrition of commercial banks based on SVM model." *ProcediaComputerScience* 31 (2014): 423-430.
- 10.Kim, Gitae, Bongsug Kevin Chae, and David L. Olson. "A support vector machine (SVM) approach to imbalanced datasets of customer responses: comparison with other customer responsemodels." *ServiceBusiness* 7.1(2013): 167-182.
- 11.“Student Placement Analyzer: A Recommendation System Using Machine Learning” 2017 International Conference on advanced computing and communication systems (ICACCS-2017), Jan 06-07,2017, Coimbatore, INDIA.
12. “Prediction Model for Students Future Development by Deep Learning and TensorFlow Artificial Intelligence Engine” 2018 4th IEEE International Conference on Information Management.
- 13.B.Pavani, A.Siva Nandini, B.Thanuja, D. Sai Hasitha. “ANALYSING CUSTOMER BUYING BEHAVIOUR IN ONLINE SHOPPING USING RANDOM FOREST CLASSIFIER” 2020 International Research Journal of Engineering and Technology (IRJET), Volume: 07 Issue: 05 | May 2020.

## AN INTELLIGENT AID: FACE MASK FOR SAFAI KARAMCHARIS

**Spruha S More** Asst. Professor, IT, Vidyalankar School of Information Technology, Wadala.

**Snehal Tandale** Asst. Professor, IT, Vidyalankar School of Information Technology, Wadala.

### ABSTRACT

A lot of gases are produced due to bacteria breakdown through organic waste. The increase in gas discharge has created a ultimatum threat against human health. Safai Karamcharis are the one who have been greatly affected by these gases. No proper safety measures are given to the one who are helping keep our country clean and green. Even if safety measures are provided, they are not sufficient for all the safai Karamcharis. To protect them from these harmful diseases which are caused due to gases we have proposed an idea of making an intelligent mask. This mask will be cost effective and hence can be made available to all the safai Karamcharis so that they don't have to lose their lives.

**Keywords:** *Safaikaramcharis, SwachhBharatAbhiyan, dumpingground, sensors, air purifier, face mask*

### 1. INTRODUCTION

The Prime Minister of India, Shri Narendra Modi has launched Swachh Bharat Abhiyan which is one of the most outstanding campaign started by the Government of India. The safai Karamcharis of India are safeguarding Clean India. The Safai Karamcharis are the people who are employed as sweepers, cleaning workers. The one who are keeping our country clean are suffering from extreme serious conditions or dying. Tuberculosis, Upper tract respiratory problems accounts for more death in Safai Karamcharis. They collect garbage from public dustbins, lying on roads and from various other places. The Public dustbins are filling faster and sometimes they are overflowing before collected. [1] [2] During monsoons, when the streets are flooded, the garbage lying on the road mix with the water and spreads various diseases. The safai Karamcharis works round the clock to bring cities on feet. They firstly collect garbage from various places across the city and then load it into municipal trucks. These trucks containing garbage are taken to dumping grounds across the city. These Karamcharis almost spend around 6 hours at the dumping ground. The dumping Ground generates While these karamcharis are performing the task, no proper facilities are provided to them. No protective clothing, protective kits, water, or soap for cleaning themselves are available to them.

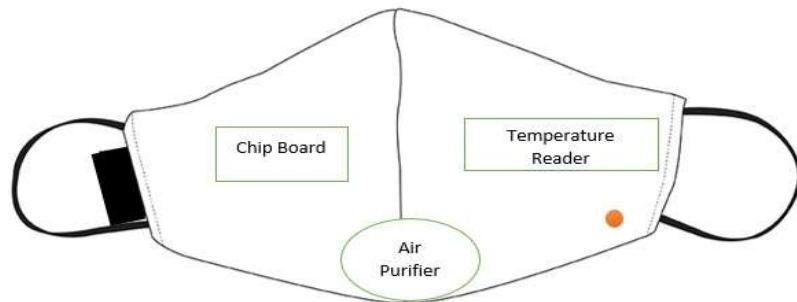
### 2. INTELLIGENT MASK

While passing through the road we often see the pile of garbage, this garbage contains numerous decaying substances such as diapers, rotting fish, meat and vegetables, expired products and many more such things. Bacteria which are present in the air, and in the garbage also, degrade the garbage, while degrading, it releases different gases such as ammonia, carbon dioxide and methane. Beside this, sometime contents in the garbage react with each other and releases gases such as oxides of sulphur and nitrogen. [3] All these gases are very dangerous. Now how safai karamcharis works in such environment. They clean all the garbage with their hands. Just imagine how risky it is. It is their work profile only to clean the garbage and make city "Swachh" but what about their protection. Majority of safai karamcharis are on contract basis, they will get compensation only when they are on duty.

Here we are presenting the idea of Intelligent mask, we are saying it intelligent because not only it detects the presence of harmful gases but also protect life of Safai Karamcharis.

This mask is composed of several layer. In between the layers we have placed one smart board which consist of multiple sensors like temperature sensors, air quality sensor, air purifier module as well as one alarm system.

### 3. MODULE DESCRIPTION



**Temperature sensors:** It is a contact type temperature sensor, it collects signals from the face surface and display the result in the display device. [4] Reason for implementing temperature sensor is to ensure that the working Safai Karamchari is well, not suffering from fever and it will be fine if he works today.

**Air quality gas sensor:** The working environment of Safai Karamchari is full of poisonous gases, it is very important to check the level of all gases to make it sure that whether it is safe to go and work there [5].

**Air purifier module:** As we know that most of Safai Karamchari suffers from Tuberculosis, cardiac problems, upper tract respiratory problems. It is very important that they breathe pure air. For the same we must implement this module.

**Alarm System:** It has one alarm sensor also which is connected to the mobile number. In case the sweeper is ill having problem in breathing, with the help of this sensor he will send notification to the linked mobile number.

Important thing is that we can wash this mask as and when required like a normal mask. Only we need to remove the chip from the mask. As the circuit board is inserted in one of the layers of the mask, user can easily remove it and place it easily after wash.

### 4. COST FOR IMPLEMENTING MODEL

Particular	Amt (₹)	Amt (₹)
<b>Required Equipment / Materials</b>		
Temperature sensor	200	
Air purifier	100	
Air Quality sensor	400	
Mask making	100	
Alarm System	100	
		900
<b>Total Cost</b>		<b>900</b>

Table 1

## 5. CONCLUSION

For the successful implementation of this module requires careful planning, economic and financial analysis, effective design. Instead of giving compensation after the death it will be good if we put efforts in protecting them by providing them such a mask which not only protect them but inform them also about the environment in which they are working.

## References

- [1] E. Labs, “Overflowing garbage bins: 5 impacts on health and environment, and how to prevent,” no. 3, 8 july 2016
- [2] T. o. India, “Safai karamcharis face health hazards,” TOI, Jun 13, 2007, 03:58 IST.
- [3] T. o. I. India, “High death rate among BMC’s clean-up staff,” Bhavika Jain, 09 Apr 2019.
- [4] [https://robu.in/product/grove-i2c-high-accuracy-temperature-sensormcp9808/?gclid=EAIaIQobChMI8PSqn\\_3p7gIVhq6WCh06bQz6EAQYAiABEgIfB\\_D\\_BwE](https://robu.in/product/grove-i2c-high-accuracy-temperature-sensormcp9808/?gclid=EAIaIQobChMI8PSqn_3p7gIVhq6WCh06bQz6EAQYAiABEgIfB_D_BwE), “ROBU.In”.
- [5] <https://www.amazon.com/Dioxide-Detection-Quality-Detecting-CJMCU-811/dp/B084F944DK>, “Amazon”.

## SYSTEMATIC REVIEW ON DATA MINING AND MACHINE LEARNING ALGORITHMS FOR ANALYSING STUDENT'S PERFORMANCE

**Pallavi Devendra Tawde**, Research Scholar, JJT University, [Pallavi.tawde09@gmail.com](mailto:Pallavi.tawde09@gmail.com)  
**Dr. Yogesh Kumar Sharma**, Research Guide, JJT University, [dr.yogeshkumar@yahoo.in](mailto:dr.yogeshkumar@yahoo.in)

### ABSTRACT

Institution's performance is often measured by the success of its students. It is an important indicator of education institution success. Students are often associated with same institution for a long period and hence institution has sufficient duration to identify strong and weak points of its student. It is extremely important for the institution to detect improvement areas of student at early stage of their education career. This gives institution enough time to draft and implement improvement plan for the students to excel in their education performance. Predicting can be done using Machine Learning techniques. Appropriate application of Data Mining procedures can provide multiple indicators of student performance. This paper critically reviews research papers published on Machine Learning and Data mining procedures used for prediction analysis. This paper presents characteristics of data collected, techniques and algorithms used for prediction model. The paper can be a guide for researcher to know the references of papers published.

**Keywords:** Machine Learning, Performance, Data Mining, Prediction Analysis, Improvement areas

### 1. INTRODUCTION

Every institute aims and strive towards achieving success by helping their students to grow in professional career. Student's success is a vital parameter to judge an institution performance. It is very significant for educational institute to plan for success path of each student. Planning is possible only when past data is critically analysed and definite patterns are identified. With these patterns system can predict future events and accordingly provides path of success. Students are closely connected with educational institute and hence provide vital data points to define their personality traits. It is always beneficial for every educational institute to know the personality of their students and accordingly plan for their future. Educational institute can derive patterns from the data collected from students about their past academics, interest and competencies. Machine learning techniques can be applied on these data sets to build a personality prediction model. Once institute know about the strong and weak points of a student, a comprehensive customize plan can be prepared and tracked for each student. Even student can track progress by comparing actual progress with plan. There are various researcher working on designing this model using multiple parameters.

Machine Learning methods are widely used to for data analysis and build predictive analysis tools. These are useful techniques to analyse huge database to identify patterns and accordingly predicts future events. These techniques are extremely useful to analyse huge data set and summarise findings for further process. Machine Learning algorithms are effective techniques to predict future events based on past data trends. These techniques proves helpful especially dealing with huge and multi-dimensional database. Objective of this paper is to know the existing predictive methods, tools, parameters for students performance prediction.

### 2. LITERATURE REVIEW

This paper [1] presented social demand information for college development and education guidance. For college educational development it is important to check the social demand. Social demand can improve college competitiveness with attention from management and technical. This paper has followed three perspectives for their study.

- a. Developed a social opinion collection network.
- b. Used the Information Architecture system for performing analysis and investigation on social opinion.

c. Used data mining and data warehouse technology for the college data analysis.

This paper [2] presented prediction of academic performance with two data mining methods. Authors have compared Artificial Neural Network and Clustering with Decision Tree techniques for prediction. Some students are very weak in certain subjects and some are very good which gives poor academic result of the organisation. To analyse the weak students at the starting authors have used data mining techniques. CRISP data mining methodology was used in this research.

In this paper [3], authors illustrated the applications of data mining for online courses and electronic learning. The paper predicted academic dismissal and GPA for the graduate students. CRISP data mining technique was used to achieve the goal in this paper. Cross Industry Standard Process divides the project in six phases. This paper has presented an analysis of real data from the online courses and e-Learning system. The authors concluded that a Regression and C5.0 technique of prediction has shown some weaknesses.

This paper [4] shows relation between students' personality with performance. Five personality models were used in this paper for checking the features of the students and then performance analysis was provided. Authors have utilised support vector regression technique of machine learning for finding the correlation between the data samples. SVR technique provides a regression value which is used to predict the performance. Authors have collected 120 undergraduate data from Taiwan with the help of questionnaires.

In this paper [5], authors have predicted slow learners with the support of classification and prediction techniques of data mining. Primary records were collected from high school. WEKA was the tool used in this paper for applying five data mining algorithms. All the five algorithms were tested to display their accuracy and to make comparison.

This paper [6] shows Career prediction method by C4.5 Algorithm. It uses data mining and statistical algorithms for prediction and recommendation. Authors have used personality traits for career prediction. Student career were predicted on the basis of his skills. Different Intelligent methods like decision trees, expert systems, fuzzy sets, rough set theory and neural networks were studied in literature survey. C4.5 algorithm was used for prediction purpose. Java, SQL Server, WEKA and Statistical tool were used in this experiment.

This paper [7] presented prediction model for career using data mining techniques. Personality and aptitude are the main parts of career guidance. The personality of student and aptitude were predicted in this paper for career guidance. One hot and label encoding were performed on the dataset. Four algorithms were applied on the datasets. KNN, Stochastic Gradient Descent, Random Forest and Logistic Regression were used in this model. The authors concluded that personality, aptitude and background datasets were utilized to forecast the career and the model has good accuracy.

This paper [8] shows prediction model for behaviour and performance of student in online learning by decision tree algorithm. In this study authors predicted behaviour and performance of students by means of a decision tree constructed model. Different software's used for developing the model were SPSS, Weka, SQL server and SSAS. Attributes used under different studies were demographic, personal, learning and others. The paper concluded that male students were performing very poorly in studies and learning time was also poor.

In this study paper [9], author compared supervised learning algorithms for predicting students' performance. KNN, Decision Tree and Naïve Bayes data mining algorithms were used in this paper for prediction. Authors also have performed literature reviews on different research papers on data mining, KDD, classification and EDM. Three supervised learning procedures were applied on the dataset.

This paper [10] presents a model for student performance prediction. In study educational data mining algorithms were used for the analysis purpose. Authors have utilized machine learning procedures and regression technique for developing learning model for prediction. This model predicts student GPA. Weka tool was used for this experiment. Four algorithms from the weka

toolbox were used for attribute evaluation. The authors concluded that regression algorithms show more accurate result than the classification algorithms.

### 3. RESULT

Total 45 research papers were reviewed for techniques used, year of review and data source to critically analyse the approaches discussed in respective papers. For this review, research papers from 2008 to 2019 were considered. Papers with data mining or machine learning techniques were preferred for this review. Highest number of papers from recent years were shortlisted to improve relativity.

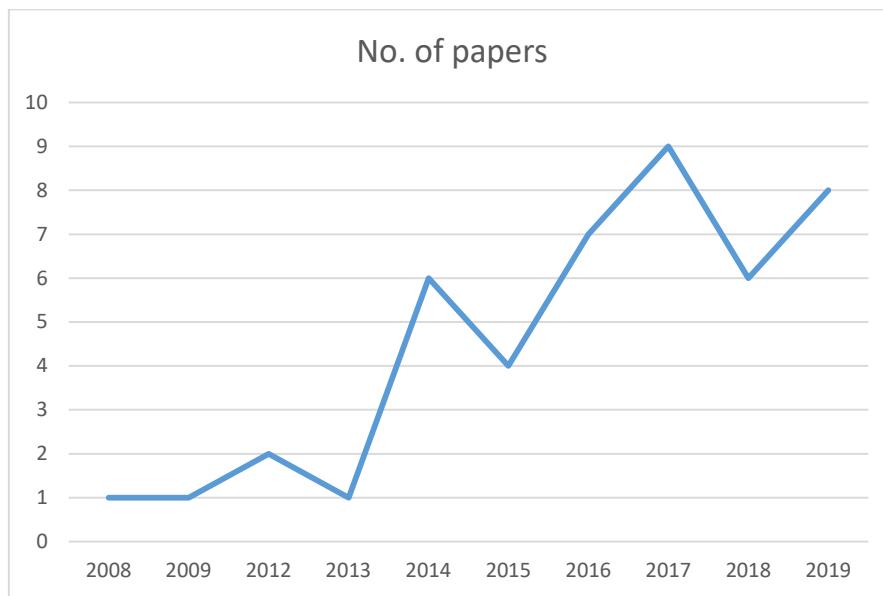


Fig 1: Year wise review

It is observed that 87% of research papers shortlisted for this review are based on primary data collected from colleges where 13% is collected from school. This suggest that data collected from college are more reliable to predict performance.

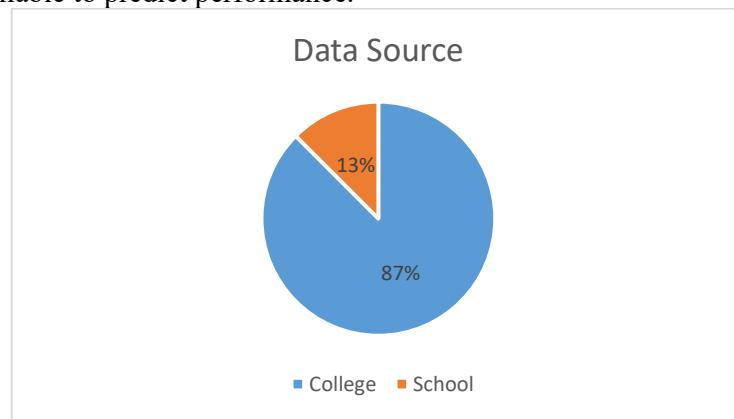
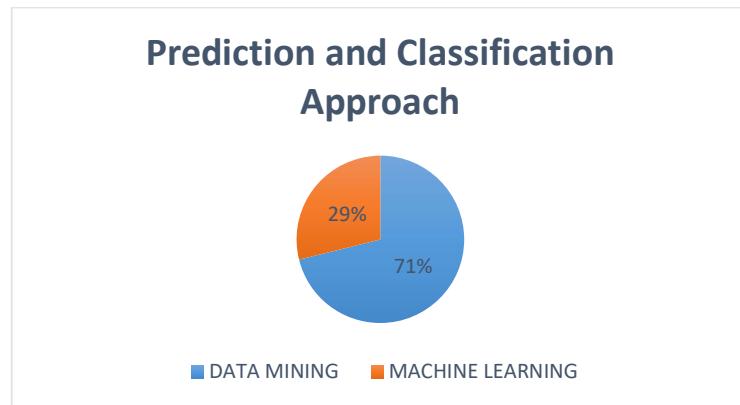


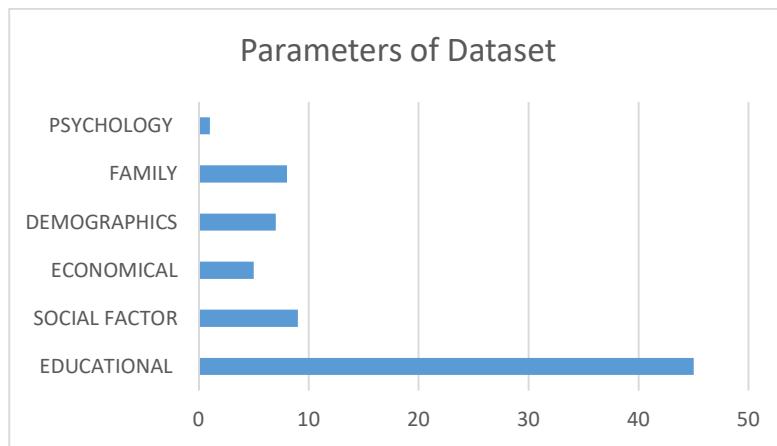
Fig 2: Data Source

It was observed that 71% of prediction approaches are based on Data Mining where as 29% are based on Machine Learning. It denoted that Data Mining techniques are widely used for prediction. Machine Learning techniques are more frequently used in recent years and have potential to further explore.



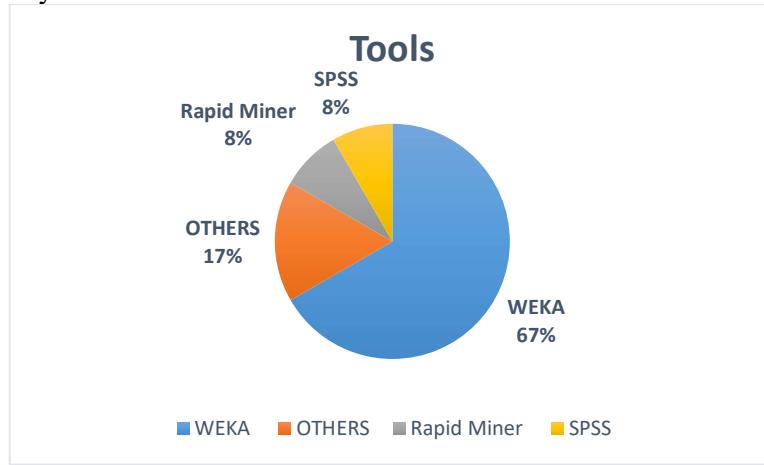
*Fig 3: Prediction and classification approach*

Various parameters are used for performance predication. Basic data from educational background is used for all papers. Along with educational parameter these papers also use additional parameters like Psychological, Family Background, Social and economical information.



*Fig 4: Parameters of dataset*

Different tools were used to implement Data Mining or Machine Learning algorithms. WEKA is most widely used tool for prediction and classification. Other tools like, SPSS, Rapid Miner, Python and R are also used by the researchers.



*Fig 5: Tools to implement model*

Combination of algorithms are used for predicting student's performance. Researcher has used Classification with clustering, Classification with regression, Clustering with regression for building their predictive model.

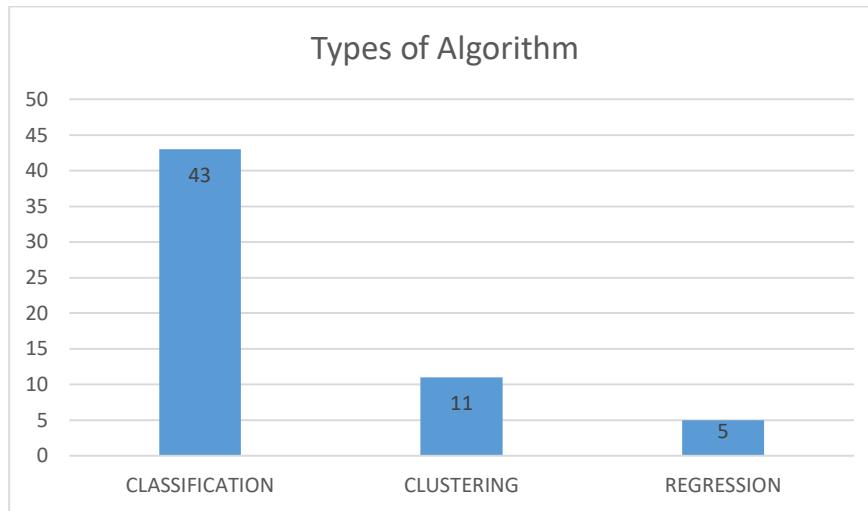


Fig 6: Types of algorithm

## 5. CONCLUSION

A definite model to predict students' performance will be truly beneficial for all the stakeholders of educational institute as well as students. By early detecting improvement areas of students, educational institute can build customize plans for students to support their needs. Machine Learning techniques are base of all predictive analysis by way of identifying patterns in database. These techniques provides valuable inputs to educational institute about personality traits of their students. There are various techniques available to implement on different types of data. It is very important that researcher use correct method and derive conclusion on student personality. Research papers selected for this study are primarily based on defining predictive analysis using machine learning techniques. These papers collects samples from various sources to build comprehensive database on which machine learning techniques can be applied. Maximum number of researchers has proposed a framework to build predictive model based on students past academic performance, socio-economic factors, Family background and psychology.

## REFERENCE

1. Song Lihua, Zhao Yongsheng, Zhang Zhonglei(2008), "Research on data mining in college education", International Conference on Computer Science and Software Engineering, 978-0-7695-3336-0/08, IEEE
2. Muslihah Wook et. al. (2009), "Predicting NDUM Student's Academic Performance Using Data Mining Techniques", Second International Conference on Computer and Electrical Engineering, 978-0-7695-3925-6/09, IEEE
3. Mahdi Nasiri et. al. (2012), "Predicting GPA and Academic Dismissal in LMS Using Educational Data Mining: A Case Mining", 6th National and 3rd International conference of e-Learning and e-Teaching(ICELET2012),978-1-4673-0957-8/12, IEEE
4. Jui-Hsi Fu et. al. (2012),"A Support Vector Regression-based Prediction of Students' School Performance", International Symposium on Computer, Consumer and Control, 978-0-7695-4655-1/12, IEEE
5. Parneet Kaur et. al.(2015),"Classification and prediction based data mining algorithms to predict slow learners in education sector", 3rd International Conference on Recent Trends in Computing 2015, 1877-0509, ScienceDirect
6. Lokesh S. Katore et. al.(2015),"Novel Professional Career prediction and recommendation method for individual through analytics on personal Traits using C4.5 Algorithm", Proceedings of 2015 Global Conference on Communication Technologies, 978-1-4799-8553-1, IEEE
7. Rucha Hemant Rangnekar et. al. (2018), "Career Prediction Model Using Data Mining And Linear Classification", Fourth International Conference on Computing Communication Control and Automation, 978-1-5386-5257-2/18 IEEE

8. Gai-hua WANG et. al. (2018), "Predicting Student Behaviors and Performance in Online Learning Using Decision Tree", Seventh International Conference of Educational Innovation through Technology, 978-1-5386-9603-3/18 IEEE
9. Mehdi Mohammadi et. al. (2019), "Comparative study of supervised learning algorithms for student performance prediction", 978-1-5386-7822-0/19, IEEE
10. Balqis Al Breiki et. al. (2019), "Using Educational Data Mining Techniques to Predict Student Performance", International Conference on Electrical and Computing Technologies and Applications, 978-1-7281-5532-6/19 IEEE
11. Mamta Singh, Dr. Jyoti Singh (2013),"Machine Learning Techniques for Prediction of Subject Scores: A Comparative Study", International Journal of Computer Science and Network, Volume 2, Issue 4, August 2013, ISSN(Online) : 2277-5420
12. Ajay Shiv Sharma et. al. (2014),"PPS - Placement Prediction System using Logistic Regression", IEEE International Conference on MOOC, Innovation and Technology in Education (MITE), 978-1-4799-6876-3/14, IEEE
13. Elakia et. al.(2014),"Application of Data Mining in Educational Database for Predicting Behavioural Patterns of the Students", International Journal of Computer Science and Information Technologies, Vol. 5 (3) , 2014, 4649-4652, ISSN:0975-9646
14. S.Venkata Krishna Kumar, S.Padmapriya(2014),"An Efficient Recommender System for Predicting Study Track to Students Using Data Mining Techniques", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 3, Issue 9, September 2014, ISSN (Online): 2278-1021, ISSN (Print): 2319-5940
15. Mrs. M.S. Mythili, Dr. A.R.Mohamed Shanavas(2014),"An Analysis of students' performance using classification algorithms",IOSR Journal of Computer Engineering (IOSR-JCE), e-ISSN: 2278-0661, p- ISSN: 2278-8727,Volume 16, Issue 1, Ver. III (Jan. 2014)
16. Anal Acharya, Devadatta Sinha(2014),"Early Prediction of Students Performance using Machine Learning Techniques", International Journal of Computer Applications (0975 – 8887) Volume 107 – No. 1, December 2014
17. T. Jeevalatha et. al.(2014),"Performance Analysis of Undergraduate Students Placement Selection using Decision Tree Algorithms", International Journal of Computer Applications (0975 – 8887) Volume 108 – No 15, December 2014
18. C. Anuradha and T. Velmurugan(2015),"A Comparative Analysis on the Evaluation of Classification Algorithms in the Prediction of Students Performance", Indian Journal of Science and Technology, Vol 8(15),ISSN (Print) : 0974-6846, ISSN (Online) : 0974-5645
19. Havan Agrawal, Harshil Mavani (2015), "Student Performance Prediction using Machine Learning", International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181, Vol. 4 Issue 03
20. Gabriel Barata et. al. (2016), "Early Prediction of Student Profiles Based on Performance and Gaming Preferences", IEEE Transactions on Learning Technologies, Vol. 9, No. 3, Electronic ISSN: 1939-1382, CD-ROM ISSN: 2372-0050
21. Tripti Mishra et. al. (2016), "Students' Employability Prediction Model through Data Mining", International Journal of Applied Engineering Research, Volume 11, Number 4, pp 2275-2282, ISSN 0973-4562
22. Radhika R Halde et. al. (2016), "Psychology assisted Prediction of Academic Performance using Machine Learning", IEEE International Conference On Recent Trends In Electronics Information Communication Technology, May 20-21, 2016, India, 978-1-5090-0774-5/16, IEEE
23. Mojisol G. Asogbon (2016), "A Multi-class Support Vector Machine Approach for Students Academic Performance Prediction", International Journal of Multidisciplinary and Current Research, ISSN: 2321-3124
24. P. Kavipriya (2016), "A Review on Predicting Students' Academic Performance Earlier, Using Data Mining Techniques", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 6, Issue 12, December 2016, ISSN: 2277 128X
25. M Krishna Satya Varma, N K Kameswara Rao (2016), "Comparative Study of Different Data Mining Prediction Algorithms", International Journal of Latest Trends in Engineering and Technology, ISSN: 2278-621X
26. Alaa Khalaf Hamoud (2016),"Selection of Best Decision Tree Algorithm for Prediction and Classification of Students' Action", American International Journal of Research in Science, Technology, Engineering & Mathematics, ISSN (Print): 2328-3491, ISSN (Online): 2328-3580, ISSN (CD-ROM): 2328-3629
27. G.Vadivu, K.Sornalakshmi (2017),"Applying Machine Learning Algorithms for Student Employability Prediction Using R", International Journal of Pharmaceutical Sciences Review and Research, ISSN 0976 – 044X
28. Thi-Oanh Tran et. al. (2017), "Performance Prediction for Students: A Multi-Strategy Approach", Cybernetics and Information Technologies, Volume 17, No 2, Print ISSN: 1311-9702; Online ISSN: 1314-4081
29. S.A. Oloruntoba,J.L.Akinode (2017), "Student Academic Performance Prediction Using Support Vector Machine", International Journal Of Engineering Sciences & Research Technology, ISSN: 2277-9655

30. Senthil Kumar Thangavel (2017), "Student Placement Analyzer: A Recommendation System Using Machine Learning", International Conference on Advanced Computing and Communication Systems, 978-1-5090-4559-4/17, IEEE
31. Nawal Ali Yassein et. al. (2017), "Predicting Student Academic Performance in KSA using Data Mining Techniques", Journal of Information Technology & Software Engineering, Volume 7, Issue 5, 1000213, ISSN: 2165-7866
32. Pratik Nanavati et. al. (2017), "Student Information System and Performance Prediction in Educational Data Mining", International Journal of Advanced Research in Computer and Communication Engineering ISO 3297:2007 Certified Vol. 6, Issue 3, March 2017, ISSN (Online) 2278-1021, ISSN (Print) 2319 5940
33. Kalpesh P. Chaudhari et. al. (2017) , "Student Performance Prediction System using Data Mining Approach", International Journal of Advanced Research in Computer and Communication Engineering ISO 3297:2007 Certified Vol. 6, Issue 3, March 2017, ISSN (Online) 2278-1021,ISSN (Print) 2319 5940
34. Tripti Mishra, Dharminder Kumar and Sangeeta Gupta (2017), "Students' Performance and Employability Prediction through Data Mining: A Survey", Indian Journal of Science and Technology, Vol 10(24), ISSN (Print) : 0974-6846, ISSN (Online) : 0974-5645
35. Surbhi Agrawal et. al. (2017), "Using Data Mining Classifier for Predicting Student's Performance in UG Level", International Journal of Computer Applications (0975 – 8887) Volume 172 – No.8
36. Dr. Mohd Ashraf, Dr. Zair Hussain (2018), "Investigation of Performance Analysis of Classification Algorithm in Data Mining", © 2018 IJSRSET | Volume 4 | Issue 4 | Print ISSN: 2395-1990 | Online ISSN : 2394-4099, Themed Section : Engineering and Technology
37. Aysha Ashraf et. al. (2018), "A Comparative Study of Predicting Student's Performance by use of Data Mining Techniques", American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS) ISSN (Print) 2313-4410, ISSN (Online) 2313-4402
38. N. Mohamed Farook Ali, Dr. N. Sasirekha (2018), "A Comparative Study on Educational Data Mining Using Classification Techniques", International Conference on Computing Intelligence and Data Science, ISSN (e): 2250-3021, ISSN (p): 2278-8719
39. Anjali Sharma et. al. (2018), "A review on tracking of student performance using decision tree", International Journal of Advance Research, Ideas and Innovations in Technology , ISSN: 2454-132X
40. Babajide Olakunle Afeni et. al. (2019), "Students' Performance Prediction Using Classification Algorithms", Journal of Advances in Mathematics and Computer Science , ISSN: 2456-9968
41. Anbukarasi V, A. John Martin (2019),"Student Learning Prediction Using Machine Learning Techniques",International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-8 Issue-6
42. Syed Arshad Raza (2019),"Predicting Collaborative Performance at Assessment Level using Machine Learning An Application of Educational Data Mining", 978-1-7281-0108-8/19 IEEE
43. Navyashree S L et. al. (2019), "EVALUATING SUPERVISED MACHINE ALGORITHMS FOR STUDENT PLACEMENT PREDICTION", International Research Journal of Engineering and Technology (IRJET) , Volume: 06 Issue: 02, e-ISSN: 2395-0056 , p-ISSN: 2395-0072
44. Sana et. al. (2019), "ANALYZING STUDENTS' ACADEMIC PERFORMANCE THROUGH EDUCATIONAL DATA MINING", 3C Tecnología. Glosas de innovación aplicadas a la pyme. ISSN: 2254-4143
45. Jabeen Sultana et. al. (2019), "Student's Performance Prediction using Deep Learning and Data Mining Methods", International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8, Issue-1S4

## A STUDY ON DEPOSITS OF COMMERCIAL BANKS DURING COVID 19.

<sup>1</sup>**Agnus A Meledath**, <sup>1</sup>Assistant Professor, Commerce Department, Vidyalankar School of Information Technology

<sup>2</sup>**Sagar Balu Gaikwad**, <sup>2</sup>Assistant Professor, Commerce Department, Vidyalankar School of Information Technology, Mail Id: agnus.anthony@vsit.edu.in

### ABSTRACT

Bank Deposits play a vital role in the Banking Sector. The savings are collected through intensive deposit collection by the commercial Banks. Acceptance of deposits is one of the primary functions of the commercial Banks. Thus the mobilization of funds take place from those who have money to those who need money. In this paper an attempt is made to study the impact of volume of deposits on investments, the impact of deposits on profitability, the impact of deposits on advance giving capacity of ICICI Bank in India. The attempt is made to evaluate the volume of deposits of ICICI Bank from the period 2011 to 2020. The total annual deposits of ICICI Bank Ltd is considered for the study along with the annual investments, annual advances and annual profits of ICICI Bank Ltd.

**Keywords** :— *Banks, Deposits, , profitability ,investments, advances.*

### I Introduction

A bank account serves a lot of purposes for anyone in the process of financial planning, the three most important ones being safety, convenience, and savings. Traditionally in India, we have four major types of Bank Deposits, namely Current Account, Savings Accounts, Recurring Deposits and Fixed Deposits, each with varying advantages. However, these days, some banks have also introduced many new products, which combine the features of two or more types of bank deposits like 2-in-1 Deposits,

Power Saving Deposits, Smart Deposits, etc. In the private banking sector ICICI bank Ltd. provides different types of deposits. ICICI Bank Ltd. has designed a gamut of accounts and deposits to cater to the unique banking needs of customers. FDX is a Now presenting a range of fixed deposits that give extra choice and even extra benefits. Fixed Deposit with Monthly Income option which is Term deposit with features of a Cumulative Fixed Deposit in Investment phase and Fixed Deposit with Monthly Income in Pay out phase. Recurring Deposit with Monthly Income Option which is a Term deposit with features of a Recurring Deposit (RD) in Investment phase and Annuity Fixed Deposit in Payout phase. Fixed Deposit that helps the customers to put idle money in a fixed deposit and earn attractive returns. Fixed Deposit (without premature withdrawal facility).

### II Objectives of the study

1. To study the relationship between volume of Deposits and profitability of a commercial Bank.
2. To study the relationship between volume of Deposits and Advances.
3. To study the relationship between volume of Deposits and Investment.

### III Hypothesis to be tested

1. The amount of deposits gets affected due to profitability, advance and investment.

### IV Scope of the proposed study:

The scope of the study is to cover One of the most important aspect of the commercial banks is the collection of funds from the customers and mobilizing into capital formation. The Bank considered for this purpose is ICICI Bank Ltd.

## **V Limitations of Study**

1. Few perceived limitations:
2. The study is restricted to only one private sector Bank.
3. More appropriate result may be arrived by including some more private sector Banks

## **VI Research Methodology**

### **Secondary Data:**

Secondary data will be procured through, survey reports, books and periodicals, ICICI Annual Reports, RBI website and Reports, journals and research publications will be referred.

## **VII Tools and Techniques of Data Analysis**

Tools and Techniques of Data Analysis used are E-views.

## **VIII Basic Literature Review**

Sr.No	Author(Year)	Research subject
1.	Himanshu Mathur(2010)	<p>“Analysis of growth rate of deposits and advance: a study of selected banks”</p> <p>Banks play a fundamental role in the growth of the economy of the country. A bank is an institution engaged in accepting deposits and granting loans. One of the important roles of the banking industry is to channelize the deposit money for the purpose of the lending activity. A pattern of deposit and lending is one of the important factors which affect the profitability and risk management of a bank. The objective of the research study is to analyze the difference between the growth rate of deposits and advances of selected banks.</p>
2.	Selvakumar, M., (2010)	<p>“Analysis of Deposits and Advances of Selected Private Sector Commercial Banks” The author concluded that there was no significant difference in the growth rate of the deposits, advances, income, expenditure and profit of Regional Rural Banks (RRBs) operating in Tamil Nadu. In addition, there was no significant difference in the growth rate of deposits, advances, income, expenditure and profit of RRBs in the other states of India and RRBs operating in Tamil Nadu.</p>
3.	Hatif Haddaweea, Hakeem Hamood Flayyihb, 2020	<p>“The Relationship between Bank Deposits and Profitability for Commercial Banks” The relation between bank deposits and profitability generated in all kind of commercial banks and to determine the types of deposits that have greater effect on the bank’s profitability. The Commercial Bank of Jordan was selected as the study sample for a period of five years between 2012 and 2016. The study revealed that there is a significant relation between deposits and the indicators of profitability. The saving deposit is the biggest contribution to profitability; followed by time deposits, and finally the current deposits which have the lowest contribution. Therefore, the same approach of the Jordanian commercial bank is to draw special strategic action and diversify the credit and attract investment deposits.</p>
4.	Dr.M.Ganesan1 ,Kanagaraj, Dr.S.Raja	<p>“A Study On Analysis Of Loans And Deposits At Axis Bank” The Project aims at analyzing the Deposits and Advances of the bank; thereby it helps the bank to improve its leading process. The main purpose of this research is to identify Loans and Deposits at AXIS BANK to calculate the proportion of different Deposits to the total Deposits, to find the proportion of different loans to the total loans.</p>

		The study is analytical in nature; the study is done for the period of five years. Deposits held at financial institute that has a fixed term. These are generally short term with maturities ranging anywhere from a month to a few years. When a term deposits is purchased, the lender (customer) understands that the money can only be withdrawn after the term has ended or by giving the predetermined number of days' notice. A number of studies related to performance of Private banking sector in India related to Deposits and Advances have been conducted
--	--	--

## **IX Rationale of proposed Investigation**

### **Definitions of major deposits schemes are as under:**

- i. "Term deposit" means a deposit received by the Bank for a fixed period withdrawable only after the expiry of the fixed period and includes deposits such as Recurring/Fixed Deposits etc.
- ii. "Demand deposits" means a deposit received by the Bank which is withdrawable on demand;
- iii. "Savings deposits" means a form of demand deposit which is subject to restrictions as to the number of withdrawals as also the amounts of withdrawals permitted by the Bank during any specified period;
- iv. "Current Account" means a form of demand deposit where from withdrawals are allowed any number of times depending upon the balance in the account or up to a particular agreed amount and will also include Account opening and operation of deposit accounts .

### **Benefits of Deposit creation function of ICICI Bank.**

#### **Money Multiplier Plan**

The Money Multiplier feature gives the liquidity of a Savings Account coupled with high earnings of a Fixed Deposit. This is achieved by creating a Fixed Deposit linked to Savings Account .

#### **Maximum Returns**

The money is never idle. Creation of a linked FD ensures higher rate of interest on the Savings Bank Deposits. One can issue instructions through any channel such as the ICICI Bank Branch, ICICI Bank Phone Banking and ICICI Bank's Internet Banking for creation of Fixed Deposit(s) from the surplus funds in your Savings Bank Account (subject to a minimum of Rs. 10,000). The Fixed Deposits will be created in multiples of Rs. 5,000 for a tenure of one year or more as instructed by you.

#### **Maximum Liquidity**

One can withdraw the funds from savings account through any channel such as the ICICI Bank ATM, ICICI Bank Internet Banking or by issuing a cheque. etc. All linked Fixed Deposits will be enabled for automatic Reverse Sweep in multiples of Rs. 5000 on a Last-In-First-Out (LIFO) basis when the balance in the Savings Account falls below Rs.10,000. The amount reverse swept will earn interest rates at the applicable rate for the period that the deposit was held with the bank less applicable premature withdrawal penalty. The remaining amount will continue to earn higher interest at the original rate applicable to the fixed deposit.

#### **Auto-Renewal**

Under this facility, when the deposits fall due, the bank will automatically renew the principal and accrued interest for the same tenure as the original deposit.

## **x Growth of Deposits of ICICI Bank Ltd**

Deposit growth was higher compared to credit growth during fiscal 2020, though there was a drop in growth at end-March 2020. Growth in total deposits remained above 9.0% through the year in fiscal 2020, but dropped to 7.9% at March 27, 2020. Demand deposits grew by 7.0% and time

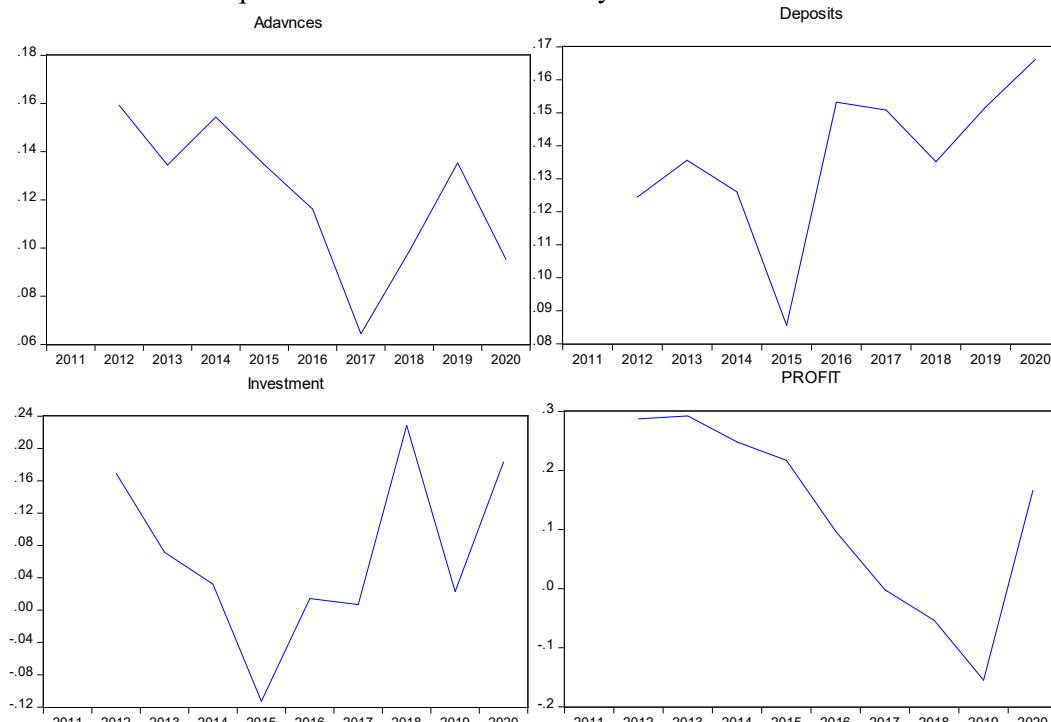
deposits grew by 8.1% at March 27, 2020 compared to growth of 10.3% in demand deposits and 10.0% in time deposits at March 29, 2019. The Bank has repositioned its international franchise to focus on non-resident Indians for deposits, wealth and remittances businesses, with digital and process decongestion as a key enabler. Total liabilities (including capital and reserves) increased by 13.9% from ₹ 9,644.59 billion at March 31, 2019 to ₹ 10,983.65 billion at March 31, 2020 primarily due to a 18.1% increase in deposits. Deposits increased by 18.1% from ₹ 6,529.20 billion at March 31, 2019 to ₹ 7,709.69 billion at March 31, 2020. Term deposits increased by 28.6% from ₹ 3,289.80 billion at March 31, 2019 to ₹ 4,231.51 billion at March 31, 2020. Savings account deposits increased by 7.9% from 2,276.71 billion at March 31, 2019 to ₹ 2,455.91 billion at March 31, 2020 and current account deposits increased by 6.2% from ₹ 962.69 billion at March 31, 2019 to ₹ 1,022.2 billion at March 31, 2020. The current and savings account (CASA) deposits increased by 7.4% from ₹ 3,239.40 billion at March 31, 2019 to ₹ 3,478.19 billion at March 31, 2020. The CASA ratio was 45.1% at March 31, 2020 compared to 49.6% at March 31, 2019. Deposits of overseas branches increased by 33.3% from ₹ 54.21 billion at March 31, 2019 to ₹ 72.27 billion. Total deposits at March 31, 2020 formed 82.6% of the funding (i.e., deposits and borrowings) compared to 79.8% at March 31, 2019.

## XI Data Analysis

Stationary

Augmented Dickey-Fuller Unit Root Test		
Variable	T-Statistics	P Value
Deposits	-1.956331	0.2958
Advances	-1.846745	0.3362
Profitability	-1.412666	0.5222
Investment	-2.521663	0.1447

The p Value for Augmented Dickey-Fuller Unit Root Test is more than 0.05 which means the data is free from unit root problem. The data is stationary.



Correlogram of Residuals

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
. ***  .	. ***  .	1	-0.358	-0.358	1.5831 0.208
. ***  .	*****  .	2	-0.453	-0.666	4.4893 0.106
.  ****.	.  * .	3	0.554	0.094	9.5594 0.023
. *  .	. *  .	4	-0.135	-0.172	9.9208 0.042
. **  .	.   .	5	-0.237	0.064	11.307 0.046
.  * .	. **  .	6	0.138	-0.314	11.932 0.064
.   .	. *  .	7	0.023	-0.085	11.957 0.102
.   .	. *  .	8	-0.032	-0.140	12.057 0.149

Regression Equation:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.165774	0.034845	4.757398	0.0051
ADV	-0.253572	0.296848	-0.854214	0.4320
PROFIT	-0.036583	0.056289	-0.649923	0.5444
INV	0.087790	0.073184	1.199579	0.2840
R-squared	0.454800	Mean dependent var		0.136542
Adjusted R-squared	0.127679	S.D. dependent var		0.023591
S.E. of regression	0.022033	Akaike info criterion		-4.491407
Sum squared resid	0.002427	Schwarz criterion		-4.403751
Log likelihood	24.21133	Hannan-Quinn criter.		-4.680567
F-statistic	1.390314	Durbin-Watson stat		2.616378
Prob(F-statistic)	0.347862			

Deposits = 0.165773815777 - 0.253571571423\*Advances - 0.0365834001091\*Profitability + 0.0877898163318\*Investment

The above regression equation indicates deposits as a dependent variables and advance, profitability and investment are the independent variable. The constant is 0.165773815777 and co-efficient of advance is 0.253571571423, co-efficient of profitability is 0.0365834001091 and co-efficient of investment is 0.0877898163318. 25.35 variance in deposits is explain by a advances, 3.6 variance in deposits explain by profitability and 8.7 variance in deposits is explain by investment.

## XII Conclusion

The deposits of commercial banks get affected majorly due to advances given by banks to general public. The other components like profitability and investment also affects the deposits.

## XIII References

- ICICI Annual Reports, Management Science Letters 4(6):1335-1340  
 DOI: 10.5267/j.msl.2014.4.008, Allen, F., Carletti, E., Marquez, R., 2015. Deposits and bank capital structure. Journal of Financial Economics 118 (3), 601 – 619, Greenwood, R., Shleifer, A., 2014. Expectations of returns and expected returns. The Review of Financial Studies 27 (3), 714–746. Greenwood, R., Shleifer, A., 2014. Expectations of returns and expected returns. The Review of Financial Studies 27 (3), 714–746.

## INSIDER THREAT RISK DETECTION MODEL

**Ujwala Madhav Sav**, Research Scholar, P. G. Dept. of Computer Science, S.N.D.T. Women's University, Mumbai, India. [ujwalasav@gmail.com](mailto:ujwalasav@gmail.com)

**Ganesh Magar**, Associate Professor, P. G. Dept. of Computer Science, S.N.D.T. Women's University, Mumbai, India. [gmmagar@gmail.com](mailto:gmmagar@gmail.com)

### ABSTRACT

Anomalous behaviour of the user in the organization can be the basis for the detection of insider threats. In the business sector of private or public, there is always the risk of data theft, data leakages, and data hacking. It is necessary to take precautionary measures to avoid potential cyber-attacks due to insiders. Insider threat is very risky therefore there is a need to control. Insider can share all the secrets of the organization with competitors. This can be controlled by monitoring online logs of inside users and find out anomalous behaviour. This analysis of user anomalous behaviour helps to detect insider threats. This paper presents a conceptual risk model for insider threat detection based on anomalous behaviour using log data. This risk model is helpful to the business sector to protect the organizational sensitive data theft and cyberattack.

**Keywords:** Anomalous Behaviour, Cybersecurity, Insider Threat, Outlier Algorithm, Machine learning, risk model.

### 1. INTRODUCTION

Insider threat detection is a difficult and challenging task as insiders have access to sensitive data/confidential data of an organization. As compare to outsider's threat, insider threat is a more challenging task. Risk quantification presents in the risk model form. A risk model based on historical data gives a solution to control risk by identifying and reducing the risk. The insider threats taken place due to three main reasons, i) unsatisfied users ii) accidental action and iii) negligence in work. These users are becoming insider threats in the future. The power and position are given to the insider in an organization. The abused insider may damage the image and reputation of the business in the market. The conceptual risk model capable of detecting insider threats and risk level. The conceptual insider threat detection model is helpful to control these threats in an organization. This risk model based on the log dataset provided by Computer Emergency Response Team CERT (Lindauer, 2020). CERT dataset is the insider threat data that is made available for research and study by Carnegie Mellon and Exact limited. This dataset is available with insider log data.

The research paper starts with section 1 introduction. Section 2 of this research paper presents related work done by the other researchers based on the insider threat detection and risk model based on the anomalous behaviour of the user for cybersecurity. Section 3 presents the risk model, concept using dependent and independent variables caused for risk occurrence. It also presents a mathematical, graphical, and informative approach for the insider threat detection risk model. In section 4, describe the result and analysis of the risk model and its functionality. Section 5, concludes the conceptual insider threat detection model based on the anomalous behaviour of a user for cybersecurity and identifies the risk level. The research paper ends with acknowledgment and references.

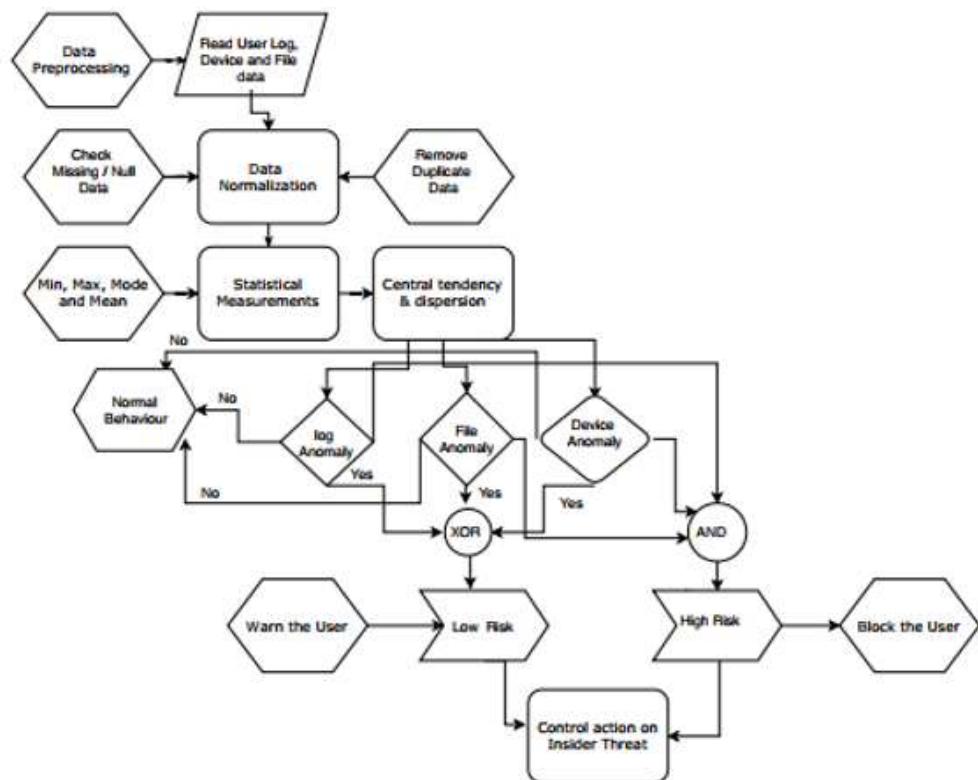
### 2. RELATED WORK

Insider threat detection risk model based on the anomalous behaviour of user presents in this research paper. A similar research domain articles literature survey was done. Some of the relevant related work is covered in this related work section. is done by using Machine learning and Deep learning algorithms.

The insider threat risk is predicted by using Bayesian network to control the user behaviour.(Elmrabit et al., 2020). The computer usage is the base to captured the user activities to detect the insider threats

in real corporate database. (Bose et al., 2017) The insider threat problem is more elusive and perplexing than any other threat. (Roy Sarkar, 2010). The objectives of a conceptual model of risk assessment for insider threats detection in Cyber-Physical system (CPs) research are two folds: a) finding the gap of study and b) produce a conceptual model of risk assessment for insider threats. The methods used to detect the insider threat are FRAP, CRAMM, OCTAVE, Monte Carlo, Markov Chain, and NIST. (Alsowail & Al-Shehri, 2020). In dealing with personal and computer-related risks, vigorous, compelling, and cognitively clear educational programs are essential for modulating unhealthy behaviour and endorsing new attempts to deal with changing environments. (Zegans, 2008), (Huang et al., 2018). The structured model focused on individual and sociotechnical factors while incorporating technical indicators with expert knowledge elicitation study and examine models for assessment indicators. None of the previous research investigated the use of head micromovement patterns while presenting visual stimuli that represent possible malicious intentions to detect insider threats. (Almehmadi, 2018). Access control is a necessary, but often insufficient, a mechanism for protecting sensitive resources. (Legg et al., 2017). The psychosocial behaviour studied and presented psychosocial modelling base on behaviour and word used. (Greitzer et al., 2013). The sociotechnical factors of individual and organizational focused and describe a use case applied on ontology in quantitative model.(Greitzer et al., 2018).

### 3. INSIDER THREAT DETECTION RISK MODEL



*Fig. 1: Insider Threat Detection based on Anomalous Behaviour of User and Risk Control*

In this section, the insider threat detection risk model is designed and presented. The insider threat detection is based on the CERT dataset (Glasser & Lindauer, 2013). The conceptual risk model is designed and presented in the figure 1. Starting from the data collection to decision of the risk and its classification is elaborated in the designed model. The risk model is presented below in figure 1. In this model main three parameters are considered. This model can be the base for the further experimental evaluation and results to find out the insider threats in the organization. The remedial

action can be taken in advanced. This model will help to protect the system confidential data form the insider and outsider threats.

#### 4. RESULT AND ANALYSIS OF RISK MODEL

In this proposed model conceptual insider threat risk model based on the anomalous behaviour of the user is presented. The risk is finding out true positive and true negative with the help of the analysis and calculations of the user's log data. This data further processed and used to identify risk levels. The low-risk level can be managed at a preliminary level. If the user behaviour is found anomalous in one or two cases then it is low risk and the warning will be given to the user and asked not to repeat this kind of malicious activities in the future. But if the user behaviour is found anomalous in a greater number of cases then it is high risk and then immediate action will be taken by the Security Executives and reported to the management.

##### 4.1 Risk level and Actions against Insider:

The Risk level is classified into two categories. Low risk and High risk based on occurrence of the behaviour of the user. Anomalous behaviour of the user causes may be unintentional. Therefore, if the low and high-risk level. In section 3, we have designed the for the risk model. The action and risk level detected based on occurrence of the risk factor. The anomalies found in one or two activities are identified as low level risk. This risk model is elaborated in the Table 1 with it's action against occurrence of the risk. If low risk occurred then there is a mild action will be taken by the security executive. The 'warning' or 'show cause' notice will be sent to user. The user activities will be under monitoring to control and avoid further anomalous behaviour of user.

<b>Logon Risk</b>	<b>File Risk</b>	<b>Device Risk</b>	<b>(Logon <math>\oplus</math> File <math>\oplus</math> Device)</b>	<b>Risk</b>	<b>Action</b>
False	False	False	False	No Risk	No Action
False	False	True	True	Low Risk	Warning
False	True	False	True	Low Risk	Warning
False	True	True	True	Low Risk	Warning
True	False	False	True	Low Risk	Warning
True	False	True	True	Low Risk	Warning
True	True	False	True	Low Risk	Warning
True	True	True	False	High Risk	Report

Table. 1: Insider Threat Detection at Low Risk

The action and risk level detected based on occurrence of the risk factor. When anomalies occurred in all the activities then it is turned to identify high level risk. This risk model is elaborated in the Table 2 with it's action against occurrence of the risk. If high risk occurred then there is a severe action will be taken by the security executive. The very first action will be against the high-risk insider threat is to block the account of that user and request for further investigation to secure the system.

<b>Logon Risk</b>	<b>File Risk</b>	<b>Device Risk</b>	<b>(Logon <math>\wedge</math> File <math>\wedge</math> Devie)</b>	<b>Risk</b>	<b>Action</b>
False	False	False	False	No Risk	No action
False	False	True	True	No Risk	No action
False	True	False	True	No Risk	No action

False	True	True	True	No Risk	No action
True	False	False	True	No Risk	No action
True	False	True	True	No Risk	No action
True	True	False	True	No Risk	No action
True	True	True	False	High Risk	Report

Table. 2: Insider Threat Detection at High Risk

#### 4.2 Recommendations to Control Insider Threat Risk:

The study of insiders and the proposed conceptual model recommends the control measures to avoid the risk of insider threats in an organization.

- Hiring Security Analysts and Consultants: Security Analysts have strong security assessments on the web, various operating systems, API, data platforms with financial services, and an understanding of a data-centric approach. He must have the 'Insider Threat Modelling capability.
- Secure the Intellectual Property: Organizations should protect their intellectual property by physical security and logical security. Privileges to access the data and system must be given as per the work and position in the organization.
- Security Rules and Policies: Every organization must prepare the rules and policies and communicate with all the users in time. The importance of the security should be informed so they will follow and risk of insider threats controlled.
- Monitoring and Auditing: Security Executives must monitor the online and offline activities of the insider's anomalous behaviour to protect the systems from insider threats. Auditing the log data is also helpful to detect insider threats.

### 5. CONCLUSION

The research paper concludes with methods used for insider threat detection and novel concept based anomalous behaviour of the user. A risk model can be implemented to control the insider threat risk in an organization. The anomalous behaviour of the user is classified in to insider threat occurrence or not. It anomalous behaviour is occurred for parameters defined for insider threat detection. These parameters insider threat value is further classified into low risk and high risk. This risk model helps to identify the level of risk and action to be taken against the user in both the risk level. This research paper presented conceptual insider threat detection risk model to help analyse the anomalous behaviour of the user. This risk model efficiently covers the conceptual processing of insider threat assessment.

### ACKNOWLEDGEMENT

Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center sponsored by the Department of Defense.

### REFERENCES

- [1] Almehmadi, A. (2018). Micromovement Behavior as an Intention Detection Measurement for Preventing Insider Threats. *IEEE Access*, 6, 40626–40637. <https://doi.org/10.1109/ACCESS.2018.2857450>
- [2] Alsowail, R. A., & Al-Shehri, T. (2020). Empirical Detection Techniques of Insider Threat Incidents. *IEEE Access*, 8, 78385–78402. <https://doi.org/10.1109/ACCESS.2020.2989739>
- [3] Bose, B., Avasarala, B., Tirthapura, S., Chung, Y.-Y., & Steiner, D. (2017). Detecting Insider Threats Using RADISH: A System for Real-Time Anomaly Detection in Heterogeneous Data

- Streams. *IEEE Systems Journal*, 11(2), 471–482. <https://doi.org/10.1109/JSYST.2016.2558507>
- [4] Elmrabit, N., Yang, S.-H., Yang, L., & Zhou, H. (2020). Insider Threat Risk Prediction based on Bayesian Network. *Computers & Security*, 96, 101908. <https://doi.org/10.1016/j.cose.2020.101908>
- [5] Glasser, J., & Lindauer, B. (2013). Bridging the Gap: A Pragmatic Approach to Generating Insider Threat Data. *2013 IEEE Security and Privacy Workshops*, 98–104. <https://doi.org/10.1109/SPW.2013.37>
- [6] Greitzer, F., Purl, J., Leong, Y. M., & Becker, D. E. S. (2018). SOFIT: Sociotechnical and Organizational Factors for Insider Threat. *2018 IEEE Security and Privacy Workshops (SPW)*, 197–206. <https://doi.org/10.1109/SPW.2018.00035>
- [7] Greitzer, Kangas, Noonan, Brown, & Ferryman. (2013). Psychosocial Modeling of Insider Threat Risk Based on Behavioral and Word Use Analysis. *E-Service Journal*, 9(1), 106. <https://doi.org/10.2979/eservicej.9.1.106>
- [8] Huang, X., Lu, Y., Li, D., & Ma, M. (2018). A Novel Mechanism for Fast Detection of Transformed Data Leakage. *IEEE Access*, 6, 35926–35936. <https://doi.org/10.1109/ACCESS.2018.2851228>
- [9] Legg, P. A., Buckley, O., Goldsmith, M., & Creese, S. (2017). Automated Insider Threat Detection System Using User and Role-Based Profile Assessment. *IEEE Systems Journal*, 11(2), 503–512. <https://doi.org/10.1109/JSYST.2015.2438442>
- [10] Lindauer, B. (2020). *Insider Threat Test Dataset* (p. 93667406290 Bytes) [Data set]. Carnegie Mellon University. <https://doi.org/10.1184/R1/12841247.V1>
- [11] Roy Sarkar, K. (2010). Assessing insider threats to information security using technical, behavioural and organisational measures. *Information Security Technical Report*, 15(3), 112–133. <https://doi.org/10.1016/j.istr.2010.11.002>
- [12] Zegans, L. S. (2008). The psychology of risks. *Communications of the ACM*, 51(1), 152–152. <https://doi.org/10.1145/1327452.1327496>

## ACADEMIC PERFORMANCE AND PREDICTION OF STUDENTS' PLACEMENT USING ANALYTICAL TECHNIQUES

**Mrs. Geeta Abakash Sahu**, Assistant Professor, Information Technology, VSIT, Mumbai-400037

**Mrs. Janhavi Mandar Vadke**, Assistant Professor, Information Technology, VSIT, Mumbai-400037

**Mrs. Ujwala Madhav Sav**, Assistant Professor, Information, VSIT, Mumbai-400037

### ABSTRACT

Students' academic performance is a metric used to judge the student's knowledge and potential. Bad academic performance and not completing undergraduate degree results in less chance of getting a good placement from college campus. Various educational institutions are trying to improve good quality of education system and adopt different teaching methodologies in learning to improve the pass percentage, professional skills and provides good placement to students. The purpose of this paper is to gather students's past academic percentage in matriculation, higher secondary, graduation and post graduation with other independent and dependent variables and determine whether the student will get placement or not using different educational data mining tools and accuracy is also measured.

**Keywords:** Academic Performance, Placement, Analytical Tools, Percentage, Degree.

### 1. INTRODUCTION

Attri& Kushwaha (2015) focused on industry is hiring undergraduate and post graduate students on certain employability features and personality during the placement selection on the candidate in the institution. There is a need to find factors that has an impact of academic performance on students' placement. Educational Data Mining (EDM) and Learning analytics helps in finding out the academic performance and non-performance of students, also students who are at the risk of failing a particular course/program enrolled into it. These analytics will improve student results by sending alert mail and messages to students, their parents, and instructors as well such that some additional benefits or remedial sessions can be conducted before the final examinations to achieve the pass percentage and good results. This can help the learners to achieve motivation, confidence and finally succeed in the exam.

The academic performance of students mainly depends on percentage of attending lectures, submissions, class test marks. It has also direct impact on the passing percentage rate in the final examinations. Other than from academic influence, some behavioural factor like practice or self-study, influence of friend circle, solving assignments, problem-based learning all these greatly influence the overall academic performance. The huge amount of data generated during admission and educational journey will be useful in finding the success or failure rate of the student and it will also help to identify the impact of academic performance on placement.

The research methodology will work on gathering data through survey, then converting them in excel datasets, cleaning the unwanted data, removing the missing values, and pre-processing the data and judging them to find the impact on student's placement. Student historical data such as social, demographic, and behavioural, qualification, past examination grades, present semester attendance, self-study hours are considered as best source of information. Data Mining techniques – Classification, Linear and Multi Linear Regression, Clustering. Finding linear and non-linear relationship. Input variable such as grades obtained in previous examination or direct entry and their score.

## 2. REVIEW OF LITERATURE

The academic success or failure rate of student is affected by teaching methodology, and self-learning style of students. Data Mining techniques are applied to determine the academic success or failure rate of architecture students on past academic achievements(Megan et al. 2013). The input variables used are prior academic achievements which is extracted from students' past academic records. Tools used are for this are – Logistic regression and support vector machine. Decision support tools are also used in the screening process for new admissions in an undergraduate architecture course. To forecast the model, selected variables used are – grades obtained from the final exams of 11 subjects, entry medium and score performance. The output variable is CGPA which will determine the academic performance. Thus, SVM model developed helps in decision making to select new students at undergraduate architecture program (Ralph et al. 2018).

When the child takes admission in a school, a bonding is created between student and a teacher. This bonding to some extends influence student achievements in education to succeed in academic environment. Hence student-teacher trust relationship, schooling factor is a good predictor of academic performance. Student-teacher trust relationship, Academic press-practices, policies, expectations, norms, study for exam, complete homework that also helps student to achieve performance in academics. The relationship between these factors were carried out, bi-variate correlational analyses was done with the help of ANOVA.

Megan et al. (2013) applied Correlation analysis and Cronbach's coefficient to check the reliability. Future research is needed based on behaviour that encourages trusting relationship in schools with respect to teacher-specific and campus-wide actions.

Preet & Sachin (2019) identified a prediction/ensemble model which is developed by studying the factors that affects the student's success rate in an undergraduate professional program BCA and identify students who are at the risk of failing the exam. Various factors which affect the results are – siblings count, travelling distance from institution to residence (McQuiggan et al. 2007).

Rahila et al. (2017) used a process mining approach that helps in making prediction in massive open online courses. Student's data such as assessment grades, demographic data and weekly report based on the logs (login, logout, online assignment submission, watching of video lectures. The completion rate and retaining of students are low till the completion of the course.

Getting the data from survey, different classifiers, ensembles of classifier techniques are applied in predicting student academic performance (Olugbenga & Thomas 2016).

Other skills like oral and written communication, leadership quality, team building, inter-personal skills also needed to judge the recruiters during the placement. (Padmini 2012). Graduate management Admission Council explored the need of team building, inter-personal skills, and should impart the training skills at management institutes. (Tewari & Sharma 2012).

## 3. RESEARCH QUESTIONS

What are the criteria companies are demanding during the recruitment process in the university campus?

What are the factors needed to identify the academic performance and students' placement at under-graduate level?

How the data will be collected and pre-processed before it is applied for analysis?

Which technique or algorithm will be used for the academic performance of students on placement?

How the performance or accuracy will be evaluated?

## 4. OBJECTIVES

1. To identify the factors that influence the academics performance and placement of students in higher educational institutions.
2. To find the relationship between academic performance and students' placement.
3. To establish empirical analysis between academic performance and placements.

4. To predict whether the student will be placed or not –Yes/No based on academic performance matrix using AI and other analytical tools.

## 5. SCOPE OF THE STUDY

The scope of the research is to address the above-mentioned problem. The focus of the research would be on finding the factors which are the predictors and have positive and negative impact of academic performance of placement of students. For this process, data will be collected in form of conducting survey, questionnaires, missing data will be removed, cleaned, and processed. The processed data will be used in the analysis and using latest analytical modelling techniques such as – Classification, Logistic Regression, K Nearest Neighbour. The processed data will be trained and tested to achieve the accuracy and results.

## 6. METHODOLOGY, TOOLS, AND TECHNIQUES

For this purpose, we will be doing qualitative and quantitative data collection using archival, survey, questionnaires and interviews, Data from 120 students is collected from one of the colleges.

**Quantitative research methodology** – The study will be on use of quantitative data to be collected from the institutional database and through survey questionnaire. The goal of survey is to collect the data which is not a part of student's database record (SDR) or enterprise resource planning (ERP). The data will be taken in excel using rapid miner, pre-processing by removing the unwanted or missing values.

**Statistical Methods** - Logistic regression, Multiple and Linear regression, Quantile regression analysis (25%, 75% and 100%) will be used when the relation and impact need to be determined. EasyReg International software can be used for regression analysis. [10]. Performance measurement – Accuracy, Precision and Recall is calculated.

**Regression analysis**- Linear and Multilinear regression analysis will be used to find the impact of academics on placement of student.

## 7. IMPLEMENTATION

Data is collected in the form of questionnaire and survey from MBA, MCA and MSc.IT students from one of the colleges in Mumbai. Collected data of 120 students was processed, missing values are removed and then the data is taken for experimental purpose. Dataset is converted in CSV file named: Academic\_Placement.CSV having 120 rows \*13 columns and the implementation is done using the software package anaconda under Jupiter notebook with the python source code.

#	Column	Non-Null Count	Dtype	ssc_pass_percent	hsc_pass_percent	degree_pass_percent	postgrad_percent
0	gender	120	non-null	category	count	120.00000	120.00000
1	ssc_pass_percent	120	non-null	float64	mean	67.49150	66.847167
2	ssc_board	120	non-null	category	std	10.77968	10.827188
3	hsc_pass_percent	120	non-null	float64	min	40.89000	37.000000
4	hsc_board	120	non-null	category	25%	60.35750	61.000000
5	hsc_stream	120	non-null	category	50%	67.50000	67.000000
6	degree_pass_percent	120	non-null	int64	75%	76.00000	75.000000
7	degree	120	non-null	category	max	87.00000	97.700000
8	internship	120	non-null	category			85.00000
9	specialisation	120	non-null	category			91.000000
10	postgrad_percent	120	non-null	int64			
11	status	120	non-null	category			
dtypes: category(8), float64(2), int64(2)							

Table. 1: Variable Data Types

Table 2: Measures of Central Tendency and Dispersion

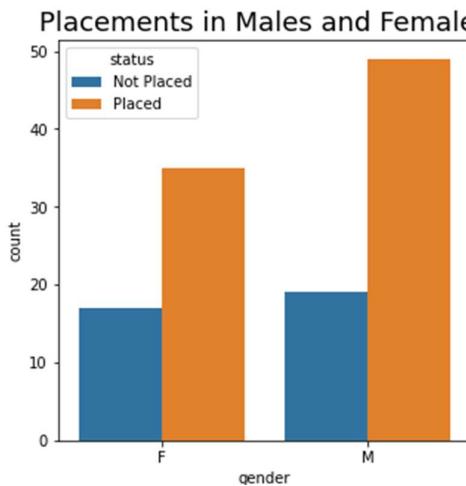


Fig 1: Placement of Male and Female Fig 2: Student chosen stream and their placement

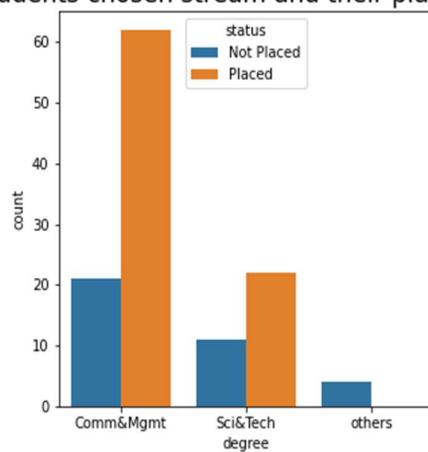


Fig 1: Placement of Male and Female Fig 2: Student chosen stream and their placement

Converting some variables from text to their numerical values from the dataset on the variables – gender (female-0, male-1), ssc\_board(state board-0, cbse-1), hsc\_board(state board-0, cbse-1), hsc\_stream(arts-0, commerce-1, science-2), degree(commerce-0, others-2,sci&tech-1, internship (No-0, Yes-1), specialization (MBA-0, MCA-1, MSc.IT-2) and status (not placed-0, Placed-1).

gender	ssc_pass_percent	ssc_board	hsc_pass_percent	hsc_board	hsc_stream	degree_pass_percent	degree	internship	specialisation	postgrad_percent	status
0	67.0	0	51.0	0	2	70	1	0	0	78	1
0	77.4	0	60.0	0	2	65	1	1	1	65	1
1	62.0	0	54.0	0	2	50	2	0	2	66	0
0	69.0	1	78.0	1	1	72	0	0	0	62	1
1	51.0	1	42.0	1	1	57	0	0	1	73	0

Table. 3: Text to Numeric Values: Academic\_Placement.CSV

For prediction and accuracy purpose we will divide the data set in training and testing purpose. 80 percent i.e. 72 out of 120 of the dataset is trained (variables: gender, ssc\_pass\_percent, hsc\_pass\_percent, degree\_pass\_percent, postgrad\_percent, internship, degree, specialization) to build a model and remaining 20 percent i.e. 48 out of 120 will be used for testing and will predict the status (placed-1, not placed-0) of the student whether he or she will be placed or not. In this paper 3 machine learning algorithms are used to check the accuracy.

```
input_data = [[0,71.00,65.00,75.00,0,80,0,1]]
user_pred = lr.predict(input_data)
if user_pred == 1:
    print("Congratulations !, Selected Candidate will be Placed.")
else :
    print("Sorry !, Candidate will not be Placed")
```

Congratulations !. Selected Candidate will be Placed.

```
print("Accuracy:",accuracy_score(y_test, pred)*100)
print("Precision:",precision_score(y_test, pred)*100)
print("Recall:",recall_score(y_test, pred)*100)
```

Accuracy: 83.33333333333334  
Precision: 81.81818181818183  
Recall: 93.10344827586206

#### *Output 1. Accuracy, Precision and Recall using Logistic Regression*

```
#Using KNN
from sklearn.neighbors import KNeighborsClassifier

knn = KNeighborsClassifier(n_neighbors=3)
knn.fit(x_train,y_train)
knn_prediction = knn.predict(x_test)
print(knn_prediction)

[1 1 1 1 0 1 1 0 1 1 1 1 0 0 1 1 1 0 1 1 0 1 1 1 1 1 0 1 1 1 1 0 0 1
```

```
print("Accuracy:",accuracy_score(y_test, knn_prediction)*100)
print("Precision:",precision_score(y_test, knn_prediction)*100)
print("Recall:",recall_score(y_test, knn_prediction)*100)
```

Accuracy: 70.83333333333334  
Precision: 70.27027027027027  
Recall: 89.65517241379311

## *Output 2. Accuracy, Precision and Recall Using K Nearest Neighbour*

```
#Using SVC
from sklearn.svm import SVC
svc = SVC()
svc.fit(x_train,y_train)
svc_prediction = svc.predict(x_test)
print(svc_prediction)
```

```
print("Accuracy in Percentage:",accuracy_score(y_test, svc_prediction)*100)
print("Precision:",precision_score(y_test, svc_prediction)*100)
print("Recall:",recall_score(y_test, svc_prediction)*100)
```

Accuracy in Percentage: 72.91666666666666  
Precision: 70.0  
Recall: 96.55172413793103

### *Output 3. Accuracy, Precision and Recall Using Support Vector*

## 8. CONCLUSION

The proposed research work would be analysing the academic factors of students based on the criteria such as – GPA, Attendance, Communication Skills, quantitative aptitude, and entrance examinations. Based on the analysis and data analytical modelling techniques once can find the impact of academic performance on students' placement.

This research will also help instructors to take required remedial sessions as needed for the weak students based on the attendance record, assessment methods (assignments, class test, mid-term test, Tutorials etc.). It will also help the university or the institution to reduce the dropout rate and increase the pass percentage of the students per semester basis so that the level of good placement can be achieved. Out of these three algorithms logistic regression and support vector gave the highest accuracy and able to predict with good accuracy.

## REFERENCES

- [1] Megan T., Regina A., Bankolex, Roxanne M. Mitchell, Dennis M. Moore, (2013). Student Academic Optimism: a confirmatory factor analysis. *Journal of Educational Administration* Vol. 51 No. 2.
  - [2] Ralph A., Emmanuel I., Daniel O., and Clinton A., Abiodun A. (2018). Towards reliable prediction of academic performance of architecture students using data mining techniques. *Journal of Engineering, Design and Technology* Vol. 16 No. 3, 2018.
  - [3] Preet K., Sachin A. (2019). An ensemble-based model for prediction of academic performance of students in undergrad professional course. *Journal of Engineering, Design and Technology* Vol. 17 No. 4, 2019.

- [4] Rahila U., Teo S. & Mathrani A., Suriadi (2017). On predicting academic performance with process mining in learning analytics. *Journal of Research in Innovative Teaching & Learning* Vol. 10 No. 2, 2017.
- [5] Olugbenga Wilson A., Thomas C., (2018). Predicting student academic performance using multi-model heterogeneous ensemble approach. *Journal of Applied Research in Higher Education* Vol. 10 No. 1.
- [6] Gupta A., & Joseph T., (2015). Empirical investigation of predictors of success in an MBA programme. *Education + Training*, Vol. 57 No. 3.
- [7] Ying C. & Fu C., Shiri A., and Yaqin F. (2019). Predictive analytic models of student success in higher education A review of methodology *Information and Learning Sciences* Vol. 120 No. 3/4.
- [8] Pani P., Kishore P. (2016). Absenteeism and performance in a quantitative module A quantile regression analysis. *Journal of Applied Research in Higher Education* Vol. 8 No. 3.
- [9] Darwish Y., (2017). Factors Influencing Academic Performance in Quantitative Courses among Undergraduate Business Students of a Public Higher Education Institution. *Journal of International Education in Business* Vol. 10 Issue: 1
- [10] Dekker, G., Pechenizkiy, M. and Vleeshouwers, J. (2009). Predicting students drop out: a case study. *International Conference on Educational Data Mining (EDM)*, ERIC, pp. 41-50. (x)
- [11] Ning Y., Oliver A. (2019). Online learning behaviour analysis based on machine learning. *Asian Association of Open Universities Journal*, Vol. 14 No. 2.
- [12] Carlos J. Villagra A., Francisco J. Gallego D., Faraon L. Rosique, Rosana C., Rafael C. (2016). Improving the expressiveness of black-box models for predicting student performance. *Computers in Human Behavior* xxx (2016) 1-11.
- [13] Uhler B., & Janet E. (2013). Using Learning Analytics to Predict (and Improve) Student Success: A Faculty Perspective. *Journal of Interactive Online Learning* Volume 12, Number 1, Spring 2013 ISSN: 1541-4914.
- [14] Ahmed O, (2016). An evaluation model of teaching assistant using artificial neural network *Transactions on Computer Sciences*, ISSN(e):2308-8168, ISSN(p): 2411-6335, Volume 11, Number 2, November- December 2016
- [15] Ali D., Naif A., Rabeeh A., Miltiadis L., (2017). Predicting Student Performance using Advanced Learning Analytics. *International World Wide Web Conference Committee (IW3C2)*. ACM 978-1-4503-4914-7/17/04. 19.
- [16] Suhang J., Adrienne E., Katerina S., Mark W., Diane D. *Proceedings of the 7th International Conference on Educational Data Mining*.
- [17] Burgos C., MaríaL. JuanA. Martínez (2017). Data mining for modelling students' performance: A tutoring action plan to prevent academic dropout. *Computers and Electrical Engineering* 1–16.
- [18] Nick Z. (2016). Predicting student academic performance in blended learning using artificial neural networks. *International Journal of Artificial Intelligence and Applications (IJAIA)*, Vol. 7, No. 5.
- [19] Romero C., Manuel I., Sebastián V. (2013). Predicting students' final performance from participation in on-line discussion forums. *Computers & Education* 68, 458–472.
- [20] Shaymaa E., Tsunenori M., (2016). Building an Interpretable Model of Predicting Student Performance Using Comment Data Mining. *5th IIAI International Congress on Advanced Applied Informatics*.
- [21] Lisa B., (2017). Using Learning Analytics to Predict Academic Success in Online and Face-To-Face Learning Environments.
- [22] Marius K., Felix S., Zhilin Z., Niels P., (2014). Predicting MOOC Dropout over Weeks Using Machine Learning Methods. *Proceedings of the 2014 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, October 25-29, Doha, Qatar, Association for Computational Linguistics.

- [23] Ghada B., Afnan A., Hanadi A., Manal A. (2016). Predicting Students' Performance in University Courses: A Case Study and Tool in KSU Mathematics Department. Symposium on Data Mining Applications, SDMA2016, 30 March 2016, Riyadh, Saudi Arabia.
- [24] Galina D., Johannes S., Pieter K., Jochen W., (2018). Dropout Prediction in MOOCs: A Comparison Between Process and Sequence Mining. Springer International Publishing.
- [25] Al-Saleem M., Al-Kathiry N., Sara Al-Osimi Ghada Badr (2015). Mining Educational Data to Predict Students Academic Performance. Springer International Publishing Switzerland. P. Perner (Ed.): MLDM 2015, LNAI 9166, pp. 403–414.
- [26] AL-Shabandar R., Hussain A., Laws, Radi N. (2017). Machine Learning Approaches to Predict Learning Outcomes in Massive Open Online Courses. 978-1-5090-6182-2/17 IEEE.
- [27] Boyer S., and Veeramachaneni K. (2015). Transfer Learning for Predictive Models in Massive Open Online Courses. International Publishing Switzerland, Conati et al. (Eds.): AIED 2015, LNAI 9112, pp. 54–63.
- [28] Chen Y., Mingqian C., Zhao, Boyer S., Veeramachaneni K., and Huamin Qu (2016). Dropout Seer: Visualizing Learning Patterns in Massive Open Online Courses for Dropout Reasoning and Prediction. IEEE Conference on Visual Analytics Science and Technology (VAST) 23-28 October, Baltimore, Maryland, USA 978-1-5090-5661-3/16 IEEE.
- [29] Chen W., Christopher G. Brinton C., Singh, Lu C., Chiang M., (2017). Early Detection Prediction of Learning Outcomes in Online Short-Courses via Learning Behaviours. DOI 10.1109/TLT.2018.2793193, IEEE Transactions on Learning Technologies.
- [30] Corrigan W., Smeaton A., Glynn M., and Smyth S. (2015). Using Educational Analytics to Improve Test Performance. Springer International Publishing Switzerland. G. Conole et al. (Eds.): EC-TEL 2015, LNCS 9307, pp. 42–55.
- [31] Owen Corrigan and Alan F. Smeaton (2017). A Course Agnostic Approach to Predicting Student Success from VLE Log Data Using Recurrent Neural Networks Springer International Publishing AG 2017. E. Lavou'e et al. (Eds.): EC-TEL 2017, LNCS 10474, 2017.
- [32] Gerben W. Dekker, Mykola Pechenizkiy and Jan M. Vleeshouwers (2009). Predicting Students Drop Out: A Case Study. Educational Data Mining 2009.
- [33] Asmaa Elbadrawy, Agoritsa Polyzou, Zhiyun Ren, Mackenzie Sweeney, George Karypis, Huzefa Rangwala, (2016). Predicting students' performance using personalized analytics computer 0018-9162/16/april 2016 IEEE.
- [34] Meimei Han, Mingwen Tong, Mengyuan Chen, JiaMin Liu, ChunMiao Liu (2017). Application of Ensemble Algorithm in Students' Performance Prediction 978-0-7695-6178-3/17 2017 IEEE, DOI 10.1109/IIAI-AAI.2017.73.
- [35] Glyn Hughes and Chelsea Dobbins (2015). The utilization of data analysis techniques in predicting student performance in massive open online courses (MOOCs). Hughes and Dobbins Research and Practice in Techology Enhanced Learning (2015) a SpringerOpen Journal.
- [36] Sandeep M. Jayaprakash, Erik W. Moody, Eitel J.M.Lauria, James R. Regan, and Joshua D. Baron (2014). Early Alert of Academically At-Risk Students: An Open-Source Analytics Initiative Journal of learning Analytics.
- [37] Digna S. Evale (2017). learning management system with prediction model and course-content recommendation module. Journal of Information Technology Education: Research.
- [38] Marcus K, Albrecht F. (2015). Predicting Students' Success Based on Forum Activities in MOOCs. The 8th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications.
- [39] Olaya D., Vásquezb J., Maldonadoc, Jaime Mirandac, Wouter V (2020). Uplift Modelling for preventing student dropout in higher education.
- [40] Berie G., Tarekegn, Sreenivasarao (2016). Application of Data Mining Techniques to Predict Students Placement into Departments. International Journal of Research Studies in Computer Science and Engineering (IJRSCSE).

- [41] Sharma A., Swaraj P., Kapoor S, Keshav Kumar (2014). PPS - Placement Prediction System using Logistic Regression 978-1-4799-6876-3/14 2014 IEEE.
- [42] Shrestha R., Mehmet A., Orgun1., Peter B., Busch (2015). Offer acceptance prediction of academic placement. "Department of Computing, Macquarie University, North Ryde, NSW 2109, Australia, Neural Comput & Applic DOI 10.1007/s00521-015-2085-7. Springer".
- [43] Bhagavan S., Thangakumar J., Subramanian V., (2019). Predictive analysis of student academic performance and employability chances using HLVQ algorithm Journal of Ambient Intelligence and Humanized Computing
- [44] Singh I., Choudhury T., Dewangan B., (2020). Mapping Student Performance with Employment Using Fuzzy C-Means. International Journal of Information System Modeling and Design Volume 11, Issue 4.
- [45] Reddy P & Moores E., (2012). Placement year academic benefit revisited: effects of demographics, prior achievement and degree programme. "Teaching in Higher Education Vol. 17, No. 2, April 2012, 153-165 Taylor & Francis.
- [46] Patel N., Brinkman W., Coughlan J., (2012). Work placements and academic achievement: undergraduate computing students. Education & Training Vol. 54 No. 6, 2012 pp. 523-533.
- [47] Attri R., & Kushwaha P., Enablers for good placements of graduates: fitting industry's needs. Jaipuria Institute of Management Indore, Indore, India. DOI 10.1108/HESWBL-11-2017-0096.
- [48] Dhar, S.K. (2012), Employability of management students in India: some concerns and considerations. AIMA Journal of Management Research, Vol. 6 No. 4, pp. 1-16.
- [49] Padmini, I. (2012). Education vs employability – the need to bridge the skills gap among the engineering and management graduates in Andhra Pradesh. International Journal of Management and Business Studies, Vol. 2 No. 3, pp. 90-94.
- [50] Tewari, R. & Sharma, R. (2012). Managerial skills for managers in the 21st century Management. Vol. 1 No. 3, pp. 1-15.

## CHALLENGES FOR ECONOMIC GROWTH IN INDIA

**DR PRITI GANESH GHAG, COURSE CO-ORDINATOR, GURUKUL COLLEGE OF COMMERCE, GHATKOPAR, EAST, pritimande@gmail.com**

### ABSTRACT

Economic growth in India has been broadly on an accelerating path. It is likely to be the fastest growing major economy in the world in the medium-term. While presenting the Finance Bill for the year 2020-21, the Union Government on 01.02.2020 had reasonably estimated India's nominal GDP growth rate (*i.e.*, real growth + inflation) of 10 percent, however, the same now seems far from reality and certainty. The slowdown in demand, closure of production activities, fall in the global price of crude oil, ban on foreign trade, price decrease in the commodities like energy, metals and fertilizers, restrictions on the aviation industry as also on tourism, amongst others, are bound to exert downward pressure on the inflation, thus adversely affecting the economy chart. It is believed that India's aggressive lockdown could bring the country's growth down to 2.5 percent from 4.5 percent it had earlier estimated. However, as per a statement released by Chief India Economist of Goldman Sachs on 09.04.2020, the economic growth of India has been estimated at a low figure of 1.6% only. Overall uncertainty and lack of demand, coupled with no investment seen in near future, the Indian stock markets crashed. A UN report estimated a trade impact of more than USD 350 million on India due to this outbreak, making India one of the top worst affected economies across the world. However, along with macroeconomic stability, the sufficient condition for escalating growth is to continue with the structural reforms that address the binding constraints for a more robust supply-side response.

---

### INTRODUCTION

The economy of India is characterised as a middle income developing market economy. It is the world's fifth-largest economy by nominal GDP and the third-largest by purchasing power parity (PPP). According to the International Monetary Fund (IMF), on a per capita income basis, India ranked 142nd by GDP (nominal) and 124th by GDP (PPP) in 2020. From independence in 1947 until 1991, successive governments promoted protectionist economic policies with extensive state intervention and economic regulation, which is characterised as dirigisme, in the form of the License Raj. The end of the Cold War and an acute balance of payments crisis in 1991 led to the adoption of a broad economic liberalisation in India. Since the start of the 21st century, annual average GDP growth has been 6% to 7%, and from 2014 to 2018, India was the world's fastest growing major economy, surpassing China. Historically, India was the largest economy in the world for most of the two millennia from the 1st until 19th century.

The long-term growth perspective of the Indian economy remains positive due to its young population and corresponding low dependency ratio, healthy savings and investment rates, and is increasing globalisation in India and integration into the global economy. The economy slowed in 2017, due to shocks of "demonetisation" in 2016 and introduction of Goods and Services Tax in 2017. Nearly 60% of India's GDP is driven by domestic private consumption and continues to remain the world's sixth-largest consumer market. Apart from private consumption, India's GDP is also fuelled by government spending, investment, and exports. In 2019, India was the world's ninth-largest importer and the twelfth-largest exporter. India has been a member of World Trade Organization since 1 January 1995. It ranks 63rd on Ease of doing business index and 68th on Global Competitiveness Report. With 500 million workers, the Indian labour force is the world's second-largest as of 2019. India has one of the world's highest number of billionaires and extreme income inequality. Since India has a vast informal economy, barely 2% of Indians pay income taxes. During the 2008 global financial crisis the economy faced mild slowdown, India undertook stimulus measures (both fiscal and monetary) to boost growth and generate demand; in subsequent years economic growth revived.

According to 2017 PricewaterhouseCoopers (PwC) report, India's GDP at purchasing power parity could overtake that of the United States by 2050. According to World Bank, to achieve sustainable economic development India must focus on public sector reform, infrastructure, agricultural and rural development, removal of land and labour regulations, financial inclusion, spur private investment and exports, education and public health.

In 2020, India's ten largest trading partners were USA, China, UAE, Saudi Arabia, Switzerland, Germany, Hong Kong, Indonesia, South Korea and Malaysia. In 2019–20, the foreign direct investment (FDI) in India was \$74.4 billion with service sector, computer, and telecom industry remains leading sectors for FDI inflows. India has free trade agreements with several nations, including ASEAN, SAFTA, Marcos, South Korea, Japan and few others which are in effect or under negotiating stage. The service sector makes up 50% of GDP and remains the fastest growing sector, while the industrial sector and the agricultural sector employs a majority of the labour force. The Bombay Stock Exchange and National Stock Exchange are one of the world's largest stock exchanges by market capitalization. India is the world's sixth-largest manufacturer, representing 3% of global manufacturing output and employs over 57 million people.

Nearly 66% of India's population is rural, and contributes about 50% of India's GDP. It has the world's fifth-largest foreign-exchange reserves worth \$585 billion. India has a high public debt with 89% of GDP, while its fiscal deficit remained at 4.6% of GDP. However, as per 2019 CAG report, the actual fiscal deficit is 5.85% of GDP. India's government-owned banks faced mounting bad debt, resulting in low credit growth, simultaneously the NBFC sector has been engulfed in a liquidity crisis. India faces moderate unemployment, rising income inequality, and major slump in aggregate demand. In recent years, independent economists and financial institutions have accused the government of fudging various economic data, especially GDP growth.

India is the world's largest manufacturer of generic drugs, and its pharmaceutical sector fulfils over 50% of the global demand for vaccines. The Indian IT industry is a major exporter of IT services with \$191 billion in revenue and employs over four million people. India's chemical industry is extremely diversified and estimated at \$178 billion. The tourism industry contributes about 9.2% of India's GDP and employs over 42 million. India ranks second globally in food and agricultural production, while agricultural exports were \$35.09 billion. The construction and real estate sector ranks third among the 14 major sectors in terms of direct, indirect and induced effects in all sectors of the economy. The Indian textiles industry is estimated at \$100 billion and contributes 13% of industrial output and 2.3% of India's GDP while employs over 45 million people directly. India's telecommunication industry is the world's second largest by number of mobile phone, smartphone, and internet users. It is the world's 25th-largest oil producer and the third-largest oil consumer. The Indian automobile industry is the world's fifth-largest by production. It has \$1.1 trillion worth of retail market which contributes over 10% of India's GDP and has one of world's fastest growing e-commerce markets. India has the world's fourth-largest natural resources,

YEAR	GDP (real) growth	Inflation (in Percent) rate	Government debt (in % of GDP)
2011	▲6.63%	▲9.5%	▲69.6%
2012	▲5.45%	▲10.0%	▼69.1%
2013	▲6.38%	▲9.4%	▼68.5%
2014	▲7.41%	▲5.8%	▼67.8%
2015	▲7.99%	▲4.9%	▲69.9%
2016	▲8.25%	▲4.5%	▼69.0%

Gross domestic product (GDP)	growth rate in India
2017	▲7.04%
2018	6.12%
2019	4.18%
2020	-10.98%

Published by H. Plecher, Dec 8, 2020

The statistic shows the growth of the real gross domestic product (GDP) in India from 2015 to 2020, with projections up until 2025. GDP refers to the total market value of all goods and services that are produced within a country per year. It is an important indicator of the economic strength of a country. Real GDP is adjusted for price changes and is therefore regarded as a key indicator for economic growth. In 2020, India's real gross domestic product growth was at about -10.29 percent compared to the previous year. Recent years have witnessed a shift of economic power and attention to the strengthening economies of the BRIC countries: Brazil, Russia, India, and China. The growth rate of gross domestic product in the BRIC countries is overwhelmingly larger than in traditionally strong economies, such as the United States and Germany. While the United States can claim the title of the largest economy in the world by almost any measure, China nabs the second-largest share of global GDP, with India racing Japan for third-largest position. Despite the world-wide recession in 2008 and 2009, India still managed to record impressive GDP growth rates, especially when most of the world recorded negative growth in at least one of those years. Part of the reason for India's success is the economic liberalization that started in 1991 and encouraged trade subsequently ending some public monopolies. GDP growth has slowed in recent years, due in part to skyrocketing inflation. India's workforce is expanding in the industry and services sectors, growing partially because of international outsourcing — a profitable venture for the Indian economy. The agriculture sector in India is still a global power, producing more wheat or tea than anyone in the world except for China. However, with the mechanization of a lot of processes and the rapidly growing population, India's unemployment rate remains relatively high. The Indian economy is going through a turbulent period with key indicators hinting at a prolonged slowdown. The coronavirus pandemic has weakened all sectors of the Indian economy since April and a recovery seems unlikely this year. From contraction in growth to rising inflation and unemployment, challenges are aplenty. The sharply surging coronavirus cases make the case for recovery worse. India's GDP growth is expected to remain in negative zone for the entire year and projections for June quarter signal how adversely Covid-19 has disrupted the livelihood, particularly of the poor. The annual GDP is forecast to sink over 5.1 per cent. This will mark the weakest GDP growth rate in over four decades.

Five major challenges that Indian economy faces:

#### Weak demand

Stagnated demand seems to be the biggest challenge for the economy at the moment. Demand for key goods and commodities like fuel, food, consumer goods and electricity has fallen over the last few months. While India's demand woes began in 2019, the coronavirus pandemic only worsened the scenario. India's consumer demand is declining due to drop in household incomes in the wake of major job losses in the wake of a raging pandemic that has forced closures of factories and businesses.

#### Ballooning unemployment

The latest unemployment figures, released by the Centre for Monitoring Indian Economy (CMIE), are another evidence of economic weakness. The CMIE data show that nearly five million or 50 lakh salaried jobs were lost in July, taking the total number of layoffs in the formal sector to over 1.8 crore. While some businesses in the informal sector have reopened post-lockdown relaxations, they are struggling to survive due to lack of demand, and constrained by the lack of available workforce. Over 1.8 crore salaried jobs lost since April, nearly 50 lakh in July: CMIE Experts say most informal businesses depend on the cash flowing from the formal economy i.e. salaried jobs. The economic situation could worsen further if more salaried jobs are lost.

### Lack of fiscal stimulus

Many noted economists have made it clear that India needs another round of fiscal stimulus to support growth. While the government, at the start of the pandemic, announced a fiscal stimulus package of nearly Rs 21 lakh crore, most of it was focused on bank credit for businesses.

Experts said the government's inability to provide direct fiscal stimulus, like many other countries, is due to India's stretched fiscal deficit. The fiscal deficit has already hit a record \$88.5 billion over April to June, which is over 83 per cent of the target for the current financial year.

Lower tax collections and front-loaded spending are some of the reasons pushing the fiscal deficit higher. Finance Minister Nirmala Sitharaman has, however, promised to take some steps for businesses that have been hurt most — travel, tourism, hospitality — once they are allowed to completely reopen.

### Rising inflation

Rising inflation has complicated the economic situation further. In July, retail inflation rose to 6.93 per cent, way above the RBI's medium-term target of 4 per cent. Economists say it is an unusual situation where prices of food items like vegetables, pulses, meat and fish are on the rise despite weak demand. The July inflation figure at 6.93 per cent is worrisome when compared to the 3.15 per cent on the consumer price index (CPI) in July 2019. This reduces the possibility of a rate cut by the RBI in near future. It also means that demand for loans could remain lower due to elevated interest rates. Low demand for loans means lesser new business activities, and fewer new employment opportunities.

---

## IMPACT OF DATAMINING ON E-CRM

**Janhavi Vadke**, Research Scholar, JJTU &Assistant Professor, VSIT, Vidyalankar School of Information Technology, Wadala, East.

**Dr. Sarika Chouhan**, Ph.D Co-Guide, JJTU &Assistant Professor, VSIT, Vidyalankar School of Information Technology, Wadala, East.

### **ABSTRACT**

Electronic customer relationship management (e-CRM) is the application of Internet-based technologies such as websites, forums, emails, chat to achieve Customer Relationship Manager objectives. It is a well-structured and organized process of CRM that automates the processes in sales, marketing, promotion and customer service. An effective e-CRM increases the efficiency of the processes and also improves the interactions with customers and facilitates businesses to customize services and products that meet the customers' individual needs. With the help of various techniques of data Mining like clustering, regression useful information can be extracted from customers data which will help organizations in decision making and to retain its customers. The right to information privacy includes that certain information should not be collected at all by business firms or Government but data Mining techniques makes it easier for different firms to easily extract customers private data which affects the privacy of customers.

**Keywords:***Data Mining, Customer, Decision Making, Clustering, Businesses*

### **1. INTRODUCTION**

e-CRM had emerged from CRM and emphasis on personalization, direct marketing technologies for selling and providing distinct services to small parts of the market. It is an online sale, marketing and service strategy used to identify, attract, and retain an organization's customers. It improves and increase communication between an organization and its clients by creating and enhancing customer interaction through innovative technology. Data Mining is finding out the unseen patterns and relationships in a profound large volume of data. The data is collected and a suitable algorithm to uncover trends and correlations for facilitating better business decision making. Data Mining helps to examine and process the data and make it easier for the business to interact with customers and future clients.

### **2. e-CRM**

CRM is the process of acquiring, holding and growing profitable customer. A clear focus is required on the service aspects that represent value to the customer and creates loyalty. It is a comprehensive sales and marketing methodology to build long term customer relationship management and improve business performance. Electronic customer relationship management, e-CRM derive from CRM techniques. e-CRM is the adaptation of CRM in an e-commerce environment and helps build and sustain customer relationship using the net. e-CRM systems will capture data in one place and integrate it seamlessly throughout various departments and processes. e-CRM software systems contains following features:

- 1. Customer Management:** customer information can be accessed having enquiry status and Correspondence.
- 2. Knowledge Management:** Centralised knowledge base which is responsible to handle and shares customer Information.
- 3. Account Management:** Customer information can be accessed such that sales teams and customer service teams can function efficiently.

4. **Case Management:** It deals with enquiries, increases priority cases and notifies management of unresolved issues.
  5. **Back-End Integration:** It handles systems such as inventory, billing and logistics through websites and call centres.
  6. **Reporting and Analysis:** customer behaviour and business reports are generated.
- Following benefits can be achieved by e-CRM



*Fig No 1-benefits of e-CRM*

1. **Service level improvements:** Integrated database is used to deliver steady and improved customer responses.
2. **Revenue growth:** Cost is Decreased by focusing on retaining customers and using interactive service tools to promote and sell additional products.
3. **Productivity:** Productivity is increased by Consistent sales and service procedures.
4. **Customer satisfaction:** With the help of Automatic customer tracking and detection it will be ensured that enquiries are met and all issues are managed. This will improve the customer's overall experience in trading with the organisation.
5. **Automation:** e-CRM software helps to automate all the processes like telemarketing, mail, sales, tracking response, opportunity management and order management.

### **3. Data Mining**

Data Mining is the process of finding abnormalities, correlations, patterns and relationships within large set of data to predict particular outcome. Using different techniques, we can use the information to increase revenues, improve customer relationships, reduce costs and reduce risks. Data Mining helps business analysts to generate assumptions and Data Mining tools take data and construct a representation of reality in the form of a model. The resulting model describes patterns and relationships present in the huge data. Data Mining is used to construct different six types of models aimed which are used to solve business problems like classification, time series, regression, clustering, sequence discovery and association analysis. Classification and regression are used to make predictions, Clustering can be used for either forecasting or description while association and sequence discovery are used to describe behaviour. Data Mining is a method or tool that can help companies in their mission to become more customer-oriented.

#### **3.1 Effect on Privacy of customers**

The term “customer lifecycle” is the different stages in the relationship between a customer and a business. It relates directly to the customer income and customer profitability. Customer relationship changes over time as the business evolves and the customer learn more about each other. Customer lifecycle is essential because it is a framework for understanding customer behaviour.



*Fig No 2- customer Life Cycle*

- 1. Reach:** This is the initial stage of the customer life cycle. The primary goal at this phase is to bring awareness to brand and to entice the consumer to want to learn more about goods or services.
- 2. Acquisition:** Customer's contact information, such as email addresses, phone numbers or social media profiles are obtained.
- 3. Conversion:** Customer is converted into an actual paying customer. Consumer is convinced to buy goods or services.
- 4. Retention:** In this phase customer relationships are developed during the acquisition stage. Regular engagement with the consumer is done to encourage repeat purchases. Sales techniques like up selling, cross selling and loyalty programs are very efficient at retaining customers.
- 5. Advocacy:** Advocates customers are created in this phase. These are faithful customers who not only make regular purchases but also are willing to promote goods or services to others.

The customer lifecycle provides a good structure for applying data Mining to CRM. Data Mining is the way companies get a lot of information. It can protect from fraud, but it may also expose private information. Data Mining uses automated computer systems to sort lots of information and to identify trends and patterns in it. It is often used to check people's behaviour based on past purchases or routine travel or the events in their lives. The practice creates ethical issues for organizations that use the data and privacy concerns for consumers. Mining large collections of data gives big companies insight into where shopping behaviour of customers, health and many more. Customers leave a big enough data footprint worth Mining.

### **3.2 Risks to Consumers**

It will be a great risk for consumers to store a lot of information in one place. The mined data of customers can sometimes be misused or even stolen. It can lead to problems for consumers in future. All this information helps businesses to target potential customers. But it may also make personal information a target for unethical businesses or cybercriminals. There are things which can be done to guard privacy and minimize risks of unscrupulous data Mining.

### **3.3 Protection from Data Mining Risks**

It's virtually impossible to avoid leaving a trail of at least some data. But we can control how much information becomes available to data miners.

We should read over the terms of service before buying, sign up for any social media account, credit card or website. This will convey the information we are providing to hackers. Don't click on "Agree" unless we are willing to agree with all the terms.

We should look and read carefully the privacy policy for any website or social media platform. This may be different from the terms of service.

#### 4. CONCLUSION

With the help of Data Mining techniques, we can retrieve information in smart ways. Algorithms are used to predict user behaviour and interests by tracking their activities and searches. Predictions and intelligent Mining are done through large and complex algorithms. Intelligent data Mining enhances to the Web the intelligence's characteristic, which can be used in techniques of data transfer protocols, algorithms shortest path, network structure, etc.

Privacy is the respect and preservation of user data from the use or access to others without their permission and is a major concern. The intelligent data Mining targets user data directly under the pretext of understanding the user, his interests, monitoring his movements on Web and his behaviours so that these data are easy to access and use which is contrary to the concept of privacy, therefore, applications that violate privacy are sometimes inconvenient to users. Intelligent data Mining primarily serves the user in all areas of life, but at the expense of their privacy.

#### REFERENCES

- [1] R. Uma Maheswari , S. Saravana Mahesan , Dr. Tamilarasan , A. K. Subramani , “Role of Data Mining in CRM”, Tamilnadu, India.
- [2] Miguel A.P.M Legeune, “measuring the impact of data Mining on churn management” New Jersey, USA.
- [3] Savitha S. Kadiyala, Alok Srivastava, “Data Mining For CustomerRelationship Management”, Georgia State University.
- [4] Sarada sowjanya.C, R.M.Sravan Ch, “Application of Data Mining techniques for Customer RelationshipManagement (CRM)”, Mysore, India.
- [5] Matthew D Dean, Dinah M Payne , Brett J.L. Landry “Data mining: an ethical baseline for online privacy policies”, Portland, Maine, USA
- [6] “E-CRM: Meaning, Evolution and Benefits” Article by : Diksha S
- [7] Ulrike Hugi, “Reviewing person's value of privacy of online social networking”, Innsbruck, Austria
- [8] T. Femina Bahari , M. Sudheep Elayidom,“An Efficient CRM-Data Mining Framework for the Prediction of Customer Behaviour”, Kochi, India
- [9] Seyed Mohammad Seyed Hosseini, Anahita Maleki , Mohammad Reza Gholamian, “Cluster analysis using data mining approach to develop CRM methodology to assess the customer loyalty”, Tehran, Iran

## REMOTE WORK: TRANSFORMATION OF WORK PATTERN IN INDIA

**Dr. M. Uma Maheswari**, Assistant Professor, Department of Commerce, S.T. Hindu College, Nagercoil, Kanniakumari district, Tamil Nadu

**Dr. R Babita**, Assistant Professor, Department of Commerce, S.T. Hindu College, Nagercoil, Kanniakumari District, Tamil Nadu

### ABSTRACT

The advancements in ICT facilitated the performance of the assigned work from anywhere not necessarily in the physical office environment. In the present study Remote Work means working from home. Covid 19 has made remote work in India a necessity and people have learnt this new normal work environment. Yet this work culture is perceived differently by different people. The study primarily focuses on employee perspectives and hardships in remote working. The study is descriptive in nature. Information were gathered from both primary and secondary sources. Snow Ball Sampling method was adopted to collect data from 111 remote workers. Descriptive statistics and Friedman Ranking technique were used for statistical analyses. It is noted that the pandemic has rapidly transformed the respondents work pattern from physical office environment to remote work. The respondents felt comfortable to work from home but they are not enjoying it equally. Majority of respondents look forward to return to office. The respondents indicated that they had to work lengthy hours without breaks at home than office. The respondents were missing the aura of inter personal relationships rather than work related hardships. Therefore, a hybrid model of work, where employees can work in office on certain days of a week and remotely on the rest of working days would lend a hand to employees to overcome the hardships and create a sustainable work environment where both organizations and employees progress.

**Key Words:** *Remote Work; Work from Home; Transformation in Work; Perspectives Towards Remote Work; Hardships in Remote Work*

### 1. INTRODUCTION

Information and Communication Technology sector witnessed a swift during the 21<sup>st</sup> century. The development of ICT facilitated the performance of the assigned work from anywhere not necessarily in the physical office environment. Advancements in technological infrastructures and resources have led to a rise in work from home model globally. The recent Covid 19 pandemic in the year 2020 has accelerated digitalization and transformed the working pattern of Indian labour in various sectors. Remote working in India has gained momentum due to frequent lock downs and restrictions by the Government and fear of getting affected by corona virus among common man. The concept of remote work or telecommuting became popular and implemented by organizations with office automation technology in India. Capgemini Research Institute (2020) found that “widespread remote working is increasingly becoming the new normal. Three-quarters of organizations expect 30 percent or more of their employees to be working remotely, and over a quarter expect over 70 percent of their staff to be working remotely.” Remote work refers to performance of work assigned by the organization to its employee outside the formal office environment. Telecommuting replaces the communication capabilities for travel to work location. A remote employee is someone who is employed by a company, but works outside of a physical office environment. In the present study Remote Work means working from home. The Union Labour and Employment Ministry has published a draft of separate Model Standing Order for services sector on 31<sup>st</sup> December, 2020, “Standing orders encourage employers for use of information technology in dissemination of information to the workers through electronic mode. The concept of ‘work from home’ has been formalized for the service sector.”

## 2. REVIEW OF LITERATURE

**Sarah T. Soroui (2021)** found that the firms indicated that remote work is increasingly utilized as a strategy to overcome the difficulties of regional talent acquisition. Remote work utilization can rework or attenuate the local economic and social linkages of remote-utilizing firms and remote employees. **Bin Wang et.al.(2020)** identified four key remote work challenges (i.e., work-home interference, ineffective communication, procrastination, and loneliness), as well as four virtual work characteristics that affected the experience of these challenges (i.e., social support, job autonomy, monitoring, and workload) Virtual work characteristic are a powerful vehicle for improving remote workers' work effectiveness and well-being. It was found that remote workers were struggling with work-home interference as a major challenge and procrastination was one of the concrete challenges. They also revealed self-discipline an important moderating individual difference factor and significantly shapes remote working experiences. **Cinni K R et.al. (2019)**, found that preference to work from home is gender independent. All demographic variables are independent with work from home. All employees support work from home option since it helps in having better work-life balance. Work from home also increases quality of work and increases loyalty. It reduces mental and physical stress. It saves time, money and energy. **Olson, J. S., Olson, G. M., & Meader, D. (1997)** found that the quality of work with remote high-quality video is as good as face-to-face but the same is not good without video Face-to-face work is better when supported by a shared editor. Video neither engaged the participants nor to discuss things more critically. But in remote work, video is preferred by participants over audio-only, and equally to face-to-face work. **Margrethe H.Olson (1983)** in her study revealed that the individuals who worked from home were found to be highly self-motivated and self-disciplined and possessed skills for bargaining power. Remote work was done due to family requirements or due to preference of few social contacts beyond family.

## 3. STATEMENT OF PROBLEM

In India, the pandemic forced the organizations and employees to practice remote working. The transformation happened so rapidly that none of them could wait or think of slowing down in their work. Remote work has become the need of the day. Companies' had to implement it to keep going and employees had to accept the pattern of work from home willingly or unwillingly for safety and survival. For some employees it is very convenient to work from home but for others it is full of challenges and distractions finding it difficult to separate personal life and work life. Though there are favourable aspects of remote work like flexibility, saving time, money and efforts to travel to workplace, there are certain other aspects which create hardships for the remote worker. Hence this study is attempted to analyze the perception towards remote working and also to study the hardships experienced by the respondents while working remotely.

## 4. OBJECTIVES OF THE STUDY

The study is carried on with the following objectives:

1. To identify the socio-economic profile of the remote workers.
2. To analyze the employee perception and nature of transformation towards remote work.
3. To examine the hardships experienced by the respondents in the course of remote work.

## 5. SCOPE OF THE STUDY

The organizations are greatly benefited with the remote work model as it facilitates major saving on infrastructural spending which is usually incurred in the formal office environment. It is the employees who have to adjust to new normal environment of working from home. The present study focuses on the

perspectives of employees who work remotely from different parts of India. The study throws light on the experiences of the remote workers in various dimensions.

## 6. METHODOLOGY

The present study is descriptive in nature. Data and information were gathered from both primary and secondary sources. The secondary data were collected from websites. The primary data have been collected through structured questionnaire typed in Google forms and circulated during January and February, 2021. Snow Ball Sampling method was adopted to collect data from remote workers. 111 responses were received from various parts of India. The responses were tabulated and the data were analysed with the help of SPSS 20.0. Descriptive statistics and Friedman Ranking technique were used for statistical analyses.

## 7. RESULTS AND DISCUSSION

The results of the analysis and related discussions are presented below:

### 7.1 Socio-Economic and Demographic Profile of Remote Workers

The parameters such as gender, age, education, marital status, type of family, occupation and monthly income are considered in the present study to understand the socio-economic and demographic profile of the respondents in the study area and exhibited in *Table 1*.

Profile Variables	Particulars	No. of Respondents	Percentage
Gender	Male	78	70.3
	Female	33	29.7
	<b>Total</b>	<b>111</b>	<b>100</b>
Age (in years)	Below 25	15	13.5
	25-35	54	48.6
	36-45	36	32.4
	Above 45	06	05.5
	<b>Total</b>	<b>111</b>	<b>100</b>
Educational Status	School Education	-	-
	College Education	35	31.5
	Professional Education	67	60.4
	Diploma/Certificate Courses	09	08.1
	<b>Total</b>	<b>111</b>	<b>100</b>
Marital Status	Married	75	67.6
	Un-married	36	32.4
	<b>Total</b>	<b>111</b>	<b>100</b>
Type of the Family	Nuclear	72	64.9
	Joint	39	35.1
	<b>Total</b>	<b>111</b>	<b>100</b>
Occupation	IT	57	51.4
	Accounts	21	18.9
	Marketing	06	05.4
	HR	20	18.0
	Others	07	6.3
	<b>Total</b>	<b>111</b>	<b>100</b>
Monthly Income	Below Rs. 25000	21	18.9
	Rs.25001 – 50000	42	37.8

	Above Rs.50000	48	43.3
	<b>Total</b>	<b>111</b>	<b>100</b>

Source: Primary data.

*Table 1: Socio-Economic and Demographic Profile of the Respondents*

It is revealed from *Table 1* that 70.3 per cent respondents were males, 48.6 per cent of the respondents belonged to the age group of 25 to 35 years, followed by 32.4 per cent belonged to the age group of 36 to 45 years. 60.4 per cent of the respondents have completed professional education and 67.6 per cent of the respondents were married. The type of the family of the respondents revealed that 64.9 per cent of the respondents lived in a nuclear family. 51.4 per cent of the respondents were IT employees and 43.3 per cent were earning monthly income of above Rs.50000. Thus it is interpreted that majority of the respondents are middle aged married males living in nuclear family set up. Major per cent of the respondents have completed their professional education and working in IT sector earning monthly income above Rs.50000.

## 7.2 Perspectives of Respondents towards Remote Work

The perception of the remote workers were measured with 22 statements formatted in 5 point Likert Scale from Strongly Agree (5 points) to Strongly Disagree (1 point). The 22 statements were framed after brainstorming with 10 remote workers. The tabulated responses with mean score and standard deviation is presented in *Table 2*.

S. No.	Statements	Mean	Std. Deviation
1	I look forward to return to office	3.97	1.031
2	I could quickly adjust to remote work	3.97	1.107
3	I feel free from gossips, rumours	3.84	1.058
4	I have appropriate work space at home	3.76	1.154
5	I have adequate communication with my colleagues	3.73	1.061
6	I can connect with my superior as the same as if I were in the office	3.73	1.111
7	I know clearly what my superior expects from me every day	3.73	1.206
8	I could arrange the resources and tools to work from home quickly	3.70	1.014
9	I am able to stick to my work schedule	3.57	1.032
10	I feel that remote work policy of my organization is clear	3.54	1.134
11	I feel comfortable to work from home	3.43	1.291
12	I can draw a hard line between work and home	3.38	1.104
13	At the end of the day, I get a complete satisfaction of working from home	3.30	1.233
14	I missed skill development training programs	3.29	1.023
15	I can attend religious and family functions conveniently	3.24	1.154
16	I have a good working routine at home	3.22	1.217
17	I am able to spend quality time with my family	3.19	1.359
18	I am able to learn more through work from home	3.11	1.012
19	I am enjoying work from home	3.11	1.317
20	I felt a kind of employer exploitation when I work from home	3.03	1.208
21	I am having a healthy work life balance through work from home	3.00	1.342
22	I am taking regular breaks in remote work	2.89	1.377

Source: Primary Data

*Table 2: Perspectives of Respondents towards Remote Work*

It is found from *Table 2* that 'I look forward to return to office' and 'I could quickly adjust to remote work' statements scored the maximum mean score of 3.97, followed by 'I feel free from gossips, rumours' with the mean score of 3.84, 'I have appropriate work space at home' with the mean score of 3.76. The three statements 'I have adequate communication with my colleagues', 'I can connect with my superior as the same as if I were in the office' and 'I know clearly what my superior expects from me every day' have the same mean score of 3.73. The minimum mean score of 2.89 is for the statement 'I am taking regular breaks in remote work', followed by 'I am having a healthy work life balance through work from home' with the mean score of 3.00 and 'I felt a kind of employer exploitation when I work from home' with the mean of 3.03. The statements 'I am able to learn more through work from home' and 'I am enjoying work from home' fetched the same mean score of 3.11. Thus, it is interpreted that the respondents felt comfortable to work from home but they are not enjoying it equally. Majority of respondents look forward to return to office though they felt some positive aspects of remote work as they are free from gossips, have appropriate work space at home with necessary tools and resources and adequate communication with colleagues and superiors. It is also interpreted that though the respondents work from home and have good working routine at home, regular breaks and healthy work life balance is possible to limited extent.

### 7.3 Nature of Transformation and Satisfaction

The nature of transformation and satisfaction aspect in the present study includes Duration in remote work, Transition from physical to Remote work, Hours worked in a day at office and at home and level of satisfaction. The frequency and percentage of responses are presented in *Table 3*.

Variables	Particulars	Frequency	Percentage
Duration in Remote Work	Less than 6 months	03	02.7
	6 months to 12 months	93	83.8
	More than 12 months	15	13.5
	<b>Total</b>	<b>111</b>	<b>100.0</b>
Transition from Physical to Remote Work	Gradually	33	29.7
	Momentarily	12	10.8
	Progressively	6	5.5
	Rapidly	60	54.1
	<b>Total</b>	<b>111</b>	<b>100.0</b>
Hours Worked in a day in Office	Less than 8 hours	12	10.8
	8 hours	59	53.2
	9 hours	37	33.3
	10 hours	03	02.7
	Above 10 hours	-	-
	<b>Total</b>	<b>111</b>	<b>100.0</b>
Hours Worked in a day at Home	Less than 8 hours	12	10.8
	8 hours	09	08.2
	9 hours	18	16.2
	10 hours	54	48.6
	Above 10 hours	18	16.2
	<b>Total</b>		
Level of Productivity in remote work than office work	Less Productive	12	10.8
	Equally productive	54	48.6
	More productive	45	40.6
	<b>Total</b>	<b>111</b>	<b>100.0</b>

Level of Satisfaction in Remote Work	Highly satisfied	15	13.5
	Satisfied	42	37.8
	Neutral	30	27.1
	Dissatisfied	12	10.8
	Highly dissatisfied	12	10.8
	Total	111	100.0

Source: Primary data

*Table 3: Nature of Transformation and Satisfaction*

*Table 3* indicates that Majority of the respondents (83.8%) started working remotely for the past six to 12 months. Majority of the respondents (54.1%) felt there was a rapid transition from physical to remote work. Majority of the respondents (53.2%) worked eight hours a day in office. Major portion of the respondents (64.8%) worked 10 hours and more than 10 hours a day in remote work. Major portion of the respondents (48.6%) believed that they are equally productive and 40.6 per cent of the respondents felt that they are more productive than regular office environment. 37.8 per cent of the respondents felt satisfied and 24.4 per cent were neither satisfied nor dissatisfied. Thus, it is interpreted that the pandemic has rapidly transformed the respondents work pattern from physical office environment to remote work. The respondents indicated that they had to work lengthy hours without breaks at home than office and therefore felt they are equally productive or more productive in work. The satisfaction level is moderate among the remote workers.

#### 7.4 Hardships in Remote Work

Hardships are the difficulties or challenges experienced by the respondents during the period of work from home. Eleven variables were identified after discussion with people working remotely. The variables were measured in 5 point Likert Scale such as 'Always Experienced (5 points)', Often Experienced (4 points), 'Experienced Sometimes' (3 points), 'Rarely Experienced' (2 points) and 'Never Experienced'(1 point). Friedman Ranking Technique has been followed to find out the mean and ranks are given accordingly and the results are exhibited in *Table 4*.

S. No.	Hardships	Mean (Friedman)	Rank
1	Missed get together and gatherings	7.57	I
2	Lack of visual admiration	7.34	II
3	Lack of interpersonal relationship	7.34	II
4	Isolation	6.88	III
5	Distractions at home	6.50	IV
6	Improper Net work connectivity	6.11	V
7	Couldn't Stay motivated	5.61	VI
8	Lack of Communication	4.95	VII
9	Power cuts and Inadequate back up facility	4.89	VIII
10	Couldn't take vacation time	4.70	IX
11	Lack of trust from the superiors	4.12	X

Source: Primary Data

*Table 4: Hardships Experienced by the Respondents*

*Table 4* shows that the hardships of 'Missed get together and gatherings' with the highest mean value of 7.57 is ranked first, followed by 'Lack of visual admiration' and 'Lack of interpersonal relationship with the same mean value of 7.34. 'Isolation' was ranked third with the mean value of 6.88, followed by

‘Distractions at home’ with the mean value of 6.50 was ranked fourth. ‘Improper network connectivity’ was given fifth rank with the mean value of 6.11. Thus, it is interpreted that the respondents experienced mainly the hardships of not able to meet people in person and missing the aura of inter personal relationships rather than work related hardships. With all comforts working only with machine and seeing people virtually and no touch and feel aspect of relationship itself leads to isolation, depression and health related issues.

## 8. CONCLUSION

Advancements in technological infrastructures and resources have led to a rise in work from home model globally. Remote working culture in India has gained momentum due to frequent lock downs and restrictions by the Government on public interest and fear of getting affected by corona virus among common man. Remote work has become the need of the day. Covid 19 has made remote work in India a necessity and people have transformed to this new normal work environment. Yet this work culture is perceived differently by different people depending upon their nature of work.

It is concluded from the study that this global pandemic has rapidly transformed the respondents work pattern from physical office environment to remote work. Remote workers felt comfortable to work from home at the same time they are not enjoying it equally. Though the work is from home, with proper working, regular breaks and healthy work life balance could be established only to a limited extent. In spite of positive aspects of working from home, majority of respondents look forward to return to office. The respondents indicated that they had to work lengthy hours without breaks at home than office. From the productivity point of view, remote worker is equally productive as in office, in fact some are even more productive than they were in office. The satisfaction level is moderate among the remote workers. Employees working from home experienced hardship of not being able to meet friends and colleagues in person and missing the aura of inter personal relationships rather than work related hardships. Remote workers experienced a vacuum due to lack of socialization and visual admiration. With all comforts, working only with machine and seeing people virtually without touch and feel attribute of relationship exposes a remote worker to the risk isolation, depression and health related issues. Hence, it can be concluded that though remote work has become the new normal yet the old office environment is fondly remembered and cherished. Therefore, a hybrid model of work, where employees can work in office on certain days of a week and remotely on the rest of working days would lend a hand to employees to overcome the hardships and create a sustainable work environment where both organizations and employees will benefit and contribute to progress.

## REFERENCES

- [1] Bin Wang et.al (2020). Achieving Effective Remote Working During the COVID-19 Pandemic: A Work Design Perspective. *Applied Psychology*, November, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7675760>
- [2] Cinni, K R., Prasanth Warrier C. B. & Rosa K D (2019). A Sustainable Innovation through Work from Home and Work Life Balance at Information Technology Sector in Kerala. *IOSR Journal of Business and Management (IOSR-JBM)*. Volume 21, Issue 9. <https://www.researchgate.net/publication/336406365>
- [3] Margrethe H.Olson (1983). Remote office work: changing work patterns in space and time. *Communication of the ACM*. Vol.26, Issue 3. <https://dl.acm.org/doi/abs/10.1145/358061.358068>
- [4] Olson, J. S., Olson, G. M., & Meader, D. (1997). Face-to-face group work compared to remote group work with and without video, Computers, cognition, and work. Video-mediated communication (p. 157–172). Lawrence Erlbaum Associates Publishers. <https://psycnet.apa.org/record/1997-08440-006>

- [5] Sarah T. Soroui (2021). Understanding the drivers and implications of remote work from the local perspective: An exploratory study into the dis/reembedding dynamics, *Technology in Society*, Vol.64 <https://www.sciencedirect.com/science/article/abs/pii/S0160791X19305251>
- [6] Work from Home part of new Service norms, The Hindu Newspaper, 3<sup>rd</sup> January, 2021.
- [7] <http://www.panoramic.com/wp-content/uploads/2020/08/Remote-Work-Forever>
- [8] <https://www.capgemini.com/wp-content/uploads/2020/12/Report-The-Future-of-Work.pdf>

## **THE STUDY OF MARKETING INPUTS IN ORDER TO UNDERSTAND NEUROMARKETING: AN EMERGING AREA OF CONSUMER BEHAVIOUR**

---

**Dr. Rahul Wagh**, STES'S SKN Sinhgad School of Business Management, Pune (Maharashtra)  
Email: f18rahulw@jima.ac.in

**Dr. Ambrish Singh**, Rajkiya Engineering College, Azamgarh (Uttar Pradesh)  
Email: ambrish.singh08@gmail.com

---

### **Abstract:**

The paper provides understanding of neuromarketing with reference to consumer behavior. There is no study available on neuromarketing that provided a detailed overview of neuromarketing with reference to consumer behaviour. The assessment of preferences in decision-making by using neuromarketing techniques are measured by the equipments like EEG, fMRI and MEG. As a result, the field of neuromarketing is strongly interrelated to consumer behavior, and decision-making. Therefore, neuromarketing can be considered an interesting topic in marketing context.

**Keywords:** Neuromarketing, Consumer Behaviour

---

### **1. Introduction:**

The emergence of Neuromarketing and its importance is consistently growing; this paper will consider the clarification of consumer behavior by the use of neuromarketing and its benefits and drawbacks. There are evidences suggesting that the brain itself is mediator of human behavior, expressed emotions and decision-making processes.

The branding and advertising are considered to possess relevant impact on consumer choices for products, the neuromarketing could contribute and influence these consumer choices by the application of neuromarketing techniques in a positive manner.

### **2. Statement of meaning of Neuromarketing:**

The marketing is defined as an activity which tries to compile products and services by understanding and analyzing human behavior with regard to market. Marketing deals with the products that satisfy consumer needs. Neuromarketing is that the study of the system that seeks to understand the biological basis of behavior. It's a wise application of neurological findings to sciences that tries to understand human behavior, emotions and thoughts. The term Neuromarketing has several different definitions. Neuromarketing deals with problems relevant to marketing by making use of methods from brain research specifically brain operating principles in managerial practice. Neuromarketing is that the application of neuroscientific methods to research and understand consumer behavior in regard to markets and marketing exchanges.

### **3. Objectives:**

- a. To understand neuromarketing and its uses.
- b. To study influence of neuromarketing on consumer behavior, advertising and decision-making.

### **4. Methodology:**

The nature of research is in qualitative in structure. The data mainly gathered by making use of electronic search engines like Google Scholar, Scopus and the online library of the Savitribai Phule Pune University.

As the research is in qualitative manner therefore the researches have applied an in-depth content analysis. The literatures are evaluated within the following.

### **A. Neuromarketing on Consumer buying behavior**

The use of neuromarketing to study consumer-buying behavior is usually advantageous. There are certain things that need consideration. Most of the buyers are unable to phrase their desires and needs that is why it's assumed that the brain itself encloses internal information, which could elucidate true desires and needs. Therefore, neuromarketing techniques are a perfect opportunity. Neuromarketing uses the most recent advances in brain scanning to seek out more about the mental processes behind consumer buying.

The buy switch within the brain, which could be able to determine the buying behavior of consumers by activating the brain area responsible for making the last word decision. Finally, neuromarketing particularly in regard to consumer buying behavior, can measure significant influences, and its results are often used as a template for further research.

### **B. Neuromarketing on Advertising**

The advertisements as a promotional tool to consumers on the market are becoming increasingly relevant. neuroimaging techniques are considered to be an exciting and helpful instrument for marketers.

The attractiveness of a advertisement and its correlated activation of brain areas. By making use of neuromarketing tools, they acknowledged that more attractive advertisements activate the ventromedial prefrontal cortex and thus the ventral striatum, which are responsible for emotions within the decision-making process and thus the cognition of rewards. These brain regions weren't activated when a less attractive advertisement was presented.

This suggests that by making use of neuromarketing techniques, it's possible to hunt out if a billboard is appeared to be attractive or not and therewith determine its effectiveness. Finally, we can say that if advertisers have the power to figure out which images cause which responses within the medial prefrontal cortex, it should enable advertisers to increase sales by making use of this method.

### **C. Neuromarketing on Decision Making**

The decision-making process with consideration of neuromarketing consists of five different stages as follow:



This decision-making as explained above can also be considered as a marketing tool, which can be studied by the neuromarketing techniques. The decision-making process is extremely influenced by the blending of emotions, which can provide one with additional information. The several researches proved that the uses of neuromarketing techniques are beneficial in decision making process.

Finally, one can say that the actual final decision depends on the overall evaluation of gain and loss in value before and after the selection has been made. However, there are certain arguments also that this evaluation and free decision-making are often manipulated.

## 5. Conclusion

Neuromarketing is typically explained as a tool to figure out secrets of the human brain by making use of imaging technology. This may be impacted by the actual fact that the number of researchers continuously increasing to study emotions and unconscious processes that influence human behavior.

Finally, we can say that if the moral aspect is taken into consideration by executing neuromarketing activities in an ethically correct way, it will often argue that the emergence of neuromarketing creates a future perspective for marketers and consumers.

Marketers can get maximum internal information which ends up in better product commercialization with more customized products.

## References

1. Adolphs, R., Tranel, D., Koenigs, M., & Damasio, A. (2005). Preferring one taste over another without recognizing either. *Nature Reviews Neuroscience*, 8(7), 860–861.
2. Ailawadi K.L., Keller K.L. (2004). Understanding retail branding: conceptual insights and research priorities. *Journal of Retailing* 80(4): 331–342.
3. Ambler T., Burne T. (1999). The impact of affect on memory of advertising. *J Advert Res* 39:25–34
4. Ambler T, Ioannides A, Rose S (2000). Brands on the brain: neuro-images of advertising. *Bus Strategy Rev* 11:17
5. Ariely, D., & Berns, G. S. (2010). Neuromarketing: the hope and hype of neuroimaging in business. *Nature Reviews Neuroscience*, 11(4), 284-292.
6. Bagozzi, R. P. (1991). The role of psychophysiology in consumer research. *Handbook of consumer behavior*, 124-161.
7. Bechara A., Damasio A.R. (2005). The somatic marker hypothesis: a neural theory of economic decision. *Games and Economic Behavior* 52: 336–372.
8. Bijmolt, T.H.A., van Heerde, H.J., Pieters, R.G.M., (2005). New empirical generalizations on the determinants of price elasticity. *J. Mark. Res.* 42, 141–156.
9. Braeutigam S. (2005). Neuroeconomics – from neural systems to economic behavior. *Brain Research Bulletin* 67: 355–360
10. Braun, C. (2007). Magnetenzephalographie: Eine Methode zur Untersuchung von Hirnfunktionen in der Neurochirurgie. *Zeitschrift für Medizinische Physik*, 17(4), 280-287.
11. Butler, M. J. (2008). Neuromarketing and the perception of knowledge. *Journal of Consumer Behaviour*, 7(4-5), 415-419.
12. Calvert, G. A., & Brammer, M. J. (2012). Predicting consumer behavior: using novel mind-reading approaches. *Pulse, IEEE*, 3(3), 38-41.

13. Camerer, C., Loewenstein, G., & Prelec, D. (2005). Neuroeconomics: How neuroscience can inform economics. *Journal of Economic Literature*, 9-64.
14. Chandon, P., Hutchinson, J. W., Bradlow, E. T., & Young, S. H. (2009). Does in-store marketing work? Effects of the number and position of shelf facings on brand attention and evaluation at the point of purchase. *Journal of Marketing*, 73(6), 1–17.
15. Cranston, R.E. (2004). Neuromarketing: Unethical Advertising? Retrieved November 14, 2007, from [http://www.cbhd.org/resources/biotech/cranston\\_2004-02-13.htm](http://www.cbhd.org/resources/biotech/cranston_2004-02-13.htm)
16. Dapkevičius, A., & Melnikas, B. (2011). Influence of price and quality to customer satisfaction: neuromarketing approach. *Science–Future of Lithuania/Mokslas–Lietuvos Ateitis*, 1(3), 17-20
17. Deppe M, Schwindt W, Kugel H, Plassmann H, Kenning P. (2005). Nonlinear responses within the medial prefrontal cortex reveal when specific implicit information influences economic decision-making. *Journal of Neuroimaging* 15: 171–182.
18. Dimoka, A., Bunker, R. D., Benbasat, I., Davis, F. D., Dennis, A. R., Gefen, D., & Weber, B. (2012). On the use of neurophysiological tools in IS research: developing a research agenda for neurois. *MIS Quarterly*, 36(3).
19. Dreze, X., & Hussherr, F. -X. (2003). Internet advertising: Is anybody watching? *Journal of Interactive Marketing*, 17(4), 8–23.
20. Editorial. (2004). Brain scam? *Nature Neuroscience* 7: 683.
21. Erk, S., Martin, S., & Walter, H. (2005). Emotional context during encoding of neutral items modulates brain activation not only during encoding but also during recognition. *NeuroImage*, 26(3), 829-838.
22. Esch, F. R., Möll, T., Elger, C. E., Neuhaus, C., & Weber, B. (2008). Wirkung von Markenemotionen: Neuromarketing als neuer verhaltenswissenschaftlicher Zugang. *Marketing ZFP*, 30(2), 111-129.
23. Eser, Z., Isin, F. B., & Tolon, M. (2011). Perceptions of marketing academics, neurologists, and marketing professionals about neuromarketing. *Journal of Marketing Management*, 27(7-8), 854-868.
24. Evanschitzky H, Kenning P, Vogel V. (2004). Consumer price knowledge in the German retail market. *Journal of Product and Brand Management* 13(6): 390–405
25. Schaefer, M., Berens, H., Heinze, H., & Rotte, M. (2006). Neural correlates of culturally familiar brands of car manufacturers. *Neuroimage*, 31, 861–865.
26. Senior, C., & Lee, N. (2008). Editorial: A manifesto for neuromarketing science.
27. Simon H, Dolan RJ. (1998). Price Customization. *Marketing Management* 7(3): 11–17.
28. Taher, N. (2006). Neuromarketing. New York: ICFAI University Press.
29. Tusche, A., Bode, S., & Haynes, J. D. (2010). Neural responses to unattended products predict later consumer choices. *The Journal of Neuroscience*, 30(23), 8024-8031
30. Vanhuele M, Drèze X. (2002). Measuring the price knowledge shoppers bring to the store. *Journal of Marketing* 66(4): 72–85.

## TECHNOLOGICAL PERSPECTIVES OF EDUCATION FOR GENERATION Z AND GENERATION ALPHA

**Neha Soly**, Research Scholar, Department of Commerce, CHRIST (Deemed to be University)  
**Kevin Benny**, Research Scholar, Department of Commerce, CHRIST (Deemed to be University)  
**Dr. Mary Rani Thomas**, Assistant Professor, Department of Commerce, CHRIST (Deemed to be University)

### Abstract

This research emphasizes the changes that are taking place in the process of learning. The conventional monotonous teaching is replaced by effective and technologically advanced teaching and learning practices that involve the students' active participation. Today's digital world has initiated opportunities for educational institutions to supplement a more interactive learning atmosphere for the students by providing necessary materials for the same. The current paper is focused on the educational transformation, and technology acceptance of Generation Z and Generation Alpha. It also stresses on the transition of these generations in terms of technology, learning, and behavior. This research attempts to highlight the distinguishing factor in the area of educational changes that have taken place concerning the two most important generations, Generation Z and Alpha. The methodology used in this research is a systematic narrative review. As such, the research is the compilation of literature that highlights the different methods used to engage both generations and is conducive to the educational stakeholders such as teachers, students, parents, and policymakers.

**Keywords-** Generation Z; Generation Alpha; Technology learning; Smart Education; Digital Learning; 'K12 Education.

### Introduction

There have been differences in the qualities, convictions, visions, and opinions among various ages of individuals regarding their outlook on different aspects of life. Those believing in these changing outlooks assume that they are critical in perceiving and defining the characteristics of various generations. The hypothesis behind the generational gap is that the individuals who share age, birth years, and noteworthy life occasions at basic formative stages (Berge and Berge, 2019). The generations themselves have classifications within, like, people born between 1946 and 1964 are called "baby boomers"; born between 1965 and 1977 are called "X Generation"; born after 1978 are called "Y Generation." "Z Generation" is for those who were born between 1990 and 2010. The "Alpha Generation" belongs to the group born after 2010 (Reis, 2018).

Technology has been a part of the everyday lives of the Z generation and Alpha generation. It has been influenced by their parents, teachers and other interactions socially (Tootell, 2014). A strong bonding has been established between the Z generation and the digital devices, where the generation has accepted to be emotionally affected if their digital devices are taken from them. Usage of gadgets have also dominated the lives of children which helped sharpen their brain and improve the medium of language skills and learning (Sihura, 2018). Generation Z feels more comfortable interacting online with their peers rather than face to face. The technology has impacted the generation in such a way that the students no longer find information through the traditional methods rather require instant information through search engines (Turner, 2015). Generation Z and Generation Alpha together are more inclined to using digital technology in their classrooms as the technology is more flexible and attractive to these generational students. These generation students need technologically advanced teaching methods as they can access information quickly and multitask very well (Januariyansah&Rohmantoro, 2018)

Generation Alpha kids are highly dynamic and tech-savvy and thus it calls for the urgent need to change the conventional teaching methods of K12 education to a much faster and technologically oriented one. Innovation must be welcomed in the system of K12 education which makes their learning process active and productive and if not initiated, can result in a scenario with no students attending schools in the near future. (Britten, 2019)

### **Educational Transformation over the years**

Schooling has a major role in developing the modern world, but education is beyond schooling; it is a lifelong enterprise. The advances in technology have helped transform the educational sector, and therefore, time-bound schooling is being gradually sidelined, and the wider picture of education is gaining importance (Collins, 2018). The Educational arena is undergoing a massive transformation due to technology. Technology itself has changed a lot in due course of time, way from its primitive stage to the present stature, and of course, the same has been progressing further, with marked refinements being done. Technological advancements paved the way for faster learning, which is quite evident from children playing complex video games; students of all ages are taking online classes (Reis, 2018). The introduction of technology-oriented learning methods has boosted the speed and quality of both teaching and learning. The new technology-based learning techniques are more interesting for both teachers and students. It creates an atmosphere of fun-learning and also inculcates a more disciplined and focussed behaviour of students in the classroom (Ghavifekr&Rosdy, 2015). Making use of technology lets teachers diversify lecture presentations, enhance learning, and provide further information. Also, if diverse technologies are applied within the classroom, time is saved, thereby liberating teachers to dedicate their time to lecture content (Aljawarneh, 2019)

The arriving of the third millennium experienced a new form of gaining knowledge, referred to as e-learning. Contrary to traditional learning, e-learning entails lower academic expenses and is taken into consideration to be an eminent and influential way of learning. Educators in every area have amassed some unique interest in technologically oriented learning frameworks, given that they offer new learning possibilities (Al-Samarraie et al. 2017). Various technologically assisted intellectual methods, like digital and mobile teaching, have been obtainable for years and several universities now avail those methods. The newest techniques can ascend ubiquitous technology and computing that enhance powerful knowledge gaining activities (Kattoua et al. 2016) E-learning knowledge systems like Blackboard and MOODLE are being utilized by universities.

These portal websites are useful resources that help students and instructors to introduce the educational content in a robust and trouble-free manner. Various activities provided by these portals stated as Student corroboration to modules, grades; English and computer skills modules; Teacher verification for contents including student's grades and names, description of modules; Online activities and brand new information regarding college campus; Distance education; E-attendance for staff and educators (Aljawarneh, 2019)

### **Theoretical framework for the study**

Lev Vygotsky(1934) initiated the Social Development Theory and highlighted the importance of socialization in young minds' lives. They tend to obtain a good deal of knowledge and develop intricate ideas through their social involvement and interaction with others. In assessing this theory, all the factors, including classroom management, cooperative learning, and teaching techniques, will be considered. The initial step is to establish a bond between the teacher and the student (Barnett, 2019). Vygotsky's theory has been compared to Jean Piaget's theory.

Jean Piaget's research on cognitive development has been of much use to his successors in understanding and communicating with the children. Discovery learning, which indicates that children learn best by doing and exploring, was seen as a core transformer of the curriculum in the primary classes. As per the theory, concepts are to be taught to the children at appropriate stages of cognitive development; also problem-solving skills cannot be taught; they are to be discovered, was Piaget's notion (Lourenco, 2014). Concerning teaching practices, his finding was that teachers are

facilitators, not direct tutors. Learnings are required to be student-centered and imparted through active discovery learning or learning by cooperation with others. Teachers' role is to encourage the students within the classroom, making them focus on the pace of learning, applying live methods, and also motivating them to learn more by interacting with their peers (Yassin *et al.* 2018).

Piaget's theory is used as an appropriate reference in this research as the theory can be linked cordially with Generation Alpha and Generation Z. The first three stages, Sensorimotor stage, Preoperational stage, and Concrete Operational stage noted in this theory can be associated with Generation Alpha that includes children up to the age of 10. In the last stage mentioned in the theory, Formal Operational stage can be compared with Generation Z that includes children above the age of 11.

**Table 2 Technological learning for generation Z**

Contributing author of the literature	The technology used by the facilitator	Age group /Year	Country from which the sample is studied	Positive/Negative impact of technology	Stakeholder Perspective	Findings
Cillers(2017 )	3. Social media WhatsApp, Personal computer (PC) recordings, questions online.	From 1995-2010	South Africa	Greater involvement of social media activates better modes of learning.	Teachers agree to have comparatively less knowledge about computers, than the students, still, they find technology as an effective medium to use for the teaching process.	The task of teaching Generation Z is to move from the conventional teaching styles and to adopt new and effective digital methods like social media, online recordings. Students demand for instant communication and depend on PC recordings rather than taking notes.
Cirilli et al(2019)	5. Web, social media, WhatsApp, Instagram, digital information.	1997-2010	NA	There exists a high risk of human beings being replaced by technology, and therefore the need to master technical skills becomes a necessity.	Technological advancements have a mixed impact on the Z generation as scholars and parents may agree that technology favors an organized life but this generation may question the traditional roles adopted in learning.	The advance in technology has changed the way in which Gen Z interact with each other. The digital skills of Generation Z are explained and compared with other generations in this article. Multitasking and digital skills have been mastered by this generation.
Swanzen (2018)	7. Digital technologies, snapchat, whisper, YouTube,	From 1995-2012	South Africa	Learning and teaching styles changed with the advent of technology. New	The use of mobile phones and other apps are much preferred by educators. The use of social media as a	Generation Z students learn through practice and experience

	Tumblr, twitter			tech-based education shaped new experiences and new expectations.	platform for collective learning is a much-accepted method.	and not by listening or reading. Teachers act as facilitators. Their education system is technology integrated and tends to obtain information from various online sources.
Chauhan (2016)	<b>11.</b> Computer simulations, animated cartoons, game-based learning, internet, electronic portfolio.	5 to 12 years . Only written elementary students .	NA	Educational performance and overall development improve with more practical based learning methods. Technology learning helps in increasing the effectiveness of learning in long term and short for the elementary students.	Teachers are on the path of fresh learning and teaching as the tech-based procedure is new to them. Teachers and school authorities should be promoted to bring in more application oriented learning which must be done in informal settings to increase effectiveness in learning for the elementary students.	Effective learning combines not just theory but also informal forms of it like teaching outdoors. Technology does contribute to effective learning in elementary students. The effectiveness of technology would be varying according to different subjects, practical application, duration of interventions and the environment of the elementary students.
Berge and Berge (2019)	<b>12.</b> Virtual Reality, Gamification	From 1996-2011	NA	Technology-based learning will always prove to be more interesting and entertaining, with an effective impact on the student's development.	There is a need of change in higher education that considers technical skills and soft skills as critical aspects.	Generation Z values diversity, and technology. Virtual reality is a three-dimensional visual experience giving a realistic form to the images to enhance learning among students.
Aljawarneh (2019)	<b>15.</b> Moodle, blackboard, web 2.0,	N A	NA	Blackboard is a good tool in designing students' curriculum simultaneously;	Educators have responded positively and gained a special interest in technological learning	Three main E-learning LMS(Learning Management Systems), which are - Blackboard, Moodle, Web 3.0,

				moodle, which is best known for the flexibility and comfort it possesses, even though moodle cannot be used for group activities and lacks communication facilities.	environments as it offers new teaching methods and learning opportunities enhancing innovative approaches.	integrating effective learning.
Turner(2015 )	<b>17.</b> Social media, flat screen televisions, tablets, smartphone, internet	From 1993-2005	NA	Technology has helped in processing knowledge in a more effective and less time-consuming manner. Youth are more comfortable interacting online. Cyberbullying, declining communication are the other drawbacks.	Teachers feel rightly compatible with tech and have adopted high technology standards to enhance classroom experience.	Technology has affected the social interests of Generation Z. Interaction between them are more preferred online rather than face to face. Digital media has been a part of this generation and cannot be taken from them. Hence, connecting to a child, technology can be used as support but must not depend only on it.
Shatto and Erwin (2017)	<b>18.</b> Social media examples Tumblr twitter etc, internet games, youtube	From 1995-2010	NA	New and advanced teaching methods enhance students' learning standards.	Teachers prefer to help in eliminating the gap between diverse generations using more effective teaching methods.	Generation Z is more active and involved in tech-based environment, that they are more often multitasker and different from other generations.
Berkup(2014)	<b>21.</b> Social Media Tools- facebook, Instagram Twitter Pinterest, internet-based games	1995-2010	NA	Several subjects can be focussed upon at the same time with the help of technology. There is a planned education system and increased creativity with the inclusion of technology. Social media can cause addiction to the Z	Educators can use innovation in delivery of content. The addiction can be channelised in a positive and collaborative manner.	Generation Z are born into technology and are known as the children of the internet who are constantly trying to comprehend the changing world. They are known for their freedom, reliance and addiction towards technology and their ability to be interested in learning more subjects at a time.

				generation.		
Domingo andGargante (2016)	<b>23.</b> Mobile technology, teaching apps, social media	NA	Spain	Everything is available in a single touch and it saves time, keeps the user active, and entertains the user.	Educators feel that teaching using technology has become more advanced and easy that it facilitates effective learning. They are in favor of the idea of technology inculcation.	Mobile technology and apps have the potential to improve learning. It's a boon in the education system.
Csobanka (2016)	<b>24.</b> Gadgets, video games, internet, youtube	1996-2010	NA	Active social interactions, active device skills, global connectivity. Kids lack strong family relations and also lag in developing their own creative ideas, sleep deprivation	Technology education has increased motivation and improved teaching methods supporting the teachers to define their new roles.	Students today are all 'native speakers' of the digital language; that is, they have learned to speak the language of computers, the internet, and video games.
Rasiah (2014)	<b>25.</b> Social Media	1995-2010 (undergraduate students )	Malaysia	Connection strengthens between educators and students via positive learning.	Educators are active in shaping the education process well for students.	Social media like Facebook is a great tool for communication and better learning.
McKnight et al. (2016)	<b>26.</b> Digital learning, YouTube Pinterest		US	Tech-based platforms- provide wider scope for learning and also increases the competitiveness in all sectors of the economy	Teachers find comfort in creating an atmosphere fit for effective learning for students.	The learning process is made interesting by educators by initiating new forms and methods of teaching.
Jack &Higgins(2)	<b>36.</b> Internet, YouTube,		England	Technology associated learning	Practitioners talked about the need to	Various articles being

018)	digital toys with lights, and buzzers.			enhances curricular knowledge and understanding and develops positive learning outcomes like persistence, confidence, and independence .	provide time for exploratory, child-led, play-based activities. In another study, educators were reluctant to use technology and did not value the use of Digital technology.	reviewed of how educational technology has changed over the years and not just limited to computers but the usage of Tablets and Interactive Whiteboards(I WB) could be perceived as more broadening and replacing the computers. It enables learning and makes it easier for children to use it.
------	--	--	--	--	---	---

**Table 2 technological learning for generation Alpha**

Contributing author of the literature	The technology used by the facilitator	The age group of children	country	Positive/Negative impact of technology	Stakeholder perspective	Our understanding in a few words
Januariyansa h&Rohmanto ro, (2018).	Digital classroom facilities, digital technology (internet, smartphones, tablets, web technology learning.	From 2010 to present	Indonesia	Overall enhancement in the teaching and learning process. Classrooms having digital facilities can influence the learning capabilities of alpha generation to a great extent.	Teachers perceive technology based learning as an effective approach proving WEB technology as a good tool adopted in classroom learning.	Generation Alpha experiences better and advanced learning with digital resources. There is an increased importance of digital classroom facilities, and it helps to accommodate the learning process of alpha generation.

Aggrawal (2019)	Advanced technology courses, Augmented Reality and VR (Virtual Reality), Gamification	From 2010	NA	Virtual social-based interaction. Gamification helps in imparting knowledge and ideas.	Schools and Corporates are altering themselves in such a way to best serve the needs of the alpha generation.	Alpha generation will have improved productivity and work-life in the future with more online interactions. One of the essential methods of transmitting knowledge would be the gamification of ideas in education.
Augusto(2018)	Digital media, digital literacy in school, computer programming social networks, touch screen devices.	From 2010	Brazil	An increase in technology access helps people to connect on a global level and to ease the work. A disadvantage is that one's own creativity and patience to hold on to a particular task are highly challenged.	Without parental supervision, the digital platform is largely used. Teachers agree with the fact that technology-based learning is essential as they feel the traditional teaching methods are outdated in today's time.	New teaching and learning methods are essential today and also have societal implications regarding employment.
Cirilli et al(2019)	Web, social media, whatsapp, instagram, digital information	From 2010	NA	There exists a high risk of human beings being replaced by technology, and therefore the need to master technical skills becomes a necessity.	Technological advancements have a mixed impact on the Z generation as scholars and parents may agree that technology favors an organized life but this generation may question the traditional roles adopted in learning.	Alpha Generation is the most experienced in technology, and children are exposed to screens more than social interactions. This generation prefers fast reactions, visual images, multitasking capabilities, quick responses, online games, and virtual friendships.
Ramadlan and Wibisono (2017)	Visual - Images, Digital literacy	From 2010	Australia	Visual literacy educates the generation to develop good character as a fundamental trait. At the same time, cybercrimes exist.	Teachers must have certain skills like communication skills, technological teaching skills, etc., which will help students learn things well and efficiently.	Visual literacy includes individual skills that are used to develop and understand visual language is an important step in evaluating the overall impact of student learning.
Romero (2017)	Technology-driven	From 2010	NA	Technology-based learning lessens	Teachers do understand that the	The future education system- entirely

	education			the burden of memorizing everything and makes it a fun and entertaining learning experience.	curriculum of the academics must be more eased and also keep close check with the character of the new students. They do agree that to capture the attention of the students rather than traditional teaching methods, they must bring more innovation with the help of technology to teach these tech savvy students.	technology-based, and thus schools and authorities should accept and adapt to necessary changes. The school authorities must look into the future and plan what is the best for the upcoming students.
Tootell et al. (2014)	ICT, Gamification	From 2010	NA	Progressive technology: effective learning and fun experience	The manner in which teachers interact with their students in the gaming scenario is significant and also the connection between teachers, students, and content.	Focuses more on the impact of play and technology on alpha generation students. How relevant gaming technology concepts can be used in educating the alpha kids.
Taylor and Hattingh (2019)	Gamification , Minecraft game	From 2010	Australia	The child does all multitasking while successfully playing and creating within the available virtual spaces.	The parent views are not favorable towards Minecraft as they think that it does not help the mind grow in any manner.	Detailed about the Four Resource Model( FRM) model reading practices when playing Minecraft by Alpha generation. The child can be seen as a text user, codebreaker, text analyst, and text participant playing within the given virtual area.
Novianti et al. (2019)	Common electronic gadgets used by parents and children	From 2010	Indonesia	Children learn well from tech when parents supervise. Social behavior deteriorates.	Most parents monitor their child's gadget usage and restrict the duration.	Parents can monitor their children while engaging in gadgets, making them more aware of the right things.
Rusman et al(2019)	Edutainment on Tv, Internet, and computer also tele-teaching and	From 2010	Malaysia	Rich, realistic, and effective learning available through Edutainment.	Teachers are in favor of Edutainment, as students become creative and more engaged in learning.	Edutainment is an effective method of learning, and along with it other informal settings like outdoor learning is essential.

	tele-learning					
Jha(2020)	Alexa, Siri, video games	From 2010-2020	America	Continuous usage results in a lack of creativity, lesser socialization, and patience.	Parents need to play a major role in supervising their kids so that technological growth turns to be a boon than a bane.	Generation Alpha- Combination of new chances, thrills, and findings. There is a need to add value to their personal growth.
Putri and Umah (2020)	Digital technology	From 2010-2020	Indonesia	Increased focus on gadgets makes kids less social and more ignorant about their surroundings.	Parental supervision is very necessary for the fuller and effective use of technology.	Children with a higher level of thinking can identify patterns of relationship to incoming information. Generation A is the smartest of all the generations.
Hamimah et al. (2020)	Digital Books	2010-2020	Indonesia	Literacy of the Alpha Generation is improved with digital books. Digital books have a positive influence on children making them more interested in subjects like science.	Shaped better social attitudes.	Literacy digital reading books are valid, practical, and effective for the alpha generation.
Serinikli(2019)	Digital tech, cloud tech, facebook, twitter, linkedin	2010-2020	NA	They tend to be isolated from themselves and others when they log out from the online space. Headache, eye strain, depression etc are highly experienced in them.	Alpha generation perceive the world to be within a single touch of their screens. They feel more connected to the online world and in short that turns to be their whole world.	Many features of generation Alpha are similar to other generations, but their tech-based working is very different, more user-friendly. This is a generation that prefers playing with their robot friends and assistants.
Nagy and Kölcsény(2017)	Youtube, Instagram	2010-2020	NA	They are more self-sufficient, better educated,	Parents of the Alpha generation would have a strong influence on	Generation Alpha has not experienced the world without the internet.

				and prepared for big challenges due to the advancement and improved knowledge in dealing with technology, tech-savvy.	them. The alpha generation's method of learning would be different and the educators must change their method of teaching by keeping in mind the technology addiction and multitasking characteristic of this generation.	YouTube and Instagram have more influence on them than TV. They have rapid learning, multitasking and information gathering skills.
Apaydin et al (2020)	Digital, Tablets phones	2010-2020	Turkey	Technology addiction with a tablet, phone, internet, television, or digital media. Technology addicted students are more prone to violence.	The parents consider teachers here as pupils' caretakers and thus respect, love, and the right attitude towards teachers are reduced.	Alpha generation: negative traits include a tendency towards violence and egocentrism Positive: behaviors are high perception levels, tapping out with music, and effective usage of numbers.
Akmal et al (2019)	No such digital devices used	2010-2019	Indonesia	Nil	Parents are motivated to promote Social Emotional Learning (SEL) models to their children to increase their social emotional development.	Social emotional skills of children are nurtured through models prescribed. The role of parents, teachers in developing this skill is extremely important. It helps the child in coping up with more difficult situations in life.

## Methods

The research consists of a wide range of contents in which 80 records were identified through Research gate, Jstor, Google Scholar, and Science direct. As many as 44 duplicates were removed. There were 68 abstracts, and the articles were screened based on their titles. The inclusion criteria maintained a record of articles written only in English and articles published after 2010. The eligible articles were 50 in number, and the articles which were excluded had unrelated content; for example, there were 10 chemistry-related articles, 4 other language articles, articles which were not published between 2010 and 2020, without any source and details like the author's name, journal title, etc. and some reports were by unauthorized publishers.

## Findings and implications generation Z

### How educational institutions can facilitate active learning via social media platform

Social media is an efficient platform for learning as they provide wider opportunities to discover and learn more things. They provide information regarding anything happening in any part of the world in just a click. The knowledge scope is wide, and the presentation is more interesting, easy to understand, and flexible enough to be changed according to the user's convenience. The process of learning and teaching becomes straightforward and interesting as several elements are contributing to the same. Educational institutions can very well benefit from social media platforms

if they use it effectively. The entire learning process can be transformed into an active and enthusiastic journey with the efficient involvement of social media platforms. Social media have advanced options and tools to make the learning process impactful.

### **WhatsApp**

WhatsApp is one of the most accepted and used social media platforms that have a wider reach globally. It can enhance the quality of education in today's time when everything around is swiftly evolving and becoming more and more digitized. WhatsApp enables sharing information like images, texts, links, etc., and is the most loved platform for instant messaging. All these features of WhatsApp make it an effective tool to be used in the teaching and learning process. It can be used to share notes and study material, clearing doubts, and other communication between students and teachers. Generation Z is highly compatible with social media, and thus this platform benefits them very well.

### **YouTube**

YouTube is the most praised and popular video sharing platform. Concerning the education of Generation Z, this platform can be efficiently used to teach and clear concepts with much more ease as it provides multiple interesting options making the video interesting and thus making the concepts easy to grasp. Teachers can upload videos explaining their content and students can learn from the same as per their convenience, also, they can review the video multiple times. YouTube also offers the 'live' option which makes it a really good platform for learning. YouTube notifies the subscribers every time a new video is uploaded and therefore this will keep the students updated about the recent videos, also the comment section can be utilised to ask questions and clear queries. YouTube has now turned out to be an evolving career option.

### **Instagram**

Instagram users are very much pleased by the time to time updates introduced in the app, making the platform interesting every day. This feature itself is its highlight as more and more people get attracted to the same. Instagram provides the information the user is looking for and is interested in, and therefore they automatically display those in the feed. This can be used as a major boon, especially for Generation Z seeking educational content on a social media platform like Instagram.

### **Facebook**

Facebook is one of the most convenient and user-friendly social media platforms. It has now turned to be one's identity proof as it is a tool mainly used to locate and find people. This feature of Facebook can be used in favor of Generation Z's educational upliftment as they will be open to the world and new people in just a matter of a few clicks. It is also a place for instant messaging and sharing all kinds of information.

### **Twitter**

A similar social media platform that connects people to the world is Twitter. Twitter is a hub of information that can benefit the Generation Z students in learning. Information is circulated on Twitter with great ease and speed. Twitter is used by many public figures to share their ideas and other important information, and it is nowadays seen as a platform for many official purposes. The users are given the opportunity to follow pages of people, organisations and other institutions of their choice. Once any page is followed, the user is constantly updated on the happenings of the page. Education is not just schooling or academic learning, whereas education is a lifelong process of learning and acquiring knowledge, and since the contents uploaded in twitter is a source of knowledge, it is highly beneficial for Generation Z in terms of their education. The contents on Twitter or any other social media platforms can be filtered according to the preferences of the user. Students are accustomed to getting information instantaneously as their attention spans are much shorter and Twitter provides concise and accurate information looking for a quick and convenient experience.

### **Findings and implications for Alpha Generation**

## **Virtual reality**

Virtual reality or VR provides an interactive experience that has the potential to revolutionize the educational sector of the country. The alpha generation students would be able to learn more in a realistic environment through virtual methods. The use of examples from the textbooks would be not required as real life examples would be simulated virtually. Visiting sites, conducting experiments, and trips to historic places can be all done in the place of education itself. Researchers have proven that learning is done best by trying out things. Virtual reality helps students in experiencing what they learn in educational institutions. Since this generation is highly addicted to technology, it motivates students and makes them learn more.

## **Gamification**

Education is one of the sectors where gamification is brought in actively. Creating games, known to effectuate motivation and engagement, are notably popular; the concepts to motivate the learner and incorporate game mechanics are engaging. Gamification in the education sector initiates game design elements and gameful experiences in the learning process. It has been carried out as support in learning a variety of contexts and subject areas and to address related attitudes, activities, such as participatory approaches, self-guided study, collaboration, completion of assignments, making assessments easier and attractive, strengthening student creativity, and integration of exploratory approaches to learning.

**Table 3 Findings incorporated with theoretical framework**

Stages	Age	Development stage with respect to learning	Educational Toys having element	Sharpen which kind of skills at respective stages(very specifically to learning skills)
Sensorimotor	Birth to 18–24 months old	It's the time when the child starts to move and shows responsiveness to the people and things around	Channapatna toys Lego, a familiar toy that was already playing around with fundamental skills related to STEM — building, problem-solving, pattern recognition Toy Telephone Ball Drop Cow	Self-help skills, Cognitive skills and Speech skills. Sharpens memory and is highly active. Improves language . Increases grip on hands and coordination of the eyes and hand
Preoperational	2 to 7 years old	Curiosity begins in the child at this stage followed with reasoning.	Toys such as Photon (one robo dog), Digital writing notepad	Gross motor skills, Fine motor skills, Cognitive skills. Inquisitiveness and Enthusiasm to discover.
Concrete operational	7 to 11 years old	This stage is when they know and understand people and things around. Emotional context is more specific.	Logical games, number games, remote control toys, stem toys, Kaleidoscope	Cognitive skills, advanced speaking and language skills, adaptive skills, initial logical and technical skills. Improves creativity
Formal operational	Adolescence to adulthood 11<(Ge	Emotional maturity, clarity of thoughts and actions, mental and physical balance.	Hoverboards, VR - Gear VR and Playstation VR AR Toys- Augmented reality glo	Advanced Cognitive skills, intellectual and reasoning skills, emotional balance skills.

	neratio n Z)			
--	-----------------	--	--	--

### **Limitation and Future Research**

Generation Z and Alpha who are more involved in digital technology has become a challenge to the field of education. The digital classroom concept is becoming more popular and it is increasing the positive impact of students using the technology at home. Teachers using traditional methods have realized that the education methods must be changed for the generations especially for the alpha generation who are more into the technology than its previous generations. Digital classrooms require high costs like requirements of smartphones, computers, internet availability, etc. Also, the teachers should have the technological ability to apply digital technology in the classrooms. Students' health is also getting affected by the excessive use of technology. Students at an early age experience severe headaches, poor eyesight, tend to be less energetic.

Literature collected from various sources are limited to the keywords used. Articles were collected through databases like Google Scholar, JSTOR, Proquest hence information is limited to these databases. The research being a systematic review paper is a perspective based method of research in which no responses are measured. Difference of opinion can come up and using statistical calculations to prove is not possible in a qualitative paper. Certain articles on Alpha generation were written originally in foreign languages and then translated into the English language. Hence language barriers in translation can affect the understanding of certain concepts in those articles. Also translation of certain papers was not found therefore they had to be avoided. Results and conclusions are limited to few selected articles. Technology innovation can be done in such a way that the cost of technology is minimized and the teachers can adapt well to digital technology. The parents and teachers also lack knowledge on Alpha generation and it is very important to conduct more research on this generation.

### **Conclusion**

**From the viewpoint of the educators:** The teachers and tutors need to change their views and methods from traditional thinking methods and imparting learning in the changing scenarios, particularly in the wake of compelling circumstances of shifting educational platforms from the real classrooms to the virtual classrooms. For making this a reality, the existing systems need a complete paradigm shift. This apart, the teachers need to get trained to equip themselves to make them capable of handling smart classes through online teaching, conducting webinars. For this, they are to be appropriately trained, technologically equipped, and digitally empowered. Certainly, the students are far capable of digital and technological advancements on account of their contemporary living with technology-based utilities than the lesser technology equipped teachers and tutors. The gap in technology know-how in the learning process has to be filled first, by proper training to the educators, to equip them to lead the virtual classrooms. The students use various digital learning platforms like Google, LinkedIn, Moodle, Blackboard, Google Classroom, and social media platforms for their learning and communications. Once fully fit with the digitalization and technology, the educators can take the lead and go forward with the virtual classes more effectively. To conclude, technology is the new way to impart and share knowledge and conduct classes in the changed scenario. It is not the ultimate knowledge, but the process of knowledge.

**From the viewpoint of parents:** In earlier times, parents used to raise apprehensions about the usage of smartphones, social media, and online games by the children. These are all major shifts from the traditional methods they used to follow and newer methods that they are not accustomed to. Parents are always apprehensive of and fearful of changes, which they think is not conducive to children's overall growth, alien to them. So, the newer technology advancements were regarded as

elements contributing to the degradation of values and ethics they experienced hitherto. The parents cannot be blamed for this, as industrialization, urbanization, and technology upgrades have led to the deterioration of moral values, human bonds in the past. However, in the changed situations, particularly in the COVID situations, there has been an increased realization among the parents that online classes, social media interactions, virtual classes, webinars, etc. hold their own value and are inevitable. Parents have been involved more in smart ways to be competitive themselves and be supportive to their children. It seems that their understanding is to go with the times, as the present situations demand tech-driven solutions for survival. However, the parents are not free from confusions as to the long term impacts of technology-driven advancements of the society without rational studies or learnings, as the swift changes are consequent to emergent necessities, rather than its usual course of change.

## References

- Aggrawal, S. (2019). *The Less Known Alpha Generation*.
- Akmal, Y., Koeswanton, S., Hartati, S., & Hikmah. (2020). Character Development in Generation Alpha Through Social-Emotional Learning With Parent Involvement. *Proceedings of the 1st International Conference on Early Childhood Care Education and Parenting (ICECCEP 2019)*, 503, 87–93. <https://doi.org/10.2991/assehr.k.201205.091>
- Aljawarneh, S. A. (2019). Reviewing and exploring innovative ubiquitous learning tools in higher education. *Journal of Computing in Higher Education*, 32(1), 57–73. <https://doi.org/10.1007/s12528-019-09207-0>
- Al-Samarraie, H., Teng, B. K., Alzahrani, A. I., & Alalwan, N. (2017). E-learning continuance satisfaction in higher education: a unified perspective from instructors and students. *Studies in Higher Education*, 43(11), 2003–2019. <https://doi.org/10.1080/03075079.2017.1298088>
- Apaydin, Ç. ȇ., & Kaya, F. (2020). AN ANALYSIS OF THE PRESCHOOL TEACHERS' VIEWS ON ALPHA GENERATION. *European Journal of Education Studies*, 6(11), 123–141. <https://doi.org/10.5281/zenodo.3627158>
- Barnett, S. (2019). Application of Vygotsky's Social Development Theory. *Journal of Education and Practice*, 10(35), 1–4. <https://doi.org/10.7176/jep/10-35-01>
- Berge, Z. L., & Berge, M. B. (2019). The Economic ABC's of Educating and Training Generations X, Y, and Z. *Performance Improvement*, 58(5), 44–53. <https://doi.org/10.1002/pfi.21864>
- Berkup, S. B. (2014). Working With Generations X And Y In Generation Z Period: Management Of Different Generations In Business Life. *Mediterranean Journal of Social Sciences*, 5(19), 218–229. <https://doi.org/10.5901/mjss.2014.v5n19p218>
- Britten, J. (2019, July 4). *Innovating for Generation Alpha in Our Schools - Jody Britten*. Medium. <https://jodybritten.medium.com/innovating-for-generation-alpha-in-our-schools-12a8006516b8>
- Chauhan, S. (2017). A meta-analysis of the impact of technology on learning effectiveness of elementary students. *Computers & Education*, 105, 14–30. <https://doi.org/10.1016/j.compedu.2016.11.005>
- Cilliers, E. J. (2017). THE CHALLENGE OF TEACHING GENERATION Z. *PEOPLE: International Journal of Social Sciences*, 3(1), 188–198. <https://doi.org/10.20319/pijss.2017.31.188198>
- Cirilli, E., Nicolini, P., & Mandolini, L. (2019). DIGITAL SKILLS FROM SILENT TO ALPHA GENERATION: AN OVERVIEW. *EDULEARN19 Proceedings*, 5134–5143. <https://doi.org/10.21125/edulearn.2019.1271>

- Collins, A., & Halverson, R. (2010). The second educational revolution: rethinking education in the age of technology. *Journal of Computer Assisted Learning*, 26(1), 18–27. <https://doi.org/10.1111/j.1365-2729.2009.00339.x>
- Csobanka, Z. E. (2016). The Z Generation. *Acta Technologica Dubnicae*, 6(2), 63–76. <https://doi.org/10.1515/atd-2016-0012>
- Domingo, M. G., & Garganté, A. B. (2016). Exploring the use of educational technology in primary education: Teachers' perception of mobile technology learning impacts and applications' use in the classroom. *Computers in Human Behavior*, 56, 21–28. <https://doi.org/10.1016/j.chb.2015.11.023>
- Ghavifekr, S., & Rosdy, W. A. W. (2015). Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools. *International Journal of Research in Education and Science*, 1(2), 175–191. <https://doi.org/10.21890/ijres.23596>
- Hamimah, H., Arlis, S., Arwin, A., Chandra, C., Anita, Y., Kenedi, A. K., & Kharisma, A. (2020). Thinking the Most Convenient Analysis of Alpha Generation by Using Social Science Story Digital Books. *İlköğretim Online*, 19(1), 78–86. <https://doi.org/10.17051/ilkonline.2020.654895>
- Jack, C., & Higgins, S. (2018). What is educational technology and how is it being used to support teaching and learning in the early years? *International Journal of Early Years Education*, 27(3), 222–237. <https://doi.org/10.1080/09669760.2018.1504754>
- Januariyansah, S., & Rohmantoro, D. (2018, April). *THE ROLE OF DIGITAL CLASSROOM FACILITIES TO ACCOMMODATE LEARNING PROCESS OF THE Z AND ALPHA GENERATIONS*.
- Kapucu, H., & Akar, C. (2019a). *Contemporary Challenges in Business and Life Sciences*. IJOPEC PUBLICATION.
- Kapucu, H., & Akar, C. (2019b). *Contemporary Challenges in Business and Life Sciences* (2019/09 ed.). IJOPEC PUBLICATION.
- Kattoua, T., Al-Lozi, P. M., & Alrowwad, D. A. ' (2016). A Review of Literature on E-Learning Systems in Higher Education. *International Journal of Business Management and Economic Research*, 7(5), 754–762. [https://www.researchgate.net/publication/309242990\\_A\\_Review\\_of\\_Literature\\_on\\_E-Learning\\_Systems\\_in\\_Higher\\_Education](https://www.researchgate.net/publication/309242990_A_Review_of_Literature_on_E-Learning_Systems_in_Higher_Education)
- Lourenco, O. M. (2014). Piget, Jean. *Encyclopedia of Educational Theory and Philosophy*, 623–628. <https://www.researchgate.net/publication/268199547>
- Mathes, E. W. (2019). An evolutionary perspective on Kohlberg's theory of moral development. *Current Psychology*, 1–14. <https://doi.org/10.1007/s12144-019-00348-0>
- McKnight, K., O'Malley, K., Ruzic, R., Horsley, M. K., Franey, J. J., & Bassett, K. (2016). Teaching in a Digital Age: How Educators Use Technology to Improve Student Learning. *Journal of Research on Technology in Education*, 48(3), 194–211. <https://doi.org/10.1080/15391523.2016.1175856>
- Nagy, Á., & Kölcsény, A. (2017). Generation Alpha: Marketing or Science. *Acta Technologica Dubnicae*, 7(1), 107–115. <https://doi.org/10.1515/atd-2017-0007>
- Novianti, R., Hukmi, & Maria, I. (Eds.). (2019). *The Role of Parents in Assisting the Use of Gadget in Alpha Generation*. Proceeding of the SS9 & 3rd URICES.
- Putri, W. T. A., & Umah, R. Y. H. (2020). The Improving Of Higher-Order Thinking Skills As Information Filter For Alpha Generation. *Al-Bidayah: Jurnal Pendidikan Dasar Islam*, 12(1), 125–138. <https://doi.org/10.14421/al-bidayah.v12i1.341>
- Reis, T. A. (2018). Study on The Alpha Generation And The Reflections of Its Behavior in the Organizational Environment. *Journal of Research in Humanities and Social Science*, 6(1), 9–19. <http://questjournals.org/jrhss/papers/vol6-issue1/C610919.pdf>

- Rusman, N. S., Ismail, H. N., & Syed Jaafar, S. M. R. (2019). DEMAND OF PRESCHOOL EDUCATION BY ALPHA GENERATION ON EDUTAINMENT LEISURE IN THE CITY. *International Journal of Built Environment and Sustainability*, 6(1–2), 121–128. <https://doi.org/10.11113/ijbes.v6.n1-2.391>
- Shatto, B., & Erwin, K. (2017). Teaching Millennials and Generation Z: Bridging the Generational Divide. *Creative Nursing*, 23(1), 24–28. <https://doi.org/10.1891/1078-4535.23.1.24>
- Sihura, F. (2018). The Role of Parents “Generation of Z” to The Early Children in The Using of Gadget. *Proceedings of the 4th International Conference on Early Childhood Education. Semarang Early Childhood Research and Education Talks (SECRET 2018)*, 249, 55–59. <https://doi.org/10.2991/secret-18.2018.9>
- Swanzen, R. (2018). FACING THE GENERATION CHASM: THE PARENTING AND TEACHING OF GENERATIONS Y AND Z. *International Journal of Child, Youth and Family Studies*, 9(2), 125–150. <https://doi.org/10.18357/ijcyfs92201818216>
- Taylor, L., & Hattingh, S. J. (2019). Reading in Minecraft: A Generation Alpha case study. *Teach Journal of Christian Education*, 13(1), 29–36. <https://research.avondale.edu.au/teach/vol13/iss1/7/>
- Thompson, R. A. (2012). Whither the Preconventional Child? Toward a Life-Span Moral Development Theory. *CHILD DEVELOPMENT PERSPECTIVES*, 0(0), 1–7. <https://doi.org/10.1111/j.1750-8606.2012.00245.x>
- Toottell, H., Freeman, M., & Freeman, A. (2014). Generation Alpha at the Intersection of Technology, Play and Motivation. *2014 47th Hawaii International Conference on System Sciences*, 82–90. <https://doi.org/10.1109/hicss.2014.19>
- Turner, A. (2015). Generation Z: Technology and Social Interest. *The Journal of Individual Psychology*, 71(2), 103–113. <https://doi.org/10.1353/jip.2015.0021>
- V.Rasiah, R. R. (2014a). Transformative Higher Education Teaching and Learning: Using Social Media in a Team-based Learning Environment. *Procedia - Social and Behavioral Sciences*, 123, 369–379. <https://doi.org/10.1016/j.sbspro.2014.01.1435>
- V.Rasiah, R. R. (2014b). Transformative Higher Education Teaching and Learning: Using Social Media in a Team-based Learning Environment. *Procedia - Social and Behavioral Sciences*, 123, 369–379. <https://doi.org/10.1016/j.sbspro.2014.01.1435>
- Yassin, A. A., Razak, N. A., & Maasum, T. G. M. (2018). CooperativeLearning:GeneralandTheoreticalBackground. *Advances in Social Science Research*, 642–654. <https://doi.org/10.14738/assrj.58.5116>

## **ZOMATO – A NEW GROWING AND FLOURISHING BUSINESS MODEL**

**Dr.Sanchita Datta**, Associate Professor, Royal College of Arts, Science and Commerce

### **Abstract:**

Zomato started its full fledged world expansion precisely in 2012-13, after mostly covering all of India.

The present will extend existing knowledge about business model of Zomato by integrating the various responses and past research reports on similar topic. As past studies predominantly look at the business model of Zomato from a consumer's perspective, the addition of investor's perspective and also a full course strategy will bring in an additional understanding of the concepts relating business model of Zomato and the challenges of making it profitable.

By incorporating the views of strategic analysis in this study, it will provide greater insights into the role of restaurants, not only in relation to the consumers, but also in relation to the Zomato's business model. The efficiency and allocation of funds among the different revenue sources can be viewed more holistically and can be changed in order to mitigate the risk of future losses.

The high discounts offered by competitors can be connected to the easy switch by customers, which are a critical weakness/ threat to Zomato. Hence, the results in this question are consistent with the observations made previously. However, if Zomato is able to differentiate its service offering and address its related weakness such as negative reviews, the customer threat can be managed. Zomato has got large number of customers as it has zero cost of acquisition for food delivery customers. Zomato has got an edge here over Swiggy, but customers always love customized services at which Zomato is loggerheads with Swiggy.

**Keywords:** expansion, Zomato, model, differentiated, loggerheads

### **Introduction:**

Zomato was initially a restaurant searching platform and discovery service started in 2008 by Deepinder Goyal & Pankaj Chaddha. It currently operates in 24 countries including India, Australia & the United States. It was named *foodie bay* at its start in 2008 but later in 2010 it was renamed to ZOMATO. The service started as “FOODIEBAY” in cafeteria of Bain & Co. Customers used this service to look the menu at lunch, breakfast or dinner. At the start only a simple website was developed and later when it attracted a lot of traffic, it was launched publicly.

Zomato started its full fledged world expansion precisely in 2012-13, after mostly covering all of India. For expanding their foothold, they changed their marketing strategy from “full stack market” to “enterprise marketing”

This change in strategy led ZOMATO to fire 10% of its workforce which was close to 300 people approx as on 15<sup>th</sup> October, 2012. This helped ZOMATO to expand sporadically with fewer workforces and helped them cover a million restaurants in 24 countries. ZOMATO was initially started with a basic idea to offer scanned menus to the users along with the contact details of the restaurants to help them to order food by calling the restaurant.

### **SWOT Analysis of Zomato's Business Model:**

#### **Strengths of Zomato**

**First mover advantage** – One of the first-class competitive advantages of Zomato is that it is the first mover in some of the international locations where it's far organizing itself. Directories and other sorts of restaurant rankings would possibly exist. But as an app Zomato is terrific and plenty of countries (like India) have cherished the usability of the Zomato app.

**Evergreen industry** – The restaurant enterprise is an evergreen industry. Sure, there can be recessions and other downturns which might affect the industry. But overall, this enterprise is going to stick around always and is most effective going to grow with growing disposable income.

**Fantastic design of the app** – Zomato has frequently won awards for its app design and for its user-friendliness. The App design is fabulous and it helps you discover restaurants nearby as well as in an area you are going to visit.

**Number of users** – Zomato has a large number of users using their app. At the same time, Zomato's website & app together have close to 90 million visitors a month. With such large number of users following the app and site, there are more reviews and hence more chances to find good restaurants.

**Brand Equity** – Zomato's brand equity is valued at \$1.4 billion within 7 years of incorporation. That speaks volumes about the popularity and love for the brand not only in India but all over the globe.

### **Weaknesses of Zomato**

**Security issues for the app** – A major trouble for Zomato in the past has been a few security issues because of which the app was hacked and at least 17 million users information was leaked. Such security troubles are a nightmare for internet companies.

### **Opportunities of Zomato**

**Further expansion** – The important opportunity for Zomato is to have presence in more nations and establish its base faster. Service industry has a major trouble that services can be imitated very rapidly and very easily. As a result, it is critical for Zomato to establish and grow itself rapidly.

**Creating a community** – Zomato surely has a huge following but the users do not interact with each other. Creating a platform and a community out of the users already engaged with Zomato can be a huge benefit for the brand.

**Adoption of the internet and Smart phones** – There is a surge in the adoption of Internet across developing and underdeveloped countries as well. Similarly, adoption of smart phones has also increased. So a lot of orders and analysis regarding restaurants will happen on-line rather than through physical visits.

### **Threats of Zomato**

**Google's schema module** – one amongst the most important threats Zomato faces right away is that the Schema module of Google whereby Google locations itself is getting into edifice recommendations close to the involved areas. Even Google homepage shows the Google maps page wherever you'll be able to look for restaurants among your neighborhood. Google being such a large, Zomato faces vast competition from them.

**Market followers and challengers** – within the industry, it's terribly simple to copy the success of another service product or giving. Similarly, promoting followers and challengers will slowly deduct the market share of Zomato.

1. To identify the reasons for Zomato's high expenditure:
2. To find out the revenue sources of Zomato:
3. To study the reasons behind high funding of Zomato:
4. To identify the real reason for Zomato's losses:
5. To know the factors responsible for Zomato's Success:
6. To study the duration for which Zomato can continue offering discounts:
7. To understand whether the customers would order from Zomato if it stopped offering discounts:
8. To conduct a SWOT Analysis on Zomato's business model :
9. To Test Zomato's Business Model through Porter's Five Forces:
10. To conduct a PESTLE Analysis of Zomato:

### **Porter's Five Forces Analysis for Zomato**

Porter's 5 forces is a simple yet very effective tool for analyzing competition for a particular business. It helps in studying the intensity of the competition in the industry and therefore helps the

business to assess its profitability and understand its business environment. We'll have a look at 5 forces one by one in detail as follows:-

1. **Rivalry among existing competitors:** The storage cost is extremely low as the food delivery business is an aggregator based model and this model merely supplies food made by partner restaurants and not own made foods. Also, this industry is seeing a fast growth rate which attracts a lot of new entrants in the market. As this industry is highly competitive, the exit cost is high, as it's difficult to close down operations and settle all transactions as it works on roll-over basis and hence it's a lot easier to keep competing which further intensifies the competition for Zomato.
2. **Threat of Substitutes:** As discussed above, the competitors are few as this industry witness's intense competition. However, it means that Zomato has to offer better deals and services in order to keep growing and have an advantage else the customers might easily switch to a rival competitor
3. **Threat of new Competitors:** This business requires strong brand names which Zomato has. The industry requires a leadership in technology where Zomato leads. Also since Zomato has economies of scale, as regards to new competitors it is better off and that it will be extremely difficult for any new entrant to challenge Zomato.
4. **Bargaining power of Suppliers:** Zomato has low cost of switching suppliers but suppliers collectively can exit Zomato and choose Swiggy. This was recently faced by Zomato when large number of restaurants resorted to "Logout Campaign" and boycotted Zomato and hence Zomato faces a high risk here.
5. **Bargaining power of Customers:** Zomato has got large number of customers as it has zero cost of acquisition for food delivery customers. However, though Zomato has got an edge here over Swiggy, but customers always love customized services at which Zomato is at loggerheads with Swiggy. The examples of customized food can be jain food, providing options to add extra sauce/spice, etc.

#### 1.4. Business Model of Zomato:

Zomato has basically 3 sources of revenue. Let us discuss each one of them in detail.

1. **Food Delivery:** Zomato offers close to 40% discount on an average on food delivery. But this discount is not entirely the investor's money. The reason for this is because the food value is overpriced for delivery purposes by at least 20% if compared with the dine-in rates of the same restaurant. So say for example, the dine-in price is Rs.100, and then the delivery rate is Rs.120. As it is cheaper for the restaurant to deliver the food instead of dine-in, the restaurant share comes to Rs.90. The remaining part of Rs.30 is Zomato's commission being 40% of Rs.120 and the same is the percentage of discount offered by Zomato. Hence, at gross level, there is neither profit nor any loss. So the question arises that as to what is the reason for this loss? The reasons are multiple including but not limited to delivery boy payouts, customer support, Data cost, R&D cost, app cost, etc. So till when and how will Zomato continue to burn the investor's cash? This question actually brings us to the second revenue source.
2. **Advertising/Listing Fees:** Zomato takes money from the restaurants to give them priority listings on their app and show their ads to their users. This listing fee is taken both from delivery and dine-in restaurants. So now let us say that a restaurant is new and gets 50% of their initial sales from Zomato. In such case, in order to increase the restaurant revenue, the restaurant owner will pay more money to Zomato for priority listing. This money in turn will be used by Zomato to offer more discount on food ordered through those restaurants. Therefore, order increases, dependence increases and this vicious cycle sets in.
3. **Business Consultancy services:** Zomato is in the restaurant and food delivery business and hence it has a lot of data regarding price, consumer tastes and preferences with respect to

dishes, city, etc. So if one wants to open a new restaurant, they will go to Zomato and Zomato will guide them regarding the type of restaurant to be opened in a particular area, what should be the price of the food items. So Zomato will basically make business plans for third parties in exchange for a big fat fee.

### **Conclusion:**

The high discounts offered by competitors can be connected to the easy switch by customers, which are a critical weakness/ threat to Zomato. Hence, the results in this question are consistent with the observations made previously. However, if Zomato is able to differentiate its service offering and address its related weakness such as negative reviews, the customer threat can be managed. While many challenges remain in understanding Zomato's business model—including challenging theoretical and empirical questions, my symposium goal was, of course, to make some progress on the notion of a “tipping point” in Zomato's business model. Some questions I considered include: Does discount affects orders from Zomato? Are customers/restaurants, threat to Zomato's business model?

### **3. Bibliography**

- <https://www.financialexpress.com/industry/sme/zomato-acquire-uber-eats-swiggy-zomato-vs-swiggy-online-food-delivery-market-foodtech-market-india/1833272/>
- <https://bstrategyhub.com/zomato-business-model-how-does-zomato-make-money/>
- <https://www.quora.com/What-were-the-key-features-factors-for-Zomatos-success>
- <https://businessteacher.org.uk/pestel/zomato.php>
- <https://economictimes.indiatimes.com/news/company/corporate-trends/10-year-milestone-reached-but-zomato-gets-hungry-for-more/the-robin-hood-army/slideshow/64942535.cms>
- <https://www.marketing91.com/swot-analysis-of-zomato/>

# **A RESEARCH REPORT ON THE IMPACT OF COVID-19 PANDEMIC ON BANKING SECTOR AND THE MEASURES INITIATED BY RESERVE BANK OF INDIA TO RESOLVE THE CRISIS**

**Dr. K.G.S.Mani**

Retired Senior Foreign Banker & Asst. Professor (Finance),  
Pillai Institute of Management Studies & Research (PiMSR), New Panvel, Navi Mumbai.

## **Abstract**

The corona-virus, named as Covid-19 which is believed to have originated from an Asian country, was initially an epidemic in the local area in that country and subsequently spread all over the globe as destructive pandemic claiming many lives. The invisible corona-viruses weighing less than 1 mg each, have infected more than 1 million people across the globe. As there was no vaccine to control its impact, it has thrown all economic activities out of gear. As per the estimate, there are 3 crore migrant workers in India and major part of them were rendered jobless and stranded without money and food. As the transport system in the country was suspended, initially they could not go back to their native place.

The Banks, NBFCs and other financial services institutions had performed very poorly as the Corona-virus pandemic ravaged the markets, investments, industrial activities, livelihood of employees and workers and the economy at large. The Government had imposed lock-down as a measure of containing the spread of Covid-19.

In this background, the Researcher, who is a Senior Retired Banker and presently working as Finance Faculty at PIMSR, New Panvel, found it as an opportunity to make a study on the impact of Covid-19 on the Banking Sector. This report is the outcome of his effort with restricted flow of information under lock-down and shut-down.

The Researcher has collected data and information from various sources, like news agencies, visual media, RBI website, Government, as per the list provided under appendix. He has classified and analysed the information, RBI measures and Government stimulus packages and has presented this report. The financial sector which is the backbone of Indian economy was severely affected. The researcher has confined his study and analysis only to the Financial Sector, in the light of supportive measures of RBI and the Government.

The Researcher has drawn his conclusions and made recommendations to revive the financial sector, keeping in view the financial health of banks and to implement certain measures to fight covid-19 to pull back the Banking sector to the path of recovery. The research report is presented under various heads hereunder.

**Key Words:** COVID-19, Lockdown, Liquidity, Profitability, Repo Rate, Reverse Repo Rate, Interest spread, Liquidity Adjustment Facility, Moratorium period, Non-Performing Assets (NPA), Capital Adequacy, Core Equity Tier-1 capital, Additional Tier-1 capital, Targeted Long Term Refinancing Operations (TLTRO), Micro, Small and Medium Enterprises (MSME), Banking Sector, Reserve Bank of India (RBI), Indian Banks' Association (IBA), Asian Development Bank, Non-Banking Financial Companies (NBFCs), Rating Agencies.

## **1. Introduction:**

The corona-virus (Covid-19) pandemic, an invisible assassin, has seriously dented economic growth prospects globally was first recorded in Kerala. Starting its origin from Wuhan City in China, it

has rapidly spread all over the world. It has impacted human lives, industrial activities, banking business, employment, agriculture, economic growth of many countries world over, in particular India. It has thrown serious challenge to the Indian Government. It needs to be contained quickly before it wreaks havoc on valuable human lives and the macro economy. The Indian economic growth has fallen down steeply, during the last 11 months, as the economic activities have come to a grinding halt due to the corona lockdown and industrial shut-down. Banking sector was the worst affected, that lending activity was stopped, cashflow almost dried up, many loan accounts having turned Non-performing assets (NPAs).

Since the imposition of the nationwide lockdown starting March 25, 2020, the RBI has taken slew of measures-1, 2 and 3 to extend various supports to the banks, improve flow of credit to Non-banking Financial Companies, Mutual Funds and to provide financial support to industries, businesses, Micro, Small and Medium Enterprises, agriculture, middle class people and the poor workers hit by covid-19. The Central Government has also announced stimulus measures to retrieve the economy and launched a battle against Covid-19 attack.

The Researcher has analysed the prevailing situation in the financial sector caused by Covid-19 pandemic and presented his conclusions arising out of his study and made recommendations to improve the financial sector, particularly banks. The Researcher has not covered in this research report, the impact on other sectors like manufacturing, services and the overall economy, as it forms part of another research study. .

## **2. Literature Review:**

**Profitability:** Lavinia (2015) studied the assets and liabilities of the banks, financial leverage, loan to asset ratio, deposit to asset ratio, number of employees, liquidity, monetary policy variables affecting the performance of banks in the country during the period 2003 to 2013. The study concluded that the performance of the banks were significantly affected by financial leverage, deposit to asset ratio, no of employees, net result and monetary policy variables.

**Non-Performing Assets (NPAs):** Vadivalagan and Selvarajan (2013) studied the impact of non-performing assets on liquidity of banks in India. They concluded that banks viability and financial health depends on quality of loans. However, corrective measures must be taken to increase recovery of non-performing assets, lest the quality of loans would deteriorate and profitability and efficiency of banks will be adversely affected.

**NPA and Capital Adequacy:** Ramesh Chandra Das et.al. (2014) attempted to study the management of NPA by means of capital adequacy norms. He studied the profile of scheduled commercial banks in relation to capital adequacy and compared their relative positions in different time periods. He correlated CRAR trend with NPA- Deposit ratio and Credit –Deposit ratio. The NPA - Deposit ratio is positively correlated with banks having CRAR below 10% and it is negatively correlated with banks having CRAR above 10%. Reverse relationship was found in the case of Credit-Deposit ratio. The correlation between NPA- Deposit ratio and Credit-Deposit ratio is negative and significant.

## **3. Objectives of Research study:**

The Researcher expects to achieve the following objectives through his study:

- (i) To analyse the impact of Corona virus (COVID-19) pandemic on the Banking sector in India;
- (ii) To study the initiatives of Reserve Bank of India (RBI) to provide financial support to Banks and other Financial Institutions;
- (iii) To understand the non-financial support such as, moratorium, restructuring of loans, extended by RBI to the Banks' loans.

#### **4. Research Methodology:**

- (i) All the data and information required for the research study have been obtained only from secondary source.
- (ii) All information have been collected from various National and International business news channels, business news papers websites as mentioned under Appendix at the end.
- (iii) The audited financial information for FY2021 are not yet available, since the Q4FY21 is not yet completed. As such no analytical tools could be applied for analysis.
- (iv) Expert opinions expressed by the Economists and Investment Analysts are collected, condensed and presented.
- (v) The data regarding the actual provisions for non-performing assets, made by the banks will be announced after statutory audit as on 31.3.021. As such provisional information are only analysed.

#### **5. Limitations of study:**

- (i) The information relating to the banks were collected only from published sources/public domain, which provide only filtered and minimum information.
- (ii) Due to confidentiality risk many banks do not publish detailed information relating to Non-performing Assets (NPA), liquidity position, opportunity loss, re-investment risk and so on. As such primary data and information could not be collected.
- (iii) Position of Standard Loans might have come under 'moratorium' because of non-payment of loan dues to banks, as a consequence of industrial shut down, could not be assessed, due to non-availability of data.
- (v) 'Lockdown' has also restricted the movement of the Researcher to collect data directly from the financial market. Also Research Firms are operating at low scale due to lockdown free flow of information is affected and available only at high cost (like Bloomberg, Reuters, etc). As such collection of information has been a limiting factor in the research study.

#### **6. Analysis of impact of COVID-19 on Banking Sector:**

##### **6.1 Impact on Banks:**

The COVID-19 pandemic has seriously affected the banking sector globally and particularly in India. With the successive lockdowns, the business of banks were severely affected since industrial and business activities were shut down. The banking and financial services segments which were affected since the outbreak of COVID-19 in India are summarised and presented below.

###### **6.1.1 Lending activities :**

Lending activities of Banks have come to a grinding halt due to lockdown of all business activities. Further, The higher operating capacity of industries and business will depend on the expected growth of the economy. But the growth has been marred by the COVID-19 pandemic disease. Moreover, the corporate shall not borrow additional loans from banks in the backdrop of industrial shutdown.

###### **6.1.2. Repayment of loan dues:**

In many business segments like, corporate loans the serviceability of instalments and interests depends on the income generating capacity of the borrowers. As there is no cashflow for industrial and other borrowers, they would be able to repay the loans. This may lead to increase in non-performance assets (NPA) level in banks. The Housing Loans, Vehicle loans, Consumer Loans extended by the banks to salaried employees may also come under stress due to reduction in salary or loss of jobs.

### **6.1.3 Non-performing Assets:**

The Covid-19 pandemic had rendered many of bank accounts as Non-Performing Assets account due to non-payment of instalments and interest by all types of borrowers. It is also estimated that the existing NPA accounts together with those becoming NPAs during the current period may balloon into huge amounts for banks. As per research study, Companies may default on Rs 2.54 lakh crore bank loans in the next 3 years, if the pace of economic expansion does not pick up sufficiently. Further the Central Government had put on hold all legal proceedings of National Company Law Tribunal cases for one year. This would largely affect the banks in their recovery of bad loans. CRISIL has estimated that the Gross non-performing assets (NPAs) of the bank could rise to 11 to 11.5% during the current Financial Year 2021.

India Rating & Research conducted a study of top 500 private sector companies, observed that these 500 debt-ridden borrowers have an outstanding loans of Rs 39.28 lakh crore. Out of this, the existing default amounts to Rs 7.35 lakh core loans and it would increase to Rs 10.5 lakh crore, if the debt further turns vulnerable. Moody's, the global rating agency said that the RBI's measures and Government's steps to provide some support to financial system will not fully offset Covid-19 impact in the short run.

### **6.1.4 Provisioning for NPA:**

The provisioning requirements for existing NPA accounts would continue and the lockdown has further complicated the process of recovery of amount by sale of assets or through court proceedings. As such the recoverable value of assets could not be estimated. This will entail higher provisioning requirements by banks. However, RBI has extended relaxation on provisioning of loans but not of much help for banks. Nevertheless, existing NPAs would continue be treated for provisioning requirements. The provisions for non-performing assets, made by all banks will be announced after the statutory audit (31.3.2021) and higher provisioning are required to be made by banks.

### **6.1.5 Stress on Profit: (done)**

As per the Research Report of India Rating and Research, the estimates fresh default of Rs 2.54 lakhs crore is likely to result in around Rs 1.37 lakh crore in credit costs (interest), may put banks' profitability under more pressure. The profitability has come down on many counts, namely, (i) existing loan repayments and interest were not forthcoming, (ii) many of the account had turned non-performing assets and hence not yielding any interest income to banks, (iii) No fresh lending is possibility due to shutdown of operations. (iv) Creation of provision out of profit for non-performing assets. Many banks have reported loss or marginal profit for the previous quarters in Financial Year 2021.

### **6.1.6 Capital Adequacy Requirements (CAR):**

Many Banks had faced financial difficulty in meeting the capital adequacy requirements based on international BASEL risk framework and RBI guidelines. Some of the Private sector banks had sourced funds by issuing Non-Convertible Dentures (NCDs) and Tier-II capital bonds. The Government had already pumped in ₹3.5 lakh crore in the last five years to rescue the state-owned banks towards capital adequacy requirements. In the budget 2021, the Govt. has announced an aggregate capital funding of Rs 20,000 crore to PSBs to shore up their capital adequacy.

## **7. RBI's supportive financial measures to banks :**

RBI had announced certain important measures aiming at alleviating the impact of Covid-19 on the banking businesses and on financial institutions. The measures are summarized briefly hereunder:

### **7.1 RBI Measures-1:**

RBI announced certain financial measures (RBI Measures-1) on 27.3.2020, which are briefly presented hereunder:

- (i) RBI cut the repo rate by 75 basis points to 4.40% and subsequently to 4% and injected funds of Rs 3.74 lakh crore by way of Liquidity Adjustment Facility (LAF) in the banking system.
- (ii) RBI has resorted to targeted liquidity injection to ease funding for Companies. Under the measures, RBI advised the banks on 27.3.2020, to buy investment-grade corporate bonds issued by them to provide liquidity to corporates.
- (iii) RBI announced moratorium from time to time for repayment of loans dues and interest to the banks. All dues payable by the borrowers during current period, are further extended by RBI upto 31.12.202. It provides a great financial relief for corporate and other borrowers.
- (iv) RBI further relaxed the timelines for bad-loan rules, and barred lenders from paying dividends for the year ended 31.2.2020. RBI has given all banks a three-month grace period during which they have some relief from the rules relating to bad-loan classification and interest income recognition.

## 7.2 RBI Measures-2:

RBI (Apex Bank) announced on 17.4.2020 additional liquidity measures. The following are the highlights of measures introduced by the Central Bank (RBI):

- (i) RBI had conducted Targeted Long Term Repo Operations (TLTRO-2) for Rs 50,000 crore at reduced policy repo rate of 4% to utilise 50% funds for providing cheaper loans to Non-banking financial companies, Micro Finance Institutions (MFIs) and Mutual Funds to revive their activities.
- (ii) The Apex Bank has provided this Long Term facility at cheaper rate to the banks to enable them to buy investment grade corporate bonds, commercial paper, and non-convertible debentures. This had enabled the Corporates and NBFCs to raise money at cheaper rate.
- (iii) RBI had extended special Refinance Facilities of Rs 50,000 crore to National Bank for Agricultural and Rural Development (NABARD), Small Industrial Development Bank of India (SIDBI), National Housing Bank (NHB) for extending financial assistance to agriculture, small and medium enterprises, and housing finance respectively.
- (iv) RBI has reduced the 'Reverse Repo' rate from 4% to 3.75% with effect from 17.4.2020 to discourage the banks to park the funds with RBI, instead, lend more funds to corporate and other financial institutions at higher rate of interest at 4%.
- (v) With a view to providing more liquidity to the banks, RBI reduced cash reserve ratio (CRR) of all banks from 4% to 3% from 28.3.2020 upto 26.3.2021 and released excess amounts aggregating to Rs 1,37,000 crore to the banks, and thereby provided further liquidity for lending activities.
- (vi) Other measures extended by RBI to the banks include the following:
  - (1) Moratorium period shall be excluded from 90-day NPA period. It means that 90-day NPA norms will not apply on moratorium granted on existing loans by banks. Moratorium on all loans extended upto 31.12.2020.
  - (2) Liquidity Coverage Ratio (LCR) under Basel-II requirements for banks was brought down to 80% from 100% with immediate effect.
  - (3) Additional provisioning on standstill NPA accounts was reduced from 20% to 10%. This will provide financial relief to the banks.
  - (4) Statutory Audit of Public Sector Banks (PSBs) has been relaxed as on 31.3.2020.
  - (5) Banks and Co-operative banks shall not make any payment of dividends for the year ended 31.3.2020 as a measure of conserving profit to meet the financial stress caused by Covid-19.
- (vii) Under RBI instructions, State Bank of India (SBI) has been extending loans to its customers (under 'SBI Emergency Loan Scheme;) upto Rs5 lakh with simplified procedures, at a minimum interest of

10.5% which is fairly reasonable when compared to other personal loans. The Equated Monthly Instalment (EMI) repayment for the loan will start after six months. This is a great financial help for individuals who may have lost their salary income during the Covid-19 pandemic period.

### **7.3 RBI Measures-3:**

The following are the highlights of relief and thrust Measure-3 extended by the RBI under financial support to the banks:

- (i) Working Capital borrowers (companies and others) can repay the accrued interest in tranches till 31.3.2021.
- (ii) Funds exposure limit to group companies increased to 30% of capital base of bank. This would enable the corporate groups to get higher limits of loans from the Banks.
- (iii) RBI relaxed maximum permissible period of export credit from 12 months to 15 months. Normally, the loans extended by banks for exports should be repaid within 12 months earlier.
- (iv) RBI rolls over refinance facility of Rs 15,000 crore to SIDBI for 3 more months.

## **8. Other Relief measures:**

### **8.1.1 Establishing a ‘Bad Bank’:**

In the Budget 2021, it has been mentioned that ‘Bad Bank’ would be established. All the Non-performing Assets of banks would be transferred to ‘Bad Bank’. It will be jointly established by all banks jointly. It will function under the model of Assets Reconstruction Company (ARC) or Assets Management Company (AMC). This proposal gives greater relief to the banks since they can transfer all NPA accounts and clean their Balance Sheet during Financial Year 2022. This will help the banks to improve profitability and reduce burden on Capital Adequacy Requirement under Global Risk Management Guidelines (Basel risk framework) introduced under RBI guidelines. Also the Banks will get sufficient funds for their lending activities.

### **8.1.2 Effect of RBI measures-1 to 3:**

- (i) RBI's massive liquidity injections are yet to bring forth the desired results due to various bottlenecks and risk aversion of banks caused by potential problem accounts.
- (ii) Financial relief measures of RBI, are expected to bring the desired results only in the long run, since they did not yield any visible results in the short run in the backdrop of very low level of business activities.
- (iii) RBI mentioned that the damage brought by the virus is so deep and extensive that India's potential output has been pushed down and will take more than a year to repair.
- (iv) Monetary Policy Committee (MPC) of RBI had discussed on the status of Indian Economy and mentioned that the GDP growth will fall steeply for more than one year. RBI earlier also said that GDP for the current FY 2021 is likely to be negative.

## **9. Suggestions:**

The Researcher has made the following suggestion to extensively revive lending business of banks to industries and business activities with redoubled thrust and focus.

- (i) RBI should advise the Banks to extend liberal financial assistance to manufacturing sector, services sector and exports activites with a view to (1) boosting their activities and (2) meeting incremental operating costs on the business as a result of shutdown of their operations under lockdown.

- (ii) RBI should continue to extend liberal credit facilities to other financial services companies namely, NBFCs, Mutual Funds to go for business growth for higher profits.
- (iii) RBI should reduce the percentage of lending amounts under 'Priority Sector' advances at cheap rate of interest, for one year or more.
- (iv) RBI should extend restructuring of loans (instalments and interest), to industries, corporates, real estate business and individual borrowers for a longer period. In addition, appropriate relaxation shall also be issued to Banks for classifying and treating the funded loans under IRAC norms (Income Recognition and Assets Classification).
- (xiii) RBI shall extend additional, liberal, financial measures and support to the banks and other financial intermediaries during the current year, with a view to providing financial stability to them. This would be of great assistance to them to come out of financial stress presently faced by them.

## **10. Conclusion:**

In spite of the above-mentioned crisis caused by the covid-19 pandemic to various segments of financial sector, Indian Economy is fundamentally on strong footing. RBI measures and all the Government stimulus schemes would enable the industrial activities to make steady growth. Even world Economic forums are of the view that India would be least affected, even if the world economy falls into recession. Although the epidemic leaves a trail of damage across all sectors, including banking and other financial sector, many people (including me), are of the considered opinion that the Indian Financial Sector and the Economy will bounce back within short period of one year or so.

## **11. Future scope for Research:**

There is further scope for research on the impact of Covid-19, in the Industrial Sector, Unemployment and Indian Economy.

---

### **(i) References:**

- (1) [www.bloombergquint.com](http://www.bloombergquint.com)
- (2) [www.reutersindia.com](http://www.reutersindia.com)
- (3) [www.livemint.com](http://www.livemint.com)
- (4) [www.thehindubusinessline.com](http://www.thehindubusinessline.com)
- (5) [www.etnowtimes.com](http://www.etnowtimes.com)
- (6) [www.moneycontrol.com](http://www.moneycontrol.com)
- (7) [www.economictimes.indiatimes.com](http://www.economictimes.indiatimes.com)
- (8) [www.cnbc18.com](http://www.cnbc18.com)
- (9) [www.caclubindia.com](http://www.caclubindia.com)
- (10) [www.businessstandard.com](http://www.businessstandard.com)
- (11) [www.valueresearch.com](http://www.valueresearch.com)

## **FACTORS AFFECTING CAREER COMMITMENT OF WOMEN: A STUDY OF JAMMU REGION OF UT OF J&K\***

- **Neelam Choudhary**, Assistant Professor of Economics, DDE, University of Jammu  
neelam11choudhary@gmail.com
- **Neelam Kumari**, Research Scholar, Department of Economics, University of Jammu  
Neelamjangral077@gmail.com

### **ABSTRACT**

**Purpose:** The purpose of this study is to highlight the factors that determine the career commitment among women.

**Research design:** A nine item Likert scale was taken. Items were drafted on the basis of literature. The scale was validated through reliability and validity measures. Before starting with final analysis, a pilot study was done on 100 respondents. Results were satisfactory.

**Results:** The results show that despite facing many barriers, working women are committed to their professions. The barriers do not reduce their level of commitment. Also bankers and teachers do not differ significantly with regard to their commitment levels.

### **Introduction**

Women face unique circumstances. Despite being members of the same family, men and women experience life differently. Since time immemorial, women have been confined to the four walls, while men were considered the bread winners of the family. However, one fine day, that unproductive agent metamorphosed into an indispensable income earner. The process was not smooth, as it required a reviewing of the existing situation, identifying the flaws and replacing it with a better one. The rest is history. Given the backdrop, this paper throws light on career commitment among women. It starts with a general introduction to career orientation among women where it discusses the problems faced by women before joining the work force, canvasses the extant literature on the various difficulties encountered by women in work force and explores the contextual factors determining career commitment among women.

Before discussing career commitment among women, it is worthwhile to add that it was never so easy for a woman to overcome the strong roadblocks created for her confinement to households. Initially, she was considered a run-of-the-mill person, as her potential beyond child bearing and care taking was not realized (Wright, 1985). The first distinguishable step in this regard was taken in the post world war-II (Karen H et al;2006). Though the mental makeup as we see today has undergone considerable change, most of it can be attributed to recent decades, when women started participating in work force to the fullest extent. But the journey has been turbulent. Not only men, but also women were responsible for women's non-participation in labour force (Clutterbuck & Devine, 1987). While for a woman, the needless barricades were strong enough to obstruct her, she herself was (Kimmel 2001) and continues to be a facilitator for the working male of the family. The hiccups still exist, as women, who in the pursuit of their goals wish to achieve excellence (Blau, 2000) not at the cost of family needs, trouble people in policymaking. That women have been encountering difficulties in this endeavour has been discussed at length by different scholars (e.g. Clutterbuck & Devine 1987; Bryce, 1989; Ilagan-Bian,2004). Most of the scholarly work in this regard has been focused on the challenges confronted by them at workplace, where they need to be more competent than their male counterparts to make their presence felt or at times to follow the latter.

Patriarchal domination characterizes the Asian societies. This was discussed in the context of organizational culture by Sengupta.,S.S(2006), who evaluated how the man's superior position in this society lets this socio-cultural reality get reflected in organizational situations. Gender differences were also acknowledged in an earlier study by Cook et al.(1993). Further, Cooke.(2010) analysed that different patterns of employment observed in Asian women could be attributed to the heterogeneity radiating from multiple institutions, including political, arrangements in the institutions and the existing value system. Wu (2007) concluded that Self-efficacy, social support, gender role attitudes and role model were significantly related to career aspiration. Alsharif (2018) examined multiple factors that posed challenges to women in their journey towards career development at the state universities in Saudi Arabia. He identified seven factors , including cultural, family, individual, organizational, geographical, economic, legal and constitutional.

To get to grips with the situation faced by women, an attempt has also been made by few scholars to give it a gender wise look (e.g.(Phillips & Imhoff, 1997(Bierema, 1998; Mallon & Cassell, 1999; Tanton, 1992; Tharenou, 1999, 2001; Stroh & Reilly, 1999 Powell & Mainiero, 1992). They ascribe the specific problems faced by a working woman to her very status of being a woman. The typical circumstances and the responsibilities faced by her and not her male counterparts makes all the difference. Household chores, taking care of the children, elderly and others is her prime responsibility irrespective of her job status.

Whether or not women's career progression is a function of family factors has also been discussed by many other scholars. As early as 1976, Rosen & Jerdee concluded that the desire to personally achieve makes women move forward, while high income acts as a stumbling block. Chusmir (1985) and Matsui et al.(1991) too emphasized on these factors.

Many a time, work-family conflicts and the pressure to balance both the spheres make situation so unbearable that they make an exit from the labor market . (Mathews, Collins, & Cobb, 1974; Terborg, 1977).,Hwang & Ramadoss (2017) have dealt with this issue. The untimely and forceful exit (Community Business, 2017),lack of support system ((Chawla & Sharma, 2016,Srinivasan et al., 2013,Unilever, 2017 Grafton and Gordon (2018) and the constrained conditions under which they work (Desai et al., 2011, Sahu & Rath, 2003), in particular when they are expected to be equally efficient in both often leaves them emotionally disturbed.

While women continue to work their way through this road of uncertain and unpredictable problems, globalization did catalyse their entry into workforce. One such study has been carried out by Sundari(2020), who apart from recognizing the role of changed global scenario as a facilitator for the educated middle class women to make their dreams come true at the same time also admits that despite this, making their presence felt in the top positions still seems a taxing task. Mittal & Bhakar (2018 ) too move along the same line and emphasise on the time constraint confronted by working women. The job stress sometimes becomes so unbearable that they need to quit the labour market. Several scholars have worked on ways to handle these hindrances. They talk about a positive intervention model which can help women adapt themselves to stress situations, so that they are able to work in a happy environment built up of strong networking and are able to overcome different impediments to their progress. A support system does help in retaining women in work force. Institutional reforms too make a positive difference in attracting and retaining women. This has been put forward in a study by Fritsch (2015), who ascribes the progress of women in academics to the reforms made .

In the same spirit, two studies (MU Orbih and D Imphonopi ,2019; Sultana (2019)) have exclusively focused on the women in banking sector. The former concluded that while factors such as employment opportunities, hope for career advancement, personal skills, prestige and attractiveness of bank job, remuneration, educational qualification and job suitability motivated women in choosing to be

bankers, certain family factors and rigid promotion policies did obstruct their career progression. The latter investigated it in Bangladesh. The researcher concluded that positive perception of management regarding female employees and flexibility play a positive role in women's career advancement. Sethi (2015) and Shabir and Gani (2020) have thrown light on the positive role of work-life balance on organizational commitment.

A discernible shift away from feminine professions to more diverse fields has been dealt with in a study by Mehta(2011).

In a very recent study, Kang & Kaur (2020) have underscored the need for understanding factors internal to a woman's personality like occupational self-efficacy, proactive personality etc. ,which influence women's career advancement substantially.

Notwithstanding circumstantial factors, once they join the labour force, they need to work with full dedication, motivation and commitment, as every organization demands it from its employees. Now, an overview shall be presented of research undertaken by different scholars in this regard.

Though the exact origin of career commitment with any other name may not be easily traced, in its current form, its meaning and measure had their genesis in a piece of research by Blau (1988). The paper was on professionalism and comprised six characteristics, including commitment to work and profession. As normally understood, the latter was defined as dedication to work and aspirations to a career. Scholars have been working on and adding more and more to it ever since. Scholars have been using the following terms interchangeably: professional commitment, occupational commitment, career salience and career orientation to translate commitment to work and profession.(Blau 1988).

The issue of commitment, says Sharan (2017) holds a significant place in the labour-productivity and labour recruitment . Many scholars have delved into the factors affecting job or career commitment. The factors discussed widely include mother's work orientation, family background, status of finance and current marital status (White 1967); sex role conflict, satisfaction of needs, work commitment ( Chusmir,1982);parental background including socio-economic status, educational qualification and expectation (Khallas ,2000; Stitt & Gohdes 1997;) or relatives (or influential sibling etc.) (Brown 2001); age, educational qualification and the desire to achieve ( Cassie et.al.1981); liberal sex role values and instrumentality (Matsui & Onglatco,1991) . The investigations carried out by these scholars led them to conclude that these factors affect career commitment positively.

However, certain studies are sector-specific and include factors related positively as well as negatively. Jones et al.(1988) explored how extra work variables like family, career planning, and individual career planning, marital stability, coping behaviors, financial status influence different types of commitment i.e. organizational, career and community commitment. They reached the following conclusions: the three types of commitment are independent, the aforementioned factors strongly influence career commitment and that a woman's improved financial status contributed positively to her career commitment and organizational commitment, but negatively to her commitment towards community.

In an investigation carried out by Helen et al.(2010) on women in the Australian construction industry, it was observed that while commitment with regard to choice of career, level of satisfaction in the current profession and a healthy support system at work place were positively correlated with organizational commitment, the latter was not influenced by demographic or household factors. Marital status, job position, service year, education and organizational status (Shrestha 2016) do not influence commitment significantly. Alsharif et al.(2018) examined career development in case of women at state universities in Saudi Arabia. He came out with seven factors i.e. cultural, family, individual, organizational, geographical, economic, legal and constitutional.

There is no dearth of literature to support that level of job commitment among women is a negative function of sex-role conflict (Gordon & Hall, 1974; Herman & Gyllstrom, 1977; Mathews, Collins, & Cobb, 1974; Terborg, 1977). So despite her desire to work and earn, she considers managing both the spheres an uphill climb, which might never have been encountered by males. (Hamner & Tosi, 1974; Mathews, Collins, & Cobb, 1974). These other factors are referred to as interruptions in the women's careers by scholars. However, of late, things have started to change, says Bierema (1998). Women in many developed countries like USA are deciding not to marry or not to have children, as these are considered distractions in career progression. But these changes can't be generalized, so that in the larger perspective, the situation remains unaltered. Further, scholars (e.g. Rosin et al. (1995), Nath (2000), Datta & Agarwal, 2017, etc.) have inferred from their studies (with little variation in the variables taken) that being married and being a mother affect job commitment negatively.

Though the issue of career commitment among women has been extensively studied, there is considerable scope for a new research in this area, as there are few relevant studies on women in banking and teaching. But a comparative study of teachers and bankers in general and in the study area (geographically as well as with regard to answering the current research questions) in particular is not available. Hence there is a strong need for such a study, as its findings are expected to have wide implications for working women.

**Objectives:** The main objectives of the paper are :

1. To evaluate the level of career commitment of working women.
2. To study the impact of demographic factors on career commitment among working women.
3. To study whether the two groups of women i.e. Teachers and Bankers differ with regard to career commitment.

**Hypotheses:**

1. Ho: There is no impact of demographic factors on the level of career commitment of women.

This hypothesis has several sub-hypotheses, as each demographic variable has to be taken separately.

2. Ho: There is no statistically significant difference between the career commitment of women employed as teachers and bankers.

**Methodology:** A nine item five point Likert scale (where 1 means strongly disagree, while 5 means strongly agree) on career commitment was prepared, based primarily on the existing literature. A decision regarding the retention of items was taken, based on pilot study. Saunders (2007) suggested it as a prerequisite for carrying out main analysis. For running factor analysis, a sample of 100 was taken. Many scholars have recommended this as the minimum size (e.g. Hair (2010) and Awang (2014, 2015)). Factor analysis was run to reduce the data and extract factors.

The Kaiser-Meyer-Olkin, a measure of sampling adequacy (0.736) was found enough to run factor analysis. Likewise, Bartlett's test of sphericity, that tests the null hypothesis of no correlation among variables, was found significant. The results are shown in table I.

**Table I (KMO and Bartlett's Test)**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.736
Approx. Chi-Square	382.693
Bartlett's Test of Sphericity Df	36

Sig.

.000

The communalities table ( that shows how much of the variance in the variables has been explained by the extracted factors) shows all the values above 0.5. It is shown in table II.

The table depicting Total variance explained (Table III) shows that three components have Eigen values  $>1$ . The extracted sum of squared loadings column shows that the first three components account for 42.85, 16.09 and 12.22 of the variance respectively. The total variance explained is 71.16%. In Roated Component Matrix (table IV), all factors have been loaded significantly. In factor 1, four items (CC 6, 7, 8 and 9) are loaded significantly, while in 2<sup>nd</sup> and 3<sup>rd</sup> factors , three ( 2, 4 and 5) and two (1<sup>st</sup> and 3<sup>rd</sup> ) items have significant loading respectively. Cronbach's alpha Reliability check was done to evaluate the reliability of the scale. The value of Cronbach's alpha (table Va) has been found to be .821. The last Column of the item-Total Statistics table (Table Vb)shows that all the values of Cronbach's alpha were below .821 .So there is no need for deletion of any item. Hence the scale of career commitment among working women is both reliable and valid. All the original nine items have been retained for carrying out further analysis.

**Table II (Communalities).**

	Initial	Extraction
Career is the core issue in my life.	1.000	.738
My current profession is the one I always desired to join.	1.000	.525
I am ready to work for any other organisation if work is similar.	1.000	.699
I Can't think of changing my career at this stage.	1.000	.762
I have worked a lot to pursue my current career. So I can't leave job at any cost.	1.000	.861
My career means a lot to me.	1.000	.628
I would recommend others taking up my profession as a career.	1.000	.686
I am proud to be part of this profession.	1.000	.836
I relate to the values of this Organisation.	1.000	.770

Extraction Method: Principal Component Analysis.

**Table (III) Total Variance Explained**

Compon ent	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulati ve %	Total	% of Variance	Cumulati ve %	Total	% of Variance	Cumulati ve %
1	3.857	42.853	42.853	3.857	42.853	42.853	2.583	28.704	28.704
2	1.448	16.091	58.944	1.448	16.091	58.944	1.961	21.792	50.497
3	1.100	12.222	71.165	1.100	12.222	71.165	1.860	20.669	71.165
4	.837	9.297	80.463						
5	.529	5.875	86.338						
6	.431	4.793	91.131						
7	.413	4.587	95.718						
8	.202	2.246	97.964						
9	.183	2.036	100.000						

Extraction Method: Principal Component Analysis.

**Table IV Rotated Component Matrix**

	Component		
	1	2	3
Career is the core issue in my life.			.847
My current profession is the one I always desired to join.		.509	.407
I am ready to work for any other organization if work is similar.			.757
I Can't think of changing my career at this stage.		.738	.440
I have worked a lot to pursue my current career. So I can't leave job at any cost.		.871	
My career means a lot to me.	.594	.459	
I would recommend others taking up my profession as a career.	.753		
I am proud to be part of this profession.	.853		
I relate to the values of this Organization.	.864		

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

**Table Va Reliability Statistics**

Cronbach's Alpha	N of Items
.821	9

**Table Vb Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Career is the core issue in my life.	32.0700	21.379	.393	.819
My current profession is the one I always desired to join.	31.9700	21.363	.375	.822
I am ready to work for any other organization if work is similar.	32.0900	19.820	.562	.798
I Can't think of changing my career at this stage.	32.2100	18.854	.643	.787
I have worked a lot to pursue my current career. So I can't leave job at any cost.	32.1300	19.690	.583	.795
My career means a lot to me.	31.9300	22.409	.407	.815
I would recommend others taking up my profession as a career.	31.9200	20.579	.627	.792
I am proud to be part of this profession.	31.8800	20.814	.624	.793
I relate to the values of this Organization.	31.8800	21.400	.543	.802

The sample size for the main analysis has been taken as 435 i.e. 139 bankers and 296 teachers respectively. The no. of items being nine, the sample size is good enough for doing further analysis (Comrey and Lee 1992).

Further, normality test was done to decide about which technique to use for hypothesis testing. The normality tests table (not shown here) shows that for all the variables, the assumption of normality has been violated (as  $p < 0.05$  in most of the variables). So non-parametric techniques need to be employed to do hypothesis testing.

**Results:** An objective wise presentation of results is as follows:

1. **Level of career commitment** : The mean score (CC mean) was found to be 4.1504 . It shows a high level of commitment among working women (table VI) .

**Table VI Descriptive Statistics**

	N	Mean	Std. Deviation	Minimum	Maximum
CC_Mean	435	4.1504	.68873	1.44	5.00
Profession	435	1.68	.467	1	2

2. **(Hypothesis 1):** To evaluate the impact of demographic factors (age, status of no. of children, monthly salary of the woman, educational qualification of the woman, educational qualification of the spouse, ,no. of family members, status of the no. of dependents in the family, type of family and the region to which they belong) on their career commitment, two types of non-parametric tests were conducted depending on whether the variable has two or more than two levels. Mann Whitney test was employed in case of former, while Kruskal Wallis was found appropriate in case of the latter. Mean score, the dependent variable, has been considered as a metric variable. It must be mentioned that two important demographic factors marital status and religion have been excluded from the analysis, as the distribution was found to be highly skewed in favour of married and Hindus respectively.

The socio-economic profile shows that most of the women belong to the age category 25-40 (271), have two children (184), have monthly salary >50,000 (222), are postgraduates (254), most of the husbands hold a postgraduate degree (191) and are Govt. employees (210), no. of family members is 4-6 (196) and have dependents in the family (392). However, there is not much variation in the distribution of women with regard to the region to which they belong and the type of family.

On running the tests of hypotheses, it has been observed that (table VII) out of the nine demographic factors, only one has been found to be significant. The p value in eight of them was insignificant ( $>0.05$ ), so that there is no statistically significant difference between working women of different age groups, no. of children, monthly salary, their educational qualification as well as the educational qualification and occupations of their husbands, type of family, no. of family members and status of dependents in the family with regard to their level of career commitment (CC mean score). However, the region to which they belong holds significance, as p is  $<0.05$ , with mean ranks of rural and urban respondents being 235.38 and 202.65 respectively. This lead us to the conclusion that rural women are more committed .

**Table (VII)**

S.No	Categorical Independent variable	Dependent variable	Levels of the Independent variable	Test run	Result	Remarks
1	Age	CC mean score	>2	Kruskal Wallis	P=0.417( $>0.05$ )	Retain the null hypothesis
2.	Status of no. of children	CC mean score	>2	Kruskal Wallis	>0.05	Retain the null hypothesis

3.	Monthly salary of respondent	CC mean score	>2	Kruskal Wallis	0.941 (>0.05)	Retain the null hypothesis
4.	Educational qualification	CC mean score	>2	Kruskal Wallis	0.312(> 0.05)	Retain
5	Educational qualification of husband	CC mean score	>2	Kruskal Wallis	0.953(>0.05)	Retain
6.	No. of family members	CC mean score	>2	Kruskal Wallis	0.587 (>0.05)	Retain
7.	Type of family	CC mean score	2	Mann Whitney	0.736 (>0.05)	Retain
8.	Status.of dependents in the family	CC mean score	2	Mann Whitney	0.051	Retain
9.	Current residence (region)	CC mean score	2	Mann Whitney	0.006	Reject

**(Hypothesis 2) :** About 139 respondents are Bank Employees and 296 are from Teaching Profession having mean ranks 207.03 and 223.15 respectively. P value is >0.05, which leads us to the conclusion that the type of Profession has no impact on the career commitment of working women. In other words, there is no statistically significant difference between the two groups of women. The results have been shown in tables VIII and IX.

**Table VIII Ranks**

	Profession	N	Mean Rank	Sum of Ranks
CC_Mean	Bank Employee	139	207.03	28776.50
	Teacher	296	223.15	66053.50
	Total	435		

**Table IX Test Statistics<sup>a</sup>**

	CC Mean
Mann-Whitney U	19046.500
Wilcoxon W	28776.500
Z	-1.251
Asymp. Sig. (2-tailed)	.211

a. Grouping Variable: Profession is

**Conclusion and discussion:** The results of this study show that not only are women committed workers, but also the perceived barriers (i.e. demographic factors) do not stop them from performing well in the organizations where they are employed. Moreover, there is no statistically significant difference between women employed as teachers and as bankers. Though this study has been conducted in Jammu region of UT of J&K, the results have implications for women working in other professions as well as other parts of the country. However, future studies can be carried out on more professions so as to draw a better comparison.

## REFERENCES

- Alsharif, A. S.(2018). “The Challenges Associated with Women Career Development at the State Universities in Saudi Arabia: A Ground Theory Approach,” *International Journal of Gender and Women’s Studies*.
- Awang, Z. (2014) *A Handbook on SEM*, MPWS Publisher
- Awang, Z. (2015). *SEM Made Simple: A Gentle Approach to Learning Structural Equation Modelling*. Bandar Baru Bangi, MPWS Rich Resources
- Bierema, L.L.(1998).”A synthesis of women’s Career development Issues”, *New Directions for adult and continuing Education*, 80, 95-103.
- Blau, G. (2000), “Job, organizational, and professional context antecedents as predictors of intent for interrole work transitions”, *Journal of Vocational Behavior*, Vol. 56, pp. 330-45
- Blau, G. J. (1988) “ Further exploring the meaning and measurement of career Commitment “, *Journal of Vocational Behavior*, vol. 32, no. 3, pp. 284–297.
- Blau. F. D. (2000). “Gender and Family issues in the workplace”, <http://www.secure1.sc.netnation.com> Bryce, L. (1989). *The influential women - How to achieve success without losing femininity*. London. Judy Piatkus (Publishers).
- Caassie,B.M.,& Bhagat, S, R.(1981). “Determinants of Organizational Commitment in Working Women:Some Implications for Organizational integration”, *Journal of Organizational Behaviour*. Vol2,Issue 1.
- Chawla, S., Sharma, R. R. (2016). “How women traverse an upward journey in Indian industry: Multiple case studies” *Gender in Management: An International Journal*, 31(3), 181–206. [Google Scholar](#) | [Crossref](#)
- Chusmir ,Leonard H. (1982) “Job Commitment and the Organizational Woman”, *Academy of Management Review VOL. 7, NO. 4* 1 Oct <https://doi.org/10.5465/amr.1982.4285252>
- Chusmir, L. H. (1985). “Motivation of managers: Is gender a factor?” *Psychology of Women Quarterly*, 9, 153–159. doi:10.1111/j.1471-6402.1985.tb00868.x [CrossRef](#) | [Google Scholar](#).
- Clutterbuck. D. and Devine. M. (1987). *Business Women - Present and Future*. London. Macmillan Press Ltd.
- Community Business (2017). “Gender Diversity Benchmark for Asia 2014.” <https://www.communitybusiness.org/latest-news-publications/gender-diversity-benchmark-asia-2014> [Google Scholar](#)
- Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Cook et al.(1993) “Gender Differences in organizational Commitment :Influence of Work Positions and Family Roles”, *Sage Journals*, Vol 20(3).

- Cooke, F(2010). *Women's participation in employment in Asia: A Comparative analysis of china, India, Japan, and South Korea*. Monash University.
  - Datta, S., Agarwal, U. A. (2017). “Factors effecting career advancement of Indian women managers” *South Asian Journal of Business Studies*, 6(3), 314–336. [Google Scholar](#) | [Crossref](#)
  - Desai, M., Majumdar, B., Chakraborty, T., Ghosh, K. (2011). “The second shift: Working women in India.” *Gender in Management: An International Journal*, 26(6), 432–450. [Google Scholar](#) | [Crossref](#)
  - Fritsch N-S.(2015) “At the leading edge – does gender still matter? A qualitative study of prevailing obstacles and successful coping strategies in academia”. *Current Sociology*. ;63(4):547-565. doi:[10.1177/0011392115576527](https://doi.org/10.1177/0011392115576527)
  - Gordon F. C. , Hall D. T.(1974) , “ Self image and stereotypes of femininity: Their relationship to women's role conflicts and coping”, *Journal of Applied Psychology*, 59, 241–243.[Google Scholar](#)
  - Grafton, K., Gordon, F. (2018). “The motivations and aspirations of Indian physiotherapists who migrate overseas to study and work: A grounded theory study.” *Physiotherapy*. [https://www.physiotherapyjournal.com/article/S0031-9406\(18\)30346-8/fulltext](https://www.physiotherapyjournal.com/article/S0031-9406(18)30346-8/fulltext) [Google Scholar](#)
  - Hair, J.F., Anderson, R.E., Babin, B.J. and Black, W.C. (2010), *Multivariate Data Analysis: A Global Perspective*, Vol. 7, Pearson, Upper Saddle River, NJ.
  - Hamner W. C. , Tosi H. L.(1974), “ Relationship of role conflict and role ambiguity to job involvement measures”, *Journal of Applied Psychology*, 1974, 59, 497–499.[Google Scholar](#)
  - Helen, Clare Lingard, Valerie Francis & Michelle Turner (2010) “ Work–family enrichment in the Australian construction industry: implications for job design”, *Construction Management and Economics*”, 28:5, 467-480, DOI: [10.1080/01446190903511268](https://doi.org/10.1080/01446190903511268)
  - Herman J. B. , Gyllstrom K. K. (1977), “ Working men and women: Inter-and-intra role conflict”, *Psychology of Women Quarterly*, 1, 319–333.[Google Scholar](#)
  - Hwang, W., & Ramadoss, K. (2017). “The job demands–control–support model and job satisfaction across gender: The mediating role of work–family conflict”. *Journal of Family Issues*, 38(1), 52– 72.[Crossref](#) [Web of Science®](#)[Google Scholar](#)
  - Ilagan-Bian, J. (2004). “This leader is a woman!” Cebu Daily News, hup: wnvN.inq7.net
  - Jones et al.(1988) “The impact of family and career planning variables on the organizational, career and community commitment of professional women”.
  - Kang LS, Kaur G.(2020) “Personal Cognitive Factors Affecting Career Aspirations of Women Working in Financial Sector in India”. *Vision*. 2020;24(4):419-430. doi:[10.1177/0972262920931344](https://doi.org/10.1177/0972262920931344)
  - Karen, H. Jones & Desirae M. Domenico (2006) “Career Aspirations of Women in the 20th Century”, *Journal of Career and Technical Education*, 22(2), Fall.
  - Khallad, J. (2000). “Education and career aspirations of Palestinian and U.S. youth”. *Journal of Social Psychology*, 140, 789-792
  - Kimmel, M. S. (2001). *Gender Equality: Not for Women Only*. USA. Stony Books.

- M U Orbih and D Imhonopi (2019 ) *OP Conf. Ser.: Mater. Sci. Eng.* 640 012127
- Mallon.M &Cassell.C. (1999), “What do women want? The perceived development needs of women managers”, *Journal of Management Development* Vol 18,NO.2, PP.137-154.
- Mathews, J. J., Collins, W. E., & Cobb, B. B.(1974) “ A sex comparison of reasons for attrition in male dominated occupation,” *Personnel Psychology*, 27, 535, 541
- Matsui, T., & Onglatco, M. L. (1991). “Instrumentality, expressiveness, and self-efficacy in career activities among Japanese working women”, *Journal of Vocational Behavior*, 39, 241–250.[CrossRef](#)[Google Scholar](#)
- Mehta, Sandhya (2011) “Job Involvement Among working women”, *.Journal of Multidisciplinary Research. Vol. 1*, Issue 2, June ,ISSN 22315780.
- Mittal. M & Bhakar. S.S.(2018) “ Examining the impact of Role overload on Job stress, Job Satisfaction and Job performance-A Study among Married Working women in Banking Sector”, *International Journal of Management Studies.* Vol 2(7):01.
- Nath, Deepika 2000).”Gently Shattering the glass Ceiling: Experiences of Indian Women Managers”, *Women in Management Review.* Vol 15, No.1, PP, 44-52.
- Phillip .D.S and Anne R. Im hoff.(1997). “Women and Career Development :A Decade of Research”, *Annual reviews of Psychology*, Volume 48, PP-31-59.
- Powell. N. G, Mainiero. A. L. (1992). “Cross- Currents in the River of Time: Conceptualizing the complexities of women’s careers.” *Journal of Management*, Vol 18, Issue 2, 1992.
- Ranganathan, Sundari. (2020). “Women employment in Indian banking sector”-a trend analysis.
- Rosen, B., & Jerdee, T. H. (1976). “The influence of age stereotypes on managerial decisions. *Journal of Applied Psychology*, 61(4), 428–432. <https://doi.org/10.1037/0021-9010.61.4.428>
- Rosin, Hazel & Karen Korabik, (1995) “Organizational Experiences and Propensity to Leave: A Multivariate Investigation of Men and Women Managers,” *Journal of Vocational behavior*,Volume 46, Issue 1,Pages 1-16,ISSN 0001-8791,<https://doi.org/10.1006/jvbe.1995.1001>.
- Sahu, F. M., Rath, S. (2003). “Self-efficacy and wellbeing in working and non-working women: The moderating role of involvement.” *Psychology and Developing Societies*, 15(2), 187–200. [Google Scholar](#) | [SAGE Journals](#)
- Saunders, M.N.,( 2007). *Research methods for business students*, 5/e. Pearson Education India.
- Sengupta, S. Sunita.(2006) . “Gender, Work and Organisational Culture: A Southeast Asian Experience.” *Indian Journal of Industrial Relations*, vol. 41, no. 4, pp. 304–328. *JSTOR*, [www.jstor.org/stable/27768036](http://www.jstor.org/stable/27768036). Accessed 16 Feb. 2021.
- Sethi, Joshi, Upasna (2015). “Influence of Work Life Balance on Organizational Commitment: A Comparative Study of Women Employees Working in Public and Private Sector Banks”, *International Journal of Management, IT and Engineering* Vol5,issue 1.

- Shabir, S. and Gani, A. (2020), "Impact of work-life balance on organizational commitment of women health-care workers: Structural modeling approach", *International Journal of Organizational Analysis*, Vol. 28 No. 4, pp. 917-939. <https://doi.org/10.1108/IJOA-07-2019-1820>
- Shrestha, I. (2016). "Organizational Commitment of Female Employees of Nepalese Financial Institutions". *Journal of Nepalese Business Studies*, 9(1), 126-136. <https://doi.org/10.3126/jnbs.v9i1.14602>
- Srinivasan, V., Murty, L. S., Nakra, M. (2013). "Career persistence of women software professionals in India." *Gender in Management: An International Journal*, 28(4), 210–227. <https://doi.org/10.1108/gm-01-2013-0011> Google Scholar | Crossref
- Stitt-Gohdes, W. L. (1997). *Career development: Issues of gender, race, and class*. Columbus, OH: Center on Education and Training for Employment, The Ohio State University. (ERIC Information Series No. 371)
- Stroh L., Reilly A. (1999). "Gender and careers: Present experiences and emerging trends," In Powell G. N. (Ed.), *Handbook of gender and work*: 307–324. Thousand Oaks, CA: Sage. [Google Scholar](#)
- Sultana, Salma (2019) "Factors affecting career progression of women in the banking sector in Bangladesh: Barriers and challenges." *Journal of Research in Business and Management*. Vol 7, Issue 6, PP: 56-62.
- Tanton, M.(1992)."Developing Authenticity in management-development programs". *Women in Management Review*, 7(4), 20-26.
- Terborg, J. R. (1977) "Women in management, a research review", *Journal of Applied Psychology*, 62, 647-664
- Tharenou, P.(1999) "Gender Differences in advancing to the top", *International Journal of Management Review*, 1(2),111-132.
- Unilever (2017). "Opportunities for women: Challenging harmful social norms and gender stereotypes to unlock women's potential." [https://www.unilever.com/Images/unilever-opportunities-for-women-report-march-2017-final\\_tcm244-500988\\_en.pdf](https://www.unilever.com/Images/unilever-opportunities-for-women-report-march-2017-final_tcm244-500988_en.pdf) Google Scholar
- White, K.(1967) " Social background variables related to career commitment of women teachers". *The Personnel and Guidance Journal*,45, 648–652. [Google Scholar](#)
- Wright, E.O. (1985) *Classes*, London.
- Wu, Hwei Ming (2007) *Self-Efficacy, Work-Family Conflict, Social Support, Gender Role Attitude and Role Model as Antecedents of Career Aspiration among Women in Middle Management*. Masters thesis, Universiti Putra Malaysia.

