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TILAK COLLEGE OF SCIENCE & COMMERCE

ONE DAY NATIONAL CONFERENCE

ON

RESILENCE, RECOVERY & REVIVAL: POST PANDEMIC IN INDIAN ECONOMY

Saturday, 11th March, 2023

Dr. Anita Joshi
(Chief Editor)

Dr. Shoba James
(Convenor)

Mrs. Neha Khandare
(Co-Convenor)

Mrs. Shifaunisha Karin
Mrs. Sarita Balakrishnan
Mrs. Sanober Bhatt
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PREFACE

I would like to take this opportunity to welcome you all to the proceedings of the one-day national conference "Resilience, Recovery, and Revival: Post Pandemic in Indian Economy" on March 11, 2023. I wish you a fruitful conference full of stimulating discussions and knowledge exchange so that we can all look forward to a future of ground breaking knowledge for research and technology in the humanities. Information technology advancements have significantly altered how people communicate as well as how we perceive and respond to events and issues.

The Covid 19 pandemic, which has completely shocked society, businesses, organisations, and governments all over the world, would undoubtedly qualify. One of the most significant effects is an exponential rise in perceived risk and uncertainty. Various aspects of human behaviour are unknown. Due to the global economic slowdown, the epidemic has forced businesses to reconsider their operating procedures. In the face of such massive obstacles, business executives, policymakers, and management experts are under extreme pressure to reconsider recovery, resilience-building, and adaptation to new normal tactics.

It was intended to bring together renowned professors, scientists, researchers, industrialists, and others. Under one roof, professionals from all walks of life—technocrats, government officials, social visionaries, and others—explore the potential of novel technology and chart a course of action. This new path should break down barriers, discourage pointless work, and advance science in ways that will help India realise and achieve its 2030 goal of becoming a developed nation, as well as accelerate its overall growth and rise to prominence internationally. In addition to invited speeches, keynote addresses, panel discussions, and poster exhibitions, the conference will include regular sessions for paper presentations.

I am very grateful to Shri J.N. Kurup, Chairman of Tilak Group of Schools and Colleges, for providing us with this research platform; I just wanted to express my gratitude for his guidance and support.

I am grateful to the directors of Tilak Group of Schools and Colleges, Dr. Ajit Kurup and Dr. Arun Janardhan, for providing us with the opportunity to grow and succeed. It would not have been possible without their assistance and guidance.

We would also like to take this opportunity to thank the various organisations that have sponsored and worked with us to organise this conference.

I want to thank everyone who helped make this conference a success, whether directly or indirectly.

Last but not least, I would like to take this opportunity to thank my entire team for successfully completing this Proceedings, and to personally accept responsibility for all errors, deficiencies, and shortcomings. Due to the limited time available, errors may remain despite our best efforts to produce a quality publication with a consistent format.

Dr. Anita Joshi
Principal Tilak College of Science of Commerce

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TO STUDY SWAMI VIVEKANANDA'S IDEAL EDUCATIONAL PHILOSOPHY

Dr. Anita Joshi
Principal Tilak college of science and commerce, Vashi
E-mail : principaljk101@gmail.com

ABSTRACT:
The term "Bunch of Values" best describes what education is. We seek education that develops character, strengthens the mind, broadens the intellect, and enables one to stand on one's own two feet, according to Swami Vivekananda. The education we receive now, in some ways, drives us astray in the path of materialism and creates a division between the lofty and the poor, whereas the education of ancient India fostered human oneness and harmony.

Our present-day education aims only at scoring high marks for the students to become either a doctor, or a chartered account or an Engineer, or other professional. Therefore, there is an urgent need to re-introduce value-based education dealing specifically with human values, to redesign the fabric of our educational system. The mind of a youngster is like pliable clay that is easily moulded into any desired shape. Hence, this is the ideal age and time to instill moral values so that the youngster will be guided by the proper ideas throughout his life. Unquestionably, such a life would be governed by moral and fair values. Vivekananda's educational thought can be effectively embedded in to a person's character. In addition to being a social reformer, Swami Vivekananda was also an educator. His contribution to modern India's awakening is critique in both nature and quality. His contribution to educational philosophy is of utmost significance if it is believed that education is the most effective tool for social transformation. He declines education as 'the manifestation of perfection that is already in man Redesigning the foundation of our educational system through education that focuses primarily on human values It is possible to mould a child's mind into any desired shape because it is like malleable clay. In order to ensure that the child's mind is imprinted with the proper values that will guide him throughout his life, this is the appropriate age and time to give value education. Unquestionably, such a life would be governed by moral and just values.

A person can successfully internalise Vivekananda's educational philosophy. In addition to being an educator, Swami Vivekananda was a social reformer. Critique in its kind and quality is his contribution to the modernization of India. Considering that he contributed to the idea that education is the most potent tool for social change His influence on the way that people think about education is crucial. He rejects education because it represents the perfection that exists in man already.

Keywords: *Ideal, creating, man making, character forming*

INTRODUCTION:
The secret to prosperity and a successful life lies in education. It is one in which a person realises

their potential as an individual and contributes positively to society. When it comes to shaping a person's character, education is crucial. Education may start societal transformation by altering people's perspectives and attitudes. The development of social and personal skills should go hand in hand in order to create an entirely unbiased uniqueness. A society's social and cultural transformations are mostly carried out through education. Education is a crucial component of young people's socialisation as they strive to live up to society's standards. the development of the human an appropriately designed educational curriculum can develop human resources. Teachers need to assume greater responsibility to mobilise society for change and so contribute to the achievement of the objective of national development. It is important to make use of Swami Vivekananda's thoughts and ideas for the reconstruction of society in the complex social environment of today, where there is fierce competition for material success and a value crisis in the community. This can be done by incorporating these ideas into the process of human development through education and making use of Swami Vivekananda's thoughts and ideas. This study discovers a method for obtaining the inner self, which is present in everything and everywhere.

Objectives of the Study:

1. To identify the Swami Vivekananda's educational views on ideal education meaning.
2. To find out the importance of Vivekananda's idea of education.

Methodology:

The study in this work was based on secondary data gathered from various books, research reports, journals, and research papers.

Aim of education:

According to Swami Vivekananda, the goal of real education is to create people who would elevate society and the nation to their highest potential.

Swami Vivekananda made significant contributions to the realm of education despite not having authored a book on the subject that is still applicable and beneficial today. He contends that the future of mankind and the prevention of societal evils depend on education.

In the same way as a scientist would, Swami Vivekananda started by figuring out the system's purpose. According to Swamiji, who took his cue from his guru, "the purpose of man is to attain God," education is the "manifestation of the perfection already existent in man." Eminent specialists have effectively addressed this subject in a number of books.

He simply expressed the high concept by using the term "man-making education." The benchmark for all education, this should be a universal training objective. However, we constantly work to polish the outside instead of doing that. With no interior, what purpose is there in shining up the exterior? All training has one primary goal: to help a person grow. When a man has the ability to influence, or "throw his magic," on his fellow beings, he becomes a powerhouse who, when ready, is capable of doing anything and everything he desires.

Education, according to Vivekananda, is an essential component of human life. Real education is that which one can put up with. According to Swamiji, the purpose of all education and training should be to create men. Education should also aim to foster self-esteem and self-awareness. Training should make a man mindful of his inborn capacities.

Instead of focusing on a nation's physical assets and material wealth, economists measure a nation's wealth based on its population of intelligent, resourceful people. Therefore, it is imperative that educational institutions focus on providing education that emphasises knowledge, skills, and values to students in order to fully empower the young people who will be the future of our nation. Only education that instils life values in youngsters may accomplish this. Value-free education may ultimately be harmful to society. This value-based education will foster the growth of sharp minds. Swami Vivekananda correctly points out the flaw in modern education and promotes the idea that the goal of all education should be the creation of human beings.

He also addresses the need of tutoring students' morals and the novelties of love. A value-grounded education is the only way for adolescent people to learn how to live for others." Those alone survive who live for others," remarked Swami Vivekananda.

Together with their technical knowledge and abilities, students who receive a thorough education also improve their social, moral, and spiritual elements. The goal of education should Swami Vivekananda thought that education had to work to bring forth the best in students.

In other words, education ought to work towards highlighting human excellence. In general, it demonstrates that true education should be about man-making, character-building, and life-building. Education shouldn't only be about memorising passages from books and regurgitating them verbatim on tests without actually understanding them. The assimilation of concepts, on the other hand, should be the goal of education, just as food is digested and assimilated into our bloodstream.

According to Swami Vivekananda, education would have achieved its goals if each person learnt 15 different concepts and put at least one of them into practise throughout their life. We may argue that education has achieved its goals when we put what we learn in school into practise throughout our lives. He describes this by using words like "creating a man," "building a life," and "forming a character."

To put it simply, education should be more focused on human values. However, the way education is now organised does not work to develop the best in people. The ability to handle life's obstacles is not improved by it. The only cure is for each individual's mentality to completely change. All of an individual's problems are caused by their materialism and selfishness. The spiritual attitude needs to take the place of the degrading of values and, subsequently, of behaviours. The only means by which this transition may be affected are education and education alone.

India's greatest thinker and reformer, Swami Vivekananda (1863–1902) favoured education and believed that it should be aimed at creating men as its ultimate aim. In addition to being a philosopher, he also advocated for changes in society, culture, and religion. Without distinction for race, religion, or ethnicity, he said, "Welfare of all."

His views on schooling offer a wealth of knowledge. He places a lot of stress on education for the underprivileged members of society as well as on moral and physical education as well as education in a medium language.

Through his words and actions, Swamiji tries to prove that education is ultimately man-made. In light of his overall Vedanta philosophy, he formulates the plan for this man-making education. The essence of man, according to

Vedanta. Vedanta asserts that a person's soul, which he or she possesses in addition to their body and mind, contains the essence of that person. Swamiji defines education as the expression of the perfection already present in man, in keeping with this philosophy. Education's main goal is to help us become more flawless in our lives, which is what our inner selves are made of by nature. This perfection represents the understanding of the limitless power that permeates existence, consciousness, and happiness (Sachi Ananda). One must get rid of their ego, ignorance, and any other false identifications after realising and achieving this, as these are obstacles.

As opposed to its physical and material wealth, a nation's wealth is measured by the brainpower of its creative citizens. Therefore, it is imperative that educational institutions work to provide students with information, skills, and value-based education in order to fully empower the young people who will be the future of our nation. Only education that teaches kids life lessons will be able to accomplish this. Lack of morals in education could eventually harm society. The growth of sharp minds will result from this value education. Swami Vivekananda correctly points out the flaw in modern education and recommends that the goal of all education is to create people. He discusses schooling as well. impart the understanding of love and a set of principles. Youth can only develop the sense of living for others through a values-based education. They alone live who live for others, as swami Vivekananda once stated. A full and entire education is one that not only develops technical knowledge and skills in students, but also their social, moral, and spiritual selves.

1. Moral, spiritual, and character development are all important aspects of education, according to Vivekananda. Education should also help students become more intelligent and strong-minded. According to Swamiji, one of education's main goals is character building, which helps pupils develop their moral and intellectual faculties.

Character is the foundation of self-development which leads to moral and spiritual development. Education should present high ideals before students and remove the evil tendencies of our mind. Formation of a high character depends on hard work and struggle. Also, purity, thirst for knowledge, faith, humanity is very much needed for building a high character. Teachers are highly responsible in forming a good character and pupils should be self-motivated for acquiring the right kind of knowledge from everywhere.

2. Education for self-sufficiency and development: According to Vivekananda, knowledge is innate, and the self is the source of all knowledge. Thus, self-development is Vivekananda believed that knowledge is innate and that the self is the source of all knowledge. He advocated education for self-reliance and development. Hence, self-development higher priority. Learning to access the knowledge that already exists in our minds is the goal of education. Students should be able to learn how to access their innate, hidden abilities through education

Conclusion:

It is evident from the examination of Vivekananda's educational plan that education is the only means by which the masses can be lifted. His opinions on education shed light on a beneficial, realistic, and all-encompassing approach to education. By providing education, he seeks to bring about the moral and spiritual wellbeing and elevation of all people, regardless of caste, creed, nationality, or time. With the help of his educational programme, we can create a powerful nation devoid of caste and creed and one

that is characterised by peace and harmony. But instead of adopting his ideas, we are only exposing our children to bookish information without exposing them to other areas of education, which has the effect of not helping them develop strong moral character even when they finish their schooling and receive degrees.

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TO STUDY THE IMPACT OF E-COMMERCE ON ONLINE GROCERY SHOPPING AMONG GENERATIONS "X" AND "Y"

Paramjit Vedprakash Rajput
Assistant Professor
Department of Commerce and Allied Studies, Tilak College of Science and Commerce Vashi
E-mail: paramjeetnandrajog9@gmail.com

ABSTRACT:

This research paper aims to study the impact of e-commerce on online grocery shopping behaviour among generations X and Y. The objectives of the study are to analyze the level of awareness and usage of e-commerce for online grocery shopping among these generations, examine the factors that influence their online grocery shopping behaviour, and compare their online grocery shopping behaviour and preferences. The study found that both generations X and Y have adopted e-commerce for online grocery shopping to a significant extent, and several factors such as convenience, time-saving, and access to a wider range of products were found to influence their online shopping behaviour. The study also identified differences in online grocery shopping preferences between the two generations, with generation Y being more inclined towards using technology and being more open to trying new online grocery shopping platforms. These findings provide insights into the impact of e-commerce on online grocery shopping behaviour among generations X and Y and could be useful for retailers and e-commerce platforms to better understand and cater to their customers' needs.

Keywords: *E-commerce, Generation X and Y, digital platforms, online grocery shopping behaviour.*

Introduction:

People's lifestyles are changing nowadays. Going to crowded markets is both uncomfortable and time-consuming. As a result, E-Shopping is a blessing because it saves a lot of time. Online shopping is the process of purchasing goods, services, and other items directly from a seller over the Internet without the need for an intermediary provider. Shoppers can visit web retailers while sitting in front of their computers from the comfort of their own homes. Online stores are typically open 24 hours a day, and many consumers have access to the internet both at work and at home. This research paper aims to investigate the impact of e-commerce on online grocery shopping among Generations X and Y. In which Gen X, or **Generation X** as a whole, is a term used to describe a group of people who were born between **1965 - 1980.** Currently, the group's age ranges from **42 to 57**, and some of them are millennials' parents. Generation X, which came before Generation Y, was likewise impacted by a broad shift in societal attitudes. A segment of the population that was born between **1981 - 1995** is referred to as **Generation Y(Millennials)**. The group's age range as of right now is **26 to 41**. They go by the name millennials as well. It will investigate these groups' views and behaviors toward online food buying, as well as the various variables that impact their decision-making

process. The research will also look at the effect of e-commerce on the traditional grocery business and its chances for the future. The results of this study can assist online and conventional food merchants in better understanding the requirements and desires of Generations X and Y, as well as in developing effective marketing strategies to attract and keep these customers.

OBJECTIVES OF THE STUDY:

1. To identify the variables that impact Generations "X" and "Y" for adoption of internet grocery purchasing.
2. To examine the impact of e-commerce on the purchasing behavior of Generations "X" and "Y".
3. To assess the satisfaction level of Generations "X" and "Y" with online grocery shopping.
4. To explore the potential opportunities and challenges of online grocery shopping for retailers and marketers targeting Generations "X" and "Y".
5. To provide recommendations to improve the online grocery shopping experience for Generations "X" and "Y".

NEED AND IMPORTANCE OF STUDY

The purpose of the current study is to better understand the factors influencing Generation X and Y customers' decisions to make purchases online in Navi Mumbai. To promote online grocery in such a way that will truly satisfy clients with innovative ideas. This study includes suggestions for marketing online purchases in a simple method as well as ways to address a good online grocery format.

SCOPE OF THE STUDY:

In the future, this study might be repeated with other new products to boost happiness in all other places, as well as to assist in designing the best online format for the consumers' comfort.

METHODOLOGY:

In order to better understand customer attitudes toward online grocery shopping in Navi Mumbai, a study was performed. In order to get the required information as quickly as possible, an online questionnaire was developed. Potential participants received the questionnaire through email. Each Navi Mumbai grocery customer, with or without prior online grocery shopping experience, served as the study's unit of analysis.

1.5.1. Sample size:

It includes 66 respondents from the Navi Mumbai region, representing a range of socio-demographic profiles.

1.5.2. Sampling Design:

In this research, the study's sample subjects were chosen using a random selection technique.

1.5.3. Tools:

- Percentage analysis

Literature Review:

Hsiao and Chen's (2019) The study looks into the variables that influence people's intentions to use online food buying across generations. The research says that the individual's mood, subjective standard, and observed behavioural control affect their purpose to execute a specific behavior.

Koo, Kim, and Kim's (2019) The research is founded on the idea that by reducing the amount of trips to real stores, internet grocery buying can help to reduce pollution.

Krishnamurthy and Singh's (2019) The study contributes to the understanding of the digital transformation of grocery shopping and the differences in shopping behavior between brick-and-mortar and online stores. It provides insights into how retailers can leverage the advantages of both shopping channels to enhance customer

experience and increase sales. The study also highlights the need for retailers to adapt to the changing shopping behavior of customers and embrace the digital transformation of the grocery industry.

Lee and Kim's (2020) The study investigates the online grocery shopping behavior of different generations through a qualitative study. The authors conducted in-depth interviews with 16 participants from four different generations (Baby Boomers, Generation X, Millennials, and Generation Z) in South Korea. The findings suggest that the online grocery shopping behavior of different generations is influenced by various factors, including convenience, time-saving, cost-effectiveness, and trust in online platforms. However, the study revealed that the importance of these factors varied among the different generations.

Liang and Huang's (2021) The study contributes to the understanding of the effect of online reviews on online grocery shopping behavior and highlights the differences in this effect across different generations. The authors suggest that retailers and marketers should leverage online reviews to enhance the trust and perceived value of their online platforms, particularly for non-food items. The study also emphasizes the need for retailers to tailor their strategies to the preferences and concerns of different generations when promoting online grocery shopping.

Data analysis:

Analysis and interpretation are the two most important steps of the research process. Typically, the initial step in data analysis would be to recode each variable measured; however, because SPSS products are compatible, the values were already appropriately coded when the raw data was imported.

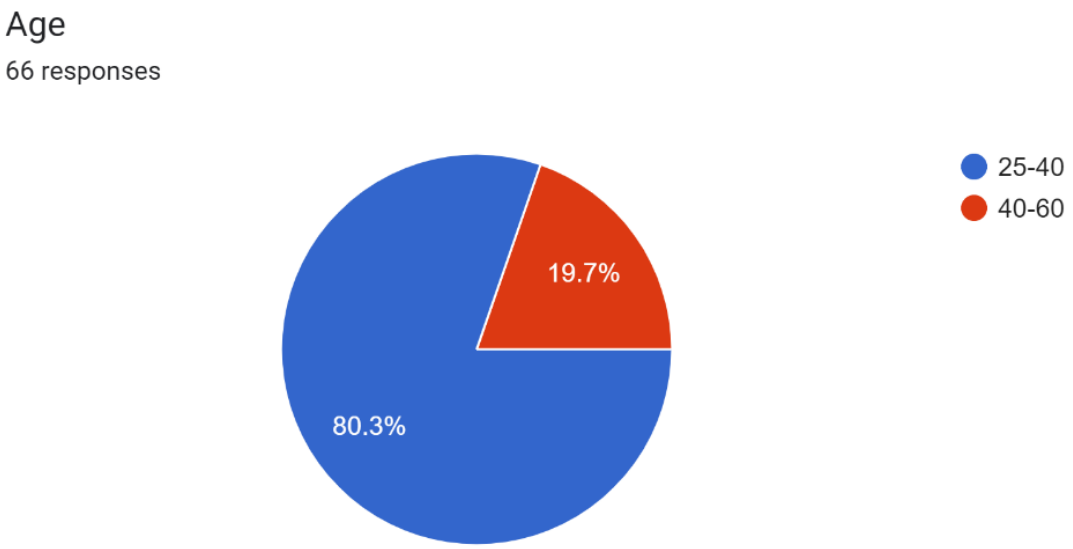
Percentile Analysis:

Percentage approaches are methods for comparing two or more sets of data. The percentage is determined by the descriptive link. It compares similar items. The data is reduced to the shape of a percentage with a basis equivalent to 100% by using percentages, making it simpler to compare things.

$$\textbf{Percentage} = \frac{No\ of\ Respondents}{Total\ No.of\ Respondents} \text{ x } 10$$

TABLE 3.1.1
TABLE DISPLAYING THE RESPONDENT'S AGES

AGE	RESPONDENT	PERCENTAGE
25-40	53	80.3
40-60	13	19.7
TOTAL	66	100



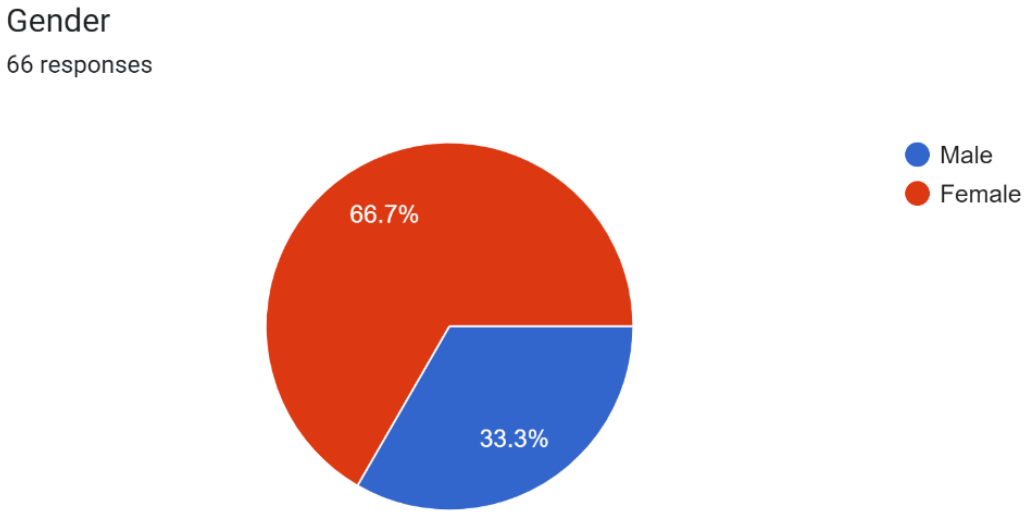
INTERPRETATIONS

19.7% of the total responses are between the ages of 25 and 40, while 80.3% are between the ages of 40 and 60. The majority of responses (80.3%) are in the 25–40 age range.

TABLE 3.1.2

TABLE DISPLAYING THE RESPONDER'S GENDER

GENDER	RESPONDENTS	PERCENTAGE
Male	22	33.3
Female	44	66.7
Total	**66**	**100**

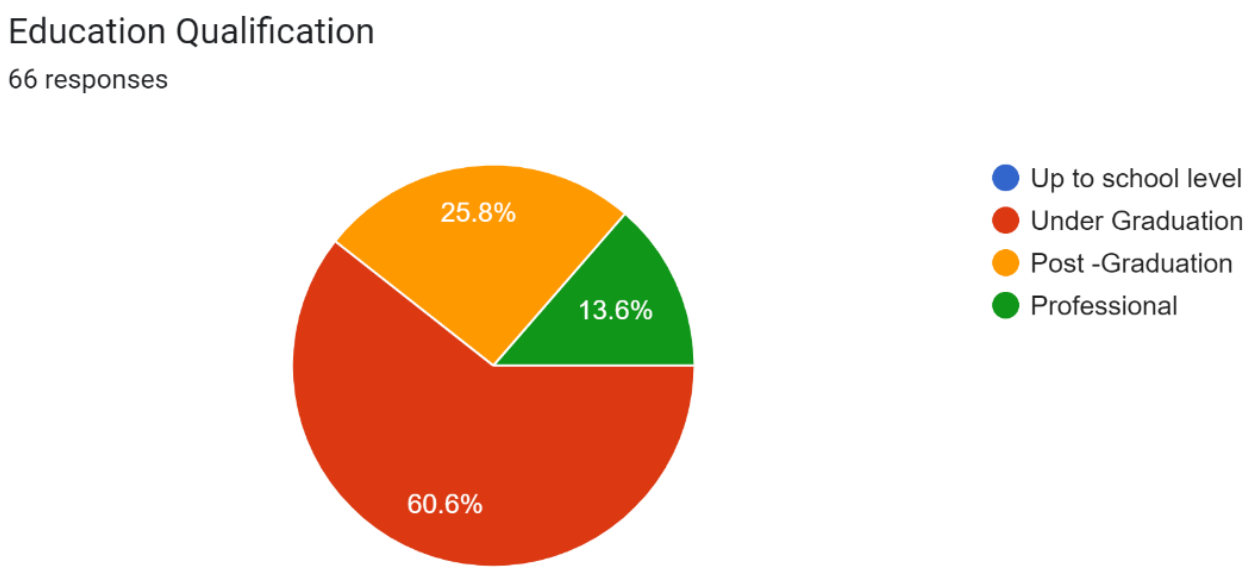


INTERPRETATIONS

The proportion of male respondents is 33.3%, while the percentage of female respondents is 66.7%. Maximum responses received (66.7%) are women**.**

TABLE 3.1.3
CHART OUTLINING THE RESPONDENTS' EDUCATION QUALIFICATIONS

EDUCATIONAL QUALIFICATION	RESPONDENTS	PERCENTAGE
Up to school level	00	00
Under Graduation	17	60.6
Post-Graduation	40	25.8
Professional	9	13.6
Total	**66**	**100**

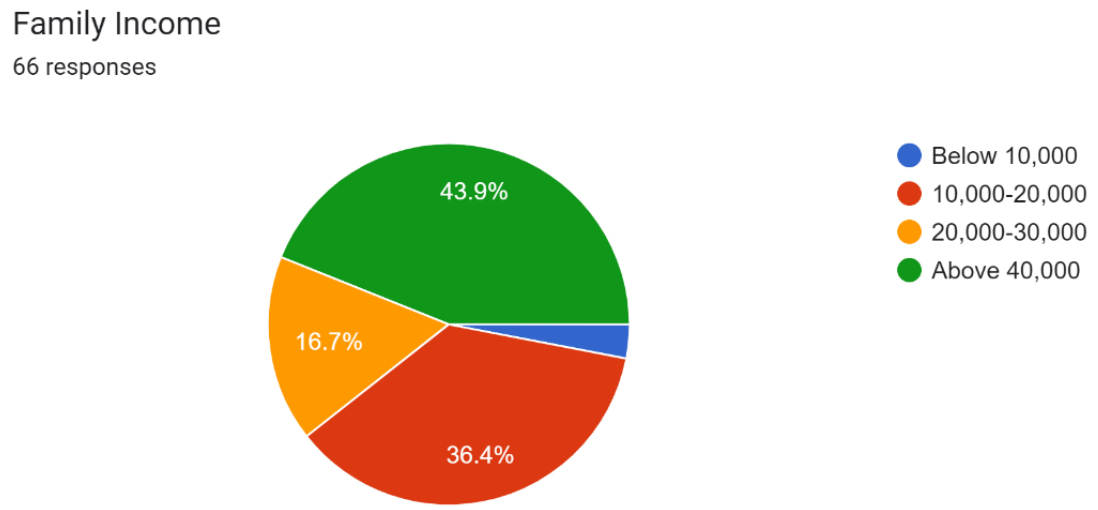


INTERPRETATIONS

No one is in school, with 60.6% of responses from under graduation, 25.8% being post-graduation, and 13.6% being professionals, according to the mentioned chart. (60.6%) Undergraduates make up the bulk of the responses.

TABLE 3.1.4
TABLE SHOWING THE RESPONDENTS' FAMILY'S MONTHLY INCOME

FAMILY MONTHLY INCOME	RESPONDENTS	PERCENTAGE
Below 10,000	2	3
10,000-20,000	24	36.4
20,000-30,000	11	16.7
Above 30,000	29	43.9
Total	**66**	**100**



INTERPRETATIONS

According to the above-mentioned chart, 16.7% of respondents have a monthly salary of ₹20,000 or less, 36.4% of respondents earn between ₹10,000 and ₹20,000, and 43.9% of respondents make more than ₹40,000. A whopping 44.9% of respondents report having a monthly salary of at least ₹40,000.

TABLE 3.1.5
TABLE DEPICTING ONLINE GROCERY SHOPPING EXPERIENCE

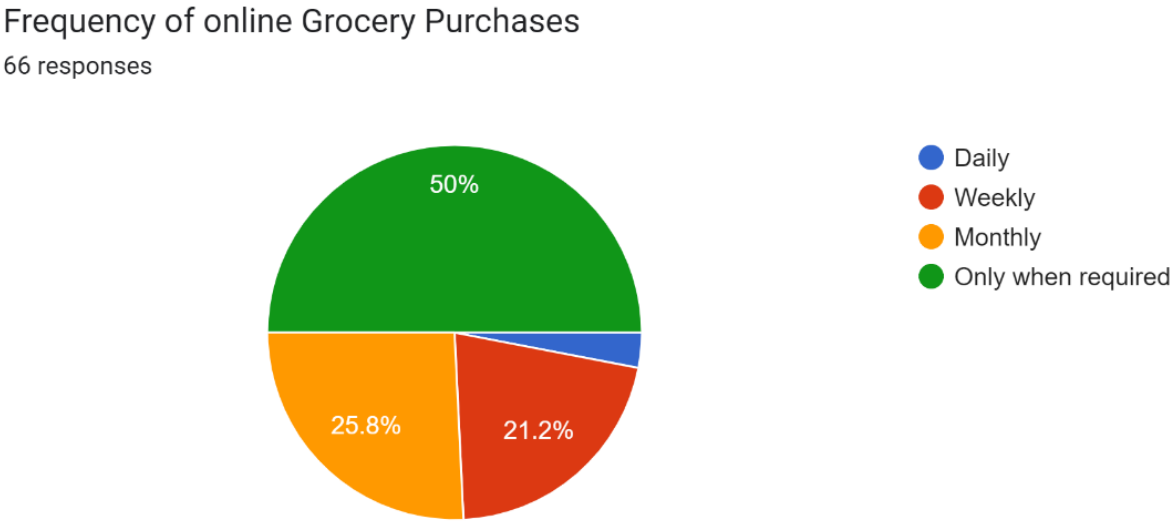
EXPERIENCES	RESPONDENTS	PERCENTAGE
YES	53	80.3
NO	13	19.7
TOTAL	**66**	**100**

INTERPRETATIONS

According to the above-mentioned table, 80.3% of respondents have done purchasing online, while only 19.7% do not. Eighty-three percent of the respondents (80%) have good experience with internet purchasing.

TABLE 3.1.5
CHART OUTLINING HOW OFTEN GROCERIES ARE PURCHASED

FREQUENCY	RESPONDENTS	PERCENTAGE
Daily	2	3
Weekly	14	21.2
Monthly	17	25.8
Only when required	33	50
Total	**66**	**100**

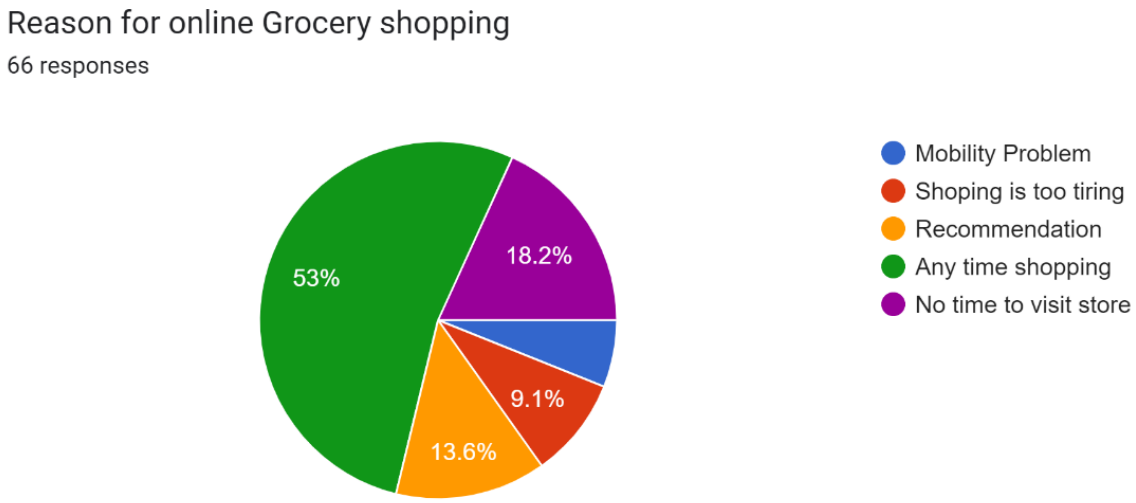


INTERPRETATIONS

According to the chart, 3% of respondents buy goods every day, 21.2% buy them once a week, 25.8% buy them once a month, and 50% only buy them when they are absolutely necessary. The bulk of data (50%) indicates that people only buy food when necessary.

TABLE 3.1.6
TABLE OUTLINING THE PURPOSE OF ONLINE GROCERY SHOPPING

REASONS	RESPONDENTS	PERCENTAGE
Mobility Problem	4	6.1
Shopping too tiring	6	9.1
Recommendation	9	13.6
Any time shopping	35	53
No time to visit the store	12	18.2
Total	**66**	**100**

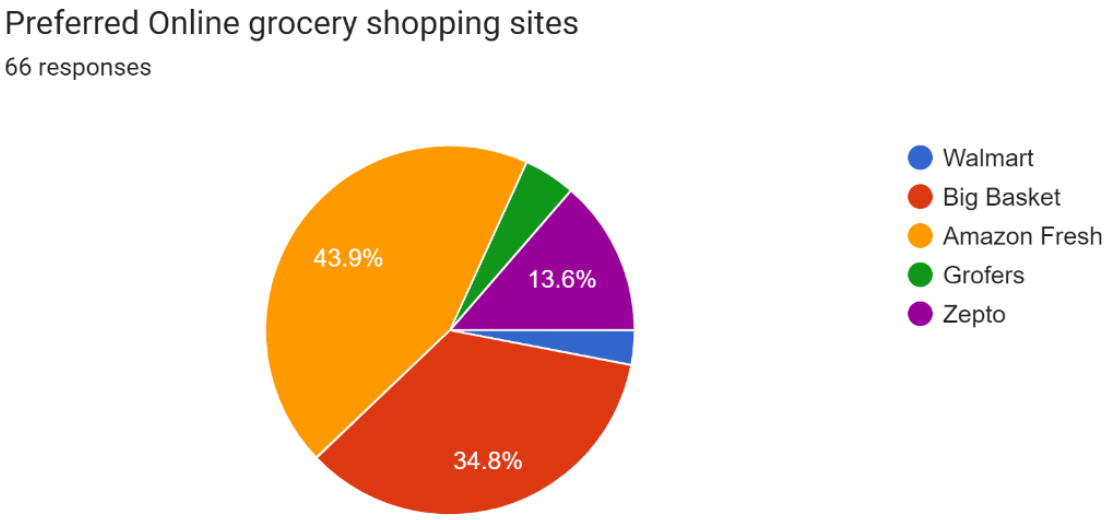


INTERPRETATIONS

According to the above-mentioned table, 6.1% of respondents have mobility issues, 9.1% of respondents find in-store shopping to be tiresome, 13.6% of respondents start shopping for groceries online as a result of a recommendation, 53% of respondents need any free time for shopping, and 18.2% of respondents have no time to go to a store. Because they can buy whenever the majority of respondents (53%) prefer to do their grocery purchasing online.

TABLE 3.1.7
TABLE LISTING RESPONDER'S PRIMARY GROCERY SHOPPING SITES

SHOPPING SITES	RESPONDENTS	PERCENTAGE
Amazon Fresh	29	43.9
Walmart	2	3
Big Basket	23	34.8
Grofers	3	4.5
Zepto	9	13.6
Total	**66**	**100**



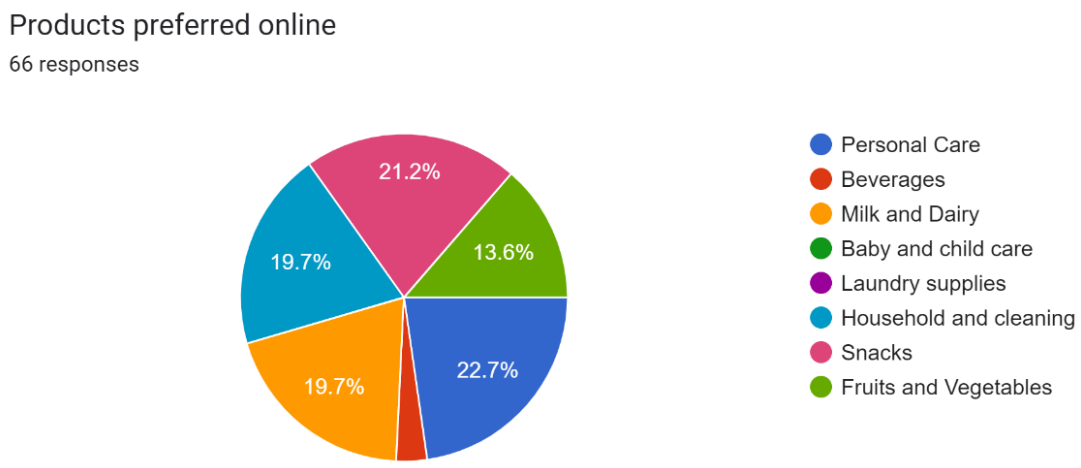
INTERPRETATIONS

According to the above-mentioned chart, 43.9% of respondents purchase their goods from Amazon Fresh, 3.0% from Walmart, 34.8% from Big Basket, 4.5% from grofers, and 13.6% from Zepto. 34.8 percent of respondents said they favored Big Basket.

TABLE 3.1.8

TABLE LISTING THE PRODUCTS MOSTLY PURCHASED FOR ONLINE PURCHASE

PRODUCTS	RESPONDENTS	PERCENTAGE
Personal Care	15	22.7
Beverages	2	3
Milk and Dairy	13	19.7
Baby and childcare	9	13.6
Laundry supplies	00	00
Household and cleaning	13	19.7
Snacks	14	21.2
Fruits and Vegetables	9	13.6



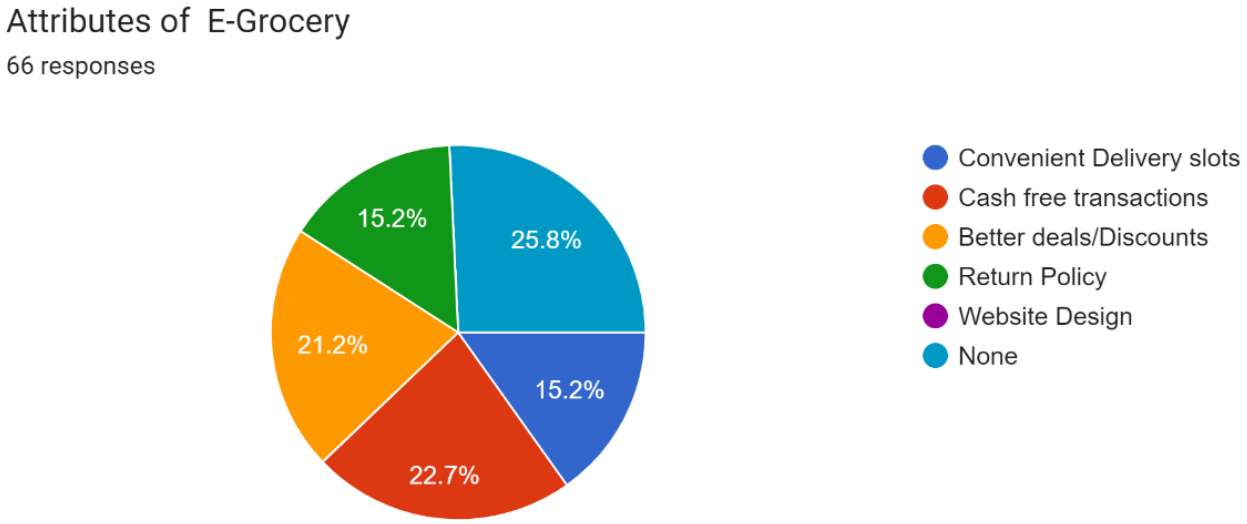
INTERPRETATIONS

According to the above chart, personal care and snacks respectively received a maximum of 15 and 14 answers, milk, journals, and domestic cleaning received 13 responses, and beverages and laundry cleaning received the fewest responses. Personal maintenance and snacks were chosen by the vast majority of respondents.

TABLE 3.1.9

TABLE OUTLINING THE E-GROCERY ATTRIBUTES

ATTRIBUTES	RESPONDENTS	PERCENTAGE
Convenient delivery slots	10	15.2
Cash-free transactions	15	22.7
Better deals/discounts	14	21.2
Return policy	10	15.2
Website design	00	00
None	17	25.8
Total	**66**	**100**

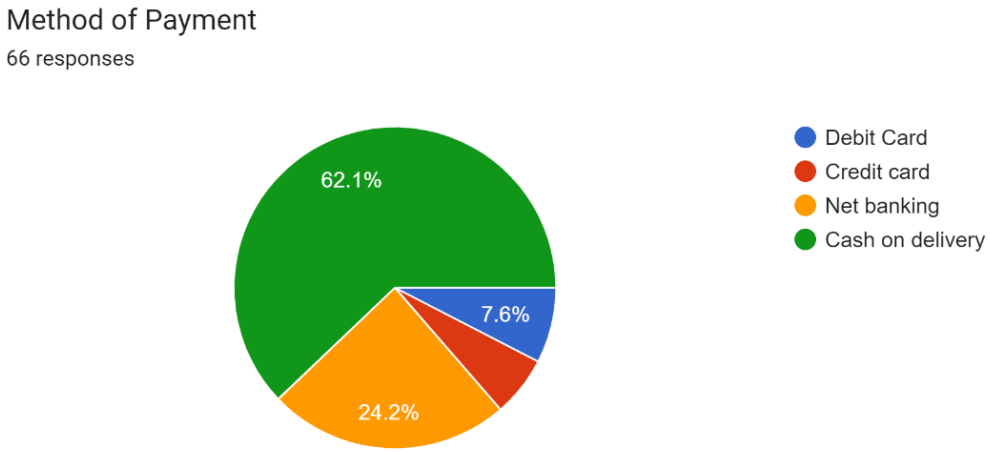


INTERPRETATIONS

The characteristics that people value when using e-grocery websites are displayed in the above chart. It is abundantly clear from the data that 15.2% of respondents select convenient delivery times, 22.7% prefer cashless transactions, 21.2% prefer better offers or discounts, 15.2% prefer a return policy, there were no respondents for website design, and 25.8% say that none of the attributes are particularly noteworthy. None of the characteristics are remarkable, according to the bulk of respondents (25.8%)

TABLE 3.1.10
TABLE OUTLINING THE RESPONDENTS' PAYMENT METHOD

PAYMENT METHOD	RESPONDENTS	PERCENTAGE
Debit card	5	7.6
Credit Card	4	6.1
Net Banking	16	24.2
Cash on Delivery	41	62.1
Total	**66**	**100**



INTERPRETATIONS

The above-mentioned chart displays the respondents' preferred methods of payment, with 7.6% of respondents using debit cards, 6.1% using credit cards, 24.2% using net banking, and 62.1% opting for cash on delivery. The vast majority (62.1%) of respondents favor payment on delivery.

Findings:

- The majority of respondents are over the age of 25, and the majority of respondents are female.
- The majority of respondents are mothers and working women.
- The bulk of respondents earns more than ₹ 40,000 per month.
- The vast bulk of people only buys supplies when they are absolutely necessary.
- The vast bulk of respondents has done their grocery buying online.
- The majority of respondents prefer online grocery buying because they can purchase whenever they want.
- The overwhelming bulk of respondents favored Amazon fresh.
- The majority of respondents opt to purchase personal care items.
- The bulk of respondents prefers none of the characteristics.
- The bulk of respondents favor payment upon delivery.

LIMITATION OF THE STUDY:

1. The study focuses solely on generation X and generation Y; other demographic groups are not included.
2. The study is limited to the Navi Mumbai region.

3. The study's consumer sample is limited to those who purchase online
4. Primary data may not give exact information due to some personal bias.
5. Due to time constraints, data from a small sample is obtained.

Conclusion:

The study found that e-commerce has had a significant impact on online grocery shopping behavior among both generations. Both generations X and Y are adopting online grocery shopping at an increasing rate, driven by factors such as convenience, availability, and price. There are also noticeable variations in internet grocery buying habits and views between generations X and Y. For example, generation Y tends to be more tech-savvy and comfortable with online shopping, while generation X is more likely to prefer traditional brick-and-mortar stores. The study also found that online grocery retailers must understand the unique needs and preferences of each generation to provide a better shopping experience. Retailers need to offer a user-friendly and personalized interface, provide high-quality products, and ensure a seamless checkout and delivery process to gain and retain customers. Finally, the study concluded that the impact of e-commerce on the grocery industry will continue to be significant, with potential implications for local communities, sustainability, and social responsibility. It is vital for retailers and policymakers to be aware of these impacts and take steps to mitigate any negative effects. In summary, this research provides useful insights into the effect of e-commerce on online food buying among generations X and Y, emphasizing the importance of merchants adapting to changing customer behavior and tastes in order to stay competitive in the market. The study's findings provide valuable guidance for retailers and policymakers looking to optimize the online grocery shopping experience and drive growth in the industry.

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A STUDY ON "ENVIRONMENTAL ACCOUNTING PRACTICES IN ONGC: A PATH TO SUSTAINABLE DEVELOPMENT"

Prof. Bhavika Patel
Assistant Professor
Department of Management Studies, Tilak College of Science and Commerce

ABSTRACT:
Industrialization has a significant impact on a nation's economic prosperity, but it also has a negative impact on the environment. Today, it is obvious that economic growth must be ecologically sustainable. The expenses associated with the exploitation of natural resources and the environment are not taken into account by conventional accounting methods. There has been a significant demand for financial and economic data on the environment and natural resources during the past ten years. The goal of environmental accounting is to include both economic and environmental data. Either the company level or the level of the national economy might be used. However, there isn't a standard format for corporate-level environmental accounting or reporting in India. This essay examines the theoretical underpinnings of environmental accounting and how two petroleum firms report on it. The secondary data used in this study was gathered from the secondary Data.

This study is based on a content analysis of ONGC Limited. According to the findings of the study, ONGC Limited is reporting Environmental Accounting in a positive manner.

Keywords: *Environment, Environmental Accounting, Corporate, Economic growth, ONGC etc.*

INTRODUCTION:
The COVID-19 pandemic has emphasised the connectivity of people, planet, and profits - specifically between health, poverty, climate change, and the global financial system's stability. The pandemic examined the 'S' in ESG (environmental, social, and governance) and presented an opportunity to reconsider the 'E'. The instability of supply networks, labour markets, credit quality, and liquidity are financial system flaws exposed by the epidemic (CFA Institute, 2020). Furthermore, there is growing fear that climate change may reveal the financial system's fragility and put its resilience to the test (Franklin, 2020).

Professor Peter Wood coined the phrase "environmental accounting" for the first time in the 1980s. Environmental accounting, also known as green accounting, is a new discipline of accounting that focuses on the environment and its well-being.

Despite the fact that it is a completely new field/branch of study and practise, it is quickly

acquiring prominence due to its value. Environmental or green accounting is a burgeoning discipline that focuses or offers for accounting the environmental impact that various circumstances may bring to a business or organisation, in addition to just reviewing a company's profit or loss or income and costs. Green accounting displays a company's or organization's environmental commitment.

Literature Review:

Alka Solanki (2016), concentrated on studying and analysing the available literature on green accounting and understanding how it has been investigated and appraised by various writers who are working on it.

Shavita Deshwal is an Indian actress (2015), She shed light on chosen corporations' green accounting and reporting methods. They chose 27 manufacturing and 23 non-manufacturing companies and developed a questionnaire on 15 key issues such as environmental policy, health safety and environment, energy conservation, corporate sustainability, environmental initiative, sustainability reporting, water management, waste management, renewable energy sources, environmental information system, environmental disclosure practises, environmental targets, The "F" test revealed that there is a significant difference in green practises implemented between manufacturing and non-manufacturing enterprises.

Preeti Malik and Alka Mittal are doctors (2015), They focused on the steps that corporations in India should take to implement green accounting, such as identifying environmental reporting parameters, deciding on environmental reporting parameters, defining the environmental reporting targets to be met, developing environmental performance indicators, and reporting environmental performance results. They also discussed India's legal system for environmental accounting. At the conclusion of their research, they discovered that environmental accounting is still in its infancy in India.

At. el Robert Ombati (2015), The topic of the environment and its phases of contamination was explored. The function of environmental accounting in achieving a balance between environmental conservation and economic development was also a key topic of discussion. In-depth theoretical support for environmental accounting was also provided, specifically with regard to India.

Objectives of the Study:

1. To study the Concept of Green Accounting.
2. To assess green accounting processes and propose recommendations, including disclosure procedures of Oil and Natural Gas and Company Limited.

Need for the study:

Green accounting is unavoidable in order to safeguard and advance the green environment. As a result, the current study is critical for familiarising the notion of green accounting and therefore raising knowledge about green accounting. The current study is also necessary to evaluate its history, development, and significance.

Scope of the study:

The current study focuses on the notion of green accounting and its significance. The legal basis for green accounting practise in the Indian corporate sector.

Research Methodology:

This research is primarily conceptual in nature. The current analysis is based on secondary data; information was obtained from several websites including the ONGC website.

The data is gathered through the website of the relevant firm. The Green Accounting Practices of the Indian Business Oil and Natural Gas Limited (ONGC) are being researched and investigated. The primary goal was to expound on green accounting procedures. The initial study was done by visiting the official website of the Petroleum firm.

Green accounting includes estimating environmental costs, capitalising those expenditures, identifying environmental liabilities, and measuring environmental liabilities.

Environmental expenditures:
These are expenses or costs associated with environmental measures, such as production-related costs and product research and development expenditures, that are incurred primarily to ensure environmental protection. Capital investment, operational expenses, research and development costs, environment administration and planning, corrective measures, and recovery measures are the six areas of total environmental expenditures.

Capitalization of Environmental expenditures:
Capitalization of environmental expenditures is justified in cases where the expense lengthens the useful life, boosts the resource's capacity, enhances its effectiveness or safety, mitigates or prevents environmental contamination, improves the resource's condition from that at the time of acquisition, or is incurred in connection with getting the property ready for sale.

Environmental liabilities:
Responsibility to pay future costs to repair environmental harm caused by earlier events, activities, or transactions, or to make up for losses experienced by a third party. It may also involve a contingent environmental responsibility that is based on the occurrence or not of one or more unpredictable future occurrences or to make up for harm done to a third party.

Forms of environmental or green accounting:
Environmental Management Accounting (EMA):
Accounting for management with an emphasis on data on the flow of materials and energy as well as environmental costs.

Environmental Financial Accounting (EFA):
It is financial accounting that places a special emphasis on disclosing expenses associated with environmental liabilities and other major environmental costs.

Environmental National Accounting (ENA):
It is a national level accounting that focuses specifically on the stocks and defects of natural resources, as well as on environmental costs, externality costs, and other expenses.

Application and Process of Environmental Accounting:
The most fundamental prerequisite for implementing environmental accounting in a business is to balance the needs of the environment and the business. The following list contains the minimum requirements that an organisation must meet in order to apply environmental accounting:

- making sure that senior management will back you embedding environmental culture acknowledgement of the environmental harm caused by corporate activity,
- all projects should evaluate their effects on the environment. educating all employees about environmental issues
- Making ensuring that the meaning of the description of what is being measured and the purpose for which it is necessary is integrated.

The application procedure has nine steps. The following are;

- Creation of input-output analytical modelling for material and energy use,
- An explanation of and comprehension of environmental costs,
- monitoring and reporting of non-financial data related to the enterprise's main material and energy flow.
- tracking and disclosing environmental expenses,
- adoption of decision-making models and procedures that take environmental costs and sensitivity into consideration,
- Using cutting-edge technology to distribute environmental costs to organizational units, process costs, and product prices extending the scope of environmental accounting and
- analysis through value chain analysis and lifelong valuation,
- achieving environmental perfection by external reporting and informing interest groups of the evaluation of the provided activity, a project aimed at achieving sustainable development.

Understanding "sustainability" should go hand in hand with "environmental perfection," which is discussed in the eighth stage. Because sustainable development anticipates a fair distribution of environmental costs and benefits among people and, in particular, the protection of both current and future generations' rights, environmental perfection concentrates on reducing waste and pollution in addition to the efficient use of resources.

The following are the many laws relevant to environmental protection:

1) Water (Prevention and Control of Pollution) Act of 1974 (directly connected to environmental protection).

- The Water (Prevention and Control of Pollution) Cess Act of 1977.
- The 1981 Air Pollution (Prevention and Control) Act.
- The 1980 Forest (Conservation) Act.
- The 1986 Environment (Protection) Act.

2) Indirectly connected to the environment: Constitutional Provision (Article 51A).

- The Factories Act of 1948.
- Rules for the Management and Handling of Hazardous Waste, 1989.
- The 1991 Public Liability Insurance Act.
- The Motor Vehicle Act of 1991.
- 1987 Indian Fisheries Act.
- The Merchant Shipping Act of 1958.
- Act Concerning Indian Ports.
- Criminal Code of India.
- The 1995 National Environment Tribunal Act.

Green Accounting Practices of ONGC:

ONGC has a strong Environment Management System in place to manage environmental challenges that arise from E&P activities. It is profoundly devoted to environmental and ecological preservation, sustainable development, and the enhancement of the quality of life of its employees, customers, and the community around its operations regions. The platform also illustrates the Maharatna's proactive environmental management through its integrated health, safety, and environment (HSE) strategy.

It is the company's policy to guarantee that the environment is not harmed in any manner, hence maintaining the ecological equilibrium. The extensive and well-defined Corporate Environment Policy of ONGC gives broad guidance on the corporate and work-center approach to ensuring a cleaner and healthier workplace. ONGC has implemented environmental management objectives, targets, strategies, systems, and trainings in accordance with the policy. The regulatory measures

mandated by the Ministry of Environment, Forests, and Climate Change (MoEFCC), State Pollution Control Boards (SPCB), OISD, and other statutory bodies for environmental protection are followed in letter and spirit. It is critical to recognise that the oil and gas sector has long struggled to address the difficulties of environmental protection.

It has a robust internal audit and management review procedure for its QHSE management system, and it examines its QHSE policy and maps hazards on a regular basis. Regular QHSE internal audits, fire safety measures, regular fire and earthquake mock drills, health awareness programme, material safety datasheet (MSDS), personal protective equipment, implementation of Environment Management Systems (EMS), occupational health and safety (OH&S), Near Miss Reporting, risk management, and compliance reporting are some notable HSE practises.

The operational activities of the oil and gas sector have environmental features that may have an effect on the environment's numerous elements, including the air, water, land, and biological elements. ONGC has been taking the necessary steps to reduce the environmental effect of its operations.

Environmental clearances and compliance with regulations:

At the start of every new project or change to an existing project, environmental clearance is a legal necessity. Environmental impact assessments, disaster management plans, and risk analyses, among other things, are completed as part of the approval process. For the purpose of conducting this research, qualified outside agencies or consultants are employed. Moreover, ONGC has created studies on a few projects. These research reports are submitted to MOEF together with the application for environmental clearance, which is then granted along with monitoring requirements. Conscientiously complying with these requirements, compliance reports are delivered to MOEF on or before the first of June and December each year.

One of the most important company functions is considered to be environmental preservation. A system of environmental management is in place that is based on ISO 14001 in order to attain and maintain the best environmental management practises.

Environmental Management System
All installations and facilities have an integrated HSE management system (QHSE) based on ISO 14001, ISO 9001, and OSHAS 18001 standards. The core staff of QHSE and an internal team of around 300 environmental lead auditors helped to achieve this objective. EMS is founded on precautionary principles and manages all of the organization's important environmental aspects (Brown, 1993). Implementing and maintaining QHSE requires going above and beyond compliance. It was the first time ever in India that any industry, in any sector, has achieved QHSE certification for all installations (source website-ONGC).

Conclusion:
In India, environmental accounting is still in its infancy, and any information provided by businesses about environmental matters that is recorded in their financial statements is generally in accordance with applicable laws and regulations. As each firm has its own unique reporting requirements, there are no established standards for environmental reporting, which makes inter-company comparison difficult.
The goal of the current study is to assess the environmental accounting and disclosure procedures used in the Indian petroleum industry.

ONGC aggressively monitors its environmental implications along the whole value chain, starting with research and development and continuing through production, sales, and end usage. Environmental protection is a key component of ONGC's sustainable development strategy, and it follows a general approach to developing and implementing operational goals in a responsible and thoughtful manner while also taking corrective action as needed. To foster a culture of environmental protection, a variety of strategies are used, such as maintaining pollution inventories through monitoring and disseminating data on ambient environment and pollution loads, cleaner production methods supported by top management, environmental management systems based on continuous environmental improvement, and entering into negotiated agreements and government-industry partnerships for achieving defined environmental goals.

Thus, the development of the coronavirus (COVID-19) has result for sustainability which is growing at the local, national, and international levels, and this climate is forcing businesses to create and adopt business strategies that will help them thrive in a post-pandemic future.

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THE NEXUS BETWEEN ECONOMIC GROWTH, INFLATION AND UNEMPLOYMENT IN INDIA

Prof. Monideepa Das
Assistant Professor
Bachelor of Banking & Insurance, Tilak College of Science & Commerce,
Email: monideepadas91@gmail.com

ABSTRACT

It has been observed that India's economic growth has failed to create enough job opportunities. The rate of unemployment remains a matter of concern for the country. On the other hand, India has faced the issue of persistent rise in general price level over the period which is another major problem. As both these parameters are crucial for economic growth, this paper attempts to find the correlation between these variables in the Indian context from the year 2012 to 2022. A. W. Phillips in his theory, Phillip's Curve states that inflation and unemployment has a stable and inverse relationship. The major claim of the theory is that economic growth is accompanied by rising prices i.e., inflation, which in turn should lead to more jobs and less unemployment. Based on Phillips Curve this paper attempts to study the effect of economic growth and Inflation on unemployment in India during the time of 1993 to 2020. The observational findings in the study revealed a negligible association between the macroeconomic variables' unemployment, inflation, and economic growth in India.

Keywords*: Employment, Inflation, Economic, Growth, Problem*

INTRODUCTION

Unemployment and inflation are issues that are central to economic life of every developing nation. When an individual who is actively hunting for employment is unable to find a suitable work, unemployment arises in the economy. The Indian economy is experiencing the consequences of persistent rise in prices and unemployment for several years which has worsened since the Covid-19 pandemic. As India is a developing economy, the nature of unemployment is quite different from the scenario of unemployment prevailing in a developed nation. In India, unemployment exists in both rural as well as urban areas. The relationship between inflation and unemployment has been traditionally representing an inverse relationship. However, this relationship is more complicated and it has broken down on a number of occasions. Inflation and unemployment are some of the most closely monitored economic indicators reflecting the health of an economy. According to the Phillips Curve, there is a trade-off between inflation and unemployment in the short run. When inflation is high, unemployment is low. On the contrary, when inflation is at a lower level, unemployment levels increase. The underlying principle behind Phillips curve is that as aggregate demand rises, it triggers an increase in demand for factors of production, especially labour force pushing wages and employment upward. As wages rise, cost of production also increases, leading to greater cost of living. In the long run, the economy returns to its long run output and its natural rate of unemployment. For this reason, Phillips curve has been estimated as the short run relationship between rate of unemployment and inflation. As the former decreases, the latter increases. This paper attempts to understand the link between economic growth, unemployment, and inflation in India.

Objectives of the study

1. To study the trends of unemployment and inflation in India

2. To analyse the trade -off between unemployment and inflation in Indian economy - The Phillips curve concept.
3. To identify the causes of unemployment in India
4. To understand the impact of unemployment and inflation on economic growth

Research Methodology

The present study uses secondary data from 2012 to 2022. Therefore, data is sourced from Reserve bank of India (RBI) statistical bulletin, Centre for Monitoring Indian Economy Pvt. Ltd.(CMIE) and Ministry of labour and Employment.

Data Collection Methods:

a) Type of Data:

b) Secondary data has been collected and used for the present research study.

c) Sources of Data:

d) Secondary data was collected from internet, reference books, journals, articles, publications and various printed material.

e) Duration:

f) The study covers time duration for last ten years i.e. from 2012-2022.

Limitations of study:

a) The present study is based on the available information of Inflation and Unemployment rate of India.

b) The area of study is only limited to Indian scenario of Inflation and Unemployment rate.

c) The time span taken for the study is confined to 10 years.

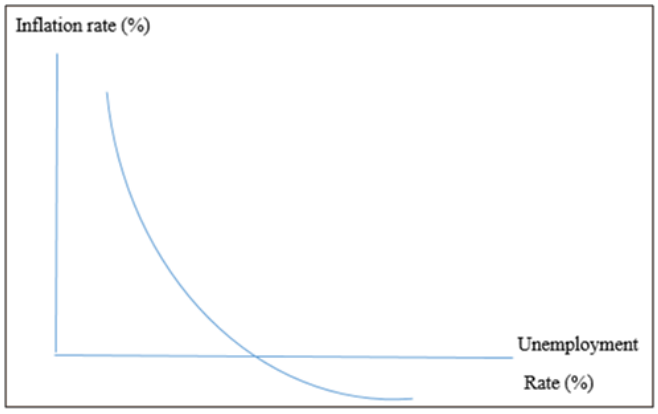
THEORETICAL BACKROUND OF THE STUDY

In 1958, Alban William Housego Phillips, a New-Zealand born British economist conducted Empirical Study of the British economy, utilizing data collected from 1861 to 1957. The study estimated the relationship between the unemployment and the rate of change in the money wage as an indicator of inflation, given that wages represent a large proportion of cost and hence the price, the results of the study reveal the existence of a trade-off between the rate of unemployment and the rate of change in wages as a representative of the rate of inflation.

Phillips interpreted the result of his study, that during prosperity, the demand for labour increases and the rate of unemployment decreases then workers could demand higher wages. On the other hand, during depression, the demand for labour decrease and unemployment rate increases then the ability of workers to demand higher wages gets restricted and decreasing wage rate increase significantly. The studies revealed the trade-off between the two variables. This relationship when graphed led to formation of the Phillips curve.

The theory helped economists to understand that when unemployment rises, the inflation rate will fall because during such situation the labour power and wage bargaining of employees will be less as employers can easily rent other workers instead of paying higher wages. High unemployment is an indicator of the decline in economic output. Subsequently, researchers from other countries also found that the discovery of A.W.Phillips extended beyond the economy of the United Kingdom.

Graphically, when the unemployment rate is represented on the x-axis, and the inflation rate on the y-axis, the short-run, Phillips curve will be L-shaped.



THE INDIAN SCENARIO OF UNEMPLOYMENT

The growing population in India has led to a greater demand for employment opportunities. However, the job vacancies available are lesser than the number of jobseekers in the country. The low level of education and vocational skills have

further led to an increase in the unemployment rate. Unemployment in India has increased to more than what it was during the pandemic times when millions lost their jobs. What's more disturbing is the pace of job addition has slowed down, as well. The unemployment rate in India rose to 8.30% in December 2022 from 5.41% in 2012. According to the data published by CMIE, the rate of unemployment in the urban area in India was 10% and the rural unemployment rate was 7.7% on December 31, 2022. The unemployment rate in India rose to an all-time high of 8.00% in 2020, which is an 2.73% increase from 2019. In a jobless growth economy unemployment remains at a higher level even when the economy expands.

India Unemployment Rate - Historical Data		
Year	Unemployment Rate (%)	Annual Change
2022	8.30%	2.32%
2021	5.98%	-2.02%
2020	8.00%	2.73%
2019	5.27%	-0.06%
2018	5.33%	-0.03%
2017	5.36%	-0.07%
2016	5.42%	-0.01%
2015	5.44%	0.00%
2014	5.44%	0.01%
2013	5.42%	0.01%
2012	5.41%	-0.01%

Causes of Unemployment-

1. The inability of the nation's economy to keep up with the increasing population resulting in a higher proportion of the population being unemployed.
2. Inadequate economic growth and slow industrial development
3. Low or no educational levels and vocational skills of working population.
4. The Indian educational system emphasizes more on the academic components of certain subjects rather than on the skill development.

Impact on economic growth-

1. The problem of unemployment leads to the problem of poverty.
2. Young people after a long time of unemployment indulge in illegal and anti-social activity for earning money leading rise in criminal activities in the country.
3. It also affects economy as the workforce that could have been successfully employed to generate resources gets dependent on the remaining working population, thus worsening the situation.
4. Most of the latest job openings that will be created in the future will be highly skilled and skill shortage in the Indian workforce is the most important challenge.

THE INDIAN SCENARIO OF INFLATION

The year 2022 came up with severe challenges for the economy since the very beginning. As Russia invaded Ukraine in the month of February, the entire world found itself fighting to secure basic amenities of life. Disruption of the trade routes because of the war impacted the global supply chain. Oil prices started to rise, pushing up inflation. The spill over effect fell on India causing prices to rise, rupee plunged, and forex reserves took a hit as well.

The government and the RBI was under the dilemma of whether to opt for measures to boost economic growth in the country or take steps to soothe the

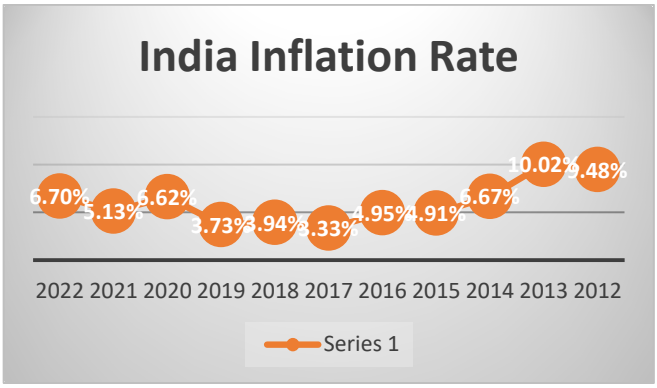
growing inflation. Eventually, the focus was on to control the rapidly rising prices in the country.

There are two indices that are utilized to measure inflation in India — the consumer price index (CPI) and the wholesale price index (WPI). These are recorded monthly taking into consideration different approaches to calculate the change in prices of goods and services helping the government and the central bank to keep a tab on inflation in the country.

The CPI, which refers to the Consumer Price Index, studies the retail inflation of products and services across 260 commodities. It considers the change in prices at which the consumers purchase goods. The information is collected separately by the Ministry of Statistics and Program Implementation and the Ministry of Labour.

The WPI, which refers to the Wholesale Price Index, examines the inflation of only goods across 697 commodities and considers the change in prices at which consumers buy goods at a wholesale rate or in bulk.

India Inflation Rate - Historical Data		
Year	**Inflation Rate (%)**	**Annual Change**
2022	6.7%	1.57%
2021	5.13%	-1.49%
2020	6.62%	2.89%
2019	3.73%	-0.21%
2018	3.94%	0.61%
2017	3.33%	-1.62%
2016	4.95%	0.04%
2015	4.91%	-1.76%
2014	6.67%	-3.35%
2013	10.02%	0.54%
2012	9.48%	0.57%



Causes of Inflation-

1. The central banks have injected a lot of liquidity into the economic system to drive through the uncertainties of lockdowns and pandemic resulting in inflationary trend.
2. Crude oil prices are the biggest contributors to the rise in inflation as it accounts for more than 40% of the CPI index.
3. Rising prices of essential food items because of geopolitical crisis resulting from Russia-Ukraine war.
4. In 2020-21, when the Covid-19 pandemic hit the economy, food prices rose by 7.3% and even core inflation rose by 5.5%. Whereas in 2021-22, the year when the global economy started recovering from the consequences of the pandemic, even though food price inflation moderated to 4%, fuel prices rose by 11.3% and core inflation went up to 6% contributing to rising prices in the country.

Impact on economic growth-

1. To control inflation RBI increases the repo rate that pushes up the interest rates in the banking system making borrowing costlier and impacting the consumption and demand levels in the country.
2. The hike in CRR as one of the measures adopted by RBI to tackle inflation brings down the lendable resources of banks.

3. Inflation also impacts the purchasing power of consumers as the value of money declines.
4. Higher inflation discourages saving, since it erodes the purchasing power over time. This makes the consumers to spend due to the value of money and businesses to invest. As a result, unemployment often declines at first as inflation climbs as explained by the Phillips curve.

India GDP Growth Rate - Historical Data	**India GDP Growth Rate - Historical Data**	
Year	**GDP Growth (%)**	**Annual Change**
2022	7%	-1.63%
2021	8.68%	15.28%
2020	-6.60%	-10.33%
2019	3.74%	-2.72%
2018	6.45%	-0.34%
2017	6.80%	-1.46%
2016	8.26%	0.26%
2015	8.00%	0.59%
2014	7.41%	1.02%
2013	6.39%	0.93%
2012	5.46%	0.22%

RECOMMENDATIONS & SUGGESTIONS

1. There is need of capital account surplus which can be utilized for employment generation in the country.
2. Active skills training program with advanced technology would be beneficial in elimination of natural rate of unemployment.
3. Increasing productive efficiency and import substitution of commodities thereby reducing the price of commodities.
4. Setting up of unbiased labour unions to assist and solve the issues and to raise effective demand.
5. Promote entrepreneurship development program for self-employment and autonomous investment in the country.

CONCLUSION

The main purpose of this study is to examine the relationship between unemployment inflation and economic growth in India; especially, it focuses on the impact for the period 2012-2022. 2022 was a milestone year for India as it marked 75 years of Independence from colonial rule and the beginning of its journey as a modern democratic country. The year saw several significant developments as well – even though India stepped into 2022 with an infectious wave of Covid-19 impacting lakhs of people in the country, the wave receded a few weeks into the year. As hopes for a post-pandemic recovery rose, war in Ukraine brought in new challenges for the global as well as for the Indian economy. With supply chains disrupted, global sanctions imposed on Russia, prices of fuel and food increased leading to inflation. The impact of the pandemic on employment was also harsher as it resulted in acute job losses. The findings show that the traditional Phillips curve persists in the Indian Economy establishing an inverse relationship between the Inflation rate and Unemployment in the Indian context impacting the economic growth.

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A STUDY ON 'OPPORTUNITIES AND CHALLENGES IN THE GIG ECONOMY, PARTICULARLY IN A POST-COVID'.

Prof. Neha Khandare
Assistant Professor
Tilak College of Science and Commerce)

ABSTRACT:

The phrase "gig economy" describes temporary employment, contract or freelance work, and occupations with flexible hours as opposed to typical full-time employment, which has seen a significant increase over the past ten years worldwide. Digital platforms have essentially created a free-market environment where independent employees may engage with service consumers. Since the COVID-19 pandemic's beginning, the platform or gig economy has expanded at a rate that is far quicker than it has ever been. The labor market has been significantly impacted since the COVID-19 lockdown, and a tendency towards temporary and short-term employment has taken hold. Over the past decade, a significant expansion in the number of freelancing platforms and digital businesses led to the emergence of the 'gig culture'. As of 2021, India was the fifth biggest country for gig employment, with the gig economy predicted to develop at a CAGR of 17% by 2024.

In particular in a post-COVID world, the study explores the opportunities and challenges of the gig economy and highlights the many ways that key players and decision-makers can work together to address these issues and promote the expansion of this dynamic sector for the creation of sustainable and equitable jobs.

Keywords: *Gig economy, opportunities, challenges, post covid etc.*

Introduction:

A gig economy is a flexible, short-term, or freelance working relationship in which a service seeker, i.e., a client, interacts with a service provider, i.e., a gig worker, to complete a specified task. The income of gig workers is derived entirely or partially from short-term contracts in which they are compensated for specific tasks or occupations. Service exchange often entails communicating with customers via a digital platform. The rapidly growing gig economy may help individuals, organizations, and consumers by making labor more flexible, customizable, and situational. Even in the aftermath of the Covid-19 outbreak, it has proved its durability and promise by continuing to unburden millions of jobs and keep communities connected.

Literature Review:

Ernst & Young (EY) explores five industries in depth in their research 'Future of Jobs in India: A 2022 Perspective' (IT/ITES, retail, financial services, textile & apparel, and auto). It examines the influence of three key forces: globalization, demographic shifts, and the use of exponential technologies by Indian businesses. It takes an educated picture of the future based on assumptions produced through secondary research and validated by experts, industry leaders, and academicians through primary encounters. According to the analysis, the future of jobs in India in 2022 would

be defined by the country's response to the unavoidable influence of three key forces - globalization, demographic shifts, and the adoption of Industry 4.0 exponential technologies by Indian enterprises.

NITI Aayog, India's Booming Gig and Platform Economy (2022): The research provides a thorough analytical methodology to estimating the present size of the Gig Economy and its potential for job development. It investigates the advantages and disadvantages of the Gig and Platform Economy, as well as worldwide best practices for social security programmes. The study's goal is to analyze the relevance of job creation and to propose methods to encourage employment in the industry.

(Pal, 2021) emphasized the topic of the growing popularity of the gig economy, as well as its benefits and drawbacks in both the global and Indian settings. The author of the report mentioned a recent effort launched by the Central Government of India.

(Sujatha and Mukherjee, 2020): The study investigated the process of independent workers constructing professional identities over organizational identities, as well as the influence of learning agility on professional identity while participating in the Gig Economy.

(Rukhsar, 2019): The research examined employees' awareness and perceptions of the Gig system. The writers also examined the issues and potential remedies. They discovered that the Gig system does not limit talent by imposing any restrictions, and it also allows for a stronger network within and outside of the firm.

Akansha Tyagi (2017) discusses the "GIG Economy and Its Effect on India" in her article. The research looks at the situation of independent workers in India. It also investigates the legislative constraints affecting independent workers and the influence of the gig economy on the Indian labor market. According to the report, the notion of the gig economy would present three challenges: legal or regulatory uncertainty, a corporate culture hostile to part-time and contingent workers, and a lack of understanding among leaders. The paper suggests combining traditional job descriptions with skills-based gig workers, overhauling employee policy assessments and evaluations, and enacting effective labour law changes.

Objectives of the study:

1. To investigate the Gig Workforce in India.
2. To learn about the many career options available on Gig platforms.
3. To examine the issues confronting Gig Workers.

Research Methodology:

Research is wholly descriptive in nature. All of the pertinent information for the research study was gathered from secondary sources, such as e-journals, newspapers, government documents, and numerous online sites.

The gig economy in India:

According to a recent NITI Aayog research, 7.7 million employees participated in the gig economy between 2020 and 2021, accounting for 2.6% of India's non-agricultural labour and 1.5% of the overall workforce. With the gig economy expected to continue its spectacular rise, industry leaders are urging the government to give assistance through incentives and regulations to safeguard employees' livelihoods and corporate success.

Nowadays, almost 47% of gig workers are employed in medium level occupations, roughly 22% in high skilled jobs, and nearly 31% in low skilled professions. Trends demonstrate that the

concentration of workers with medium skills is steadily falling, while the demand for low skilled and high skilled people is growing.

According to a recent analysis by Taskmo, a gig labor platform, demand for gig workers jumped tenfold while participation climbed thrice in calendar year 2022 compared to the previous year.

Furthermore, young engagement in the gig economy surged eight times between 2019 and 2022, according to the report. As many as 49% of the platform's gig employees are under the age of 25.

Women's participation has more than doubled, rising from 18% last year to 36% in 2022. They have mostly worked in customer service, content monitoring and moderation, tele sales, and audits and surveys.

Companies are increasingly eager to hire gig workers as a result of the COVID-19 epidemic, which has blurred the age-old skepticism about the efficiency and trustworthiness of contractual or part-time employees.

According to ASSOCHAM, India's gig economy is predicted to grow to US$455 billion by 2024 at a CAGR of 17%, with the potential to grow at least twice as fast as pre-pandemic forecasts.

Opportunities and Challenge for gig Economy:

After the United States, China, Brazil, and Japan, India has emerged as the fifth largest country for flexi-staffing.

Flexi-workers have the highest opportunities in Haryana, Madhya Pradesh, Andhra Pradesh, Gujarat, and Telangana.

According to another prediction, India will have 350 million gig jobs by 2025, creating a massive potential for job searchers to capitalize on and adapt to shifting work dynamics.

India now has a pool of 15 million freelance employees working on projects in IT, HR, and design. Furthermore, India's workforce is rising by 4 million people every year.

Moreover, because the majority of them are young millennials, they are increasingly favoring gig contracts. In the near future, this tendency is projected to have a considerable influence on the gig economy.

In 2023, since the gig economy is growing, gig workers may predict the following:

1. **More Opportunities:**

The year 2023 is on track to create new milestones for the gig economy. With the ongoing surge in demand, a 15x increase in demand for gig workers is anticipated in only the first two quarters.

Employees will emphasize their mental health, families, and work flexibility after COVID-19, and this will result in a healthy demand and supply condition for the economy. The demand will continue to be strongest in the e-commerce, mobility, IT, and marketing sectors, with positions like business development executives, field sales executives, micro influencers, tele callers, etc. being in high demand.

2. Health and Money Savings:

In every industry, the gig economy has become a well-known type of workplace culture. Gig workers are the most economical option to do tasks, from generating leads to carrying out effective marketing campaigns across India.

The most important year in terms of creating a positive work environment for gig workers will be 2023. Gig discovery platforms, as well as the government, are all prepared to prioritize the emotional and physical health of gig workers by offering different social and financial assurances, from giving health benefits to providing all the essential job perks.

The gig economy is regarded as the most volatile sector, with demand for skills fluctuating according to session and market trends, thus ongoing upskilling will be critical in determining how much you may make.

Major Drivers of the Gig Economy

(1) Millennials' unconventional work attitude

Employees' frantic lifestyles in the private sector have developed an unfavourable view of full-time employment among millennials.

Growth prospects, flexibility, a better work-life balance, and the possibility to not have a college degree are all motivating millennials to pursue freelancing options rather than corporate work cultures.

(2) The rise of a startup culture

The Indian start-up ecosystem is quickly expanding. Hiring full-time staff results in high fixed expenses for start-ups, therefore contractual freelancers are engaged for non-core operations.

Startups are also considering employing talented technology freelancers (on a project basis) in fields such as engineering, product, data science, and machine learning (ML) to supplement their IT platforms.

(3) MNCs hire contract workers

MNCs are implementing flexi-hiring alternatives, particularly for specialty projects, to decrease operating expenditures during the epidemic. This tendency is greatly contributing to the gig culture in India.

(4) Increase in freelance platforms

The rise of freelancing platforms has also contributed to the growth of the gig economy. Numerous home-grown sites, such as Upwork, Truelancer, and Guru, allow access to highly competent freelancers.

The number of freelancing platforms has expanded dramatically, from 80 in 2009 to 330 by 2021. These platforms include clients that include both start-ups and Fortune 500 corporations.

(5) Business Models

Gig workers are compensated using a variety of methods, including fixed-fee (determined upon contract beginning), time & effort, actual unit of labour completed, and quality of output.

The fixed-fee approach is the most common, while the time & effort model is a close second.

The "Code on Social Security" has to be adjusted even if the government has already taken the first measures to safeguard the social security of gig workers.

Also, the Bharat Pradhan Mantri Jan Arogya Yojana, Pradhan Mantri Suraksha Bima Yojana, and Pradhan Mantri Jeevan Jyoti Bima Yojana should be made obligatory for all platform workers.

The difficulties encountered in the gig economy

- There are no labour welfare emoluments such as pensions, gratuities, and so on for the workers.
- Gig workers may be terminated unfairly. Moreover, they can receive minimal pay and less paid vacation days.

- Workers lack the negotiating capacity to reach a fair agreement with their bosses.
- Unionization of workers will be challenging.
- Document confidentiality and other workplace privacy are not guaranteed.
- Many people in remote regions lack access to the gig economy because they lack access to internet and energy.
- If commercial and profitable freelance opportunities are given priority, social welfare objectives may suffer.

Recommendations:

- The gig economy has been growing, and due to the anticipated surge of gig workers leaving full-time employment, it is anticipated to surpass pre-pandemic forecasts.
- Assessments and evaluations of employee policies need to be updated. To ensure consistency and high-quality work, an efficient evaluation process is necessary, and specific assessment protocols must be created.
- India could take lessons from industrialized nations like the US and provide people basic training and classes on freelancing, among other things.
- Students and gig economy employees should have access to career avenues, alternatives, and counselling.
- Also, businesses will require a human resources division that can oversee a varied workforce and instill the corporate culture in gig workers.

Conclusion:

The gig economy, which is still challenging established working practices, is anticipated to drive the direction of employment in the future. By establishing a comprehensive ecosystem of service enablers, technology-based platforms, and public regulations, the public and private sectors can help the nation's economy develop at a 17 percent CAGR and create $455 billion in gross volume by 2024. Even though the sector faces a variety of obstacles, it is equipped with the resources and tools needed to overcome them. India's work culture has seen a significant transformation as a result of the gig economy. It has made it possible for workers to earn more freedom and flexibility, which is a crucial aspect that will continue to influence how work is done in the future.

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A STUDY OF INVESTING BEHAVIOUR OF WORKING WOMEN WITH SPECIAL REFERENCE TO NAVI MUMBAI

Alka Sharma
Assistant Professor
Department of Commerce and Allied Studies, Tilak College of Science and Commerce Vashi
Research Scholar
Department of Commerce & Management, University of Kota, Kota Rajasthan
E-mail: alka.jkcollege@gmail.com

ABSTRACT
With the changing scenario, women are actively participating in commercial activities to contribute to family income and become financially independent. They have more earning potential & more influence over their financial decisions than ever before. The general profile of women's investment preferences has diversified with time. The present study seeks to understand investing behaviour of working women located in Navi Mumbai in terms of their preferred avenues of investment, the purpose behind the investment, sources of information, and factors influencing their investing behaviour and related concerns. An attempt was also made to find the impact of their sector of employment (Government vs. Private) on their investing behaviour. The results indicated that a significant association of sector of employment was found with preferred avenues of investment, the reason for selecting an avenue, and factors influencing investment decisions. However, no significant association was found with the purpose behind investments, source of information, and change in investing behaviour due to COVID-19.

Keywords: *Investment behaviour, investment decision-making, investment avenues, working women*

Introduction

The economic development of a country is essentially dependent upon its savings and investment pattern. More investments lead to increased growth of the economy and improved growth of the economy further pushes investments. Investment may be defined as the sacrifice of a certain present value for some uncertain future value. In other words, investment means the purchase of a financial product with an expectation of future returns. Investment behaviour reveals how the individual investor allocates the surplus financial resources to various instruments available (Selvakumar & Mahesh, 2015). In various empirical studies, it has been found that information is an important factor in making a decision to invest, which influences the choice of investment and later on how they act after investment (Kasilingam & Jayabal, 2008). Investors have different mindsets when they decide about investing in a particular avenue. The decision varies for every individual depending upon their risk aptitude which is reflected through their investment behaviour.

With the changing scenario, women are actively participating in commercial activities to contribute to family income and become financially independent. They have more earning potential & more influence over their financial decisions than ever before. The general profile of women's investment preferences has diversified with time. There are various investment options available for working women such as mutual funds, shares, insurance, children's education plan, bank, gold, real estate, and post office services, with different objectives such as profit, security, appreciation, and income stability. Though their investment decisions depend upon various parameters such as the degree of their risk-taking capability, the

influence of family members and friends, their income, expenditure, savings, awareness and knowledge about various investment instruments. Hence, the investment behaviour of each working woman is different due to many factors including, the safety associated with the investment, regular flow of income, tax saving benefits, retirement benefits etc. But to make a correct investment decision they should be aware of various investment plans & their financial needs.

Therefore, the present study seeks to understand investing behaviour of working women located in Navi Mumbai, their preferred avenues of investment, the purpose behind the investment, sources of information, and factors influencing their investing behaviour and related concerns.

Literature Review

Kathuria et al. (2012) both male and female respondents in Ludhiana were using magazines, the internet, and TV channels as the three most important sources of awareness regarding various investment alternatives. About 60% of the respondents (both male and female) had a moderate level of awareness regarding various investment avenues, despite being bank employees. Also, male and female respondents were investing a larger portion of their savings in safe and risk-free investment avenues like employee provident funds, public provident funds and life insurance policies.

Geetha and Ramesh (2012) aimed to discover the significance of demographic factor, for example, gender, age, training, occupation, wage, savings and family estimate more than a few components of speculation choices like needs in view of attributes of investment, time of investment, the reach of data source, recurrence of investment and analytical capacities. The investigation found that there had been no significant association between demographic variables and other elements that impact the investment decision-making process. However, with regard to the association between demographic factors and times of investment, family measure, annual salary and annual investment funds were found to have a significant relationship. The factors like gender, age, instruction and occupation were found to have a non-significant association with the time of investment made by the investor.

Jain (2014) conducted a study to analyze the income and investment patterns of working women in Ahmedabad. The objective of the study was to determine the relationship between income and investments pattern among respondents. The study was conducted on working women across both government and private sectors in the city of Ahmedabad. It has been found that the majority of them preferred to invest their savings in fixed deposits with banks for the safety of a volatile future followed by investing in gold. The major impact on savings is due to the level of income which has considerably increased in the last decade.

Ramanujam, V. (2016) attempted to analyze the investment literacy of working women based on demographic factors. It was concluded that in a more or less similar manner, their demographic factors like age, type of family, the status of the family and annual income emerged as determinants of investment literacy and decision-making behaviour.

Riyazahmed K. (2021) analyzed the impact of investor motives and awareness on investor preferences. The results revealed that the impact of the investment motives and the awareness on the investor preferences explains 52.3% of changes in investor preference. Investment factors like the sector of investments, investor personal characteristics, investor behaviour, investor options, awareness of mutual funds, and shares have a significant impact on investor preferences. Further, the awareness level of mutual funds and the stock market are the major variables contributing to investors' preferences rather than identified investment factors. Investors' personal characteristics like knowledge, confidence, ability, responsibility, and belief negatively influence investor preferences.

Sukhija, S. (2021) discussed the investment patterns of working women in India. Descriptive and analytical research design has been used to gain a better understanding of the requirement and significance of investment avenues among

working women of both public and private sectors in Punjab. A survey of 480 female respondents including working women from banks, colleges, and other professional firms was done. Factor analysis was done to identify factors affecting women's investment decisions. The study found that National Saving Certificate (NSC) is preferred as a safe and low-risk investment avenue, the commodity market is preferred as a high-risk investment avenue, and gold/silver is preferred as a traditional investment avenue by working women in India.

Methodology

Research Objective

1. To study the investing behaviour of working women
2. To analyze the impact of the sector of employment of working women on their investing behaviour

Research Hypotheses

H_{01}: There is no significant difference in investment avenues preferred by working women based on their sector of employment.

H_{02}: There is no significant difference in the reason for selecting investment avenues by working women based on their sector of employment.

H_{03}: There is no significant difference in working women's purpose behind investment based on their sector of employment.

H_{04}: There is no significant difference in factors influencing investment decisions of working women based on their sector of employment.

H_{05}: There is no significant difference in the source of investment advice for working women based on their sector of employment.

H_{06}: There is no significant difference in the change in investment behaviour due to COVID-19 for working women based on their sector of employment.

Delimitation

- The study covers the investing behaviour of working women only.
- The area of the study is confined only to Navi Mumbai.

Population

In the present study, the population comprises working women located in Navi Mumbai.

Sample and Sampling Method

100 working women were randomly identified for data collection out of which the researcher could get 93 questionnaires that were found complete and considered for the analysis.

Data Collection Tools

A self –administered questionnaire was designed using Google forms to gather data.

Statistical Techniques

In this study, the researcher applied percentage analysis and the Chi-Square test for analysing data.

Analysis and Interpretation of Data

H_{01}: There is no significant difference in investment avenues preferred by working women based on their sector of employment.

Table 1
Association between Preferred Investment Avenues and Sector of Employment

Preferred Investment Avenues	Sector of Employment		Total
	Private Sector	Public Sector	
Bank Fixed Deposits	11	18	29
	21.6%	42.9%	31.2%
Insurance	9	2	11
	17.6%	4.8%	11.8%

Gold/Silver	3	12	15
	5.9%	28.6%	16.1%
Mutual Funds	8	3	11
	15.7%	7.1%	11.8%
Mutual Funds & Bank Fixed Deposits	9	0	9
	17.6%	0.0%	9.7%
Equity Shares	8	0	8
	15.7%	0.0%	8.6%
Real Estate & Bank Fixed Deposits	3	7	10
	5.9%	16.7%	10.8%
Total	51	42	93
	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	Df	P Value
	31.844[a]	6	0.000

Most of the respondents (approx. 31%) preferred Bank Fixed Deposits followed by nearly 16% of respondents who prefer to invest in Gold/Silver. Nearly 12% of them preferred Mutual Funds to invest and an equal percentage preferred Insurance, approx. 11% of them were interested in investing in Real Estate & Bank Fixed Deposits, approx. 10% of them preferred Mutual Funds & Bank Fixed Deposits while 8.6% of them preferred to invest in Equity Shares.

Most women working in Government Sector (approx. 43%) preferred to invest in Bank Fixed Deposits while women working in the Private sector used to invest in a variety of avenues.

The chi-square test was applied to know the association between sample women's preferred avenues of investment and their sector of employment. A statistically significant ($p<0.05$) association was found between the two, showing the preferred investment avenues of working women vary with their sector of employment. Thus, the null hypothesis (H_{01}) gets rejected.

H_{02}: There is no significant difference in the reason for selecting investment avenues by working women based on their sector of employment.

Table 2
Association between Reason for Selecting Avenues and Sector of Employment

Reason for Selecting Avenues	Sector of Employment		Total
	Private Sector	Public Sector	
Any other	3	3	6
	5.9%	7.1%	6.5%
Long term profit seeking	43	24	67
	84.3%	57.1%	72.0%
Short term profit seeking	3	0	3

	5.9%	0.0%	3.2%
Steady income (Dividends, Interest, Rent, etc.)	2	15	17
	3.9%	35.7%	18.3%
Total	51	42	93
	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	Df	P Value
	17.623	3	0.001

Most of the respondents (72%) were found to invest for long-term profits followed by nearly 18% of respondents who invested to earn a steady income, approx. 7% of them stated any other reason behind their investment while only 3% of them invested for short-term profits.

Most women working in Government Sector (approx. 84%) stated to invest for long-term profits while nearly 57% of women working in the Private sector invested to earn long-term profits and nearly 36% were seeking a steady income.

The chi-square test was applied to know the association between the reason behind selecting avenues by sample women and their sector of employment. A statistically significant ($p<0.05$) association was found between the two, showing the reason behind selecting avenues by working women vary with their sector of employment. Hence, the null hypothesis (H_{02}) gets rejected.

H_{03}: There is no significant difference in working women's purpose behind investment based on their sector of employment.

Table 3
Association between Purpose behind Investment and Sector of Employment

Purpose behind Investment	Sector of Employment		Total
	Private Sector	Public Sector	
Future expenses	14	11	25
	27.5%	26.2%	26.9%
Tax saving	14	11	25
	27.5%	26.2%	26.9%
Wealth creation & Future expenses	20	15	35
	39.2%	35.7%	37.6%
Wealth creation & Tax saving	3	5	8
	5.9%	11.9%	8.6%
Total	51	42	93
	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	df	P Value
	1.073[a]	3	0.784

Most of the respondents (37.6%) agreed to invest for both wealth creation and future expenses followed by nearly 27% of respondents who used to invest to meet future expenses and an equal percentage of them make it for tax saving only. Nearly 9% of them agreed to do it for both wealth creation and tax saving.

The chi-square test was applied to know the association between the sample women's sector of employment and their purpose of investment. A statistically non-significant ($p>0.05$) association was found between the two, showing the purpose of investment for working women does not vary with their sector of employment. Thus the null hypothesis (H_{03}) holds true.

H_{04}: There is no significant difference in factors influencing investment decisions of working women based on their sector of employment.

Table 4
Association between Factors Influencing Investment Decisions and Sector of Employment

Factors Influencing Investment Decisions	Sector of Employment		Total
	Private Sector	Public Sector	
Returns	24	5	29
	47.1%	11.9%	31.2%
Safety	3	9	12
	5.9%	21.4%	12.9%
Safety and return	24	28	52
	47.1%	66.7%	55.9%
Total	51	42	93
	100.0%	100.0%	100.0%
	Value	df	P Value
Pearson Chi-Square	15.026[a]	2	0.001

Most of the respondents (55.9%) agreed to get influenced by both safety and returns features followed by nearly 31% of respondents who prefer returns of investment while approx. 13% of them get influenced by the safety of investment while making investment decisions.

Most women working in Government Sector (approx. 67%) get influenced by both safety and return features while nearly 47% of women working in Private sector prefer returns and an equal percentage of them prefer both safety and return.

The chi-square test was applied to know the association between factors influencing the investment decisions of sample women and their sector of employment. A statistically significant ($p<0.05$) association was found between the two, showing factors influencing investment decisions of working women vary with their sector of employment. Thus the null hypothesis (H_{04}) gets rejected.

H_{05}: There is no significant difference in the source of investment advice for working women based on their sector of employment.

Table 5
Association between Source of Investment Advice and Sector of Employment

Source of Investment Advice	Sector of Employment		Total
	Private Sector	Public Sector	
Certified market professionals & financial planners.	3	5	8
	5.9%	11.9%	8.6%
Family or friends Advisors	31	26	57
	60.8%	61.9%	61.3%
Internet	12	8	20
	23.5%	19.0%	21.5%
News channel	3	3	6
	5.9%	7.1%	6.5%
Newspaper	2	0	2
	3.9%	0.0%	2.2%
Total	51	42	93
	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	df	P Value
	2.895[a]	4	0.576

Most of the respondents (61.3%) agreed to get the advice of their family and friends for making investment decisions followed by nearly 22% of respondents who used to refer to various websites. Nearly 9% of them agreed to take help from certified market professionals & financial planners, 6.5% of them follow news channels while 2.2% of them go with the information given by newspapers while making investment decisions.

The chi-square test was applied to know the association between the sample women's sector of employment and their source of investment advice. A statistically non-significant ($p>0.05$) association was found between the two, showing the source of investment advice for working women does not vary with their sector of employment. Thus the null hypothesis (H_{05}) holds true.

H_{06}: There is no significant difference in the change in investment behaviour due to COVID-19 for working women based on their sector of employment.

Table 6
Association between Change in Investment Behaviour due to COVID-19 and the Sector of Employment

Change in investment behaviour due to COVID-19	Sector of Employment		Total
	Private Sector	Public Sector	
No	39	29	68
	76.5%	69.0%	73.1%
Yes	12	13	25
	23.5%	31.0%	26.9%
Total	51	42	93
	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	df	P Value
	.646[a]	1	0.422

Most of the respondents (73.1%) stated not having any change in their investment behaviour due to COVID-19. However, nearly 27% of them agreed to have a change in their investing behaviour.

The chi-square test was applied to know the association between sample women's sector of employment and the change in their investment behaviour due to COVID-19. A statistically non-significant ($p>0.05$) association was found between the two, showing the change in investing behaviour of working women does not vary with their sector of employment. Thus the null hypothesis (H_{06}) holds true.

Conclusion

It can be inferred from the results that working women are risk averse as they prefer to invest in less risky avenues of investment viz., bank fixed deposits, gold/silver, and insurance. However, women working in the private sector were found to invest in a variety of avenues. This is due to their increased financial knowledge. It was also found that working women select a particular avenue because they want to earn long-term profits however, private sector women employees also want to earn a steady income. Moreover, working women invest to create wealth for the future, to meet future expenses, and to tax savings. Safety of investment is the main factor that influences the majority of working women particularly, the government sector employees. Private sector women employees were found to be equally influenced by returns of investment also. Most working women were found to refer to their family and friends while making investment decisions. When asked about changes in their investing behaviour due to COVID-19. Most of them denied it.

Implications of the study

The study entails the following implications-

- Working women should be given more knowledge about various investment avenues by organizing seminars, conferences, workshops etc.
- Investment companies, banking and financial institutes, and other policymakers should design customized plans to meet the investment needs of working women which can offer both safety and returns on their investment

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EQUITY VALUATION USING DISCOUNTED CASH FLOW (DCF) MODEL – A CASE STUDY OF STATE BANK OF INDIA

Author
Prof. Trupti Mandar Joshi
Assistant Professor
Indira School of Business Studies, Pune
Email Id: trupti2880@gmail.com

Co-Author
Vishal Tanpure
Student
Indira School of Business Studies, Pune
Email Id: vishaltanpure91@gmail.com

ABSTRACT

This research paper is an exploratory case study attempting to examine the financial performance of the largest lender of the country- The State Bank of India. This study tries to identify trends in financial statements of the company over the past ten years and based on these trends, forecasts for next five years has been done. The study uses various quantitative techniques to analyse financial statements of SBI viz. Income Statement, Balance sheet and Cashflow Statement. Some of the key objectives behind this research was to analyse company's current financial position as well as accurately project future financial performance. To find the intrinsic value of the company so that it would be helpful before making any investment decision in SBI. Forecasting of the future cash flows of the company has been done by using Discounted cash flow (DCF) model and the Net Present value of those cashflows is calculated to reach the intrinsic value of the company. Major findings of this research were- the revenue of SBI has increased over period of ten years till FY 2022, and it continues to increase till FY2027. Net profit of SBI is increased consistently because of increasing revenue and sluggish growth in its borrowing which helped SBI to reduce its cost and maximize its profit. EPS of the company has also shown steady growth which is sign of a healthy company. Since the EPS is increasing consistently company may declare dividend which is also good for investors. The Intrinsic value of SBI is more than its market value this shows that it is undervalued stock which is good for investment. The quantitative data has been collected from Annual reports of SBI, Newspaper and various websites etc.

Keywords: *Financial Modelling, Discounted Cashflow Model (DCF), Forecasting, Free Cash Flows (FCFs), Intrinsic Value, Market Value etc.*

INTRODUCTION

A Discounted Cash Flow (DCF) Model is a kind of financial model that uses cash flow forecasting and discounting to assess a company's current, present worth. DCF calculates the present value of a company or asset to determine its intrinsic

value and determine whether the price is high enough to adequately reward investors for the risk they take by discounting the operating cash flows that a company is anticipated to produce in the future.

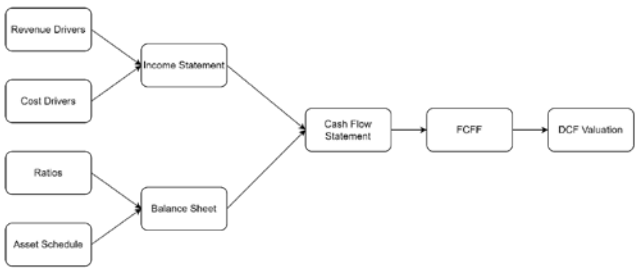
DCF analysis makes use of a company's Free Cash Flow to Firm (FCFF), terminal value, and weighted average cost of capital (WACC), which is the rate at which the FCFF and terminal value are discounted to their present values. Future cash flows are only projected for the following 5 to 10 years because projecting cash flows over a longer time horizon is difficult.

BACKGROUND OF STATE BANK OF INDIA

State Bank of India, a multinational public sector bank with its headquarters in Mumbai, Maharashtra, is a statutory organisation for financial services. As of 2022, SBI, a public sector bank and the largest bank in India, was ranked 236 on the Fortune Global 500 list of the largest corporations in the world. SBI is the 49th largest bank in the world by total assets. SBI holds a 25% market share of all loans and deposits and a 23% market share based on assets. On 14 September 2022, State Bank of India became the third lender after HDFC Bank and ICICI Bank and seventh Indian company to cross the ₹ 5-trillion market capitalisation on the Indian stock exchanges for the first time.

DCF MODEL SCHEME

Fig. 1 DCF Model Scheme



Source: Model by researcher to evaluate DCF for taking investment decision

The above DCF model is the model used to find out the Discounted Cash Flow (DCF) for the firm which help the investor in taking investment decision. One has to follow certain steps to reach to the DCF value. Revenue driver and Cost drive lead to Income statement. Ratios and Asset schedule lead to Balance sheet. Income statement and Balance Sheet are the base for Cash Flow Statement leads to calculate FCFF followed by DCF.

To decide on whether to invest or not to invest taken on the rule of -

If, Intrinsic Value > Current Market Price, which is 15% + indicates one should **Buy** the stock of that company.

LITERATURE REVIEW

(Cassia et al., 2007) This study compares the two-stage Discounted Cash Flow (DCF) models' sensitivity analyses to the long-term steady-state assumption. It suggests what "Joint Sensitivity" means.to assess the combined impact of forecast input variations on the estimated value. One of these parameters that we find to be particularly significant is the duration of the explicit forecast's first period. The Competitive Advantage Period (CAP), also known as the time during which the return on capital can exceed its cost, ends at the beginning of the DCF. In order to determine whether a DCF valuation is theoretically reliable, this paper suggests a measure of long-term excess return that checks to see if the return on invested capital is asymptotically equal to its average cost.

(Cifuentes, 2016) This study explains some of the difficulties of using DCF models. It forms analogy between bond prices and project cash flows and suggest that the right discount rate to use when evaluating a project is the opportunity cost of capital. It also highlights the problems of uncertainty in cashflows in DCF calculations, because of the probabilistic nature of cashflows. Estimating the correct discount rate is also an issue while using DCF model. DCF model

assumes there is only one capital outlay followed by number of cash inflows but there are certain infrastructure projects which requires capital expenditure for many years in that case calculating NPV is very tedious task.

(Copiello, 2016) The Discounted Cash Flow method has been around for a while and is widely used to evaluate the viability of investment projects. It serves as the foundation for a wide range of techniques, including Cost-Benefit Analysis and Analysis of Life Cycle Costs. weighted average cost of capital is the most prevalent reference in the context of real estate investment valuation, the discount rate is based on the idea of expected return on equity instead. The DCF variant essentially deals with an optimization problem, which can be resolved using straightforward financial mathematics one-shot equations or iterative calculations if additional constraints need to be considered.

(Hendrawan et al., 2020) This study aims at finding the fair value of The Indonesian Regional Development Banks which were established to support economic equality for all of Indonesia's regions, but most of them have capital constraints. For the projection from 2018 to 2022, financial historical data from the last five years, from 2013 to 2017, are used as a basic reference. Pessimistic, moderate, and optimistic scenarios are included, and the value is compared to the market price on January 2, 2018. The study's findings show that BJBR and BJTM have overvalued in every scenario when using FCFE valuation, whereas BEKS has undervalued in every scenario.

(Jumran & Hendrawan, 2021) In this study, the intrinsic value of state-owned banks listed on IDX is projected for the period from 2021 to 2025. By examining regulatory capital, this study uses the Discounted Cash Flow (DCF) method and the Free Cash Flow to Equity (FCFE) approach specifically for banks. Three scenarios will be used in this study to project the stock value over the next five years: a pessimistic scenario (the average industry condition), a moderate scenario (the same condition as the company's growth), and an optimistic scenario (a condition above industry growth). The historical data from the years 2016 to 2020 were used to generate the data for this study. According to the findings, all scenarios for the stock prices of state-owned banks using the FCFE method show undervalued results.

(Michael J. Mauboussin & Dan Callahan, 2022) The present research paper explains in detail about DCF i.e., Discounted Cashflow Model. It helps companies to identify whether any project undertaken by them is it going to generate good returns for them or not, this is done by forecasting the cashflows for particular period of time and then present value of those cashflow is calculated.

(Panigrahi et al., 2021) "Application of discounted cash flow model valuation: The case of Exide industries." This paper examines in detail the theoretical and practical aspects of the widely used discounted cash flow (DCF) valuation approach. Using the DCF Valuation method, this study assesses Exide Industries. It is widely acknowledged that the discounted cash flow approach is a useful tool for assessing an organization's state even in the most challenging situations. The DCF approach, on the other hand, is extremely susceptible to assumption bias, and even minor changes to the analysis' underlying assumptions may have a significant impact on the valuation results.

(Steiger, 2008) This study is an In-depth theoretical and practical analysis of the widely used discounted cash flows (DCF) valuation method is presented in this paper. It evaluates its strengths as well as several weaknesses. A

particular focus is being placed on the DCF method of company valuation. The discounted cash flow method is found to be a potent tool for analysis of even complex situations.

RESEARCH GAP ANALYSIS

We identified there were much research reports available on SBI specially covering the fundamental aspect but none of them has used DCF model to calculate the cashflow of SBI. BFSI sector is one of the major sectors of Indian economy and SBI is one of the top players in that sector, with various initiatives taken by government for the growth of this sector, banking companies provide good opportunities of investments for investors.

Risk assessment is one of the important parameters in investment which investor should consider and make investment at fair valuation. Hence the study is needed to analyse performance of stock through financial modelling to determine the growth of revenue, profits etc which helps in deciding whether the same growth will continue in future or not which ultimately help investor to decide whether to invest in that company or not.

AIM AND OBJECTIVES

To study the growth and performance of State Bank of India.

To analyse company's current financial position as well as accurately projecting the future financial performance.

To find out the Intrinsic value using Discounted Cashflow method and give recommendation whether to Buy, Sell or Hold the stock.

To forecast the future cash flow of the company through financial modelling and find out Net present Value of those cashflows.

RESEARCH METHODOLOGY

Type of research – Forecasting by CAGR (Compound Annual Growth Rate)

Type of study : Quantitative

Type of Data : Secondary

Data Collection source: Income Statement, Balance Sheet & Cash flow statement

Period of Study: from 2012 to 2022 (10 years)

Sample Size: One unit (State Bank of India Ltd.)

Data Analysis Technique: DCF Model

Data Analysis Tools: MS Excel

Analysis Process: CAGR (Compound Annual Growth Rate) is the rate of return (RoR) that would be required for an investment to grow from its beginning balance to its ending balance, assuming the profits were reinvested at the end of each period of the investment's life span. After the forecasting WACC (Weightage Average Cost of Capital) is Calculated based on the forecasted data. After that, DCF (Discounted Cashflow) model is prepared using FCFF (Free Cashflow to Firm) to determine the target price.

DATA ANALYSIS AND INTERPRETATION

Data Collection Tabulation and Analysis of SBI Profit & Loss Statement

Income Statement Assumptions

1. Using the compound annual growth rate (CAGR) over the previous ten years, from FY 2013 to FY 2022, total revenue is estimated.
2. Using the average of FY 2021 and FY 2022, operating expenses, provisions, and contingencies as a percentage of revenue were determined.

3. For the next five years, depreciation was estimated at 9.29 percent of fixed assets (as per average of FY 2021 and FY 2022).
4. Interest costs are calculated using the average interest costs for the fiscal years 2021 and 2022.

State Bank of India Ltd.															
Template															
(All numbers in INR Million, Except per share data)															
(Red for assumptions, Blue for Acutal data and Black for Calculations)															
PROFIT & LOSS STATEMENT OF STATE BANK OF INDIA LTD.															
Date	Mar-13	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22	Mar-23	Mar-24	Mar-25	Mar-26	Mar-27
Year	2013-A	2014-A	2015-A	2016-A	2017-A	2018-A	2019-A	2020-A	2021-A	2022-A	2023-E	2024-E	2025-E	2026-E	2027-E
Interest Earned	167976	189062	207974	221855	230447	228970	253322	269852	278115	289973	306244	323429	341578	360746	380989
Other Income	32584	37882	49315	51016	68193	77557	77365	98159	107222	117000	120191	122021	123752	125375	126875
Total Income	200560	226945	257289	272871	298640	306528	330687	368011	385338	406973	426436	445450	465331	486121	507864
Operating Expenses	51242	61426	68096	71465	84375	93049	111304	128120	146719	170672	170904	180494	190622	201319	212616
Provision and Contingencies	15040	20771	22944	57930	53692	56394	54090	45054	46089	26680	39464	41678	44017	46487	49096
EBITDA	134277	144747	166250	163476	160573	157084	165293	194836	192530	209621	216068	223278	230691	238315	246152
Depriciation	1577	1942	5129	2252	2915	3105	3496	3662	3711	3691	3852	3866	3900	3953	4025
EBIT	132700	142805	161121	161224	157658	153979	161797	191175	188819	205929	216068	223278	230691	238315	246152
Interest Expended	106818	121479	133179	143047	149115	146603	155867	161124	156010	156194	168374	177822	187801	198339	209469
EBT (Profit Before Tax)	25882	21326	27942	18177	8544	7376	5950	30051	32809	49735	47694	45455	42891	39976	36684
Tax	7559	6836	10425	5434	8934	11563	2860	11875	8529	13379	12830	12228	11538	10754	9868
PAT	18323	14489	17517	12743	-391	-4187	3069	18176	24280	36356	34864	33228	31353	29222	26815
Share in Profit/Loss of Associates	232	318	514	276	295	438	281	2963	-392	827					
Minority Interest	-638	-633	-838	-795	339	-807	-1051	-1372	-1482	-1809					
Net Profit for the Group	17916	14174	16994	12225	241	-4556	2300	19767	22406	35374	34864	33228	31353	29222	26815
EARNING PER EQUITY SHARE															
Basic (In Rs.)	25.77	18.99	22.76	15.95	0.31	-5.34	2.58	22.15	25.11	39.64	39.07	37.24	35.13	32.75	30.05
Diluted (Rs.)	25.77	18.99	22.76	15.95	0.31	-5.34	2.58	22.15	25.11	39.64	39.07	37.24	35.13	32.75	30.05
Number of Shares															
Basic	695.23	746.38	746.67	766.43	778.13	853.24	891.48	892.41	892.31	892.37	892.37	892.37	892.37	892.37	892.37
Diluted	695.23	746.38	746.67	766.43	778.13	853.24	891.48	892.41	892.31	892.37	892.37	892.37	892.37	892.37	892.37

Data Collection Tabulation and Analysis of SBI Balance Sheet

8.2.2 Balance Sheet Assumptions

1. It was anticipated that capex as a share of revenue would remain at levels from the fiscal years 2021–2022.
2. It was assumed that investments, advances, cash, and balances with the RBI, along with other assets, would remain at the same lever for the subsequent five years.
3. The equity share capital remained the same over the next five years.
4. We assumed that the company won't take on any new debt for the following five years.
5. Deposits were also kept at the same level as in FY 2022 for other liabilities and provisions.

Data Collection Tabulation and Analysis of SBI Cashflow Statement

Discounted Cashflow Analysis of SBI

State Bank of India Ltd.															
Template															
(All numbers in INR Million, Except per share data)															
(Red for assumptions, Blue for Acutal data and Black for Calculations)															
BALANCE SHEET OF STATE BANK OF INDIA LTD.															
Date	Mar-13	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22	Mar-23	Mar-24	Mar-25	Mar-26	Mar-27
Year	2013-A	2014-A	2015-A	2016-A	2017-A	2018-A	2019-A	2020-A	2021-A	2022-A	2023-E	2024-E	2025-E	2026-E	2027-E
Equity Share Capital	684	747	747	776	797	892	892	892	892	892	892	892	892	892	892
Reserve and Surplus	124349	146624	160641	179816	216395	229429	233603	250168	274669	304696	337848	369444	399258	427045	452544
Total Equity Capital	125033	147371	161388	180592	217192	230322	234496	251060	275562	305588	338741	370337	400150	427938	453437
Minority Interest	4254	4909	5497	6267	6481	4615	6037	7944	9626	11207	11207	11207	11207	11207	11207
Deposits	1627403	1838852	2052961	2253858	2599811	2722178	2940541	3274161	3715331	4087411	4087411	4087411	4087411	4087411	4087411
Borrowings	203723	223760	244663	258214	336366	369079	413748	332901	433796	449160	449160	449160	449160	449160	449160
Other Liabilities and Provisions	172696	181090	235601	271966	285272	290238	293643	331427	411304	507518	507518	507518	507518	507518	507518
TOTAL LIABILITIES	2133109	2395982	2700110	2970898	3445122	3616433	3888464	4197492	4845619	5360884	5394036	5425632	5455446	5483233	5508732
Cash and Balances with RBI	89574	114096	144288	160425	161019	150769	177363	166968	213499	258086	258086	258086	258086	258086	258086
Balances with Banks & Money at call	55654	53066	44194	43735	112179	44520	48150	87347	134208	140819	173925	205271	234637	261786	286460
Investments	590877	578793	673507	705189	1027281	1183794	1119270	1228284	1595100	1776490	1776490	1776490	1776490	1776490	1776490
Advances	1321074	1578277	1692211	1870261	1896887	1960119	2226854	2374311	2500599	2794076	2794076	2794076	2794076	2794076	2794076
Fixed Assets	10705	11909	12379	15256	50941	41226	40703	40078	40167	39510	39556	39807	40254	40892	41717
Other Assets	65224	59842	133531	176033	196816	236005	276125	300503	362045	351902	351902	351902	351902	351902	351902
TOTAL ASSETS	2133109	2395982	2700110	2970898	3445122	3616433	3888464	4197492	4845619	5360884	5394036	5425632	5455446	5483233	5508732

8.4 Other Assumptions

1. The risk-free rate of return was obtained from the 10 Year Bond Yield on the official website of the Reserve Bank of India.
2. The market risk premium was calculated using the Nifty's ten-year CAGR.
3. Beta was taken from the official Moneycontrol website, i.e., 1.
4. The weighted average cost of capital, which was calculated to be 7.7%, is based on equity value and debt as of FY 2022.
5. The long-term growth rate was anticipated to be 5%.
6. The latest annual report of the company was used to determine the total number of shares.
7. The target share price was determined to be Rs 628.1 based on the information that was available.

Discounted Cash Flow Analysis

Valuation Assumptions		Data Sources
g (World Economic Growth)	5.0%	Paper 99 , Goldman Sachs Publication 2003
Rf	7.3%	10 Year GOI Bond Yield
Rm	12.5%	10 Year CAGR% - NIFTY
Beta	1.00	www.investing.com
CMP	538	www.investing.com

Valuation Data		
Total Debt (Long Term Borrowings) (20	4,49,160	<== CURRENT
Cash & Cash Equivalents (2022)	3,98,905	<== CURRENT
Number of Diluted Shares (2023)	892	<== 1 YR FORWARD EST.
Tax Rate (2023)	27%	<== 1 YR FORWARD EST.
Interest Expense Rate (2023)	3.44%	
MV of Equity	4,80,096	NO. OF SHARES * CMP
Total Debt	4,49,160	
Total Capital	9,29,256	MV OF EQUITY + TOTAL DEBT

WACC		
We	51.7%	MV OF EQUITY / TOTAL CAP
Wd	48.3%	1 - We
Ke	12.5%	Rf + BETA*(Rm - Rf)
Kd	2.5%	INT EXP ATE * (1 - TAX RATE)
WACC	7.7%	We*Ke + Wd*Kd

Enterprise Value (EV)	6,10,752	
Less: Debt	4,49,160	
Add: Cash	3,98,905	
Equity Value	5,60,497	EV - DEBT + CASH
Target Price	628.1	EQ VALUE / NUMBER OF DILUTED SH
% Returns	117.0%	TP/CMP - 1
Rating	BUY	

% Returns	Rating
< 5%	SELL
>5%, < 15%	HOLD
>15%	BUY

FCFF & Target Price

	Explicit Forecast Period					Linear Decline Phase						Terminal Yr
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
EBIT * (1-Tax Rate)	34,864	33,228	31,353	29,222	26,815	25,114	23,996	23,381	23,223	23,506	24,237	25,449
Dep	3,852	3,866	3,900	3,953	4,025	3,583	3,424	3,336	3,314	3,354	3,458	3,631
Purchase of Assets	(3,898)	(4,117)	(4,348)	(4,592)	(4,849)	(4,244)	(4,055)	(3,951)	(3,924)	(3,972)	(4,096)	(4,301)
Changes in Working Capital	-	-	-	-	-	-	-	-	-	-	-	-
FCFF	34,818	32,977	30,905	28,584	25,991	24,453	23,364	22,766	22,612	22,888	23,600	24,780
% Growth in Post Tax EBIT		-4.7%	-5.6%	-6.8%	-8.2%	-6.3%	-4.5%	-2.6%	-0.7%	1.2%	3.1%	5.0%
					-1.89%							
As % Of Post Tax EBIT												
Dep	11.0%	11.6%	12.4%	13.5%	15.0%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%
Purchase of Assets	-11.2%	-12.4%	-13.9%	-15.7%	-18.1%	-16.9%	-16.9%	-16.9%	-16.9%	-16.9%	-16.9%	-16.9%
Changes in Working Capital	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FCFF	34,818	32,977	30,905	28,584	25,991	24,453	23,364	22,766	22,612	22,888	23,600	
Terminal Value											9,26,484	FCFF(TY)/(WACC
Total Cash Flow	34,818	32,977	30,905	28,584	25,991	24,453	23,364	22,766	22,612	22,888	9,50,083	

Revenue

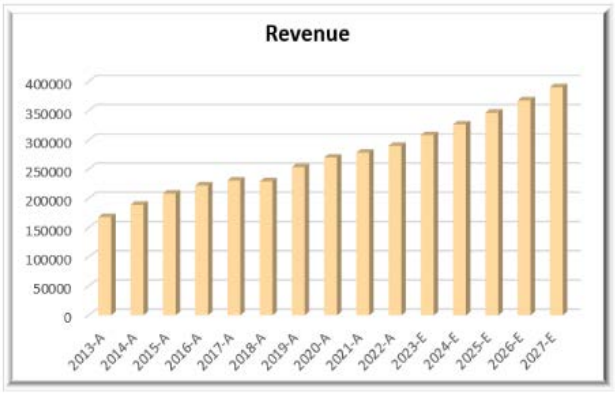


Fig.1

Revenue of SBI in 2013 was Rs.167976 Cr. it was increasing at steady rate over the past ten years, only in 2018 it had shown negative growth of -1%. For forecasting the revenue for next five years i.e. from FY 2023 to FY 2027 year on year growth and compounded Annual growth rate has been considered for last ten years. Year on year growth is around 6.12% whereas CAGR is at 5.61% hence for forecasting the revenue 5.61% is considered. In FY 2022 the revenue Rs. 289973 Cr. which increased to Rs. 390279.1 Cr. in FY 2027.

Net Profit

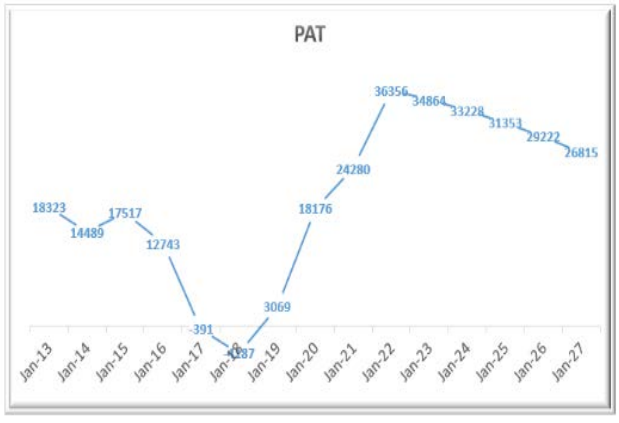


Fig. 2

Net Profit of SBI was Rs. 17916 Cr in FY 2013, it has shown negative growth in few years such as in 2014, 2016 and 2017 still it has grown to Rs. 35374 Cr in FY 2022. It is showing decrease in profit and by the end of FY 2027 SBI would have Net Profit of Rs.26815 Cr.

Earning Per Share

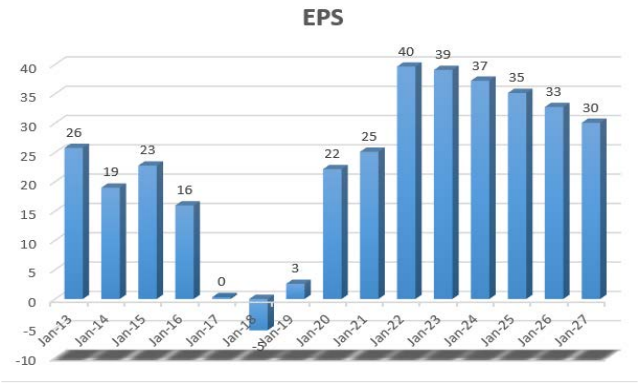


Fig .3

Earnings Per Share is one of the important parameters to assess the company's financial health. EPS tells us that how much profit the company is earning per share. It is very important indicator for investors because they can analyse how much profit company is earning on each share held by them. Higher the EPS better is the company. As per above chart EPS is of SBI was Rs 25.77 in FY 2013 it went down to low of Rs. -5.34 in FY 2018, later on it has decreased and as per forecasting it will be at Rs. 30 in FY 2027.

Interest Earned and Expended

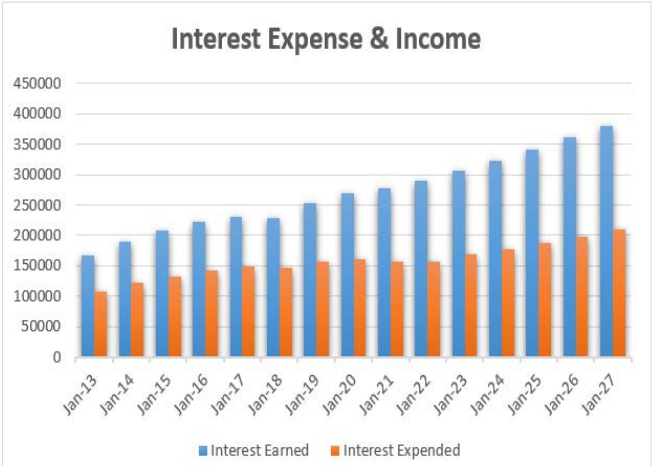


Fig. 4

From the above fig we can see that Interest earned by SBI is increased at higher rate than interest expended which resulted in increased profits for the company. SBI has increased its advances keeping their borrowing which is their primary cost as low as possible.

FINDINGS AND CONCLUSION

- The revenue of the bank has increased over period of ten years till FY 2022 and it continues to increase till FY2027.
- Net profit of SBI is increased consistently because of increasing revenue and sluggish growth in its borrowing which helped SBI to reduce its cost and maximize its profit.
- EPS of the company has also shown steady growth which is sign of an healthy company. Since the EPS is increasing consistently company may declare dividend which is also good for investors.
- The Intrinsic value of SBI is more than its market value this shows that it is undervalued stock which good for investment.

LIMITATIONS OF THE PROJECT

- The forecasting has been done on the basis of past performance of last ten years, which can be misleading and may be subject to change depending upon other factors since it the performance may not remain same in future.
- The study has taken only quantitative data to prepare financial model on the basis of which recommendations has been given, there other factors such as demand, management analysis and other qualitative factors which are neglected.
- The study is based on secondary data only as result of which some results and conclusion may not be accurate and may have some limitations.

RECOMMENDATIONS

- As per three statement financial model the intrinsic value of the company is above the current market value hence SBI is good stock for investment.
- Growing profits and increasing EPS shows healthy financial position of the company, it is also one of the parameter to consider for making investment decision.
- The Indian banking industry is one of the fastest growing industry, and SBI being largest bank in India is good choice for investment as it will benefit from increasing demand.
- SBI should continue to work same as its currently operating to maintain the steady growth.
- SBI bank should keep on adopting the new Artificial Intelligence (AI) based technology to maintain the position in the banking industry and to beat the competition with other banks.
- SBI bank also should train the employees to work effectively and efficiently to operate the adopted technology and should run the awareness campaign for customers to use those technology adopted.

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A PARADIGM SHIFT OF CONSUMER PERCEPTION TOWARDS UPI AND ITS IMPACT POST PANDEMIC

Author:
Dr. James Shoba Kamala
Asst. Professor, Head, Department of Management Studies,
Tilak College of Commerce and Science, Vashi.

Co-Authors:
Miss Divya Gilda, Miss Hiya Gajora
(SYBMS, Tilak College of Commerce and Science, Vashi)

INTRODUCTION

In the ever-changing world, modern and technological facets have evolved and led to the progress of humankind in the most efficient manner. It is through these digital idiosyncrasies that humans are connected globally, in terms of social conduct, and economic developments. The world has come a long way from telephones and cable to smartphones and panoramic screens, economies have diversified and modes of transactions have skyrocketed. In the times where digitization has spread its roots all over the world, internet banking and one-touch mobile transactions have gained popularity. These electronic payment methods have brought renewed energy and efficiency amongst the youth and old alike. Unified Payments Interface not only allows better user connections but is very efficient and accessible. These cashless intermediaries relieve consumers of the burden of hefty wallets. As the world was hit by the devastating effects of COVID-19, it was a tremendous help to the public for their daily transitive needs. The consumer perception on the development of digital payments, suffice to say have proven positive.

Unified Payments Interface (UPI) is an advance level of mobile transaction that allows multiple banks accounts over a single mobile application without disclosing personal, sensitive card details making it more secure. This system of give and take has changed the perceptions of consumers tenfold. The emergence of the introduction of this system showed transparently after the surging motion of demonetization in 2016. The repercussions of such drastic decision led to the exponential growth of UPI and Electronic payments over the nation. The idea of creating a digital footprint over the vast Internet network to help in tracking of funds and avoiding traditional illegalities, the arrangement of such cashless transactions proved unique and certifiable. The idea still budding at the time, found its foot concretely during the pandemic. COVID-19 empirically promoted UPI system for its 'no-touch' feature making it the best solution for the fundamental problem. The many outstanding features of the UPI system have made it the most preferable choice among the consumers and have opened doors for alternative, modern and easy means of transaction technology. The aim of this paper is to study the factors facilitating the sudden growth of UPI and learning the perception of consumers towards the system post pandemic.

REVIEW OF LITERATURE:

Bohra, NS, Agarwal, Anurag, Dr. Prakash N. (2016), The growth of UPI from the perspective of the Pandemic first wave concludes that the abnormal situation has led to a drastic increase in usage of electronic means of payment and has shed light on the fact that covid acted as a catalyst and has contributed immensely to the growth of UPI.

Kumari N, Khanna Jhanvi (2017), Working of a cashless economy includes increasing the usage of plastic money and digital money by reducing the paper or cash form transactions. This economy provides a gateway to technological advancements which thereby brings the country a step closer towards a developed nation.

Kalyani Pawan (2021), The growth of UPI from the perspective of the Pandemic first wave concludes that the abnormal situation has led to an increase in usage of electronic means of payment and has shed light on the fact that Covid acted as a catalyst in the process of UPI systems gaining momentum.

IMPORTANCE OF STUDY:

1. The study will be beneficial in understanding consumer perceptions of UPI following the pandemic.
2. The study will aid in understanding the factors that promote UPI growth.
3. The study will assist in exploring the many features of UPI and categorising its benefits and drawbacks based on the needs and requirements of the consumer.

SCOPE OF STUDY:

1. The study will be useful to comprehend the perception of consumers towards UPI post pandemic.
2. The study will help to understand the factors facilitating the growth of UPI.
3. The study will help to explore the many features of UPI and segregate its merits and demerits according to the consumer's needs and requirements.
4.

OBJECTIVES OF STUDY:

1. To know Whether the respondents are aware of UPI mode for making payment method.
2. To study the consumer perception towards UPI post Pandemic.
3. To know the various technique used to persuade the customers to use the UPI interface frequently.
4. To analyse the factors responsible for the sudden boost in the usage of UPI.

RESEARCH METHODOLOGY:

Research methodology creates a framework towards study area specifically with proper direction with planning, which helps in conducting the research work. Hence, the main purpose is to highlight the problem statement of the research, sample population and sample size, methods of data collection, data analysis and statistical test and tools used for the research.

1. **Data Sources:**
   a. **Primary Data sources**: - Primary data collection was done with the help of Structured Questionnaire devised for consumers to understand the media factors facilitating the growth and impact of UPI post pandemic.
   b. **Secondary Data sources: -** Secondary data collected with the help of Research papers, Journals, Reports, webliography links etc.

2. **Area of Study:** The universe of the study is Navi Mumbai Region. The data are collected within the area of Navi Mumbai Region.

3. **Sampling Technique:** The sampling technique used is Simple Random Sampling.

4. **Sample size: -** 175 respondents from Navi Mumbai Region.

5. **Tools of data collection: -** The primary data was collected with the help of Structured Questionnaire.

6. **Data analysis: -** Data analysis has been analysed using Reliability Test, frequency tables, charts, bar diagram, graph and using SPSS method to arrive at conclusion.

HYPOTHESIS:

H0: There is no significant relationship between the factors that promote the growth in usage of UPI Interface Post COVID-19 among the gender in the study area.

H1: There is significant relationship between the factors that promote the growth in usage of UPI Interface Post COVID-19 among the gender in the study area.

LIMITATION OF THE STUDY:

1. The study is restricted to Navi Mumbai region only.
2. The sample size is also not enough to give full and concrete suggestion for the study.
3. Though there are many variables to study in detail, only 6 factors could be considered in the course of the study.
4. The survey for the study was only based in the Navi Mumbai region.

VALIDATION OF THE INSTRUMENT:

To validate the Instrument Cronbach's alpha was used

Reliability Statistics of Questionnaire		
	Cronbach's Alpha	**N of Items**
Based on Structured Questionnaire Items	0.645	17

Source: Primary Data

As per the above Table No, the reliability of the questionnaire was conducted using Cronbach Alpha the value of which is 0.645, Any value greater than 0.6, considered as highly reliable.

FACTORS FACILITATING GROWTH OF UPI:

Unified Payments Interface was devised as an alternative to cash transactions long time ago, initially it was not as widely recognised and trusted, however, the usage of the same apparent during the drastic times of demonetization and pandemic. This notion of cashless payment system was majorly facilitated due to these circumstantial factors but UPI proved to be immensely useful for its various unique features as well. The surge of UPI therefore can be reasoned in six elements:

- **Demonetization –** The changes in currency led to frequent use of online payment as a refined alternative to long ATM and bank queues. Demonetization came into force on 8th November, 2016 declaring ban on rupees 500 and 1000 , the highest denominations in circulation. This step acted as a blow to corruption as well as gave a pause to the flow of money obtained through undeclared income. UPI posed as a platform to carry out the most basic of transaction. The Government believed that this would be a step to take the economy closer towards an organised and formal sector.

- **Convenience –** UPI system have made it flexible for consumers to carry out transactions at all times any time from

anywhere due to its 24/7 availability feature. This system albeit challenging to adapt at first, proved the most convinent and user friendly at the time of need.This encouraged consumers to use it more often for major payments like electricity bills and even recharges orr DTH.

- **Rewards & Cashback –** As a highlighting feature of the UPI cashbacks have attracted an exponential audience as it reembraces a small amount spent on purchases which has led to an increase in the buying intentions of consumers. Retailers have had their fair share of benefits as they get to practice second degree price discrimination which in turn boosts their profits.

- **Safety & Security –** The fundamental need of contact was jeopardized as a consequence of the world wide Pandemic. In these severe times, Cashless and contactless payment transaction became dire. As all digital transaction of UPI are carried out and supported by two step authentication in the form of device lock screen password or a finger print measure and a four to six digit MPIN created by the user. All these PINS are encrypted and hence are safe and secure.

- **Discounts –** UPI systems include eye catching schemes of discounts for users, for example 10 % discounts on NH toll payment through RFID or Fastag, 0.5% discount on seasonal and suburban railway tickets, 0.75 % off on fuel through debit or credit card or E-wallets, 8 % discount on LIC insurance if payment done through official website. The discounts feature can be a good mode to save money using these freebies and offers

- **Efficient Tracking of Funds –** UPI system keeps a record of all the spending done by the user. This way there will always be a digital trail of the user's online transactional activities which contributes to transparency in the whole process and helps to curb generation of black money leading to economic development. As a result, The traditional illegalities have been minimized gradually and has provided "the nation a fresh start as all the back doors towards black money and corruption have closed.

OBSERVATION FROM THE STUDY:

The following are the observation which reflect the responses on the research topic **"A paradigm shift of consumer perception towards UPI and its impact post pandemic"**

Table and Figure No.1: Respondents by Gender:

	Male	Female
18-30	37.14%	36.00%
31-45	7.43%	7.43%
46-59	5.71%	6.29%

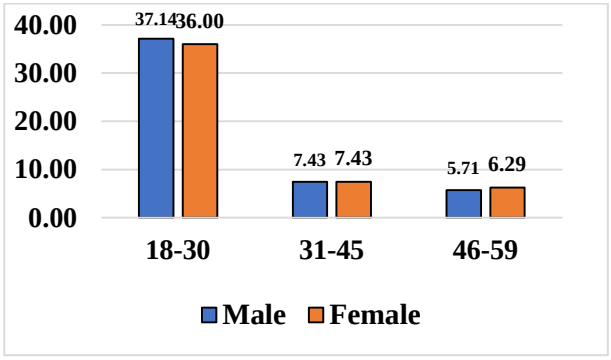


Table and Figure No.1 exhibit the distribution of respondents age by their gender. It is observed from the study that 37.14% respondents are male and 36% respondent are female from the age category of 18-30years. 7.43% respondents are male and 7.43% respondent are female from the age category of 31-45years and 5.71% respondents are male and 6.29% respondent are female from the age category of 46-59years respectively.

Table and Figure No.2: Respondents by Profession:

Qualification	
SSC	5.71
HSC	44.00
Graduation	42.29
Post-Graduation	5.71
Professional	2.29

Table and Figure No.2, Clearly states that 88.3% of respondents belong to the student category while salaried people are second to the lead. There is a bifurcation among the HSC and graduates with a percentage of 41.7% and 45.6% respectively.

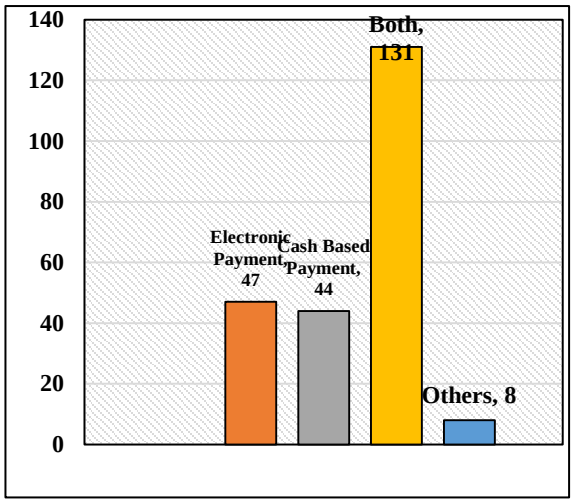
Table and Figure No.3: Awareness on type of Payment mode.

Awareness on type of Payment mode.	
Cash	**167**
UPI	**158**
RTGS/NEFT/IMPS	**95**
Debit/Credit Card	**143**
Others	**49**

Table and Figure No.3, exhibits that 27% respondents are aware of cash payment mode, 26% aware of UPI based payment mode, 23% respondents are aware of plastic mode of payment, 16% of the respondents are aware about bank based payment transactions and others respectively.

Table and Figure No.4: Consumer Preference of Payment mode.

Consumer Preference of Payment mode.	
Electronic Payment	**47**
Cash Based Payment	**44**
Both	**131**
Others	**8**



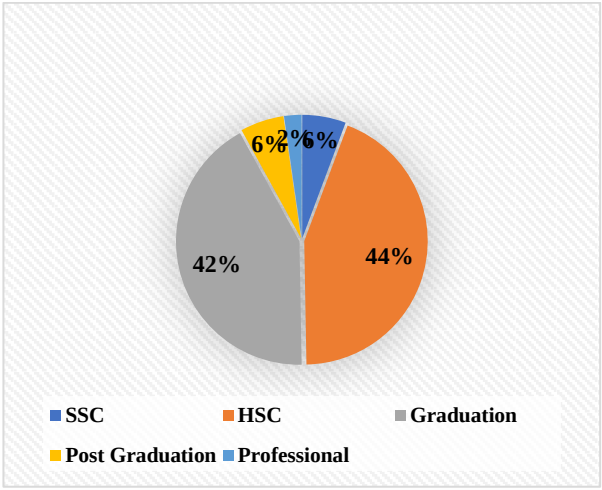


Table and Figure No.4, demonstrates the distribution of Consumer Preference payment mode. 72.8% respondents form the major group that prefer both modes of payment.26.1% respondents prefer electronic payment mode. 24.4% prefer cash-based payment mode. 8% Prefer other payment mode.

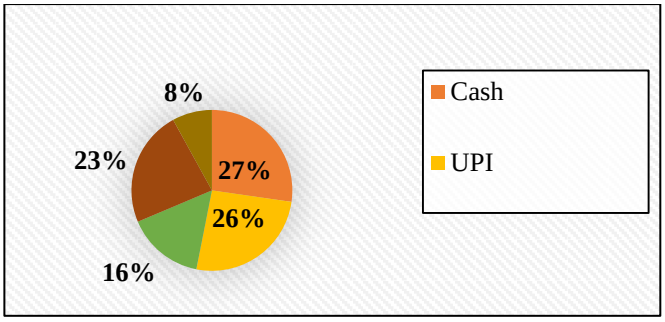


Table and Figure No.5: Consumer Opinion on following:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Consumer Opinion on Money transfer through UPI made Easy, Convenient and Efficient.	0.00	1.14	14.86	42.86	41.14
Rewards and cashback feature of UPI has compelled the consumers to use UPI frequently	0.00	5.71	29.14	49.71	15.43
Demonetization played a major role in the awareness of cashless payment mode	0.00	5.71	19.43	48.00	26.86
Digitization in terms of payment transactions has increased the level of transparency for the consumer as well as for the government.	0.57	0.57	20.57	41.14	25.14
The whole covid- 19 debacle surged the growth of UPI system.	0.00	0.57	13.71	54.29	34.29

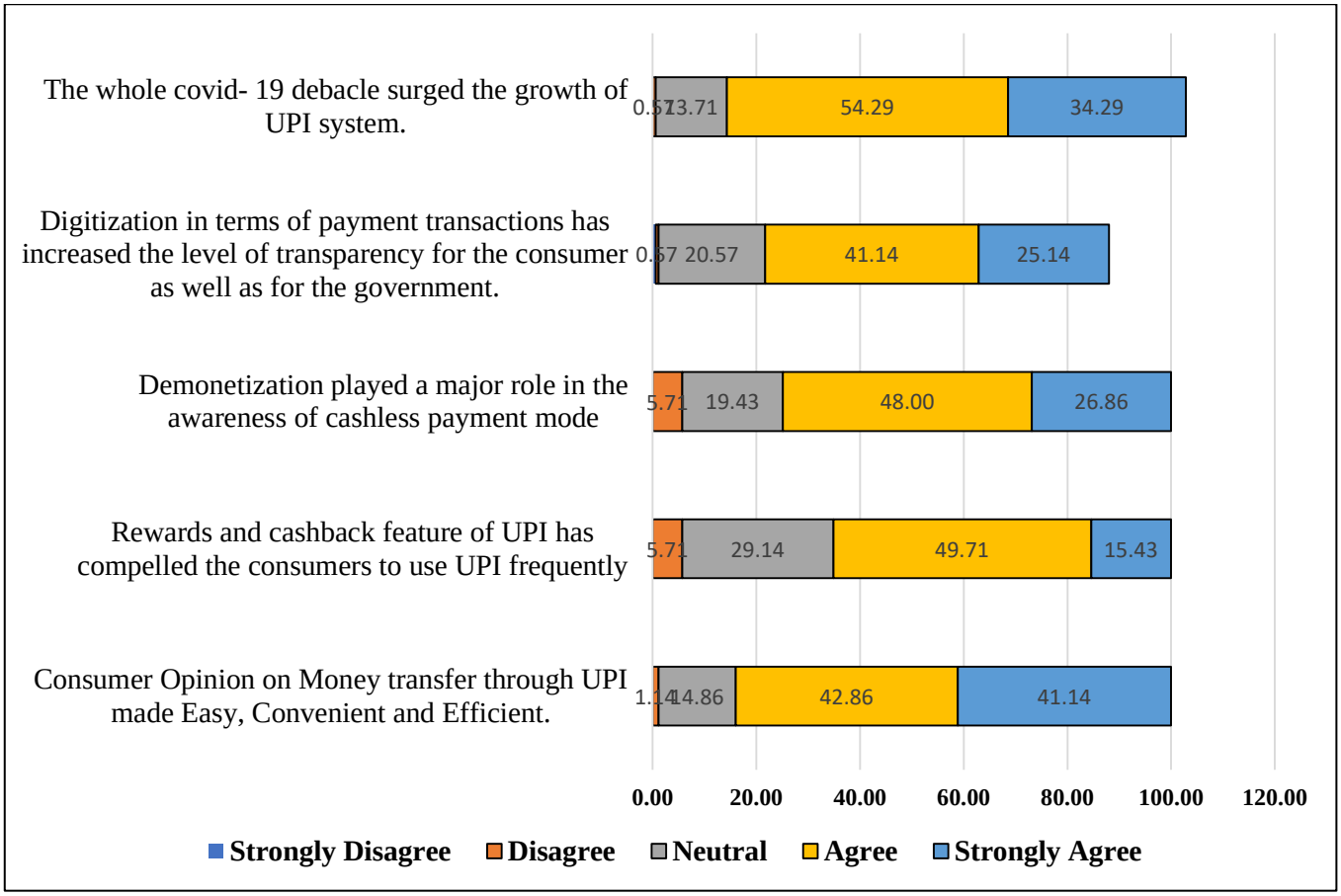


Table and Figure No.5, Explains the consumers opinion on various parameters those are as follows:

1. **Money transfer through UPI made Easy, Convenient and Efficient:**
   41.14% of respondents strongly agree with the stated question, 42.86% of respondents agree with the given feature, 14.86% of the respondents feel neutral with the condition and Minimal percentage of respondents disagree with the question.

2. **Rewards and cashback feature of UPI has compelled the consumers to use UPI frequently.**
   15.43% of respondents strongly agree with the stated question, 49.71% of respondents agree with the given feature, 29.14% of the respondents feel neutral with the condition and a small percentage of respondents disagree with the question.

3. **Demonetization played a major role in the awareness of cashless payment mode.**
   26.86% of respondents strongly agree with the stated question, 48.00% of respondents agree with the given feature, 19.43% of the respondents feel neutral with the condition and a small percentage of respondents disagree with the question.

4. **Digitization in terms of payment transactions has increased the level of transparency for the consumer as well as for the government**
   25.14% of respondents strongly agree with the stated question, 41.14% of respondents agree with the given feature, 20.57% of the respondents feel neutral with the condition, and a very minimal percentage of respondents disagree with the factor.

5. **The whole covid- 19 debacle surged the growth of UPI system.**
   34.29% of respondents strongly agree with the stated question, 54.29% of respondents agree with the given feature, 13.71% of the respondents feel neutral with the condition and a very minimal percentage of respondents disagree with this factor.

Table and Figure No.6: Impact of UPI on general public during Pandemic.

Impact of UPI on general public during Pandemic		
	Male	**Female**
Positive	39.43	40.57
Negative	2.29	2.86
Neutral	4.57	10.29

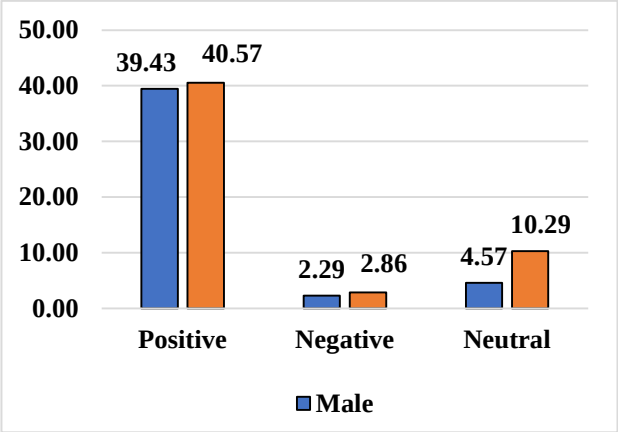
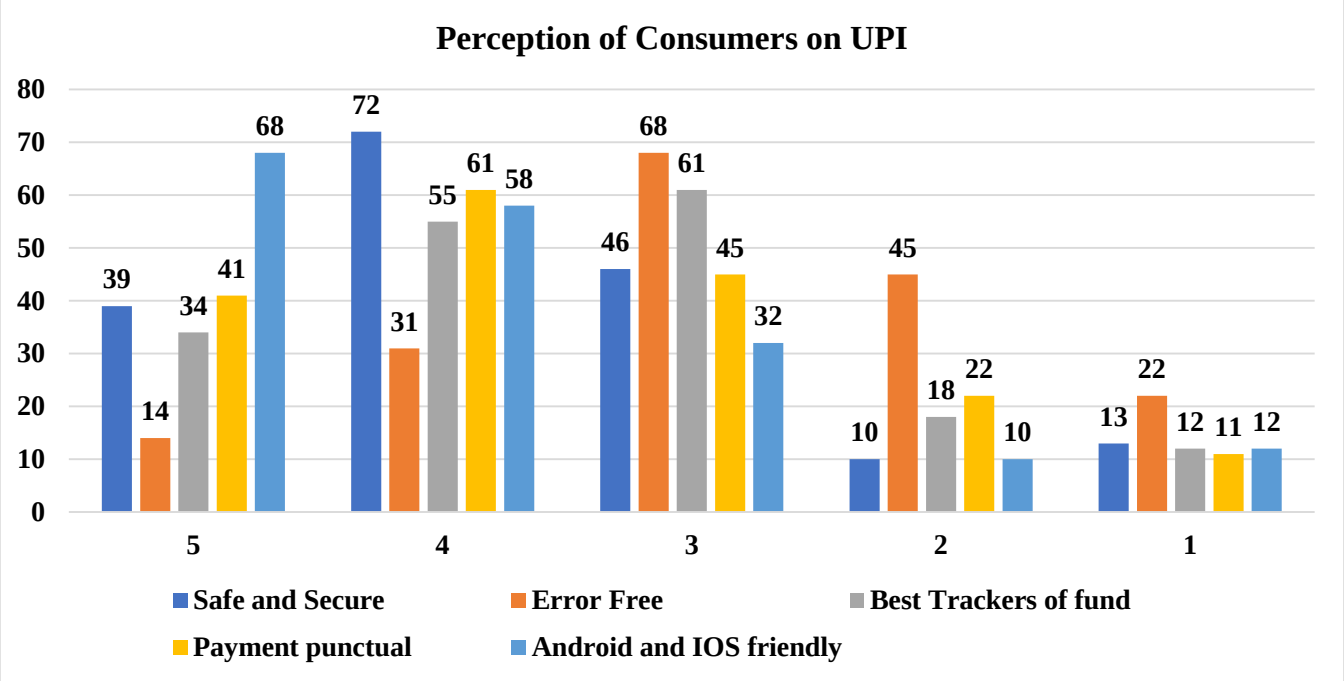


Table and Figure No.6, demonstrates the distribution Impact of UPI on general public during Pandemic as per gender and it has been observed that. 80% of the respondent said that impact of UPI was positive during pandemic in that 39.43% were Male respondent and 40.57% were female respondent. 14.86% of the respondent said that impact of UPI was Neutral during pandemic in that 4.57% were Male respondent and 10.29% were female respondent. And 5.14% respondent felt that the impact was negative respectively.

Table and Figure No.7: Perception of Consumer on UPI.

	5	4	3	2	1
Safe and Secure	39	72	46	10	13
Error Free	14	31	68	45	22
Best Trackers of fund	34	55	61	18	12
Payment punctual	41	61	45	22	11
Android and IOS friendly	68	58	32	10	12



Hypothesis Testing

Hypothesis Testing N0.1

Parameters	**CHI-SQUARE TESTING**			
	Value	df	Asymptotic Significance (2-sided)	Accepted Hypothesis
Money Transfer Easy, Convenient & Efficient	4.605[a]	1	.248	H0
Rewards & Cash Back	0.049[a]	1	.324	H0
Demonetization	1.335[a]	1	.037	**H1**
Digitization	1.455[a]	1	.048	**H1**
COVID-19	0.84[a]	1	.033	**H1**

- For the Hypothesis all the above variable were individually tested, it was found that the variables like Demonetization, Digitization, COVID-19, the *P* value are 0.037, 0.048 and 0.033 which is less than the Significance level that is 0.05. Hence Null hypothesis is rejected.
- It is found that the two-variable Money Transfer Easy, Convenient & Efficient and Rewards & Cash Back, the *P* value are 0.248 & 0.324. which is more than the Significance level that is

0.05. Hence the Null hypothesis is failed to be rejected.

- Since out of five parameters in three the researcher rejected the Null Hypothesis. Hence the Null hypothesis is rejected and alternate hypothesis is accepted i.e. **"There is significant relationship between the factors that promote the growth in usage of UPI Interface Post COVID-19 among the gender in the study area."**

Findings and conclusion

The various tests done on primary data collected from 180 respondents has helped in determining the factors facilitating the growth of UPI as well as gauge the impact of the same post pandemic. The findings for the same are:

- The parameters of Demonetization, Digitization and COVID-19 failed in accepting the hypothesis.
- The parameters of Money transfer – easy, convenient and efficient accepted the proposed hypothesis.
- It is concluded that there exists a significant relation between the factors facilitating the growth and the impact of UPI post COVID-19 among the field of gender study.

Limitations and recommendations

A few limitations to the study are listed below:

- The survey for the study was only based in the Navi Mumbai region.
- Only 181 respondents could be selected for the analysis.
- 6 factors could be considered in the course of the study.

A few factors that could be added to the list of growth of employment are:

- Spectrum of choices is provided.
- Better efficiency is granted, the concept of fast-moving world is instated.
- Gaining knowledge of different aspects and embracing change.

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ONLINE LEARNING VS OFFLINE LEARNING

Sherly Roy
Assistant Professor
Department of Mathematics, Information Technology and Computer Science
Tilak College of Science and Commerce Vashi
E-mail : roysherly63@gmail.com

ABSTRACT:
This paper provides an abstract on the topic "Online Education versus Offline Education. "Online education and traditional, offline education are two different methods of learning that have been widely used by students around the world. Due to the COVID-19 pandemic, online education has achieved more popularity. The objective of this paper is to analyse and do a comparative study between these two systems.
The traditional form of education, also known as offline education, involves attending physical classes, interacting with teachers and fellow students in person, and completing assignments and exams within a set timeline. In contrast, online education involves learning through digital platforms, which allows students to study from anywhere and at any time. It eliminates the need for a physical classroom and enables students to access study materials and interact with teachers and peers using various online tools. This paper highlights the differences between the two forms of education and explores their respective advantages and disadvantages. The choice between online education and traditional, offline education ultimately depends on various factors such as personal preferences, learning style, and career goals.

Both forms of education have their advantages and disadvantages, and the decision to choose one over the other should be made with careful consideration of the individual's needs and circumstances. As technology continues to evolve, it is likely that online education will become more accessible and widespread, and traditional education will need to adapt to meet the changing needs of students.

Keywords: *Education, online, offline, pandemic*

Introduction:
The education sector in India is vast and diverse, with multiple languages, cultural backgrounds, and socioeconomic factors influencing the adoption of various modes of education. Offline education, which involves attending physical classes, has been the primary mode of education in India for decades. However, with the increasing penetration of the internet and mobile devices, online education has emerged as a viable alternative. The COVID-19 pandemic has forced a rapid shift towards online education in India, leading to a renewed debate about the effectiveness of online education versus offline education. This research paper aims to analyze online education versus offline education in India, with a focus on data analysis.

Methodology:
This research paper analyzes various studies and surveys conducted in the field of online education versus offline education in India. The research paper also examines the various factors that influence the adoption of online education in

India, such as cost, accessibility, and the quality of education. The data for this research paper is collected through secondary sources, such as academic journals, research papers, and online articles. The data analysis is conducted using various statistical techniques, including regression analysis and correlation analysis.

Online Education:

Online education in India has gained significant momentum in recent years, with the increasing penetration of the internet and mobile devices. The COVID-19 pandemic has forced a rapid shift towards online education, with schools and universities closed due to lockdowns. Online education in India offers various advantages, including cost-effectiveness, flexibility, and access to a broader range of courses and programs.

A study conducted by the National Sample Survey Organization (NSSO) found that the enrollment in distance education courses had increased significantly in India. In 2018, about 28% of all higher education students in India took at least one distance education course, compared to only 4% in 2006. The study also found that the majority of students who enrolled in online courses in India did so because of the flexibility it offered. However, online education in India also faces various challenges, including limited access to the internet and online tools in rural areas. Online education has several advantages, including:

1. Flexibility: Online education allows students to study from anywhere at any time. It is particularly beneficial for working professionals and those with other commitments. Students can choose to study at their own pace, which is not possible in traditional, offline education.
2. Cost-effectiveness: Online education is generally more affordable than traditional education. It eliminates the cost of transportation and accommodation, making it an affordable option for many students.
3. Access to a broader range of courses and programs: Online education offers access to a broader range of courses and programs than traditional education. Students can choose from various online courses and degree programs offered by universities and colleges worldwide.

However, online education also has some disadvantages, including:

1. Limited face-to-face interaction: Online education lacks face-to-face interaction, which is an essential aspect of traditional education. The lack of physical presence may result in students feeling isolated and disconnected.
2. Dependence on technology: Online education depends on technology, and technical glitches may disrupt the learning process. This may cause frustration and inconvenience for students.
3. Limited opportunities for hands-on experience: Some subjects, such as science, require hands-on experience. Online education may not provide students with the opportunity to gain practical experience in these areas.

Offline Education in India:

Offline education, also known as traditional education, has been the primary mode of education in India for decades. It involves attending physical classes, interacting with teachers and fellow students in person, and completing assignments and exams within a set timeline. Offline education in India has several advantages, including face-to-face interaction and a structured learning environment.

A study conducted by the National Assessment and Accreditation Council (NAAC) found that students in traditional, offline courses in India had better learning outcomes than those in online courses. The study found that students in traditional courses had better retention rates and higher grades than those in online courses. However, offline education in India also faces various challenges, including inadequate infrastructure and limited access to quality education in rural areas. Offline education has been the dominant form of education for centuries and offers several advantages, including:

1. Face-to-face interaction: Traditional education allows for face-to-face interaction between students and teachers, which is an essential aspect of learning. Students can ask questions and receive immediate feedback, enhancing the learning experience.
2. Structured learning environment: Traditional education provides a structured learning environment, with fixed schedules and timelines. This helps students develop discipline and time-management skills.
3. Opportunities for hands-on experience: Traditional education provides students with hands-on experience in various subjects, such as science, that require practical knowledge.

However, traditional education also has some disadvantages, including:

1. Limited flexibility: Traditional education follows a fixed schedule, which may not be suitable for students with other commitments.
2. Cost: Traditional education can be expensive, with the cost of tuition, transportation, and accommodation being significant barriers for many students.
3. Limited access to courses and programs: Traditional education may not offer access to a broad range of courses and programs, particularly in remote or underprivileged areas.

Literature Review:

1. Online Education Growth:

According to a report by ResearchAndMarkets, the online education market is expected to grow by $247.46 billion during 2020-2024, with a CAGR of over 18%. The COVID-19 pandemic has led to a surge in demand for online education, as schools and universities were forced to switch to online learning to maintain social distancing.

2. Challenges in Online Education:

A survey conducted by UNESCO found that the rapid shift to online education during the pandemic has posed several challenges for students, teachers, and institutions. The survey found that 90% of countries reported at least one major challenge related to online learning, such as lack of access to technology, lack of teacher training, and lack of student engagement.

3. Student Attitudes Towards Online Learning:

A survey conducted by QS Quacquarelli Symonds found that a majority of students are willing to consider online learning as an alternative to traditional, on-campus learning. The survey found that 53% of students would consider taking a fully online degree, while 41% would consider a partially online degree.

4. Learning Outcomes in Online Education:

A study conducted by the National Bureau of Economic Research found that online learning can be as effective as traditional, on-campus learning when certain conditions are met, such as providing high-quality instructional materials and promoting active student engagement. The study found that online students performed slightly

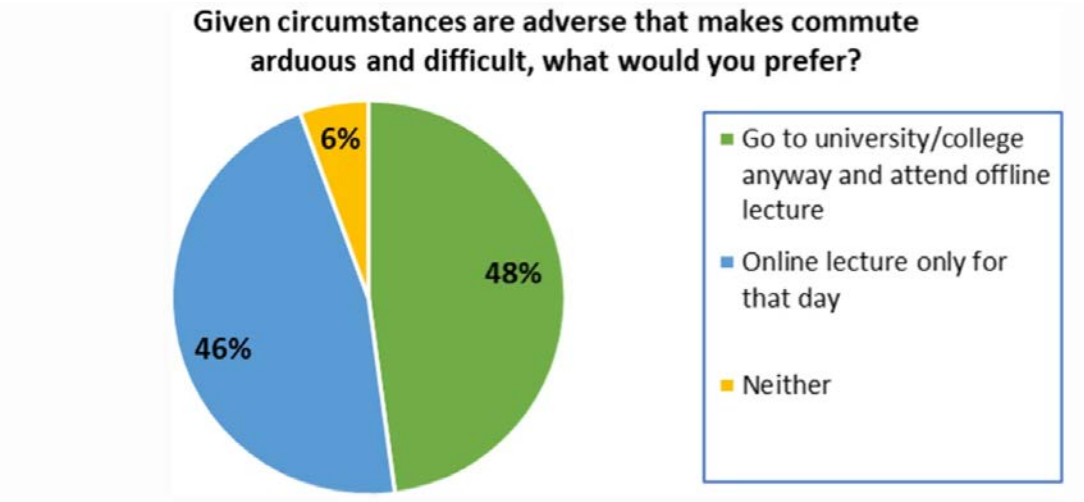
better than traditional students, with an average exam score of 68.4% compared to 66.5% for traditional students.

5. Cost of Online Education:

According to a report by CollegeBoard, the average cost of tuition and fees for in-state students at public four-year institutions increased by 2.3% in 2020-21, while the average cost of tuition and fees for private nonprofit four-year institutions increased by 3.1%. In contrast, online courses can be more affordable, with some institutions offering online courses at lower tuition rates.

Survey:

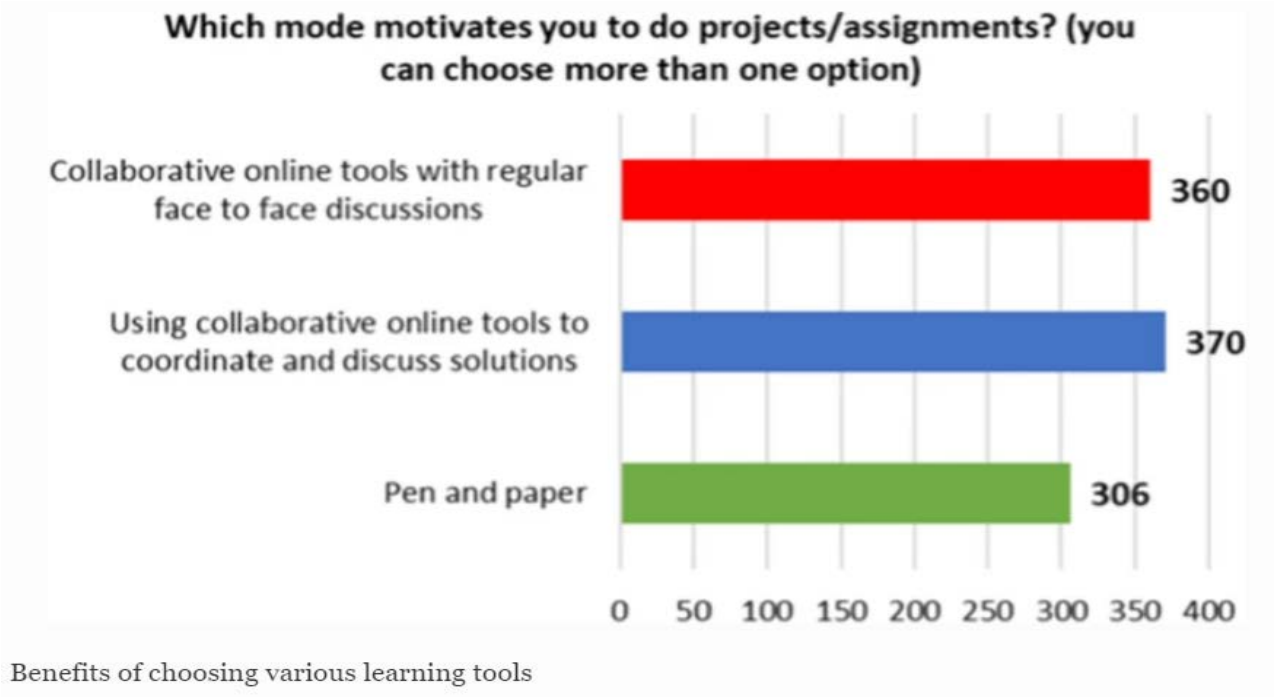
The majority of students would still choose to travel to the institution to attend offline lectures even in a challenging circumstance where travelling looks to be an issue. [1] Although many students would still prefer online courses on such days, this demonstrates their propensity to attend offline lectures. Some students were unable to provide a specific response. According to the graph below, 48% of students prefer offline lectures when conditions are bad, 46% of students prefer online lectures, and 6% of students are unsure. There are many opportunities to socialise and meet new people when taking lessons offline. The pupils are always fascinated by their strong desire to interact with their peers in order to learn and discover new things together. Also, kids can meet with their professors to discuss both academic and extracurricular issues. Jefferson and Paul [2] said Face-to-face classroom discussions cover the main topics and offer prompt responses that assist students in finding solutions to their problems. A well-organized classroom speeds up higher order thinking, which can be very helpful in pursuing research projects and other class assignments. Overall, offline sessions increase student participation in the learning process and foster class interactions. According to Kemp and Grieve [3], teachers can quickly modify their teaching methods in offline mode to increase student engagement and performance.



Students' preferred mode of learning in the adverse situation

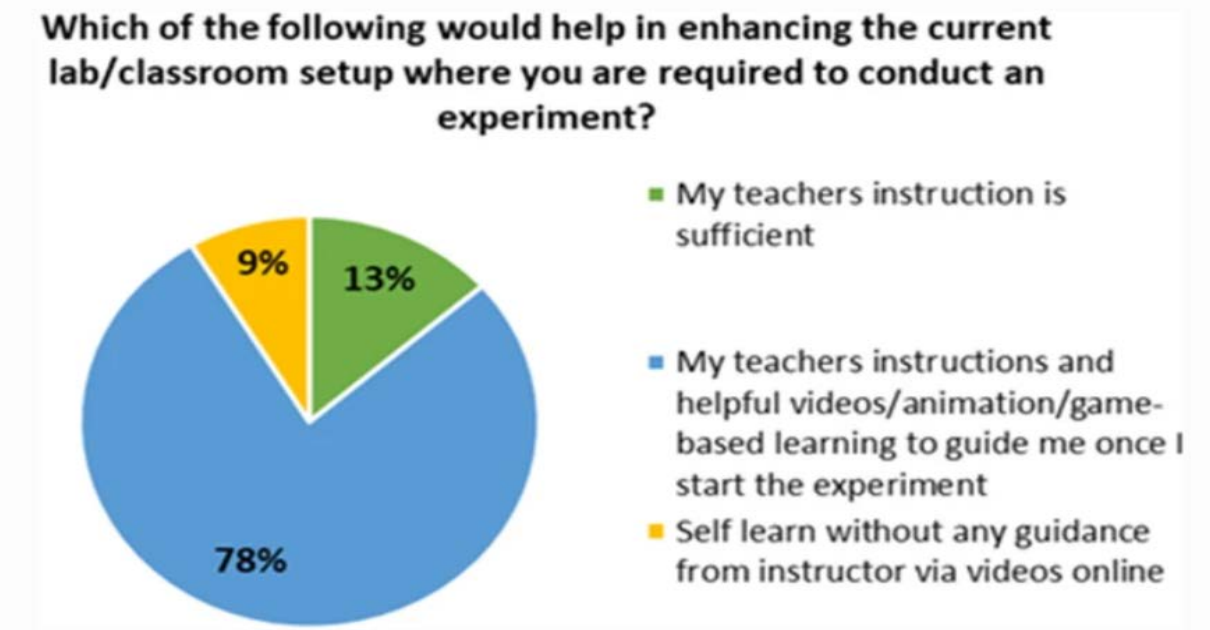
The pupils profit from the availability of diverse tools in various learning styles. To finish their tasks and projects, they can select the appropriate modes and tools. The students are not limited to one choice, as illustrated in the image below. They look into all the possibilities. Overall, 370 students prefer using online collaboration tools, as can be observed. 360 students combine in-person talks with collaborative technologies. 306 pupils say they prefer writing on paper. The effectiveness and knowledge level of the students are improved when online technologies are used

in conjunction with offline classroom activities. They also aid in shortening lecture periods because prolonged lectures devoid of activities can occasionally grow boring. Combining face-to-face and online learning fosters the development of strong interpersonal, problem-solving, collaborative, and critical thinking abilities.



Benefits of choosing various learning tools

Labs are essential for learning and developing concepts. Students can always complete their laboratory activities with the support of concise and coherent instructions. According to the graph below, 78% of students believe that the laboratory setup is improved by the teacher's instructions and other tools like films, animations, and games. 13% of students believe that their teachers' instructions are sufficient, whereas 9% think that self-learning and independent task management are true. In laboratories, students can practise their experimentation and verification skills. Labs are one of the most efficient ways to see the real-world application of theoretical principles, according to Wollenberg and Mohan [4]. The students are eager to test their knowledge as the theoretical principles are applied in the laboratory. Students can improve their technical proficiency through a variety of experiments and practical activities.



Conducive set up of laboratories activities

Conclusion:

Online education and traditional, offline education both have their advantages and disadvantages. The choice between the two depends on various factors, including personal preferences, learning style, and career goals. Students who prefer a more flexible and cost-effective option may choose online education, while those who prefer a structured learning environment with face-to-face interaction and hands-on experience may opt for traditional education.

The COVID-19 pandemic has accelerated the adoption of online education, and it is likely that online education will continue to play a significant role in education in the future. However, it is important to note that online education cannot replace traditional education entirely. Both forms of education have their unique strengths and weaknesses, and a blended approach that combines the best of both worlds may be the optimal solution.

Overall, the choice between online education and traditional, offline education should be made after careful consideration of individual needs and circumstances. Both forms of education have their place in the modern world, and the key is to find the one that works best for each student.

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TO ASCERTAIN LEARNING OBJECTIVE, SATISFACTION, AND BENEFITS IN ONLINE LEARNING AMONG STUDENTS OF MANAGEMENT, COMMERCE, IT/CS AND MASS MEDIA

Mrs. Sheetal Aditya
Assistant Professor
Tilak College of Science and Commerce, Vashi
Email ID: - Sheetal.adityas@gmail.com, Mobile no: - 9167280216

ABSTRACT

The relationship between learning objective of online learning with learning satisfaction acquired by students and learning outcome achieved by them is studied through understanding the association of various factors under learning objective, learning satisfaction and learning benefits. The understandings of association of factors were studied through exploratory factor analysis with principal component and confirmatory factor analysis with path diagram. The analysis has been conducted with 173 respondents of students from various fields with their sincere option on learning benefits acquired through online learning. Learning objective caters the purpose of the task with appropriate means and measures to achieve learning benefits and learning satisfaction. The study focuses on learning outcomes based on course studied by the students such as Management, Commerce, IT/CS and Mass Media.

Keywords: *- Learning objective, Learning satisfaction, Learning benefits, exploratory factor analysis, confirmatory factor analysis, online learning.*

Introduction to Title

Education has a term can be described in various ways; some scholars define it as formal schooling or lifelong learning. It is also described as acquisition of knowledge, skills and attitudes and also as training of people's mind in a direction to bring about desired changes. According to (Good, 1973) education is defined as "the aggregate of all the processes by which a person develops abilities, attitudes and other forms of behaviour of practical values in the society in which s/he lives; the social process by which people are subjected to the influence of selected and controlled environment (especially that of the school), so that they may obtain social competence and optimum individual development".

As education renders learning and it causes a desired change in the behaviour of recipient. According to (Atkinson, 1975), Learning is a relatively permanent change in behaviour that occurs as result of practise". The definition clearly explains that learning to emerge has a desired change or permanent change must have occurred through practise. The notion of practice has to be inclusive with reinforcement of factors of learning objective along with learning satisfaction and learning benefit. The study focusses on understanding the factors achieving learning objective along with learning satisfaction and learning benefits.

Learning objective can be assumptions or statements which are expected to be achieved by a student or learner at the end of a course or unit or qualification. They can be consequences a student or learner must know, evaluate and be able to exhibit after completion of a process of learning. The factors to ascertain or study are

- Better understanding of complex and abstract concepts (LOB 1)
- Better communication between tutor and learner (LOB 2)
- Better Collaboration with learning style (LOB 3)
- Availability of Prompt Feedback (LOB 4)
- Opportunities for practice and reinforcement (LOB 5)
- Better focus on real examples (LOB 6)
- Increase interest in the subject (LOB 7)
- Skill upgradation (LOB 8)
- Increase in the quality of interaction with the instructor has increased (LOB 9)
- Improvement in presentation of work (LOB 10)
- Quality learning to be achieved through better grasping of concepts (LOB 11)
- Learning retention can be achieved (LOB 12)

Reliability Statistics		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
.944	.944	12

Item Statistics			
	Mean	**Std. Deviation**	**N**
LOB1	3.58	.857	173
LOB2	3.40	.963	173
LOB3	3.61	.796	173
LOB4	3.62	.845	173
LOB5	3.48	.919	173
LOB6	3.55	1.002	173
LOB7	3.60	.957	173
LOB8	3.69	.899	173
LOB9	3.44	1.002	173
LOB10	3.73	.870	173
LOB11	3.60	.834	173
LOB12	3.61	.847	173

Learning Satisfaction is a experience or outcome that is achieved by a fullfilled expectations. It is also stated as experience of fulfillments of an expected outcome or consequence. Learning satisfaction is an attitude resulting from evaluation of students/learners experience with learning objective is put into implementation. If the learning objective has been successful in imparting a good experience or outcome, learning satisfaction can be achieved. The factors to ascertain or study are

- Ease of using technology and its features in online learning (LS1)
- Met expectations of your learning needs (LS 2)
- Easily achievable Learning objectives (LS 3)
- Concise and precise learning material for learning (LS 4)
- Learning material was in accordance to your individual preferences (style of learning, speed of learning) (LS 5)
- Learning resources were ease to grasp (LS 6)
- Easy understanding and application of concepts (LS 7)

Item Statistics			
	Mean	**Std. Deviation**	**N**
LS1	3.86	.831	173
LS2	3.64	.875	173
LS3	3.66	.891	173
LS4	3.64	.821	173
LS5	3.66	.803	173
LS6	3.50	.826	173
LS7	3.71	.969	173

Reliability Statistics	
Cronbach's Alpha	**N of Items**
.889	**7**

Learning benefits are statements which are favourable and achieved towards learning objective for effective and impactful learning. These advantages are aquired and helped in achieving learning objective or outcome. The factors to ascertain or study are

- Learning at your own pace and time (LO1)
- More interesting and attractive than traditional learning methods (LO2)
- Mobility and ease of usage of online learning tools (at home, at work etc.) (LO 3)
- Cost effective (saving cost of books, transport etc) (LO 4)
- Helps to increase interest in using other online learning techniques (LO5)

Reliability Statistics		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
.879	.879	5

Item Statistics			
	Mean	**Std. Deviation**	**N**
LO1	3.95	.963	173
LO2	3.48	1.065	173
LO3	3.70	.966	173
LO4	3.92	.924	173
LO5	3.69	.950	173

Objectives of the study: -

1. To ascertain relationship between factors of learning objective, learning satisfaction and learning benefits in online learning
2.

Hypothesis of the study:-

H0:- There is no significant relationship between factors of learning objective, learning satisfaction and learning benefits in online learning.

Ha: - There is a significant relationship between factors of learning objective, learning satisfaction and learning benefits in online learning,

Review of Literature

	Title of research article with author name	Summary	Key words
1	The impact of online interaction on student learning outcome Chou **(Chou, Peng, & Chang, 2010)**	Has defined active interaction in online learning activities including the types of interaction: the learner -self, learner- learner, learner - instructor, learner -content, and learner interface. The results of their study showed that students with better results and need less time learning when interacting more with the system	Online learning activities, learning analytics, blended learning
2	Factors of learner instructor interaction which predict perceived learning outcomes in online learning environment **Kang and colleagues (Kang & Im, 2013)**	The interactive activities between teachers and students have an impact on learning outcomes of students when implementing learning activities such as learning assistance, and social intimacy, communication and instructional Q & A, instructor presence, Instructional support.	Student - teacher interaction, traditional teaching, blended learning environment
3	A Study on teachers' perceptions of and their satisfaction with interaction type in blended learning environments by **Brian R. Schroder, Andrew E.**	Walker and Belland, Kerstin E. Blended learning is an approach that combines technology based learning. With face-to face interactions, Within their article, the blended learning model approach.	Blended learning, technology based learning
4	Factors that influence students' decision to drop-out of online courses. **(Willging & Johnson, 2009**)	Research shows that absence of learner interaction causes failure and eventual drop-out in online courses and the lack of learner connectedness was noted as an internal factor leading to learner drop-out in online courses. It was also noted that learners may not continue in e- and blended learning if they are unable to make friends thereby being disconnected and developing feelings of isolation during their blended learning experiences.	Feelings of isolation, blended learning experiences, learner interaction

Sr. no	Title of research article with author name	Summary	Key words
5	The Effect of Using Blended Learning on the Achievement of Students and Information Retention of Fifth Graders in the Biology Course **Maccoun, Hussein Salem. (2016).**	Paper aimed to find the effect of using the blended learning in students' achievement and information preservation for the fifth graders in the biology course. The results showcase the superiority of the experimental group to the control group in the achievement test and information retention.	Students' achievement, Information preservation, Information retention
6	The Effect of Using Blended Learning in Teaching English Language on the Direct and Delayed Achievement among the Sixth Graders. **Al-Rimawi, Firas Tharwat. (2014).**	Author aimed to focus the effect of blended learning on the direct and delayed achievement of the sixth graders in the English language course and to achieve the objectives of the study, the quasi experimental approach was used. The study results showed the presence of statistically significant differences between the means of the direct and delayed achievement for the members of the experimental group.	Blended learning, Direct and Delayed achievement.
7	Critical thinking, cognitive presence, and computer conferencing in distance education. **Garrison, D. R., Anderson, T., & Archer, W. (2009**).	The authors present encouraging empirical findings related to an attempt to create an efficient and reliable instrument to assess the nature and quality of critical discourse and thinking in a text- based educational context. The authors suggest that cognitive presence (i.e., critical, practical inquiry) can be created and supported in a computer-conference environment with appropriate teaching and social presence	Reliable instrument, cognitive presence
8	Online education: Best practices to promote learning. **Finch, D., & Jacobs, K. (2012).**	Qualitative method was used to collect the relevant responses. This paper discusses best practices & evidence literature related to online education. High quality educational experiences in human factors and ergonomics (HFE) are of interest to the global ergonomics community in order to promote the development of the profession, enhance the skill set of HFE practitioners, and facilitate the translation of knowledge into practice	online education, global ergonomics community, human factors and ergonomics

Research Methodology:-

Primary Data Sources: - Questionnaire devised for students among Management, Information Technology and Commerce Students under graduation level from different colleges.

SPSS Software used: - **Exploratory Factor Analysis using Principal Component and Confirmatory Factor Analysis and Reliability testing**

Secondary Data Sources: - Research papers, Journals, Reports, webliography links

Sample: - 173 respondents

Sampling: - Purposive Sampling Method

Data Interpretation and Data Analysis:-

1. Testing of reliability of data of all 24 factors under study

Reliability Statistics		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
.955	**.955**	**24**

Item Statistics			
	Mean	**Std. Deviation**	**N**
LS1	3.86	.831	173
LS2	3.64	.875	173
LS3	3.66	.891	173
LS4	3.64	.821	173
LS5	3.66	.803	173
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LO2	3.48	1.065	173
LO3	3.70	.966	173
LO4	3.92	.924	173
LO5	3.69	.950	173

Cronbach's alpha is the common measure of internal consistency ("reliability") as Cronbach's alpha is **0.995**, which indicates a high level of internal consistency in the variable of study to understand online learning benefits among students.

2. Understanding devices used for online learning by students across Commerce, Management, Mass Media and IT/CS

Devices used for online learning						
Count						
		Devices used for online learning				Total
		Cell or digital phone	Personal desktop computer	Personal Laptop computer	Smart phone	
Stream of study	Commerce	2	1	4	44	51
	IT/CS	0	1	0	0	1
	Management	0	2	5	36	43
	Mass Media	5	3	11	59	78
Total		7	7	20	139	173

Devices Used for Online learning					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cell or digital phone	7	4.0	4.0	4.0
	Personal desktop computer	7	4.0	4.0	8.0
	Personal Laptop computer	20	11.5	11.5	19.5
	Smart phone	139	80.5	80.5	100.0
	Total	173	100.0	100.0	

Interpretation: - 80.5 % of students use smart phones as device for online learning

1. To understand Skill level of students under various streams of study

Skill Level of students under Email usage						
Count						
		Email				Total
		Do not use	Skilled	Unskilled	Very Skilled	
Stream of study	Commerce	10	29	7	5	51
	IT/CS	0	0	0	1	1
	Management	5	29	3	7	44
	Mass Media	3	60	5	10	78
Total		18	118	15	23	173

Skill Level of students under Web surfing						
Count						
		Web surfing				Total
		Do not use	Skilled	Unskilled	Very Skilled	
Stream of study	Commerce	5	31	10	5	51
	IT/CS	0	0	0	1	1
	Management	7	20	6	11	44
	Mass Media	4	48	12	14	78
Total		16	99	28	31	173

Skill Level of students under Word Processing, Power point Presentation, Excel						
Count						
		Word Processing, Power point Presentation, Excel				Total
		Do not use	Skilled	Unskilled	Very Skilled	
Stream of study	Commerce	14	26	8	3	51
	IT/CS	0	1	0	0	1
	Management	5	26	3	10	44
	Mass Media	6	47	18	7	78
Total		25	100	29	20	173

Interpretation:-

The students of skilled with usage of Email, Web surfing for information and Word Processing, Power point Presentation, Excel and it implies students rely on this tools for learning .

Factor Analysis

Factor analysis (FA) attempts to identify the variables, of factors which affect relationship between factors of learning objective, learning satisfaction and learning benefits in online learning.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.932**
Bartlett's Test of Sphericity	Approx. Chi-Square	**3006.362**
	df	**276**
	Sig.	**.000**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy value is greater than 0.5 so it indicates the sample is adequate for factor analysis.

Since significant value is less than 0.05 it indicates that the factor analysis is correct technique for reducing the large no of attributes into small no of factor components. **As p value is less than 0.05 we can reject the null hypothesis and accepted alternative hypothesis.**

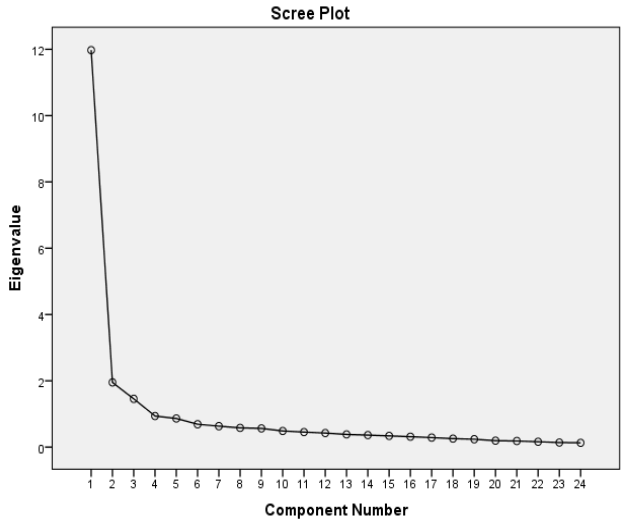
Ha: - There is a significant relationship between factors of learning objective, learning satisfaction and learning benefits in online learning, (is accepted)

Communalities		
	Initial	Extraction
LS1	1.000	.868
LS2	1.000	.879
LS3	1.000	.752
LS4	1.000	.841
LS5	1.000	.882
LS6	1.000	.770
LS7	1.000	.810
LOB1	1.000	.753
LOB2	1.000	.870
LOB3	1.000	.810
LOB4	1.000	.896
LOB5	1.000	.746
LOB6	1.000	.831
LOB7	1.000	.829
LOB8	1.000	.830
LOB9	1.000	.858
LOB10	1.000	.784
LOB11	1.000	.847
LOB12	1.000	.871
LO1	1.000	.741
LO2	1.000	.782
LO3	1.000	.840
LO4	1.000	.824
LO5	1.000	.735
Extraction Method: Principal Component Analysis.		

Extraction communalities are estimates of the variance in each variable accounted for by the components. The communalities in this table are all high, which indicates that the extracted components represent the variables well. Values closer to 1 suggest that extracted factors explain more of the variance of an individual it.

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.974	49.892	49.892	11.974	49.892	49.892	6.464	26.932	26.932
2	1.952	8.133	58.025	1.952	8.133	58.025	5.153	21.472	48.404
3	1.455	6.064	64.089	1.455	6.064	64.089	3.764	15.685	64.089
4	.938	3.907	67.996						
5	.863	3.596	71.592						
6	.689	2.869	74.461						
7	.631	2.629	77.091						
8	.579	2.414	79.505						
9	.565	2.354	81.859						
10	.486	2.026	83.885						
11	.454	1.893	85.778						
12	.424	1.766	87.543						
13	.383	1.596	89.139						
14	.362	1.508	90.647						
15	.339	1.411	92.058						
16	.315	1.312	93.370						
17	.287	1.195	94.564						
18	.257	1.071	95.635						
19	.238	.991	96.626						
20	.194	.808	97.435						

Analysis: - The cumulative percentage is appropriate no of factors generated which are 3 with a value 64.08 so the total variance can be explained by 3 factors components.



The scree plot graphs the eigenvalue against the factor number. Elbow of the graph where the eigenvalues seem to level off is found and factors or components to the left of this point should be retained as significant.

Rotated Component Matrix[a]			
	Component		
	1	2	3
LOB5	.796	.257	.176
LOB9	.790	.249	.162
LOB12	.789	.276	.220
LOB10	.757	.146	.250
LOB11	.740	.339	.159
LOB8	.734	.258	.228
LOB6	.696	.332	.271
LOB3	.586	.387	.343
LOB7	.565	.500	.299
LOB2	.562	.454	.125
LOB4	.559	.344	.002
LOB1	.550	.542	.234
LS2	.186	.770	.086
LS6	.288	.704	.224
LS3	.291	.700	.270
LS5	.270	.692	.172
LS7	.378	.671	.217
LS4	.312	.667	.203
LS1	.260	.600	.208
LO3	.156	.223	.847
LO1	.201	.163	.800
LO5	.261	.156	.779
LO4	.113	.166	.720
LO2	.342	.419	.629
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]			
a. Rotation converged in 5 iterations.			

Interpretation:-

1. After the extraction of fixed three factors, F1 factors are derived
2. F1 factors are considered as important elements to understand significant relationship between factors of learning objective, learning satisfaction and learning benefits in online learning,
3. F1 factors are

- Opportunities for practice and reinforcement (LOB 5)
- Increase in the quality of interaction with the instructor has increased
- (LOB 9)

To further analyse the relationship between factors of learning objective, learning satisfaction and learning benefits in online learning,

- Learning retention can be achieved (LOB 12)
- Improvement in presentation of work (LOB 10)
- Quality learning to be achieved through better grasping of concepts (LOB 11)
- Skill upgradation (LOB 8)
- Better focus on real examples (LOB 6)
- Better Collaboration with learning style (LOB 3)
- Increase interest in the subject (LOB 7)
- Better communication between tutor and learner (LOB 2)
- Availability of Prompt Feedback (LOB 4)

F1	F2	F3
Opportunities for practice and reinforcement (LOB 5)	Met expectations of your learning needs (LS 2)	Mobility and ease of usage of online learning tools (at home, at work etc.) (LO 3)
Increase in the quality of interaction with the instructor has increased (LOB 9)	Learning resources were ease to grasp (LS 6)	Learning at your own pace and time (LO1)
Learning retention can be achieved (LOB 12)	Easily achievable Learning objectives (LS 3)	Helps to increase interest in using other online learning techniques (LO 5)
Improvement in presentation of work (LOB 10)	Learning material was in accordance to your individual preferences (style of learning, speed of learning) (LS 5)	Cost effective (saving cost of books, transport etc) (LO 4)
Quality learning to be achieved through better grasping of concepts (LOB 11)	Easy understanding and application of concepts (LS 7)	More interesting and attractive than traditional learning methods (LO2)
Skill upgradation (LOB 8)	Concise and precise learning material for learning (LS 4)	
Better focus on real examples (LOB 6)	Ease of using technology and its features in online learning (LS1)	
Better Collaboration with learning style (LOB 3)		
Increase interest in the subject (LOB 7)		
Better communication between tutor and learner (LOB 2)		
Availability of Prompt Feedback (LOB 4)		
Better understanding of complex and abstract concepts (LOB 1)		

Confirmatory Factor Analysis was applied

Factor Loadings

Factor	Indicator	Estimate	SEz	95% Confidence Interval		Z	p	Stand. Estimate
				Lower	Upper			
Learning Satisfaction	LS 1	0.517	0.0588	0.401	0.632	8.79	< .001	0.624
	LS 2	0.606	0.0601	0.488	0.724	10.09	< .001	0.694
	LS 3	0.704	0.0579	0.591	0.817	12.16	< .001	0.792
	LS 4	0.589	0.0558	0.480	0.699	10.57	< .001	0.720
	LS 5	0.567	0.0549	0.459	0.674	10.33	< .001	0.708
	LS 6	0.639	0.0542	0.533	0.745	11.79	< .001	0.776

Factor Loadings

Factor	Indicator	Estimate	SEz	95% Confidence Interval		Z	p	Stand. Estimate
				Lower	Upper			
	LS 7	0.769	0.0628	0.646	0.892	12.24	< .001	0.796
Learning Objective	LOB 1	0.657	0.0554	0.548	0.765	11.84	< .001	0.769
	LOB 2	0.669	0.0647	0.542	0.796	10.34	< .001	0.697
	LOB 3	0.599	0.0519	0.498	0.701	11.54	< .001	0.755
	LOB 4	0.500	0.0594	0.384	0.617	8.43	< .001	0.594
	LOB 5	0.747	0.0577	0.634	0.861	12.95	< .001	0.816
	LOB 6	0.804	0.0635	0.679	0.928	12.65	< .001	0.804
	LOB 7	0.743	0.0617	0.622	0.864	12.05	< .001	0.779
	LOB 8	0.698	0.0579	0.585	0.812	12.06	< .001	0.779
	LOB 9	0.798	0.0637	0.674	0.923	12.54	< .001	0.799
	LOB 10	0.651	0.0569	0.540	0.763	11.45	< .001	0.751
	LOB 11	0.670	0.0529	0.566	0.773	12.66	< .001	0.805
	LOB 12	0.704	0.0527	0.601	0.807	13.37	< .001	0.834
Learning Benefits	LO 1	0.744	0.0640	0.618	0.869	11.62	< .001	0.774
	LO 2	0.852	0.0698	0.715	0.989	12.20	< .001	0.802
	LO 3	0.811	0.0614	0.691	0.932	13.21	< .001	0.843
	LO 4	0.604	0.0650	0.477	0.731	9.29	< .001	0.655
	LO 5	0.735	0.0629	0.612	0.859	11.69	< .001	0.776

Factor Estimates

Factor Covariances								
				95% Confidence Interval				
		Estimate	SE	Lower	Upper	Z	p	Stand. Estimate
Learning Satisfaction	Learning Satisfaction	1.000 [a]						
	Learning Objective	0.819	0.0324	0.756	0.883	25.3	< .001	0.819
	Learning Benefit	0.645	0.0548	0.538	0.752	11.8	< .001	0.645
Learning Objective	Learning Objective	1.000 [a]						
	Learning Benefit	0.642	0.0527	0.539	0.746	12.2	< .001	0.642
Learning Benefit	Learning Benefit	1.000 [a]						

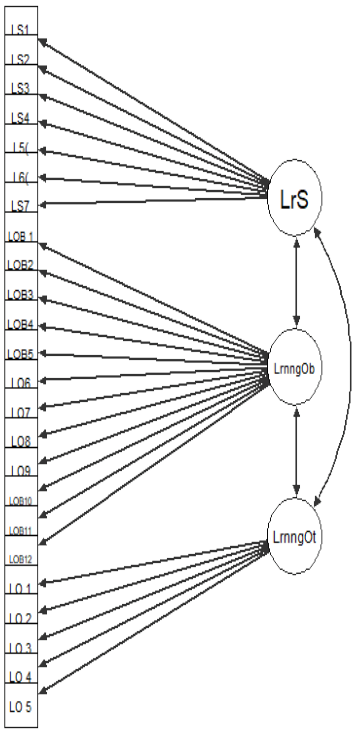
[a] fixed parameter

Model Fit

Test for Exact Fit		
χ^2	df	p
594	249	< .001

Fit Measures				
			RMSEA 90% CI	
CFI	TLI	RMSEA	Lower	Upper
0.881	0.869	0.0895	0.0803	0.0988

Path Diagram



Recommendations and Suggestions:-

- Through the statistical analysis it is evident that online learning has gained immense importance in education system by its acceptance by students and teachers as well.
- There are various multifaceted online learning mediums available according to learning pattern, teaching pattern, students' ability etc.
- Online learning mediums which would radically change the traditional pedagogy for prospective future technological change happening
- Students would benefit immensely with the integration of online learning as it would help them learn and grasp effectively
- Challenges of traditional pedagogy can be minimized or reduced
- Under the various available online learning mediums for students according to Factor Analysis explains that an online learning medium becomes relevant for students if factors of learning retention can be achieved, Quality learning to be achieved through better grasping of concepts, Improvement in presentation of work, Opportunities for practice and reinforcement and Skill upgradation are focused on.

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AN EMPIRICAL STUDY ON WORK LIFE BALANCE AMONG THE DEGREE COLLEGE TEACHING PROFESSIONALS IN NAVI MUMBAI

Prof. Dr. Aabha Maheshwari
MBA (Finance & Marketing), B.Ed, PhD,
Coordinator of Bachelor in Commerce (Banking and Insurance),
Tilak College of Science and Commerce, Vashi, Navi Mumbai)

INTRODUCTION

Work-life balance is a measurement of having adequate control over how, when, and where people work. A person can attain a healthy work-life balance when they are able to meet all of their needs in terms of their family, career, and society.

Clark (2000) defined Work-life balance as satisfaction and smooth functioning at work and home without any role conflict. The difficulty of striking a work-life balance is increasingly on the minds of employers and employees both inside enterprises and at home. In the quick-moving environment of today, human resource managers look for ways to boost their companies' bottom lines, boost employee happiness, keep on top of workplace trends, and retain people with vital company expertise.

All of humanity has been impacted by the novel coronavirus disease 2019 (COVID-19) pandemic, which has forced us to navigate a world we have never known before. Nobody could have predicted that this health crisis would keep us confined to our homes for more than a year and that it would have worsened the economy to the point that it appears like India has been transported back 20 years to its early stages of growth. Even the academicians weren't expecting such a radical adjustment. The entire work environment and processes were significantly impacted. Work from home as an alternative to physical labour was widely embraced and, as was expected, brought about a number of issues. Work-life balance is getting harder and harder to accomplish in the fast-paced business environment of today. Work-life balance has emerged as a key concern in the workplace in our society of competing obligations and commitments.

People today, especially in the fast-paced period of life, genuinely struggle to strike a balance between the demands of the workplace and the responsibilities of a homemaker, whether they are male or female. Time management and stress management are the two key problems that must be resolved to attain work-life balance, according to observations of many employees. Consequently, the demands of teaching professionals must also be taken into consideration in maintaining a balance between work and life. As a result, this study is conducted on the work-life balance of teaching professionals of degree colleges in Navi Mumbai region.

This study places a strong emphasis on the examination of the respondents' demographic

profiles and the association between these factors and respondents' attitudes towards teaching profession. This study also looked at the relationship between respondents' levels of job satisfaction and their attitudes towards work-life balance, as well as the significant differences between respondents' levels of attitude towards work-life balance and their gender, marital status, dependents and job satisfaction level towards the strategy to improve work-life balance at home.

REVIEW OF LITERATURE

Anshu Thakur and Vishal Geete (2014) in their study "A study on work – life balance of Female Employees in Education Sector" concluded that women are definitely facing difficulty in balancing their personal and professional life at the same time.

Adeeba Irfan & Dr. Feza Tabassum Azmi (2015) in their research paper entitled, "Work Life Balance among Teachers: An Empirical Study" constructs different dimensions to work life balance like Work Interference with Personal Life (WIPL), Personal Life Interference with Work (PLIW), Work Personal Life Enhancement (WPLE).

Mari S and Haja Mohideen O M (2015) says that faculties undergo severe stress while trying to balance their personal and professional life and continued work pressure resulted in poor performance in the institution as well in their personal life, in their empirical study "A study of work-life balance among the college teachers in Pudukkottai and Thanjavur districts".

Gayatri Pradhan (2016) in her study "Work-life balance among working women – A cross – cultural review" investigates that women are still struggling a lot with their personal and work lives in order to achieve a balance between both domains. As a result of the dominance of gendered work environment, women are unable to achieve equality though being educated, efficient and employed. They are not able to question or challenge the gender role assumptions, in spite they being highly educated.

Himangini Rathore Hooja (2018) in her study, "Work-Life Balance: An Overview" has focused on the importance of studying work-life balance in high-stress environments like police organisations, while also calling for more awareness of these concerns in developing nations.

Sumathi. V and Velmurugan R (2018) in their research work on "Work life balance of female faculty in arts and science colleges in Coimbatore District" concludes that women staff members balance their work and life responsibilities by working for additional hours by carrying out their allocated jobs in time. By carrying out their work in planned manner, female staff are able to manage their work and family commitments.

Muthulakshmi C (2018) in her research paper entitled, "A study on work life balance among the teaching professionals of arts and commerce colleges in Tuticorin District" briefly concluded that the modern social structures like; dual-earner couples, single parent, blended families, have somehow increased the complexities of the interface between work and life roles.

Dr. Balu L and Adrija Shivani (2019) in their study Work-life balance, a conceptual study discusses about using a range of motivating strategies to motivate individuals to perform their tasks quickly and successfully, organisations should consider Work centrality and other attitudes towards work. Employees should never experience stress before entering an organisation, while working there, or as they depart the organisation and return home, happy but aware that they must report to the place of wisdom the following day.

Suresh V. (2021) in his paper titled, Work Life Balance Among the Women College Teachers: A Study with Reference to Belthangady Taluk, concludes that the female faculties work-life balance is solely impacted by one aspect, namely, an excessive workload that forces them to work from home.

Kumari Rashmi and Aakanksha Kataria (2021) in their study, "Work–life balance: a systematic literature review and bibliometric analysis", gives a clear picture of the present dynamics and research diversity of the literature that has already been published in the area of work-life balance (WLB). Using bibliometric analysis, this work presents a methodical and critical analysis of WLB literature.

Sonal Gupta and Anshika Mittal (2022) in their paper Work Life Balance have focused that while work is vital, it is also important to prioritise your health, your home, and your family. Additionally, for a balanced life, happiness, rest, and enjoyment must be frequently experienced as they are too important components of our lives.

OBJECTIVES OF THE STUDY

1. To assess the relationship between the respondents' level of work-life balance and their demographics.
2. To investigate the relationship between different subjective variables and Work Life balance.

HYPOTHESIS

H01: There is no significant association between the level of job satisfaction, Personal satisfaction, happiness, stress levels, time to de-stress, work brought home and loyalty of the respondents and their level of attitude towards work life balance.

RESEARCH METHODOLOGY

Research Methodology is not only about the research methods but also about the logic behind the methods we use in the context of the research and explain why a particular method is used and why the others are not been used and that the research results can be evaluated not only by the researcher but also by others.

SOURCES OF DATA

1. PRIMARY DATA

Primary data are those which are accumulated in spite of any point of reference in actuality and which can be extraordinary in nature because of the way it is collected. Although, there are a number of techniques which were available for collecting primary information from academicians, employers and policy makers as well as students but for this research well-structured questionnaires were designed and used as prime survey instrument for data collection as the questionnaire addressed the issue of reliability of information by reducing and eliminating differences in the way the questions were asked, and how they were presented. In order to maintain accuracy of the data all close ended questions were included which could be easily understood and answered by the sample population.

SECONDARY DATA

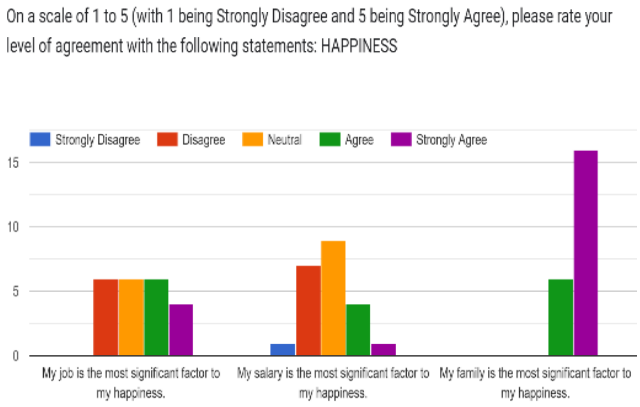
The secondary data were gathered from websites, books, magazines, and journals that had already been published. Literature was taken from the research journals to have an understanding of the research problem so that the gap in this exploration work could be identified and hypothesis could be framed.

RESEARCH DESIGN

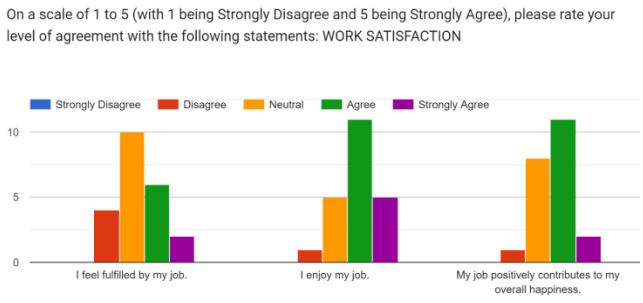
Research Design is a blueprint of exploration study which shows that what the researcher will do from composing the entire theory and its operational suggestions which can help the society at large and bring in a change. The structured questionnaires built a correlation with the objective and hypothesis of the research

study. The survey includes inquiries regarding personal information on the respondents and inquiries about factors influencing the work-life balance of teaching professionals in Navi Mumbai colleges. The study's sample size was 22 respondents. To choose the sample, stratified random sampling technique was used. The basic data were analysed using a variety of statistical procedures, including percentage analysis and factor analysis. The data were tabulated for effective analysis and simple interpretation in order to analyse the data and arrive at study findings.

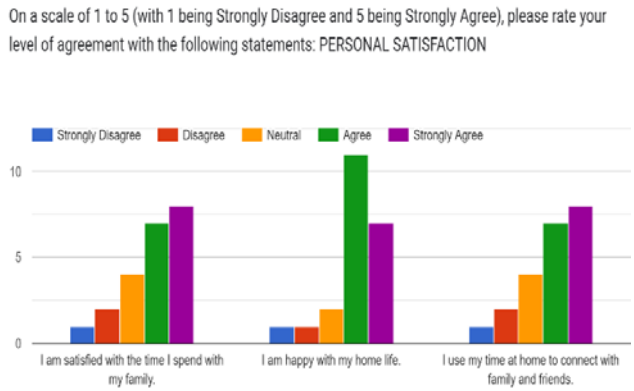
PERCENTAGE ANALYSIS



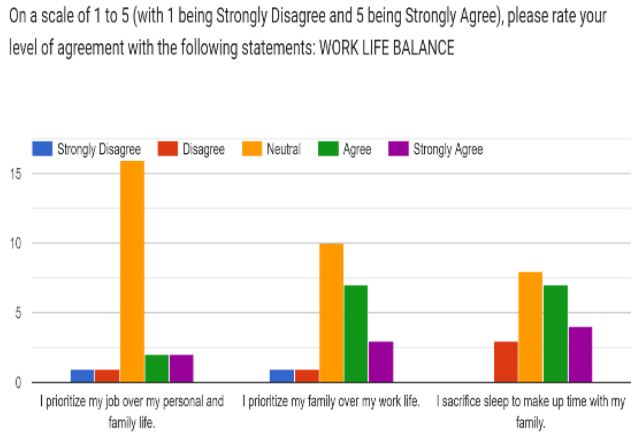
Almost 100% teachers strongly believe that their family is the most significant factor to their happiness.



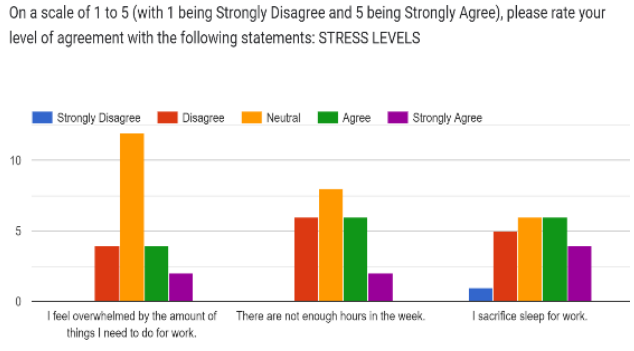
50% teachers agree that work satisfaction comes because they feel fulfilled by their jobs and they mostly enjoy their job. There are more 60% teachers those who agree that work satisfaction is received because their jobs positively contribute to their overall happiness.



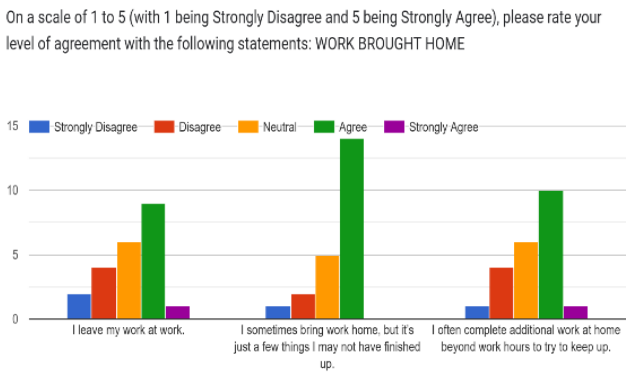
60% teachers are satisfied at personal level because they are happy in their family life which gives them personal satisfaction which contributes to Work Life balance.



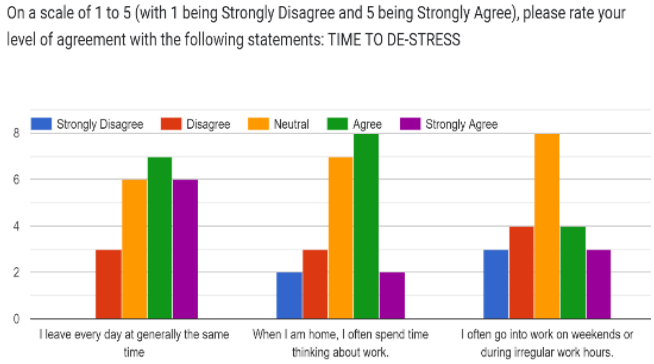
80% teachers have responded neutrally whether they prioritize their job over personal life and 30% of them feel they sacrifice their sleep to make up time with their family which affects their work life balance.



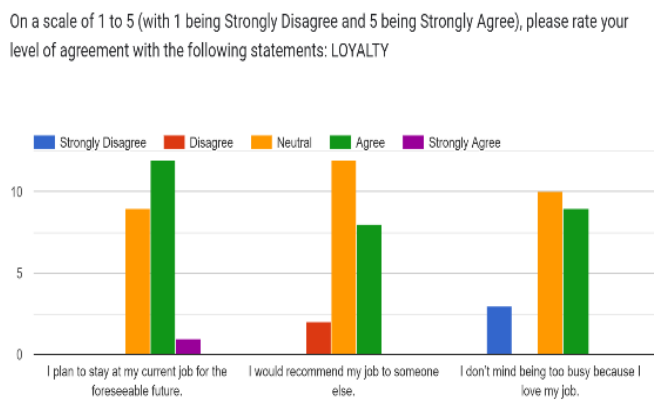
60% teachers are overwhelmed by the number of things they do for work which increases the stress levels.



80% teachers agree that they sometimes bring their unfinished work home and and often finish the additional work at home to meet the deadlines.

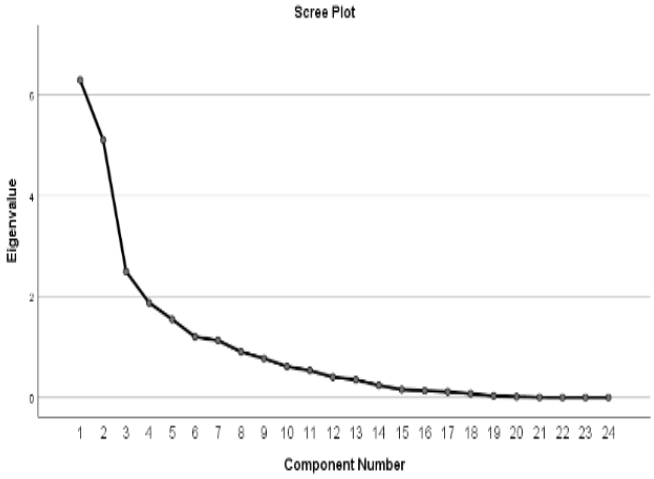


60% teachers agree that after going back home they often spend a lot of time thinking about work itself and there is no time to de-stress.



60% teachers plan to stay at their current job for the foreseeable future. 60% are quite neutral that they would recommend their job place to someone else which shows their loyalty and also don't mind being too busy because they love their jobs.

FACTOR ANALYSIS



Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.293	26.220	26.220	6.293	26.220	26.220	4.238	17.659	17.659
2	5.107	21.280	47.500	5.107	21.280	47.500	4.232	17.634	35.293
3	2.496	10.400	57.899	2.496	10.400	57.899	3.405	14.186	49.479
4	1.878	7.823	65.723	1.878	7.823	65.723	2.177	9.072	58.551

5	1.551	6.461	72.184	1.551	6.461	72.184	1.927	8.031	66.582
6	1.202	5.008	77.192	1.202	5.008	77.192	1.856	7.733	74.314
7	1.131	4.713	81.905	1.131	4.713	81.905	1.822	7.591	81.905
8	.906	3.775	85.681						
9	.773	3.221	88.902						
10	.613	2.556	91.458						
11	.534	2.225	93.683						
12	.404	1.682	95.365						
13	.352	1.466	96.831						
14	.239	.997	97.828						
15	.156	.649	98.476						
16	.133	.555	99.032						
17	.111	.463	99.494						
18	.075	.311	99.805						
19	.030	.125	99.930						
20	.015	.061	99.991						
21	.002	.009	100.000						
22	2.232E-16	9.300E-16	100.000						
23	1.286E-16	5.360E-16	100.000						
24	-6.909E-16	-2.879E-15	100.000						

Extraction Method: Principal Component Analysis.

a. There are 7 components extracted for all 24 iterations designed in the questionnaire.

Rotated Component Matrix[a]

Component

	1	2	3	4	5	6	7
HAPPINESS [My job is the most significant factor to my happiness.]	.776	.245	-.019	.495	-.109	.032	.024
HAPPINESS [My salary is the most significant factor to my happiness.]	.349	.172	.212	.788	-.096	-.123	.025
HAPPINESS [My family is the most significant factor to my	.171	.029	.706	-.479	.135	.017	.306

happiness.]"							
WORK SATISFACTION [I feel fulfilled by my job.]	.803	-.158	.006	.345	.225	-.090	-.140
WORK SATISFACTION [I enjoy my job.]	.780	-.068	.443	-.069	.009	.124	.060
WORK SATISFACTION [My job positively contributes to my overall happiness.)	.863	-.089	.034	.007	-.035	-.233	.069
PERSONAL SATISFACTION [I am satisfied with the time I spend with my family.]	.042	-.148	.727	.076	.005	-.515	-.070
PERSONAL SATISFACTION [I am happy with my home life.]	-.011	-.337	.826	.103	.139	.265	-.037
PERSONAL SATISFACTION [I use my time at home to connect with family and friends.]	.029	-.400	.812	.062	.089	.120	-.134
WORK LIFE BALANCE [I prioritize my job over my personal and family life.]	.350	.122	-.298	.667	.014	-.071	.271
WORK LIFE BALANCE [I prioritize my family over my work life.]	-.018	-.215	.371	.041	-.047	.022	-.771
WORK LIFE BALANCE [I sacrifice sleep to make up time with my family.]	.235	.794	-.120	-.008	.121	.308	.056
STRESS LEVELS [I feel overwhelmed by the amount of things I need to do for work.]	.119	-.033	.285	.268	.160	-.210	.697
STRESS LEVELS [There are not enough hours in the week.]	-.003	.693	-.494	.051	.158	-.234	.101
STRESS LEVELS [I sacrifice sleep for work.]	-.093	.865	-.229	.020	-.037	.195	.062
WORK BROUGHT HOME [I leave my work at work.]	-.241	-.233	.165	-.178	-.145	.688	-.161
WORK BROUGHT HOME [I sometimes bring work home, but it's just a few things I may not have finished up.]	.079	.031	.064	.113	.637	.614	-.095
WORK BROUGHT HOME [I often complete additional work at home beyond work hours to try to	.170	.407	.131	.200	.701	-.030	.398

keep up.]							
TIME TO DE-STRESS [I leave every day at generally the same time]	.092	.012	-.094	.231	-.880	.105	-.058
TIME TO DE-STRESS [When I am home, I often spend time thinking about work.]	-.069	.814	-.158	.130	.166	-.372	-.053
TIME TO DE-STRESS [I often go into work on weekends or during irregular work hours.]	-.027	.767	-.114	.085	-.112	-.383	.223
LOYALTY [I plan to stay at my current job for the foreseeable future.]	.769	.314	-.193	.199	-.051	.065	.282
LOYALTY [I would recommend my job to someone else.]	.536	.499	-.085	.115	.063	-.131	-.280
LOYALTY [I don't mind being too busy because I love my job.]	.546	-.264	.186	.451	.012	.080	.312

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Interpretation

These are the factors which has a strong impact on Work Life Balance among teachers of degree college.

Teachers are happy because their job is the most significant factor to their happiness.
There is work satisfaction as teachers feel fulfilled by their job.
They are satisfied with work as they mostly enjoy their job.
Get work satisfaction because their jobs positively contribute to their overall happiness.
Teachers plan to stay at their current job for the foreseeable future.
They would recommend their job place to someone else which shows their loyalty.
They also don't mind being too busy because they love their job.

CONCLUSION

Work-life balance is impossible to define in a way that applies to everyone or that encompasses its entire meaning. Furthermore, it is constantly evolving; what is appropriate today may not be appropriate tomorrow. Additionally, maintaining a healthy balance is important for everyone, whether they are teenagers, adults, or seniors. It is not just about allocating the same amount of time to all of your daily tasks and obligations with regard to your job; rather, it is about managing all of your life domains efficiently and effectively without compromising your physical, mental, or emotional well-being. But with this study we could analyse that there are few factors which can have a strong impact on positive work life balance among teachers which can be taken as a base by the Management of various institutions.

SUGGESTIONS

1. Evaluate the time when do you work best and make the most of that time and be productive.
2. Prioritize your work and manage it during the working hours so that there is no need to take your work home.
3. Take out time to socialize, connect with people which is very essential for mental health.
4. Work with the strengths of people those who are around you and seek support from them and actively support them as well.
5. Engage in self-care activities like meditation, yoga, reading, etc. to reduce stress and give time to de-stress yourself.

https://www.researchgate.net/publication/356266113_Worklife_balance_a_systematic_literature_review_and_bibliometric_analysis

LIMITATION OF THE STUDY

1. The scope of the study is limited only to teachers of degree colleges.

2. The study is limited to colleges in different regions in Navi Mumbai city only.

3. Primary data may not reveal exact details due to some personal bias.

4. Due to time constraints, data is collected from limited sample.

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UNDERSTANDING, 'THE ROLE OF CENSORSHIP AND ITS NECESSITIES IN OTT PLATFORM WITH THE PERSPECTIVES OF YOUNG ADULTS IN INDIA'

Prof. Shifaunisha Abdul Karim
Department of Multimedia & Mass Communication
Tilak College of Science & Commerce, Vashi.
E-mail: shifakarim.sk@gmail.com

ABSTRACT
Although the Internet was designed to be free, it is now restricted almost everywhere and extensively regulated in a few countries. The tug of war on the Internet between censors and anti-censors is intensifying. Censorship is the authority provided by the government or regulatory agency to limit access to particular material in an effort to preserve public harmony, national security, and peace. The freedom of speech and expression is guaranteed by Article 19 of the Indian Constitution, although it is fairly and sensibly constrained by Article 19(2).

Since OTT platforms are a relatively new form of entertainment, they are not subject to any laws or regulations, specifically in India. This research paper is centred to necessities of censorship in OTT Platform. Also, it examines young adults' perspectives on censorship. The young adults in the Navi Mumbai Area are the ones who provided the data. A Google form was used to build a structured questionnaire, which was then distributed online. The survey reveals that although young individuals are not aware of the rules governing OTT filtering, they are fairly conscious of the necessity for censorship. Purposive sampling was used as the sample method for this study in order to understand the association viewpoint of young adults and their requirement or necessity for OTT censorship.

Keywords: Censorship, OTT, Internet, Young Adults.

1. Introduction

1.1 Censorship

In the age of globalization and information technology, freedom of speech and freedom of sharing are increasingly facilitated. Accessing knowledge from the Internet has given a new direction of development. Every coin, however, has two sides. Several issues, including religious riots, the deterioration of moral norms, the damaging impact of terrorists and motivated dissidents on young people, have been brought about by the great system of knowledge sharing, access to information, freedom of expression, and methods of communicating messages. - sociological aspects. Hence, regulatory authorities must strategically regulate access to uninvited speech and communications in order to maintain control without interfering with the information base necessary for society's progress.

The notion of Internet censorship may be described as the control over what can be viewed, published or assessed on the Internet. Monitoring the availability of content on the Internet is the responsibility of governments, business organisations, and numerous regulatory

authorities. Censorship levels vary from country to country.

Some publications, films, newspaper scenes, hazy images of victims, age limitations for going to the cinemas, and particular pieces of art have all been outlawed due to insulting a certain age group, community, or religion. These are a few examples of censorship. The word "censorship" is derived from the Latin verb "censere," which meaning to judge, evaluate, or examine anything. Censorship is the act or process of removing, deleting, or containing something that might provoke social outcry. (Sriram & Sandhiya)

The suppression of speech, public communication, or other information on the grounds that the content is objectionable, risky, delicate, or inconvenient is known as censorship. According to Merriam Webster (Public Broadcasting Service, 2018). It is the limitation of material that has been determined to be improper for the general public to own or be exposed to through publication, transmission, or exhibition.

Encyclopaedia Encarta reports Censorship is the modern-day monitoring and regulation of the ideas and information that are spread across society. Censorship is the process of scrutinising media, such as books, journals, plays, movies, television, and radio programmes, with the goal of removing or changing anything that is deemed offensive. The offending content may be construed as immoral, indecent, heretical, blasphemous, seditious, treasonous, or endangering to national security (Public Broadcasting Service, 2018)

Censorship in India is crucial because of the multitude of religions, cultures, and races that call the country home. Because of this, we are known for our commitment to promoting unity in diversity. Censorship protects content creators by forbidding them from creating any materials that might offend their religious or cultural sensibilities, ensuring that no situation arises that might jeopardise national law and order or threaten the peace in the nation as a whole (Sharma, 2020)

1.2 OTT

The telecommunications industry began to build its existence; the value of OTTs increased exponentially. People tend to be more inclined towards OTT platforms and thus OTT platform regulations and related issues have also emerged.

Platforms for over-the-top media services (OTT) have grown in popularity in India during the past several years. Several filmmakers are already publishing their films on significant OTT platforms rather than waiting for the theatres to reopen as a result of the COVID19 epidemic in the nation. When it comes to OTT services, India offers a wide range of choices.

Because OTT is a relatively new phenomena, there is a tonne of development potential. The service is provided "over the top" of another platform. OTT replaces the traditional cable, broadcast, and satellite television platforms as the controllers or distributors of such content.

Yet, the matter of whether OTT material can be censored or is still open for discussion. How can be the OTT content regulated? The problems arose from the uneven spacing of the items online. The investigation on how to regulate this platform has been ongoing for the past decade.

Indian censorship's development

We've all observed the movie's age restrictions for theatre viewing, buzzer sounds that periodically interrupt the dialogue, and victims' photographs that occasionally appear hazy in newspapers and other daily periodicals. All of this has been restricted because it either directly or indirectly damages the sentiments of a certain

population. Censorship is what all of these signs are. **(Bhagavattula, 2020)**

Only through the open exchange of ideas can society advance. The assertion that free exchange of information, ideas, and viewpoints is necessarily has a profound value to it. Speaking and expressing oneself freely is essential to democracy.

India's film industry is seen to be the most efficient way to communicate with its audience in a language they can comprehend. The Indian cinema and theatre business employed street plays, motion pictures, colour pictures, television channels, cassettes, and DVDs before it began to transform into what it is now, owing to the creation and greater usage of internet streaming and OTT platforms. **(Bhagavattula, 2020)**

The Indian Constitution's Article 19(1) permits the expression of the viewer's perceptions through the medium of film. Because of its efficacy and depth, movies may operate as a separate medium and cannot be compared to reading books, magazines, or newspapers.

Also, the pandemic condition increases the number of users who watch these streaming services. In no time, the streaming service connects the nation's semi-urban areas to metro and metropolitan centres. **(Chen, 2017)**

Under the pretext of providing local content and audience choice, OTT platforms have been regularly using profanity, harsh language, soft pornography, and adultery. As OTT platforms are a relatively new type of entertainment, they are not subject to the same laws or regulations as in India. **(Aggarwal, 2021)**

As a result, in the current study, we examine how young adults see censorship.

2. Literature Review

(Dr. S. Dinesh Babu, 2021) In their study they advocate that OTT platforms created a heavy impact on the innovative drive to entertainment sector. Study analysed the different types of OTT platform censorship around the world, found that censorship has been conducted in different countries. This censorship regulations are compared to Indian regulations of OTT platforms which proceeded through quantitative analysis.

(Nagoriastha, "Censorship of OTT Platforms : A Boon or Bane") According to the current situation, a neutral regulatory body or authority is required since internet material cannot be regulated and decided by self-regulatory bodies. The major responsibility of this authority or body is to distinguish between appropriate and objectionable information. Total censorship of OTT platforms will turn those shows into mere television programmes because audiences today look for content that deals with socio-political issues and shows the truth of society. As a result, there needs to be a regulatory body that ensures that the feelings of one class of people aren't hurt. It also highlights the need for government and OTT platforms to sit down at a table and find a solution to the problem and put an end to this issue.

(Lexlife, "Censorship of OTT Platform – A Necessity") The reason OTT platforms have been uncontrolled for so long is largely due to the fact that filmmakers, directors, and producers use them. The government has repeatedly attempted to signal that the platforms should be regulated, but the OTT sector has been opposed, arguing that doing so may limit their creative freedom. As a result, many OTT platforms have signed self-regulation codes that allow viewers the authority to police themselves.

(Baidya, "How Censoring of OTT Platforms will Hamper art") It points out that community viewing is out of date and that censorship on

OTT platforms can limit the creativity of its directors and producers by preventing them from showcasing what they want to. It also takes note of the fact that the OTT business contributes significantly to the nation's economy.

Nowadays, every individual will have their own mobile and will be watching material through it, therefore they argue that regulation should not be implied since we are watching the content we desire, so there should be no restriction suggested on the content that might hinder the creativity of film makers and the business involved with it.

3. Statement Of The Problem

The study aims to understand the perspectives of young adults in context of censorship in OTT platforms, the study also would help to focus on the various factors that may have influenced to the use of these platforms. And why there is a need to censor the OTT contents.

3.1. Objectives

- Understanding the function of censorship in India.
- Assessing young adults' understanding of censorship.
- Gaining insight into how young people feel about censorship on OTT platforms are all goals.

3.2 Hypothesis

- **H0:** There is no necessities of censorship in OTT platform.
- **H1:** There is necessities of censorship in OTT platform.

3.3 Data Collection

The study takes into account the viewpoint of Young Adults to comprehend the necessity of censorship on OTT platforms. The information is gathered from Young Adults (18 to 25) in the Maharashtra State city of Navi Mumbai. A Google form was used to build a structured questionnaire, which was then distributed online. For the study, 81 total responses were gathered and utilised. The study has used both primary data and secondary data.

Primary data: the primary data has been collected through random sampling, from the sample respondents through the schedule with the help of a questionnaire which was distributed online.

Secondary data: the secondary data has been collected from standard reference book and various websites.

Tools used for analysis: The tools for data analysis are tables, graphs, pie charts.

Sampling Design: Purposive sampling technique has been opted here to get a sample that is most likely to provide information that will answer the research question.

Sample size: 81 Young Adults

4. Framework of Analysis

Respondent Gender

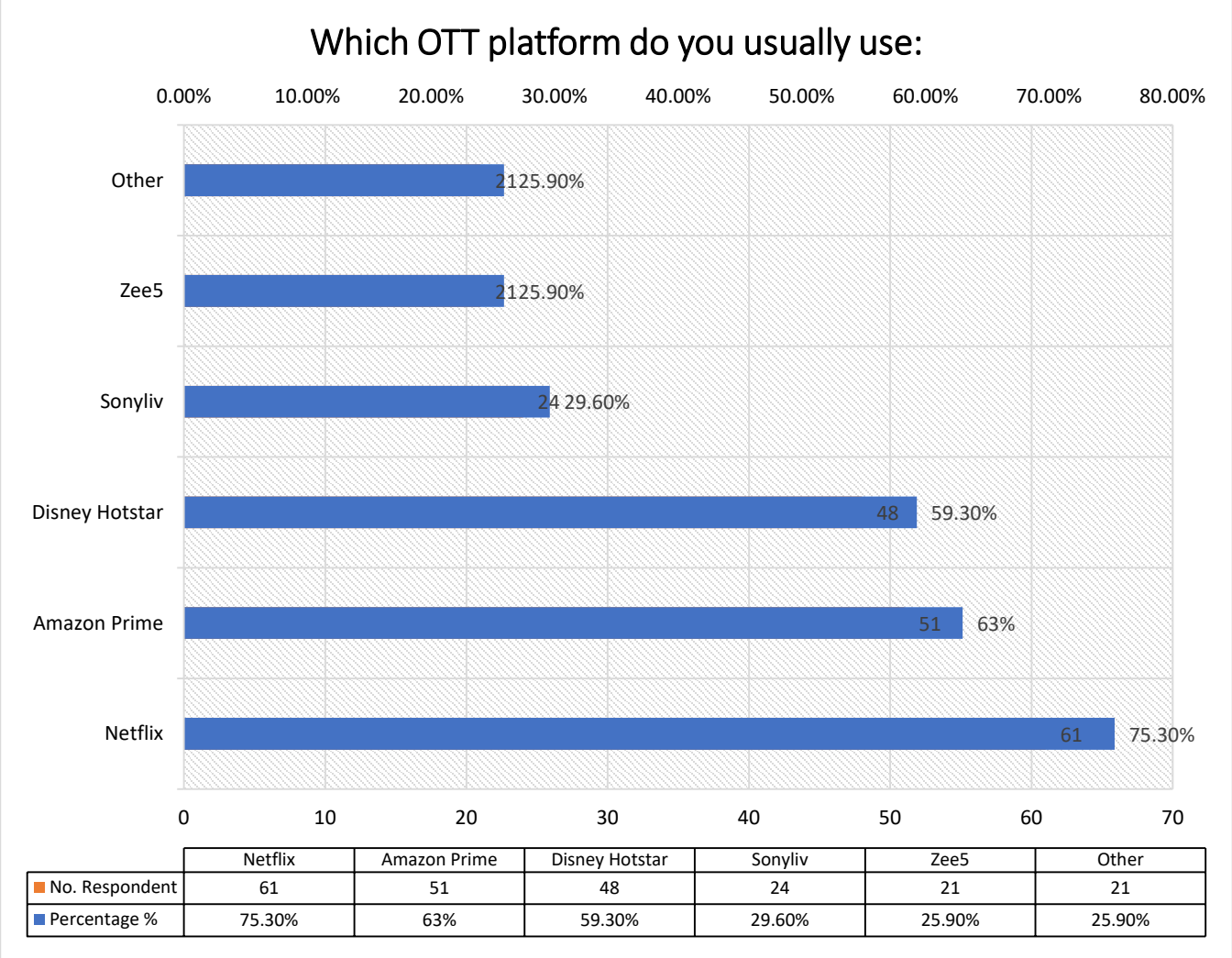
Gender	NO. OF RESPONDENT	PERCENTAGE %
MALE	45	55.6
FEMALE	36	44.4
Total	81	100

Respondent Age Group

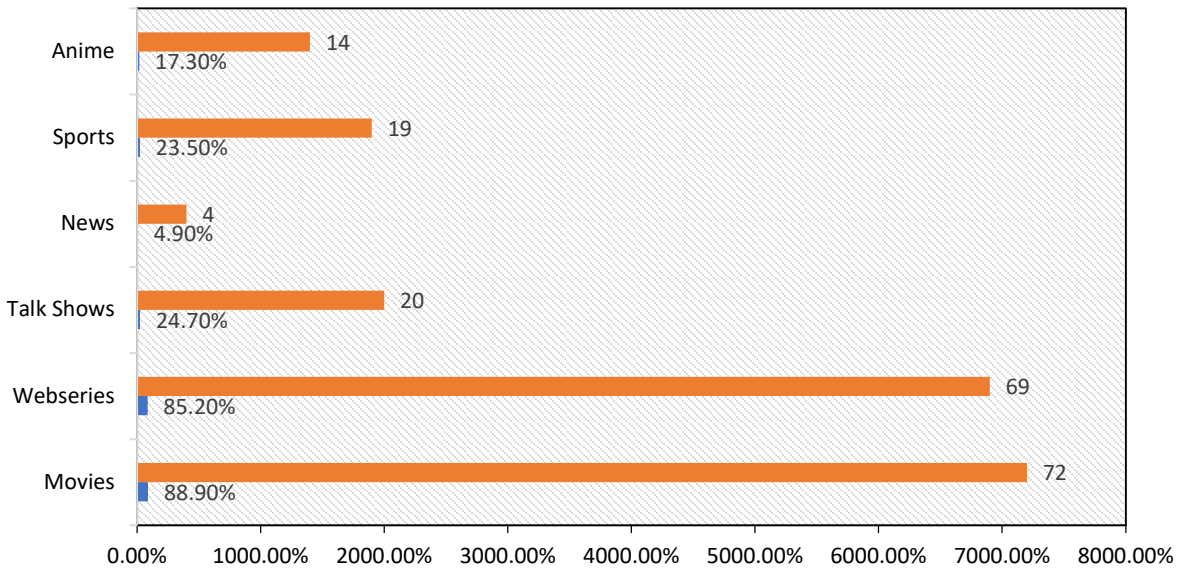
Age Group	NO. OF RESPONDENT	PERCENTAGE %
Group 1 – 18 to 21 Years	55	67.9
Group 2 – 22 to 25 Years	26	32.1
Total	81	100

Occupation Status

Occupation	NO. OF RESPONDENT	PERCENTAGE %
Students	61	75.3
Employed	20	24.7
Unemployed	00	00.0
Total	81	100

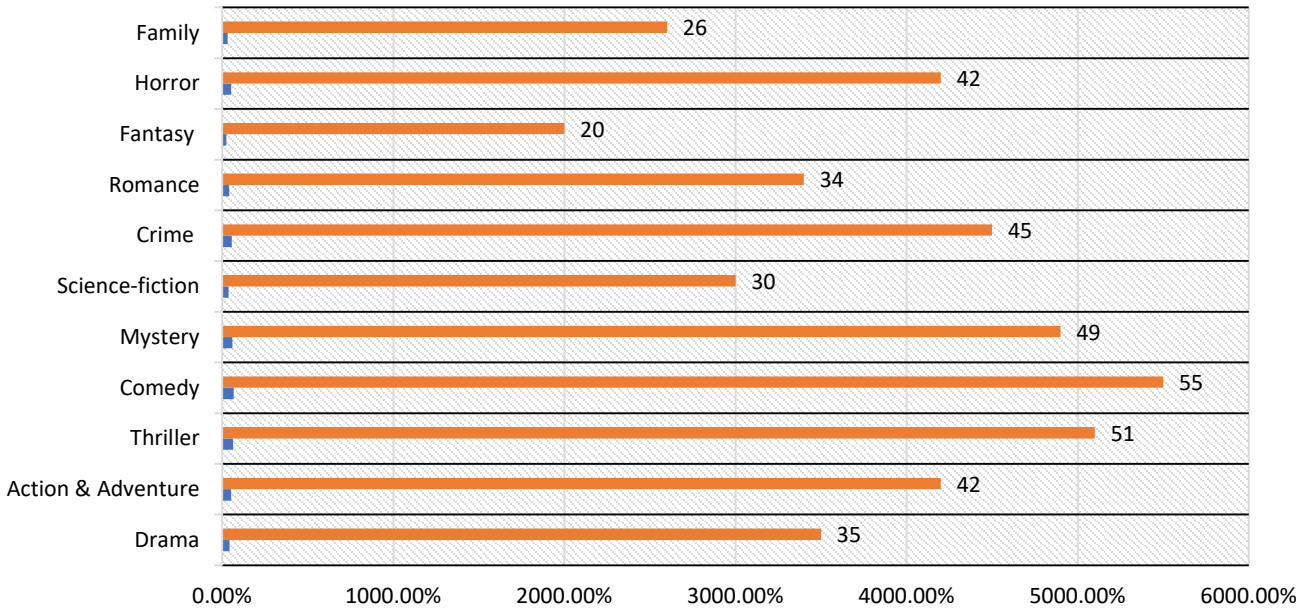


Preferred Category



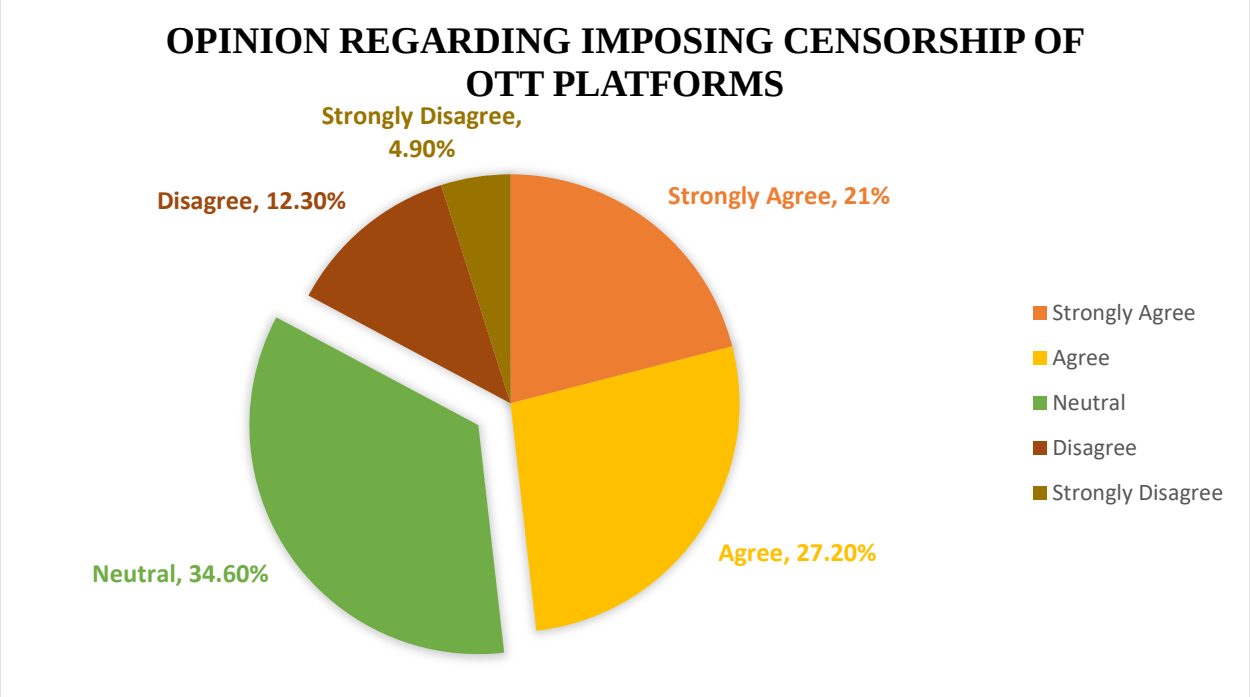
	Movies	Webseries	Talk Shows	News	Sports	Anime
No. Of Respondents	72	69	20	4	19	14
Percentage %	88.90%	85.20%	24.70%	4.90%	23.50%	17.30%

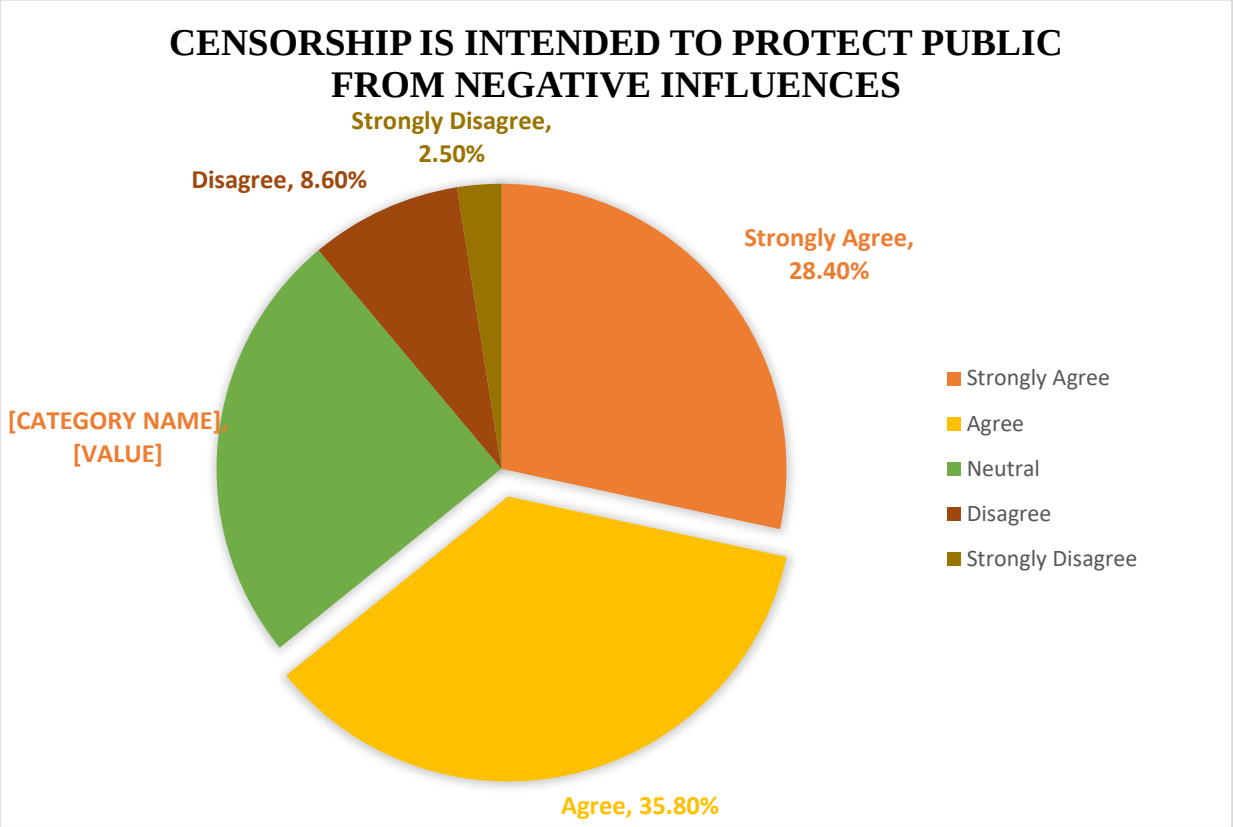
Preferred Genre



	Drama	Action & Adventure	Thriller	Comedy	Mystery	Science-fiction	Crime	Romance	Fantasy	Horror	Family
No. Of Respondents	35	42	51	55	49	30	45	34	20	42	26
Percentage %	43.20%	53.10%	63%	67.90%	60.50%	37%	55.60%	42%	24.70%	51.90%	32.10%

No. Of Respondents Percentage %





Censorship organisations should have more control over what is released to the public

Opinion	No. of Respondent	Percentage %
Strongly Agree	23	28.4%
Agree	27	33.3%
Neutral	22	27.2%
Disagree	5	6.2%
Strongly Disagree	4	4.9%
Total	81	100

The content limits which include filtering and blocking inappropriate content in Indian context are necessary?

Opinion	No. of Respondent	Percentage %
Strongly Agree	22	27.2%
Agree	22	27.2%
Neutral	28	34.6%
Disagree	6	7.4%
Strongly Disagree	3	3.7%
Total	81	100

Censorship in OTT Platform is necessary to control unwanted events/riot and protect moral in the society and country

Opinion	No. of Respondent	Percentage %
Strongly Agree	21	25.9%
Agree	25	30.9%
Neutral	28	34.6%
Disagree	7	8.6%
Strongly Disagree	0	0.0%
Total	81	100

If OTT Platform in India become fully censored it brings the positive changes and can control religion-based riots, antisocial activities and maintain culture and decorum of society.

Opinion	No. of Respondent	Percentage %
Strongly Agree	**20**	**24.7%**
Agree	**24**	**29.6%**
Neutral	**26**	**32.1%**
Disagree	**8**	**9.9%**
Strongly Disagree	**3**	**3.7%**
Total	**81**	**100**

Finding of the study

- 55.6% of the respondents were male and 44.4% were female.
- 67.9% of the respondents were from the Age group 1 – 18 to 21 Years, 32.1% of the respondents are from the Age group 2 – 22 to 25 Years.
- 75.3% are the students and 24.7% are working employed whereas 0% of respondents were unemployed.
- The most preferred OTT Platforms chosen by respondents were Netflix 75.3%, Amazon Prime 63%, Disney Hotstar 59.3%, Sony Liv 29.6%, Zee5 & Other Platforms with 25.9%.
- The Respondents most preferred category in OTT Platforms were, Movies 88.9%, Web series 85.2%, Talk Shows 24.7 %, News 4.9%, Sports 23.5% and Anime 17.3%.
- The respondents most preferred genre in OTT Platforms were, Comedy 67.9%, Thriller 63%, Mystery 60.5%, Crime 55.6%, Action Adventure 53.1%, Horror 51.9%, Drama 43.2%, Romantic 42%, Sci-fi 37%, Family 32.1% & Fantasy 24.7%.
- Majority of the respondents chosen to stay neutral with 34.6% in regards to impose censorship of OTT Platforms. In contrast, 27. 2% respondent agreed to impose censorship of OTT Platforms. Remaining respondents' details are mentioned in above Pie chart.
- 35.8% of respondents agreed to the statement of censorship is intended to protect public from negative influences whereas only 2.5% of the respondents opt to strongly disagreeing the given statement.
- 33.3% of the respondents agree to the statement of censorship organisations should have more control over what is released to the public. Whereas only 4.9% of the respondents strongly disagreeing it.
- It has been observed from the given data the majority of the respondents chose to remain neutral with 34.6% to the statement of content limits which include filtering and blocking inappropriate content. Where as 27.2% of the respondents are strongly agreeing to this statement.
- 34. 6% of respondents chose to remain neutral for the statement on necessities to control unwanted events/riot and protect moral in the society and country by imposing censorship on OTT Platforms, whereas, 30.9% & 25.9% of the respondents are staringly agreeing with the given statement.

- 32.1% of the respondents are neutral whereas, 29.6% & 24.7% of the respondents strongly agreeing to the given statement on censoring OTT Platform fully in India can bring positive changes, maintain culture and decorum of society.

Conclusion

The survey comes to the conclusion that young adults in India, regardless of their gender and age, are generally in favour of OTT censorship. They have a distinct understanding of what has to be done to manage riots motivated by religion, deviant behaviour, and preserve society's culture and decorum. Young adults who view OTT censorship as a weapon to protect national security and social components are abusing social media by using it as a platform to persuade young people in India to participate in such undesirable actions. As a result, implementing censorship in (OTT Platforms) doing this action could assist to resolve the problem. They also think that censorship encourages peace and equality.

We can draw the conclusion that restricting access will filter the material and provide citizens with only useful information. In the end, this won't have an impact on how knowledge is processed. As a result, a sizable portion of young individuals support OTT censorship**.**

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THE COMPARATIVE ANALYSIS OF LEARNING MATHEMATICS IN ONLINE VS OFFLINE MEDIUM

Author
Prof. Amrita Upadhyay
M.Sc. Mathematics
Tilak College of Science & Commerce, Vashi
E-mail: amrita.upadhyay2014@gmail.com.

ABSTRACT:
Mathematical thinking involves the ability to reason in rigorously composed stages, each related to the previous ones but also the ability to concentrate on long-term attention. Within the professional training of a teacher, two sides are combined: the scientific and the pedagogical. Online learning has become an increasingly popular mode of education in universities for all subjects including Mathematics, with the COVID-19 pandemic accelerating its adoption. This paper compares online and offline learning in colleges for the subject Mathematics, focusing on their respective benefits and challenges. The study analyzed primary data from surveys with students to gain a comprehensive understanding of both modes of learning of Mathematics.

Mathematics learning, on the other hand, offers a more traditional classroom experience, with opportunities for face-to-face interaction and problem solving on board. The paper concludes that each mode of learning has its strengths and weaknesses for any subjects including Mathematics, and that a blended approach may be the best solution for study of Mathematics in colleges. The study highlights the importance of considering the needs of both students and teachers when deciding on the mode of learning to implement for subjects like Mathematics.

Keywords: *Mathematic, online & offline learning, classroom experience.*

Introduction

Since the start of the global Coronavirus epidemic, the phrase "Pandemic" has taken on a more bittersweet meaning (also known as Covid-19). In December 2019, coronavirus, a fatal infection, was first identified in China. As it grew over time, it assumed the shape of a worldwide crisis. The world's ability to function regularly had been disrupted by an illness for the first time in many years. Due to the infection's extreme contagiousness, every nation implemented a nationwide lockdown. Since then, everything has gone online, including offices, classes, and grocery shopping. The "Pandemic" refers to changes in the way of living. Classes, tests, presentations, vivas, and other academic activities are all done online at schools and universities. Math education online involves taking classes online at a time and place that is convenient for both the teacher and the students. In contrast, face-to-face instruction between students and teachers occurs in the traditional learning system known as offline education. Both educational models have benefits and drawbacks.

The COVID-19 epidemic has accelerated the global acceptance of online mathematics education, making it a common style of instruction. Questions have been raised concerning the effectiveness of online learning compared to traditional offline learning, This

research aims to gather students' experiences with both online and offline mathematics education. This is real study on college students' experiences with online and traditional learning. Students were asked 10 questions as part of this survey on pupils. The All students are enrolled in degree-granting colleges and primary data has been obtained for this research article. 90 students in total shared their opinions about learning mathematics both online and offline.

Only a small number of schools and colleges provided their professors with training when they began teaching via the internet during the pandemic. The majority of professors lacked sufficient training, and the same is true of pupils when it comes to using internet platforms. Every day, both teachers and students spend time learning how to use online technologies more effectively. Many Mathematics home tuition classes, such as CUE-MATHS and 3-I math's and science classes, switched from offline to online during the pandemic by providing a little training; however, parents' satisfaction with online classes was very low. Many parents were completely dissatisfied with online classes, and this is a major area of research on Parents satisfaction on both online and offline classes.

Research Methodology:

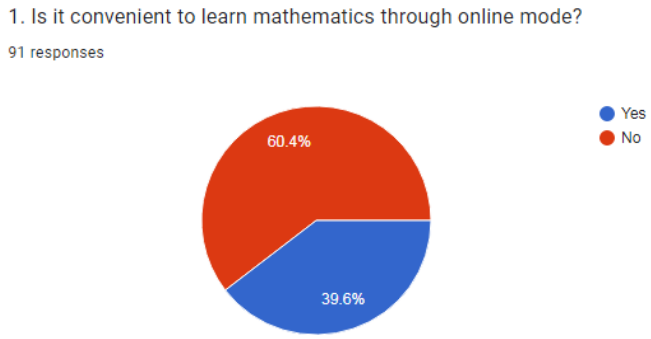
Research Techniques I employed primary data collecting to make my research fruitful and authentic. As we all know, primary data collection has several benefits. In this study, primary data is directly gathered from students who have taken mathematics courses both online and in person with the same teacher. As a result, it is more trustworthy and accurate than other sorts of data that are gathered through surveys using Google forms.

I gathered my sample via purposeful sampling, which is a common practise in qualitative and mixed-methods research. We are aware that using this sample will enable us to find situations with a wealth of information or to make the most of our limited resources. My sample of students included college students majoring in mathematics. Their opinions are valuable since they are genuine fresh and experienced samples who have studied mathematics in both online and offline modes. The sample's age ranges from 17 to 21year old of Navi Mumbai city, and both sexes are represented, however there are somewhat more girls than males. Examples of my research come from the four departments of computer science, information technology, commerce, and management studies.

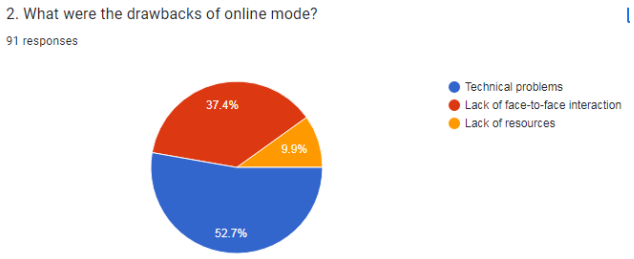
This research article analyses the data based on the student-reported questions. These straightforward research-related questions allow for the conclusion of the study.

Research Observation

In this section of the study, data from a question that was posed to students is displayed along with a graphical depiction, and an explanation of the data is provided underneath the question.

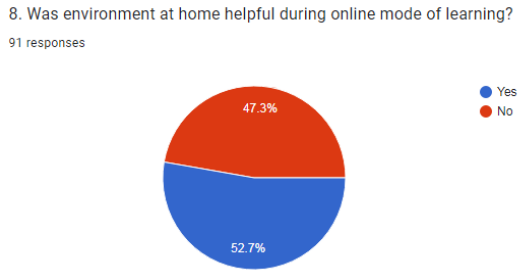


Results for the aforementioned question indicate that the majority of students prefer offline study methods over online ones when learning mathematics. 55 pupils (60.4%) in the pie chart above completely rejected using the internet to learn math concepts.

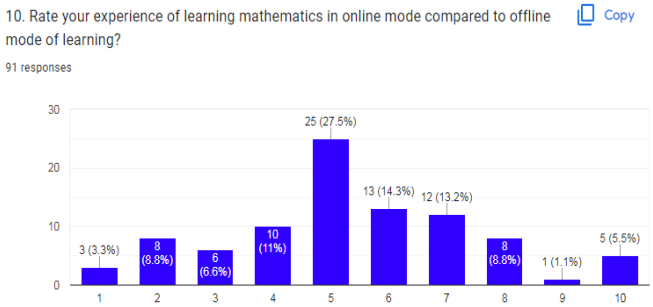


As you can see from the pie chart, the majority of students gave their opinions on technological issues, which was a major reason why they rejected the online form of study for learning mathematics. There were three options available to the students for the aforementioned question. Ten students, or around 10% of the class, choose the option "lack of resources," which means that, of the 91 pupils, 10 were Gaged-free. 37.4% of students reported that they did not interact with their teachers in person.

In response to the sixth research question, which concerned the students' study habits, 65 of the 91 participants in the study spent fewer than two hours per week studying mathematics. Students who opted to spend more than five hours a week on arithmetic are extremely rare. Math studies take up 26.4% of students' time.



The atmosphere of the location of study was the subject of the eighth and most crucial research topic. Environment has a significant impact on everyone's quality of life. According to servey data, a lot of students found the surroundings unhelpful when studying online. Out of 91 pupils, 48 claim that their home situation was a major obstacle to their ability to concentrate on their studies throughout the pendemic. Chattering, mixer noise, utensil noise, and tiny child noise all contribute to an unfriendly environment that makes it difficult to study arithmetic at home.This is the conclusion of the eighth question.



In the image above, a bar graph depicts how they found online versus offline learning to be generally more effective for math. According to the graph above, out of 91 pupils, 64 had ratings greater than 5, while 27 received ratings below 5. Three students in all gave this question a rating of 1 out of 91, even though five students were given a score of 10.

Generalization and Interpretation

Based on the results of the research, the following recommendations are made for the education:

1. Provide students with a choice between online and offline learning, considering their individual needs and preferences.
2. Invest in the development of high-quality online resources, including multimedia materials and online discussion forums, to enhance the online learning experience.
3. Provide training for instructors to effectively teach online and facilitate interaction with students.
4. Offer opportunities for face-to-face interaction and hands-on learning, to maintain the benefits of traditional offline learning.
5. Monitor and evaluate the effectiveness of both online and offline learning and adjust

as needed to ensure that students receive the best possible education.

Conclusion

In conclusion, this study provides valuable insights into the benefits and challenges of online and offline learning in universities and highlights the importance of considering the needs of both students and teachers when deciding on the mode of learning to implement. A blended approach may be the best solution for universities, as it allows for the benefits of both online and offline learning to be realized.

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WOMEN EMPOWERMENT IN THE COMMUNITY

Aarti Bhanushali
Tilak college of science & commerce.
Mob.: 7208168339

ABSTRACTS:
Women's empowerment can be stated as promoting women's sense of self-pride, ability to determine their own choices, and right to determine social change for individuals and others. Women's empowerment could be defined in five separate categories that are social, educational, economic, political, and psychological. Empowering women and closing the gender gap is central to ending poverty, improving food security, improving health, and reducing inequalities.

Empowering women is essential to the health and social development of families, communities, and countries. When women are living safe, fulfilled, and productive lives, they can reach their full potential. Women empowerment helps boost women's status through literacy, education, training, and awareness creation. Women are the primary caretakers of children and elders in every country of the world.

Objectives:
women's empowerment is to ensure equate right for women, to make them confident, and freely live their life with self-respect and self-dignity

The present paper is an attempt to analyze the status of women's empowerment in the community using various indicators like women's household decision-making power, financial autonomy, acceptance of unequal gender roles, access to education, and the experience of domestic violence.

Keywords: *women empowerment, financial autonomy, community.*

Introduction
Most females are not involved in economic and political decision-making, equitable involvement in the formal economy is constrained, less salary, and have unequal distribution of assets and property. Moreover, for a huge portion of women, the day when she gives birth becomes the most dangerous day of her life. Inequalities are seen in all the nooks and corners of the world which differ from country to country and region to region. The impediments and imbalances that women and girls experience frequently arise as they do not have control over their own lives and futures and are mainly due to gender inequalities in power relations. Women empowerment can only be achieved if from the very basic we nurture our children without any gender bias during their developmental stage by providing appropriate training, education, awareness, building self–confidence to women and girls, also providing them free reign to expand their choices, strengthen their voices and transforming power to claim they'reright in the society, community and in their own lives

Empowerment
Empowerment means the power to take decisions by their own will. The word empowerment is associated with all kinds of power to take decisions like household decisions, and financial autonomy. empowerment provides power to take decisions for individuals, communities & society.

Empowerment is a powerful process to utilize our power to make decisions for society.

Women empowerment

empowerment consists of three factors voice, and power. Empowerment of women means gaining more authority and charge over their own life.

Women's empowerment is a significant step toward achieving gender equality. As a result, women's empowerment can be considered as a significant step toward achieving gender equality, which is defined as "individuals' rights, duties, and opportunities will not be determined by whether they are born male or female."

An empowered woman, according to the UN Population Fund, has a sense of self-worth. She has the ability to make her own decisions and has access to opportunities and resources that provide her with a variety of possibilities. Legislative, educational, political, and economic systems all help to institutionalize gender role expectations.

Reservation in the Panchayats was viewed as a noteworthy milestone during the time spent empowering women in India. Empowerment of women is essential for maintaining the economic development of the nation when 50 percent of the populace comprises of ladies. As Ex-President A.P.J. Abdul Kalam stated that empowering women is essential for making a decent country, when women are empowered,ae society with stability is guaranteed

Characteristics of Women's Empowerment

1. Women empowerment is a process of acquiring power for women in order to understand their rights and to perform their responsibilities towards themselves and others in the most effective way.
2. Women empowerment provides greater autonomy to women.
3. Women empowerment means women's control over material assets, intellectual resources, and ideology.
4. Women empowerment occurs within sociological, psychological, political, cultural, familial, and economic spheres and at various levels such as individual, group, and community.

Importance of women's empowerment

Education is one of the most important means of empowering women with the knowledge, skills, and self-confidence necessary to participate fully in the development process.

Empowering women in such a way that they can take the best decision in financial activity for their household decisions. Both genders are working equally but when it comes to managing finance women are the best decision maker.

Empowering women with financial autonomy is an important factor. Certain factors affect this variable like gender bias, and male dominance in society.

Various Indicates of Women's Empowerment

1. Household decision-making power:
2. In recent scenarios, even men & women are working together equally but when it comes to paying level equality society considers women as only able to handle household & domestic responsibilities. She is managing every responsibility Then too she is not part of household decision-making.

3. Financial autonomy: there are women who are earning financially independently still they don't have financial autonomy just because men are earning more as compared to women.

4. Acceptance of unequal gender roles: Often women and girls are confined to fulfilling roles as mothers, wives and caretakers. Gender norms position girls as caretakers, which leads to gender inequality in how roles are distributed at the household level. This also results in a lack of education due to the restriction of outside opportunities.

5. Access to education: this is another indicator to measure the level of women's empowerment. There are some women's they unable to get higher education due to financial instability, restrictions to travel, and early marriage.

6. Violence against women: violence means strength of emotion or of a destructive natural force. Violence takes place at the domestic level, human trafficking is a variable that affects women's safety.

3.3.Government Schemes for Women Empowerment The Government programs for women's development began as early as 1954 in India but the actual participation began only in 1974. At present, the Government of India has over 34 schemes for women operated by different departments and ministries. Some of these are as follows;

1. Rastria Mahila Kosh (RMK) 1992-1993

2. Mahila Samridhi Yojana (MSY) October, 1993.

3. Indira Mahila Yojana (IMY) 1995.

4. Women Entrepreneur Development program has given top priority in 1997-98.

5. Mahila Samakhya is being implemented in about 9000 villages.

CONCLUSION

Women empowerment refers to increasing the spiritual, political, social, educational, gender, or economic strength of individuals and communities of women. Women's empowerment in India is heavily dependent on many different variables that include geographical location (urban/rural) educational status social status (caste and class) and age. The Empowerment of Women has become one of the most important concerns of the 21st century not only at the national level but also at the international level. Government initiatives alone would not be sufficient to achieve this goal. Society must take initiative to create a climate in which there is no gender discrimination and women have full opportunities of self decision-making and participating in the social, political, and economic life of the country with a sense of equality.

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POST COVID WRITTEN (OFFLINE) EXAMINATION FEAR IN DEGREE COLLEGE STUDENTS OF NAVI MUMBAI

Shikha Mukesh Shrivastav
M. Com; NET, Assistant Professor, Tilak College of Science and Commerce, Vashi, Navi Mumbai. Mob- 81404746079, E-mail- shikhashrivastavsai@gmail.co

ABSTRACT
COVID-19 had drastically affected life of every people, business, institution, industry and society at large. An unplanned pandemic which caused many problems related to stress, anxiety, overthinking, psychological and cognitive changes, etc.

Pandemic started from end of year 2019 and continued for almost two years. A complete lockdown and social distancing was only cure to stop outbreak of pandemic. Because of pandemic campus were closed of almost all colleges and universities, teachers-students interaction, learning, examination and evaluation were all done through online mode with the help of various technologies. This pandemic had drastically affected the life of students, their habits and academic performance. This research were undertaken to understand students perspective towards online and offline examination and challenges which are faced by them in offline (written) examination.

Through conducting a survey of 119 students, majority of students were agreed their academic performance was impacted by COVID 19 pandemic and they are still facing issues related to writing speed, time management, grasping and remembering the concepts in written (offline) examination post COVID-19.

Keywords: *COVID- 19 PANDEMIC, WRITTEN (OFFLINE EXAMINATION)*

INTRODUCTION:

COVID-19 PANDEMIC

COVID-19 was an unknown and unplanned threat which has been faced by almost all country in the world. India is also among the worst hit country. COVID has impacted almost all life. The life style of all the human beings has been changed drastically through this pandemic. Many people had become jobless due to pandemic and had faced the financial crisis.

Due to COVID-19 pandemic GDP of almost all the country has affected. Due to this pandemic period people has realized the importance of technology and digitalisation. Where social distance has become the life style of the people and almost everything turns out to be done through digitally.

India is one of the largest populated country had managed this pandemic very well. Yes, the issues and problem which has been faced by migrant cannot be ignored but overall, it has shown and created a good image in managing the pandemic with less resources and with over population. Almost every sector of India has been impacted through this pandemic.

INDIAN HIGHER EDUCATION SYSTEM:

India being a highly populated country had occupied a significant position in the global education industry. India is recognized as one of the largest networks of institution of higher

learning. Education sector of India provides numerous opportunities for growth and advancement. Government of India had also taken various initiatives to promote education sector. India had 38.5 million students which had been enrolled for higher education in 2019-20. The union Budget of 2023 presented by finance minister Nirmala Sitharaman have kept set aside of Rs 1.12 lakh crore for education with special focus on teachers training and development. National digital library of India a initiative of IIT (Kharagpur) and sponsored by Ministry of Education provides a quality of information and books to youngster digitally.

Higher education is also called by different names such as post-secondary education, tertiary or third level education. In terms of students India ranked as third largest next to China and the United States. In India there is 100% FDI approval through automatic route. Higher education is the shared responsibility of both centre and states, Department of higher education, Ministry of education is responsible for the overall development of the basic infrastructure of higher education sector, both in terms of policy and planning.

Challenges which are commonly faced by higher education sector in India is low GER, underdeveloped infrastructure, faculty shortage, outdated curriculum, low level of PhD enrolment, etc.

COVID 19 IMPACT ON HIGHER EDUCATION SYSTEM OF INDIA:

COVID-19 pandemic had drastically impacted almost all human aspect. Higher education sector was also greatly disturbed from this pandemic. Over worldwide college and university campus were closed and teaching- learning were forced to move online. Pandemic forced the people to realize the importance of technology. During pandemic education imparted to students through online mode. It can be rightly said if there is no technology, we can't imagine an education in pandemic. Educational sector was steering forward today with the use of technology and innovation.

Demand for online learning were increased during pandemic, online interaction was only one mode were students and teachers can interact in pandemic.

Government of India has also taken various initiative to promote online learning and higher education in pandemic through various schemes. The greatest challenge for e-learning in India is low internet penetration and fear of use of technology. Including rural and backward people in e-learning environment and by providing proper training in the use of technology can enhanced overall higher education system of India.

IMPORTANCE OF EXAMINATION AND EVALUATION:

One of the proverb of our great leader 'DR. A P J Abdul kalam- " Man needs his difficulties because they are necessary to enjoy success." Had truly highlighted the importance of examination and evaluation. Examination is an integral part of learning process. Examination builds confidence and improve other cognitive skills of the students.

One of the great saying is that life is an examination, those who have talent and ability to face will succeed in all paths. Through examination, teachers can judge individual ability of students and understanding of a students related to subject. Examination creates a positive competition within a students and they try to work hard to score good marks and succeed. It is a tool to understand students' knowledge and skills.

There is always a debate about examination, some people are of view that examination create stress and anxiety in students but nevertheless examination is should not be considered as only criteria to judge students' ability rather a piece of paper which promote development and strong competition within a student.

STATEMENT OF THE PROBLEM:

Due to COVID 19 pandemic, students writing skills and cognitive skills have been impacted. Pandemic phase started from end of 2019 and continue for almost two years. All campus of colleges and university were closed during this pandemic. Examination and evaluation almost for all colleges and university were done through online mode using various technology. After opening up of colleges in post pandemic and restarting with old offline methods of evaluation students are facing difficulties like with writing speed, comprehending the answer and remembering the concepts. This research will help to understand students perspective towards written examination and difficulties which are facing by them.

RELEVANCE OF THE STUDY:

This study will helps us to understand problems which had been faced by students of degree college while writing written (offline exam). Students' perspective towards online and offline exam. This study will also provide insights about what students need from college and teachers side to boost their confidence and rebuild a positive attitude towards examination.

OBJECTIVE OF THE STUDY:

- To understand students' perspective towards written examination.
- To understand problem and difficulty faced by degree college students in written examination.
- To compare prior and post COVID attitude of students towards written examination.
- To study the transformation of education sector from chalk & board methods of instruction towards technology enhanced instructions.
- To know the student's psychological behaviour towards written examination.

SCOPE AND LIMITATION OF THE STUDY:

SCOPE:

- The study is related to understand degree college students' attitude towards offline (written examination) and problems which are faced by them Post COVID-19 pandemic.
- The main cause of the study is to find out the ways and methods which can be used by teachers to improve students writing and comprehensive skills and reinforce a positive attitude towards written (offline) examination.

LIMITATION:

- The study is limited to Navi Mumbai Students of degree college.

STATEMENT OF HYPOTHESIS:

The hypothesis is an uncertain proposition formulated to determine its validity.

- Students are facing challenges of learning losses and reduced academic skills post COVID-19.
- Students face a problem to comprehend and write precisely an answer to a given question post COVID-19.
- Students writing skills and vocabulary skill are seriously affected due to pandemic.

RESEARCH METHODOLOGY:

The study will be qualitative, analytical and quantitative in nature which will help us to understand in dept about research topic.

PRIMARY DATA:

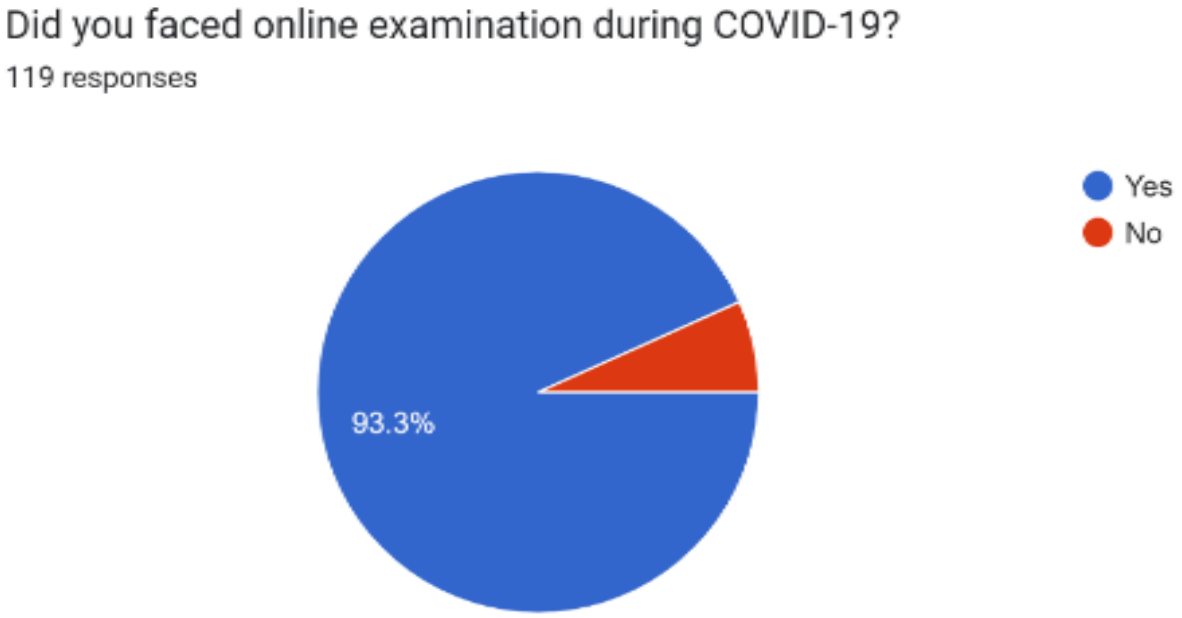
Primary data provide first-hand information. The primary data for this research had been collected from google forms. The data for this research had been collected from 119 respondents which were the students who are pursuing graduation and post-graduation from Navi Mumbai colleges and university.

REVIEW OF LITERATURE:

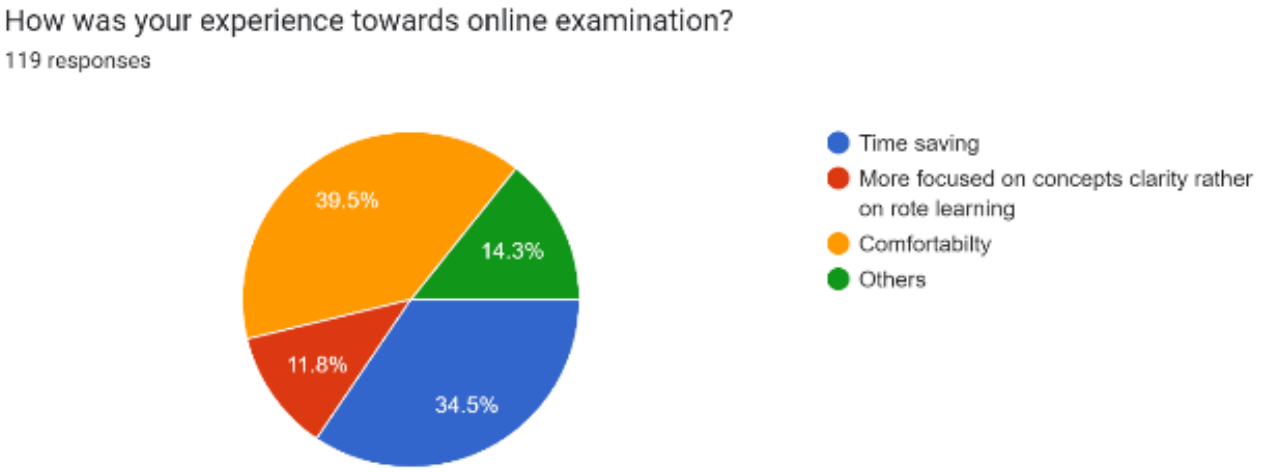
Preeti Tarkar had published its article on International Journal of Science and Technology have discussed about Impact of Covid-19 Pandemic on Education System and had concluded that the closure of schools, colleges and universities is interrupting the learning of students and also disrupting the internal assessment and public assessments for qualifications. The traditional method of teaching has been replaced by the online teaching.

Paper published by **Pravat Kumar Jena** on September 14, 2020 in International Journal of advanced Education and Research on topic "Impact of Covid-19 on Higher Education in India" had concluded that Virtual education is the most preferred mode of education at this time of crisis due to the outbreak of Covid-19. The post Covid-19 education seems to be an education with widely accepted online/virtual education which may perhaps be a parallel system of education.

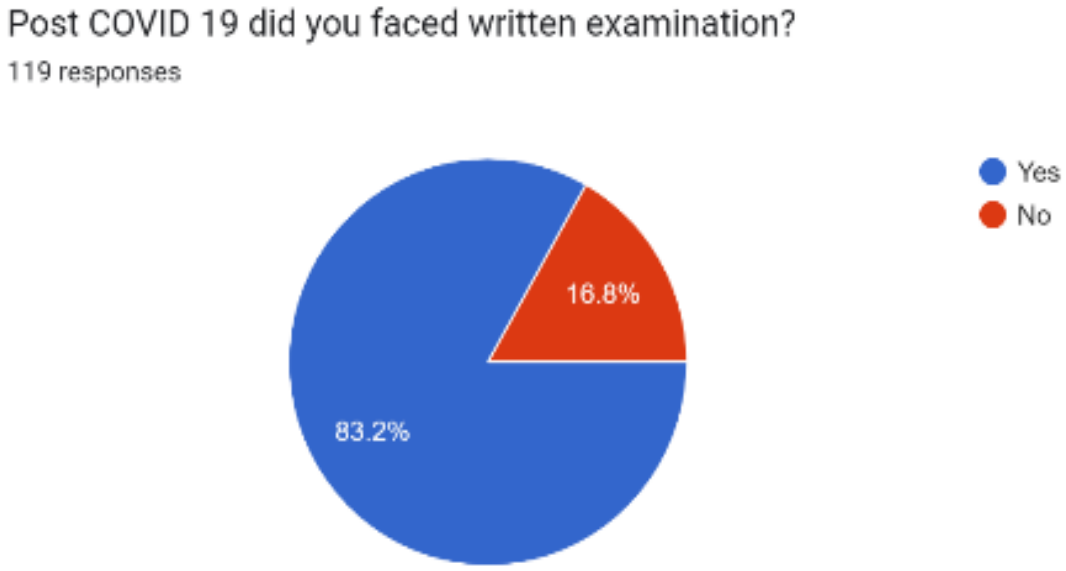
DATA ANALYSIS AND INTERPRETATION



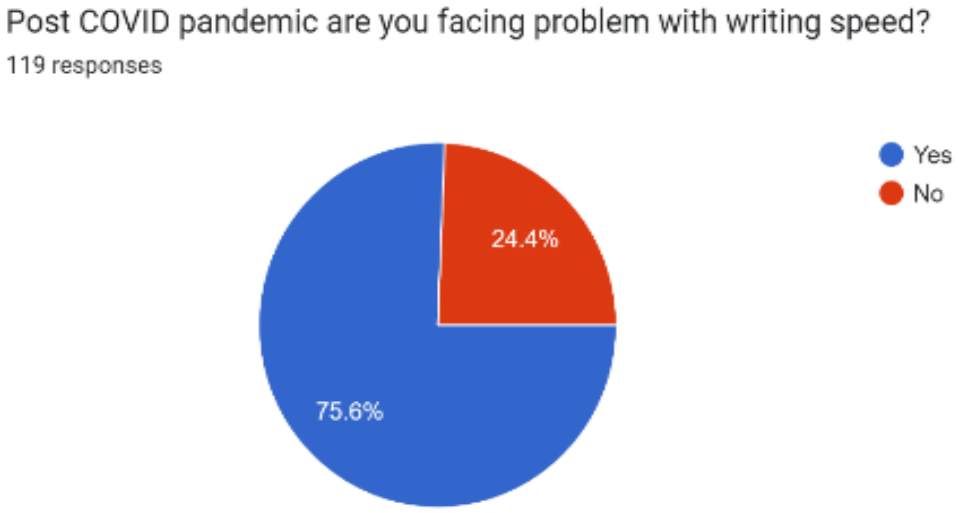
Yes	93.3% (111 respondents out of 119 respondents
No	6.7% (8 respondents out of 119 respondents



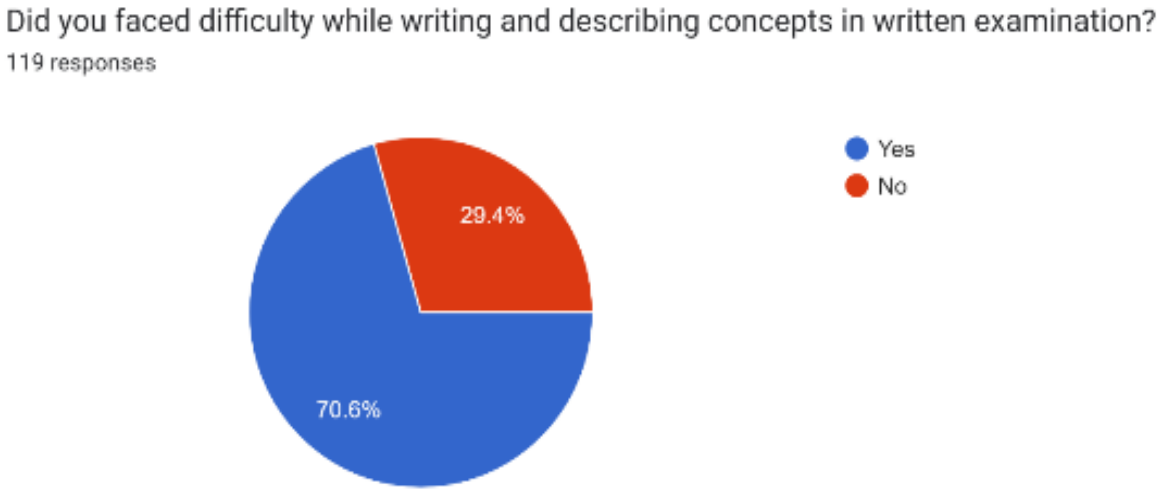
Time Saving	41 respondents
More focused on concepts clarity rather on rote learning	14 respondents
Comfortability	47 respondents
Others	17 respondents



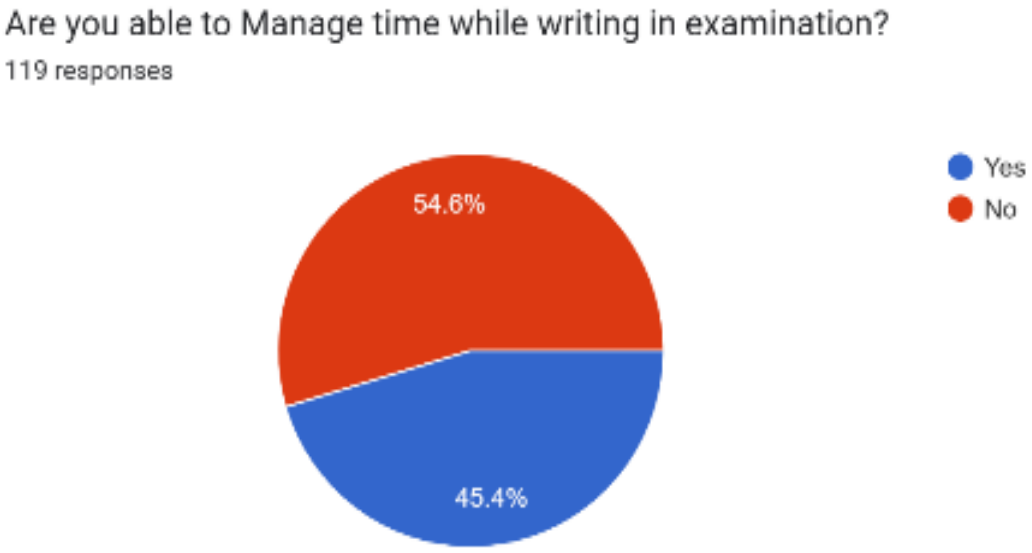
Yes	99 respondents
No	20 respondents



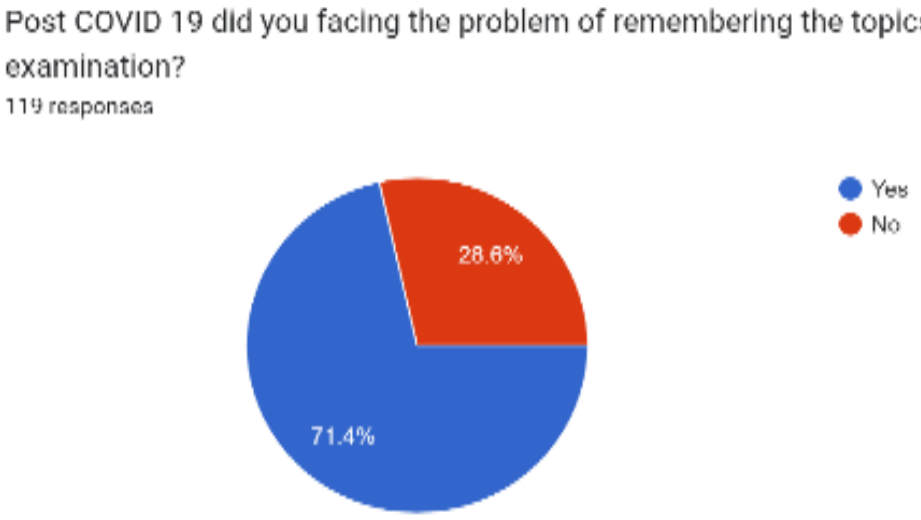
Yes	90 respondents
No	29 respondents



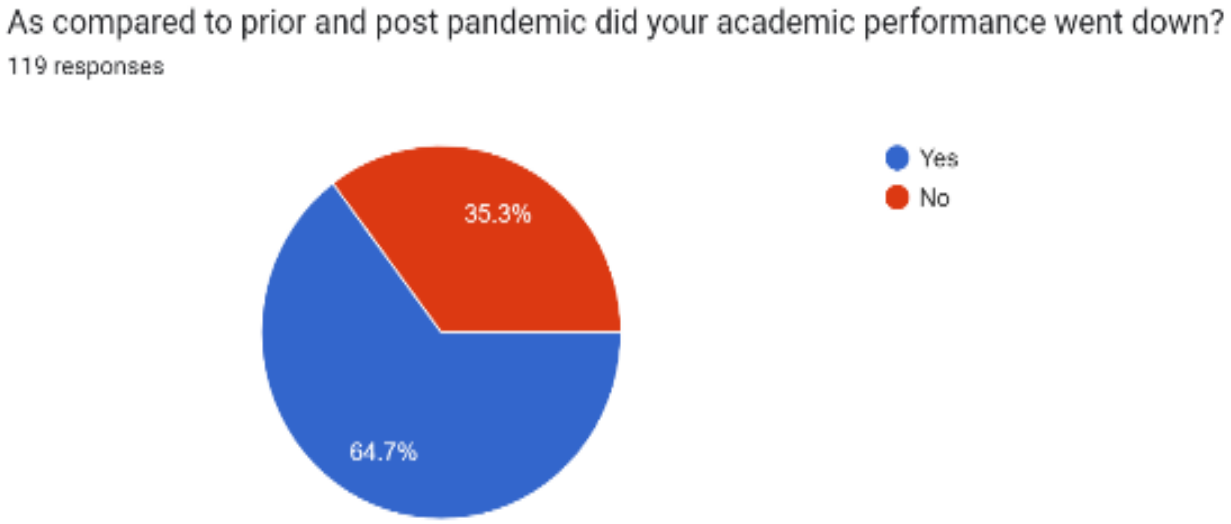
Yes	84 respondents
No	35 respondents



Yes	54 respondents
No	65 respondents



Yes	85 respondents
No	34 respondents



Yes	77 respondents
No	42 respondents

Being a student, what you need from teachers end to improve your confidence towards offline (written examination)?

Explain the concept in detail n in simple words give question paper to solve so that we may get a practise

For at least 6months 30min extra time should be given for examination

Explain the concept one day before exams
I want a written exam. If concept is not clear or can't write it's ok. Offline exams can help up many students as time managing, increasing writing speed etc.

Words of motivation are required from the teacher's end.

More practical teaching method then theoretical method

Set the papers conceptually and expect the explanation of concept rather than expecting worldwide knowledge in one question

Change in paper pattern as it is very difficult for us to write down 8 questions (4 questions of 7 marks each and 4 questions of 8marks each) in 2 hrs it would be great if you could add on some objectives in it. Secondly please provide us with question bank and simplified notes.

The teachers should give tips about from where to start the written examination so we can finish our exam on time

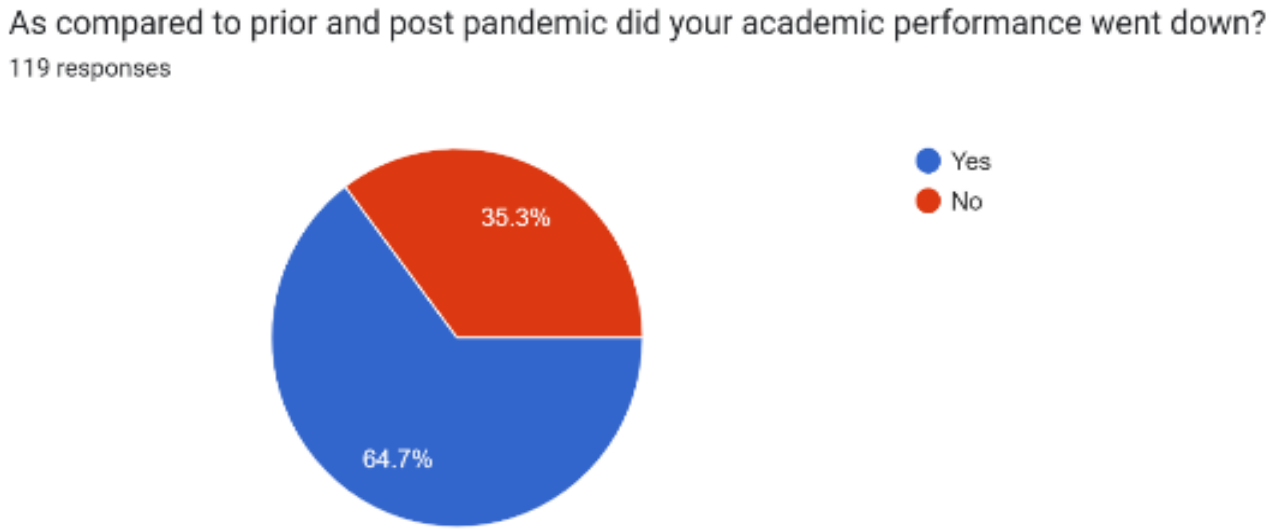
Taking weekly test, or doing some creativity to understand the concept more easily.

We need guidance and positive Approach ,theory based help and also for maths problems and also get last minutes revision and to build up confidence towards offline Examination.

FINDINGS AND CONCLUSION:

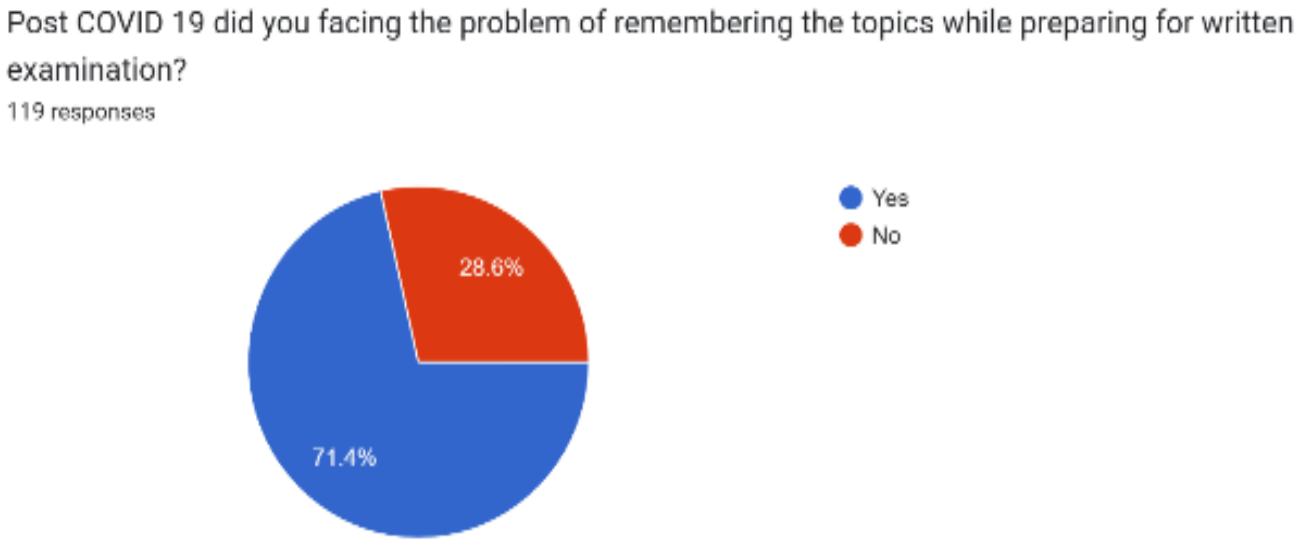
Hypothesis 1

- Students are facing challenges of learning losses and reduced academic skills post COVID-19



Yes	77 respondents
No	42 respondents

77 respondents were agreed out of 119 respondents when asked about did academic performance impacted through COVID 19.



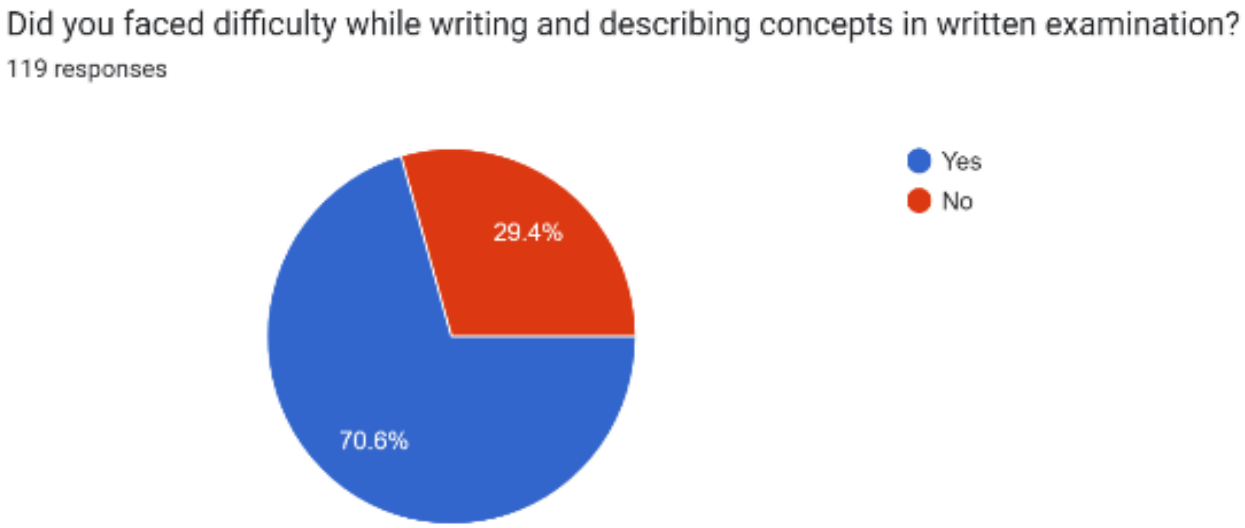
Yes	85 respondents
No	34 respondents

85 respondents agreed with the statement from 119 respondents.

From the above data it had been proofed that hypothesis is true.

Hypothesis 2

- Students face a problem to comprehend and write precisely an answer to a given question post COVID-19.

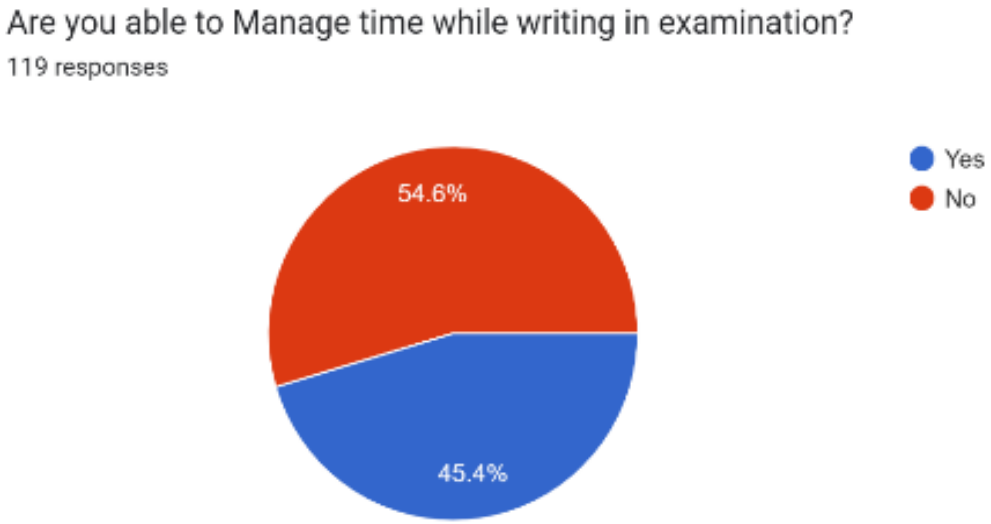


Yes	84 respondents
No	35 respondents

84 respondents were agreed out of 119 respondents. Hence hypothesis found to be true.

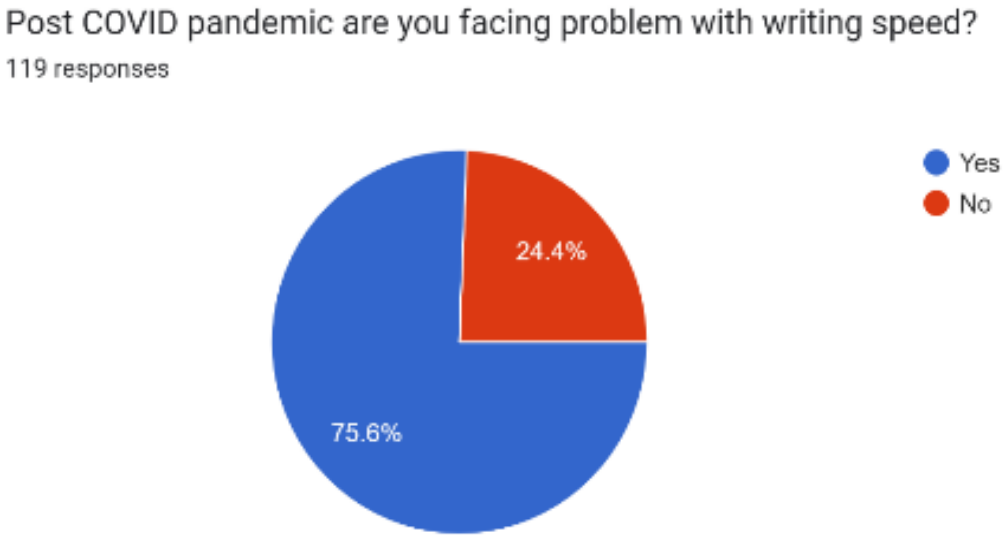
Hypothesis 3

- Students writing skills and vocabulary skill are seriously affected due to pandemic.



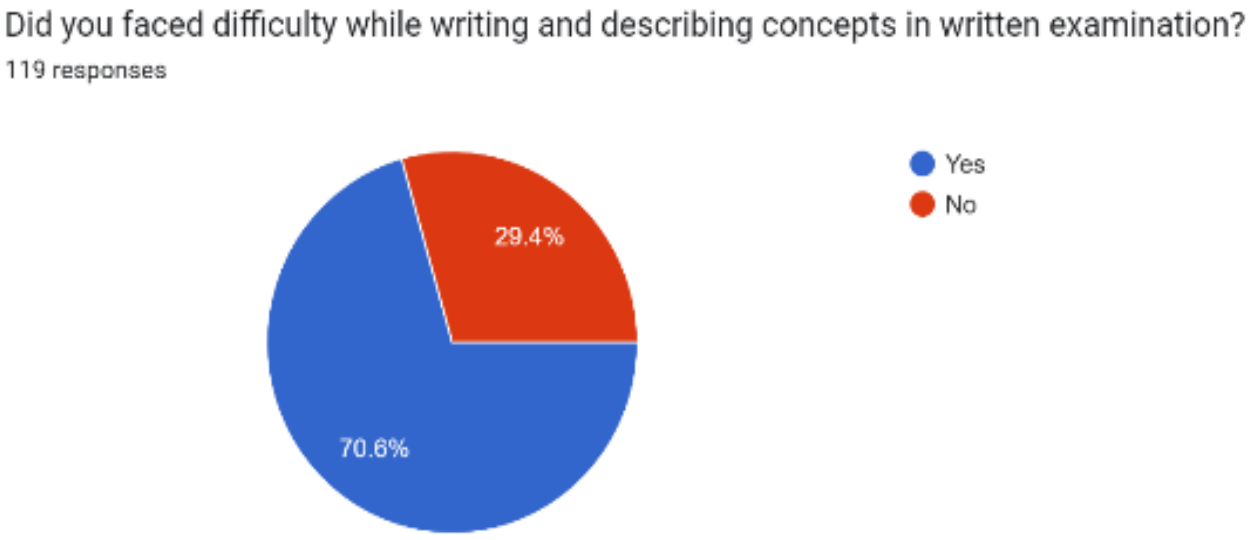
Yes	54 respondents
No	65 respondents

54 respondents were agreed that they are facing time management issue in written (offline) examination.



Yes	90 respondents
No	29 respondents

90 respondents were agreed out of 119 respondents that they are facing writing speed issue post COVID-19.



Yes	84 respondents
No	35 respondents

84 respondents were agreed with above statement out of 119 respondents.
Hence hypothesis found to be true.

CONCLUSION:

After analysing the data which had been collected from 119 respondents which were degree college students of Navi Mumbai. I conclude that students facing problems related to time management, grasping and comprehending the concept in written (offline) examination post COVID-19.

Many students were agreed that their writing speed and overall academic performance were impacted by COVID-19.

RECOMMENDATION:

When question were asked from students that what all things and help you required to boost your confidence in written examination post COVID-19:

Many Students Replied:

- They need practice to improve writing speed.
- Students need extra time while writing offline examination for few months to cope up with problem.
- Students need last movement revision before examination to improve their grasping and remembering power.
- Proper Teacher guidance to students related to answer writing and Doubt solving session can be proof as fruitful to reinforce positive attitude in students towards examination.

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APPENDIX:

Questionnaire link which had been used to collect the data from students and to analysis the hypothesis.

https://forms.gle/7bYmbwKEbo4eHmXn6

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COMPARATIVE ANALYSIS OF EFFECTS OF ONLINE AND OFFLINE LEARNING FROM THE PERSPECTIVE OF STUDENTS

Mrs. Jyoti Udaynath Panda
Research Scholar,
Changu Kana Thakur, Arts, Commerce and Science College,
New Panvel (Autonomous)
Mobile: 8108090329

Dr. Elizabeth Mathews
Research Guide, Professor and Head,
Department of Commerce,
Changu Kana Thakur, Arts, Commerce and Science College,
New Panvel (Autonomous)

Introduction:

When the COVID 19 Pandemic shut down everything, people were looking out for ways to keep running the business with the safety guidelines in place. Education industry also came up with remedies to cope up with the challenging situation. Institutes implemented different modes of online teaching for the students through applications like Zoom, Google Meet, Google Classroom, Teams, and many such applications. Scholars came forward to conduct research on COVID-19 from various perspectives, about various fields and industries. Research was also conducted on the Education industry, where some of the researchers emphasised on the importance of online learning, some suggested various means to enhance the efficiency of online learning, some discussed about the challenges faced by students and teachers, some mentioned the remedies to cope up with such challenges. In 2022, when the effect of COVID pandemic subsided, some educational institutes completely resumed back to offline mode, some are still following a hybrid mode of offline and online.

Keywords*:Impact of Digital Technology, Online and Offline Learning, Lockdown, chi-square analysis.*

Literature Review:

Parentela, Gil and Vargas, Danilo (2021) conducted a study in Philippines with an aim to study the situation of higher education during the Covid-19 Pandemic. It concluded that while virtual-online platforms enabled students and teachers to remain safe and continue, the studies, innovative technologies and strategies enabled the smooth functioning of online learning and teaching.

Soni, Vishal Dineshkumar (2020) aimed at learning the Global impact of e-learning during COVID-19. It recommends a suitable training of usage of educational apps used globally like Zoom, Voom, Google classroom, Teams, etc.. to the educators and the students. Due to sudden outbreak of Pandemic, the switch from offline to

online learning was too quick and thus was a challenge for the educators as well as students to cope up with it. However, it also acted as a boon whereby revealing the immense importance of e-learning in today's world.

Mahyoob, Mohammad (2020) considered the target audience for this research from Alula, Madina, Taibha University of Saudi Arabia. English Language Learners in the faculty of Science and Arts were studied under this research. It concludes that some of the challenges faced by the students due to online learning were technical issues like problem internet connectivity, downloading courses, accessing e-materials, attending exams through mobile phone, in English skill class it was tough for the students to efficiently interact with the teachers. Less than 50 percent students were satisfied, 14% were not satisfied and 43% of them do not support online learning if there is no crisis. Some students also mentioned the missing of blackboard and activities related to blackboard.

Oranburg, Seth (2020) suggests easy and quick strategies for professors for online teaching in the period of COVID -19. It suggested systematic steps to online teaching - To determine whether the teaching needs to be delivered through live video (synchronously) or recorded video (asynchronously), decide the medium of delivery, software applications, etc…; Create the Video content, develop the online learning environment, deploy the content to the students, provide platform for feedback, etc…

Jena, Pravat Kumar (2020) conducted a research based on secondary sources about Impact of COVID -19 on higher education. The data is collected for this paper, from authentic websites and other secondary sources that are available online. The paper mentions that virtual platform has come for the rescue for higher education all over the globe; it talks about various initiatives taken by Government like creating online depositories, e-books and virtual platforms.

Benefits to the Society:

This study can act as a very important tool for institutes to design effective and efficient style for designing and delivering the course content to the students, which can work irrespective of pandemic or lockdown.

It will help students to avail the same course in variety of formats as per their ease and convenience from different parts of the globe without needing 100 percent classroom attendance.

Objectives:

1. To analyze the effect of online learning mode on students
2. To study the effect of offline learning mode on the students
3. To compare the effect of online and offline mode on students
4. To suggest the most suitable mode of learning to the education industry

Hypothesis:

$\mathbf{H_{o1}}$: There is no significant association between mode of learning and perceived effect of learning on students.

$\mathbf{H_{a1}}$: There is a significant association between mode of learning and perceived effect of learning on students

Research Methodology:

Data Collection:

The researcher collected the primary data from students who have attended online classes due to COVID 19 through questionnaire.

Questionnaire Design:

The responses are captured through 5-point Likert scale by asking the students about their

perception of advantages and disadvantages of online and offline learning with respect to convenience of attending the class, ease of understanding, interactivity, technology, scope of participation, competition, relationship building and personality building. To create this questionnaire, the researcher referred the scale that was developed by psychologist Carol D. Ryff, the 42-item Psychological Wellbeing (PWB) Scale measures six aspects of wellbeing and happiness: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Ryff et al., 2007; adapted from Ryff, 1989).

Sample Size:

Through purposive and convenience sampling method, the researcher has collected responses from the Bachelor's degree college students whose degrees are of three years duration from colleges of Navi Mumbai region. The sample size of the respondent students is 218.

Hypothesis Testing:

Technique for testing Hypothesis: Chi Square Test

i. **Limitations:**

- This study will be restricted only to college students of Navi Mumbai.
- This study is only taking the students perception into consideration and not considering the perception of academicians
- The sample size is of only 218
- This study has not taken the academic performance or scores of candidates into consideration while comparing the two modes of learning.

Future Scope for Research:

- To conduct the research by taking academic performance or scores of candidates into consideration while comparing the two modes of learning.
- To research with students of different age group and different geographical location and by taking the opinion of teachers and parents.
- To conduct further research to identify various means and modes and improve the online learning experience
- To collect inputs from teacher about how they think that the teaching-learning experience can be improvised. These inputs together can help the authorities to design and equip the right techniques and methods for betterment of the teaching-learning experience.

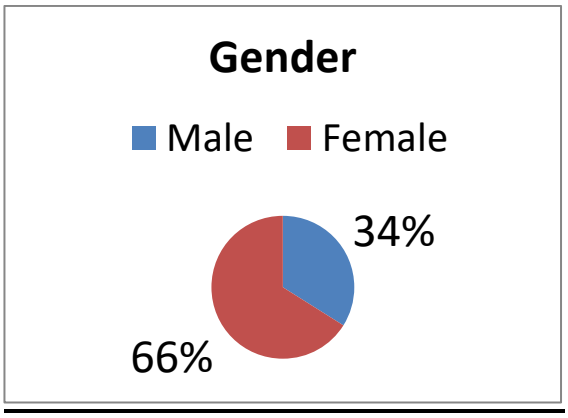
Primary data analysis:

Table 1
Gender of the respondents

Male Respondents	74
Female Respondents	144
Total Respondents	**218**

As per Table 1, out of the total respondents, 74 students are male and 144 students are female.

Chart 1
Gender of respondents



As per Chart 1, out of the total respondents, 34% are male students and 66% of the total respondents are female students.

Table 2
Academic Class of the Respondents

Class	**Number of Students**
First Year of Degree College	31
Second Year of Degree College	70
Third Year of Degree College	117
Total	**218**

As per Table 2, out of the total respondents 31 students were in First Year of the Degree College, 70 students were in Second Year of the Degree College and 117 students were from Third Year of the Degree College.

Chart 2
Academic Class of the Respondents

As per Chart 2, out of the total respondents 14% of the students were in First Year of the Degree College, 32% of students were in Second Year of the Degree College and 54% of students were from Third Year of the Degree College.

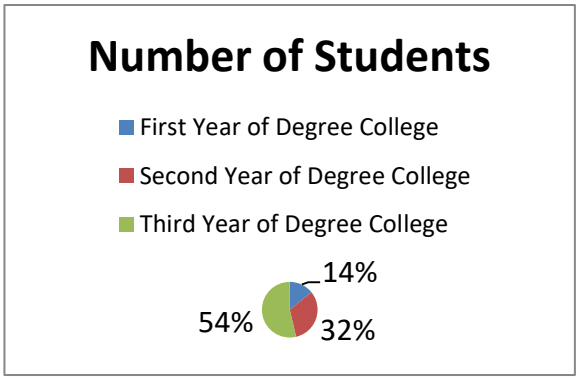


Table 3

Frequency and percentage distribution of responses received from students on statements regarding advantages of online learning mode:

Statements:	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Total
Online learning reduces your chances of missing a lecture because it allows you to attend it from any location	13	27	27	95	56	218
	6%	**12%**	**12%**	**44%**	**26%**	**100%**
Online learning allows usage of PowerPoint presentation, YouTube videos thus enhancing the learning experience by contributing to more knowledge and value	10	25	29	96	58	218
	5%	**11%**	**13%**	**44%**	**27%**	**100%**
Online learning saves your time, efforts and hassle of travelling	6	14	13	116	69	218
	3%	**6%**	**6%**	**53%**	**32%**	**100%**
Online learning allows you to be at the comfort of your home	9	14	30	112	53	218
	4%	**6%**	**14%**	**51%**	**24%**	**100%**

Table 4

Frequency and percentage distribution of responses received from students on statements regarding disadvantages of online learning mode:

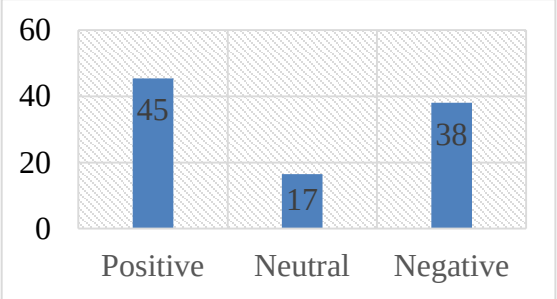
STATEMENTS:	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Total
You have to often miss lectures due to technological issues like problem in the gadget or low bandwidth of internet, etc.	13	23	31	99	52	218
	6%	**11%**	**14%**	**45%**	**24%**	**100%**
Lack of classroom interaction hinders the process of active learning, changing and growing.	10	23	37	112	36	218
	5%	**11%**	**17%**	**51%**	**17%**	**100%**

Online classes restrict your physical participation in extracurricular activities thus giving you a sedentary life and avoiding you from mental recreation.	16	21	38	96	47	218
	7%	**10%**	**17%**	**44%**	**22%**	**100%**
Lack of classroom interaction does not give space for healthy competition, active participation resulting into lethargic state of mind and body.	13	21	47	104	33	218
	6%	**10%**	**22%**	**48%**	**15%**	**100%**

Table 5
Analysis of responses received for online learning mode

	Frequency
Positive	99
Neutral	36
Negative	83
Total	**218**

Graph 1
Analysis of responses received for online learning mode



Interpretation:

Positive perceived effect of online learning mode by the students is highest
Negative perceived effect of online learning mode by the students is lower.
Neutral perceived effect of online learning mode by the students is lowest

Table 6
Frequency and percentage distribution of responses received from students on statements regarding advantages of offline learning mode:

STATEMENTS:	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Total
Classroom interaction encourages healthy competition	8	17	33	93	67	218
	4%	**8%**	**15%**	**43%**	**31%**	**100%**
Classroom interaction gives scope	12	14	14	99	79	218

for building and growing relation with classmates and teachers thus teach you life skills of interacting with people.	**6%**	**6%**	**6%**	**45%**	**36%**	**100%**
Classroom interaction gives you the opportunity to face new people and new challenges.	10	9	21	98	80	218
	5%	**4%**	**10%**	**45%**	**37%**	**100%**
Making friends in the offline class allows you to share your thoughts, concerns, worries etc. with your friends thus helping you to release your stress and get solutions to your life problems.	11	28	23	79	77	218
	5%	**13%**	**11%**	**36%**	**35%**	**100%**

Table 7

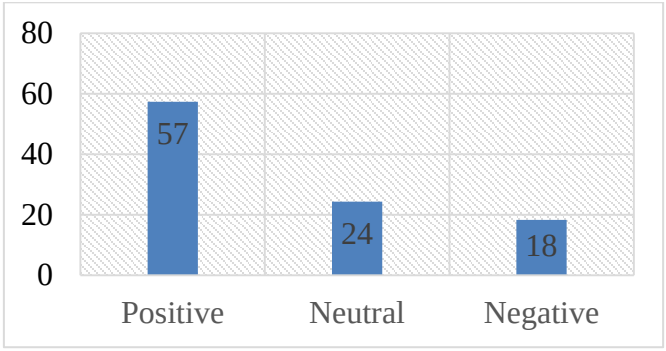
Frequency and percentage distribution of responses received from students on statements regarding disadvantages of offline learning mode:

STATEMENTS:	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Total
You have to miss the lecture if you are unable to physically be present in the class	10	22	36	117	33	218
	5%	**10%**	**17%**	**54%**	**15%**	**100%**
Classroom learning gives chance for antisocial activities like ragging, bunking, bullying, etc.	13	22	38	105	40	218
	6%	**10%**	**17%**	**48%**	**18%**	**100%**
Classroom learning, at times develops feelings like favouritism by teachers, unhealthy competition amongst students, jealousy etc..	16	21	34	102	45	218
	7%	**10%**	**16%**	**47%**	**21%**	**100%**
Classroom learning encourages groupism, partiality amongst the classmates	18	30	35	96	39	218
	8%	**14%**	**16%**	**44%**	**18%**	**100%**

Table 8
Analysis of responses received for offline learning mode

	Frequency
Negative	40
Neutral	53
Positive	125
Total	**218**

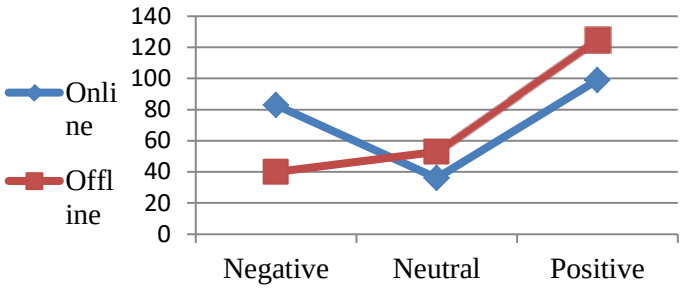
Graph 2
Analysis of responses received for offline learning mode



Interpretation:

Positive perceived effect of offline learning mode by the students is highest
Neutral perceived effect of offline learning mode by the students is lower.
Negative perceived effect of offline learning mode by the students is lowest

Graph 3
Comparing the perceived effects of online and offline mode of Learning



Interpretation:

Positive Effect is higher in offline mode than online mode

Negative Effect is higher in online mode than offline mode

1. **Testing of hypothesis:**

Hypothesis is tested using Chi-square test:

Table of observed values				
Mode of Learning/Effect of Learning	**Negative**	**Neutral**	**Positive**	**Total**
Online	83	36	99	218
Offline	40	53	125	218

Table of Expected Values			
Mode of Learning/Effect of Learning	**Negative**	**Neutral**	**Positive**
Online Learning mode	61.5	44.5	112
Offline Learning Mode	61.5	44.5	112

Calculation of Chi Square				
Observed Values	**Expected Values**	**O-E**	**(O-E)square**	**(O-E)Square/E**
83	61.5	21.5	462.25	7.516260163
40	61.5	-21.5	462.25	7.516260163
36	44.5	-8.5	72.25	1.623595506
53	44.5	8.5	72.25	1.623595506
99	112	-13	169	1.508928571
125	112	13	169	1.508928571
				21.29756848

21.29 (Calculated value of $\chi 2$) > 5.99 (Tabular value of $\chi 2$)

Interpretation:

Null hypothesis is rejected; hence, there is a significant association between mode of learning and perceived effect of learning

Conclusion:

1. There is a significant association between mode of learning and perceived effect of learning.
2. While comparing the effects of online learning mode with each other, it is found that positive effect is experienced by majority, negative effect experienced by few and neutral by least number of respondents.
3. While comparing the effects of offline learning mode with each other, it is found that, positive effect is experienced by majority, neutral by few and negative effect is experienced by least number of respondent students.
4. While comparing the effects of online mode and offline mode with each other, it is found that positive effect is higher in offline mode and negative effect is higher in online mode.

Suggestions:

1. To create a hybrid mode of learning for the students
2. To keep the proportion of offline learning more compared to online learning mode in the hybrid mode

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A EMPIRICAL STUDY ON THE FACTORS THAT LED TO THE GROWTH OF ONLINE MARKETING IN RECENT TIMES IN TIRUNELVELI CITY

Ms. Sorna Edwin
Manonmaniam Sundaranar University, Tamil Nadu

INTRODUCTION

Online marketing is a set of tools and methodologies used for promoting products and services through the internet. Online marketing includes a wider range of marketing rudiments than traditional business marketing due to the redundant channels and marketing mechanisms available on the internet. Online marketing is also known as internet marketing, web marketing, or digital marketing. It includes several branches similar as social media marketing (SMM), hunt machine optimization (SEO), pay- per- click advertising (PPC), and search machine marketing (SEM).

Online marketing is a system for promoting the trade of products or services over the Internet. It's salutary to companies, because it's immediate and not limited by terrain or time. It may also be known as online advertising, internet marketing. Now-a-days online marketing is a platform which has covered utmost of the request. Every company has tried to hold a spot in online request. As the current situation epidemic (Covid- 19) was hit in 2020, the whole world face heads and numerous companies faced drop in deals. Whether you run a purely online business or use e commerce to condense a physical store, the coronavirus is sure to have some impact on your business. Indeed, if your products have nothing to do with the contagion, the wider profitable impact of the epidemic is going to affect either you or your guests in some way.

Our world is facing a veritably serious challenge with the spread of the coronavirus, but there's stopgap on the horizon. Businesses have been greatly impacted as the frugality has taken a megahit because of COVID- 19.

REVIEW OF LITERATURE:

Stegemann and Sutton- Brady (2012, p. 3) anatomized that online marketing issues digital advertising, campaigning, public relations that have a sophisticated inner print in the minds of the guests. colourful organizational authorities find it fruitful to take hold of online conditioning related to marketing to reach maximum number of implicit guests.

Hu, Du and Damangir (2014) analysed in their workshop regarding the significance of advertising. They worked on the content of how the fruits of advertising can induce the interest of guests and how latterly it can be converted into deals. The work has been pursued to punctuate the significance of announcement on colourful components.

Kalyani Pawan (2021), The growth of UPI from the perspective of the Epidemic first surge concludes that the abnormal situation has led to an increase in operation of electronic means of

payment and has exfoliate light on the fact that Covid acted as a catalyst in the process of UPI systems gaining instigation.

IMPORTANCE OF STUDY:

1. To get the update of online marketing during the covid-19
2. To know the changes of the faced by the small business during pandemic
3. To find out the Competitions grown during the pandemic in the online marketing sectors
4. To learn about the website traffic during lockdown.
5. To analyse the relationship between online marketing and their customers.

SCOPE OF STUDY:

1. The study aims to understand the massive contribution of Online Marketing
2. To know its splendid efforts towards promotion in practice
3. To find out some challenges in using online marketing during the e-pandemic.
4. The study will make us understand how online thing makes marketing easy to handle in a pandemic.
5. The scope of the study is limited to the area of Tirunelveli City.

OBJECTIVES OF STUDY:

1. To study the utilization of online marketing in COVID-19.
2. To study the extension of online marketing platform during COVID-19.
3. To study customer opinion and thoughts towards online marketing. Have they been changed due to COVID-19.
4. To study, what measure were taken by company to move from offline to online.
5. To analyse the improvements done in online marketing during COVID-19

RESEARCH METHODOLOGY:

Research methodology creates a framework towards study area specifically with proper direction with planning, which helps in conducting the research work. Hence, the main purpose is to highlight the problem statement of the research, sample population and sample size, methods of data collection, data analysis and statistical test and tools used for the research.

1. **Data Sources:**
   a. **Primary Data sources**: - Primary data collection was done with the help of Structured Questionnaire devised for consumers to understand the online marketing factors that has impacted of UPI post pandemic.
   b. **Secondary Data sources: -** Secondary data collected with the help of Research papers, Journals,Reports, webliography links etc.
2. **Area of Study:** The universe of the study is Tirunelveli. The data are collected within the area of Tirunelveli City
3. **Sampling Technique:** The sampling technique used is Simple Random Sampling.
4. **Sample size: -** 80 respondents from Tirunelveli City Region.
5. **Tools of data collection: -** The primary data was collected with the help of Structured Questionnaire.
6. **Data analysis: -** Data analysis has been analysed using frequency tables, charts, bar diagram, graph to arrive at conclusion.

HYPOTHESIS:

H0: There is no good relation between customer and online marketers.

H1: There is a positive relation between the customer and Online marketers.

LIMITATION OF THE STUDY:

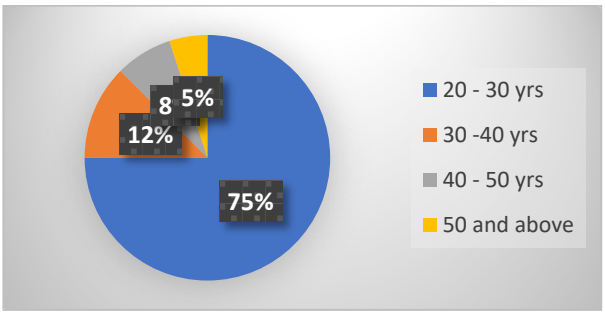
1. Survey conducted was online and there was no interaction with outsiders.
2. Limited experimental design.
3. Only secondary was mostly in use, primary data was difficult to get.
4. The recommendations are the outcome of an analysis made individually.
5. To maintain secrecy the company people did not provided the information properly.

OBSERVATION FROM THE STUDY:

The following are the observation which reflect the responses on the research topic

1.1: Respondents by Age:

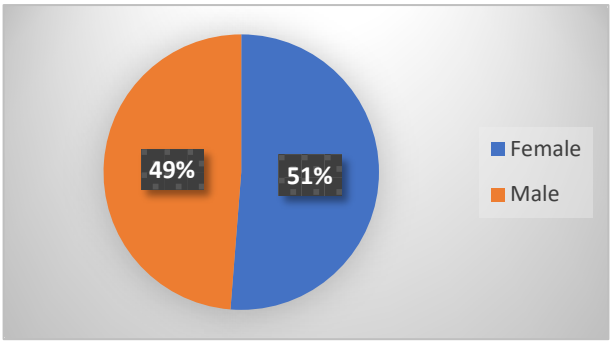
Age	No. of Respondents
20 - 30 years	60
30 -40 years	10
40 - 50 years	6
50 and above	4



Interpretation: 75% respondent age is between 20 - 30 years, 12% respondent age is between 30 - 40 years, 8% respondent age is between 40 - 50 years and 5% respondent age were above 50

1.2: Respondents by Gender:

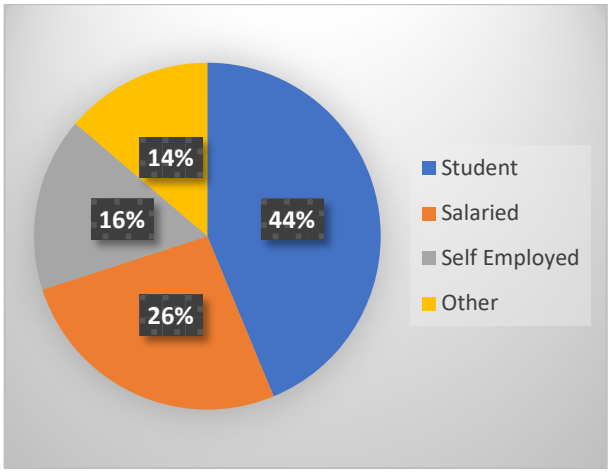
Gender	No. of Respondents
Female	41
Male	39



Interpretation: 51% respondents from the research were female and 49% respondent were male.

1.3: Respondents by Occupation:

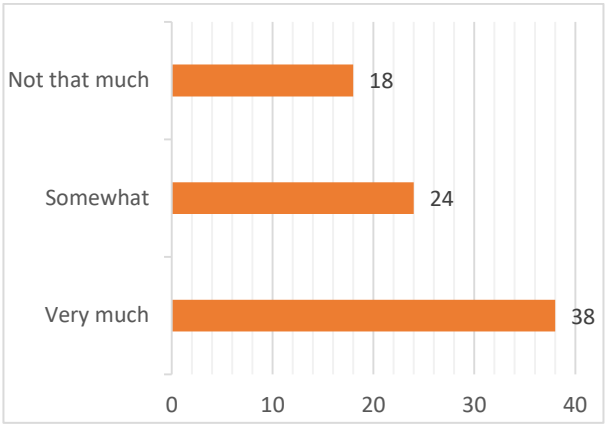
Occupation	No. of Respondents
Student	35
Salaried	21
Self Employed	13
Other	11



Interpretation: 44% Respondent were students, 26% respondent were salaried, 16% respondent were self-employed, 14% respondent were of other occupation.

1.4: Respondents Convenience to use online sites for business:

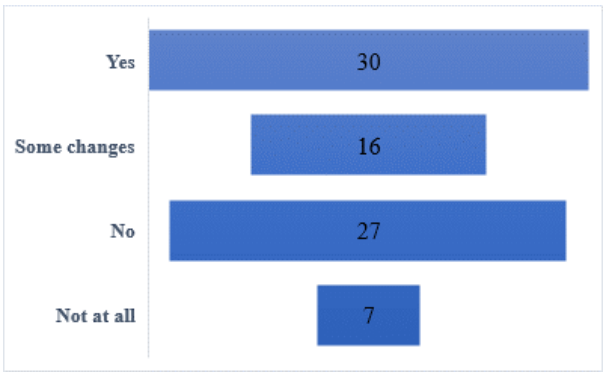
Options	No. of Respondents
Very much	38
Somewhat	24
Not that much	18



Interpretation: 51% (38 respondents) were very much convenient, 35% (24 respondents) were somewhat convenient, 14% (18 respondents) were not that much convenient.

1.5: Respondents faced competition in online marketing during the lockdown period

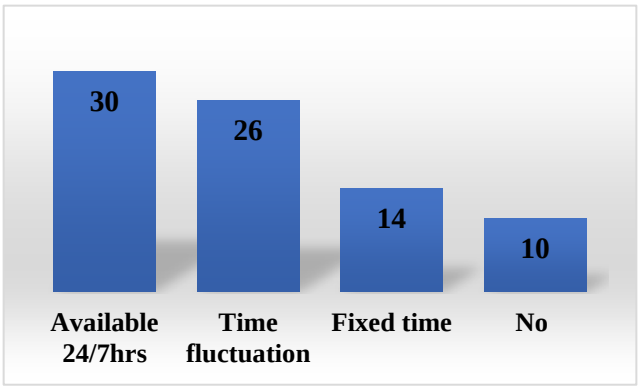
Options	No. of Respondents
Yes	30
Some changes	16
No	27
Not at all	7



Interpretation: 42% (30 respondents) said that their company faced problems during lockdown, 25% (16 respondents) that their company faced no problems during lockdown, 32% (27 respondents) that their company faced a little problem.

1.6: Availability of Staff for the query of Customers

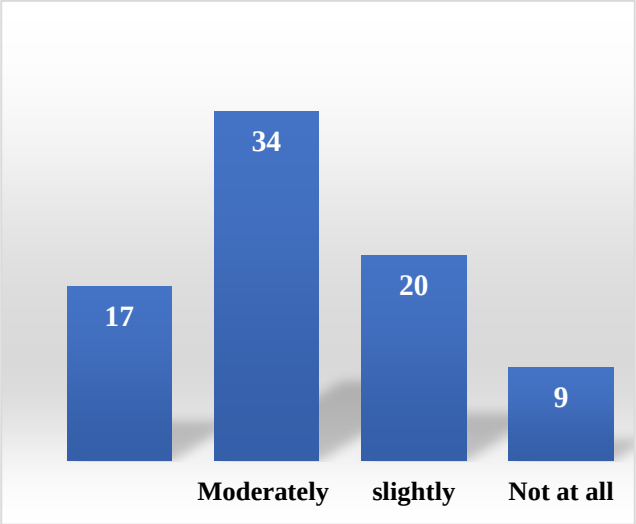
Options	No. of Respondents
Available 24/7hrs	30
Time fluctuation	26
Fixed time	14
No	10



Interpretation: 41% (30 respondents) said that staff were available 24/7 hrs, 38% (26 respondents) that time was fluctuating 13% (14 respondents) that they had a fixed time, 7% (10 respondents) that they were not available any time.

1.7: Staff members faced inconvenience to handle online sites, while working from home

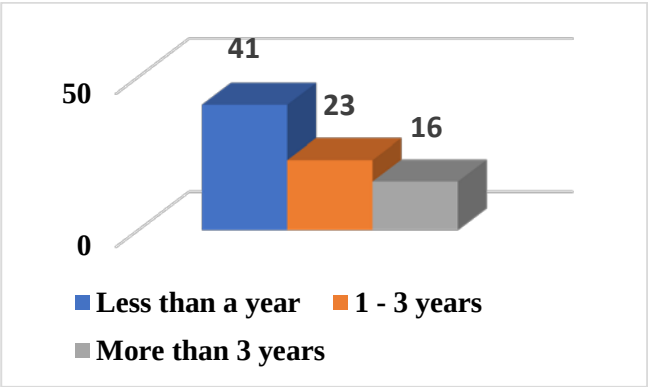
Options	No. of Respondents
Quite convenient	17
Moderately	34
slightly	20
Not at all	9



Interpretation: 22% (17 respondents) that member was inconvenient, 46% (34 respondents) that members were moderately inconvenient, 22% (20 respondents) that members were slight inconvenient, 7% (9 respondents) that members were not at all convenient.

1.8: Term Company is using the online Platform:

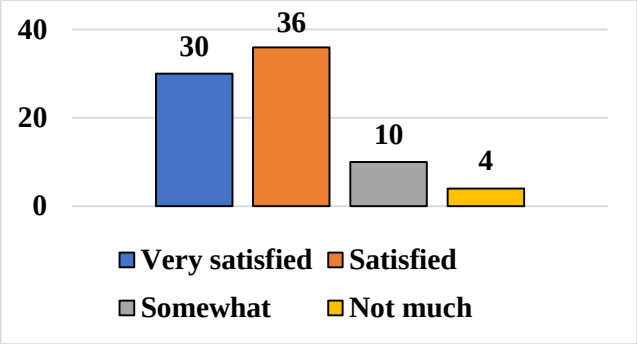
Options	No. of Respondents
Less than a year	41
1 - 3 years	23
More than 3 years	16



Interpretation: 52% (41respondents) that they are using online sites less than a year, 29% (23 respondents) that were since 1 to 3 years in online sites, 18% (16 respondents) that they were more than 3 years.

1.9: Customers Satisfaction using their online services:

Options	No. of Respondents
Very satisfied	30
Satisfied	36
Somewhat	10
Not much	4



Interpretation: 39% (30 respondents) customers said that they are Very much satisfied, 48% (36 respondents) that customers were satisfied, 8% (10 respondents) that customers are somewhat satisfied, 5% (04 respondents) that customers are not much satisfied.

Hypothesis testing

H0: There is no good relation between customer and online marketers.

H1: There is a positive relation between the customer and Online marketers.

Chi-Square Tests			
Pearson Chi-Square	1.556[a]	2	**.022**
Likelihood Ratio	2.116	2	.005
N of Valid Cases	80		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is .17			

It is found that the *P* value is 0.022 which is less than the Significance level that is 0.05. Hence the Null hypothesis is rejected

Hence the researcher rejects Null Hypothesis and the alternate hypothesis is accepted i.e. **"There is a positive relation between the customer and Online marketers"**

CONCLUSIONS

1. The conclusion that we can see from this study is online marketing has importance in every business. Due to pandemic, it has become the core of every individual business. Because online sites businesses and shops have to the door of customers.
2. Through analysis of data, we can that maximum stores have come in online world because of which there is a lot competition in now in online marketing too. But through this people have become aware of importance of online marketing in their daily needs. We can also see that people have become more update to date regarding the online sites and to the modern world of technology.
3. However, company need to give full satisfaction to their employees also. Employees should be provided safety measures and inside staff should be given to work from home .so that they can be felt convenient and safe to do work.
4. Finally, I would like to conclude that for doing online business it is important to make relationship with customers so that we can be with them in critical conditions to make a strong bond so that customers will trust the marketers in every situation.

SUGGESTIONS

1. There is a need of improvement in making customer satisfy during pandemic
2. Company should make their business should go in online sites also.
3. Company should store essential products to make it available for customers in the time of crisis like the pandemic
4. Company should always be prepared for the future
5. If company is not prepared before the crisis, then they should always make a plan according to the comfort of their employees and customers too.
6. company should have minimum staff for the query of the customer.

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IMPACT OF 5G WIRELESS SYSTEM

Mrs. Sonal Mehrotra
Assistant Professor
Department of Mathematics, Information Technology and Computer Science
Tilak College of Science & Commerce, Vashi
E-mail: Mehrotra.sonal8@gmail.com

ABSTRACT

Now days Everyone Love speedy Internet, so it's a very essential field in the world. 5G Technology stands for 5th generation Technology. 5G is a new global invention wireless technology after 1G,2G,3G and 4G networks with increased features like reliability, super speed, network capacity and imperceptible latency .It represent the next crucial phase of mobile telecommunication behind the 4G Standards. Smartphone's, watches, homes, cars are requiring stable internet connection. To survive in the world where speed changes in every seconds and we want more n more technologies. so, here comes with 5th generation technology : 5G some objectives that we need to fulfilled are improved data rate, lower the latency .To meet these demands ,Big improvement in the cellular architecture of 5G is required. This paper is contented with the details related to 5G with the prime focus on the multiple input multiple output technology and device to device communication (D2D).A general 5G cellular network architecture is being proposed with the guideline taken from the internet books and by the detailed study of the topic. This paper gives a short introduction to the newest 5G wireless system technology, development from 1G to 5Gand it's Advantages and Disadvantages. Hence the search for new technology always the main motivation of the top cell phone as in giant to out innovate their competitors.

Keywords: *5G, D2D, Wireless, standards, data rate , latency, reliability , capacity Advantages, Disadvantages.*

INTRODUCTION

5G means Fifth generation wireless technology .Wireless phone technology technically set foot in with 1G, and in early 1990s it reform to 2G when companies enabled people to send text messages between two cellular devices excited the world. In time the world moved on to 3G, which imparted the salvation of making phone calls, send text messages, and browse the internet at excellent speed. 4G enhanced the capabilities of wireless technology. People could even download and upload large video files without any problem and without waiting time. Then companies added LTE ("Long term evolution") to 4G. It creates a standard for everyone to use. LTE did just that, by making 4G technology even faster and this laid the foundation of 5G. 5G will make it easier for people to download and upload Ultra HD and 3D videos. It provides excessive bandwidth that consumers never knowledgeable earlier. This 5 G technology offers numerous modern features which makes it uttermost strong and in big demand now.

5G is designed to do a variety of things that can transform our lives, including giving us faster download speeds, low latency, and more capacity and connectivity for billions of devices-especially in the areas of virtual reality (VR) ,the IOT and Artificial Intelligence

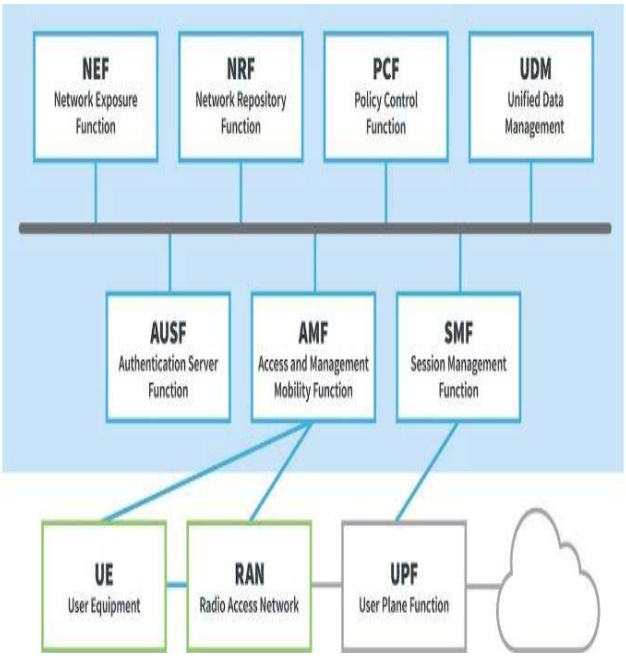
.

5G Architecture

One of three primary elements which enable the modern functionality of 5G network is 5G, also known as 5Gs(source). Other two elements are Access network(AN) and User Equipment(UE).

The 5G core supports authentication, security, session management, and traffic aggregation from connected devices using a cloud-aligned service-based architecture.

The following diagram shows the key components of a 5G network.



Enabling Technologies in 5G:

Utmost technologies enabling 5G :

- D2D Communication:

Direct connectivity is acheived through device-to-device technology.speedy data rate, improve coverage, and offer peer-to-peer services provided by D2D mmwave communication in 5G cellular system.

- M2M Communication:

While D2D communication targets mobile radio.,machine-to-machine get through the scope and ease all over affinity among mobile devices.it is estimated that in 5G backbone communication there will be over 100 billion attached devices using M2M.

- MIMO

Multiple-input-multiple-output technology plays a essential part in 4G and look forward to play main function in 5G. Massive MIMO extracts the interest of MIMO on a large scale by expand the throughput and spectrum efficiency.

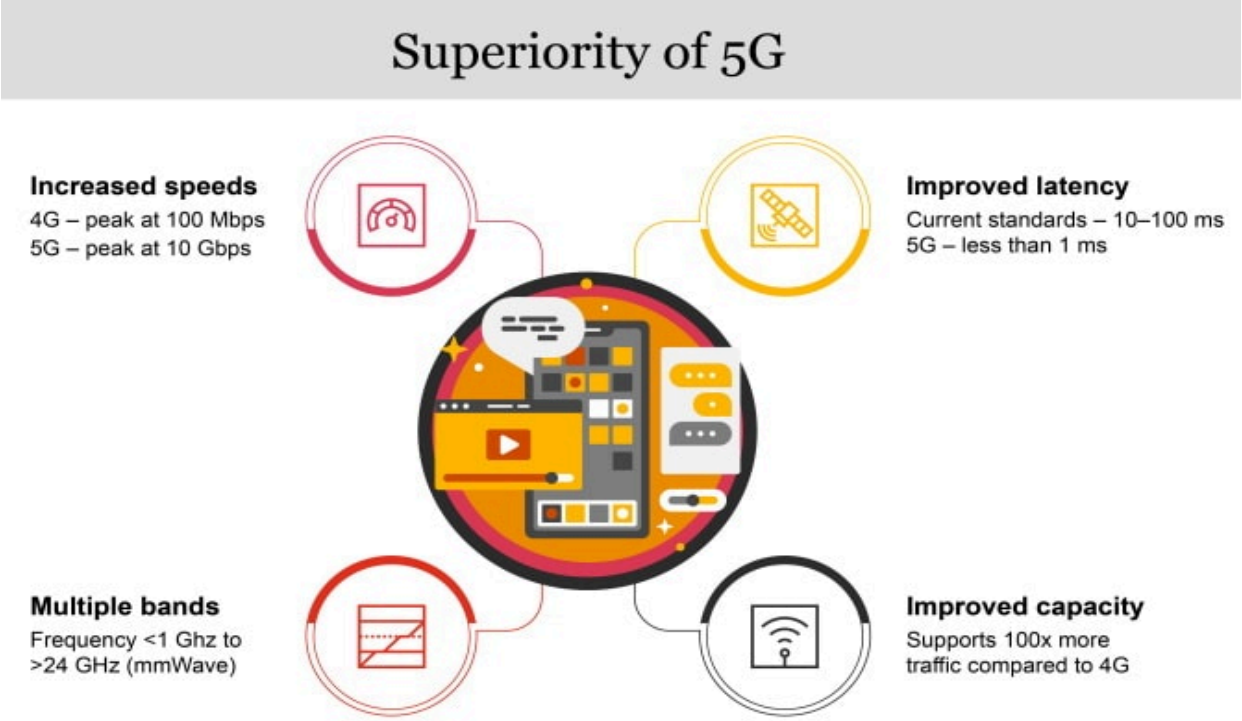
5G include mmWave communication, ultra-dense network(UDN), all spectrum access (ASA), OFDM(orthogonal frequency division multiplexing),and IOT as other technologies .

Impacts of 5G

Why it is better?

While 4G networks provide a full volume of 100-200 Mbps,speed of 5G around10 Gbps-a hundred times more in speed.5G fulfil this task by use a broad array of the spectrum from lower bands(frequency<1GHz) to higher bands called millimetre wave frequency>24GHz). The capacity of these mmWave frequencies is many times higher than that of existing technology, hence better the efficiency of 5G.

Fifth generation technology has very minimum latency(<1 millisecond) communication. This would means that there would be no serious delay times associated with the network, making it much more reliable and enabling ideal real-time access to technology.



5G Impact on Environment:

To protect and preserve the environment the capacity , speed and connectivity of 5G will provide many opportunities .5G with IOT will be able to increase energy efficiency, reduction of Greenhouse gas emissions enable more use of renewable energy. It can help reduce air and water pollution, keep down water and food waste, and protect wildlife.

city governments and businesses are looking to Fifth generation , AI and IOT technology to create smart cities where sensors, cameras and smart phones will be linked, the connectivity and speed of these networks will enable cities to be better managed and more efficient and sustainable.

Energy Consumption and Emissions Reduction:

International standards have named 5G, which means utilising less electricity while sending more data, to demand significantly less energy to run than 4G. 300 HD movies could be downloaded over 4G, whereas 5,000 UHD movies could be downloaded over 5G in just one kWh.

The Internet of Things. Photo: Wilgengebroed

5G linked with IOT will also cut energy use, because devices will be able to power up and shut down automatically when not needed. Sensors in appliances , transportation networks, buildings, factories, street lights , residences and more will monitor and analyze their energy needs and consumptions in real time and automatically optimize use.[3]

eMBB: Enhanced mobile broadband

Strengthen mobile broadband is one of the application scenarios whereby 5G will be able to deliver its full potential to the masses. Through eMBB 5G will be able to provide gigabits of data speed through mobile broadband. A real 'hotspot' situation could be where hundreds and thousands of fans are utilising limited broadband and connectivity during a sports event or a concert, and eMBB could deliver the required speeds to provide connectivity to the crowd.[10]

urLLC:ultra-reliable Low-Latency Communication

Each evolution of cellular technology has ask brilliant response time,and 5G will be able to meet this demand in a extraordinary way. Latency has been a fence for technologies dependent on processing huge amounts of data with near to no delay. Through ultra reliable low latency, 5G will license technology to do that, Thanks to 5G, technology like self-driven vehicles or augmented reality(AR) supported surgery will become possible in the near future.[4]

Impact on Education Sector:

5G can offer remote-learning opportunities

Covid-19 and the resulting lockdown have had one of the most significant effects on the education sector. It has entirely changed how classroom teaching takes place. It introduced online teaching, a relatively new trend, especially for developing and underdeveloped countries where there is no fast internet connectivity. 5G, with its tremendous speed, will make learning more accessible, appealing, and engaging.

5G will pace up online education

Online education involves the use of live streaming, online lectures, and watching videos. It requires fast internet connectivity. A slow connection will hamper the learning process leaving both students and teachers dissatisfied.

With the help of the 5G technology, watching and downloading videos will be quicker. It will be soon before one can download a video in seconds! So, 5G technology will make online education accessible, convenient, and hassle-free.

Effect of 5G on Society:

the people It has a significant influence because working speed has improved along with network speed. Time is saved since all tasks, official and unofficial, are completed more quickly**.**

From the social view, 5G networks have the capability to improve the cell-phone broadband connections in rural regions. The outlay of substance for installing a big number of BS & the less Average Revenue per User has carry over the wide-ranging coverage of rural environments.

Due to 1871 additional favourable propagation situations in the very high-frequency/ultrahigh-frequency gamut that unflinchingly transform into smaller base stations, the deployment of 5G networks in rural areas will be possible at a lower cost by utilising TV White Space and offloading of traffic elucidations.

Advantages of 5G:

5th generation objective giving numerous high speed utility to the consumer . The applications are highly customer friendly to use these utilities; among the application and the customer, intercommunication is critical. [10]

1. Such networks have the capacity to deliver content much faster than 4G. With high speeds of up to 20 Gbps, they will enable superfast download times. The low latency characteristic feature will efficiently help support new applications such as IoT, AI, and virtual reality.

2. In India, a committee on 5G technology was established, and it made a suggestion for more spectrum to be made accessible and for its initial 5G spectrum allocation to be valued at less spectrum.

3. It is anticipated to offer wireless download speeds of more than 1 Gbps in LAN and 500 Mbps in WAN, which is nearly 40 times faster than 4G wireless networks.

4. One of the main advantages of 5G is that it increases more bandwidth that will help transfer the data as soon as possible. Furthermore, mobile phone users can ensure a faster connection with more bandwidth after choosing a 5G network. Better Network Convergence.

5. Higher Bandwidth Provided

6. More efficient and effective

7. It will primarily offer broad broadcasting data (in Gigabit), supporting over 60,000 connections.

8. With our phones, we can manage your Desktops.

Disadvantages of 5G:

The fifth generation of mobile technology is proving to be a superior communication network, with outstanding speeds, coverage, and dependability. As it can manage a lot more devices, this innovative network is taught about the realities of the Internet of Things.

Nonetheless, the following drawbacks should be taken into account [10].

1. PROBLEM WITH BATTERY DRAIN

2. UPLOAD AND DOWNLOAD SPEED NOT MATCHED

3. RURAL ACCESS LIMITATIONS

4. FOR ROLLOUT INITIAL COSTS ARE HIGH

Conclusion

1 .Higher data rates and the all-IP concept are driving the development of wireless networks and mobile technology. Every year, mobile devices have increased processing power, onboard memory, and battery life for the same applications.

2 . The world is completely connected thanks to 5G Wireless, a more sophisticated technology. It is intended to offer unrestricted call volumes, astounding data capacities, and extensive data broadcast. Access to information, communication, and entertainment would be available to everyone around the world without interruption, giving our lives a new dimension and significantly altering how we live. Additionally, governments and regulators may utilise this technology to improve governance and foster healthier settings, which will undoubtedly drive further investment in 5G, the next-generation technology.10]

3.The government should address these issues as quickly as possible and introduce this technology in India, despite the fact that there are currently difficulties with the infrastructure, investments, and health aspects of 5G technology in India. Economic, socio-strategic, etc., would provide dynamism to all areas with the adoption of 5G

technologies in India, further bolstering the nation's development. technology.

4. 5G will usher in transformation for government and commercial entities in unimaginable ways, moving swiftly from pilot runs to large-scale implementation. The 5G revolution has already begun, and this technology is catering to the ever-increasing demands from a host of industries – from warehouses to ports and from manufacturing plants to smart cities. With technologies like cloud and edge computing, and IoT, 5G is set to play an integral role in Industry 4.0. It’s time to get ahead with 5G.[10]

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EMERGING TRENDS IN INFORMATION TECHNOLOGY

Ms. Ashwini Bhogle
Assistant Professor
Department of Mathematics,Information Technology and Computer Science
Tilak College of Commerce and Science,Vashi
E-mail : ashwmee21@gmail.com

ABSTRACT:
Information Technology is presently the enabler of utmost services. Advancements in technology has affected the society's way of living both appreciatively and negatively. moment, utmost of the field of mortal life are affected by new Technology. With the rapid-fire technology addition, it becomes necessary to find reciprocal arising computing technologies. The advancement has brought about colourful Technological trends like Cloud Computing, Mobile Computing, Social media, Ubiquitous computing, data analytics, data wisdom and Internet of effects (IoT), a network of large quantum of objects, calculating bias bedded with microchips, detectors, selectors making this world a smart place to live.

This paper highlights unborn computing technologies, arising trends and assiduity buzz to identify most prominent technologies in India. In the arising technologies, the request is perceiving the entry of original merchandisers covering similar areas as the Internet of effects(IoT), Robotic Process robotization immolations and Machine Learning grounded technologies. Some technologies are of transformational nature and results in the foundation of new ecosystem these are, Internet of effects with its associated operations and Machine literacy. Technologies on invention detector take further time for wide request acceptance. Main ideal of this paper is to present a unborn vision for smart terrain which can give knowledge accumulation and new directions to new experimenters in the affiliated field.

Keywords*: emerging trends; future computing technologies; edge computing; artificial general intelligence; deep learning; digital twin.*

INTRODUCTION

We're blessed that we're living in fleetly growing and fascinating times. Technology advancement makes allowing artificial and realities look like the norm. From" Internet of effects" to Neuromorphic tackle, technology is incredibly changing our lives. Though there are a number of new and innovative technologies that are ongoing but still some of them are more promising and predicated in reality as compared to others. Some of the technologies in near future(5 to 10 times) will be more dominating as compared to others, like " Artificial Intelligence far and wide ", " Digital Platforms " and " Transparently Immersive gests ". In the coming 10 times, Artificial Intelligence far and wide will turn out to be the most disruptive technology as there's tremendous computing power which will be available along with neural networks adaptive capability and big data that no bone has come across ahead. Now a days, a number of new technologies are introduced like, marketable drones, Edge Computing, Software Defined 5G relinquishment, mortal addition, stoked Reality, Quantum

Computing, Artificial General Intelligence far and wide, Deep Learning, Software Defined Security, Digital Twin, Serverless PaaS, Machine Learning, and etc. utmost of the recently introduced technologies make use of Internet of effects whereas some technologies merges two or further technologies to take the benefit of other. Al similar unborn transubstantiating technologies that can share to make world smart are described in this paper in detail. This paper highlights most dominating trends and technologies involved in the creation of smart terrain that grow fleetly to change our future and requires attention and active participation. The rest of the paper is structured as Main focus must be given to those technologies which are on the peak of the exaggerated prospects. Arising trends and technologies and conclude the findings.

EMERGING TRENDS AND TECHNOLOGIES:

A. IoT Platforms Internet of effects (IoT) connects physical effects over a network to communicate information about effects or their surroundings to which detectors are attached. In IoT, everyday objects are connected to a network furnishing enormous operations in nearly all areas including smart homes, smart megacity, smart health, smart husbandry, smart transport, and etc IoT has wide variety of compass in the near future in resource control, energy operation, quality of service, interoperability, interface operation, security and sequestration.

B. Edge Computing The rise of Internet of effects(IoT) and the consummation of rich pall services redounded a new computing paradigm, Edge Computing. Working on both downstream data on behalf of pall services and upstream data on behalf of IoT services, Edge Computing provides new horizon to colourful operations. It provides way to work on high volumes of data created at the IoT edge and enables operations to perform Machine literacy(ML), Deep Learning, and Augmented Data Discovery in- environment, where the data is being generated. By reducing cost and complexity precipitously in the pall, Edge Computing makes it easier to use Deep literacy fancies in operations

C. Virtual Reality Virtual Reality systems uphold positioned learning through the concerted experience of interactive objects, surroundings and processes. It substantially concentrate on relations with other humans and terrain by furnishing virtual gests and relations.

D. Commercial UAVs(drones) Drones are unmanned marketable upstanding vehicles which are gaining significance in the area of society, wisdom and technology with wide range of operations including surveillance, service, entertainment, videography and etc. It has an impact on our onset of security, sequestration, and safety of individual and government processes. Drones have some limitations like limited range and limited power, so it requires recharging at specified times for the flawless working of the device

E. Software Defined 5G relinquishment Software Defined Networks(SDN) has evolved to overcome the limitations posed by tackle-grounded designs which calculate on unrestricted and exacting cellular armature. SDN 5G relinquishment has given a way to consummately produce centralized network construct with the provisioning of programmability over the entire network.

F. Artificial General Intelligence far and wide " Artificial General Intelligence " has a wide range of operations in areas including " Deep literacy ", " Deep underpinning literacy ", " Artificial General Intelligence ", " Autonomous Vehicles ", " Cognitive Computing ", " marketable Drones ",

“ Conversational stoner Interfaces ”, “ Machine literacy ”, “ Smart Dust ”, “ Smart Robots ”, and “ Smart Workspaces ”. So, it's known as “ Artificial General Intelligence far and wide ” and in near future, it'll transgress all areas as a hi-tech service immersed in the cyberspace.

G. Deep Learning and Machine Learning Complex and complicated data structures in big data are discovered by Deep Learning with the help of backpropagation algorithms. Deep convolutional nets have conveyed about developments in processing images, videotape, speech, and audio, whereas intermittent nets have bettered successional data for case textbook and speech. Deep literacy is a kind of Machine literacy which assists computers to learn from understanding and passing the world as a scale of generalities. In view of the fact that the computer collects knowledge from experience thus mortal intervention for knowledge accumulation isn't needed.

H. Digital Twin Digital Twin idea refers to a comprehensive physical and functional description of a element, product or system. It's the cyber images of physical processes which are created by Digital Twin.

I.Serverless PaaS PaaS stands for Platform- as-a-Service and Serverless PaaS is a tackle-free armature which is introduced for the association and operation of pall- computing processes. Serverless computing is the coming generation pall technology well known as Function- as-a-Service(FaaS). Third party services extensively known as Backend- as-a-Service(BaaS) or custom law that is run in flash holders known as FaaS are used in Serverless operations for negotiating garçon’s tasks. FaaS by furnishing a pall platform for development and operation of operations without erecting structure is a recent development.

J. Cognitive Computing Cognitive Computing is a multidisciplinary exploration area which aims at planning computational models and decision making mechanisms grounded on the neurobiological processes of the brain, cognitive lore’s, and psychology

K. Blockchain The primary medium in a bitcoin is blockchain which serves as a communal tally and has multitudinous operations including fiscal services, character system, public systems and government systems. Tampering of deals in a blockchain is nearly insolvable. Main characteristics of blockchain agreed-centralization, persistency, effectiveness, secretiveness, and auditability.

L. Augmented Reality “stoked Reality” (AR) provides a live view of all real world objects and physical objects. Through computer generated perceptual information, rudiments are stoked rather across multiple sensitive modalities together with visual, audible, haptic, and olfactory.

M. Quantum Computing Computing by amount-mechanical marvels, like" superposition" and" trap", is known as Quantum Computing. It makes use of amount computers which works on amount bits rather than double bits which can be in superposition of countries.

N. Software- Defined Security A recent paradigm is known as" Software Defined Systems ”(SDSys), in calculating technologies which work for furnishing a supple and centralized security results by conceptualizing the security results from the h/ w subcaste to a s/ w subcaste. SDSys by significantly reducing the outflow in some operations (control and operation) of a complex computing system has served the computing assiduity. In SDSys, data aeroplane is insulated from the control aeroplane to address the

challenges faced by traditional security results like protection and effectiveness.

Some other arising trends and technologies include Autonomous Vehicles, Virtual sidekicks, Smart Workspace and Neuromorphic Hardware.

CONCLUSION

With the involvement of digitalization to a smart environment, a lot of new technologies are making their way through our lives making it better and better. In near future, more people and devices would be connected to each other. The world is heading for becoming a much better place to live with ever more communication with everyone across the world. This paper highlights most dominating trends and evolving technologies in the future computing that grow rapidly to change our future and requires attention and active participation. Some technologies show more prospective to deliver a modest advantage and most prevailing trends include Digital platforms, Artificial Intelligence Everywhere, Transparently Immersive Experiences and Internet of Things. This paper will provide new directions to the new researchers and major focus would be given to technologies requiring 5-10 years to mature.

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IMPACT OF SOCIAL MEDIA ON USER'S PRIVACY

Prof. Sarita Balakrishnan
Department of Mathematics,Information Technology and Computer Science
Tilak College of Science and Commerce,Vashi

Introduction

Data is one of the most valued & profitable asset on Earth right now[1].There was a time when oil companies ruled the globe, but "black gold" as oil was once called , is no longer considered the world's most valuable resource. Data has now replaced oil.

Most of the data around the world are controlled by just 5 global mega corporations. These corporations are Apple, Amazon, Facebook, Microsoft, and Google's parent company Alphabet. These corporations are bigger and powerful than most governments in the world. These companies have manipulated and used data in such a manner that they have taken over their respective sectors.

When it comes to India, right to privacy is about the right of personal freedom and protecting life. Privacy too can be restricted in well-defined circumstances, such as.

1. There is a legitimate state interest in restricting the right.
2. The restriction is necessary
3. The restriction is by law.
4. Right to privacy is protected as an intrinsic part of the **right to life and personal liberty under Article 21** and as a part of the freedoms guaranteed by Part III of the Constitution.

Even though Right to Privacy is not a Fundamental Right, Citizens have the right to protect their information. [2]

Right to be Forgotten (RTBF): It is the right to have **publicly available personal information removed** from the internet, search, databases, websites or any other public platforms, once the personal information in question is no longer necessary, or relevant.[3]

Have you ever wondered how we see a product on a particular website and when we open another site, it will show the advertisement related to the product that we earlier searched? Every time we visit a website, it puts an invisible marker on our systems which is known as Cookies in our computer. Cookies are actually small pieces of text sent to your browser by the web pages you visit. This helps the website/company to remember you & also to customise contents of the website or the application (app) as per your liking based on your searches. This is also the reason that we see fluctuation rates on flight or hotel bookings when we check again.

Social Media Giants like Facebook does user profiling on the basis of geography, culture ethnicity & also, on the basis of the brands one likes, movies you see, videos you watch, comments you make and shows advertisements tailor made for the user, links for apps which might interest you. It also keeps a track of all the

activities that you do in offline world, that are not even shared on the platform.

The point of contention here is that these corporations are selling access to the user's data in legal, but unethical manner & sometimes illegally. As we use their platforms in the form of websites or applications, these corporate giants are collecting our information about every aspect of our lives, our behaviour and our decision-making. This kind of data gives them tremendous power and profit over people.

In October 2022, there were a record 4.74 billion active social media users worldwide, making up 59.3% of the global population.

Social media concerns

Social Media platforms are made on exploitation of user's data and personal information. This information is stored in their huge servers & never deleted. The user may delete his account or page, but the companies will store these data.

4.74billion users are on social networking applications or websites which includes Facebook, TikTok, Instagram, Twitter, Snapchat, YouTube LinkedIn, and on dating apps including Grindr and Tinder.

Social media companies like, Facebook; collect vast quantities of personal data in order to "micro-target" advertisements to users. It means target advertisements based on the likes of the targeted user. In most cases, they exploit the user's vulnerabilities for such kind of advertisements.

This is also known as surveillance advertising or behavioural advertising where behaviour of the user is studied in depth by the companies. This has at least two major impacts on the user. One their right to privacy is atrociously hampered in the name of advertisements second is the psychological health of the users.

Companies like Facebook to maximize the probability of making profits out of a user, tries the following;

(a) Increase the total time a user engages with their platform and
(b) Customise the environment such that it makes the users to monetize his actions.

Notably, tracking and behavioural advertising by social media companies is not limited to these platforms themselves. Firms like Facebook, TikTok use hard-to-detect tracking techniques to follow individuals across various apps, websites, and devices. As a result, even those who do not have accounts on social media platforms are affected by their data collection and advertising practices. That means even if you are not having an online presence, companies still have your data.

When TikTok users enter a website through a link on their app, TikTok inserts a piece of code that can monitor much of their activity on those outside websites, including their keystrokes and whatever they tap on the page. The tracking can make it possible for TikTok to capture a user's sensitive information like credit card information or banking password as well. The company confirms that these features exist in their code, but they are not using them. [5]

TikTok has partnered with a growing number of other companies to get data about people as they browse through the internet. This is technique is called "hoover". This includes people who don't have even have TikTok accounts. [8]

These companies embed tiny TikTok trackers called "pixels" in their websites. Then TikTok uses the information gathered by all those pixels to help the companies target ads at potential

customers, and also to measure how well their ads work. That means companies are now invading privacy, unethically.

WhatsApp is a messaging service that has attracted its users because of its strong commitments to privacy. WhatsApp's founder had stated in 2012 that, "we have not, we do not and we will not ever sell your personal information to anyone."

However, everything changed in 2016 when Facebook acquired WhatsApp and they would begin acquiring the personal information of WhatsApp users, directly contradicting their previous promises to honour user privacy.

Lawsuits and Fines:
Antitrust authorities in the European Union had fined Facebook $122 million in 2017 for making deliberately false representations about the company's ability to integrate the personal data of WhatsApp users.

In 2020 FTC files an antitrust lawsuit against Facebook, which had already acquired WhatsApp.FTC publicly identified Facebook's acquisition of WhatsApp as part of a pattern of anticompetitive behaviour, but the damage was done.

TikTok paid a $5.7 million fine for violating the children's privacy law in 2019. Nevertheless, TikTok failed to delete personal information previously collected from children and was still collecting kids' personal information without notice to and consent of parents.

Also in 2020, EPIC and coalition of child advocacy, consumer, and privacy groups filed a complaint urging the Federal Trade Commission to investigate and penalize TikTok for violating the Children's Online Privacy Protection Act.

Apart from corporations, criminals can exploit social media to rapidly spread "fake news" and other forms of misinformation. This can impact politics, manipulate stock prices, harm personal or business reputations, or even cause people to take actions that harm innocent parties while helping criminals.

Objective:
To find the level in which a user's privacy is impacted because of Social Media.

This invasion of privacy can be legal, but unethical or sometimes illegal as this research paper shows.

The other objective of this paper is to know the increase in invasion of Privacy & how has caused psychological issues to the user.

Research Methodology:
This paper uses secondary data like government findings, journals and other research papers to establish its objectives and results.

Literature Review:
FTC Imposed a $5 Billion Penalty on Facebook and they will have to submit to new restrictions and a modified corporate structure that will hold the company accountable for the decisions it makes about its users' privacy, to settle Federal Trade Commission charges that the company violated a 2012 FTC order by deceiving users about their ability to control the privacy of their personal information. Facebook has blatantly flouted privacy rules around the world.[4]

Threats to Privacy on Social Media:
Data Mining
Every online user leaves a data trail on the internet. Every time someone creates a new social media account, they provide personal information that can include their personal information like

their name, birth-date, geographic location, and personal interests.

In addition, companies collect data on user behaviors: when, where, and how users use their platform. All of this data is stored and leveraged by companies to do better target advertising. Sometimes, companies share users' data with third-party entities, often without users' knowledge or consent. Again in a legal manner, because most users click on 'I agree' without checking the terms or conditions associated with it.

Phishing Attempts

Phishing is one of the most common ways criminals attempt to gain access to user's sensitive personal information.

Often in the form of an email, a text message, or a phone call, a phishing attack presents itself as a message from an actual legitimate organization.

These messages trick people into sharing sensitive data, including passwords, banking information, credit card details, or One Time Passwords. Phishing attacks often pose as social media platforms.

In August 2019, a massive phishing campaign targeted Instagram users by posing as a two-factor authentication system, prompting users to log in to a false Instagram page and thus losing out their information and in some cases their accounts as well.

Malware Sharing

Malware or malicious software is designed to gain access to computers and the data in them. Once a malware has infiltrated a user's computer, it can be used to steal sensitive information and act like a spyware, extort money that is, it's now a ransomware, or profit from forced advertising i.e. adware.Social media platforms are an ideal delivery system for malware distributors

Once an account has been compromised usually by obtaining passwords through the previously mentioned phishing attack, cybercriminals can take over that account to distribute malware to all of the user's friends or their contacts.

Botnet Attacks

Social media bots are automated accounts that create posts or automatically follow new people whenever a certain term is mentioned.

A large group of bots i.e computers can form a network known as a botnet. Bots and botnets are very much on social media and they are used to steal data, send spam, and launch distributed denial-of-service (DDoS) attacks that help cybercriminals gain access to people's devices and networks.

Online trolls.

Trolling is now an official term. It's when someone post or comments online to deliberately upset others. Trolling is when someone deliberately tries to upset others online. Most of the time, they take up fake identities online.

Cyber stalking/bullying

Cyberstalking is that the use of electronic means to stalk or harass a person or a company.

They post defamatory or derogatory statements about their stalking target (victim) on social media pages, messaging platforms designed to urge a reaction or response from their victim. This can lead to anxiety or other psychological issues in victims. Pandemic lead to more time being online & the instance of cyberstalking and Cyberbullying also has increased exponentially. [5]

Social Media Privacy Issues post Pandemic

Covid saw most businesses being conducted online. That meant everyone was on the internet. This has lead to a surge in online traffic—and increased tracking by commercial and public websites. These websites then share the data they collect with third parties, who aggregate the data to create user profiles for advertising purposes.[2] Many of these third parties are unknown to users and have access to users' data without their explicit consent.

The above mentioned attacks will continue to pose privacy threats in 2020. In fact, the attacks increased as the 2020 US presidential election came near. In early 2020, Politico reported that wide-ranging disinformation campaigns aimed at Democratic candidates. Attackers employ the same tactics as the trolls that is they use social media data to wage a disinformation "war".

The US presidential election of 2017 was tainted by Facebook's targeted ads,where the Cambridge Analytica was eager to sell psychological profiles of American voters to political campaigns,. They acquired the private Facebook data of tens of millions of users — the largest known leak in Facebook history. [6]

End Now Foundation, a non-profit organization has studied the trolling behaviour for nearing 03 years, and found that the most reason they act in this manner is due to psychological state issues or psychological problems. 60% of all Trolls have paedophile tendencies, and download pictures of child abuse, child rape, and abuse. [7]

How can you control your privacy on Social Media?

You only need to check some boxes, it is thought, to move your social media privacy from "weak" to "strong" and protect your online information.

In reality, it is hardly possible to control your social media privacy.

This is because even if you are doing everything possible to protect your privacy on social media, including deleting your account, your friends and relatives will still share your personal information.

Even getting rid of your social media apps may not be helpful in this case.

The evident lack of privacy on social media makes it important to protect your online privacy before you share anything on any social media platform.

Results:

The digital privacy divide has long been an overlooked area of injustice. The pandemic, and its implications on our life and work online, simply makes its impact clearer and more striking.

Privacy is a human right. Some people don't deserve it less than others, and no one should have to give it up just to get an education or make a living. [5]

For people victimised by stalking prior to lockdown, 49% confirmed an increase in online behaviours and 32% also saw a rise in offline behaviours. [9]

In United Kingdom, in a three-month period from July 2020 to September 2020, around 163,000 stalking reports were lodged nationwide, an increase of 31 percent on the same time period in the year prior.[10]

The governments must work together with the Social Media Giants to protect the privacy of the users who unintentionally give away their information.

Government in India should be able to use the Right to Be Forgotten Act when implied by its people about misused or long forgotten posts on Social Media.

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BENEFITS AND CHALLENGES IN WIRELESS SENSOR NETWORK WITH BLOCKCHAIN TECHNOLOGY

Sonali G. Gadwar
Assistant Professor
Department of Mathematics, Information Technology and Computer Science,
Tilak College of Science and Commerce, Vashi
gadwar.sonali@gmail.com

ABSTRACT:

Wireless sensor networks are currently being used widely in a variety of aspects of mortal life, including both civil and military activities. A wireless sensor network has many advantages and is very practical. Due to the centralized database approach used in wireless sensor networks, there are numerous security and storage issues. Therefore, the distributed database architecture must be used in the wireless sensor network system. Blockchain (BC) Technology is the most recent emerging trend technology utilized in distributed networks. Blockchain technology, also referred to as decentralized technology, aids in wireless sensor network protection as well as calculation and process improvement. This paper aims to discuss the advantages and drawbacks of a wireless sensor network that uses blockchain technology. It is concluded that the security and dispersed storage issues for wireless sensor networks can be solved using blockchain technology. It might pave the way for fresh paths in exploration research and distributed applications.

Keywords- *Blockchain (BC), WSNs, Security issues, Centralized, Distributed.*

INTRODUCTION

Security in WSN is both a task and a problem. Typically, sensor nodes are scattered throughout the environment and near to it[1]. The term "Wireless Sensor Network" (WSN) refers to a wireless network without any physical infrastructure that is implemented ad hoc among numerous wireless sensors to track system, physical, or environmental conditions. These sensing nodes are used in WSNs along with an on-board processor that controls and keeps an eye on the local environment. They are linked to the Base Station, which serves as the WSN System's working hub. A Wireless sensor network system's base station connects to the Internet to exchange data.

A blockchain is a shared distributed database or ledger between computer network components. A blockchain serves as a computer database for storing data in digital form. In a blockchain, data is gathered in groups called blocks that each contain collections of data. Blocks have certain storage capacities and, when filled, are closed, and linked to the previously filled block, creating a chain of data known as the blockchain. Every new piece of information that comes after that newly added block is combined into a brand-new block, which is then added to the chain once it is full.

In comparison to the current method, the blockchain-based WSN (BWSN) offers higher

security and trust. Various sensor nodes are stochastically linked in this system. The study includes a review of BWSN in the literature as well as a theoretical introduction to blockchain and WSN. A thorough analysis of the blockchain's capacity to integrate WSNs Additionally, it provides an insightful perspective of the technological obstacles limiting the operation of BWSN. The following are the survey's major contributions:

[3] The first survey covers the development and uses of WSN, the categorization of sensor nodes, and the many problems with energy, communication and routing, security, availability, operating system, hardware and software limitations, MAC Layer, and problems with time synchronization.

[4] This study provides an overview, the key characteristics, a security analysis, and a list of the different uses for the blockchain technology.

[5] The integration of blockchain with WSN is the primary focus of this article (BWSN). The integration of blockchain with WSN is the primary focus of this article (BWSN). The architecture, industry-specific applications, and uses of BWSN are covered in this study.

[6] This survey covers two elements of malicious node detection using BWSN:

a. the BWSN architecture for detecting malicious nodes and b. the role of smart contracts in malicious node detection.

[7] This study describes the benefits of blockchain for WSN data administration, which entails online information aggregation and may include auditing, event logs, and storage for information analysis and offline query processing. In this research, the conventional WSN solutions are first described. then the data management WSN solutions built on the blockchain.

[8] This study examines centralized wireless network models for security issues and explains the benefits of blockchain for managing WSN security.

BENEFITS OF SYSTEM

1. WIRELESS SENSOR NETWORKS

WSNs are typically characterized as a network of nodes that sense information cooperatively in daily life and, usually, permit interactions with distant computing devices, people, and the nearby environment [1], as shown in Fig. 1.

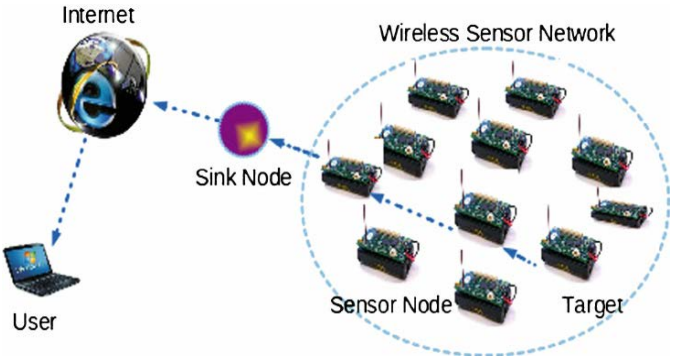

Fig.1 WSN architecture

2. BLOCKCHAIN TECHNOLOGY

With the help of the technology known as blockchain, various parties engaged in communication can carry out various transactions without the involvement of a third party. Specialized nodes perform the verification and validation of these events. The Blockchain design is shown in Fig. 2.

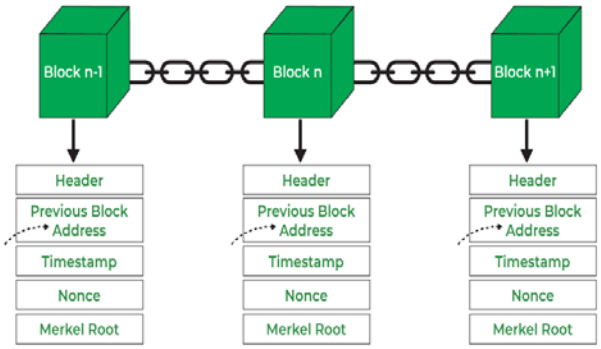

Fig.2 Blockchain architecture

1. **Header:** It is used to identify the block in the entire blockchain. It handles all blocks in the blockchain.
2. **Previous Block Address/ Hash:** It is used to connect the $i+1^{th}$ block to the i^{th} block using the hash.
3. **Timestamp:** The timestamp is a string of characters that uniquely identifies the document or event and indicates when it was created.
4. **Nonce:** A nonce number which uses only once. It is a central part of the proof of work in the block.
5. **Merkel Root:** It is a frame-like data structure made up of various data elements. A Merkle Tree creates a digital fingerprint of each transaction and saves them all together in a block.

3. INTEGRATION OF BLOCKCHAIN WITH WSN

The wireless sensor network system will use a centralized network to retrieve data. Through a centralized server, various gadgets can connect. the growing demand for large-scale network applications and the number of devices assigned to the network. The most cutting-edge technology in the WSNs system, blockchain technology, needs to be integrated. Peer-to-peer networking (PPN), distributed file sharing (DFS), and autonomous device coordination (ADC) problems will be solved by using dispersed networks. The wireless sensor network system can track and manage networked devices thanks to blockchain. This system is capable of managing system security and dependability as well as connections between devices. With the aid of a distributed ledger, the WSNs system can handle peer-to-peer connections rapidly, as demonstrated in Fig.3.

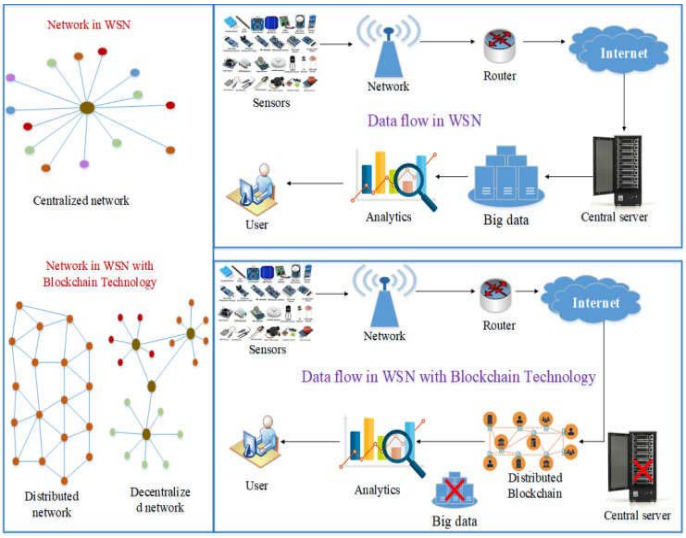

Fig.3. Centralized, Decentralized, and Distributed WSN and Data Flow in WSN with Blockchain technology

Don't use centralized data in wireless sensor networks with blockchain data. The Wireless Sensor Network with Blockchain Technology is comparable to the Wireless Sensor Network with Blockchain Technology, but when data is sent from the world wide web, it now passes through a distributed blockchain instead of a centralized server [1].

WSNs without integrating Blockchain	**WSNs with integrating Blockchain**
Centralized	Decentralized
Client- server architecture	Distributed ledger
Low Energy consumption	High Energy consumption

Less security	High security
Less processing speed and storage capacity	Large processing speed and storage capacity
Implement and maintain easily	Implement and maintain difficult

Table .1 Difference between WSN with and without Blockchain Technology

APPLICATIONS OF BLOCKCHAIN-BASED WIRELESS SENSOR NETWORKS

Following table demonstrates the application of WSN using blockchain

Application Areas	Occurrence
Smart City	Water and pollution information management, allowing transactions based on digital information
Food Retail Services	Online ordering, packing, shipping, delivery, transaction, and quality assurance data
Agricultural production	Management of soil data, implementing records associated with agriculture information, delivery of agriculture commodities, etc.
Manufacturing	Management of products manufacture information, product packing information, products shipping information
Healthcare	Storing the information of a genome, patients' digital reports, electronic healthcare records

Table .2 Applications of blockchain-based wireless sensor networks

CHALLENGES IN WSN WITH BLOCKCHAIN TECHNOLOGY

Numerous advantages of blockchain were discussed in the part above. Blockchain is therefore not a perfect system; it also has its drawbacks and difficulties. The following are these difficulties:

a. **Extensibility**: Wireless sensor networks lost a significant amount of their dispersed character scale as they grew. As the number of nodes in wireless sensor networks rises, many features of blockchain will also.
b. **Energy usage and time consumption**: While the devices in WSNs typically have low energy consumptions, blockchain requirements have very high energy consumption and processing times.
c. **Capacity**: One of the main benefits of Blockchain is the deletion of the central server architecture and the use of a distributed ledger to keep transactions and device IDs in the network. Since each network node has a copy of these ledgers, their bulk will eventually grow. Additionally, as the network is expanded, there are more network components. It is one of the system's difficulties.
d. **Problems with law and compliance**: The biggest challenges for service providers come from the ability of Blockchain technology to link various devices globally without adhering to any standards or laws.

CONCLUSIONS:

This paper highlights a current IT trend that combines wireless sensor networks and blockchain technology. Data collection has gotten simpler as a result of the sensor technology's rapid development. Lack of security, energy, and storage capacity restrictions has an impact on the network's efficiency. Blockchain is a distributed,

peer-to-peer technology that can improve the functionality of wireless sensing networks. This paper introduces an emerging tendency of blockchain integration with wireless sensor network system approaches with the aim of enhancing the network's security, dependability, and longevity.

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FROM MACHINE LEARNING TO DEEP LEARNING IN AGRICULTURE, A SURVEY

Sunandita Swain
Ph.D. Scholar , Astt.Professor
Department of Mathematics, Information technology and computer science
Tilak College of Science and Commerce, Navi Mumbai

ABSTRACT:
Agriculture is an important source of livelihood by engaging two-thirds of the population in various activities like farming, food supply, and internal and external trade. In recent times farmers are facing various challenges like crop failure due to less rainfall, infertility of soil, etc. In the last two decades, there is intensive development of artificial intelligence in the field of agriculture. This paper helps the researcher to understand how to manage crops efficiently and achieve high productivity using various machine and deep learning algorithms. In this paper transitions from simple machine learning algorithms to deep learning algorithms can be observed. In the second part of the paper emphasis is on areas of application, selected deep learning methods, input data, crop classification, and applied frameworks. In this paper Scopus, web of science, Research gate, and springer databases are used.

Keywords: *Agriculture, Artificial Intelligence, Machine Learning, Deep Learning, Smart Farming.*

Introduction
Agriculture with artificial intelligence provides an efficient way for sustainable agriculture challenges. Machine Learning, Deep Learning and time series are essential in smart farming. Various activities are like crop selection, crop classification, yield production, water management and many other processes are involved. Machine Learning algorithms are used for crop selection and management where as deep learning is used for crop selection, crop yield prediction and time series is used for demand forecasting of crop yield prediction. In this review there is a comparison study of machine learning and deep learning techniques. There is a more need of food due to the growing population, crop production forecasting is one of the crucial task. Machine Learning and Deep Learning algorithm will help the farmer to overcome the food insufficiency.

1. Machine Learning

Machine Learning is a branch of Artificial Intelligence focusing on learning [1] of practical approach that can provide better yield production based on several features. Machine learning can determine several patterns and corelations and discover knowledge from data sets, The models are trained using data sets where the outcomes are represented based on past experiences. ML model can be descriptive or predictive depending on the research problem and research questions. Machine learning studies consist of various challenges to produce high performance

predictive model. Right algorithms must be chosen to solve the desired problem and underlying platforms must be capable of handling the large volume of data. Popular machine learning algorithms are Artificial Neural Networks, Support Vector Machine, Decision trees and Random forest.

2. Deep Learning

Deep Leaning , first pronounced by Igor Aizenberg in the early 2000.Deep Learning gives depth and complexity to the model and improves the machine learning models. It transforms the data into various level of abstraction by using artificial neural networks(ANN) or machine learning algorithms.. While ANN consists of three layers as input layer, output and hidden layer, deep learning consist of more than one hidden layer number in it. Deep Learning produces output by self-learning, the information passed through hidden layer shown in the picture. To Produce high quality data and to reduce costs deep learning can process the unstructured data. Disadvantage of deep learning is that larger amount of data is required and cost of the hardware and software is at higher side. A strong advantage of DL is automatic feature extraction from raw data.[2] DL can solve more complex problems very well and fast due to the usage of more complex models which allow massive parallelization. Deep learning can increase classification accuracy to reduce the errors in regression problems. There is a great need of large dataset (Self describing) are required. Deep Learning consists of various components like convolutions, pooling layers fully connected layers, gates, memory cells, activation functions and encode/ decode/ schemas etc. It depends on the architecture used in deep Learning Like un supervised , Convolutional Neural Networks, Recurrent Neural Networks and Recursive Neural Networks. This models allows them to perform classification and predictions from a data analysis perspective.

3. Comparison of deep learning algorithms with Machine Learning Algorithms

Machine Learning is a sub field of artificial intelligence that focuses on development of algorithms and statistical models. This statistical models help the computers make predictions in farming without being explicitly programmed.[3]It involves training algorithms on large datasets to identify patterns and relationships, then use those patterns to make predictions of decisions about new data. On the other hand Deep Learning is subset of machine learning that uses neural networks with multiple layers to analyse complex patterns and relationships in data. It is inspired by the structure of human brain and successful in accomplishing various task like crop classification , soil mapping , pest control, yield prediction etc.[4]Deep Learning models are trained using large amount of data and algorithms that are able to improve overtime, become accurate as they process over time. So deep learning models are well suited for real world complex problems and help them to adopt new situations.

4.1 Research Questions

As some papers are selected from literature review were analysed one by one considering the following questions.

1. What are the different agricultural and food related problem can be solved using artificial intelligence.

2. What are the different types machine and deep learning algorithms can be used in agriculture related problem.

3. How much work has already been done so far in both the machine and deep learning models and a comparison analysis has to be made which model is showing good productivity as desired.

4.2 Applications used for DL and ML

Most used framework in the analysed paper is Keras. [5] Secondly in many papers information about the used framework is not available and thirdly tensor flow is mostly used in . Can say most popular deep learning applicationas are keras and Tensor flow. Some of the paper tensor flow is used with or without keras . The most dominant framework is CNN (Convolution neural networks) then RNN(Recurrent Neural Networks. RNN is mostly used where temporal dynamic behaviour is needed.

4. Literature Review

Many reviews deal with artificial intelligence, computer vision, machine learning and deep learning in agriculture. We can say machine learning is an art of achieve artificial intelligence. Deep learning is part of machine learning which includes convolution and recurrent network.[6] provided a comprehensive paper on public image datasets available for computer vision. He has identified a total of 34 public image datasets and categorized them into three classes based on targeted applications like 15 datasets in weed control, 10 datasets on fruit detections and remaining 9 datasets for other applications. This paper surveys the characteristics of each paper involving in image acquisitions.[7] proposes IoT and deep learning multi modal system for agricultural activities like detection, dissemination and monitoring of active fire locations. Sensor based detectors and deep learning based detectors are used and detector implements camera based mobilnetV2 architecture is used.[1] investigated to what extent deep learning algorithms are used for crop yield prediction. He identified 30 papers that applied deep learning. He observed CNN, LSTM and DNN are mostly the preferred algorithms. This paper basically focuses on crop yield production.[8] In this paper author tries to show how advancement of technologies like censors, 5G connections, cloud computing ,GPUs, quantum computing and different deep learning algorithms contributes to precision agriculture. How UAV platforms have many issues and solution is required for smart farming. One solution is to overcome such problem is to build an intelligent drone(IOD)system that could monitor farmlands to improve crop productivity with less human intervention.[9] Researcher tries to predict feature selection based predictions with UNet++ architecture and up sampling of minor classes demonstrated the capabilities of deep learning generalization for classifying of complex ground objects, offering improved performance compared to UNet, Deeplab V3+, Random forest and object oriented classification models. This paper contribute to large scale , dynamic and near real-time land use and crop mapping by integrating and multi-source remote sending imagery.

5. Methodology

In this Paper carried out Literature review of academic articles indexed in Web of Science, Science Direct, IEEE explore to review the extent which machine learning and deep learning features are used in the agriculture. Analysed and classified articles in two fields machine learning and deep learning. These Articles are explored based on various criteria like years of studies, aim of the studies like(crop classification, disease detection , soil mapping yields forecasting etc. Focussed on properties of the datasets , architectures and performance criteria examined and the output. Searched Keywords Machine [“deep learning”] AND [“agriculture” OR ”farming“] , [“Neural Networks”] AND [“agriculture” OR ”farming“]. and [“Machine Learning”] AND [“agriculture” OR ”farming“].

Focussed on what are mostly used machine learning algorithm in agriculture and how deep Learning can give better results. In this way filtered out paper from the year 2020 to 2023. Studied 28 Machine Learning Paper and 42 Deep Learning for the survey. Most of the work has been already done using machine learning for agriculture domain but there is a huge research need in deep learning. Mostly used machine learning algorithm are random forest and CNN is mostly used for deep Learning algorithm. As depicted below Neural networks are part of the machine learning fields, and deep learning is a special version of neural network usage. Relation can be seen in the below image.

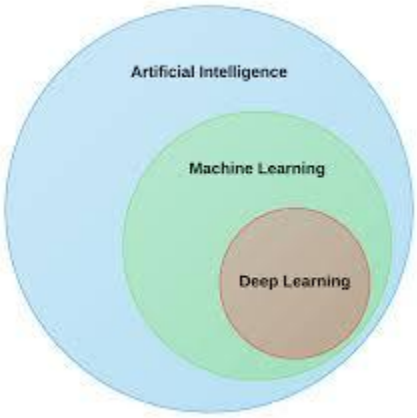

Figure1:

5. Advantages of Machine and deep learning algorithm in agriculture.

5.1 plant detection

Identification of different plants species can be done using various ML and DL methods depending on the classification algorithm in agriculture domain based on artificial intelligence.[1] Crop images obtained in different sizes and various lightening conditions were trained with ml algorithms and a study was carried out by to determine the healthy crop and appropriate crop having a particular colour.[10] plant species can also classified using deep learning models . Nitrogen and water combination also can be calculated using data combine with rain fall. Health and shape of the crop also can be recognised using various ML and DL methods.

5.2 Disease detection

One of the most important problems in the production of agriculture is plant diseases. [11]Spraying of pesticides, cleaning of weeds needs manpower to prevent and control harmful organisms. Human interventions require more time and cost. In literature review found hybrid models developed for multi class classification used for oil seed disease, multicolour fluorescent image technology for detecting diseases in tomato plant. So

5.**3 Soil Mapping and Crop classification**

Crop classification plays an important role[11][12] for the calculation of crop sown area and the productions of crops. Accurate classification will help you for the higher productivity and full fill the demand required. [2]Deep Learning is one of the versatile modern techniques for extraction of crop features and classification of structured and unstructured data.

5.4 Yield Production

As per[13][14]Depending on the increasing world population, agriculture productivity has come to very important point. Crop prediction can be done through images obtained from different soil and crop sensors by using an unsupervised learning. Machine Learning models can be applied to estimate NDVI values of large area**.**

6. Conclusion

In this paper we have performed a survey of machine learning and deep learning based research efforts applied in agriculture domain. Identified some relevant papers, examining the particular area and problem they focus on, technical details of all the models, data sources used, pre-processing tasks , augmentation techniques used. Focussed on the different types

of performance techniques used in each paper. We have compared machine learning algorithms with deep learning algorithm. Machine learning helps in various agriculture domain, Our findings indicate that machine learning mostly work on structured data. More computational overheads are required to convert unstructured data into structured data. Deep Learning provides adoptive approach for feature adaptation of plants. Our aim is that this survey motivate more researchers to experiment and applying it for solving various agricultural problems. The most popular plant and agriculture used were wheat, corn rice, tomato, sugarcane and soybean. The most popular deep learning algorithm is used in agriculture is CNN.

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A THOROUGH ANALYSIS OF THE INTERNET OF THINGS (IOT) HEALTH CLOUD, AN EMERGING TECHNOLOGY

Prof. Shraddha Krishna Gupta
Department of Mathematics, Information Technology and Computer Science
Tilak College of Science and Commerce, Vashi
shradha577@gmail.com

ABSTRACT:
Information technology (IT) is a sector that is continually changing, with new trends and advancements appearing all the time. The ways in which we work, communicate, and obtain information may be significantly impacted by these new developments. In order to remain competitive and relevant, it is crucial for IT professionals to stay up to date and knowledgeable about these developments.

This study paper's goal is to examine some of the new IOT developments and their prospective effects on the industry. The definition of "Internet of things" and the significance of remaining up to date in the industry are covered in this essay.

The term "Internet of Things" (IOT) refers to a type of network that uses the internet to connect numerous devices together. IOT helps with data transmission between devices, device tracking and monitoring, and other things. IOT enables items to exchange data and automate processes without physical interference, making them "smart." Wearable health monitoring technology is an example of how IOT may be used in our daily lives with ease. a community filled with various physical devices and things connected by the internet, with sensors covering every area of the city. IOT can be used to automate homes, offices, or other units when household equipment is connected to the internet. IOT is being utilised for contact tracing during the COVID-19 pandemic.

The IoT business in manufacturing, health and social care, electricity & gas, and worldwide agriculture IoT drone market will reach trillion to billion by 2030, according to this research paper's findings.

Keywords: *Internet of Things" (IOT), Machine learning, Artificial intelligence, Cloud storage*

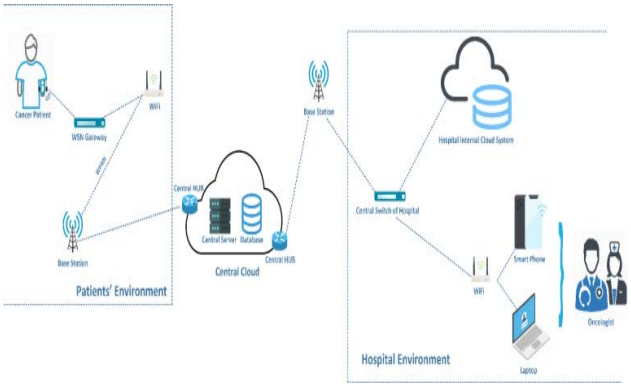
Introduction:
The World Economic Forum (WEF) stated in a new white paper on Friday that Fourth Industrial Revolution technology can play a "game-changer" role in revolutionising cancer care in India, where cancer rates have increased by over 60% since 1990. According to a study that was reported in the American scientific journal JCO Global Oncology, cancer rates are rising quickly throughout India and one in nine of the nation's 1.3 billion residents may experience the disease at some point in their lives. The second leading cause of death in Arabic-speaking nations is cancer, a condition characterized by the unchecked expansion of cells in numerous organs. Early diagnosis increases the likelihood of effective treatment and patient survival.

According to this review study, emerging technologies like artificial intelligence (AI) and the internet of things (IoT) can provide better cancer care.

Artificial intelligence and data mining are the two main application fields for machine learning. On the other hand, machine learning is required for the building of models in artificial intelligence, including robotics, image processing, computer vision, and object detection in images. Machine learning is based on creating an all-encompassing model using empirical data. With this approach, it is intended to be able to respond appropriately to new data.

The Internet of Things (IoT) is an organization of correlated preparing devices, mechanical and propelled machines, things, animals or people that are given unique identifiers and the ability to move data over a framework without anticipating that human-to-human or human-to-PC collaboration.

System Architecture:



An Internet of Things (IoT) based system for monitoring cancer patients has the potential to timely detect cancer related symptoms in its early stages, to continuously monitor cancer diagnosed patients and to monitor those that got cured for post-treatment measures. This paper proposes a multi-layered architecture of an IoT-based cancer observation system that can be utilized as a platform to remotely diagnose and monitor cancer patients. An implementation framework of the proposed system is also presented is this work, along with a prototype design of a Patient Side Unit (PSU) represented by a wearable wrist band. The proposed system has the potential to be applied as a solution for reducing expensive and exhausting hospital visits, while gaining similar quality of medical services when residing at home.

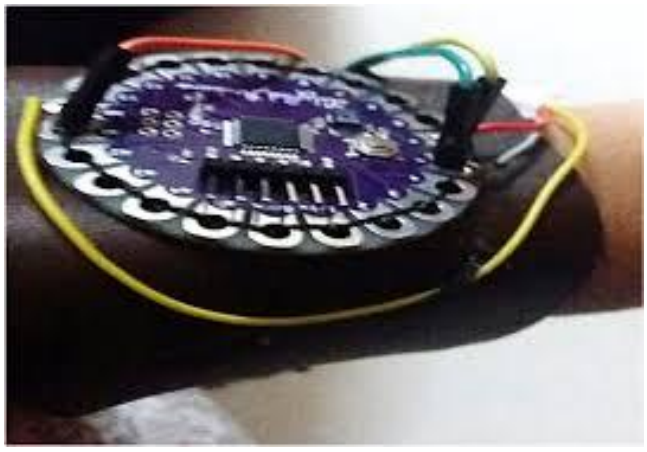
Sensors' function in Internet of Things (IoT) healthcare applications

Medical personnel can better and quicker grasp important circumstances with the use of sensor data, and patients can be more informed about their ailments and advancements.

Patient Layer:

In this layer, the patient is equipped with a smart wearable gadget that is intended to identify a specific form of cancer. We refer to these devices as "Patient Side Units" in general (PSU). A smart device with one or more sensors is represented by the PSU . The deployed sensors, which can measure body temperature, blood glucose levels, and take use of the ligand properties of DNA strands, proteins, and antibodies, can aid in the detection of problematic health patterns.

WeS, or wearable systems, are gaining popularity as an alternate tool for managing chronic conditions and tackling early diagnosis. WeS can be described as a mixture of electrical components that could be utilised as clothes or accessories to be worn on the body. These wearable systems typically include intelligent biosensors, actuators, built-in Direct Current (DC) power sources, communication modules, and computing units.



Medical Layer:

The application layer responsible for storing, analysing, and presenting the data gathered by PSU's sensors is known as the medical layer. The data we get about cancer patients is kept on a local server or in the cloud. Using online services, the saved data can be further retrieved and used. Via web services and a frontend application on a smartphone or standalone computer device, the saved data can be further retrieved and used. For any application, such as those expressly used by oncologists to keep track of their patients' health, the web services can easily be called upon.

Connectivity Layer:

On a network layer called the connectivity layer, sensors are wirelessly connected to one another and to a specific gateway. Since a network of wireless sensors can track and share patient physical state using sensors that are spatially dispersed, this technology is used. Such a network adheres to the IEEE 802.15.4 protocols standard and is a wireless personal area network (WPAN). The underlying standard can support star topology client server models as well as peer-to-peer communication among sensors forming a mesh topology.

Our system uses ZigBee as the WPAN technology since it performs well, uses little power, and has a respectable coverage area. For this project, ZigBee is used for all communication between the gateway and the sensor nodes in the Connectivity Layer and Cancer Patient Layer. The Gateway is a bridging point that is used by the cancer observation system . The Gateway, which sits in between sensors and the Internet, translates protocols between sensors and the rest of the Internet among other fundamental tasks. To make data exchange between two systems secure, it is crucial that gateways are properly positioned and use advanced encryption.

Wi-Fi access points, which serve as a bridge between the Connectivity Layer and the Medical Layer, are used to further advance the data received at the gateway to the internet and in the direction of the intended location.

Connection: Connectivity is yet another difficult component of survey studies. Surely, improper connectivity will undermine cancer patients' confidence in the suggested solutions. In this context, connectivity may include various ideas, including (1) communication protocols, (2) host machine integrity, and (3) cloud computing services. Short- or very short-range communication protocols, such as Bluetooth, Bluetooth Low Energy (BLE), WiFi, Infra-red (IR), or visible light communication, etc., may be useful given that the WeS is primarily focused on in-body attachments. This communication is needed to help detected body signals be sent to nearby machines.

Table 1 : Set of sensors usable with wearable devices at PSU.

Sensors	Purpose
Temperature Sensor	Temperature of patient
Pulse Sensor	Heart rate of patient
Enzymatic Sensor	Blood Glucose level
Immunosensor	Protein level and DNA template strand
Nanosensor	Detection of Leukemia

IMPLEMENTING IOT TO ENSURE COST EFFICIENCY

With IoT-connected medical devices, cost-effectiveness can be achieved in a number of different ways. Medical costs can drop significantly if the healthcare sector transitions from one that is reactive to one that is proactive.

There are two ways that IoT can reduce costs. First, because EMTs are more familiar with patients, treatment goes more quickly with fewer difficulties. The second benefit is that patients can use a less expensive institution for long-term care because they are allowed to leave the hospital sooner thanks to real-time data transmission. Cost-effectiveness is a comprehensive end result for the integration of IoT within medical equipment, while improving the healthcare industry with a better system to save lives.

IOT'S AFFECT ON HEALTHCARE

Medical device makers now have countless options because to the development of IoT connectivity. The automatic transmission of data that is pertinent to medicine through IoT-connected devices will transform the healthcare sector and data analysis. The instantaneous sharing of data will enable doctors and medical professionals to support their patients more quickly and effectively.

With the help of IoT-enabled devices, healthcare can finally move from a reactive to a preventative model, where illnesses are not only better treated but also preventable. With their IoT-connected monitors, elderly patients will be able to remain at home alone, and both patients and doctors will have full access to their medical records. The healthcare sector will develop faster, better, and more affordably if critical response professionals are better equipped to manage emergency circumstances.

Goal

The major goal of this research project is to leverage cloud-based IoT systems in the medical industry, such as e-healthcare systems, to monitor patient information. Several sensor devices that are implanted in the patient's body are used to collect patient-related data such as the patient's name, age, address, marital status, phone number, past medical history, blood pressure, variation in heart rate, and so forth. The decision is then made to extract the information from the blood test result for the cancer patient, which will be encrypted and authenticated before being stored in the cloud. It is preferable for a doctor to use a patient's cancer information on the internet at any time, from any location.

CONCLUSION:

Rising cancer incidence rates are becoming a significant issue for various cultures. This is mostly caused by the dearth of proper medical facilities and the high cost of care. Complex cancer patients are in an even worse predicament because they need to be monitored constantly in order to make accurate diagnoses and treatment

choices. Moreover, early cancer detection and therapy can resolve a lot of disease-related problems. The development of wireless connectivity, embedded technologies, and remote data collection can significantly aid in the early detection and treatment of cancer. For a real-time cancer surveillance system, a three-layer design was proposed in this study. Together with a description of the key components, a functioning framework presenting the implantation aspects of the proposed system is presented.

The designed prototype was tested in a series of experiments and found to be capable of successfully gathering and transmitting patient-related data to a remote collection point.

A potential direction for this research is to further assess the prototype's performance while taking into account the performance of other biosensors operating within the suggested three-layer architecture.

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IMPACT OF 5G WIRELESS SYSTEM

Mrs. Bhagyashree N. Apange
Asst. Professor
Model College of Science & Commerce, Kalyan (E)
E-mail:bhagyashreevd@gmail.com, Mob.: 9595022769

Mrs. Aakansha Wagh
Asst. Professor
Model College of Science & Commerce
E-mail:aakankshaborse30@gmail.com, Mobile No. : 8149817153

ABSTRACT:
As we see 5G is being widely adopted and people are responding well. 5 G is having more bandwidth which enables fastest data transmission with low latency. Both today's wireless infrastructure and the modern era of 5G are seen as assets of intelligent systems. The increasing reliance on wireless technology has led to a technological revolution in communication, with access to a wide range of devices and networks to deliver data across a wider and higher frequency spectrum of the electromagnetic spectrum.

Main objective of this paper, is to focus on Positive and Negative impacts of 5G wireless system. Positive impacts such as improving workplace and worker safety, increasing operational effectiveness, mobile broadband associated with artificial intelligence and drone based applications, higher transmission speeds, lower latency, increased connectivity, etc. Positive impacts improve the quality of society environment and health that's why positive impact is accepted. According to Qualcomm, the 5G value chain in a digital economy will produce revenues of up to $13.2 trillion and up to 22 million jobs by 2035. This is acceptable growth but We must also think on negative effects which are harmful to society, health and environment such as environmental degradation, radiation, harmful to wildlife, radio frequency clash, incompatibility with older equipment etc. Various studies have been conducted on the adverse effects of RF-EMF waves generated by cell towers on human health and the environment. 5G uses a very dense infrastructure and there is evidence that RF-EMF radiation levels are much stronger in fifth-generation mobile technologies compared to previous mobile technologies.

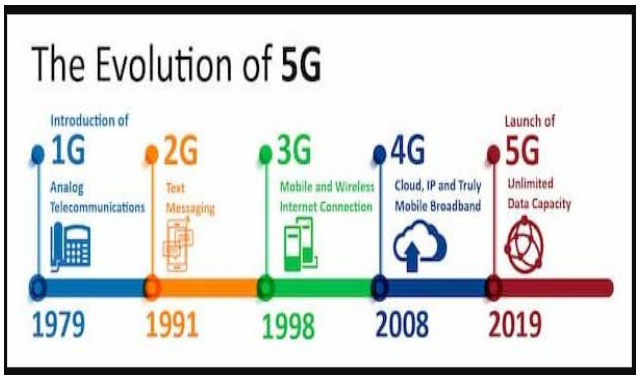
The purpose of this paper is to suggest the possible solution on negative impact of 5G on health, radiation and cyber security.

Keywords:- *wireless communication, Radio frequency, 5G technology, Quantum communication*

INTRODUCTION

5G is the fifth generation of mobile networks. 5G, which is 100 times quicker than 4G, offers people and organizations previously unimaginable opportunities. Faster connection speeds, ultra-low latency and greater bandwidth are advancing society, transforming industry and dramatically improving everyday experiences. Services we

once thought were futuristic, such as eHealth, connected vehicles and transportation systems, and advanced mobile cloud gaming, are now a reality. 5G technologies offer the potential to create a smarter, safer and more sustainable future.



5G is the fifth generation ("G" for generation) of mobile technology. The first generation of mobile technology, 1G, was broadly about voice - the ability to use a phone in a car or away from home. 2G introduced a layer for short message. 3G provided the core network speeds essential to launch the first smartphone. And 4G LTE, with its high data rates, gave us access to low-buffering mobile video and led to many of the connected devices and location services we use today.

The 5G ultra-wideband version offers speeds up to 10 times faster than the average.

POSITIVE EFFECT

1. Enhanced operational effectiveness

Multiple devices can be connected simultaneously, and more data can be moved more quickly than ever thanks to new 5G technologies. It will change how conveyors, fastening tools, robots, and other production equipment interact in assembly plants throughout the course of the following ten years. The technology will also power a number of Industry 4.0 efforts, enhancing production process automation and real-time machine condition monitoring.

With the help of new 5G technology, several devices can be connected. Autonomous mobile robots automatically deliver components to the precise area required based on communication with production line equipment, taking advantage of 5G's high speed, huge capacity, low latency, and ability to link many devices.

2. Workplace and worker safety

Digital sensors included in wearable technology such as hardhats, belts, boots, vests, and wristbands have proven to be quite effective in shielding workers from hazardous situations. Wearable sensors can recognize when a worker enters a restricted location with potentially applications.

Additionally, alarms set off by wearable might notify emergency response teams or jobsite management of issues and dangers. For instance, if a worker falls, a smart wearable might identify the accident and notify others including an emergency medical technician (EMT) so they can provide faster Geospatial positioning capabilities of vests allow for the tracking of employee movement which is crucial for maintaining social distance in pandemic situations.

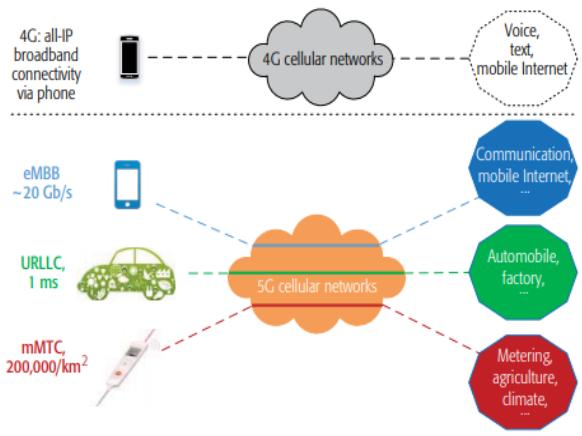
3. Greater Transmission Speed

The millimeter-wave band is a part of the 5G network spectrum in addition to the current LTE frequency range. It is anticipated that this network, which combines a large spectrum with cutting-edge radio technology, will be 100 times faster than Fourth Generation (4G) networks, with transmission speeds of up to 10 Gbps. Naturally, faster image and video transmission results from this. With 5G technology, a high-resolution video that would typically take a while to download may now be downloaded in a matter of seconds.

Based on IMT-2020 specifications, 5G is intended to achieve peak data rates up to 20 Gbps. However, 5G is more than simply a speedy connection. In addition to offering faster peak data speeds, 5G is intended to increase network capacity by utilizing additional frequencies.

To ensure that data speeds remain high even when users are moving around, 5G can also provide significantly lower latency for a quicker response and a more consistent user experience overall. And a Gigabit LTE coverage base serves as the new 5G NR mobile network's backbone.

4. Increased Connectivity



Because the 5G network uses more spectrums, it can connect with more devices it can handle 100 times as much traffic than 4G networks. As a result, more gadgets and people can communicate with one another simultaneously. This enhances the likelihood of creating smart cities that manage themselves utilizing a variety of sensor links.

This characteristic is anticipated to be used in the development of autonomous cars. These vehicles will be interconnected and exchange data (their speed, distance from each other, etc.)This idea could actually save lives, given how many people die in auto accidents each year.

5. Mobile broadband associated with artificial intelligence and drone based applications

The ability of 5G to connect every tool, person, and machine propels AI to new heights within the context of industry 4.0. For instance, a wireless 5G camera will enable you to control a robot arm, manage robots in warehouses, or even evaluate the effectiveness of each piece of hand-carried machinery employed by a chain of automakers.

For autonomous drones, 5G is a game-changer. Drones often employ less dependable point-to-point connectivity when in flight, which could experience signal loss at any time. A drone can take advantage of the ultra-high dependability and low latency connectivity when using a 5G network. This indicates that a drone can quickly respond to instructions from the operator or ground control system. With less time between transmitting, receiving, and responding to commands thanks to 5G, there is less chance of an error occurring while the aircraft is in flight.

This low-latency is especially helpful in navigation settings where drones operate outside of visual line of sight or in GPS-denied areas (BVLOS). In this use case, drones must navigate in places where the pilot's view is obstructed without the use of GPS and must instead rely on visual inertial odometry (VIO). The drone's camera feed will automatically update in real time on the pilot's ground control system thanks to 5G,

giving the pilot a precise view of the drone's location.

6. Lower Latency

The time elapsed between receiving an order and having the supplied instruction carried out is referred to as latency. The latency of 4G technology is roughly 4-5 milliseconds (ms), while with 5G technology, it can be as low as 1ms, or 10 times less. This enables us to watch high-speed virtual reality videos without any breaks. This unique attribute of 5G technology means that it can be very beneficial in industries other than IT, such as healthcare and construction. Most people believe that the faster data speeds provided by modern 5G technology are the most significant advantage. Many fail to realize that 5G may be used to reduce network latency, which is a much more pressing problem.

By measuring the interval between the sending of a specific piece of information and the associated response, latency describes the end-to-end communication delay.

It's a popular misconception that faster data speeds are the main advantage of the new 5G technology. Many people, however, are unaware of how 5G may be used to reduce network latency, a much more important problem. By measuring the interval between the sending of a specific piece of information and the associated response, latency describes the end-to-end communication delay.

NEGATIVE EFFECT

1. Harmful to human health

Ionizing radiation and non-ionizing radiation are the two types of radiation. Mobile phones and telecom antennas emit electromagnetic radiation regardless of the network production. Non-ionizing radiation, which belongs to the low frequency range of the electromagnetic spectrum, is what they produce. Due to its short wavelength and short range, 5G is non-ionizing, but there is still a possibility that it could be harmful to the environment and people's health. An increase in atmospheric electromagnetic radiation, which will increase the chance of disease and cancer, will be the main consequence of 5G.

Further up the range, ionising radiation—which includes X-rays and nuclear radiation—has been shown to have harmful effects on human health and has very different health effects. We have used mobile phones up to now, which are still non-ionizing radiation. If telecom equipment emits too much non-ionizing radiation, humans could be harmed.

There have been claims that electromagnetic radiation exposure from telco equipment causes electro hypersensitivity, which manifests as headaches, nausea, or even rashes in some cases..

2. Harmful to Animals and Birds

The 5G network's high-frequency electromagnetic waves may be hazardous to birds and animals. Researchers fear that the radiation from mobile phones will change their body temps and nervous systems. Although it's not clear if these waves will hurt animals, scientists aren't discounting the possibility that they could have an effect on ecosystems.

Scientists caution that the effects of 5G technology may be felt by a variety of creatures, including insects, birds, and amphibians. Although it is presently unknown whether it will significantly affect animal life, long-term exposure to high-frequency waves runs the risk of having negative effects.

A significant increase in energy consumption due to the growth of this new communication network will also add to global warming. The installation of the most recent 5G will squander a lot of resources and use them up. As a result, there will be a significant effect on ecosystems and animals. Recent research has also revealed that bees and birds will suffer when exposed to millimetre radiation.

It is well known that oxidative stress plays a role in the growth of cancer. In a 2015 research on animals, prolonged Wi-Fi use caused oxidative stress in the rats' uteruses.

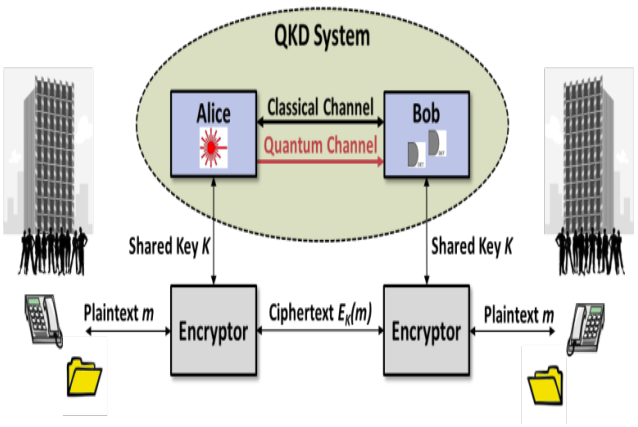
Harmful to environment

Even setting up new network equipment, according to 5G's detractors, could be environmentally harmful. Modern materials will be needed to build this high-performance network apparatus. The manufacturing process will entail vast mineral extraction and non-renewable resource depletion.

All of these actions will devastate the land in addition to polluting the water. Additionally, a significant quantity of harmful gases will be released during the process, which will pollute the air and exacerbate global warming.

Furthermore, the entire 5G infrastructure will consume three times as much electricity as the current 4G network. In the next five years, mobile operators' energy usage may increase by 2.5 to 3. The earth will undoubtedly suffer greatly from producing all the additional energy required. However, these are still only worries and need more research. There is generally a dearth of credible study on the issues. The European Union (EU) has sponsored studies on electromagnetic radiation, but none have looked at the potential health effects of 5G. The most recent study is still inconclusive. To assess the effects of 5G on the ecosystem, more research is required.

Solution



Quantum communications is the alternative strategy. Quantum information processing and

quantum teleportation are two areas of practical quantum physics that are strongly related to quantum communication. The most fascinating application of quantum cryptography is to safeguard data routes from eavesdropping. This approach will enable everyone to access an infinite number of channels with unlimited bandwidth. The slower alternative is light for touch. Both connections and radio waves are not required. Each client immediately benefits from quantum communications' highest level of information confidentiality. The harm posed by quantum communications to life and climate change is non-existent. Quantum occurrences, however, were just a normal part of the universe.

Conclusion

While many people are enthusiastic about the idea of a 5G network, some are worried about its implications on the environment. The negative effects of 5G are frequently ignored. While the new technology will make communication easier and more effective for users, it will also expose more people to radiation. Many massive amounts of energy will be needed to support the spread of 5G-capable gadgets. More pollutants will be produced than with previous technologies. Furthermore, this technology will require more energy, which will increase.

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EMERGING TRENDS IN IT

Mrs. Minakshi Manoj Dhande
Assistant Professor
Model College of Science and Commerce, Kalyan(E)
E-mail: dhande.minakshi@yahoo.com
Mob.: 932420259

ABSTRACT:
This paper illustrates the emerging trends in Information Technology and its connotation for the developing countries. In the sector of Economy because of the advancement in technology and due to quick as a wink growth and wide spread use of information systems there is a requirement for adoption of information technology in every sector. Information technology is a widely spread and it is usually used but most commonly it is used in circumstance of computers and telecommunication equipments which are useful in every organization. So we can say that Information Technology is particularly used in the connection with computer networks and telecommunication.

This paper being aware of some trends like Cloud Computing, Artificial Intelligence, Cyber Security, Internet Of Things and Blockchain in Information Technology .These new trends include the development, application, study, design, implementation, support or management of computer based information systems. Information technology has grown in importance since the start of the new millennium and companies share certain common goals to bring innovation in different areas. Cloud Computing is mainly used for providing computer system resources, especially data storage and computing power, with no active management directly by the user. Artificial intelligence refers to the simulation of human intelligence processes by machines, including computer systems. Cyber security is intended to protect computing system from unauthorized access or other damage or inaccessibility. Internet Of Things is a system of interdependent computer devices, mechanical and digital machines, objects, animals and persons which are provided with unique identifiers and the capacity to transfer data over a network without requiring human-to-human or human-to-computer interaction. A blockchain is a distributed ledger with growing lists of records (blocks) that are securely linked together via cryptographic hashes.

Keywords*: Cloud Computing, Artificial Intelligence, Cyber Security, Internet of Things , Blockchain.*

INTRODUCTION

We are blessed to live in a rapid growth and fascinating epoch. While there are a number of new and innovative technologies taking place, there are still some that are more promising and grounded in reality as compared to others. As per empirically correct Gartner, from these massive numbers of technology, some technology show most potential to supply a modest advantage over the subsequent coming years. a number of the technologies in close to destiny (5 to 10 years) will be extra dominating as compared to others, like “synthetic Intelligence everywhere”.

Gartner identified some key technologies along with "IoT Platform"," Cloud Computing"," Cyber safety" , "Blockchain" everywhere. Gartner identified some key technology such as "IoT Platform","Cloud Computing"," Cyber protection", "Blockchain".

1. CLOUD COMPUTING:

Since Amazon launched its first cloud services in 2006, cloud computing has matured, and given the volume of data processed there every day, Hong Kong is an ideal location for it. It has the potential to transform a sizable portion of the IT business, increasing the appeal of software as a service and influencing the creation and acquisition of IT hardware. New invention idea developers no longer have to stress about over- or under-provisioning for services whose popularity does not turn out to match their expectations. Without paying a premium for enormous scale, businesses with sizable batch-oriented jobs can get results as quickly as their programmes can scale.

Cloud computing refers to both applications delivered as services over the Internet and the hardware and system software in the data centers that deliver those services.

There are many definitions and metaphors for cloud computing today. In our view, cloud computing is a type of computing technology in which IT services are delivered by large, low-cost computing units connected by IP networks. The roots of cloud computing lie in the design of search engine platforms.

Cloud computing includes –

1) Massive compute resources,
2) High scalability and elasticity,
3) Shared resource pools (virtualized and physical resources),
4) Dynamic resource scheduling, and
5) General-purpose It has five main technical features.

Three most common and popularly known services are provided by Cloud computing:

a) **IaaS: (Infrastructure-as-a-Service) IaaS** is known as Infrastructure-as-a-Service. It is the most widely used cloud computing model that appeared in 2010. IaaS is an online service that provides high-level APIs to various low-level details of your network. This service is the most common on-demand service offered to users by another outsourcing platform. All services are controlled by the cloud itself and resources are shared among multiple users.

b) **PaaS: (Platform-as-a-Service): PaaS** is often referred to as Platform-as-a-Service. Easy to use, users can use the platform to deploy software and apps to the cloud. It is a popular service for doing development and deployment. The key to PaaS is that it can be easily accessed from anywhere through a web browser.
The common scenarios of PaaS:
   - Development framework
   - Analytics intelligence
   - Business intelligence
   - Security

c) **SaaS: (Software-as-a-Service) SaaS** is commonly referred to as Software-as-a-Service. This model has the ability to enable end users to use their computer as a service. With SaaS, the appliances you operate are in the cloud. A user can access her SaaS application on any device.

The common scenarios of SaaS for application :
   - CRM

. ERP

2. ARTIFICIAL INTELLIGENCE

Artificial intelligence was first proposed in 1956 by John McCarthy at his first academic conference on the subject. The idea that machines could function like humans began to develop in the minds of scientists, and whether machines could be given the same ability to think and learn on their own was questioned by mathematician Alan Turing. Introduced by Could Alan Turing put his hypotheses and questions into action by testing whether ``machines can think''? After a series of tests (later called Turing tests), machines It turns out that it is possible to make robots think and learn like humans. Turing's test uses a pragmatic approach to determine whether a machine can respond like a human.

What is Artificial Intelligence: A field of research describing the ability to perform machine learning in a human-like manner and to respond to specific actions, also known as (A.I.). The need for artificial intelligence is increasing day by day. Since the introduction of AI, it has been the reason for rapid changes in technology and business areas. Computer scientists predict that by 2020, "85% of his customer interactions will be handled without humans. This means that simple human requests, like using Siri or Galaxy to ask for the temperature of the weather, rely on computers and artificial intelligence. Like the United Arab Emirates, it is very important for Dubai to appoint a Minister of State for AI to prepare for AI exposure.

Pros and Cons of Artificial Intelligence:

AI provides reliability and cost-effectiveness to solve complex problems and make decisions. In addition, AI prevents data loss. AI is used in most fields these days, both in business and engineering. One of the great tools in AI is called "reinforcement learning" and it's based on real-world tests of success and failure to make your application more reliable. Unfortunately, AI's capabilities and capabilities are limited.

Artificial intelligence makes our lives easier and saves us more time than ever before, but scientists predict that our heavy reliance on AI could lead to the extinction of humanity. Scientists claim that owning AI machines will make people unemployed and lose their sense of life. As machines learn and do this more efficiently and effectively, this could be the reason for our extinction.

3. CYBER SECURITY:

Today, the Internet is an important component of today's life. The Internet is the fastest growing network for exchanging or transmitting information. Today, more than 60% of his business and personal transactions take place online, so this sector required high security qualities for safe transactions. Cyber security headlines are becoming more and more common these days. A thief steals a customer's social security from a computer system. Personal information passwords stolen from hackers or social media sites, or unauthorized trade secrets from the cloud.

What is cyber security?

Cyber security is the process of protecting networks, computers, servers, mobile devices, electronic systems, and data from cyber attacks. Cyber security is the application of protecting data from unauthorized access and use by criminals. This applies to both software and hardware. Cyber security processes include prevention, detection, and deterrence of cyber attacks. Any internet-connected device, computer system, or information stored on a network can be hacked, which can be prevented with cyber security.

Cyber security goals:

A key goal of cyber security is to protect information from thieves. Cyber security has three basic goals: Confidentiality, Integrity, and Availability, also known as the CIA Triad, is an information security model cited as a foundation for shaping an organization's information security environment. The CIA Triad is a security model used to develop security policies.

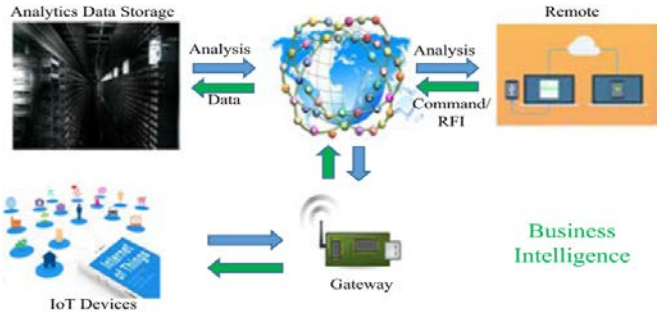
Confidentiality - Confidential means that only authorized persons or systems can see sensitive or confidential information. Hackers may try to steal your data using various tools available on the Internet. Data transmitted over networks should not be accessed by unauthorized persons.

Integrity - Integrity means that data has not been changed without permission. While the purpose of integrity management is to prevent unauthorized persons from modifying data and to provide a means of restoring data to its original state, data corruption is a failure to maintain data integrity.

Availability - Availability means that users can easily access data when they need it. This means that computer systems store and process information using security controls to protect your information. Availability can be ensured by implementing continuous service controls on computers, networks, and storage.

4. IoT (INTERNET OF THINGS) :

Advances in wireless technology over the last few decades have brought a new paradigm called the Internet of Things, called IoT. The IoT paradigm was first introduced by Kevin Ashton in 1998 as the concept of connecting things and objects to the Internet. IoT is considered to have various advantages in many IoT applications such as smart home, healthcare, transportation, environment, etc. However, more efficient and streamlined monitoring and control at lower cost will lead to It is also expected to have a significant impact on the industry. price. IoT promises industry innovation and benefits, leading to the concept of IIoT. IIoT systems enable industries to collect and analyze large amounts of data and provide different types of services to improve the overall performance of industrial systems. IIoT systems are also believed to bring cost savings in capital expenditures (CAPEX) and operating expenses (OPEX).



Overall, IoT is an innovation that integrates a wide variety of intelligent systems, frameworks, and smart devices and sensors (Figure 1). In addition, it harnesses quantum and nanotechnology for previously unthinkable storage, retrieval, and processing speeds. Extensive research studies have been conducted and are available in the form of academic articles and press reports both web and print to illustrate the potential effectiveness and applicability of IoT transformations. It can be used as a preparatory work before creating a fresh and innovative business plan with security, assurance and interoperability considerations.

Industrial IOT Use:

Predictive Quality: Predictive Quality Analytics extracts actionable insights from industrial data sources such as manufacturing assets, environmental conditions, and human observations to optimize factory output quality. AWS IoT enables industrial manufacturers to create predictive quality models that help build better products. Quality products increase customer satisfaction and reduce product recalls.

Asset Condition Monitoring : Asset health monitoring captures machine and asset health to determine asset performance. AWS IoT allows you to collect all your IoT data, including temperature, vibration, and error codes that indicate whether your device is functioning optimally. Increased transparency helps maximize facility use and investment.

Predictive Maintenance : Predictive maintenance analytics understand the health of industrial assets and identify potential failures before they impact production, extending asset life and optimizing worker safety and supply chains. AWS IoT enables you to continuously monitor and infer device status, health, and performance to detect problems in real time.

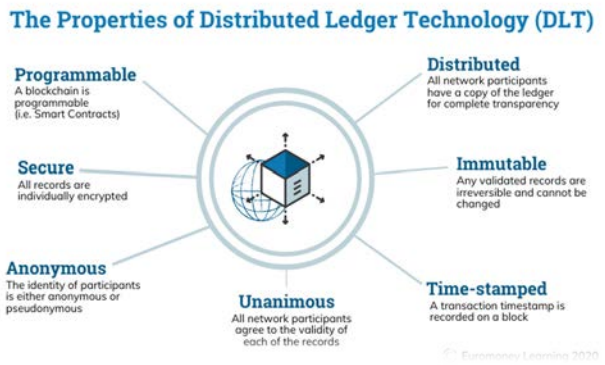
5. BLOCKCHAIN :

A blockchain is a distributed database or ledger shared between nodes in a computer network. As a database, blockchain electronically stores information in digital form. Blockchain is best known for its critical role in maintaining a secure, decentralized record of transactions in cryptocurrency systems like Bitcoin. Blockchain innovation is to ensure the fidelity and security of data records and create trust without the need for a trusted third party.

The main difference between a typical database and blockchain is the structure of the data. Blockchain collects information in groups called blocks, which contain sets of information. Blocks have a certain amount of storage, and when they are full they are closed and linked to previously filled blocks, creating a chain of data called a blockchain. Any new information following this newly added block will be compiled into a newly formed block and also added to the chain as it fills.

Whereas databases typically structure data in tables, blockchains, as the name suggests, structure data in chunks (blocks) that are ordered together. This data structure inherently creates an irreversible timeline of data when implemented in a decentralized way. When a block is full, it becomes pinned and becomes part of its timeline. Each block in the chain is given a precise timestamp when added to the chain.

The purpose of blockchain is to record and distribute digital information, not to edit it. As such, blockchain is an immutable ledger, or foundation for a record of transactions that cannot be altered, erased, or destroyed. For this reason, blockchain is also called distributed ledger technology (DLT).



Blockchain technology enables decentralized security and trust in many ways. New blocks are always stored linearly and chronologically initially. That is, they are always added to the "end" of the blockchain. After a block has been added to the end of the blockchain, it is very difficult to go back and change the contents of the block unless the majority of the network agrees to do so. This is because it contains the hash of the previous block, as well as the aforementioned timestamp. A hash code is created by a mathematical function that converts digital information into a series of numbers and letters. If this information is edited in any way, the hash code will also change.

CONCLUSION:

This paper is basically trying to inform about the IT trend including both hardware and software and may be oriented towards online trading and networking.

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RAPID BIO COMPOSTING PROCESS FOR WORKPLACES, KITCHENS AND GARDENS TO MANAGE DAILY WASTE

Prof. Sonal Gupta
Tilak College of Science and Commerce, Vashi, Navi Mumbai, Maharashtra

ABSTRACT

The term bio-compost means plant matter that has been decomposed and recycled as a fertilizer or manure. Bio-compost is considered as a key ingredient in organic farming. It is very rich in nutrients. Compost can be tilled directly into the soil or growing medium to boost the level of organic matter and the overall fertility of the soil. Compost that is ready to be used as an additive is dark brown or even black with an earthy smell. Composting can destroy pathogens or unwanted seeds. Unwanted living plants (or weeds) can be discouraged by covering with compost. The process bio-composting is done by simply piling up wastes in the field or any outdoor place and then leave it undisturbed for a month, year or more. Bio-compost in the ecosystems is very useful for control of soil erosion, wetland construction, and as landfill cover. Modern day bio-composting process has many steps like monitoring of the composting. It is usually done by shredding the plant matter, adding sufficient water to maintain the proper moisture level and then regularly turning the mixture to provide better aeration. Addition of worms and fungi helps in the process of decomposition. They break up the complex compounds into simpler ones and during the process lots of heat, carbon dioxide and ammonium is produced. This ammonium is again utilized by the microbes which are made available to the plants as nitrites and nitrates. In the present work Bio composting has been done to manage institutional dry leaves, garden and ground wastes. This technology is an easy to adopt eco-friendly alternative to waste dumping. Formulation is simple to mass produce and versatile for different wastes. Compost generated can be used as a good soil conditioner and nutrient source. This technology is based on a single, safe and beneficial microbe, and hence simple to adopt. It will also be an important contribution towards the "Swachh Bharat Mission". It is imperative therefore to create awareness among people, entrepreneurs, manufacturers and local authorities to adopt varied technologies to treat and recycle waste and convert it to wealth.

INTRODUCTION

The term bio compost means plant matter that has been decomposed and recycled as a fertilizer or manure. Soil management strategies today are mainly dependent on inorganic chemical-based fertilizers, which cause a serious threat to human health and the environment. Bio-fertilizer has been identified as an alternative for increasing soil fertility and crop production in sustainable farming. It is considered as a key ingredient in organic farming. Bio composting is very useful for control of soil erosion, wetland construction, and as a landfill cover. This technology is based on a single, safe and beneficial microbe, and hence simple to adopt. It will also be an important contribution towards "SWACHH BHARAT MISSION". It is imperative therefore to create awareness among people, entrepreneurs, manufacturers and local authorities to adopt varied technologies to treat and recycle waste and convert it to wealth. It enriches the soil with various nutrients and valuable microorganisms that enhance the growth of your plants. Composting is also known to improve the stability of your soil, facilitates drainage as well as moisture retention. Composting can be defined as "the biological stabilization of wastes of biological origin under controlled aerobic condition" and is a process that most gardeners are familiar with. Composting

method can degrade all types of organic wastes like fruits, vegetables, plants, yard wastes and others. The term ‘‘composting’’ is used here to define the process of controlled bio- logical maturity under aerobic conditions, where organic matter of animal or vegetal origin is decomposed to materials with shorter molecular chains, more stable, hygienic, humus rich, and finally beneficial for the agricultural crops and for recycling of soil organic matter. The process is mediated by different micro- Organisms actuating in an aerobic environment: bacteria, fungi, actinomycetes, algae, and protozoa, which participate naturally in the organic biomass or are added artificially. Since composting limits the use of chemical fertilizers, water sources such as rivers, lakes, and streams are not polluted. The method of composting is started by shredding the plant matter, then adding water, and ensuring proper aeration by regularly turning the mixture when open piles are used. The rapid increase of world population in the last years accompanied by the intensification of human activities brought serious environmental problems such as the pollution of soil, water, and air, forest destruction, etc. In the future these negative impacts may cause global climatic changes (greenhouse effect) and might be a menace for the existence of the human race. Immediate measures to avoid the negative influences of human activities are necessary. Many industrial processes result in a large amount of wastes. Food and agriculture industry are among the oldest of human practices, but as a source of wastes it does not make any exception from other industrial activities. In the near future the management of food and agricultural wastes will play an important role in the conservation of the natural resources in many countries, including India.

AIM

Bio composting to manage the waste of the workplace, gardens and kitchens to maintain the eco friendly environment around us.

OBJECTIVE

Composting attracts beneficial organisms to the soil and reduces the need for pesticides and fertilizers. Waste disposal has been posing problems to every country in the world. Scientists and environmentalists have brainstormed this issue time and again. After years of research, few ancient and age-old methods of waste disposal have come to the rescue to manage the waste from the workplace, to improve bio fertilizer technology to ensure high quality and improved delivery and it also helps the soil to resin moisture. Food waste and garden wastes, when dumped in the backyard, give rise to bad odour and reduce the beauty of the place. Hence the waste management companies around the world have decided to help people by collecting the wastes and composting them to create a useful substance called humus. This humus helps the plants in gardens and the crops in the fields to grow properly. It helps in increasing the fertility of the soil and keeps chemicals at bay. The farmers are benefited by it and the waste is reduced by ninety percent. Controlled conditions help optimizing the achievement of desired objectives. The controlled conditions take care of oxygen supply, temperature and pH of the decomposed materials. During a controlled composting process the temperature initially rises and then drops. Finally the compost produced is drastically reduced in volume. Desired objectives of composting involve: 1) To decompose organic material into stable humus, which helps in improving the quality of soil. 2) To manage the waste generated in the gardens and some of the kitchen waste. 3) Help increase fertility of the soil. The process of composting is gradual and happens over the time when the food and other organic waste are left unattended, since a faster reaction is desired.

MATERIALS AND METHOD

To prepare compost Collect dry leaves, stems, flowers, herbs, and all garden waste from workplaces and kitchen recyclable waste. Chop into small pieces of leaves, stems, herbs, flowers etc .Add it in a container, and also add dry soil, cow dung, and red soil in it. Add some water and mix it well and pack it tightly. Cover it with a fine mesh to prevent it from contamination and foreign particles. Maintain a temperature around 45 to 50 degree c. Keep it for 22 to 30 days for conversion of waste into fertilizer. Compost of the wastes collected and was analyzed for physicochemical properties by standard procedures. During the composting process pH, temperature and moisture contents were recorded before turning the substrates. The temperature was recorded every day up to 32nd day in degree centigrade unit (°C) by

inserting a thermometer in the subsurface layer of bio-resources in the heap. The pH of the composting mixture was determined by glass electrode method (1:2) soil: water ratio. After formation of fertilizer, compare normal soil with fertilizer by performing biochemical tests. NPK were analyzed by method of soil, plant and fertilizers and prediction of compost maturity was tested through C/N ratio, etc. Copper test was performed by Adding the sample solution in the test tube+ Acetic acid in solution+ IF reddish brown precipitate is observed which confirmed the presence of Cu^{2+}. For Zinc test - Add sample solution in test tube +Add Potassium ferrocyanide reagent in solution + IF white or bluish white precipitate is observed which confirmed the presence of ZN^{+2} .For Magnesium test- Add solution in test tube+ Add hypoiodide reagent in solution. If reddish brown colour of precipitate is observed then MG^{2+} is present. For Nitrogen test-Add solution in test tube + Add diphenylamine in solution +Add conc. H2SO4, intense blue colour is observed which confirmed the presence of NO3.

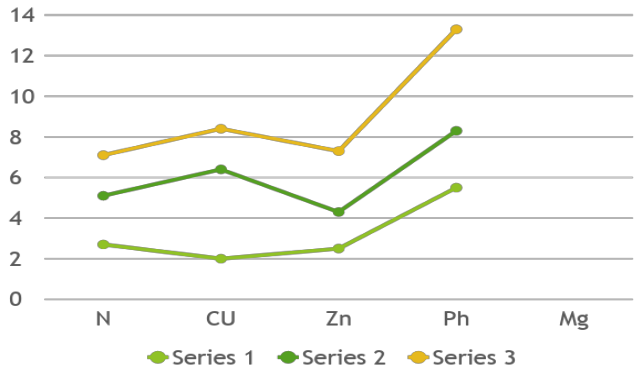
For compost making, Container contains- Dry soil-200gm, cow dung -200gm, garden waste-1kg, water-500ml, red soil-200gm. Glassware- Beaker, pipette, mortar and pestle, test tubes. Reagents- Acetic acid, Potassium ferrocyanide, Potassium ferrocyanide, Diphenylamine, Conc.H2SO4

RESULT AND CONCLUSION

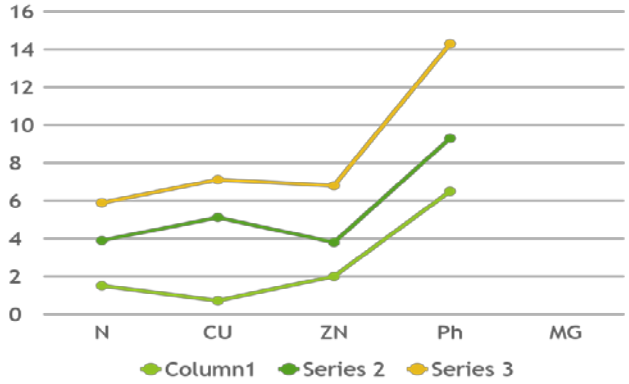
Bio fertilizers have been prepared with the help of dry leaves, stems and garden waste collected from the workplace and kitchen. All these materials were dried, crushed and then added in a container with water in particular. Biochemical tests have also been performed to check the concentration of nitrogen, copper, potassium, magnesium which is required to increase the fertility of soil, and compared it with the different soil samples. As per the experiments conducted major elements required to increase the fertility of soil were seen present more as compared to normal soil samples. Hence the quality of the soil found to be better than the normal soil. Some of the content used likes cow dung; red soil was able to make compost in a short time period because it contains nutrients which are suitable for plant growth. Results of the compost were seen in 22-32 days and compost was ready to use for plants .This is the natural process of making compost without any single use of chemicals and can be used for recyclable waste from workplaces, gardens and kitchens etc.

Compost was ready to use after 22 days of maturation. We can conclude on the basis of different biochemical's tests performed on normal soil and the soil in which compost was added. It was observed that compost containing soil samples were richer in basic nutrients required by plants. Soils nutritive quality can be improved organically without the use of any instrumental setup everyday's waste generated on a daily basis.

Normal Soil



Fertilized Soil



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DNA METHYLATION IN CANCER PATIENTS

Sanober Bhat
Assistant professor
Department of Biotechnology, Tilak College of Science and Commerce

It is an enzyme-induced modification with no alteration in the DNA sequence which are responsible for encoding the Genome. Methylation plays a very important role in normal biological processes. Abnormal patterns in DNA methylation are observed in cancers.Methylation of certain genes like tumor suppressor genes results in failure to express functional genes.Changes in DNA methylation is an early and fundamental step by which normal tissues undergo neoclassical transformation. The events that cause cancer occurs at the molecular level of DNA.The property to replicate more than normal cells is a distinctive feature in the cancer cells.Earlier it was thought that that DNA methylation decreases the gene expression and now it is an established fact that methylation is specific when methylation occurs at the promoter region of the gene.The inhibitory effect is thought to occur when specific proteins bind to DNA sequences such as MeCP2 which belongs to family of proteins that contain methylation CpG binding domain which bind preferentially to methylation CpG groups.The protein also contains a transcriptional repressor domain[TRD]which forms a complex with the corepressor protein for example m Sin3A and histone deacetylase proteins for example HDAC1 and HDAC2.The histone proteins which are wrapped around the DNA become deacylated,this causes changes in the chromatic structure. making it more condensed and the DNA less accessible, preventing active transcription from taking place .Reversal of this effect can be achieved using an inhibitor of an enzyme deacetylase, trichostatin A (TSA), which overrides this transcriptional silencing.

Altered methylation pattern breast cancer

Changes in the levels of DNA methylation in blood is linked with increased incidence of breast cancer in women in the general population. Increase methylation levels within functional Promoters have been associated with breast cancers. Peripheral blood DNA methylation at BRCA1 promoters have been found to have 3.5 fold increased incidence of breast cancer before the age of 40 years.Hypermethylation in one allele of BRCA1 gene has been observed. Control studies of women who have high probability of breast cancer and found evidence that methylation at an intragenic locus in *ATM* (ATMmvp2a) was linked with increased risk of breast cancer. Breast cancers in multiple case patients which have no known genetic history of the breast cancers are due to contribution of heritage DNA methylation mark.25 multiple breast cancer families were assessed using the Infinium HumanMethylation450 K BeadArray. Many women with breast cancer in these families had been previously screened for, and found not to carry any genetic mutations in known breast cancer genes which are susceptible. They reported a new analytic approach to identify CpG sites with inheritance patterns and a set of 24 heritable methylation sites associated with breast cancer risk.Both hypo and hyper

methylation have been known to contribute to the breast cancer.It was seen that the whole genome hypermethylation and hypomethylation are associated with malignant tumours. The Hypermethylation in promoters of *APC, SFRP1, SFRP2, SFRP5, WIF1, DKK3, I TIH5,* and *RASSF1A* are linked with the development of breast cancer, and studies have found that *APC* and *RASSF1A* are common epigenetic biomarkers for detection of breast cancer in early stages. The tumour Suppressor genes that undergo hypermethylation with the complete loss of TSG protein.

TSGs	**Function**	**Location**
APC	Inhibitor of β-catenin, cell proliferation, migration and adhesion	5q21
BRCA1	DNA damage repair	17q21
Cyclin D2	Regulators of CDK kinases	12p13
GSTP1	Conjugation to Glutathione, prevention of oxidative DNA damage	11q13
$p16^{INK4\alpha}$	Cyclin-dependent kinase inhibitor	9p21
PTEN	Negatively regulating AKT/PKB signalling pathway	10q23
RARβ	Retinoic acid receptor	3p24
RASSF1A	Ras effector homologue, cell cycle arrest	3p21
ZMYND10	Inhibitor of colony formation of cancer cells	3p21.3

Altered methylation pattern in cervical cancer

DNA hypo and hyper methylation plays a profound role in the cancer of cervix in women. The hypermethylation of DNA occurs when multiple methylation groups are transferred to cytosine that should not be methylated resulting in silencing the gene rather than expression of the gene. DNA methyltransferases are important for methylation as well as hyper and hypo methylation. Under and over expression of the genes encoding these enzymes plays an important role in silencing the gene or over expression of the gene both of which are the aberrations in the DNA methylation. Two classes of DNMTs have been identified:DNMT1 and DNMT3.DnMT1 maintains the methylation of genes by recognizing hemi methylated DNA.DNMT3 are responsible for methylating genes. It was seen as compared to healthy controls.ADCYAP1,ASCL1,CADM1,DCC,ATP10,DBC1,MOS,SOX1,ZSCAN1,GHSR,SST,ZIC1,FAM19A4,PHACTR3,PRDM14 are potential biomarkers for diagnosing cervical cancer. DNA methylation occurs during the transition from HPV infection to pre cancer stage for all 12 carcinogenic HPV types. The DNA methylation of the promoter regulates mi RNA expression that is important mechanism employed during the development of cervical cancer,miR-424 have been shown to be hyper methylated in its promoter and is linked to progression of cervical cancer. DNA methylation is performed by a complex system consisting of DNMT, epigenetic regulatory factors and environmental factors and DNA repair system. Abnormal DNA methylation like hypomethylation results in the development of tumours. During the progression of cervical cancer r RNA levels go up and DNA hypomethylation influences cervical cancer progression.STK31 is involved in DNA hypomethylation. STK31 is a potential gene that helps in development of novel clinical

approaches in the diagnosis and treatment of patients with cancer in the cervix.

Clinical application of DNA methylation in cases of cervical cancer

Urine samples increase the effectiveness of cervical cancer screening programs. All markers in urine increased significantly with the severity of the disease. There are studies that reported the existence of specific hyper methylated genes in blood and stool of patients with either cervical and breast cancer. The volume of blood in sampling affects the assay cancer detection.

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DEGRADATION OF CRUDE OIL AND LIPASE ENZYME PRODUCTION BY PSEUDOMONAS AERUGINOSA SPP.

Aparna S Bhise
Assistant Professor
Tilak college of Science & Commerce, Vashi. Navi Mumbai.
E-mail –asbhise77@gmail.com

ABSTRACT

Petroleum hydrocarbons are major pollutants of the marine environment. Bioremediation is a promising approach for treating such contaminated environments. Bacteria and fungi have an immense ability to utilize hydrocarbon as a source of energy for its survival and degrade it . If a prior exposure of the microbial community is done for the hydrocarbon uptake the rate of biodegradation is increased rapidly.

The paper here refers the effect of various parameters on the degradation of Engine Oil by *Psedomonas spp*. Enrichment of the microorganism is brought about by the use of selective enrichment medium for the hydrocarbon-utilizing microorganisms. Degradation of Crude oil by *Pseudomonas spp.* was observed in soil microorganisms. The Total petroleum hydrocarbon (TPH) degradation in the bio stimulation was calculated. The TPH degradation in aeration-limited samples was clearly reduced when compared with that in aeration-unlimited ones. Various parameters such as Temperature , Oxygen utilization were found to be important features and parameters during the study. Biodegradation of hydrocarbons in the soil were affected by pressure, salinity, pH and other physio-chemical parameters. Addition of soil microorganisms was accompanied by lipid production only in the presence of engine oil. These findings suggest that degradation of engine oil in soil microcosms would be enhanced by addition of various growth factors and inhibited by addition of various metal ions and resulted into the degradation of engine with production of lipids.

This study shows bioremediation of engine oil in various conditions by naturally existing bacteria isolated from the soil

Keywords: *Crude oil, Biodegradation,* Pseudomonas Aeruginosa

INTRODUCTION

Wastewater contaminated with oils, mainly from oil spills , are of huge concern as they cause a biohazard for earthbound creatures as well as marine ecosystems. The traditional approach of oil contaminated wastewater treatment such as collection and containment of the spilled oil by the means of floating bloom barriers, oil adsorption by natural or synthetic materials, etc., is not effective as it not efficiently able to degrade the crude oil. Hence, biodegradation proves to be an effective method. Crude oil serves as an organic carbon for the growth of the microorganisms during the biodegradation process.

However, as hydrocarbons are sprangly soluble in aqueous medium. As a result the hydrocarbons are not actively available to the microorganisms and hence not easily Biodegraded. To overcome this situation surfactants are used and surfactants are found to be useful in facilitating the uptake of

Hydrocarbons. (Urum et al., 2003; Balba et al., 2002) or other hydrocarbons (Nakahara et al., 1981)...

The main aim and objective of the study was to calculate and analyse the Biodegradation of Crude oil and Estimation of Lipase Enzyme Production by the by *Pseudomonas aeruginosa* species in the controlled environment. *Pseudomonas aeruginosa* is considered as an organism of choice when it comes to Lipase production utilizing "Hydrocarbons " as a sole source of carbon .We explored the Biodegradation of the crude oil using microorganisms and focusing mainly on the effect of Lipase production and its effect on biodegradation. During the study of the biodegradation of crude oil same initial basal mineral salt medium was used . During the whole study various supplements were added to have a comparative study and data collection.

MATERIALS AND METHODS

Culture conditions and microorganisms

Pseudomonas aeruginosa strains was isolated from the soil sample contaminated with the continuous deposition of oil was collected from Krishnanagar , Ahmedabad . (Gujarat)

The composition of the basal mineral salt medium used in this study was as follow (g/L):

This is carbon free mineral salt medium used for the cultivation of the microorganisms. The source of carbon is added prior to the inoculation of microbe.

The composition of the medium is as follows:

- **Na_2HPO_4 60g/L**
- **KH_2PO_4 30 g/L**
- **NaCl 5g/**L
- The initial pH was adjusted to 6.8.

Pseudomonas aeruginosa, bacterial cultures were subclustered by inoculating into the basal mineral salt medium comprising of various carbon and nitrogen sources.. To study the impact of various carbon and nitrogen source on the Lipase production by *Pseudomonas aeruginosa* spp. the species were grown in the basal salt medium supplemented with 6%v/v of a specific carbon source.(Crude Oil) The growth study was carried out in1L flasks containing 250 ml medium on an orbital shaker (120r/min) for a period of 48 hours and the temperature was maintained at 35°C throughout the study.

Lipase Production in Crude oil

1L Erlenmeyer flasks were filled with 250 ml of minimal salt medium and the medium was inoculated with culture of *Pseudomonas aeruginosa* of cell density 10^6cells/ml. The flasks were incubated on a rotatory shaker ,shaking at 130 r/min for 2 days at temperature of 35 °C. A continuous monitoring of the cell growth (biomass) was conducted by withdrawing the sample(5ml) from the inoculated flask at regular interval .The sample was further analysed for the assay crude oil concentration, biomass production and Lipase production.

BIODEGRADATION OF CRUDE OIL

A comparative study of the impact of biosurfactant on hydrocarbon degradation was carried out. For the purpose a strain unable to produce biosurfactant was inoculated in the minimal salt medium with the same parameters that were standardized for the *Psuedomonas* strain The results were determined by measuring the decrease in concentration of crude oil .- Crude oil was obtained from the Krishnanagar (Ahmedabad). .

Adsorption of Crude Oil by Cell Mass

The cell mass of *Pseudomonas aeruginosa* was initially isolated from 2-day-culture broth .The culture was centrifuged at 300g for 30 min. A

comparative study was carried out to for microbial culture to show the effectiveness of bio absorption and biodegradation. All the other parameters for biosorption test were similar to the biodegradation procedure such as pH, temperature, nutrition medium and speed of orbital shaker. The cell pellet were diluted using basal mineral salt medium and a specific b. The concentration of crude oil in the initial stage was compared to the final crude oil concentration and the adsorption capacity of organism.

EXTRACTION AND ESTIMATION OF LIPASE ACTIVITY

An inoculum from a pure culture is streaked on a sterile plate of spirit blue agar. The inoculated plate is incubated at 35-37 C for 24 hours. The plates were found of halos surrounding colonies indicating the organism being positive for the ability to digest the lipids and thus indicates presence of lipase.

RESULT & DISCUSSION

A combination of couple of carbon and Nitrogen sources were used for the fermentation study *Pseudomonas aeruginosa* . Soil sample was collected from in situ. Inoculum was prepared in Sterile distilled water and was streaked on Glucose Mineral Media. Various Isolates were obtained. The obtained isolates were transferred to Glucose Mineral media in which Glucose was substituted by "Degraded Oil".

Isolate 41 & Isolate 43 showed considerable results.

Gravimetric Method : Gravimetric Analysis methods of macro-quantitative analysis.

Estimation of Protein: Folin-Lowry's Method.

Estimation of Lipid: Estimated by Titrometric method

Isolate 41 & Isolate 43 were selected because:

1. They were able to tolerate 15 % v/v of "Degraded Oil".
2. The lag phase was negligible (i.e they degraded the 6 % v/v oil in nearly 6 hrs).
3. They were resistant to most of the of metal ions.
4. When supplied with optimum conditions the rate of degradation was very high.(i.e pH, temp. & Aeration, metal ion effect)
5. Hence they were selected as the organism for choice for the study.

Results : 1.

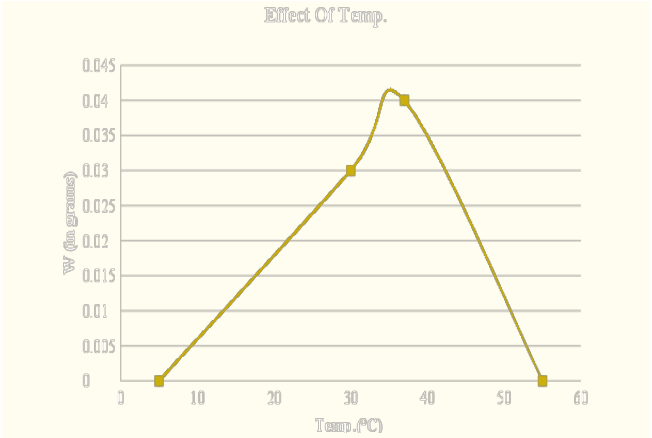
Morphological :Characters: (On Psuedomonas Agar Plate)

- **Isolate 41**

- **Isolate 43**

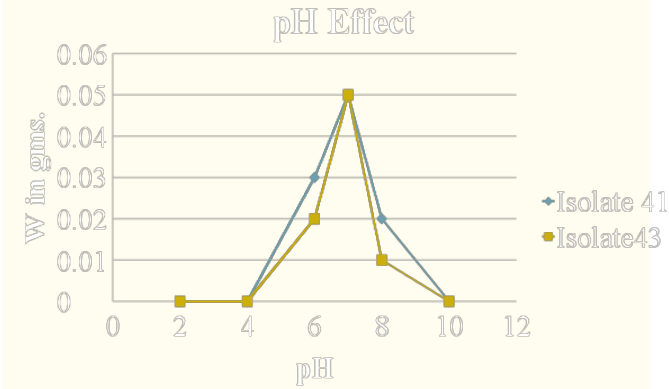
2.Temperature :

- Isolate 41 & Isolate 43 showed degrading of oil more efficiently at 37 °C comparatively less at room temperature & no degradation was seen at 5 °C and 55 °C.

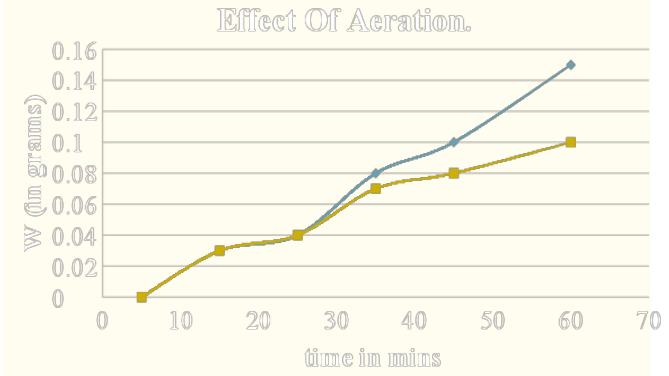


3. pH effect :

Isolate-41 and 43 are degrading oil completely at pH 7 less at pH 6 and pH 8 Where as no degradation of oil at pH 2,pH 4 and pH 10.

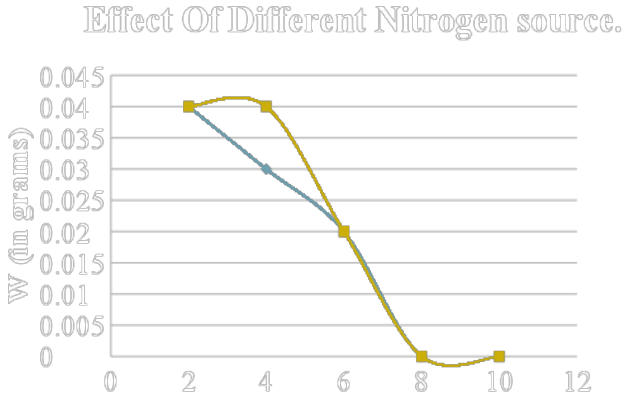


4. Aeration Effect:-The presence or absence of oxygen plays an imp role in the studies related to biodegrdation of hydrocarbons.



5.Effect of Different Nitrogen (N_2) source: NH4OH Was added as an N_2 source when the culture was supplied With complex N_2 source (i.e. Peptone), the organism had a very long lag phase; the organism was able to degrade oil in the presence of peptone but the rate of degradation was very slow.

Isolate-41 and 43 are degrading oil at 2%, 4% and 6 % peptone concentration but unable to degrade oil at higher peptone(8% and 10%) concentration Direct biodegradation of crude oil**.**



6.Estimation of Lipase activity : -

- The lipase activity of Isolate-41was 4700 unit/ml.
- The lipase activity of Isolate-43 was 5000 unit/ ml

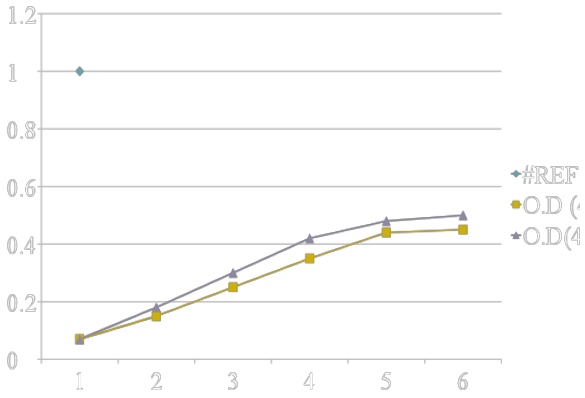
Puedomonas aeruginosa was first used to conduct the study of Crude oil using "Basal mineral Salt medium" with 6%v/v crude oil. Cell growth , emulsification of Crude Oil was observed 10 days of incubation at 37°C. Cell growth was showing flocculation above the medium in an aqueous phase.

Even a small variation in the growth factors and addition of various other physiochemical parameters show an immense impact on the complete system .i.e, Biodegradation of crude oil and Cell growth was highly facilitated by varying the nutrient as well as the physical parameters. Lipase enzyme production was positively facilitated by addition of growth factors and implementing change in the parameters..

Hence addition of small amount of growth factors yielded in 6% v/v of crude oil and noticeable amount of Lipase Production .

7.Kinetic Growth studies:-

- An appropriate introduction to the kinetics of biodegradation is to consider a pure culture of a single bacterial population that is growing on and degrading a single, soluble organic chemical and to assume that no barriers exist between the substrate and the cells.
- Knowledge of kinetics of biodegradation is essential for the evaluation of the persistence of the organic pollutants and to assess exposure of humans, animals and plants.



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ROLE OF BANKING AND FINANCIAL SECTOR

Swapnil S. Dawkhar
Department of Commerce, Mumbai University

ABSTRACT
Finance and banking are the lifeblood of business, commerce and industry. Today, the banking sector is the foundation of modern business. The development of any country depends mainly on the banking system. A bank is a financial institution that manages deposits and advances and other related services. It can save money in the form of deposits from those who want to save and lend money to those who need it. Banking is one of the most important and important parts of human life. With today's faster lifestyle, people may not make proper transitions without proper banking network. The Indian banking system is dominated by nationalized banks. The performance of the banking sector is more closely related to the economy than any other sector.

The Indian Financial System and Banking Sector are the main topics of the paper. It is divided into two pieces. The first portion provides a comprehensive overview of the financial system, including a list of its components. Also, it discusses the definition of a bank as well as its historical context, purposes, and varieties. The phases of the Indian Financial System and the current organisational structure are explained in Section B. It also emphasises how Indian Commercial Banking has developed. The Historical Background of the Financial and Indian Banking Sector is explained in the paper.

Keywords: *Banking System, Indian Economy, Financial Institution, Financial Crisis, Economic Slowdown and Financial Performance.*

Introduction
To achieve our national goals of building a market-driven, productive, and competitive economy, a financial system that is inherently robust, functionally varied, and demonstrates efficiency and flexibility is essential. Financial institutions, financial markets, financial instruments, and financial services make up India's financial system. The organised sector and the traditional sector, commonly referred to as the informal credit market, are the two main parts that define the Indian financial system. A large number of financial institutions, which are business organisations that provide financial services and whose activities may be either specialised or may overlap, provide financial intermediation in the organised sector. Financial institutions are further divided into banking and non-banking entities. The Reserve Bank of India (RBI) is the apex institution in India and serves as the primary regulator of credit.

The financial services industry offers financial services to both individuals and businesses. Several financial institutions, including banks, investment houses, lenders, financing companies, real estate agents, and insurance companies, make up this sector of the economy. As previously mentioned, the financial services sector of the economy is arguably the most

significant one, dominating the world in terms of earnings and equities market capitalization. This industry is dominated by huge conglomerates, although it also has a wide spectrum of smaller businesses.

Money is managed by businesses in the financial services sector. For instance, a financial advisor works on behalf of a customer to manage assets and provide recommendations. The advisor doesn't offer investments or any other products directly; instead, they help money travel between investors and the companies that make securities and other financial instruments. Rather than being a physical asset, this service is a transitory activity. The excessive business concentration in a small number of scheduled public sector banks defines the Indian banking system. With Regional Rural Banks (RRBs) excluded, only 27 banks currently run a sizable network of roughly 45,000 branches. With a programme of bank mergers, consolidations, and government ownership, the banking industry has become more concentrated.

Literature Review

1. **Manish Mittal and Arunna Dhademade (2005)** they found that higher profitability is the only major parameter for evaluating banking sector performance from the shareholders point of view. It is for the banks to strike a balance between commercial and social objectives. They found that public sector banks are less profitable than private sector banks. Foreign banks top the list in terms of net profitability. Private sector banks earn higher non-interest income than public sector banks, because these banks offer more and more fee based services to business houses or corporate sector. Thus there is urgent need for public sector banks to provide such services to stand in competition with private sector banks.
2. **Medhat Tarawneh (2006)** financial performance is a dependent variable and measured by Return on Assets (ROA) and the intent income size. The independent variables are the size of banks as measured by total assets of banks, assets management measured by asset utilization ratio (Operating income divided by total assets) operational efficiency measured by the operating efficiency ratio (total operating expenses divided by net income).
3. **Vasant desai (2007)** The Reserve Bank of India plays a very vital role. It is known as the banker’s bank. The Reserve Bank of India is the head of all banks. All the money formulations of commercial banks are done under the Reserve Bank of India. The RBI performs all the typical functions of a good central bank as it is involved in planning the economy of the country. The main function is that the RBI should control their credit. It is mandatory for the Bank to maintain the external value of the rupee. Major function is that it should also control the currency.
4. **K. C. Sharma (2007)** Banking has entered the electronic era. This has been due to reforms introduced under the WTO compliances. Private sector banks have been permitted to open their shops in the country. These banks are either foreign or domestic banks with foreign partnerships. Some of them have been set up by Development Financial Institutions in order to embrace concept of universal banking, as practiced in advanced countries. The private sector on the other hand have began their high tech operations from the initial stage and made the elite of the country to taste the best banking

practices that happens in the western countries.

5. **Dangwal and kapoor (2010)** also undertook the study on financial performance of nationalized banks in India and assessed the growth index value of various parameters through overall profitability indices. They found that out of 19 banks, four banks had excellent performance, five banks had good performance and six banks had poor performance. Thus the performance of nationalized banks differ widely.

Research Methodology

Research Design:

The present study is analytical and descriptive in nature. The purpose of this study is to enlighten the role of Private and Public sector banks in Indian Economy regarding its financial performance.

Sources of data collection:

- **Primary Data:** The primary data is collected through Banks.
- **Secondary Data:** The secondary data was taken from various websites, books, journals, magazines, news clippings etc. Data regarding various research papers to support research objectives was also taken from online web sources.

Sampling:

It is not possible to visit all all banks, like Private banks and Public sector banks. So only the alternative is to take a sample of the some few banks, like ICICI Bank, State Bank of India, Kotak Mahindra Bank, Axis Bank, Bank of India and HDFC Bank.

Sampling method:

Simple Random sampling method is adopted for selecting the Banks.

Sampling size:

The study includes ICICI Bank, State Bank of India, Kotak Mahindra Bank, Axis Bank, Bank of India and HDFC Bank as sample.

Objective of the study

- Describe the main classes of financial instruments issued in financial system.
- Discuss the flow of funds between saver and borrowers.
- Understanding the role of the financial institutions play in managerial finance.
- To suggest the appropriate measure to improve the efficiency of the banks.
- Understanding the major regulations and regulatory bodies that affect banks.

Scope of the study

Considering the literature reviewed and structure planned for this paper, undertaking similar surveys in the future will help draw a comparative analysis, exploring factors that will shape the expectations of people with time.

- The next phase can be another survey, 5-10 years down the line, to obtain a fresh set of values that have the potential to observe a significant shift in Banking Industry.

Limitation of study

- The information given by the bank representative might be biased because some of them might not be interested in providing correct information.
- Bank representative tried to escape some statement. This was one of the most important limitations faced, as it was difficult to analysis and come at a right conclusion.
- There was limited time to do research and study.

Data analysis and Interpretation

1. HDFC Bank Ltd:

As of January 2023, HDFC has a market capitalization of Rs. 9.3 trillion. Headquartered in Mumbai, Housing Development Finance Corporation Ltd. is currently the largest private sector bank in India and the number one bank in India according to the Forbes World's Best Bank survey. The Bank offers a wide range of products and services including but not limited to retail and wholesale banking, private banking, home, auto and business loans, lifestyle loans, credit and debit cards. The bank also boasts of introducing leading digital products such as Payzapp and Smart BUY.

Bank Products	Interest
Home Loan	8.45% - 9.45%
Personal Loan	10.35%
Education Loan	9.55% - 13.25%
Car Loan	8.75

Some of the important facts about the bank are:

- Number of Branches – 6,342
- Number of ATMs – 18,130
- Number of Employees – 1.41 Lakh+
- Number of POS Terminals – 2,43,888
- Number of Debit Cards – 4 Crore
- Number of Credit Cards – 1.76 Crore

2. State Bank of India:

State Bank of India (SBI) is a state-owned bank in India with a market capitalization of Rs. 5.3 trillion. India's largest public sector bank In 2021, State Bank of India was ranked 221st in the Fortune Global 500 list of the world's largest companies and also received the "Banker of Asia" award for repeating the award Best Transaction Bank in India. row It is also called the largest bank in India. SBI has a market share of 23% in India and has a commendable presence abroad with more than 233 foreign offices in 36 countries.

Bank Products	Interest
Home Loan	8.85% - 9.65
Personal Loan	10.90%
Education Loan	9.37%
Car Loan	7.75% - 8.45

Some of the important facts about the bank are:

- Number of Branches – 22,219
- Number of ATMs – 62,617
- Number of Employees – 2,45,642
- Number of POS Terminals – 6.08 Lakh

3. ICICI Bank Ltd:

Industrial Credit and Investment Corporation of India, commonly known as ICICI Bank, has a market capitalization of Rs. 6.08 trillion on January 23, 2023. It is the third largest among the major banks in India. The bank is headquartered in Mumbai and has its headquarters in Vadodara, Gujarat. As of last year's update, the bank's consolidated assets stood at Rs. 12.50 crowns. ICICI Bank has a commendable overseas presence with branches in Canada and UK. The bank also has branches in China, Hong Kong, USA, South Africa, Sri Lanka, etc.

Bank Products	Interest
Home Loan	8.75% - 9.80%
Personal Loan	10.75%
Education Loan	11.50%
Car Loan	10.75% - 12.75%

Some of the important facts about the bank are:

- Number of Branches – 5,275
- Number of ATMs – 15,589

- Number of Employees – 97,354

4. Kotak Mahindra Bank Ltd:

Kotak Mahindra Bank registered a market capitalization of Rs. 3.55 trillion in January 2023. The bank was established in 2003 and is currently the fourth largest private sector bank in the country. Last year, the turnover of the bank was rubbles. 58.882 billion.

Bank Products	Interest
Home Loan	8.65% - 9.45%
Personal Loan	10.50%
Education Loan	11.50%
Car Loan	10.50

Some of the important facts about the bank are:

- Number of Branches - 4,758
- Number of ATMs - 10,990
- Number of Employees – 78,300

5. Axis Bank Ltd:

With a market cap of Rs. 1,90,562.56 crore, Axis Banks is the fourth largest private sector bank in India. The bank, known for providing financial services mainly to large and medium-sized corporations, SMEs and retail businesses, posted a turnover of Rs. 68,116 million in 2019.

Bank Products	Interest
Home Loan	8.60% - 9.05%
Personal Loan	10.49%
Education Loan	7.45% - 8.95%
Car Loan	8.50% - 13.05%

Some of the important facts about the bank are:

- Number of Branches - 4,758
- Number of ATMs - 10,990
- Number of Employees – 78,300.

Findings

- As per my study private banks as more efficiency than public sector banks.
- Understanding the major regulations and regulatory bodies that affect banks.
- India’s top banks and their performance.
- Why financial institution is main in economy.

Conclusion

Banks play a very important role in the economic development of countries, because they mostly control the supply of money in circulation and are the main driving force of economic development. Economic development is a dynamic and continuous process that largely depends on the mobilization of resources, investments, and the efficiency of operations in various areas of the economy. The performance of a banking institution and another financial institution must be evaluated, because it is defined as a reflection of the use of the bank's resources in a form that allows it to achieve its goals.

Since the banking sector is considered an important segment of the modern economy, its efficiency is crucial. To ensure a healthy financial system and an efficient economy, banks and other financial institutions must be carefully evaluated and analysed. Banks and other financial institutions help entrepreneurs by offering a wide variety of products and services, but the products and services are more or less identical between banks and there is little room for differentiation.

Therefore, there is a need to measure the individual performance of banks to determine their contribution to the development of Malaysian entrepreneurship. The banking sector includes several private and state-owned banks, and some private and state-owned banks have their own branch network across the country. As

a result of economic reforms and mobilization, various financial institutions appeared on the market. This has not only created an increasingly dynamic and competitive banking environment that requires deeper evaluation and analysis, but has also generally promoted the efficiency of banking services. Therefore, a strong banking sector, including other financial institutions, is critical to economic growth that creates wealth-rich jobs. eradicate poverty from entrepreneurship and increase gross domestic product (GDP) growth.

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IMPACT OF DIGITAL TECHNOLOGY

Deepesh Menaria
Student,
FY BSc Computer Science, Tilak College of Science and Commerce,Vashi)

I. Introduction

A. Background of the Study:

- Definition of Digital Technology:
  Digital technology refers to the use of electronic devices, the Internet, and digital media to process, store, and transmit information. This technology has transformed the way we communicate, access information, and carry out our daily activities.

- Historical Development of Digital Technology:
  The development of digital technology can be traced back to the invention of the computer in the 20th century. The first electronic computer, ENIAC, was developed in the 1940s and paved the way for the modern computers we use today. In the following decades, the development of the Internet and other digital technologies revolutionized the way we communicate and access information.
  1. ENIAC was developed in the 1940s and was the first electronic computer.
  2. The development of ENIAC paved the way for modern computers.
  3. The Internet and other digital technologies revolutionized communication and information access.
  4. The development of digital technology started in the 20th century.
  5. The invention of the computer was a significant milestone in the history of digital technology.

- Significance of Digital Technology in Modern Society:
  Digital technology has transformed modern society and created new opportunities, but also raised ethical concerns. It's important to understand its impact on various aspects of life.

B. Purpose of the Study

1. Objectives:
The primary objectives of this study are to:

- Examine the impact of digital technology on various sectors such as education, the economy, and society.
- Evaluate the positive and negative effects of digital technology on these sectors.
- Identify the challenges and opportunities posed by digital technology.

2. Research Questions:
The study will be guided by the following research questions:

- What is the impact of digital technology on education?
- How has digital technology affected the economy?
- What is the impact of digital technology on society?

- What are the challenges and opportunities posed by digital technology in each sector?

C. Scope and Limitations of the Study

1. Geographical Area:

The study will focus on the impact of digital technology in developed countries, specifically the United States, India, Europe, and Asia.

2. Time Period:

The time period for the study will be from the early 2000s to the present.

3. Data Sources:

The data for the study will be collected from various sources, including:

- Scholarly articles and peer-reviewed journals.
- Government reports and statistics.
- News articles and media reports.
- Online surveys and interviews with experts and stakeholders.
-

The limitations of the study include the availability of data and the potential for bias in the data sources. Additionally, the study will focus on developed countries, and the results may not be applicable to developing countries. However, the study aims to provide a comprehensive overview of the impact of digital technology and to serve as a foundation for future research.

II. Literature Review

A. Overview of Digital Technology and Its Impact

1. Evolution of Digital Technology:

The development of digital technology can be traced back to the invention of the computer in the 20th century. In the following decades, the development of the Internet and other digital technologies revolutionized the way we communicate and access information. For example, the first email was sent in 1971, and the World Wide Web was introduced in 1989.

2. Overview of the Impact of Digital Technology on Various Sectors:

Digital technology has had a profound impact on nearly every aspect of modern society, including education, the economy, and society as a whole. It has created new opportunities for education and business, but it has also raised new social and ethical concerns. For instance, the widespread use of digital technology has led to an increase in cybercrime, data privacy issues, and digital divide among the population.

B. The Impact of Digital Technology on Education

1. Online Learning and E-Learning:

Digital tech has impacted education through online learning platforms, making education accessible and convenient. With over 6 million students enrolled in the US in 2016, online learning has grown dramatically in recent years.

2. The Role of Digital Technology in the Classroom:

Digital tech has revolutionized the traditional classroom with new tools and resources that enhance student learning. Computers, tablets, and other devices provide access to information and resources, and teachers can use interactive elements in lessons like simulations and virtual trips to engage students.

3. Impact on Student Learning and Academic Performance:

Studies show that technology in the classroom boosts student learning and academic performance. It increases engagement, motivation, and critical thinking skills. A meta-analysis of over 1,000 studies found technology positively impacts student achievement. However, its impact varies based on context and use.

C. The Impact of Digital Technology on the Economy

1. Job Creation and Employment Opportunities:

The digital economy has created new job opportunities and industries. The tech industry has boosted demand for jobs in software development, data analysis, and digital marketing. The computer and information technology sector is projected to grow 11% from 2019 to 2029, creating hundreds of thousands of new jobs.

2. Impact on Traditional Business Models:

Digital tech disrupts biz models, forcing companies to adapt. E-commerce disrupts retail, online services disrupt traditional service industries. Companies invest in tech to stay competitive and improve operations, leading to increased profits. Surveys show companies embracing tech are 26% more profitable.

3. The Role of Digital Technology in E-Commerce and Online Business:

Digital tech has brought e-commerce, creating opportunities for entrepreneurs and small businesses to sell products globally and reach new customers through online advertising. U.S. e-commerce sales reached $861 billion in Q4 2020, a 38.4% increase YoY.

D. The Impact of Digital Technology on Society

1. Social Media and Communication:

Digital tech has transformed communication and social interaction. Social media platforms like Facebook, Twitter, and Instagram allow for easier information sharing and connection with a wider audience. But the excessive use of social media also raises privacy and cyberbullying concerns, as well as misinformation spread.

2. Effects on Political and Civic Engagement:

The growth of digital technology has impacted political and civic involvement. Social media has facilitated activism and protest movements, while also making information about political issues and candidates more accessible. However, with an abundance of information online, it's become difficult to determine the accuracy and reliability of information.

3. Impact on Personal Relationships and Mental Health:

Digital technology has both positive and negative impacts on personal relationships and mental health. On one hand, social media and other digital technologies make it easier for individuals to stay connected and communicate with others. On the other hand, excessive use of technology has been linked to increased feelings of loneliness, anxiety, and depression, and a decline in face-to-face communication and human interaction.

E. Previous research on the impact of digital technology:

Previous research on the impact of digital technology has been extensive and has explored the ways in which digital technology has transformed nearly every aspect of modern society, including education, business, communication, and personal relationships. Researchers have studied the positive and negative impacts of digital technology and have found that while digital technology has created new opportunities and benefits, it has also raised new social and ethical concerns. Previous research has shown that the impact of digital technology on society is complex and multifaceted, requiring a nuanced understanding of the ways in which it is shaping our lives and future.

- **Theoretical frameworks**: The previous research on the impact of digital technology has used various theoretical

frameworks, including technological determinism, social construction of technology, diffusion of innovations, and digital divide theories.

- **Methodological approaches**: Previous research on digital technology impact used both qualitative (in-depth interviews, focus groups) and quantitative (surveys, statistical analysis) methods and some have combined both for a mixed approach.

- **Key findings and conclusions**: Digital technology has a major impact on education, economy and society with online learning, new job opportunities and changed communication and relationships, but there's a need for more research to understand the long-term effects and potential unintended consequences.

III. Research Methodology

A. Research design: In this study, a qualitative research design has been chosen. This approach is well-suited to the exploratory nature of the research, as it allows for the examination of complex phenomena and the collection of rich and in-depth data. The data collection methods used in this study include semi-structured interviews and focus groups. The data collected will be analyzed using content analysis techniques.

B. Sample selection: The study participants are people who use digital technology in their daily life. They will be chosen using a purposive sampling method where individuals are picked based on specific criteria. The sample size will be based on saturation, where data collection continues until no new information is generated.

C. Data collection methods: The study will use semi-structured interviews and focus groups to gather data from selected individuals on the impact of digital technology on their daily lives. These methods aim to provide in-depth information and group perspectives.

D. Data analysis techniques: The data will be analyzed using content analysis, coding data to find patterns and themes. The findings will help address the research questions and objectives.

E. Ethical Considerations: Conducting research involving human participants requires careful consideration of ethical issues. To ensure that the participants' rights are protected, the following ethical considerations will be taken into account in this study:

1. **Confidentiality and privacy of participants**: The participants' data will be kept confidential with anonymity maintained. Personal information won't be included in study reports/publications.

2. **Informed consent**: The participants will receive info on the study, benefits, risks and will have the chance to ask questions. Participation is voluntary and they can withdraw anytime without consequence.

3. **Dealing with sensitive information**: The researcher will handle sensitive information with sensitivity and respect, and inform participants of the confidential nature of the data.

IV. Results and Analysis

A. Data Collection and Analysis:

The data for this study will be collected using the research methods outlined in the methodology section. The following steps will be taken for data collection and analysis:

1. Data Collection:
For the purpose of this research, data was collected from a variety of sources including secondary sources such as academic journals, books, and reports as well as primary sources including surveys and interviews with participants.

2. Data Analysis Techniques:
Both qualitative and quantitative data were analyzed using content analysis and descriptive/inferential statistics, respectively.

3. Results and Findings:
The results of the analysis showed that digital technology has had a profound impact on various sectors, including education, economy, and society. In education, digital technology has changed the way students learn, providing new opportunities for online learning and e-learning, and improving student learning and academic performance.

In the economy, digital technology has created new job opportunities and has transformed traditional business models, playing a major role in e-commerce and online business.
In society, digital technology has had a significant impact on social media and communication, affecting political and civic engagement, as well as personal relationships and mental health.

B. Comparison with Previous Research:
The results of this study are consistent with previous research findings, which have shown that digital technology has had a profound impact on various sectors of society. However, Study confirms digital technology's impact on society, but shows differences due to its evolving nature.

Some collected data related to the impact of digital technology that has been reported in previous studies and reports:

1. In education, the widespread adoption of digital technology has led to an increase in the number of online courses and e-learning platforms, with the majority of higher education institutions offering some form of online learning. A study by the Online Learning Consortium found that in 2020, over 6 million students were enrolled in online courses.

2. In society, digital technology has transformed the way people communicate and access information. A study by the Pew Research Center found that as of 2021, nearly 7 in 10 Americans use social media, and 68% of American adults use the internet.

3. The widespread use of digital technology has also had a significant impact on mental health. A study published in the Journal of Affective Disorders found that excessive internet use was associated with symptoms of depression and anxiety.
4. A report by the World Economic Forum estimated that by 2022, the global e-commerce market will reach over $4 trillion in sales.

5. A study published in the Journal of Educational Technology Development and Exchange found that students who used technology in their coursework had a higher GPA than those who did not.

6. A survey by the Pew Research Center found that nearly two-thirds of American adults (65%) report that they use social media to stay in touch with what's happening in the world.

7. A report by the International Telecommunication Union found that in 2020, there were over 7.9 billion mobile phone users globally, an increase of 3.2% from the previous year.

8. A study by the Harvard Business Review found that companies that embraced digital technology saw an average increase of 21% in their productivity compared to those that did not.

V. Discussion and Interpretation of Results

A. Interpretation of results

The study found that digital technology has a major impact on education, economy, and society. It improved education through online learning and e-learning, and had a positive effect on student performance. In the economy, digital technology created new job opportunities and transformed business models, with growth in e-commerce. In society, it had a profound impact on communication and social media, but also increased feelings of loneliness and anxiety. The findings have important implications, such as considering access to technology and support in education, job creation and regulation in the economy, and the impact on relationships and mental health in society. It's crucial to consider both positive and negative consequences and take action to mitigate them.

B. Limitations of the study -

1. In any research study, it is essential to acknowledge and consider the limitations that may impact the validity and reliability of the results. In this study, the following limitations should be noted:

2. Potential sources of bias or error: This study relied on self-reported data collected through surveys, which may be subject to social desirability bias. Participants may have been more likely to provide answers that they perceived as socially desirable rather than their true beliefs or experiences.

3. Sample size: The sample size of this study may not be representative of the entire population, as it only included a limited number of participants. The results may not be generalizable to a larger population and may not be applicable to other settings or contexts.

C. Implications for practice:

The findings of this study have important implications for educators, businesses, policymakers, and society as a whole. The following are some recommendations based on the results of this study:

1. Recommendations for educators: Educators should integrate technology in their teaching and educate students on responsible use.

2. Recommendations for businesses: Businesses should adopt digital technology to stay competitive and support employees with necessary training.

3. Recommendations for policymakers: Policymakers should address tech's negative impact, promote responsible use, and invest in research.

4. Implications for society: Individuals should engage in responsible and healthy technology habits.

VI. Conclusion

A. Summary of Key Findings

This research aimed to investigate the impact of digital technology on various sectors of society. Through the analysis of various sources, it was found that digital technology has had a significant impact on several aspects of our daily lives, including education, business, and policymaking. The use of digital technology has greatly increased efficiency, productivity, and accessibility in these sectors.

B. Implications for Future Research

While the current study provides valuable insights into the impact of digital technology, there is still much to be learned. Future research could focus on more specific areas such as the impact of digital technology on individual industries, or on the effects of different types of digital technology (e.g. social media, cloud computing). Additionally, it would be useful to study the impact of digital technology on different regions, cultures, and socioeconomic groups.

C. Final Recommendations

The results of this research suggest that digital technology will continue to play an important role in shaping the future of society. Educators, businesses, policymakers, and society as a whole should embrace the opportunities that digital technology provides and work to maximize its positive impact. By doing so, we can continue to improve our lives and build a better future for all.

In conclusion, this research provides valuable insights into the impact of digital technology and highlights the need for continued investigation into this important topic. The findings suggest that digital technology has the potential to greatly improve our lives, and it is up to us to take advantage of its benefits.

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IMPACT OF COVID-19 0N ENVIRONMENT

AUTHOR:
Miss Utkarsha & Miss Pranaya
Guide by : Amrita Mam | Tilak College Of Science & Commerce, Vashi
E-mail: lalitadigrajkar@gmail.com, pranayarakshe55@gmail.com

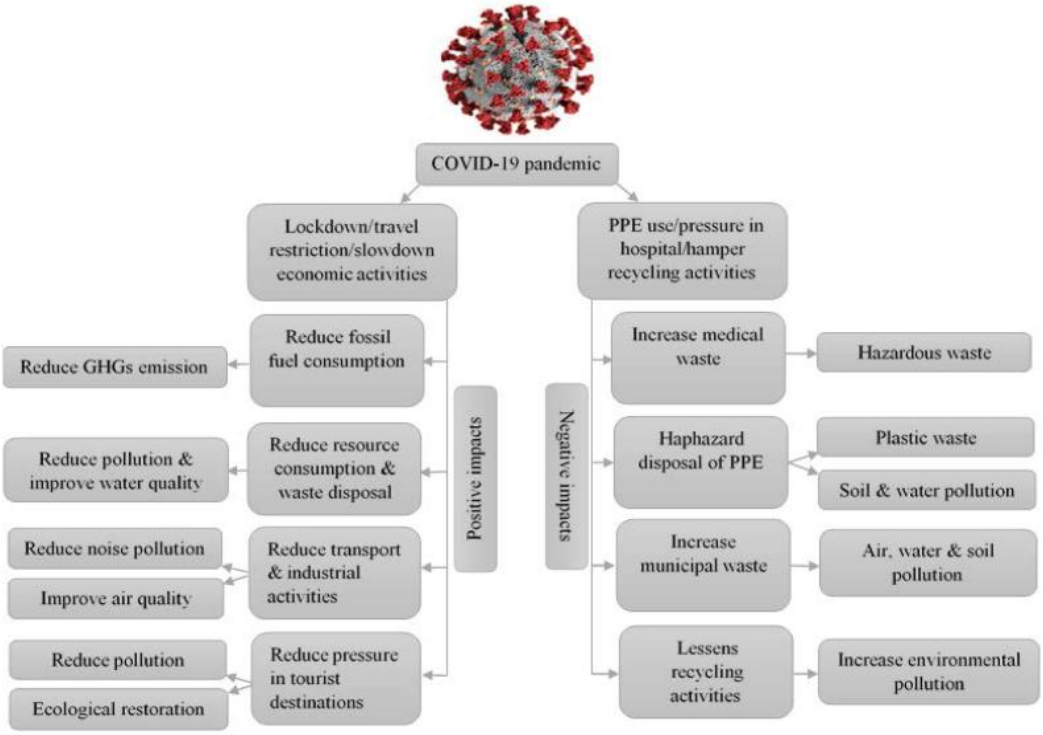
INTRODUCTION:

In late December 2019, an unprecedented global observation was repositioned in Wuhan city, Hubei province, China. An outbreak of a respiratory illness caused by an unidentified etiological agent with suspicious epidemiological associations to the local seafood market elicited unrest within the health authorities . The coronavirus disease (COVID-19) spread rapidly around the world in early 2020, changing anthropogenic activities permanently. Manifestations of variable severity, ranging from mild cough and fever to acute interstitial pneumonia and acute respiratory distress syndrome (ARDS), were identified as symptoms in the patients reported to the WHO China Country Office . January 7, 2020, marked the conclusion of the speculations, when the Chinese Center for Disease Control and Prevention (CDC) characterized novel Coronavirus as the causative virus of the pneumonia outbreak and tentatively named it nCoV2019.

The world's biggest economies like China, India, USA, Russia, France, Italy, UK, and Spain suspended public gatherings (leisure, religious, political, business, sports, educational), international and domestic travel, public transport and non-essential industries at different time dots of the pandemic with varying strictness.

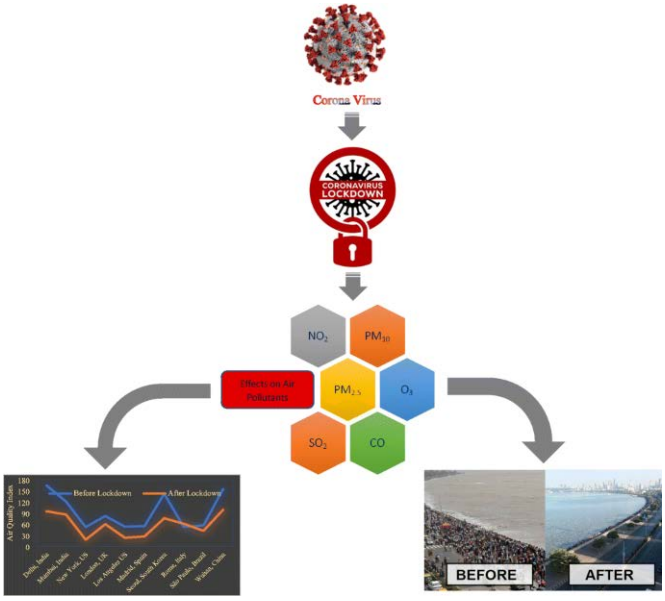
- ***Lockdown in INDIA***

On the evening of 24 March 2020, Government Of India ordered a nationwide Lockdown for 21 days, limiting the movement of the entire 1.38 billion (138 crores) population of India as a preventive measure against the COVID-19 Pandemic In India .It was ordered after a 14-hour voluntary public curfew on 22 March, followed by enforcement of a series of regulations in the countries COVID-19 affected regions. Observers stated that the lockdown had slowed the growth rate of the pandemic by 6 April to a rate of doubling every six days, and by 18 April, to a rate of doubling every eight days. As the end of the first lockdown period approached, state governments and other advisory committees recommended extending the lockdown.



Air Quality

Effect of COVID-19 on air quality was also studied through Air Quality Index (AQI) which one of the important tools to measure the levels of pollution due to measure air pollutants. Air quality should be counted as an important part of an integrated approach toward public health protection and prevention to the spread of epidemics. The COVID-19 lockdown can be seen as an unplanned experiment to study the effect on air quality of extraordinary reductions in anthropogenic activities. Furthermore, this lockdown may help to identify an air quality baseline to achieve in non-lockdown conditions. Nowadays, most existing public policies aiming to reduce air pollution are focused on the abatement of long-term emissions and increasing energy efficiency standards. Therefore, minimising the influences of meteorology and long-term policies on air pollutant concentrations is required to precisely detect changes in their concentrations ascribed to new interventions. We know that air pollution can cause health problems, like heart attacks, strokes, diabetes and high blood pressure, that have been identified as the pre-existing medical conditions that raise the chances of death from COVID-19 infection. Emerging research, finds that breathing more polluted air over many years may itself worsen the effects on COVID-19.



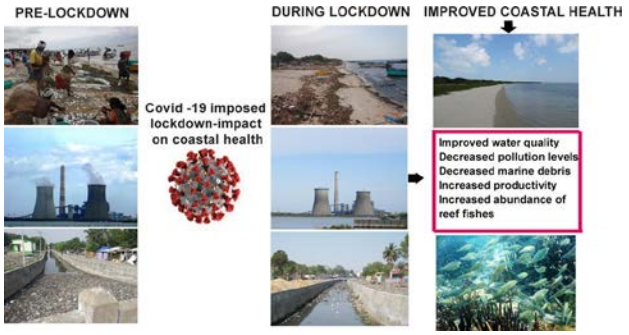
The lockdown significantly impacts social and economic activities but it has temporarily improved the air quality in most of the polluted cities in the world.

Water Quality

The global economic activities were completely stopped during COVID-19 lockdown and continuous lockdown partially brought some positive effects for the health of the total environment. The multiple industries, cities, towns and rural people are completely depending on large tropical river Damodar (India) but in the last few decades the quality of the river water is being significantly deteriorated. The present study attempts to investigate the river water quality (RWQ) particularly for pre- lockdown, lockdown and unlock period.

Highlights

- First attempt to track the impact of the COVID-19 spread on the hydrosphere.
- Business lockdown due to the COVID-19 spread improved adjacent lake water quality.
- Eleven out of 20 zones showed the lowest April SPM in 2020.
- Business activities have a significant impact on the lake water quality.

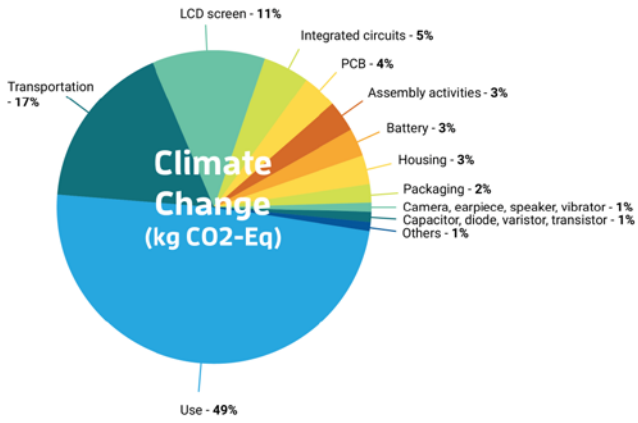


Climate Change

We don't have direct evidence that climate change is influencing the spread of COVID-19, but we do know that climate change alters how we relate to other species on Earth and that matters to our health and our risk for infections.

Many of the root causes of climate change also increase the risk of pandemics. Deforestation, which occurs mostly for agricultural purposes, is the largest cause of habitat loss worldwide. . Loss of habitat forces animals to migrate and potentially contact other animals or people and share germs. Large livestock farms can also serve as a source for spillover of infections from animals to people. Less demand for animal meat and more sustainable animal husbandry could decrease emerging infectious disease risk and lower greenhouse gas emissions.

We have many reasons to take climate action to improve our health and reducing risks for infectious disease emergence is one of them.

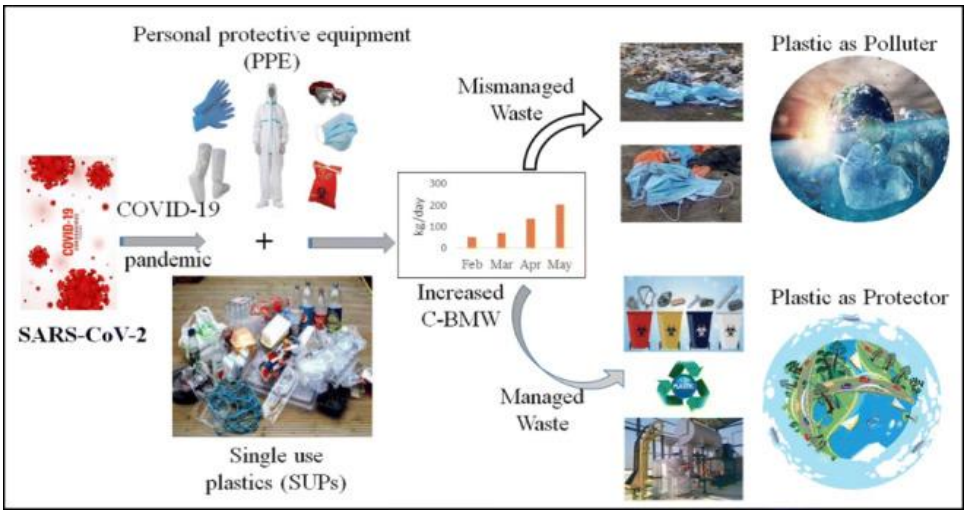


- ***Biomedical waste***

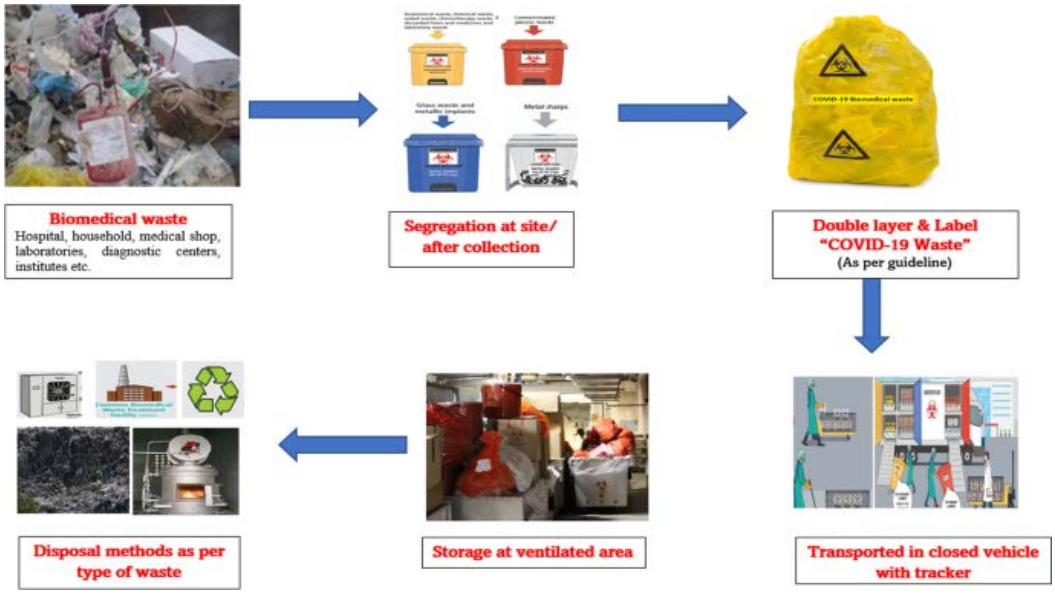
Bio-medical waste (BMW) is one of the emerging pollutants generated by healthcare facilities, such as medical diagnosis, treatment, or immunization of human beings, animals, and biological research activities. BMW is infectious and hazardous waste. It includes wastes of sharps, non-sharps, pathological/anatomical, synthetic substances, personal protective equipment (PPE), pharmaceuticals, and other infectious wastes.

According to Bio medical waste (Management and Handling) Rules, 1998 of India, "Bio medical waste is defined as any waste, which is generated during the diagnosis, treatment, or immunization of human beings or animals, or in research activities pertaining thereto, or in the production or testing of biologicals".

Already struggling with poor BMW practices deu to technical , practical and financial constraints also COVID-19 pandemic hit us hard by this sudden increase in the volume of medical waste.



According to the World Health Organisation report, the non-communicable disease (Cardiovascular disease, Cancer, Chronic respiratory disease, and Diabetes) and other health services are highly influenced by COVID-19.8 Almost majority of countries (53%) are partially or completely interrupted by COVID-19. The medical emergency was highly concerned for patients with diabetes (49%), cancer (42%) and cardiovascular (31%). Significantly, COVID-19 infection rate is increasing day by day, this imposes pressure on the demand of hospitals and medicines to tackle the challenges. Specifically, the requirement for medical resources (ventilators, masks, gloves, face shields, gowns and hand sanitizer) is in greater demand. In addition, the mental and physical pressure of healthcare workers on hospitals is becoming very high.The inadequate providence or inappropriate usage of Personal Protective Equipment (PPE) has highly affected many healthcare workers and general public. Especially, psychological context of humans has been profoundly affected by this pandemic. Notably, many adolescents have committed suicide by stress, anxiety, fears and loneliness. The over reactions of the body immune system (cytokine storm) also have induced in COVID-19 cases, because their infection did not only affect the lungs, but some of them have reported with gut issues, kidney failure and multi organ failure.



Directly or indirectly, the pandemic is affecting human life and the global economy, which is ultimately affecting the environment and climate. It reminds us how we have neglected the environmental components and enforced human induced climate change. Moreover, the global response of COVID-19 also teaches us to work together to combat against the threat to mankind. Though the impacts of COVID-19 on the environment are short-term, united and proposed time-oriented effort can strengthen environmental sustainability and save the earth from the effects of global climate change.

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EXTRACTION OF BIODIESEL FROM WASTE PLASTIC & YELLOW GREASE

Vaishnavi Chainpuria & Khushboo Sharma
TY Biotechnology
Department of Biotechnology
Tilak College of Science and Commerce

ABSTRACT

The Continuous demand for Plastics causes plastic costs to accumulate in Landfills, which consumes a lot of space and contributes to Environmental problems. The Recovery of plastic to liquid oil through the Pyrolysis process had great potential since petroleum was the main source of plastic manufacturing. Pyrolysis is a technology used to a heating substances in the absence of oxygen that dissolves all these types of waste plastic. To reduce and recycle plastic waste. Biodiesel offers many advantages because it is renewable, nontoxic, biodegradable, and suitable for sensitive environments. Yellow greases has huge quantities of free fatty acids which, the biodiesel producers are forced to turn to lower cost. The current two-step commercial processes used to convert yellow grease to biodiesel incur to added costs for pre-treatment of the yellow grease before transesterification to remove the fatty acids by the addition of extra alkali catalyst of Esterification of the free fatty acids using a Homogenous acid catalyst, eliminating the advantage of the cheaper raw material. To Convert waste Yellow grease used for Mechanical Purposes covered to Biodiesel using an Alkali-Catalysted Transesterification process. To Recycle waste Yellow Grease for Renewable energy source with less pollution

INTRODUCTION :

Plastics due to their lightweight, durability, and energy efficiency, coupled with a faster rate of production and design flexibility, have become an indispensable part of today's world.

- Due to these drawbacks, the recovery of plastic to liquid oil through the Pyrolysis Process had great potential. Since petroleum was the main source of plastic Manufacturing.
- The process is Effective & Simple.
- The current two-step processes used to convert yellow grease to biodiesel by transesterification to remove the fatty acids by the addition of an extra alkali catalyst of Esterification of the free fatty acids using a Homogenous acid catalyst, eliminating the advantage of the cheaper raw material.
- The success of this project will provide a Highly – Effective, cost–effective & Simplified process for the production from yellow grease.
- Synthetic plastic production has reached **400 million tons worldwide**. Plastics due to their lightweight, durability, and energy efficiency, coupled with a faster rate of production and design flexibility, have become an indispensable part of today's world.
- To tackle that problem one of the effective measures is by converting waste plastic into combustible hydrocarbon

liquid as an alternative fuel for running diesel engines.

- Due to these drawbacks, the recovery of plastic to liquid oil through the Pyrolysis Process had great potential. Since petroleum was the main source of plastic Manufacturing. The process is Effective & Simple.

  Waste plastics are one of the most promising resources for fuel production because of their high heat of combustion and their increasing availability in local communities.
- The conversion methods of waste plastics into fuel depend on the types of plastics to be targeted and the properties of other wastes that might be used in the process.
- Additionally, effective conversion requires appropriate technologies to be selected according to local economic, environmental, social, and technical characteristics.

RESEARCH METHODOLOGY :

Today the situation of our Environment is getting worse day by day. Due to this, we had a serious discussion on how we can contribute something to reduce the Hazardous Effect of waste on our planet. Due to this, I came up with the idea to focus on the material that drastically affects and makes the land infertile, which is nothing but plastic. The source of the idea is come from among the renewable energy sources biodiesel. This fuel is usually produced by catalytic transesterification of Waste plastic and yellow grease under heating and pressure. Yellow grease is a mixture of oils, fats, solids, and detergents from food industry wastes that are captured in grease traps**.**

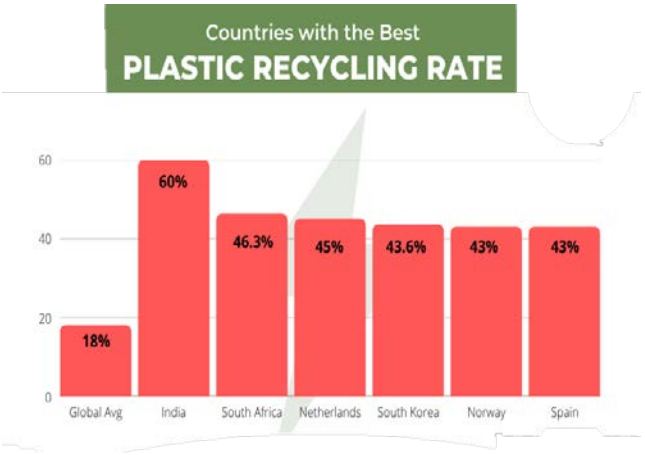
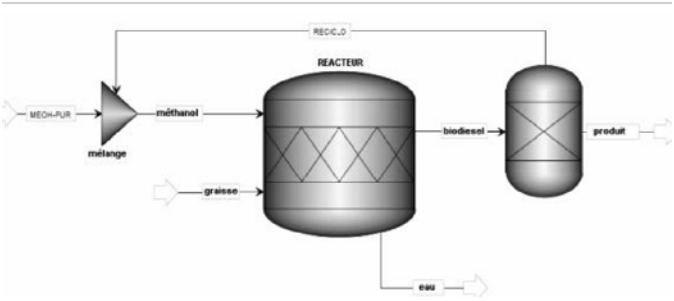


Fig: Plastic Recycling Rate



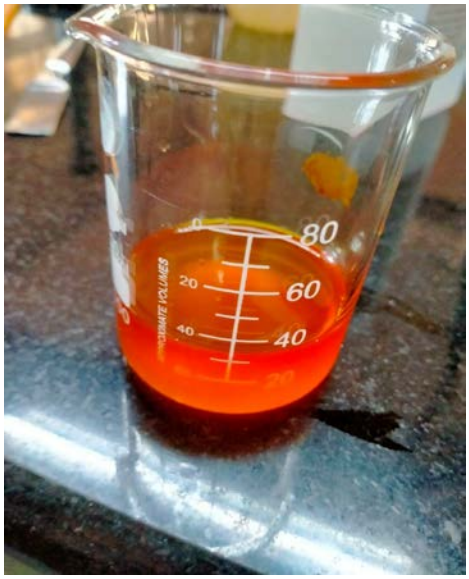
Production of Biodiesel from Yellow Grease

RESULT :

The main aim of this experiment is the production of biofuel to be extracted from yellow grease and plastic, which will reduce the harmful effects of plastics on the environment and also it will help in pollution control. And in the end, we were able to successfully get the desired result. Quality testing of biodiesel from both sources the inflammability was good in both. Free fatty acid titration was done which came in the normal range. The cost of waste plastics was economically feasible for the yellow grease. The production of biodiesel was more from waste plastics than yellow grease.

The process to make biodiesel from yellow grease this way that it will create a value-added and more profitable market for yellow grease, reduce biodiesel production and capital costs, eliminate waste streams produced from toxic acid or caution solution, reduce air pollution,

benefits consumers economically by reducing their vulnerability to petroleum price fluctuation and reduce the energy sources.



EXTRACTION OF BIODIESEL
EXTRACTION OF BIODIESEL FROM WASTE PLASTICS
FROM YELLOW GREASE

(FOR WASTE PLASTIC) :

- **Results of Acid Number Test –** Phenolphthalein endpoint colour changes to Orange, Green, or Brown Green colour. The pH of the biofuel is less than 7.35 to 7.45 this shows that the fuel is neutral.

- **Result of Cetane Number Test -** The test is approved by checking the collected Biodiesel inserted in the spirit Lamp by Flamming it. (Burning Time – More than 10 Mins).

- **Result of API Gravity Test –** API Gravity Test is American Petroleum Institute Gravity used to determine the Heavy or Low Weight of Petroleum liquid compared to water. The Test is approved by checking the weight by hydrometer that is **47** which indicates that the Biodiesel is Light in Weight.

(FOR YELLOW GREASE) :

- **Results of Acid Number Test -** Phenolphthalein endpoint colour changes to Orange, Green, or Yellow Green colour.
  The pH of the biofuel is less than 7.18 to 7.29 this shows that the fuel has neutral pH.

- **Results of Flammability Test -** The test is approved by checking the collected Biodiesel inserted in the spirit Lamp by Flamming it. (Burning Time – More than 15Mins) Quantity-20ml.

CONCLUSION :

Bio Diesel was extracted from waste plastic by pyrolysis method which can be used as an alternate for Diesel. Biodiesel produced is relatively economic than diesel and emits less pollutants. The main aim of this experiment is the production of biofuel to be extracted from waste plastics which will reduce the harmful effects of plastics on the environment and also it will help in pollution control. Quality testing of biodiesel of waste plastics that is Cetane number test, acid number test, API gravity test was done. The process to make biodiesel from waste plastics this

way that it will create a value-added and more profitable market from waste plastic, reduce the biodiesel production and capital costs, eliminate waste streams produced from toxic acid or caution solution, reduce air pollution, benefits consumers economically by reducing their vulnerability to petroleum price fluctuation and reduce the energy sources. The experimental work carries out in this project shows that biodiesel of acceptable quality can be produced on a small scale from a number of low-cost raw materials. However, the search for alternative feedstocks needs to be continued.
In this research, a method for biodiesel production from the fatty phase of Yellow grease is suggested, in which hazardous wastes are utilized for fuel production. The conditions for effective separation of the fatty phase of Yellow grease were determined, enabling an increase in the productivity of the process. The composition of the fatty phase and the obtained biodiesel was analyzed.

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EXTRACTION OF BIODIESEL FROM WASTE COOKING OIL AND WASTE ANIMAL FAT

Yogesh Ganapure, Maqsood Shaikh
TY Biotechnology
Tilak College of Science and Commerce

ABSTRACT:
Extraction of biodiesel from waste cooking oil (WCO) and waste animal fat (WAF) provides an alternative energy means of producing liquid fuels from biomass for various uses. This research focuses on the work related to the subject of biodiesel production. The main objective of the research work is to find alternative source of convectional fuel and recycles waste animal fat and used cooking oil into renewable energy with lower pollution and convert waste cooking oil and animal fat into biodiesel using an alkali-catalysed transesterification process. Every year tons of used cooking oil has been discarded which is a drawbacks, it is a very big source of Environmental Problems. Increased energy consumption and the depletion of petroleum reserves have pushed up oil prices globally. Animal fat oil was obtained by moderate heating and filteration process that minimize damage to the lipids and thus facilitated subsequent reactions. In this research, biodiesel is made from used cooking oil as well as waste animal fat and methanol using the transesterification method with a Sodium hydroxide as a catalyst. The Free Fatty Acids in the used vegetable and animal fat oils were converted to Methyl Ester by Transesterification. It offers several benefits such as economic, environmental and waste management. The transesterification process was carried out by mixing KOH (1% of oil weight) with methanol (ratio of methanol: oil 6:1) at a temperature of 650 C. Triglyceride which is composed of glycerol and 3 group of fatty acid which is main constituent of fat and oil get esterified and form fatty ester due to reaction of alcohol and acid. The Process is effective & simple. It is a Non-Toxic alternative Fuel acquired from Renewable Energy Sources. It yields high conversion (96% -98%) with minimal side reaction and short reaction time.

INTRODUCTION:
The two biggest challenges that mankind facing in this century is accessibility and energy changes. The population growth and the increasing use of vehicles have led to rapid rise in the energy demand.

The living standards of people depends on the utilization of energy, it plays a big role in socio-economic development by improving the standard of living Fossil fuel-based fuel sources such as petroleum, coal and natural gas.

The phrase “cooking oil and the animal fat ” refers to edible feedstock which has formerly been used for frying in restaurants and hotels, and no longer be used for similar purpose. Biodiesel production from WCO (waste cooking oil)and WAF(waste animal fat) is environmentally friendly for it recycles waste cooking oil and gives renewable energy with lower pollution. It substitutes some amount of petrochemical oil import and also lowers the cost of waste management.

The main purpose of this research work is to enhance the production of biodiesel from waste

cooking oil feed stock using NaOH and optimizing the major transesterification reaction parameters. The biodiesel production reaction parameters such as WAF & WCO to methanol ratio, catalyst dose and reaction temperature were optimized for optimum biodiesel yield at laboratory scale.

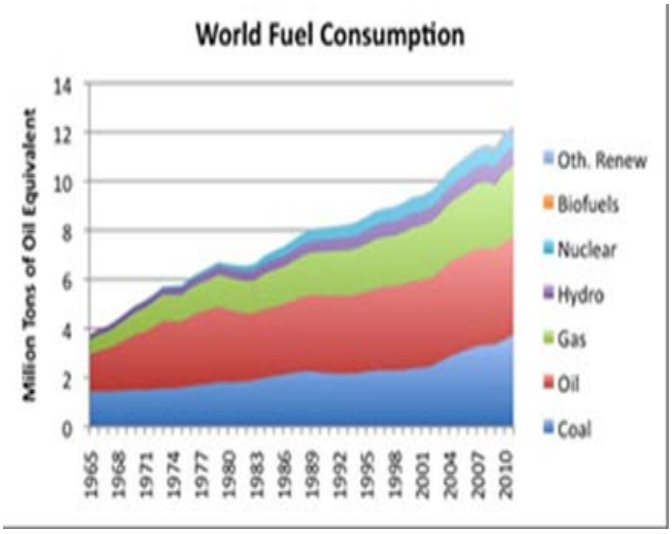
The one step biodiesel production from Waste cooking oil and Waste Animal Fat provides a success of cost effective and highly effective product.

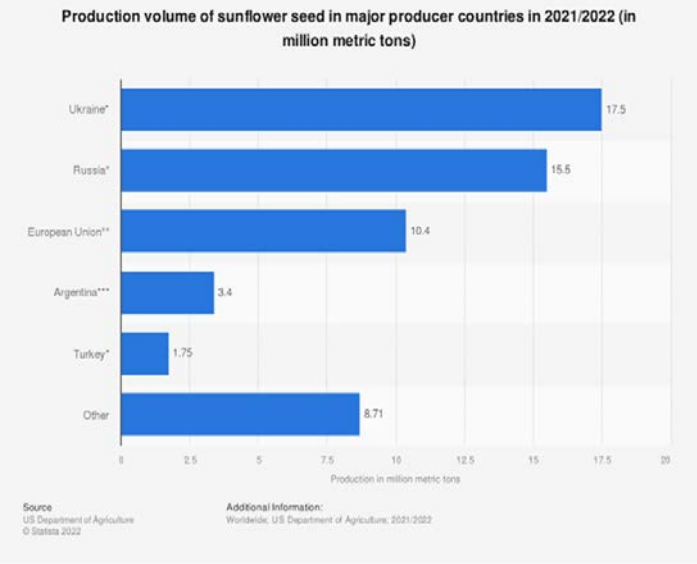
However, purification is needed before waste-cooking oil and anmal fat can be used as feedstock for BD (biodiesel production) Production. During cooking, especially deep-frying, oil hydrolysed into free fatty acid (FFA) and degrade by complex chemical reactions.

As a result used cooking oil & animal fat contain compound such as polymers, volatiles, FFA and other degradation products.

Research Methadology

Today the situation of our Environment is getting worse day by day. Due to this, we had a serious discussion on how we can contribute something to reduce the Hazardous Effect of waste on our planet. Due to this, I came up with the idea to focus on the material that drastically affects and makes the land infertile, which is nothing but plastic. The source of the idea is come from among the renewable energy sources biodiesel. This fuel is usually produced by catalytic transesterification of Waste oil and Animal fat under heating and filteration.





Result :

Biodiesel production from waste animal fat and waste vegetable oil can result in a renewable and sustainable alternative fuel source. The process of producing biodiesel from waste animal fat and waste vegetable oil typically involves several steps, including pretreatment, transesterification, and purification. The resulting biodiesel can have similar properties to conventional diesel fuel, including high energy content and low emissions. However, it is important to consider the potential impact of diverting waste materials from other uses, such as animal feed or composting. In the present work 80 ml of biodiesel was obtained from 100 ml of used sunflower oil. The estimated yield (volume/volume) is 93%. The biodiesel produced

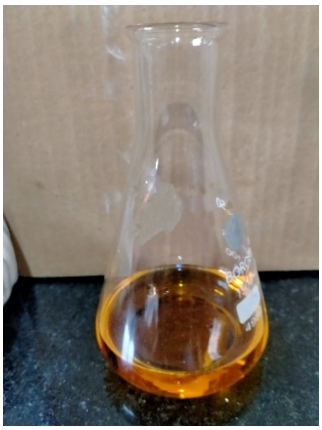
is inflammable whereas the used vegetable oil did not catch flame. And the FFA test indicated the presence of free fatty acids but in minimum amount, the presence of more fatty acids would have made the biodiesel which couldn't catch fire. In FFA test pink coloration (end point) forms which shows the free fatty acid content in biodiesel and Orange coloration in acid number test shows positive result in which we conclude that biodiesel have passed all the three tests. So the quality of the biodiesel have been tested.

(For Vegetable Oil)

Results :

Phenolphthalein endpoint color change to Orange, Green, or Brown Green color. The pH of the biofuel is less than 7.35 to 7.45 this shows that the fuel has neutral pH.

Acid Number Test :



FLAMMABILITY TEST

(For Animal Fat)

FFA Test :

CONCLUSION:

The test is approved by checking the collected Biodiesel inserted in the spirit Lamp by Flamming it. (Burning Time – More than 10 Mins),

ACID NUMBER TEST

Result :

The test is approved by checking the collected Biodiesel inserted in the spirit Lamp by Flamming it. (Burning Time – More than 10 Mins),Quantity-20ml.

Result :

The Colour Changes to Pink which Shows that the Free Fatty Acids are present in the fuel but are present in minimum amount. The biodiesel having free fatty acid below 2%.

The production of biodiesel using vegetable oil and Animal Fat has been produced. Sunflower oil and its use for production of a biodiesel is focused. The experimental work involves the production of biodiesel with used sunflower oil and Animal Fat, Ethanol is used for extraction and Sodium Hydroxide and Potassium Hydroxide are selected as homogenous Catalyst. The Ratio Alcohol to oil is the most important parameter in the production

of biodiesel. The Stoichiometric ratio for transesterification requires 3 moles of alcohol and 1 mole of triglyceride to produce 3 moles of ester and one mole of glycerol. The effect of reaction time, rate of mixing and the reaction temperature were studied in the experiment with Ethanol. The yield of biodiesel increases when the reaction time is increased from 1 to 2 hours and the yield of produces biodiesel increased from 90-94%. The experimental part of this work includes the production of biodiesel from Animal Fat and sunflower oil and ethanol, with sodium hydroxide as catalyst. The aim is to study the influence of the ratio ethanol: oil and the amount of catalyst on the yield as well on the properties of the produced biodiesel. The experiments demonstrate that the methanol / oil ratio influences on the biodiesel production. The yield of biodiesel increase with the methanol oil ratio Regarding the influence of the amount of catalyst on biodiesel production in the studied conditions is not possible to achieve a definitive conclusion. But a tendency showing an increasing of the biodiesel yield, with the amount of catalyst can be appreciated. Further experiments would be necessary in this case.

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SILICA GEL EXTRACTION FROM RICE HUSK, ITS APPLICATIONS IN ION EXCHANGE CHROMATOGRAPHY, ANTI-MICROBIAL ACTIVITY AND ANTI-FUNGAL ACTIVITY.

Harshada Girish Toraskar, Kajal Pandit Lamane, Shruti Suryakant Bhujbal
Ty Biotechnology
Tilak College of Science and Commerce, Vashi

ABSTRACT
The husk of rice, in large quantities, is an easily available agricultural residue in India.

It is a raw material which is rich in silica comprising about 90-98% silica. Due to its large ash content and the presence of sodium silicate in its ash, rice husk becomes an economical source to extract silica from the rice husk ash, which has an extensive market and also helps in ash removal. The husk of rice is a widely popular boiler fuel and the ash produced has to be disposed off properly. The process of extraction of silica not only offers a solution for waste clearance, but also recovers a valuable product. The surface area of Silica gel has high specificity which allows it to adsorb water readily, making it suitable drying agent in various purposes.Silica is also used in ion exchange chromatography.Moreover, silica's inherent anti-fungal and anti-bacterial properties makes it an anti-fungal and anti-microbial agent.In this study, an attempt is made to extract and characterize amorphous silica, from rice husk ash, for its potential use in the food industry. At the same time, resolving the disposal issue of rice husk ash and safeguarding the environment from pollution.

INTRODUCTION
In today's times, when we are facing an ever-increasing crunch in every aspect of our lives and running out of resources to find sustainable solutions, the answer lies in waste, as our primary resource. We have waste in abundance in every nook and corner, but without its judicious utilization, there cannot be sustainable development. Food waste along with its by-products that aren't edible, contain many valuable products which may not only give us green alternatives, but also benefit the economy, especially of the developing nations.

Rice is the most prominent crop of India as it is the staple food for most of the people of the country. This crop is the backbone of livelihood for millions of rural households and plays a vital role in the country's food security, so the term "rice is life" is most appropriate in the Indian context. India occupies an important position both in area and production of rice. By the adoption of improved production technologies such as high-yielding varieties/ hybrids, expansion of irrigation potential, and use of chemical fertilizer, supply of rice in the country has kept pace with the increase in demand. Demand for rice is expected to further increase in

future as population is continuously increasing, so production of rice also needs to be increased. There is a need to further increase rice productivity because land area under rice cultivation is declining. Major constraints for productivity and sustainability of rice-based systems in the country are the inefficient use of inputs (fertilizer, water, labour), increasing scarcity of water and labour especially for rice cultivation, new emerging challenges from climate change, rising fuel prices, increasing cost of cultivation, and socioeconomic changes such as migration of labour, urbanization, less liking for agricultural work by youths, and concerns from environmental pollution. The only way to sustain rice production for meeting the increasing population demand is to increase the productivity per unit of area of rice with enhanced resource use efficiency.Rice milling generates a by-product known as husk. This surrounds the paddy grain. During milling of paddy about 78 %of weight is received as rice, broken rice and bran. The Remaining 22 % of the weight of paddy is received as husk. .This husk contains about 75 % organic volatile matter and the balance 25 % of the weight of this husk is converted into ash during the firing process, known as rice husk ash (RHA). This RHA in turn contains around 85 % - 90 % amorphous silica.

Silica gel, chemical formula: $\mathbf{mSiO_2 \cdot nH_2O}$, appears as a slightly transparent White solid substance. It belongs to the genus amorphous. Silica is a highly active, porous material with large internal area. The specific surface area per silica can reach above 450 m. Therefore, it has strong absorption capability on the liquid or gas. Silica gel can't dissolve in water, not soluble in other solvents except hydrofluoric acid and strong alkali. The silica gel can be manufactured through the reaction between water glass and sulphuric acid, and further gelling, washing, desalting, animation, drying and screening. The reaction is as follows:

$$\mathbf{nNa_2O \cdot mSiO_2 + nH_2S0_4 \quad mSiO_2 \cdot nH_20 + nNa_2SO_4.}$$

It has been found that industrial silica gel has 85 to 95 % mechanical strength,water content being below 2% and the moisture absorption rate of 25 to 30%.

- Gel silica is mainly used for gas absorption or drying, liquid dehydration and liquid chromatography, also used as catalysts or catalyst carriers.

- The textile industry uses it as a sizing agent. The drying and purification of gas is done by pore silica, the dehydration and purification of organic products, also used as a supported carrier.

- Discolouration gel is mainly used to indicate the relative humidity of airtight packaging, precision instruments and the inner space of instrument as well as being used for the moisture proof maintenance of precision instrumentation.

Ion exchange chromatography separates on the basis of charge.It is frequently chosen for the separation and purification of proteins, peptides, nucleic acids, polynucleotides and other charged molecules, mainly because of its high resolving power and high capacity. However, Ion exchange chromatography must be done in conditions that are one unit away from the isoelectric point of a protein.

Anti-microbial activity is a term for all active principles(agents) that inhibit the growth of bacteria, the formation of microbial colonies, and may destroy microorganisms. The two methods used are **Agar cup method** and **Disc diffusion method.**

1. In **agar cup diffusion** assay different antibiotics to be assayed are added to the cup in the agar seeded with bacterial strains.

After incubation, the zone of inhibition is observed.

2. The basic principle of the **disc diffusion method** is that as the antibiotic diffuses into the medium, a declining concentration gradient is formed, as the distance from the disc increases. The organism grows till it reaches an area where the antibiotic is no longer effective. At this point, a zone edge is formed.

Anti-fungal activity is a collective term for all active principles(agents) that inhibit fungal growth, the formation of microbial colonies, and may destroy microorganisms.

LITERATURE REVIEW

Rice husk is an agricultural byproduct, i.e., an unavoidable food waste, which is abundantly available in rice producing countries. India produces nearly 12 million tons of rice husk annually. Rice husk has a high ash varying from 18-20%. A major problem for rice growers is the disposal of rice hulls. Until now they are discarded either by open incineration or burying. Uncontrolled burning of rice husk causes the ash, which is principally silica, to be converted into crystalline form and also renders it less reactive. Burning rice husk as fuel to generate energy results in the waste product, rice hull ash (RHA). RHA is rich in silica **(about 90-98%)** and can be an economically viable raw material for production of silica gels and powders **(Kamath and Proctor, 1998; Chakraverty and Kale-emullah, 1991)**. RHA has been evaluated as an adsorbent of minor vegetable oil components **(Proctor et al., 1995; Proctor and Palaniappan, 1990)**. Although various uses for rice hull and RHA have been suggested in the literature, their disposal or utilization remains a major concern.RHA usually contains more than 60% silica (SiO,). 10 40% carbon with minor mineral composition.Rice husk ash has a relatively high content of inorganic compounds, representing approximately 20% of the dry weight of the husk. Silica represents 94% of the total while the remaining 6% are K,O, CaO, MgO, AlO,, and P.O, in decreasing concentrations. Silica (SiO- is a basic raw material that is widely used in electronics. ceramic, and polymer material industries. Because of its particle diameter, ultra fine silica powders have many technological applications, such as thixotropic agents, thermal insulators, composite fillers, etc. Silica also has been used as a major precursor for a variety of inorganic and organometallic materials which have applications in synthetic chemistry as catalysts, and in thin films or coatings for electronic and optical materials.**(A.Umesh et al /Int.J. ChemTech Res. 2014)**

MATERIALS FOR EXTRACTION OF SILICA GEL

SERIAL NO.	PARTICULARS	VOLUME	QUANTITY
1	**Sample:** Rice Husk Ash		
2	**Reagents:** 1 N HCL 1 N NaOH 1N H_2SO_4 Ethanol Distilled Water	 500 ml 500 ml 20 ml 50 ml 500 ml	

SERIAL NO.	PARTICULARS	VOLUME	QUANTITY
3	**Glasswares:** Conical flask Beakers Pipettes Centrifuge Tubes	 150 ml 200 ml 10 ml	 5 5 5 10
4	**Miscellaneous:** Mortar Pestle Centrifuge Oven Induction		 1 1 1 1
5	**Others:** Filter Paper pH paper Foil paper		 1 1 1

MATERIALS FOR ION EXCHANGE CHROMATOGRAPHY

SERIAL NO.	PARTICULARS	VOLUME	QUANTITY
1	**Sample:** Extracted Silica Gel	5 g	
2	**Reagents:** HNO_3 Aqueous solution of malachite green 2M HCL	 1 ml 20 ml 20 ml	
3	**Glassware:** Burette Beaker		 1 1
4	**Miscellaneous:** Burette Holder Burette clamp		 1 1

MATERIALS FOR ANTI-MICROBIAL

For Agar Cup

SERIAL NO.	PARTICULARS	VOLUME	QUANTITY
1	**Sample:** Extracted Silica Gel	3g	1

SERIAL NO.	PARTICULARS	VOLUME	QUANTITY
2	**Reagents:** Saline water	 2ml	 1
3	**Culture:** *S.aureus* *E.coli* *K.pneumoniae*	 0.1ml 0.1ml 0.1ml	 1 1 1
4	**Glassware:** St. MH agar butt St. Petri Plate St. Pipette St. Test tubes	 25 ml	 1 8 8 8
5	**Miscellaneous:** Alcohol Disinfectant dish Cork borer	 5ml	 1 1 1

For Disk Diffusion

SERIAL NO.	PARTICULARS	VOLUME	QUANTITY
1	**Sample:** Extracted Silica Gel	**VOLUME**	**QUANTITY**
2	**Reagents:** Saline water	3g	1
3	**Culture:** *S.aureus* *E.coli* *K.pneumoniae*	 0.1ml 0.1ml 0.1ml	 1 1 1
4	**Paper disc:** Gentamicin (10 mg)		 1
5	**Glassware:** St. MH agar butt St. Petri Plate St. Pipette St. Test tubes	 25 ml	 1 8 8 8
	Miscellaneous: Disinfectant dish Cork borer Cotton Swab	 5ml	 1 1 1

MATERIALS FOR ANTI-FUNGAL

SERIAL NO.	PARTICULARS	VOLUME	QUANTITY
1	**Sample:** Extracted Silica Gel	3g	1
2	**Reagents:** Saline water	3ml	1
3	**Culture:** *A.niger* *S.cerevisiae*	 0.1 ml 0.1 ml	 1 1
4	**Paper disc:** Gentamicin (10 mg)		 1
5	**Glassware:** St. MH agar butt St. Petri Plate St. Pipette St. Test tubes	 25ml 4 10 6	 2 2 2 2
6	**Miscellaneous:** Disinfectant dish Cork borer Cotton Swab	 5ml	 1 1 1

PROTOCOL FOR EXTRACTION OF SILICA:

Disperse RHA in 1N HCL and stir for 2 hrs.Filter and wash the residue with water.Disperse residue in 1N NaOH and boil with continuous stirring .Filter and wash the residue with boiling water.

Cool the filtrate and titrate it with 1N H_2SO_4 until pH 7.Allow it gel for 24 hrs.Add water and crush the gel.Centrifuge at 2500 rpm.Discard the supernatant and repeat the washing .Dry at 50 for 2 hrs.

METHOD FOR EXTRACTION OF SILICA

Heat Treatment: The RHA obtained from burning paddy husk contains some product of incomplete combustion. To get complete pure burnt ash heat treatment is given. Sample was taken in a crucible and heated in an electrical oven for 700°C for 2 hours.

Heat Treatment Grinding

Grinding: The grinding step to decrease mean particles size and increase specific surface area. For grinding RHA we use mortar pestle.

Acid washing: The aim of acid pretreatment is to improve the purity of silica products. It proves to be an effective way in substantially removing most of the metallic impurities and producing ash silica completely white in colour. 60 grams of RHA sample was dispersed in distilled water. IN HCI was then added to this solution. Stirring is done for 2 hours to this dispersion. Next the ash

was filtered using filter paper. The ash obtained was sent for silica extraction.

Acid washing **Silica Extraction**

Silica Extraction: 500ml of IN NaOH is used for the extraction, 60 gram ash and NaOH are put in a container at a temperature 90°C and atmospheric pressure with constant vigorous stirring at 900 rpm. The method of Kamath and Proctor (1998) was used for extraction of silica from RHA. After constant stirring the solution was filtered through ash less filter paper, the carbon residue was washed with 100 ml distilled water. The filtrates and washing were allowed to cool down to room temperature. The filtrate formed in this process is nothing but sodium silicate solution. The reaction occurred as follows:

SiO_2 (Ash) + 2NaOH Na_2SO_3 +H_20

Filtration: The solution is filtered through filter paper, and the carbon residue is washed with 100 ml of boiling water. The filtrate obtained contains sodium silicate solution which is a clear, transparent solution brownish yellow in colour and used for further process. The solid cake retained contains fly ash and other metallic impurities.

Filtration Gel preparation

Gel preparation: The filtrate and washings were allowed to cool to room temperature and were titrated with IN H_2S0_4 with constant stirring to pH. Silica gels started to precipitate when the pH decreased to <10. The silica gels formed were aged for 18 hr. Distilled water (100 ml) was added to gels and then the gels were broken to make a slurry. Silica gel is produced by using various acids and different concentrations which is depicted in the above figure. Silica gel produced from IN H_20_4 showed good results and has a higher specific area and took less time for gelification.

Na_2SiO_3 + H_2O_4 SiO_2 + Na_2SO_4 + H_2O

Gel preparation

Washing & Centrifugation: Distilled water is added to gels and then the gels are broken with glass rod to make slurry. Slurries are then centrifuged to remove the alkaline water;

Centrifugation

the clear supernatant is discarded. Purification of this silica for removal of sulphate impurities constitutes the third step of the process. For this successive demineralized water washings are given in the filter process itself. The conductivity of the effluent follows a decreasing trend owing to removal of sodium sulphate. Thus, conductivity can be used as the criteria to decide the number of washing's for obtaining silica of desired purity.

Drying: The gels are transferred into a beaker and again washed with ethanol, allowed to age for 2 hours so that the water gets displaced by the ethanol and dried at 50°C for 2 hr.. Ethanol is used so that the gel structure does not get disrupted and shrinkage of the silica gel should be minimum.

PROTOCOL FOR ION EXCHANGE CHROMATOGRAPHY

Weigh 5 grams of extracted silica.Add 20 ml distilled water and stir well.Decant and add 1 ml HNO_3 (Keep it for 1 hour).Prepare a column of silica slurry in a burette. Take 20 ml aqueous solution of any cation dye in the column.For example, Malachite green. Observe characteristic colour over the column i.e. green.To elute exchanged colour, take 20 ml of 2M HCL and add to the column. Observe column losing colour because of ion exchange.

PROTOCOL FOR ANTI-MICROBIAL TESTS

AGAR CUP METHOD:

Inoculate 0.1 ml *S.aureus, E.coli, K.pneumoniae* culture to 20 ml cooled, melted MH agar butt mix and pour into sterile plates. Allow it to solidify. Make 4 wells in each plate using a sterile borer. Transfer 0.1 ml of different dilution of extracted silica gel into each well of plates aseptically using pipettes. Incubate the plates at 37°C for 24 hrs. Observe the results after 24 hrs.

DISC DIFFUSION METHOD:

Dip a sterile cotton swab in the culture of the *S.aureus, E.coli, K.pneumoniae ;* rotate the swap several times firmly on the inner wall of the tube to remove the excess of the culture.

Swap the isolate on the MH agar three times giving a period of 5 mins of absorption after each spreading. Allow the surface to dry for 5 mins before transferring the antibiotic discs and paper discs. The antibiotic discs are transferred on the inoculated MH agar plate aseptically using a sterile forcep. The disc must be in proper contact with the medium so that uniform diffusion of the antibiotic takes place.Incubate the plates at 37°C for 24 hrs.Observe the results after 24 hrs.

PROTOCOL FOR ANTI-FUNGAL TEST

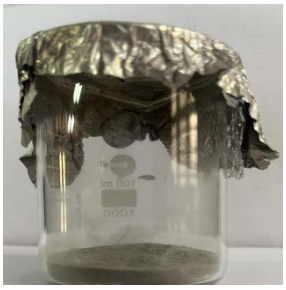
Dip a sterile cotton swab in the culture of the *A.niger, S.cerevisiae ;* rotate the swap several times firmly on the inner wall of the tube to remove the excess of the culture.

Swap the isolate on the MH agar three times giving a period of 5 mins of absorption after each spreading. Allow the surface to dry for 5 mins before transferring the antibiotic discs and paper discs. The antibiotic discs are transferred on the inoculated MH agar plate aseptically using a

sterile forcep. The disc must be in proper contact with the medium so that uniform diffusion of the antibiotic takes place. Incubate the plates at 37°C for 24 hrs.Observe the results after 24 hrs.

RESULTS

EXTRACTION OF SILICA GEL:



Silica gel is produced after calcination at 700°C for 2 hrs. The treatment using heat of RHA does not affect the structure of its silica. **This study reveals that silica content is 93%** and minimal mineral contaminants can be produced from RHA using simple chemical methods. **The silica extracted from 60 g of RHA was 19.64%**. It was possible to obtain high specific area silica from RHA after heat treatment and milling processing by applying this simple technique and it is possible to transform industrial residue in useful raw materials avoiding damage to the environment.

ION EXCHANGE CHROMATOGRAPHY:

The Ion Exchange Chromatography was performed by silica gel which was extracted by RHA. **The cation dye i.e Malachite green was successfully separated by silica gel.**

This indicates that extracted silica can be used for the chromatography or separation processes, also silica is highly purified. It can be used for separation of any type of charged molecule including amino acids, dyes, large proteins and small nucleotides.

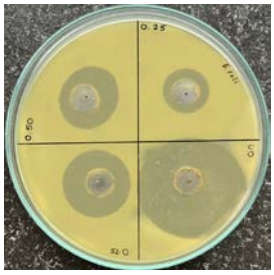
ANTI-MICROBIAL TEST

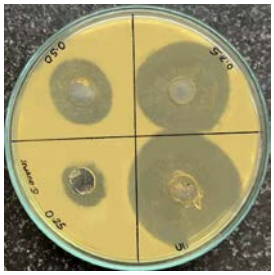
Anti-microbial tests were performed by two methods i.e. Agar cup and Disc diffusion method

A. In Agar cup method:

1. *E.coli* was tested against different dilutions of extracted silica

- For 0.25mg/ml zone of inhibition was 2.4 cm
- For 0.50mg/ml zone of inhibition was 3 cm
- For 0.75mg/ml zone of inhibition was 3.4 cm
- For undiluted zone of inhibition was 3.7 cm





E.coli *S.aureus*

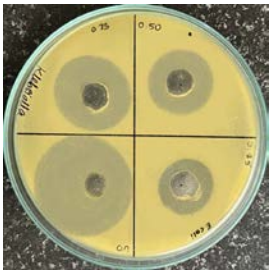
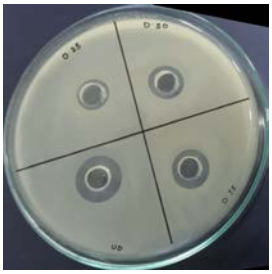
2. *S.aureus* was tested against different dilutions of extracted silica

- For 0.25mg/ml zone of inhibition was 1 cm
- For 0.50mg/ml zone of inhibition was 1.5 cm
- For 0.75mg/ml zone of inhibition was 2.3 cm
- For undiluted zone of inhibition was 2.8 cm

3. *K.pneumonia* tested against different dilutions of extracted silica

- For 0.25mg/ml zone of inhibition was 1.5 cm
- For 0.50mg/ml zone of inhibition was 1.8 cm
- For 0.75mg/ml zone of inhibition was 2.2 cm

- For undiluted zone of inhibition was 2.8 cm

K.pneumoniae *P.aeruginosa*

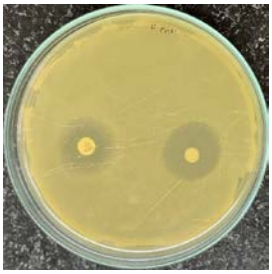
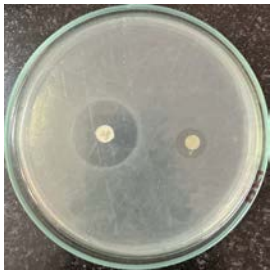
4. *P.aeruginosa* tested against different dilutions of extracted silica

- For 0.25mg/ml zone of inhibition was 0.8 cm
- For 0.50mg/ml zone of inhibition was 1cm
- For 0.75mg/ml zone of inhibition was 1.1cm
- For undiluted zone of inhibition was 1.3 cm

B. In Disc diffusion method

1. *E.coli* was tested against gentamicin(10 mg) and paper disc(silica)

- Zone of inhibition for gentamicin(10 mg) was 2.5 cm
- Zone of inhibition for paper disc(silica) was 2.5 cm

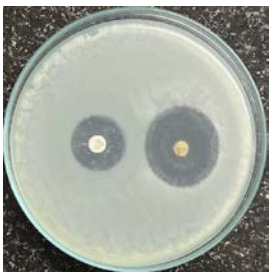
E.coli *S.aureus*

2. *S.aureus* was tested against gentamicin(10 mg) and paper disc(silica)

- Zone of inhibition for gentamicin(10 mg) was 2.3 cm
- Zone of inhibition for paper disc(silica) was 3 cm

3. *K.pneumonia* against gentamicin(10 mg) and paper disc(silica)

- Zone of inhibition for gentamicin(10 mg) was 1.2 cm

- Zone of inhibition for paper disc(silica) was 1.5 cm

K.pneumoniae *P.aeruginosa*

4. *P.aeruginosa* against gentamicin(10 mg) and paper disc(silica)

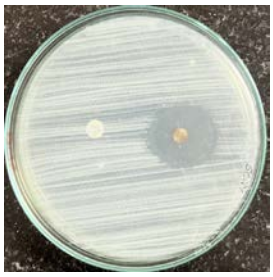
- Zone of inhibition for gentamicin(10 mg) was 1.2 cm
- Zone of inhibition for paper disc(silica) was 1.5 cm

ANTI-FUNGAL TEST

Anti-fungal tests were performed by Disc diffusion method

1. *S.cervisiae* was tested against gentamicin(10 mg) and paper disc(silica)

- No zone of inhibition was observed for gentamicin(10 mg)
- Zone of inhibition for paper disc(silica) was 1.5 cm




S. cervisiae *A. niger*

2. *A. niger* was tested against gentamicin(10 mg) and paper disc(silica)

- Improper zone of inhibition was observed.

CONCLUSION

Silica being inert, biodegradable and easily available from the waste rice husk serves as a very cheap column for the chromatography. The porous nature of the silica from rice husk makes it more appropriate. Rice husk is abundantly available and it produces about 85 to 98% of silica. The purity of the silica produced from the rice husk is very high. The silica also showed anti-fungal and anti bacterial properties which further made it a suitable material for making columns in chromatography. The column has a very less chance of contamination. It is non toxic, however burning of rice husk produces a little bit of smoke and ash.

FUTURE PROSPECTS

- The silica produced from the rice husk is cheaper than the silica brought from the market, as it is produced from the agricultural rice husk waste.
- It has huge benefits such as it can be used as a chemical product in a chemistry laboratory.
- Extracted silica can be used to keep moisture free of optical instruments.
- Silica can be employed in the flower industry for drying and storage of flowers and seeds.
- It can also be used in chromatography techniques, food additives, humidity indicators and water filtration.
- Silica is used for diagnostic test strips, inhalation devices, syringes, drugs test kits and hospital sanitation kits.

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  January 2019

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  Author: Felix Unglaube, Alexander Lammers, Dr. Carsten Robert Kreyenschulte, Prof. Dr. Michael Lalk, Dr. Esteban Mejía

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  https://doi.org/10.1002/open.202100239

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  A. Proctor

  John L Shultz (University of Arkansas)

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TILAK COLLEGE OF SCIENCE & COMMRECE

Vashi, Navi Mumbai - 400703
Ph: 27655267 / 27800299 | E-mail: tilakedn@gmail.com

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