



# “ABHIDNYA”

Research Paper Presentation Competition  
(FOR STUDENTS ONLY)      MODE:Offline

Organised by IQAC & Research Cell

“Cutting Edge Developments in Commerce  
and Management: Embracing Industry 5.0”

TOGETHER WE GROW: HUMANS AND INDUSTRY

DAY&DATE:Friday  
04thApril, 2025.



VENUE; JES College  
Campus

**PARTICIPANTS**

UG (FY/SY/TY) and PG of any faculty(Commerce,Arts and Science)  
who is currently a bona-fide student from any College / University.

## **“ABHIDNYA”**

### **Research Paper Presentation Competition For Students Organised by IQAC & Research Cell**

### **“Cutting Edge Developments in Commerce and Management: Embracing Industry 5.0”**

#### **PRINCIPALS**

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**B.M. RUIA GIRLS' COLLEGE  
GAMDEVI, MUMBAI**  
Re-accredited by NAAC with 'B+' Grade  
**PRINCIPAL: Dr. Santosh Kaul Kak**



**COLLEGE OF COMMERCE SCIENCE &  
INFORMATION TECHNOLOGY**  
Accredited by NAAC with 'B' Grade  
**PRINCIPAL: Dr. Prashant H Shelar**



**SWAMI VIVEKANAND NIGHT  
COLLEGE OF ARTS & COMMERCE**  
Re-accredited by NAAC with 'B+' Grade  
**PRINCIPAL: Dr. Anuja N. Palsuledesai**

# “ABHIDNYA”

## REPORT OF ABHIDNYA STUDENT RESEARCH PAPER COMPETITION HELD ON 4<sup>th</sup> April 2025

The registration of the participants started at 8.00 a.m. The breakfast was served to the participants. The Inaugural Session started at 9.00 a.m. Prof. Dr. Sunita Sharma welcomed the Judges of the Student Research Paper Competition – Dr. Swati Desai and Dr. Anuya Warty. The program started with Ganpati Puja, lighting of the Lamp and Saraswati Vandana. Principal Dr Prashant H Shelar presented the welcome address. Both the judges were introduced and were presented mementos and roses as a welcome. The Inaugural session ended with instructions of dividing the students into two groups. The Inaugural Vote of Thanks was given by Dr. Tejaswini Parab.

**Session I**, the Judge was Dr Swati Desai and 22 offline and online entries registered were put in this session. This session had all the commerce undergraduate students. The prizes given were, 1 First Prize, 2 Second Prizes and 3 Third Prizes.

Session II, the Judge was Dr. Anuya Warty and there were 7 entries from B.Sc (IT), 1 from Mass Media and 6 from Post Graduate Section. The prizes given were – **Post Graduate** participants - 1 First Prize, 1 Second Prize, **B.Sc (IT)** 1 First Prize and 1 Second Prize. 1 Appreciation Award was given to one entry from **Mass Media**.

In **Total 36 Presentations** and total prizes given were 3 First Prizes, 4 Second Prizes, 3 Third Prizes and 1 Appreciation Prize. **Total 14 students** got prizes.

The **Valedictory Session** started at 11.30 a.m. The Chief Guest for the Valedictory Session was Mr. Kiran Kamat. One student spoke on her experience of being a part of Research Paper Competition, this was followed by tips of improvement given by the Judges. Mr. Kiran Kamat gave his Valedictory speech in which he explained the importance of research for students and teachers. This was followed by Prize Distribution Ceremony, which was followed by a formal Vote of Thanks.



Marwadi Sammelan's



**B.M. RUIA GIRLS' COLLEGE  
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Jogeshwari Education Society's



**COLLEGE OF COMMERCE SCIENCE &  
INFORMATION TECHNOLOGY**

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PRINCIPAL: Dr. Prashant H Shelar

Rashtriya Shikshan Sanstha's



**SWAMI VIVEKANAND NIGHT  
COLLEGE OF ARTS & COMMERCE**

Re-accredited by NAAC with 'B+' Grade

PRINCIPAL: Dr. Anuja N. Palsuledesai

# “ABHIDNYA” Research Paper Presentation Competition (FOR STUDENTS ONLY)

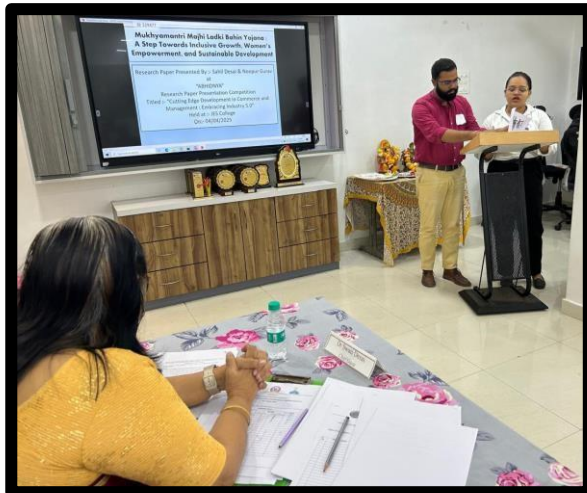
PHOTOS OF “ABHIDNYA” Student Research Paper Competition held on 4<sup>th</sup> April 2025







## INAUGURAL SESSION



## PAPER PRESENTATION SESSION





## VALEDICTORY SESSION

# ABHINDYA

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# **“Menstrual Hygiene in Urban Slums: A Sustainable Approach through Industry 5.0 Innovations”**

‘Manasi Ravi Pawar<sup>1</sup> & Fahima Rafiq Patel<sup>2</sup>’

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## **ABSTRACT**

*Menstrual health and hygiene remain significant concerns for adolescent girls, particularly those living in slums, where access to proper facilities and awareness is limited. This study explores the menstrual health and hygiene practices of adolescent girls residing in the slums of Jogeshwari, focusing on their level of awareness, challenges faced, and the impact on their daily lives. The research adopts a mixed-method approach, including surveys and interviews, to assess the availability of sanitary products, hygiene practices, and the influence of cultural taboos.*

## **INTRODUCTION**

**Menstrual health and hygiene** remain critical yet often overlooked aspects of public health, especially in marginalized communities such as urban slums. Adolescent girls face significant challenges due to lack of awareness, inadequate sanitation, and limited access to affordable menstrual products, leading to school absenteeism, health risks, and social stigma. Addressing these challenges is essential for achieving gender equality and improving overall well-being. Sustainability, and social responsibility, there is an opportunity to bridge this gap. Advanced technologies such as AI-driven health solutions, biodegradable sanitary to analyse the difficulties related to menstrual stigma, access to hygiene products, school absenteeism, and associated health risks. products, and corporate social responsibility (CSR) initiatives can revolutionize menstrual hygiene management.

This paper explores the intersection of menstrual health, Industry 5.0, and the 17 Sustainable Development Goals (SDGs), highlighting innovative approaches to ensuring equitable access to menstrual hygiene solutions.

*Adolescence phase* among girls is characterized by onset of menarche, which is characterized by physical, emotional and cognitive development. Menarche is defined as the first menstrual period in a female adolescent, which typically occurs between the ages of 10 and 16. Menarche signifies the start of a female's reproductive years, and with abrupt biophysical change for girls, it signals the transition from childhood to adulthood status within a society. At the onset of menarche, girls face various challenges, concerns, misconceptions accompanied by social psychological adjustments.

**Menstruation**, a normal biological process experienced by millions of women and girls around the world each month, yet is considered as a mysterious phenomenon, and is shrouded in language of concealment and ambivalence. Dominant discourses concerning menstruation are typically negative, suggesting menstruation needs to be hidden and imply it a source of shame and embarrassment. These menstrual taboos are a manifestation of the concept of purity and pollution, wherein menstrual flow and menstruating women are considered as polluting (Garg & Anand, 2015).

With an aim of sparking the conversation on menstruation and with the objective of spreading awareness on the importance of menstrual hygiene management in society the researchers selected this topic for research.

## **OBJECTIVE OF STUDY**

- 1.To list the difficulties related to menstrual stigma, access to hygiene products, school absenteeism, and associated health risks.
- 2.To facilitate safe menstrual practices in cultural and religious contexts.
- 3.To promote and utilize gender-responsive innovations and create awareness through Industry 5.0.
- 4.To suggest development of sustainable and biodegradable menstrual products.

## ***Challenges faced by adolescent girls in their menstrual cycle period in urban slums:***

Adolescent girls face several challenges during their periods, including:

1. Lack of Menstrual Hygiene Products – Limited access to sanitary pads, tampons, or menstrual cups.
2. Menstrual Pain and Discomfort – Cramps, headaches, and fatigue which affects their daily activities.
3. Social Stigma and Taboos – Cultural myths and restrictions make periods a topic of shame.
4. Lack of Proper Education – Many girls do not receive accurate information about menstruation.
5. Fear of Staining and Embarrassment – Anxiety about leaks affects confidence in school and public places.
6. Limited Access to Clean Toilets – Inadequate facilities make it hard to change pads or maintain hygiene.
7. Restrictions on Activities – Some girls are discouraged from sports, religious practices, or social interactions
8. Emotional and Psychological Stress – Mood swings, anxiety, and self-consciousness due to hormonal changes
9. Skipping School – Many girls miss school due to pain, lack of products, or embarrassment
10. Economic Barriers – Financial struggles prevent access to quality menstrual products.

Improving menstrual awareness, education, and access to hygiene products can help address these challenges.

### **Literature Review:**

*Chandra-Mouli, V., & Patel, S. V. (2020)* explore menstrual health education in their study, "Mapping the Knowledge and Understanding of Menarche, Menstrual Hygiene, and Menstrual Health Among Adolescent Girls in Low- and Middle-Income Countries," published in *The Palgrave Handbook of Critical Menstruation Studies* (pp. 609-636). The authors assess knowledge and perceptions related to menarche and menstrual hygiene among adolescent girls in these settings. They identify socio-cultural and economic factors influencing understanding and emphasize the need for targeted interventions to improve



education and resources, highlighting menstrual health as essential to overall adolescent health education.

**Costos, D., Ackerman, R., and Paradis, L. (2002)** conducted a study titled "Recollections of Menarche: Communication Between Mothers and Daughters Regarding Menstruation," published in the journal *Sex Roles*, volume 46, pages 49-59. The research examines how mothers and daughters discuss menstruation, highlighting the impact of these conversations on feelings and attitudes toward this natural event. Through personal stories and interviews, the authors emphasize that open discussions can foster a positive view of menstruation and aim to provide better support for young women navigating this life change.

**Dambhare, D. G., Wagh, S. V., & Dudhe, J. Y. (2012)** conducted a study on menarche age and menstrual cycle patterns among adolescent girls in Central India. Analyzing a sample of young females, the researchers aimed to highlight variations in menarcheal age and cycle regularity, which are vital for female reproductive health. The findings, published in the *Global Journal of Health Science*, volume 4, issue 1, page 105, offer important insights into the health and development of adolescents in the region, enhancing health education programs

**Elledge et al. (2018)** highlighted challenges in menstrual hygiene management and waste disposal in low and middle-income countries, emphasizing the need for better access to menstrual products. Garg and Anand (2015) addressed menstruation-related myths in India, advocating for educational initiatives to dispel these misconceptions. Additionally, Garikipati and Boudot (2017) examined sanitary care for women in Indian slums, noting socio-economic barriers to product access. Together, these studies emphasize the urgent need for enhanced menstrual health resources and education.

**House, S., Mahon, T., & Cavill, S. (2013)** *Menstrual hygiene matters: a resource for improving menstrual hygiene around the world.\* Reproductive Health Matters*, 21(41), 257-259. This resource emphasizes the significance of menstrual hygiene management for health and well-being. It addresses barriers such as inadequate access to sanitary products and clean water, which impact health, education, and human rights.

## **Research Methodology**

This study adopts a **Descriptive research design** to analyze the challenges faced by adolescent girls during menstruation. It focuses on understanding their level of awareness, access to menstrual hygiene products, social and emotional challenges, and the impact on daily activities such as school attendance and participation. By using a structured approach, the study aims to identify key issues and suggest solutions for better menstrual health management.

A **structured questionnaire** was designed to gather responses from adolescent girls. The questionnaire included multiple-choice and open-ended questions covering various aspects such as: awareness and knowledge about menstruation, access to menstrual hygiene products, social and emotional challenges, school attendance and participation during periods, health concerns and discomfort experienced.

The target population consists of adolescent girls from various backgrounds, ensuring a diverse range of responses. **Random Sampling technique** was employed to select the sample of respondents. **Personal Interview method** was used to collect information from selected sample. The survey was conducted anonymously to ensure honest responses.

### **Data Analysis**

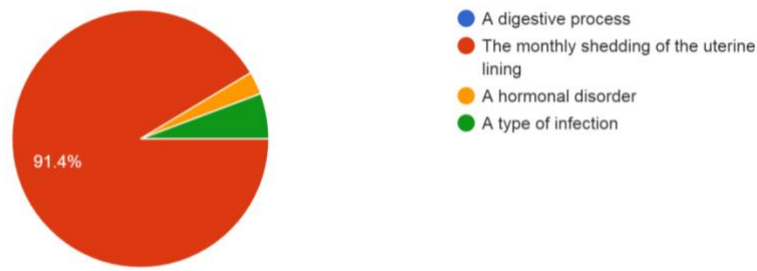
- ✓ The collected responses were categorized and analyzed statistically to identify common trends.
- ✓ A quantitative analysis was conducted using percentages and graphical representations (e.g., pie charts, bar graphs).
- ✓ Qualitative responses were grouped into themes to understand the emotional and social impact of menstruation.
- ✓ The questions are categorized as per the objective of the study mentioned above.

### **DATA ANALYSIS:**

All the 50 responses were collected and analyzed.

1. **What is menstruation:** The respondents were asked to define how they understood menstruation and the responses revealed the following as depicted in Chart 1:

Chart 1: Showing understanding the concept of menstruation

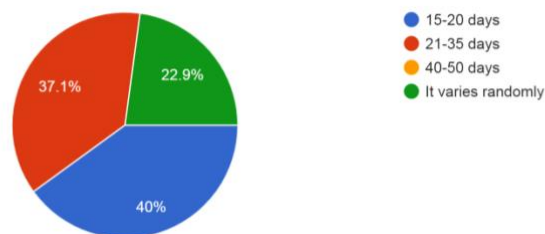


Source: Researchers complications from primary data

More than 91 percent of the respondents defined mensuration as the monthly shedding of the uterine while the remaining felt that it was related to digestive process, was hormonal disorder or a type of infection. This shows that 9 percent of the respondents were not aware about mensuration.

- 2. How long does the menstrual cycle last:** The respondents were asked to define the time period or the duration of their menstrual cycle and the responses revealed the following as depicted in Chart 2:

Chart 2: Shows the outlines the phases and duration of the menstrual cycle



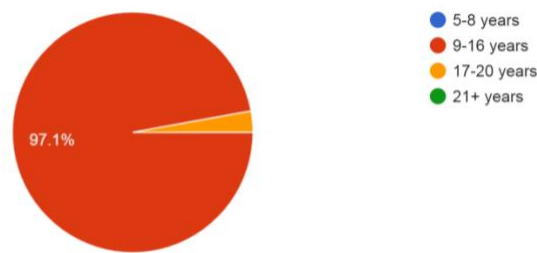
Source: Researchers complications from primary data

45.2 percent of respondents believe it lasts 15-20 days, which is shorter than the usual cycle length. 32.3 percent think it lasts 21-35 days, which aligns with the medically recognized average cycle length. 22.6 percent say it varies randomly, indicating irregular cycles

- 3. At what age do most girls experience their first period:** The respondents were asked to indicate the age at which they experienced their first menstrual cycle, and the responses are represented in Chart 3.

Chart 3: Highlights the common age range for a first menstrual cycle.



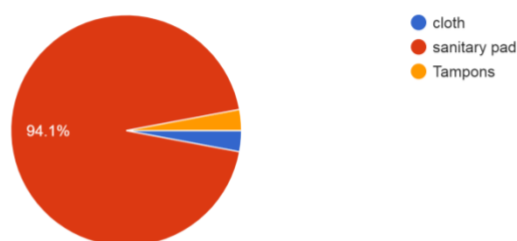


Source: Researchers complications from primary data

The chart shows that more than 97 percent of the respondents correctly identified that most girls experience their first period between 9-16 years. This aligns with the typical age range for puberty, indicating good awareness about the onset of menstruation.

4. **What do you use during your periods:** The respondents were asked about the materials they use during their menstrual cycle, and their responses are shown in Chart 4.

Chart 4: Highlights the material used by the respondents during their menstrual cycle.

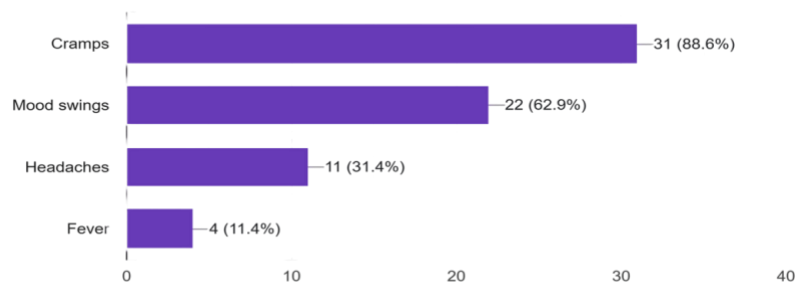


Source: Researchers complications from primary data

The chart shows that more than 94 percent of the respondents use sanitary pads during their periods, making it the most preferred option. A small percentage use cloth or tampons, indicating that alternative menstrual products are less commonly used among this group.

5. **What are some common symptoms of menstruation:** The respondents were asked the common symptoms they feel during their menstrual cycle and their responses are shown in Chart 5.

Chart 5: Displays the common symptoms they feel during menstrual cycle.

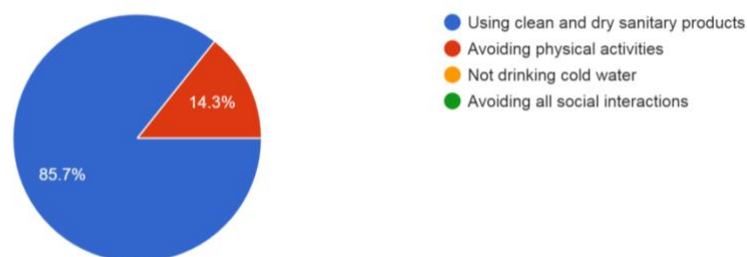


Source: Researchers complications from primary data

A survey of responses shows cramps 88.6 percent as the most common menstrual symptom, followed by mood swings 62.9 percent, headaches 31.4 percent, and fever 11.4 percent.

**6. Which of the following is a healthy practice during menstruation:** The respondents were asked about the healthy habits they maintain during their menstrual cycle, and their responses are displayed in Chart 6.

Chart 6: Highlight the healthy practices followed by the respondents during the menstrual cycle.

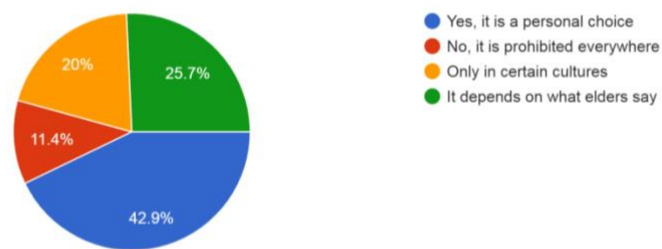


Source: Researchers complications from primary data

The chart shows that more than 85 percent of the respondents correctly identified using clean and dry sanitary products as a healthy practice during menstruation. However, more than 14 percent chose avoiding physical activities, which is a misconception, as moderate exercise can actually help relieve menstrual discomfort. This highlights the need for better awareness of menstrual health practices.

**7. Is it safe for women to enter religious places during menstruation:** The respondents were asked whether they visit religious places during their menstrual cycle, and their responses are shown in Chart 7.

Chart 7: Displays responders visiting religious places during their menstrual cycle.

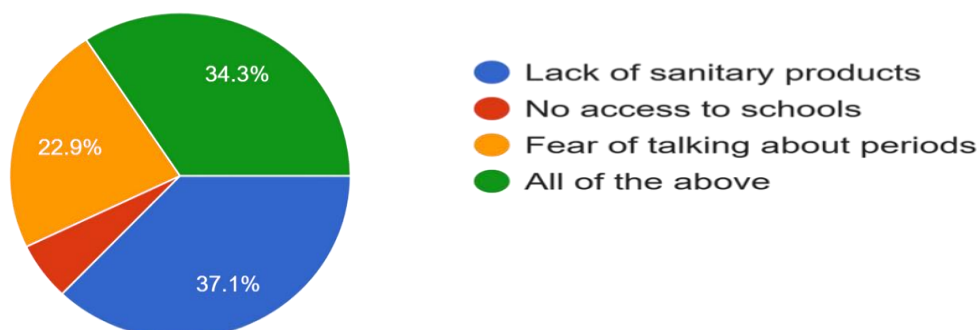


Source: Researchers complications from primary data

The majority 42.9 percent believe it is a personal choice, while 25.7 percent think elders' opinions matter. About 20 percent say it is accepted only in certain cultures, and 11.4 percent believe it is prohibited everywhere. The overall trend favors flexibility and cultural influence over strict prohibition.

**8. What is the biggest challenge faced by menstruating girls in rural areas:**The respondents were asked about the challengess they faced during menstrual cycle.. and their responses are shown in Chart 8.

Chart 8: Displays the challenges girls faced during menstrual cycle



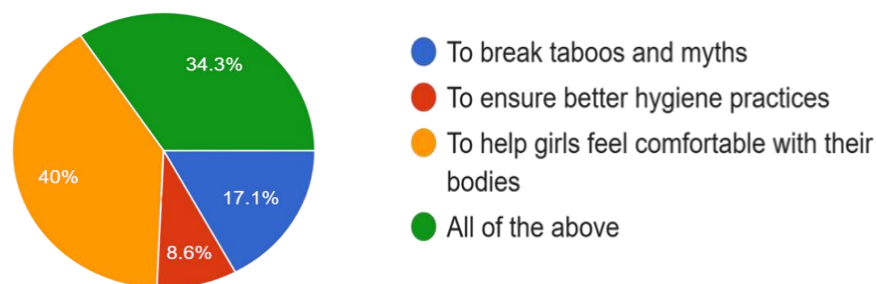
Source: Researchers complications from primary data.



A survey of responses shows 37.1 percent struggle with sanitary product scarcity, 34.3 percent face multiple challenges, 22.9 percent fear discussing periods, and 5.7 percent lack school access.

**9. Why is menstrual education important:**The respondents were asked about why menstrual education is important?. and their responses are shown in Chart 9.

Chart 9: Displays the importance of menstrual education.



Source: Researchers complications from primary data.

A survey of responses shows 40 percent value menstrual education for body confidence, 34.3 percent for all aspects, 17.1 percent for breaking taboos, and 8.6 percent for hygiene.

## **Conclusion**

This research highlights the various challenges faced by adolescent girls during menstruation, including lack of awareness, limited access to menstrual hygiene products, social stigma, and health-related discomfort. Through the collected responses and visual data representation, the study provides valuable insights into the need for better education, resources, and support systems for menstrual health and hygiene.

### **The study includes:**

*Need for Awareness Programs:* Many girls lack proper knowledge about menstruation before their first period, leading to fear and misconceptions. Schools and communities should implement comprehensive menstrual health education.

*Improved Access to Menstrual Hygiene Products:* Ensuring that all girls have access to affordable and sustainable menstrual products can significantly reduce absenteeism and discomfort during periods.

*Breaking Social Stigma:* The study indicates that menstruation is still considered a taboo topic in many households, causing embarrassment and emotional distress for adolescent girls. Open discussions should be encouraged to normalize menstrual health.

*Health and Hygiene Practices:* Many girls experience menstrual pain and infections due to a lack of proper hygiene knowledge. Awareness campaigns should focus on teaching.

### **Suggestions:**

Addressing **menstrual health** requires coordinated efforts from various stakeholders. Key recommendations include fostering awareness and open discussions to boost girls' confidence, educating mothers on menstrual hygiene, and collaborating with health clinics for better care. All schools, regardless of type, should conduct pre-puberty awareness sessions.

**Schools** should ensure clean toilets with water and disposal facilities to encourage safe hygiene practices. Health camps must focus on menstrual pain and related issues, while government programs should include urban adolescent girls, not just rural areas.

**Sensitizing shopkeepers** to create a non-intrusive environment for purchasing sanitary products is crucial. Better waste management, including community trash bins, is essential to avoid embarrassment for girls.

**Engaging male family members** can help create a supportive environment, and gender-sensitivity training for school staff will enable them to address menstruation-related challenges effectively. Community-wide efforts can dispel taboos and ensure a dignified menstrual experience for all.

### **References**

- ❖ McLaren, M. A., & Padhee, M. (2021). A Sexual and Reproductive Health Rights Approach to Menstruation. *Gender & Development*, 29(1),

Available at: <https://policy-practice.oxfam.org/resources/a-sexual-and-reproductive-health-rights-approach-to-menstruation-621169/>

- ❖ A sexual and reproductive health rights approach to menstruation

Available at: <https://www.worldbank.org/en/topic/water/brief/menstrual-health-and-hygiene>

- ❖ World Women Health

Available at: <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-024-02894-7>

GOOGLE FORM LINK: <https://forms.gle/U4aFQQ4855C6Z8yX9>



# Mukhyamantri Majhi Ladki Bahin Yojana: A Step Towards Inclusive Growth, Women's Empowerment, and Sustainable Development in India's Tech-Driven Economy

“Sahil Desai & Noopur Gurav”

TYBMS students of JES College of Commerce Science and Information Technology,  
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## Abstract:

The *Mukhyamantri Majhi Ladki Bahin Yojana* (MMLB) is a financial assistance program launched by the Maharashtra government to empower women by providing ₹1,500 per month. The scheme targets women aged 21-65 across urban and rural Maharashtra, promoting financial independence and enhancing decision-making power. This study examines its alignment with Sustainable Development Goals (SDGs), particularly gender equality and economic growth. Findings suggest the program has positively impacted women's financial security, education, and healthcare access, though challenges in sustainability and rural outreach remain. Overall, MMLB plays a vital role in fostering inclusive growth and women's empowerment.

## 1. Introduction:

### **Women's Empowerment and Sustainable Development: A Pathway to Inclusive Growth :**

**Inclusive growth** ensures equal opportunities for all, reducing income disparities and promoting broad economic participation. It enhances access to education, healthcare, and financial resources, fostering social and economic equity. By supporting financial inclusion and gender equality, it strengthens employment and community resilience. This approach drives sustainable development and improves overall quality of life.

**Women's empowerment** is a crucial element in fostering inclusive development, social equity, and economic progress. It refers to the process by which women gain the ability to make strategic life choices, develop a sense of self-worth, and actively participate in shaping social change. Empowerment encompasses various dimensions, including economic independence, access to education, political participation, decision-making power, and improved healthcare. Ensuring women's empowerment is essential for achieving gender equality and fostering a more equitable society.

**In India**, gender disparity remains a significant challenge, with women often facing limited access to education, healthcare, employment opportunities, and financial resources. According to the latest Periodic Labour Force Survey (PLFS), only **32.8% of working-age women** (15 years and above) were part of the labor force in 2021-22. Furthermore, **81.8% of women's employment** in India remains concentrated in the informal sector, limiting access to stable income and social security. The **Global Gender Gap Report (2021)** also highlights that women in India, on average, earn only **21% of men's income**, reinforcing economic inequality. Addressing these disparities through targeted interventions is crucial for sustainable and inclusive growth.

The **Sustainable Development Goals (SDGs)**, particularly **SDG 5 (Gender Equality)**, emphasize the need to empower women by ensuring equal access to opportunities and rights. Additionally, **SDG 1 (No Poverty)** and **SDG 8 (Decent Work and Economic Growth)** recognize that empowering women economically can reduce poverty and accelerate economic development. Other related SDGs, such as **SDG 3 (Good Health and Well-being)** and **SDG 4 (Quality Education)**, also highlight the role of women's empowerment in creating a healthier, educated, and more resilient society. Ensuring gender-responsive policies and financial inclusion will enable women to contribute more effectively to economic growth and sustainable development.

### **Mukhyamantri Majhi Ladki Bahin Yojana (MMLB)**

The **Ladki Bahin Yojana** (Mazi Ladki Bahin Yojana) is a financial assistance scheme launched by the Maharashtra government to support women's economic empowerment and well-being. Announced in the state budget on June 18, 2024, the scheme provides eligible women aged 21 to 65 years with a monthly financial aid of ₹1,500, directly deposited into their bank accounts. With a budget allocation of ₹46,000 crore, the initiative aims to promote economic independence, reduce financial disparities, and enhance women's overall quality of life. The scheme is inclusive, covering single, married, widowed, and economically disadvantaged women across urban and rural Maharashtra. Women can apply for the scheme online via the government portal or offline through Anganwadi centers, gram panchayats, and municipal offices. By ensuring direct benefit transfers, the Ladki Bahin Yojana seeks to create financial security, improve decision-making power within households, and foster self-reliance among women.

Additionally, it aligns with sustainable development goals (SDGs) by promoting gender equality, poverty reduction, and economic growth through targeted financial inclusion. Inspired by similar programs in other states, this initiative is a significant step toward women's empowerment and long-term socio-economic transformation in Maharashtra.

### **Benefits of Ladki Bahin Yojana**

The Ladki Bahin Yojana aims to provide financial assistance and empower women in Maharashtra by offering them ₹1,500 per month, directly deposited into their bank accounts. This scheme promotes economic independence, enabling women to manage personal expenses, invest in small businesses, or support their families. It encourages financial stability and self-reliance, particularly benefiting single, married, widowed, and economically disadvantaged women. The initiative ensures broad accessibility, covering both rural and urban areas across the state. By supporting vulnerable women, the scheme enhances their financial security, promotes empowerment, and contributes to their overall well-being and socio-economic upliftment.

## 2. Objectives of the study :

1. To analyze the **Mukhyamantri Majhi Ladki Bahin Yojana** and its role in promoting women's empowerment in India.
2. To examine the scheme's impact on women's financial independence, decision-making, and access to healthcare.
3. To assess how the scheme contributes to gender equality and economic inclusion, particularly in urban centers like Mumbai.
4. To evaluate the scheme's alignment with **Sustainable Development Goals (SDGs)** related to gender equality, economic growth, and reduced inequalities.
5. To provide insights into the long-term socio-economic benefits of the scheme in fostering women's empowerment and overall development.

## 3. Review of literature:

Present in their study an analysis of women's empowerment in India using data from the NFHS-2 across 26 states with 1999 boundaries. It aims to assess the extent of women's empowerment relative to men and track changes over time. The study evaluates empowerment through various indicators, including evidence, sources, and settings. It highlights the persistent disempowerment of women both absolutely and relatively, despite efforts for improvement. Additionally, the paper examines the significant variation in women's empowerment levels across different states and indicators, providing insights to inform future policies and initiatives to enhance gender equality and women's social status.

Ankush and Prasanna (2024) research on Ladki Bahin Yojana, launched by Maharashtra Chief Minister Shri Eknath Shinde on July 1, 2024, aims to empower poor and destitute women aged 21-65 years by providing ₹1,500 per month in financial aid. This study examines its impact on rural communities and women's development, assessing its long-term value. A mixed-method research approach is used, combining primary data from interviews and observations with secondary data from newspapers, books, and government sources. A sample of 30 women, selected through simple random sampling, helps analyse the scheme's effectiveness in fostering financial independence and self-reliance among rural women.

**Arpita and Sharmila (2024)** presents in their analysis ladki bahini yojana and Comparison with Similar Schemes

### Similar State-Level Schemes in India:

Scheme	State	Monthly Assistance	Eligibility	Objective
<b>Ladki Bahini Yojana</b>	Maharashtra	₹1,500	Women (21-65 years), income below ₹2.5 lakh	Women's financial independence & empowerment
<b>Gruha Lakshmi Yojana</b>	Karnataka	₹2,000	Female head of the household	Financial support for housewives & women's well-being
<b>Mukhyamantri Mahila Samman Yojana</b>	Rajasthan	₹1,000	Women above 18 years	Social security & economic assistance
<b>Aamadani Badhao Yojana</b>	Chhattisgarh	₹1,000	Women engaged in informal work	Economic upliftment of rural women
<b>Delhi Mahila Samman Yojana</b>	Delhi	₹1,000	All adult women	Women's financial support & security

Dr. Vishal and Dr. Rani (2025) This research examines the socio-economic impact of the "Chief Minister Majhi Ladki Baheen" scheme on women in Maharashtra. A survey of beneficiaries assessed key factors such as employment, income generation, entrepreneurship, financial planning, health awareness, and social mobility. Findings show a positive impact on confidence, education access, and decision-making, along with improved skills and community participation. Challenges include immediate financial gains and credit access. However, overall satisfaction remains high. Recommendations are provided to enhance the scheme's effectiveness and sustainability. This study offers valuable insights for policymakers to improve government-led welfare programs for women's empowerment and socio-economic development.



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

This study employs a **Descriptive and Exploratory** research design to examine whether the *Ladki Behain Yojana* (LBY) contributes to women's empowerment. To gather data, a **questionnaire** was used, targeting 50 women who had enrolled in the LBY scheme. The questionnaire addressed key aspects such as the duration of enrollment, the utilization of financial benefits, and their impact on financial independence, personal empowerment, decision-making, and gender equality.

Additionally, **Personal Interviews** were conducted with the respondents to gain in-depth insights. **Random and Convenience Sampling** methods were used to select the sample of 50 participants. For data analysis, **Tabulation and Graphical Techniques** were employed to present the results effectively. Primary data was collected from the respondents, while secondary data was sourced from online articles and existing literature relevant to the study.

The study tests the following hypotheses:

- **H0:** The *Ladki Behain Yojana* has not brought any change in women's empowerment.
- **H1:** The *Ladki Behain Yojana* has contributed to women's empowerment.

## **5. Data Analysis and Interpretation:**

An attempt was made by researchers to collect responses from respondents who are enrolled in Mukhyamantri Majhi Ladki Bahin Yojana

Table1: Showing the age group of respondents

Age	%
21-30	40%
31-40	16%
41-50	34%
51-60	8%
61-70	2%
Total	100

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows a predominantly younger demographic, with 40% of respondents aged 21-30 and 34% aged 41-50. Smaller percentages are found in the 31-40 (16%), 51-60 (8%), and 61-70 (2%) age groups. This indicates a strong representation of early to mid-career individuals, with fewer participants from older age groups.

Table2: Showing respondents who are currently enrolled in scheme

Enrolled in Scheme	%
Yes	100%
No	-
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: All respondents (100%) are currently enrolled in SEAM, with no one reporting otherwise. This indicates full participation in the program among the surveyed group.

Table3: Showing martial states of the respondents

Marital Status	%
Married	45%
Single	45%
Divorces	10%
Widow	-
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows an even split between married (45%) and single (45%) respondents, with 10% divorced and none widowed. This reflects a diverse marital status among the group.

Table4: Showing education status of the respondents

Education Status	%
Illiterate	6%
Primary	4%
secondary	26%
Graduate	56%
Postgraduate	8%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey indicates that most respondents are graduates (56%), followed by 26% with secondary education. A smaller percentage holds postgraduate degrees (8%), while 6% are illiterate and 4% have only primary education. This reflects a relatively high level of education within the surveyed group, with a significant majority having completed at least secondary or higher education.

Table 5: Showing occupation status of the respondents

Occupation Status	%
Homemaker	26%
Employed	40%
Self employed	12%
Unemployment	22%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows that 40% of respondents are employed, making it the largest group, followed by 26% who are homemakers. Additionally, 22% are unemployed, and 12% are self-employed. This suggests a diverse range of occupation statuses, with a significant portion engaged in formal employment, while others are homemakers, self-employed, or currently unemployed.

Table 6: Showing Awareness of Ladki Behain Yojan of the respondents

Source of Awareness	%
Government	24%
Media	24%
SocialMedia	32%
Friend/Family	20%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey reveals that 32% of respondents learned about the "Ladki Behain Yojana" through social media, making it the most common source of awareness. Government and media sources each account for 24%, while 20% are informed by friends or family. This highlights the significant role of social media in spreading awareness, alongside traditional channels like government and media.

Table 7: Showing how long respondents have been receiving benefit under Ladki Behain Yojana

Benefit received under Ladki Bhani Yojana	%
Less than 6months	57%
6months-1year	19%
More than 1year	24%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows that the majority of respondents (57%) have been receiving benefits under the "Ladki Behain Yojana" for less than 6 months. A smaller portion, 24%, have been receiving benefits for more than a year, and 19% for 6 months to 1 year. This suggests that most beneficiaries are relatively new to the program.

Table 8: enrollment process was easy or tedious

Enrolment Process	%
Yes	95%
No	5%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey reveals that 95% of respondents found the enrolment process easy, while only 5% found it tedious. This suggests that the majority of participants had a positive experience with the process, indicating efficiency and ease of access. The small percentage who found it tedious may highlight areas for potential improvement in the enrolment procedure.

Table 9: improvement in financial independence

Improvement in Financial Independence	%
Yes	91%
No	9%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows that 91% of respondents experienced improved financial independence, indicating the program's success. However, 9% saw no improvement, suggesting that a small portion of individuals may not have benefited as much.

Table 10: changes after receiving the benefits of ladki bahin yojana

Changes After Receiving Benefits	%
Increased self-confidence	54%
Better access to healthcare/education	30%
Greater respect in family or community	6%
None of above	10%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows that 54% of respondents experienced increased self-confidence after receiving the benefits of the "Ladki Behain Yojana," while 30% reported better access to healthcare and education. A smaller percentage (6%) experienced greater respect in their family or community, and 10% reported no noticeable changes. Overall, the program has had a positive impact on participants' lives

Table11: Have you seen any improvement in gender equality in your household or community because of this scheme?

Improvement in Gender Equality	%
Yes	84%
No	16%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows that 84% of respondents have noticed an improvement in gender equality in their household or community due to the scheme, indicating a significant positive impact. However, 16% of respondents reported no improvement, suggesting that while the program has been successful for most, there are still some individuals who have not experienced noticeable changes.



Table12: impact of ladki bahin yojana

Impact of Ladki Behain Yojana	%
Excellent	51%
Good	30%
Average	19%
Poor	1%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey reveals that 51% of respondents rated the impact of the "Ladki Behain Yojana" as excellent, with 30% considering it good. 19% viewed the impact as average, while only 1% felt it was poor. This suggests that the scheme has had a largely positive effect, with most participants perceiving significant benefits from the program.

Table13: Showing the were of assistance got under ladki behind yojana

Showing use of funds got by respordents under Ladki Behain Yojana	%
Household Expense	11%
Nutritional Diet	2%
Children education	8%
Medical needs	9%
savings	70.%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows that 70% of respondents received assistance for savings under the "Ladki Behain Yojana," making it the most common form of support. Smaller portions received help for household expenses (11%), medical needs (9%), children's education (8%), and nutritional (2%). This highlights that financial support for savings was the primary benefit provided by the program.

Table14: showing improvement in decision making power of respondents

Independent Decision-Making Power	%
Yes	70%
No	25%
Can not say	5%
Total	100%

\*Source: Researchers compilation from Primary data

Interpretation: The survey shows that 70% of respondents believe women have independent decision-making power, reflecting a positive shift. However, 25% disagreed, and 5% were unsure, indicating some uncertainty or resistance regarding gender equality in decision-making.

## **5. Conclusion**

The *Mukhyamantri Majhi Ladki Bahin Yojana* has had a largely positive impact on its beneficiaries, as evidenced by the survey results. The program has successfully reached a diverse group of participants, with a predominant representation of younger and educated individuals. Most respondents reported improvements in financial independence, self-confidence, and access to essential services like healthcare and education. A significant portion also experienced increased gender equality within their households and communities. Additionally, the majority found the enrollment process easy, further highlighting the program's accessibility. While the program's impact has been largely favorable, there remains a small segment of individuals who did not experience the full benefits, pointing to areas where future improvements could be made. Overall, the scheme has contributed significantly to enhancing the lives of its participants, particularly in terms of financial security and empowerment.

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# **Employment Struggles in Dharavi: Understanding from Early Adulthood to Middle Age**

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## *Introduction*

Dharavi history traces back to the 1880s when the area was first developed. Dharavi history in Mumbai is a key chapter in the city's evolution, with the slum emerging as a product of colonial policies and rapid industrialization. The exact origin of "Dharavi" is not definitively established. Dharavi, one of Asia's largest informal settlements, has played a significant role in Mumbai's economic and social landscape. Established during the late 19th century, it has evolved from a neglected marshland into a densely populated hub of small-scale industries, skilled labour. Despite its vibrant economic activities, Dharavi continues to struggle with issues such as inadequate infrastructure, poverty, and unemployment. Adult unemployment, in particular, remains a growing concern, affecting the aspirations and livelihoods of many adult residents. This study explores the challenges of employment struggles in Dharavi, focusing on the journey from early adulthood to middle age, shedding light on the socio-economic barriers and potential opportunities for its workforce.

## Demographics and Socio-Economic Profile:

According to the Census of India 2011, Mumbai District, which encompasses Dharavi, exhibits a high population density with significant socio-economic challenges. The area is characterized by a diverse population engaged predominantly in informal economic activities.

## *Abstract*

This study examines the issue of unemployment among adults in Dharavi, focusing on its causes, challenges, and impact. Through surveys and secondary research, findings reveal that young adults, especially women, face high unemployment due to limited opportunities and

lack of skills. The study highlights the need for skill development programs, better education, and job creation to address this issue.

### *Review of Literature:*

A literature review is a crucial step in the research process. It provides a summary of existing knowledge on a specific topic. The primary goal of a literature review is to inform readers about previous studies, theories, and ideas that have already been established. By reviewing existing work, researchers gain insights that help shape their study. Although conducting a literature review requires effort and time, it is a vital component of a successful research process.

Several scholars and organizations have defined that adult unemployment. The International Labour Organization (ILO) defines adult unemployment as the situation where Respondents who are able, and willing to work do not have a job and are Actively seeking employment. The World Bank (2021) reported that adult unemployment is a major global issue, particularly in developing countries, where economic instability and lack of job opportunities contribute to rising unemployment rates. In "Social Problems in India" by Ram Ahuja, unemployment is discussed as a pressing social issue affecting millions in the country. It is about unemployment, including rapid population growth.

In "Sociology" by C.N. Shankar Rao, unemployment is analysed from a sociological perspective, linking it to economic structures, technological advancements, and globalization.

Conclusion is that adult unemployment is a major issue in Dharavi, with most unemployed people struggling to find jobs, possibly due to lack of experience. To solve this problem, more job opportunities, and skill training programs, and better education are needed.

### *Research Methodology*

Research methodology is a systematic approach used to conduct a study, ensuring the collection, analysis, and interpretation of data in a structured manner. It outlines the methods, techniques, and procedures used to investigate the research problem effectively. The selection of an appropriate research methodology is crucial as it determines the reliability and validity of the study's findings.

Objective:

To find out the problem of unemployment among the adults of Dharavi.

Hypothesis

Adults of Dharavi are facing the problem of unemployment.

Sample selection



Researchers have selected 50 samples from Dharavi. Researchers will select the Objective method and random sampling method for research. Age, education, income, marital Status, is the variable to be considered and satisfied by random sampling.

#### Source of data collection

Primary data surveys and questionnaires, interviews, observation. Secondary data government reports and Census reports journals, books, newspapers, and online websites.

#### Classification and analysis of data

Data information collected by interview schedule will be presented in table form (tabulation) and then will be using Diagrams and Graphs.

### *Personal and Family Related Information of Dharavi Residents*

#### adult of Dharavi

Personal and family information of unemployed adults of Dharavi consists of information such as the unemployed adults; age, gender, religion, marital status, income, family type and many others. Majorly everything here is related about the personal and family life of adults. Personal and family information has a deep impact on the Respondents who are unemployed.

#### 1.Age:

Age	Frequency	Percentage
20-30	42	84%
30-40	5	10%
40-50	2	4%
50 or above	1	2%
Total	50	100

42(84%) of the age group of the adults who are men and women who are unemployed or employed. whereas 1(2%) of the members who are unemployed and 5(10%) are the adults who are of 30-40 age and 2(4%) of them who are of 40-50 age.

The data shows that adult unemployment is a major concern in Dharavi, with 84% of Respondents aged 20-30 indicating the challenge in finding jobs.

#### 2. Gender:

Gender	Frequency	Percentage
Male	13	26%
Female	37	74%
Total	50	100%

37(74%) are female, while the remaining are the male. As male are 13(26%). many of the females are unemployed as they are not getting jobs. The ratio of the female is more as per the male.

### 3. Religion:

Religion	Frequency	Percentage
Hindu	11	22%
Islam	37	74%
Christian	0	0%
Buddhist	2	4%
Total	50	100%

The study aimed to examine the religious composition of adults in Dharavi, revealing that the majority belong to Islam, accounting for 37 out of 50 respondents (74%). Hindu adults represent 22% (11 Respondents), while a small proportion of 4% (2 Respondents) follow Buddhism. Notably, there were no Christian respondents in the surveyed group.

### 4. Caste:

Caste	Frequency	Percentage
Open	42	84%
SC	5	10%
ST	3	6%
OBC	0	0%
Total	50	100%

42(84%) belong to the open category, the SC is of 5(10%) and ST is of 3(6%) and there is no one from OBC as this data highlights the social backgrounds of unemployed adults and suggest that caste can play an important role in shaping access to employment opportunities.

### 5. Literacy rate:

Literacy Rate	Frequency	Percentage
Yes	50	100%
No	0	0%
Total	50	100%

50(100%) of the study Educational qualification of Dharavi Adults reveals that all 50 respondents (100%) are literate. This indicates that despite the challenges they face, they are qualified. The adults are educated more men and women. The skills development and vocational training should be available for adults.

#### 6. Qualification:

Qualification?	Frequency	Percentage
Primary	1	2%
Secondary	7	14%
Higher Secondary	13	26%
Graduate	25	50%
Post Graduate	4	8%
Total	50	100%

Majority of the adults of Dharavi who are educated that is around 25(50%) as they are graduated as the people are between 13(26%) have done Higher secondary and from the secondary are 7(14%). As the 50 people who are not more educated or done primary is around 1(2%) The Respondents who have done post graduate are 4(8%). Majority of 25(50%) have completed their graduation.

#### 7. Marital Status:

Marital Status	Frequency	Percentage
Married	10	20%
Unmarried	39	78%
Divorced	0	0%
Widowed	1	2%
Total	50	100%

Majority of 39(78%) the respondents are unmarried. And the Respondents who are married are around 10(20%). There are no respondents who are divorced. There is 1 woman (2%) among the adults in the unemployment who are widows. There are no Respondents who are widowed.

#### 8. Family Structure:

Family Structure	Frequency	Percentage
Joint	5	10%
Nuclear	45	90%
Total	50	100%

Majority of the adults 45(90%) adults live in a nuclear family. Whereas 5(10%) of the adults live in a joint family. The percentage of adults is higher in the nuclear family.

#### 9. Number of family member:

Number of family members?	Frequency	Percentage
2-4	5	10%
4-6	32	64%
6-8	13	26%
8-10	0	0%
More than 10	0	0%
Total	50	100%

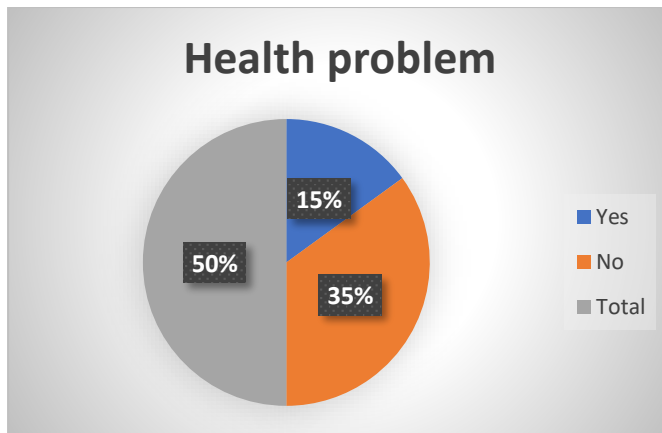
Majority of the family members, for 32(64%) of the adults are having 4- 6 members. Whereas the 13(26%) of the adults are having 6-8 members of the family. The lowest percentage is 5(10%) of them who have 2-4 members in the family. There are no 6-8 and 8-10 members in the family.

#### *The problem faced by unemployed adults in Dharavi*

The men and the women who are unemployed have the problem of unemployment. As there are various reasons because of that they are not getting the jobs. As some are studying or finding jobs many don't have the opportunities also. This creates a lot of problems for them.

#### 10. Health problem

Health problem	Frequency	Percentage
Yes	15	30%
No	35	70%
Total	50	100%

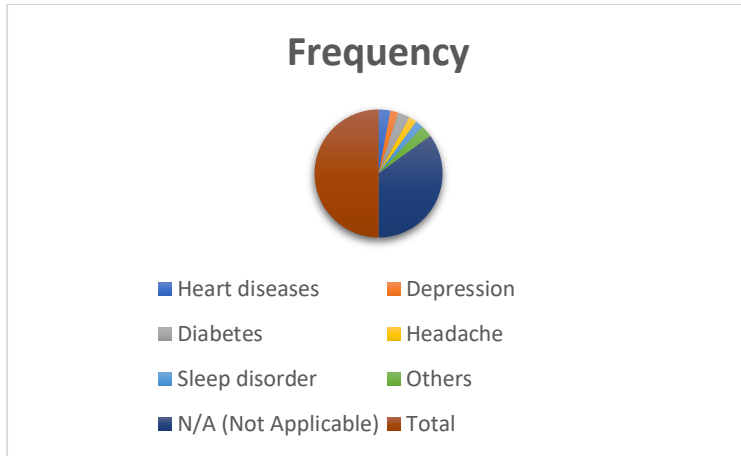


Majorly the adult 35(70%) of them have no problem but the 15(30%) of the adults have a problem. As they have some or the problem.

The above table shows that the number of the people is around 15(30%) of the adults who have a problem as there is a need to help them. And the people who don't have the problem are 35(70%) of the adults who have good health.

11. If yes, then what type of the health issues

If yes, then what type of health issues	Frequency	Percentage
Heart diseases	3	6%
Depression	2	4%
Diabetes	3	6%
Headache	2	4%
Sleep disorder	2	4%
Others	3	6%
N/A (Not Applicable)	35	70%
Total	50	100%



Majority 35(70%) of the adults around have no issues. Adults have problems with Diabetes that is 3(6%) and headache 2(4%). The problem of depression in the respondents is 2(4%) and Heart Diseases 3(6%), Sleep disorder 2(4%) and the others have different diseases. The above table is about how most people have no health issues.

#### 12. The working members of family:

The working members of family	Frequency	Percentage
1-2	39	78%
2-3	9	18%
3-4	2	4%
4-5	0	0%
5-6	0	0%
More than 6	0	0%
Total	50	100%

Majority 39(78%) of the family members are around 1-2 people who are working and their family members have a job. but 9(18%) of them are working, and 2(4%) of the adults who have family members. As there was no respondent after that because there were low working people.

#### 13. Do you have your own house?

Do you have your own house?	Frequency	Percentage
Yes	41	82%
No	9	18%
Total	50	100%



Majority of 41(82%) of the adults have their own house and they live with their family members. Some of them have a rental house or live with their friends, which is around 9(18%) of the adults.

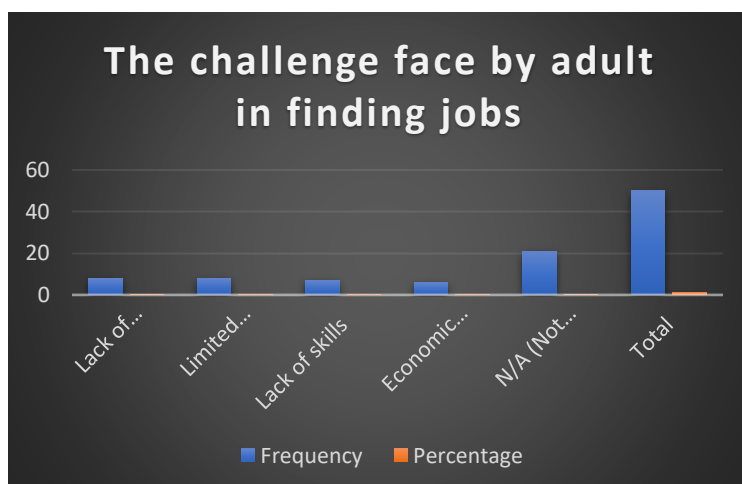
14. Are you facing any challenge in finding a job?

Are you facing any challenge in finding a job?	Frequency	Percentage
Yes	29	58%
No	21	42%
Total	50	100%

Majority of them, around 29(58%) are facing challenges in finding a job. The adults who have no problems are 21(42%). As the adults face the problem of finding jobs, the respondents have been given their answers on it. Many of them face a lot of challenges in finding a job.

15. If yes, what are the challenges:

If yes, then what are the challenges	Frequency	Percentage
Lack of opportunity	8	16%
Limited qualification	8	16%
Lack of skills	7	14%
Economic problems	6	12%
N/A (Not Applicable)	21	42%
Total	50	100%



Mostly the adults of 21(42%) are not facing any challenges in finding a job. As 2% of them don't wanted to tell they problem of 46%. The adults who are facing lack of opportunity 8(16%) As they are facing limited qualification 8(16%) And lack of skills 7(14%). There are economic problems 6(12%).

16. Do you think the government has done enough efforts to reduce unemployment?

Do you think the government has done enough efforts to reduce unemployment?	Frequency	Percentage
Yes	16	32%
No	34	68%
Total	50	100%

Majority of 34(68%) have said no because they think that the government is not doing enough to reduce unemployment as people are facing a lot of difficulties to find a job for themselves. The adults 16(32%) have said yes because they feel that the government has done enough to reduce unemployment.

17. Do you wish to start your own business

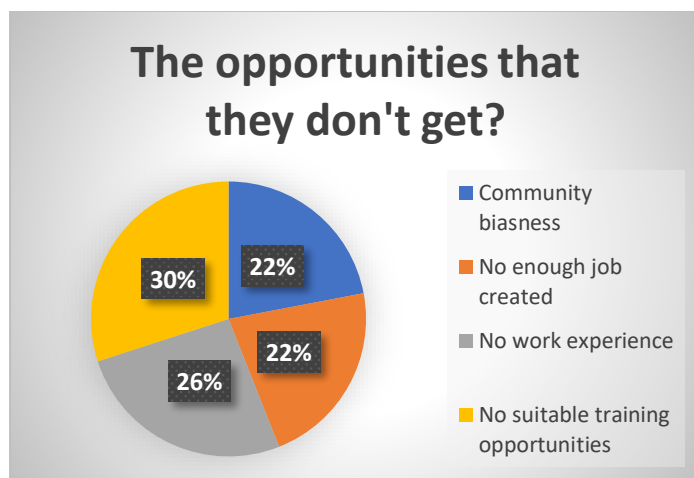
Do you wish to start your own business?	Frequency	Percentage
Yes	37	74%
No	13	26%
Total	50	100%

The above table shows that 37(74%) of the adults want to start their own business and 13(26%) of the respondents have said no. As the adults who are unemployed want to start their own business. They should get the opportunity for work.

18. What are the opportunities that you don't get

What are the opportunities that you don't get?	Frequency	Percentage
Community biasness	11	22%
No enough job created	11	22%
No work experience	13	26%
No suitable training opportunities	15	30%

Total	50	100%
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Above as the table shows that 15(30%) of the adults have no suitable training, the 13(26%) of the adults have no work experience and 11(22%) of them are those who have not enough jobs created. As the adults of 11(22%) are facing community biasness.

### *Findings*

- Majority 42(84%) of the age group of 20-30 the adults who are men and women who are unemployed or employed.
- Majority 37(74%) are female, while the remaining 13(26%) are male.
- Majority 42(84%) belong to the open category, the SC is of 5(10%) and ST is of 3(6%).
- All the respondent is literate.
- Majority of 25(50%) are graduated.
- Majority 39(78%) the respondents are unmarried.
- Majority of 45(90%) live in nuclear family.
- Majority of the family members, for 32(64%) of the adults are having 4- 6 members.
- Majorly the adult 35(70%) of them have no problem of the adult. But the 15(30%) of the adults have a problem. As they have some or the problem.
- Majority 39(78%) are having 1-2 family members working.
- Majority of 41(82%) of the adults have their own house.
- Majority of 29(58%) are facing challenge in finding job.
- Majority of 34(68%) have said no because they think that the government is not doing enough to reduce unemployment
- Majority of 37(74%) of the adults want to start their own business.

### *Conclusion:*

Unemployment in Dharavi is a serious issue that affects many adult people. It not only makes it difficult for them to earn a living but also impacts their mental well-being and future opportunities. Through this research, we found that lack of education, skills, and job opportunities are the main reasons for adult unemployment. Many adults struggle to find stable jobs, leading to financial difficulties and frustration. Providing better education, skill development programs, and job opportunities can help reduce unemployment.

If adult people are given the right resources, they can become self-sufficient and contribute positively to society. Community and government support is also essential in guiding and motivating unemployed adults toward a better future. Addressing this issue will not only benefit Respondents but also contribute to the overall economic and social development of the area.

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- e) Sociology - C.N. Shankar Rao book

# Embracing Industry 5.0: Transforming Investment Patterns across generations in India's Evolving Economy

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## **1. Abstract:**

*The transition to Industry 5.0 from Industry 4.0 has directly influenced investment planning among generations unfolding in the emerging economy of India. Economic decision-making involving digitalization, artificial intelligence, and sustainability have become central while the life cycle of economic decisions among generations and investor asset portfolios vary in terms of risk aversion, investment strategy, and asset allocation. This paper examines the extensive array of investment instruments, including mutual funds, equities, systematic investment plans (SIPs), real estate, cryptocurrencies and even ESG investments, and how various generations—the Silent Generation to Generation Z—react to dealing with them. Employing descriptive and exploratory research techniques, primary data was gathered through questionnaires from 790 participants, in conjunction with secondary data from scholarly studies. Findings suggest Millennials and Generation Z favor high-risk, technology-dependent investments (such as cryptocurrencies and ESG funds), while other generations invest in traditional investments (such as fixed deposits, bonds, and blue-chip shares). The research further identifies increasing pressure from financial advisers, robo-advisory solutions, and online investing technology in terms of influencing investments being made these days. The current research provides critical evidence of the investment behavior generation gap, for which financial education and technological development are necessary in order to fill the gap and optimize the usage of investment schemes in the era of Industry 5.0.*

## **1.1 Conceptual Framework:**

**Investment behavior:** The patterns and activities that people or groups undertake when they spread their money across a range of investment products.

**Investment Preferences:** The investor actions that are taken based on variables, such as risk appetite, expected rate of return and an investor's personal financial objectives.

**Decision-Making:** The decision-making process utilized by people or organizations for evaluating investment opportunities and entering into their financial decisions procedure.

**Generational Differences:** The variations in investment behaviors and risk tolerance among different generations, influenced by economic conditions and technological advancements.

**Risk Tolerance:** The level of uncertainty or potential financial loss an investor is willing to accept in exchange for higher returns.

**Investment Management:** The professional management of assets and portfolios to maximize returns while minimizing risks.

## **2. Introduction:**

In the constantly changing world of industrial evolution, the transition from Industry 1.0 to Industry 5.0 is a major stride in global economic growth. Industry 1.0, characterized by mechanization and steam power, led to mass production in Industry 2.0, automation in Industry 3.0, and the introduction of smart technologies in Industry 4.0. The Industry 5.0 is a paradigm revolution, human intelligence combined with advanced automation to build a more environmentally friendly, efficient, personalized industrial eco-system. About one of the fastest-growing economies, India has experienced huge technical developments that have altered not only the economic structure itself, but also the forms of investment it has traditionally used to. Along with the shift toward Industry 5.0, investment opportunities are changing, with sustainability, artificial intelligence, digitalization, and human factors taking precedence, thereby becoming key elements of the future. This study examines the impact of the transition from Industry 5.0 to the investment patterns of generations in the developing economy of India.

### **2.1 Different Investment Opportunities/Options:**

From the transition from the industry 4.0 to the industry 5.0, investment strategies are in rapid evolution, providing options for investors of various generations. Key investment options include:

**Digital Assets and Cryptocurrencies:** With the rise of block chain technology, digital assets such as Bitcoin, Ethereum, and other cryptocurrencies have gained significant traction,

particularly among younger investors. These assets offer high-risk, high-reward opportunities.

**Stock Market and Equity Investments:** Traditional stock investment is still a good candidate in the sense that companies are using artificial intelligence and automation to achieve faster growth. Investors seek out companies that are champions at the forefront of the Industry 5.0 technologies, including robotics, IoT, and AI.

**Sustainable and ESG Investments:** Industry 5.0 stresses sustainability and social responsibility, which has generated significant attention to Environmental, Social and Governance (ESG) investments. Socially responsible investors are drawn to green energy, electric vehicles and ethical businesses.

**Real Estate and Infrastructure:** With the growth of industrial sector in India, real estate continues to be a stable investment option. Smart cities and AI-driven infrastructure developments present new opportunities.

## **2.2 Different Generations and Their Characteristics:**

Investment style is different for each generation and determined by the combination of their personal experience, technological response and economics.

### **Silent Generation (Born 1928-1945):**

Favors low-risk investments, e.g., fixed deposits, pension schemes, gold, etc. Values financial security and stable returns. Less inclined toward digital assets and high-risk ventures.

### **Baby Boomers (Born 1946-1964):**

Favor real estate, blue-chip stocks, and retirement funds. Risk-averse but open to mutual funds and dividend-paying stocks. Limited engagement with cryptocurrency and digital investments.

### **Generation X (Born 1965-1980):**

Balances risk and stability with equity, mutual fund, and real estate investments. Increasing interest in technology-driven investments, startups, and international markets. Prioritizes long-term financial security and retirement planning.

### **Millennials (Born 1981-1996):**



A tech-oriented, open to investing in cryptocurrencies, startups, and ESG fund. Favor convenience with mobile trading apps and fintech platforms. Lower motivated for classic investment like gold or time deposits.

### **Generation Z (Born 1997-2012):**

Digital natives who embrace high-risk, high-reward investments. Strong preference for cryptocurrency, NFTs, and digital businesses. Emphasize ethical and socially responsible investing.

## **2.3 Objectives:**

1. To study the different investment choices available across different generations.
2. To know how the investment pattern has changed across generations.

## **3. Literature Review:**

**Tzeng (2014)** monitored that generational investor behavior patterns show the contrast of financial conduct brought about by demographic, economic, and social drivers. Investment patterns between Baby Boomers and Millennials and this finding revealed that younger generations use riskier and diversified forms of investments.

**Srilakshmi and Suryaprakash (2019)** compared investment preferences among Baby Boomers, Gen X, Gen Y, and Gen Z and discovered that, while Baby Boomers like fixed deposit and bonds, Gen X and Y prefer the equities and Gen Z like real estate and cryptocurrencies.

**Riska Rosdiana (2020)** stated on investment behavior of Generation Z and Millennials, looks at whether there is an effect of financial literacy, herding, risk aversion and risk perception on investment choice. As one of the most significant determinants, financial literacy is emphasized in order to make sound investment choices, and the financial literacy is positively related to sound choice making. Herding tendency (where the investors imitate the choice of others) often leads to irrational market evolution since it is among the pervasive heuristics among young investors. Risk aversion equates to investor action to look for high risk, low return investments, while perception of risk equates to individual subjective

estimates of risks related to an investment, subject to psychological influence. These findings have been supported in earlier research, which has indicated some degree of effects of these variables on investment decisions across various demographics and geographic locations. Collectively, the literature emphasizes the complexity of investment choices by digital-native generations based on a combination of information, social pressures, and idiosyncratic risk assessments.

**Yugandhara P, and Rajeshree G (2022)** investigates investment attitudes among Millennials and Gen Z's group. It provides a review of earlier studies on investment habits, decision-making criteria, and money habits. One such study on Millennials in Pune City shows their investment preference for those in line with financial objectives, although without income comparisons. Another study observes the high preference of Millennials for sustainable investing, while Gen-Z is also interested but varies slightly in tastes. The technology aspect is highlighted since both generations rely more on digital platforms, online trade, and cryptocurrency compared to older investors. While previous studies give answers, income-based comparison and long-term financial planning trends among Gen-Z are where the gaps still lie, serving as the impetus for this study.

**Dr. M. Bhuvaneswari and J. Mugesh (2023)** monitored generational differences in investment behavior, risk appetite and preferences. Evidence indicates that younger cohorts that is Millennials (Gen Y) and Gen Z are more aggressive, risk seeking and with a tendency to invest in emerging asset class cryptocurrencies and socially responsible investing. Remarkably conversely, while Baby Boomers and Gen X still tend to stick to the traditional asset classes stocks, bonds and fixed deposits prioritizing them versus high returns, and consequently high risk, is held by growing people in Generation Z. Young investors are also investing more into both traditional tech innovations like robo-advisory and mobile investment tools, and non-traditional innovations like crypto and block chain-based technologies. In addition, intergenerational investment behavior is not only been affected by social and economic factors but also by family and peer impacts. Given financial literacy, risk tolerance and developments in emerging markets, these observations suggest a shift in investment policy, and to that end.

**Inga Pašiušienė, Askoldas Podviekzo, Daiva Malakaite, Laura Žarskienė, Aušra Liučvaitienė and Rita Martišienė (2023)** this research paper analyzes the earlier research work on sustainability with regard to environmental, social, and economic factors. It

emphasizes various approaches employed to measure sustainability and their merits and demerits. The review further identifies research gaps, including the absence of common indicators and difficulty in implementing the models of sustainability in practical scenarios. Moreover, it examines how technology and policies can aid sustainable activity. Through a study of previous research, the literature review establishes a basis for this investigation, demonstrating how this research contributes to existing knowledge.

**Gnanadeepan G, Pushyashree M, and Vikram B (2024)** had identifies differences in investment behavior across generations whereby investment strategies are described by Baby Boomers, Generation X, Millennials (Generation Y) and Generation Z. Research indicates that younger generations, especially Millennials and Gen Z, are more risk-tolerant and opt for alternative investments such as cryptocurrency and socially responsible investment, whereas older generations, including Baby Boomers and Gen X, opt for conventional ones such as fixed deposits, bonds, and stocks. Investment choices are been influenced by macroeconomic, social and financial literacy variables, and are also affected by family and peer networks. Further, the blend of technological advancements has compelled young investors to employ digital platforms and robo-advisors, and older generations emphasize traditional financial advisory.

**Rohit Mammen Thomas, Sujith Nair, Mukalel Johns Benny and Shaeril Michael Almeida (2024)** considers investment trends across Generations X, Y, and Z in Bengaluru, highlighting financial competence, risk acceptance, technological reliance, and retirement planning. It could not find any differences in financial competence, although Gen Z was highest. Gen Z also had the highest risk-taking appetite, followed by Gen Y and Gen X. Dependency on technology was uniform across generations, reflecting general acceptance. As far as retirement planning is concerned, Gen Y had the strongest desire to invest for the future. Investment options differed, with Gen Z opting for Mutual Funds/Equity, Gen Y opting for Gold, and Gen X opting for Real Estate and Fixed Deposits. The research emphasizes the role of the investment behavior based on generational characteristics and brings forward the imperative for specific financial education.

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

This study adopts a **descriptive, exploratory and comparative research** approach to analyse various aspects of investment behaviour among investors. Both **primary** and **secondary** data sources were utilized to ensure a comprehensive understanding of the subject matter.

#### **4.1 Data Collection Methods:**

**Primary Data:** Primary data was collected using a structured questionnaire and personal interviews with respondents. The questionnaire was designed to gather insights on the following key areas:-Types of investments made by investors, Use of Systematic Investment Plans (SIP) for investment, popular tax-saving investment schemes, Awareness of equity investments and debt funds, planning for retirement, Utilization of financial advisors' services.

**Secondary Data:** Secondary data was sourced from various research articles published in reputed journals to provide a contextual framework and support primary data findings.

Sampling Methodology:

**Sample Size:** Data was collected from **790 respondents** to ensure a robust and diverse dataset.

**Sampling Technique:** A **random sampling** method was employed to select participants, ensuring unbiased representation and reliable results.

#### **4.2 Data Analysis and Presentation:**

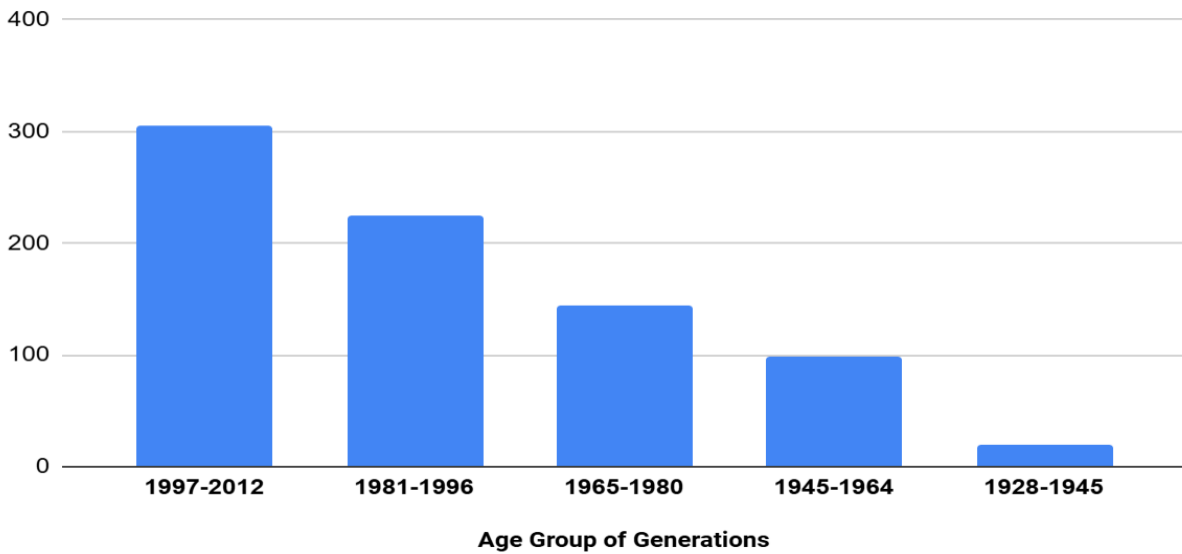
The collected data was systematically organized and analysed using **tabulation** and **graphical presentation** methods. This approach allowed for clear visualization of trends, patterns, and key insights derived from the study.

The combined use of descriptive, exploratory and comparative research methodologies provided a comprehensive understanding of investor behaviour and preferences across different investment avenues.

#### **5. Findings and Discussion:**

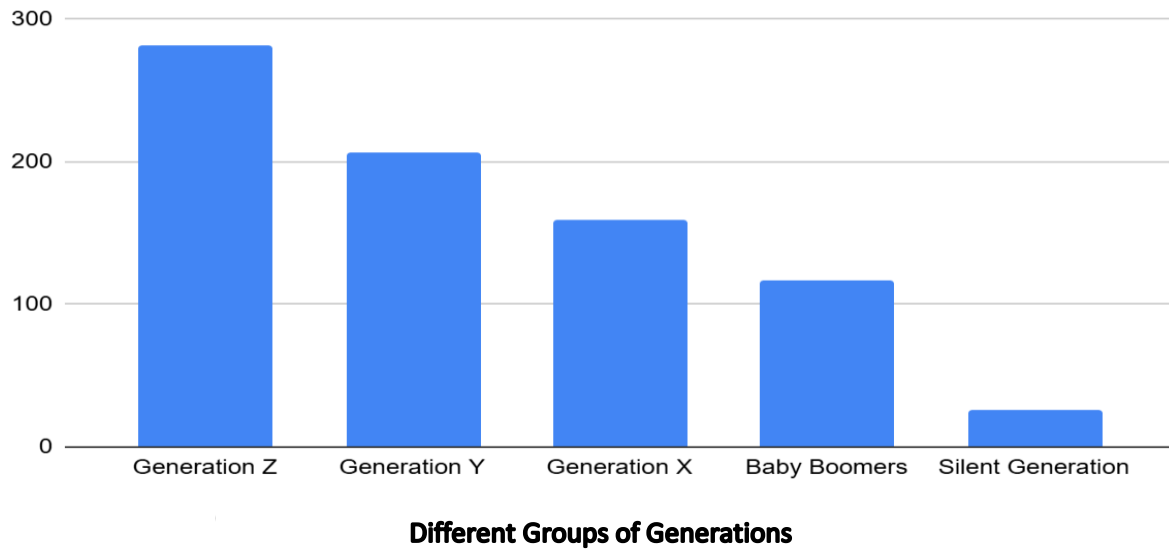
The Questionnaire was designed to gather insights into investor behavior across different generations focusing on key aspects such as Investment choices of investors, New Investment Instruments and their attitude towards risk.

**Graph 1 showing investment in Mutual Funds across generations**



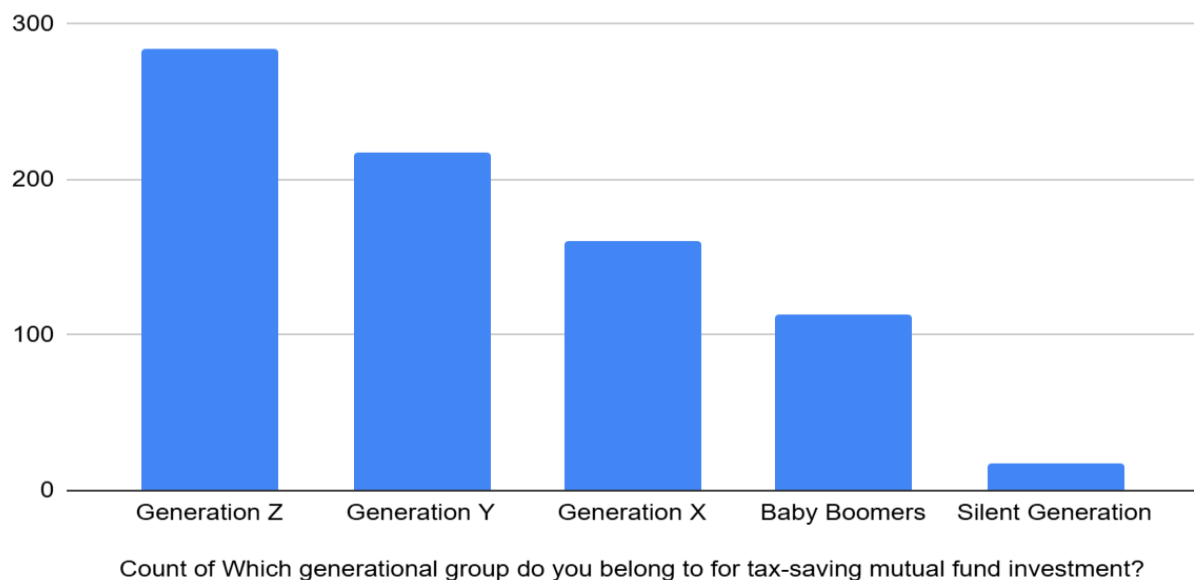
This graph maps the decision-making trends in mutual fund investments by age. In terms of numbers, the segment of people born between 1997 and 2012 is clearly the biggest by far at 38.5% and they are revealed as big players taking proactive moves. To contrast them slightly in relative size, people born a bit earlier, say between 1981 and 1996, still do things at a 28.4% level and they are on the move as active players. Therefore, we are seeing vibrancy among the younger crowds who are coming into the investing game with big enthusiasm. The group born from 1965 to 1980 tends to engage moderately, around 18.5%. Baby Boomers, born roughly from 1946 to 1964, and the Silent Generation, born roughly 1925 to 1945, engage less, most likely because of their interest in safer investments.

**Graph 2 showing investment in SIP across generations**



This graph shows generational preferences for Systematic Investment Plans (SIPs). Generation Z (35.7%) and Generation Y (26.2%) lead, indicating their inclination toward disciplined investing. Just behind Generation X are Baby Boomers at 14.8%, and then next down are those old folks of the Silent Generation at just 3.3%.

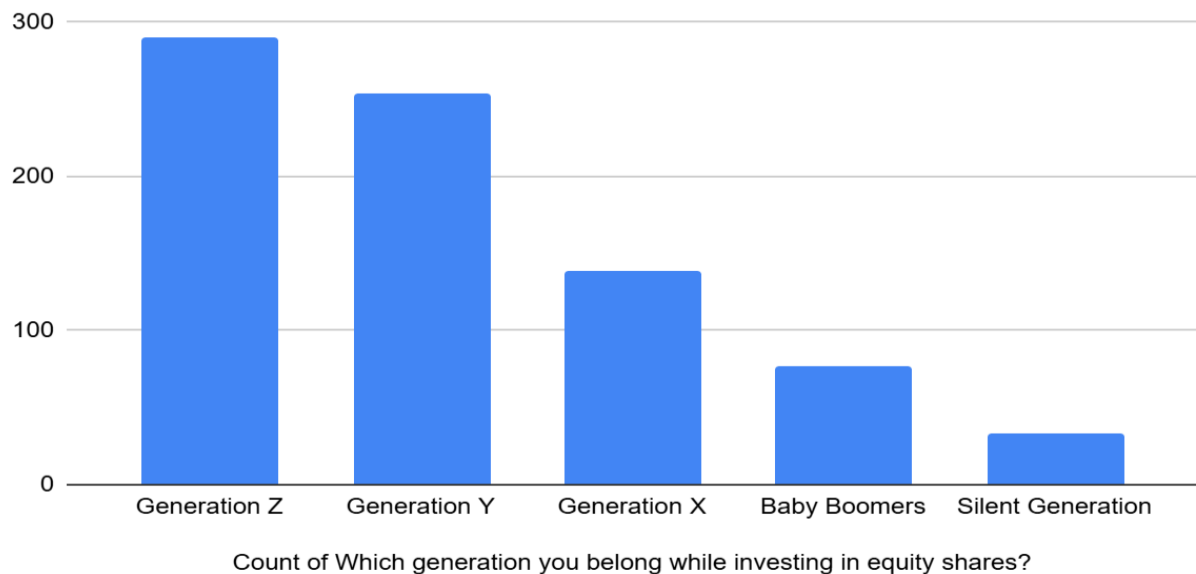
**Graph 3 showing investment in tax saving mutual fund across generations**



This graph displays the percentage of different generational groups investing in tax-saving mutual funds. Generation Z (35.9%) has the highest participation, followed by Generation Y

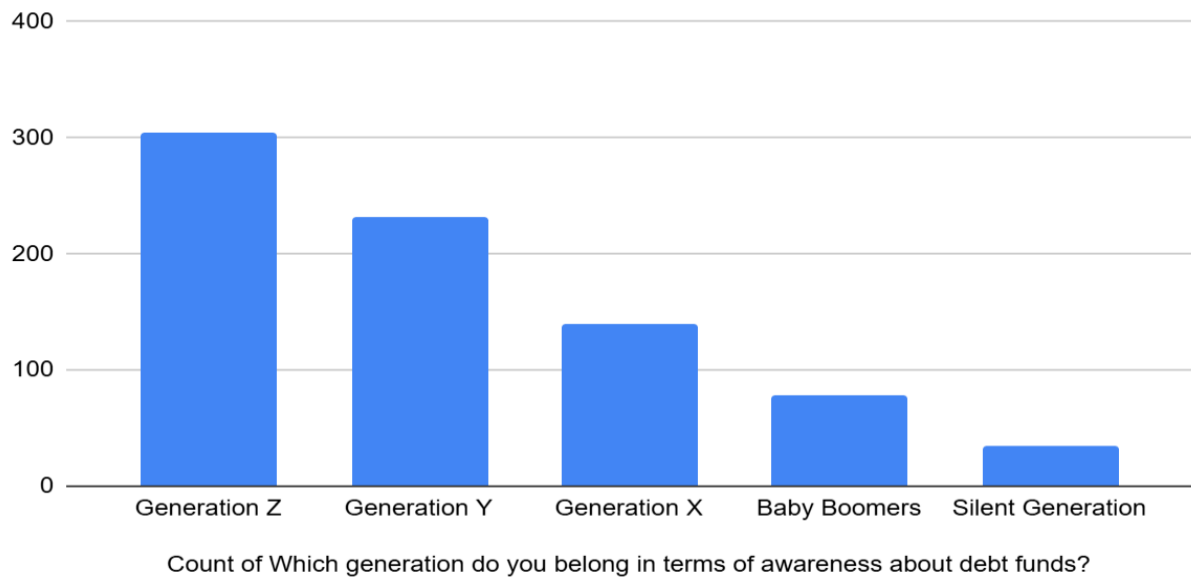
(27.5%), indicating that younger investors are actively leveraging tax-saving instruments. Generation X (20.2%) also contributes significantly, whereas Baby Boomers (14.3% and the Silent Generation (2.1%) have lower engagement, likely due to their preference for traditional savings methods.

**Graph 4 showing investors who is investing in equity shares across various generations**



This chart highlights the proportion of generations investing in equity shares. Generation Z (36.6%) is the largest investor group, followed by Generation Y (32.0%), reflecting their higher risk appetite and preference for stock market participation. Generation X (17.5%) follows, while Baby Boomers (9.7%) and the Silent Generation (4.2%) have the least exposure, indicating a conservative investment approach.

**Graph 5 represents the level of awareness about debt funds across different generations**



The last graph illustrates generational awareness of debt funds. Generation Z is really taking off here, already professionally active at 38.6% and Generation Y are not far behind either, at 29.4%. Both generations are definitely venturing out into diversifying their investments. Generation X (17.6%) shows moderate awareness, while Baby Boomers (9.9%) and the Silent Generation (4.4%) have limited knowledge, aligning with their traditional investment strategies.

Overall, the graphs collectively indicate that younger generations (Gen Z and Millennials) are more inclined toward modern investment avenues, leveraging digital tools and structured financial planning. Older people like to feel safe and secure, sticking to investments that are reliable and that they can count on, which is really important to them as they head towards retirement and want to keep their money secure. Industry 5.0 is really revolutionizing how people big and small think about investments especially when it comes to younger folks and older ones too. That means the way they put money to work and where once they get it savings is deeply connected now. Industry 5.0 is connecting the dots so to speak and mixing up investment behavior in fundamental ways.



## 6. Conclusion:

The research shows that investment habits in India are shifting across generations due to technological change, financial knowledge, and changing economic circumstances. While older generations focus on financial security in the form of low-risk, stable assets, younger investors favor high-risk, high-return instruments like digital assets, equity markets, and new financial technologies.

With India moving towards Industry 5.0, the convergence of human intellect with automation and sustainability will continue to redefine investment patterns. Policymakers, financial organizations, and advisors need to prioritize strengthening financial literacy, ensuring digital financial inclusion, and creating investment products that cater to varied generational requirements. The present research highlights the need to evolve accordingly for long-term financial development and economic sustainability in the changing Indian landscape.

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# **EFFECTIVENESS OF COMPARATIVE ADVERTISING: A STUDY OF ONLINE VS TRADITIONAL MEDIA STRATEGIES**

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## **ABSTRACT:**

This research compares cost, effectiveness, and consumer faith in online vs. conventional advertisements. It is based on analysis of data from 100 people, comparing liking, influence on shopping behavior, and faith in advertisements. According to findings, most respondents were more involved in online advertisements and found them to be more individualized and influencing in buying behaviors. Moreover, whereas conventional advertising enjoys trust among older consumers, internet advertising is perceived as more affordable and dynamic. The research highlights the changing role of both types of advertising in consumer behavior.

**KEYWORDS:** Advertising, Traditional, Online, Purchasing decision

## **INTRODUCTION:**

Advertising is a key component of marketing, acting as the main channel through which firms can reach their customers. It entails messaging with the aim of selling products, services, or brands and is meant to convince consumers to buy or otherwise act in a desired way. Advertising has progressed from the conventional channels, including printed advertisements and billboards, to contemporary digital technologies like social media and web banners.

The two most common forms of advertisement are traditional and digital. Traditional advertisement consists of television, radio, newspaper, and billboards, which have been successful in reaching a mass number of audiences for decades. These mediums suit businesses looking to make a brand name and win the attention of a large number of customers, which can include non-active internet users.

Digital marketing, however, uses the internet and other digital devices such as computers, mobile phones, and tablets. With more and more time spent on the internet, companies have turned to digital channels to reach more focused audiences. Digital advertising enables easier monitoring of consumer habits and more targeted marketing campaigns.

Another key goal of advertising is to establish brand recognition. Repetition of advertisement of a product or a company can make it more familiar, which can guide consumers to select a product. For example, a consumer may select a known soft drink over other brands because it has been advertised previously. Advertising also assists companies in reaching their target market efficiently, framing messages that resonate with consumers.

Along with brand awareness, advertising can create brand loyalty too. With repetitive reminders and emotional attachment, commercials can promote repeated purchases. For instance, brands of fast foods tend to promote the taste and quality of food in commercials to create a lasting relationship with the customers. Finally, advertising makes consumers aware of products and services. It emphasizes important features and advantages, like the look or functionality of a new smartphone, to enable consumers to make better choices. At the end of the day, advertising is meant to inform, persuade, and remind individuals about a product or service, encouraging them to act—be it buying, visiting a website, or donating to a cause. By knowing consumer behavior and needs, companies can create more effective ads that generate engagement and increase sales.

### **OBJECTIVES:**

1. To examine the reach of online advertising v/s traditional.
2. To know and compare the cost of online and traditional advertising.
3. To understand about consumer trust in online advertisement.

### **SIGNIFICANCE OF STUDY:**

Comparative advertising strategies between online and offline methods in South Mumbai need to be studied for understanding consumer behavior and marketing effectiveness in the region. With a mix of legacy businesses and digital-born startups shifting online, it is essential to compare the reach, expense, and consumer trust of both advertising strategies. Offline channels like print and TV have historically reached diverse audiences, while online advertisements provide accurate targeting. Comparing both will assist in determining which approach is more appropriate for local businesses, given the greater expense and rigidity of conventional advertising versus the lower-cost, more flexible online alternatives.

### **REVIEW OF LITERATURE:**

1. Nathan Sebastain (2025) highlights that businesses now create value through customer interactions to stay competitive. Advertising has evolved from broad, generic approaches to personalized, behavior-driven strategies, with a growing emphasis on digital innovation and customer experience for future success.
2. Ravindra Singh Rawat (2019) explores the relationship between online and traditional advertising methods, both of which are crucial for understanding consumer behavior. While online ads are gaining strength with the rise of the internet and digital devices, traditional methods like print media and radio still play a significant role in shaping advertising strategies.
3. Ms. Pavinee Srisung (2001) explores the contrast between internet and traditional advertising approaches. Since the internet became widely accessible in 1995, it has provided advertisers with an interactive platform, allowing consumers to actively engage, unlike traditional media where they passively receive information. This shift demands advertisers to create content that continuously

meets customer needs.

4. Nandita Mishra (2024) examines how advertising strategies influence consumer behavior through both traditional and modern approaches. The study highlights how digital advertising shapes buying decisions, particularly among younger and higher-income groups, while traditional methods continue to impact older audiences.
5. Qianyi Li (2014) explores consumer perceptions of traditional versus online advertising, focusing on ads on websites and online platforms. The study compares advertising strategies for electrical and non-electrical products, using popular websites to assess the impact of online ads on consumer preferences.
6. J. Hanekom (2002) examines the impact of new technologies, like the internet, on advertising by comparing them to traditional methods. While online advertising offers affordability and global reach, traditional media still holds relevance, catering to both audiences.
7. Harshita Bhatnagar (2013) compares online and traditional advertising, analyzing customer awareness and preferences. Customers prefer online ads on brand websites for their speed and easy product comparison, while TV remains the top traditional medium. Traditional ads are viewed as more reliable but often confusing.
8. Mehdi Behboudi (2018) compares online and traditional advertising, focusing on the deeper meaning behind both. The study suggests that both types share elaboration and involvement models, reflecting changes in the consumer information environment.
9. Ducoffe (1996) found that consumer sentiment towards online ads is influenced by how entertaining and informative they are. Positive reactions are tied to a better understanding and value, though many consumers feel that online ads often fall short in terms of entertainment or information.
10. A. Nithya Priya (2015) explores how new communication technologies and media impact consumer perceptions and social issues. The study compares the effects of television and online advertising, drawing on literature from both India and globally.
11. Karthik (2013) studied the impact of social network advertisements, emphasizing their cost-effectiveness in reaching large audiences. Social networks enable advertisers to target specific customers using demographic data, build trust, and drive sales, making them a powerful tool for targeted marketing and content distribution.
12. Kumar and Raju (2013) examine how advertising influences the attitudes of male and female consumers. They found that both genders prefer products that offer greater satisfaction and respond differently to brand ads when seeking information.
13. Santiago, Kian Gabrielle B (2024) compares traditional and online advertising, noting that while traditional ads offer broad reach, digital ads provide targeted, cost-effective solutions. Combining both approaches enhances brand visibility, engagement, and effectiveness by aligning with consumer preferences and product characteristics.

14. Cott Markham (2001) highlights the growing role of the internet in advertising and sales across all business sizes. As internet usage expands among diverse audiences, it's essential to understand online advertising terms and develop methods to measure its success, similar to traditional advertising.
15. S. Goyal (2015) this study examines that the internet advertising is important for businesses to reach the global audiences. It helps the businesses to attract the customers anytime, anywhere and making marketing more powerful and to be able to compete better in today's online world.

## **RESEARCH METHODOLOGY:**

### **1. DATA TYPE & SOURCES:**

This study has included both quantitative and qualitative data. Primary data is collected directly through observations, structured questionnaires. Secondary data has been sourced from published research papers by various researcher.

### **2. UNIVERSE OF STUDY:**

This study focuses on the entire age group population in South Mumbai analysing their customer behaviour in response to online v/s traditional advertising.

### **3. SAMPLE SIZE:**

This survey has targeted 100 respondents of all age group through an online questionnaire using google forms.

### **4. EXTENT:**

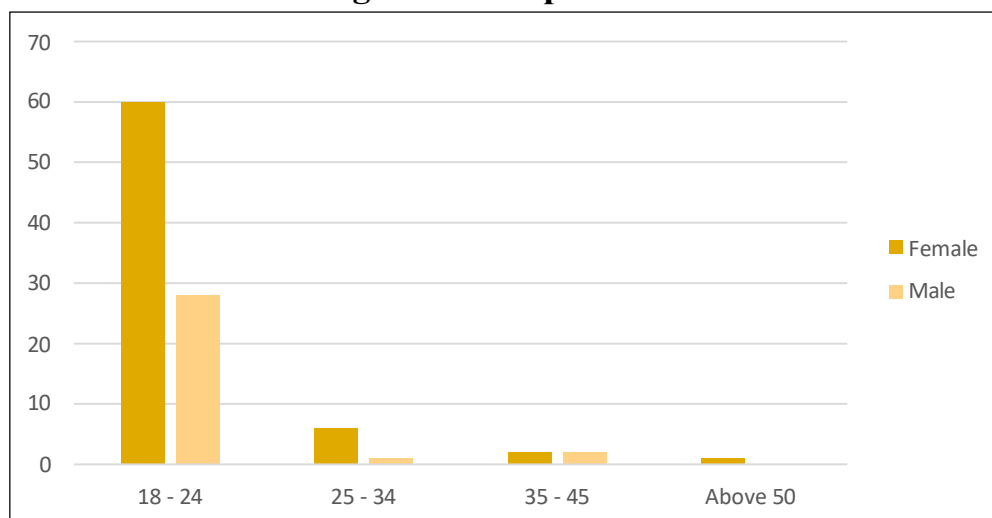
South Mumbai Area

### **5. DATA ANALYSIS & INTERPRETATION:**

The data collected from various sources has been simplified using techniques such as percentages, frequency tables, and comparative studies. Pie charts, tables, and graphs were employed to present interviewee numbers and percentages for clarity. The researcher carefully edited and encoded the data, followed by interpretation and conclusion presentation in the relevant chapters.

## DATA ANALYSIS AND INTERPRETATION:

### Age of the respondent

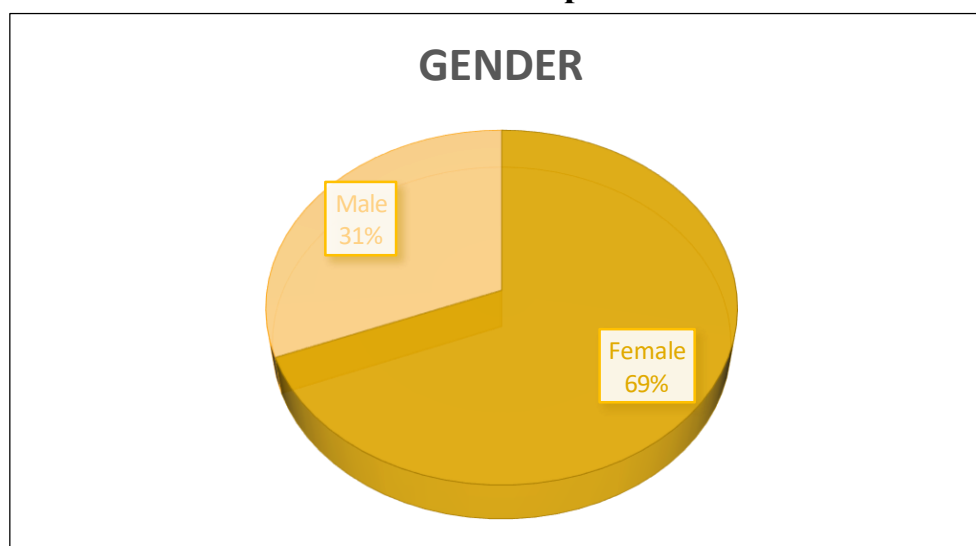


Source: Primary data

## INTERPRETATION:

The data shows that **88%** respondents are in the age group of **18 -24**, **7%** respondents are of age group between **25-34**, **4%** respondents are in the age group between **35-45** and **1%** respondents are in the age group of above **50**.

### Gender of the respondent

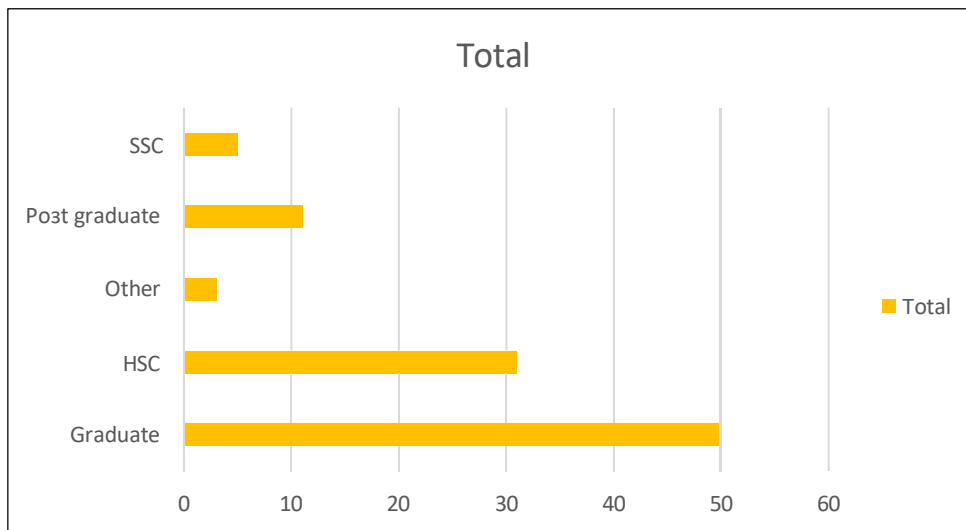


Source: Primary data

## INTERPRETATION:

The data indicates a significant gender, with **69%** female and **31%** male. This suggests that female consumers are more influenced by online v/s traditional advertising methods.

### Educational qualification of the respondent

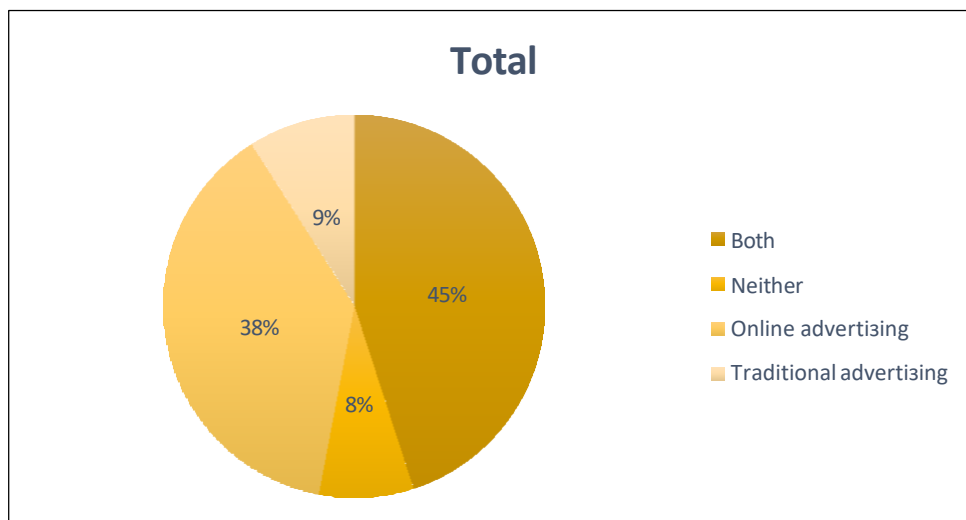


Source: Primary data

#### INTERPRETATION:

It is found that out of 100 respondents from the survey, 50 are graduate, 31 are HSC, 11 are postgraduates, 5 are SSC and 3 belongs to other.

### What type of advertising respondents find more interesting?



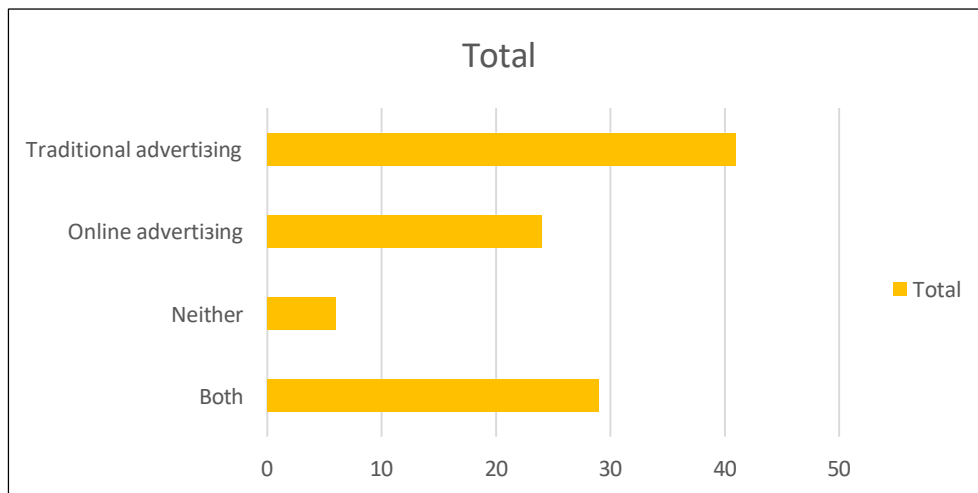
Source: Primary data

#### INTERPRETATION:

It is observed that 45% of respondents are interested in both online and traditional advertising, and 38% are interested in online advertising. Only 9% are interested in traditional advertising. Surprisingly, 8% of respondents do not find any form of advertising interesting, which means a large majority of the population consumes or enjoys advertising in some capacity.



### Which type of advertising respondent trust more?

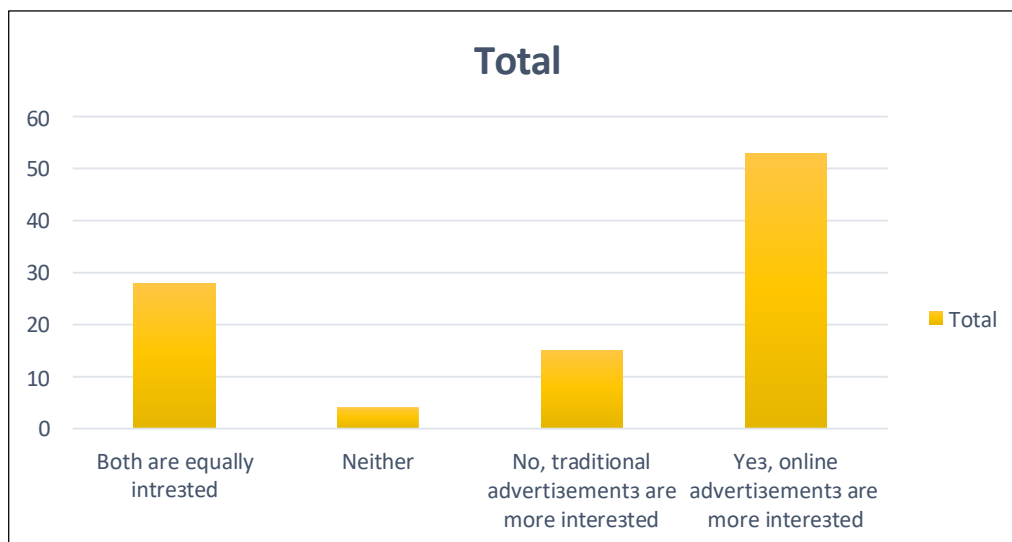


Source: Primary data

#### INTERPRETATION:

The study shows that 41% respondents trust more traditional advertising, and 24% trust online advertising. 29% trust both equally, and 6% trust neither. It indicates that traditional advertisements are usually trusted more than online advertisements.

### Do you think online advertisements are more interested than traditional advertisements?

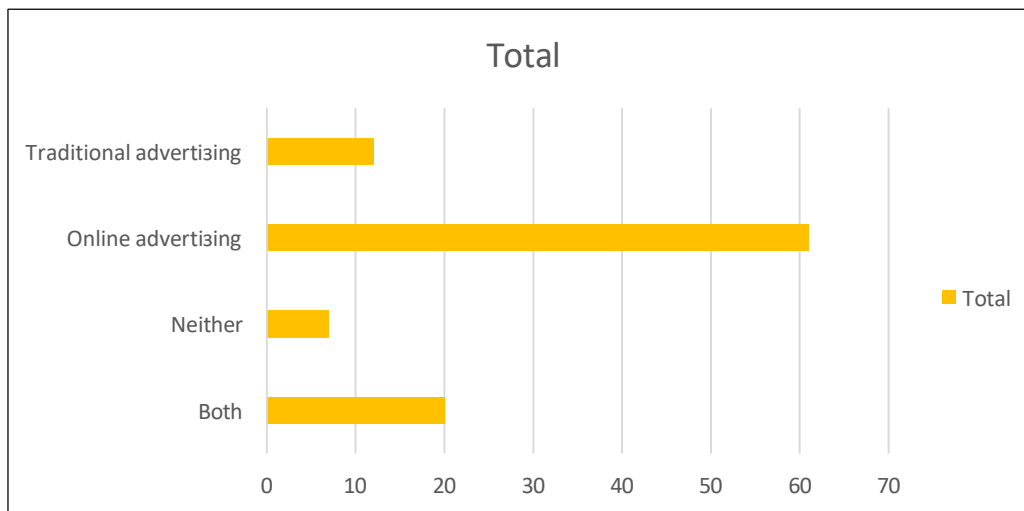


Source: Primary data

#### INTERPRETATION:

The survey shows that 53% of respondents find online advertising more interesting than traditional ads, reflecting a strong preference for digital formats. 28% find both types equally interesting, while 15% prefer traditional ads. Only 4% express no interest in any ads, indicating widespread engagement with both online and traditional advertising.

### Which type of advertising most influence your purchase?

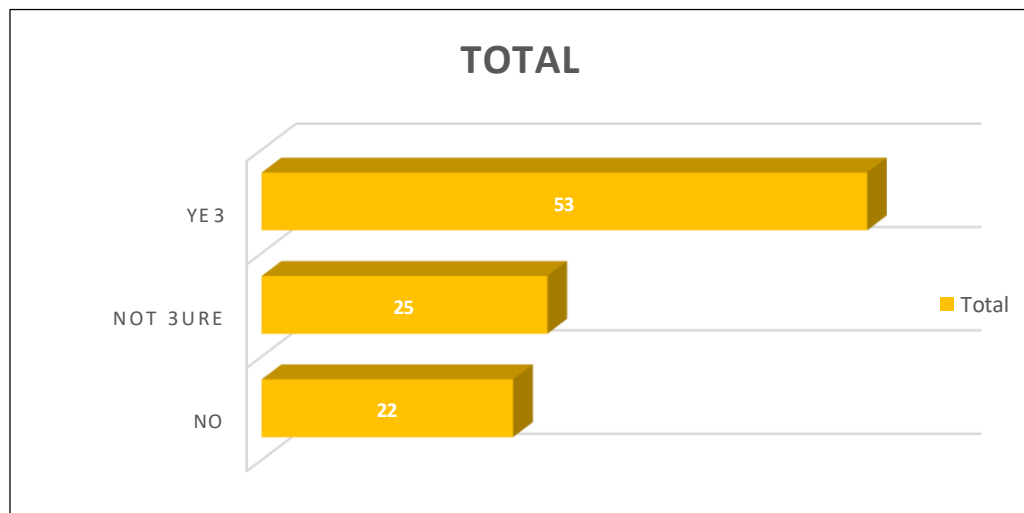


Source: Primary data

#### INTERPRETATION:

The study reveals that 61% of respondents believe online advertising has the greatest impact on their shopping decisions. Meanwhile, 20% feel both online and traditional ads influence them, and 12% are impacted by traditional ads. Only 7% of respondents think advertising has no effect on their shopping choices.

### Will traditional advertising decline with online growth?

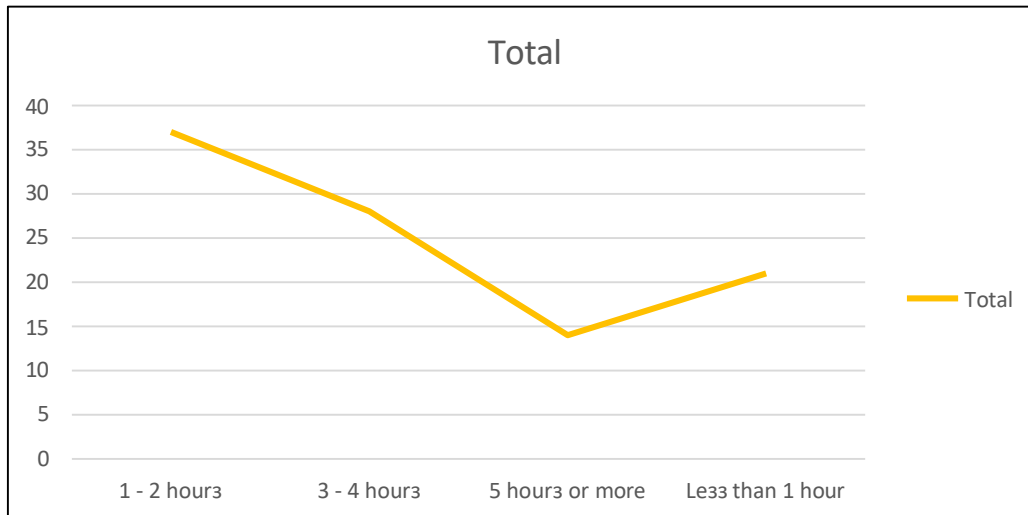


Source: Primary data

#### INTERPRETATION:

The study finds that 53% of respondents believe traditional advertising will become less effective due to the rise of online advertising. Meanwhile, 25% are uncertain about its future effectiveness, and 22% think traditional advertising will remain impactful, indicating a range of opinions among the respondents.

### How much time do you spend online daily?

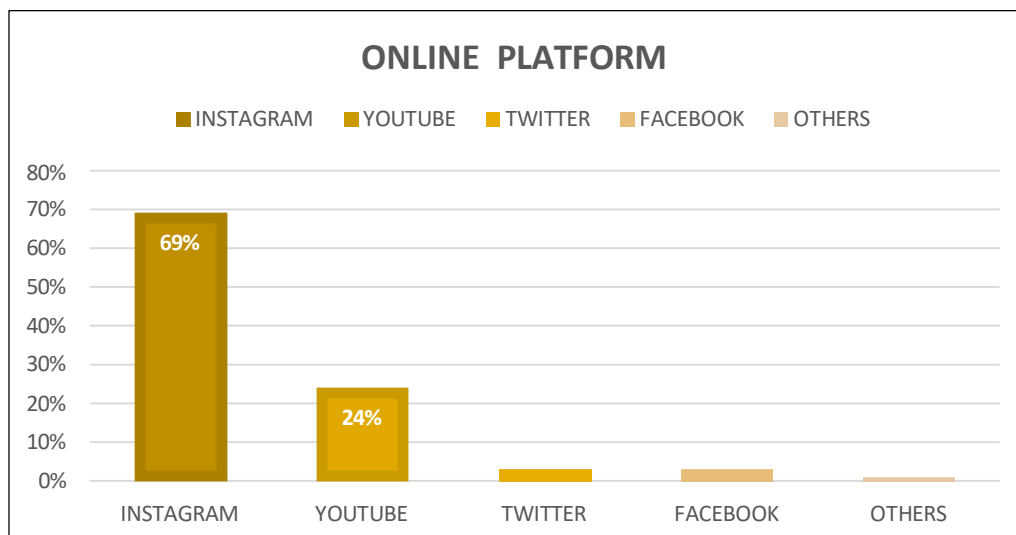


Source: Primary data

#### INTERPRETATION:

The study shows that 37% of respondents spend 1-2 hours online daily, while 28% spend 3-4 hours. 21% spend less than an hour, and 14% spend 5 or more hours online. This suggests that most respondents engage with the internet for a moderate amount of time, with fewer spending significantly more or less.

### Which online platforms do you use often?



Source: Primary data

#### INTERPRETATION:

It is observed that 69% use instagram very often, making it most used platform. 24% use youtube, 3% use facebook and 3% use twitter. Only 1% use other platforms. The high usage of instagram shows its popularity and strong presence in the respondents social media habit.

## FINDINGS:

- The data shows that **88%** respondents are in the age group of **18 -24**, **7%** respondents are of age group between **25-34**, **4%** respondents are in the age group between **35-45** and **1%** respondents are in the age group of above **50**.
- The data indicates a significant gender, with **69%** female and **31%** male. This suggests that female consumers are more influenced by online v/s traditional advertising methods.
- It is found that out of 100 respondents from the survey, 50 are graduate, 31 are HSC, 11 are postgraduates, 5 are SSC and 3 belongs to other.
- It is observed that 45% of respondents are interested in both online and traditional advertising, and 38% are interested in online advertising. Only 9% are interested in traditional advertising. Surprisingly, 8% of respondents do not find any form of advertising interesting, which means a large majority of the population consumes or enjoys advertising in some capacity.
- The study shows that 41% respondents trust more traditional advertising, and 24% trust online advertising. 29% trust both equally, and 6% trust neither. It indicates that traditional advertisements are usually trusted more than online advertisements.
- The survey shows that 53% of respondents find online advertising more interesting than traditional ads, reflecting a strong preference for digital formats. 28% find both types equally interesting, while 15% prefer traditional ads. Only 4% express no interest in any ads, indicating widespread engagement with both online and traditional advertising.
- The study reveals that 61% of respondents believe online advertising has the greatest impact on their shopping decisions. Meanwhile, 20% feel both online and traditional ads influence them, and 12% are impacted by traditional ads. Only 7% of respondents think advertising has no effect on their shopping choices.
- The study finds that 53% of respondents believe traditional advertising will become less effective due to the rise of online advertising. Meanwhile, 25% are uncertain about its future effectiveness, and 22% think traditional advertising will remain impactful, indicating a range of opinions among the respondents.
- The study shows that 37% of respondents spend 1-2 hours online daily, while 28% spend 3-4 hours. 21% spend less than an hour, and 14% spend 5 or more hours online. This suggests that most respondents engage with the internet for a moderate amount of time, with fewer spending significantly more or less.
- It is observed that 69% use instagram very often, making it most used platform. 24% use youtube, 3% use facebook and 3% use twitter. Only 1% use other platforms. The high usage of instagram shows its popularity and strong presence in the respondents social media habit.

## **SUGGESTIONS:**

- Comparison Advertising is the way a marketing company goes about telling its customers that they have something better than their competitors. This can be done through both purposeful and intentional advertisement form or other types of advertisement channels.
- Differently put, traditional comparative advertising journeys via television, print, or radio or billboard to reach a widely heterogeneous mass with very little personalization.
- Online comparative advertising uses social media rather, search engines, and influencer partnerships for focused and entertaining promotional campaigns.
- While effectiveness here is on mass reach, traditional advertising can be largely data-driven and misused, segmentation in terms of audiences.
- Online, real-time analytics enables marketers to monitor engagements and immediately adjust their campaigns for better performance.
- Traditional media carry little or no real immediate feedback such that measuring the direct effect of comparative campaigns gets tougher.
- Cost effectiveness is, on the other hand, the most different one from the other; digital ads usually require a less amount of investment and always give more returns on investments as compared to television and print ads.
- A more exciting way of reaching out to consumers online is through the inclusion of interactive portions such as comments, share options, and personalized content.

## CONCLUSION:

In conclusion, the comparative study of online versus traditional advertising strategies reveals distinct advantages and challenges for both methods. Online advertising is highly favored by respondents, with 53% considering it more interesting than traditional advertising and 61% acknowledging its significant influence on shopping decisions. Its ability to target specific audiences, offer interactive engagement, and provide real-time feedback makes it an essential tool for modern marketing. However, traditional advertising still holds relevance, especially for broader reach and credibility, with 22% of respondents believing it will continue to be effective. The study also shows that most consumers spend a moderate amount of time online, further supporting the growing dominance of digital media. While both advertising strategies have their merits, businesses can enhance their marketing impact by combining online and traditional approaches, tailoring their efforts to the specific needs and preferences of their target audience. The future of advertising lies in the integration of both strategies to maximize effectiveness.

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# **“A STUDY ON CONSUMER AWARENESS AND ADOPTION OF SUSTAINABLE PRODUCTS WITH REFERENCE TO SOUTH MUMBAI”**

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## **ABSTRACT**

The research aims to study consumers awareness and adoption of sustainable products with reference to south Mumbai. This study examines consumer awareness and adoption of sustainable products, highlighting key influencing factors. The research of this paper is done through a structured google form. Its objectives is to assess the level of consumer awareness and adoption of sustainable products and to identify the factors that influence consumer awareness and adoption of sustainable products. While awareness is high (96%), adoption lags (85%) due to affordability (39%) and availability (29%) barriers. Consumers perceive sustainable products as expensive, necessitating cost reductions through subsidies, bulk discounts, and efficient sourcing. Limited retail presence also restricts access, which can be improved by expanding supply chains and increasing visibility in supermarkets and e-commerce platforms. Awareness (12%) and credibility (11%) also impact adoption, with greenwashing concerns requiring standardized certifications, blockchain transparency, and third-party endorsements. While government policies (8%) and sustainable infrastructure (1%) have lower direct influence, regulations like carbon taxes and plastic waste reduction play a long-term role. A multi-faceted approach—enhancing affordability, accessibility, awareness, and trust—can drive mainstream adoption, promoting sustainable consumer behavior.

**KEYWORDS:** Sustainable products, consumer awareness, consumer adoption

## **INTRODUCTION**

Consumer awareness refers to how much people know about a product, service, or brand. It is not just about recognizing a product’s name but also understanding its features, benefits, pricing, and risks. A well-informed consumer can make better purchasing decisions by



comparing products and identifying the best option for their needs. Consumer adoption, on the other hand, is the process where a consumer moves from knowing about a product to actually using it. This journey typically includes different stages—first, the consumer becomes aware of the product, then develops an interest in it, evaluates whether it is better than existing options, tries it out, and finally adopts it as part of their routine. Some consumers, known as early adopters, try new products quickly, while others prefer to wait and see how well a product performs before making a purchase.

A sustainable product is one that is designed, manufactured, and used in a way that minimizes its impact on the environment while also being socially and economically responsible. These products are created with the goal of reducing waste, conserving natural resources, and promoting ethical production practices. Sustainable products can be made from eco-friendly materials, designed for durability, or created using processes that reduce pollution and carbon emissions. For example, reusable water bottles made from recycled plastic or biodegradable packaging are considered sustainable because they help reduce plastic waste and lower environmental harm.

## **OBJECTIVES**

1. To assess the level of consumer awareness and adoption of sustainable products.
2. To identify the factors influencing consumer awareness and adoption of sustainable products.
3. To recommend strategies for enhancing consumer awareness and adoption of sustainable products.

## **SIGNIFICANCE**

This study is significant as it bridges the gap between consumer awareness and sustainable consumption patterns, offering practical implications for businesses, policymakers, and researchers. By fostering greater awareness and encouraging sustainable product adoption, the study supports the transition toward a more environmentally responsible and socially conscious economy.

## **LIMITATIONS**

- Findings are specific to South Mumbai and may not apply to other regions.

- The respondents may give biased data.
- The results reflect the current situation and may not be relevant in the future.
- The research is not based on any specific brand and product.

## **RESEARCH METHODOLOGY**

This research is based on the analysis of primary data collected from structured google form.

100 respondents will be considered for the survey this will be through an online questionnaire i.e. Google form. The sampling technique used here is Non-Probability Sampling- Convenience Sampling.

## **REVIEW OF LITERATURE**

1. **V. Usha and P. Ashok Kumar (2024)** – This research paper examines that consumer awareness plays a crucial role in promoting eco-friendly products. Sustainable goods are designed to minimize environmental impact throughout their lifecycle, including production, use, and disposal. Examples include reusable bags, biodegradable cleaners, and energy-efficient appliances. Understanding the environmental consequences of production and disposal further supports sustainable choices. This study emphasizes the significance of consumer awareness in driving sustainable practices.
2. **Sujata Sen Bhowmick (2023)** - This study explores consumer behavior toward organic products in Mumbai, driven by health awareness, environmental concerns, and ethical choices. Despite their growing popularity, understanding consumer perceptions and emotions during purchase and use is essential. Using sentiment analysis, the research examines product placement, market presence, and key drivers like motivation, perceived value, and trust, offering insights into the adoption of organic goods.
3. **Jana Hojnik et al. (2019)** - This study examines how consumer awareness, familiarity with eco-friendly products, and perceived responsibility influence the link between environmental concern and purchase intent. Additionally, female consumers show higher environmental concern and awareness than males. The study discusses policy implications, theoretical contributions, and future research directions, emphasizing the need for targeted sustainability initiatives.
4. **Mark Anthony Camilleri (2023)** - This study examines consumer perceptions of

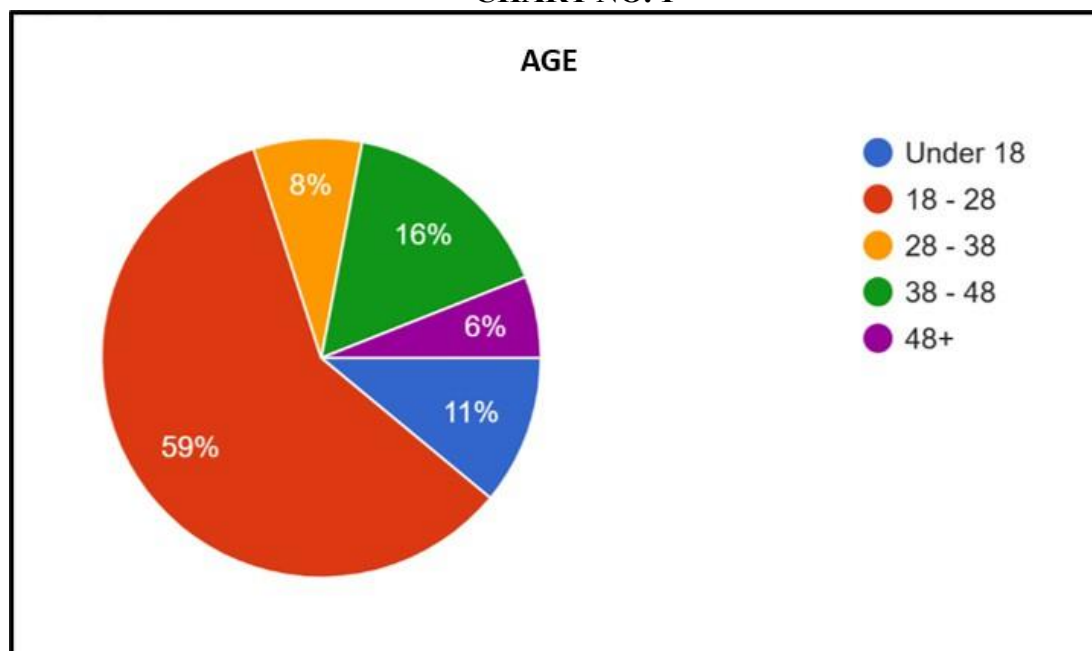
sustainable products amid growing environmental concerns. Despite rising awareness, market adoption remains low, with research yielding fragmented insights. Findings highlight the need for an integrated approach to sustainability and targeting new consumer segments to expand market share. Practical recommendations help businesses enhance the perceived value of sustainable products.

5. **Vishnu Nath et al. (2013)** - This study explores key enablers of green product adoption as consumers demand sustainable alternatives. Findings highlight how these enablers drive sustainability adoption, supporting green marketing and consumer engagement. The study emphasizes the need for businesses to strengthen these enablers through targeted strategies. Additionally, it provides insights into fostering long-term consumer commitment to green products.
6. **N. Divyapriyadharshini et al. (2019)** - This study examines consumer awareness of green products and its impact on sustainable purchasing decisions. Most consumers are familiar with green products, emphasizing the need for effective marketing strategies to drive eco-friendly consumption. The study highlights awareness as a key factor in promoting sustainability. It also suggests that businesses should invest in targeted campaigns to enhance consumer engagement with green products.

## **DATA INTERPRETATION**

### **1. AGE.**

**CHART NO. 1**



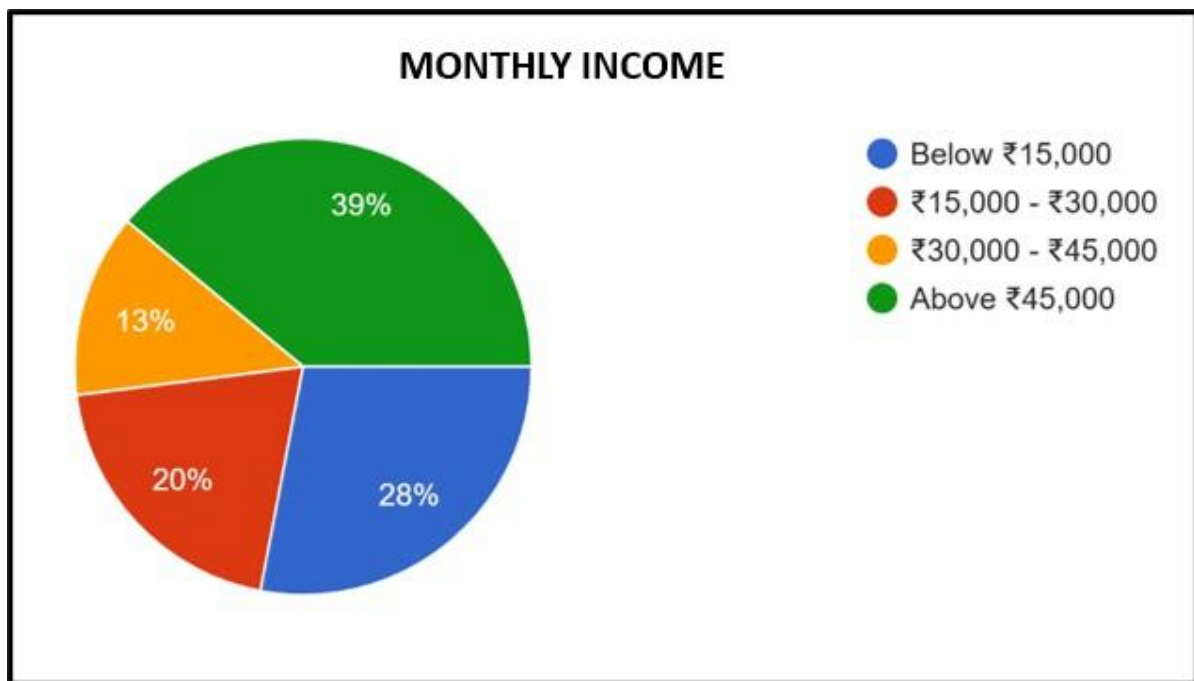
Source: Primary Data

### INTERPRETATION:

The above given chart no. 1 represents age of 100 respondents out of which 11 of them are under 18 i.e. 11%, 59 are aged 18 – 28 i.e. 59%, 8 are aged 28 – 38 i.e. 8%, 16 are aged 38 – 48 i.e. 16% and 6 are aged above 48 aged i.e. 6%.

### 2. APPROXIMATE MONTHLY INCOME.

CHART NO. 2



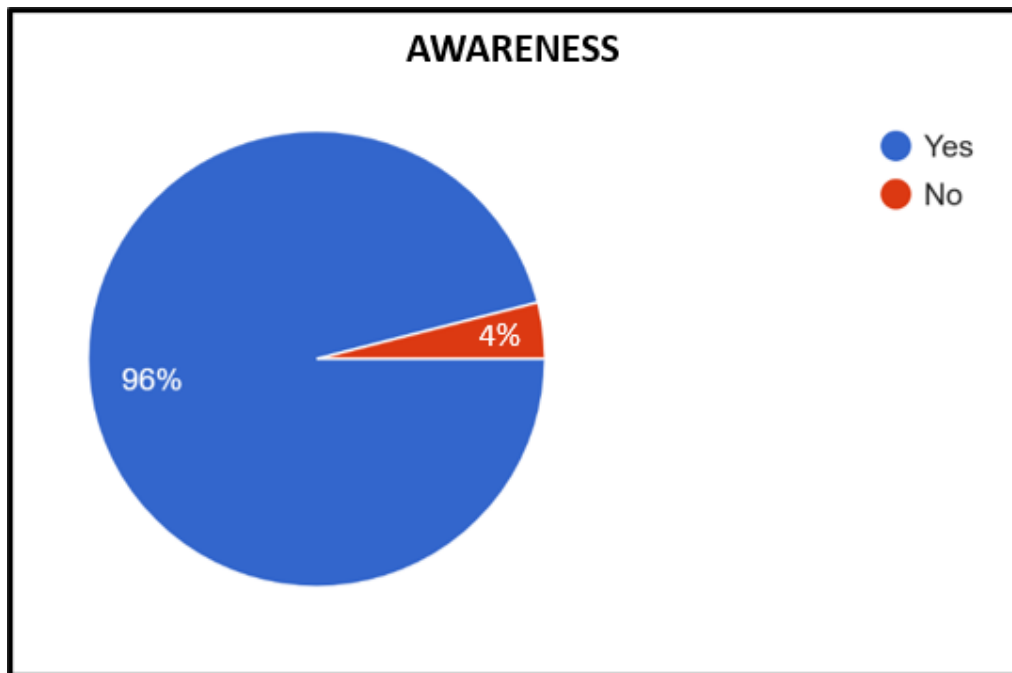
Source: Primary Data

### INTERPRETATION:

The above given chart no. 2 represents approximate monthly income of 100 respondents out of which 28 has approx. monthly income below ₹15,000 i.e. 28%, 20 have ₹15,000 - ₹30,000 i.e. 20%, 13 have ₹30,000 - ₹45,000 i.e. 13% and 39 have above ₹45,000 i.e. 39%.

### 3. AWARENESS ABOUT SUSTAINABLE PRODUCTS.

CHART NO. 3



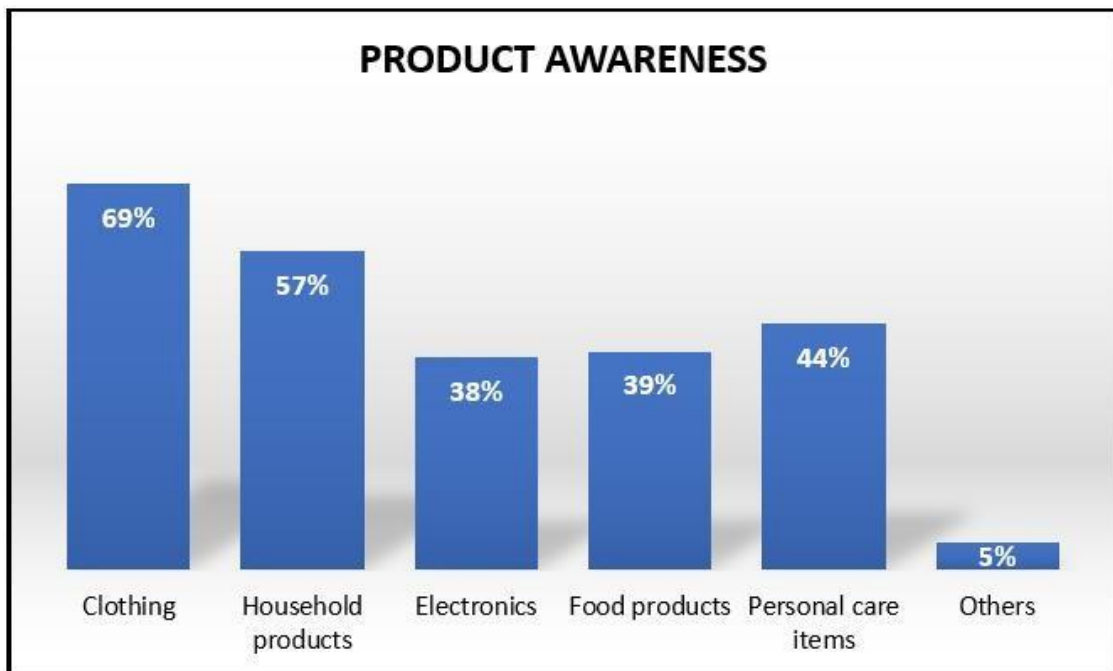
Source: Primary Data

#### INTERPRETATION:

The above chart no. 3 represents awareness about sustainable products among 100 respondents out of which 96 respondents i.e. 96% are aware of sustainable products and 4 i.e. 4% are not aware about sustainable products.

#### 4. PRODUCT AWARENESS.

CHART NO. 4



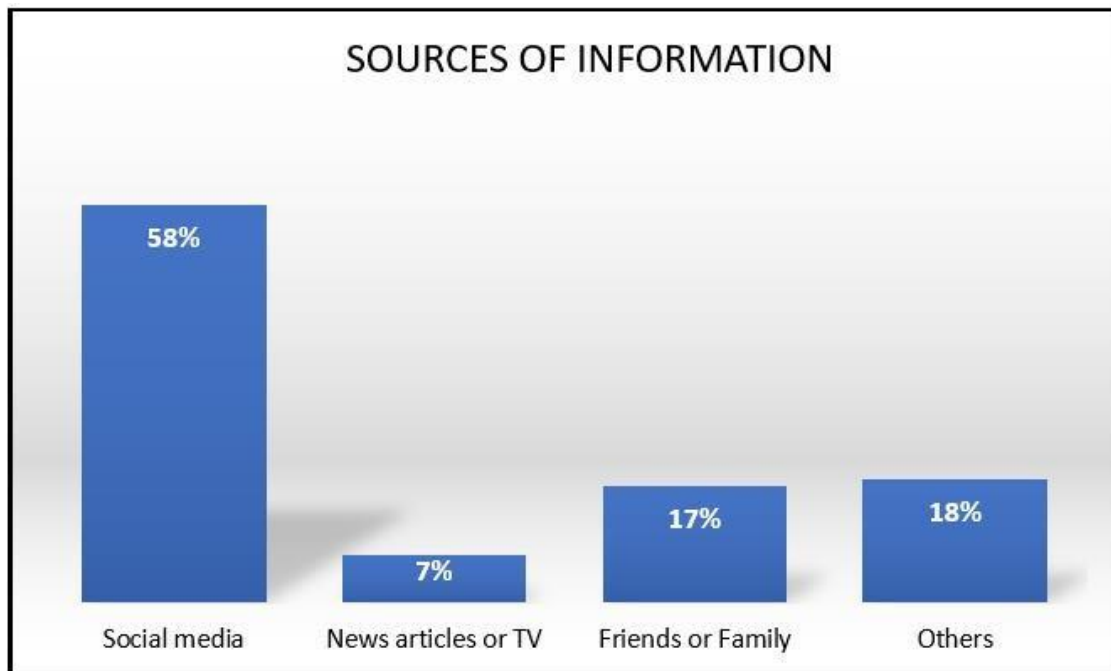
Source: Primary Data

#### INTERPRETATION:

The above given chart no. 4 represents that the respondents are aware of which sustainable products. Out of 100 respondents some also have awareness about multiples products. 69 respondents are aware of clothing i.e. 69%, 57 are aware of household products i.e. 57%, 38 are aware of electronics that is 38%, 39 are aware of food products i.e. 39%, 44 are aware of personal care items i.e. 44% and 5 are aware of other products i.e. 5%.

## 5. SOURCES OF SUSTAINABLE PRODUCT INFORMATION.

CHART NO. 5



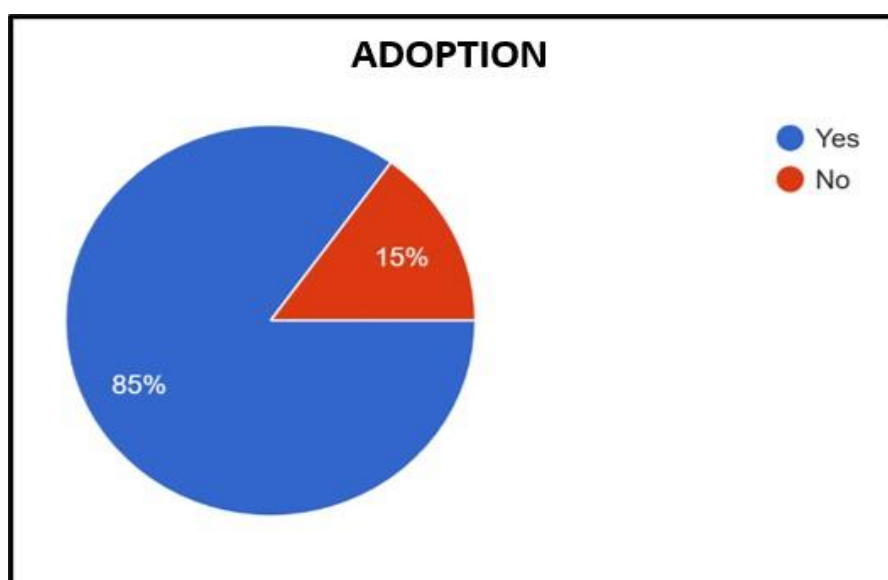
Source: Primary Data

### INTERPRETATION:

The above given chart no. 5 represents sources from which respondents got knowledge about sustainable products. Out of 100 respondents 58 came to know about sustainable products from social media i.e. 58%, 7 from news articles and TV i.e. 7%, 17 from friends and family i.e. 17% and 18 from other sources i.e. 18%.

## 6. ADOPTION OF SUSTAINABLE PRODUCTS.

CHART NO. 6



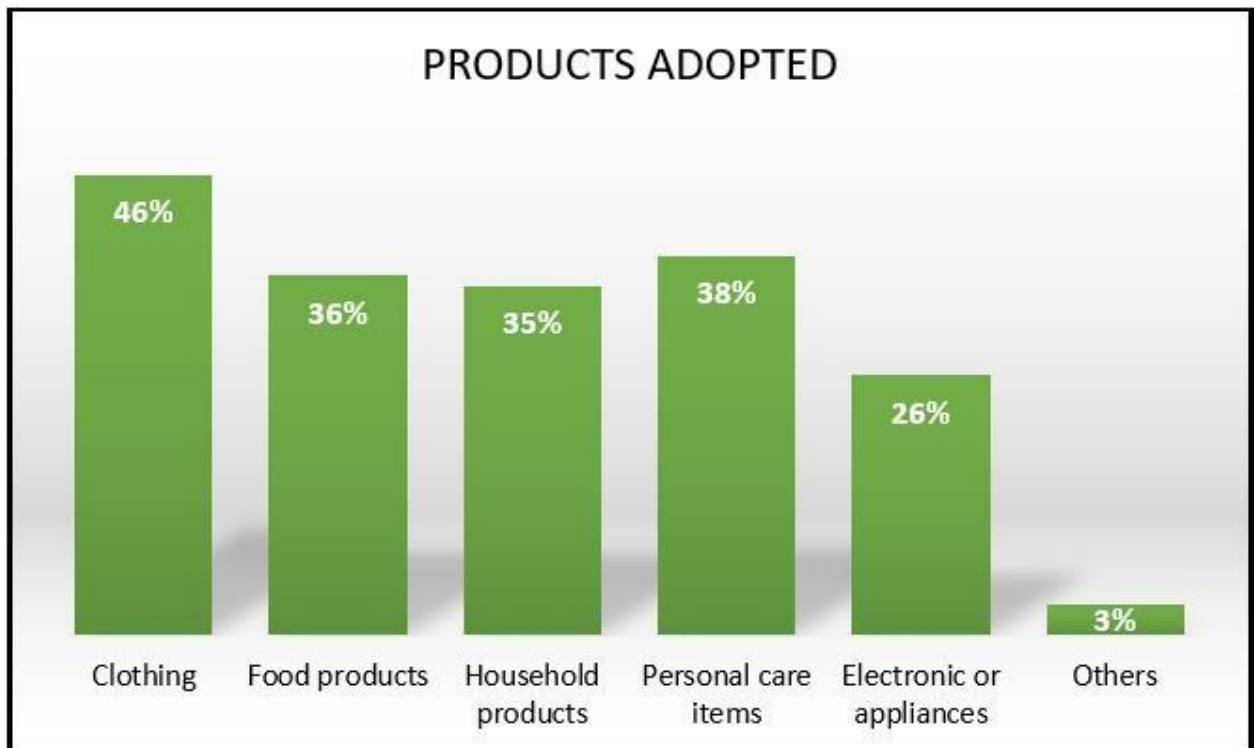
Source: Primary Data

### INTERPRETATION:

The above given chart no. 6 data represents adoption of sustainable products among 100 respondents out of which 85 have adopted sustainable products i.e. 85% and 15 have not adopted i.e. 15%.

### 7. TYPES OF SUSTAINABLE PRODUCTS ADOPTED.

CHART NO. 7



Source: Primary Data

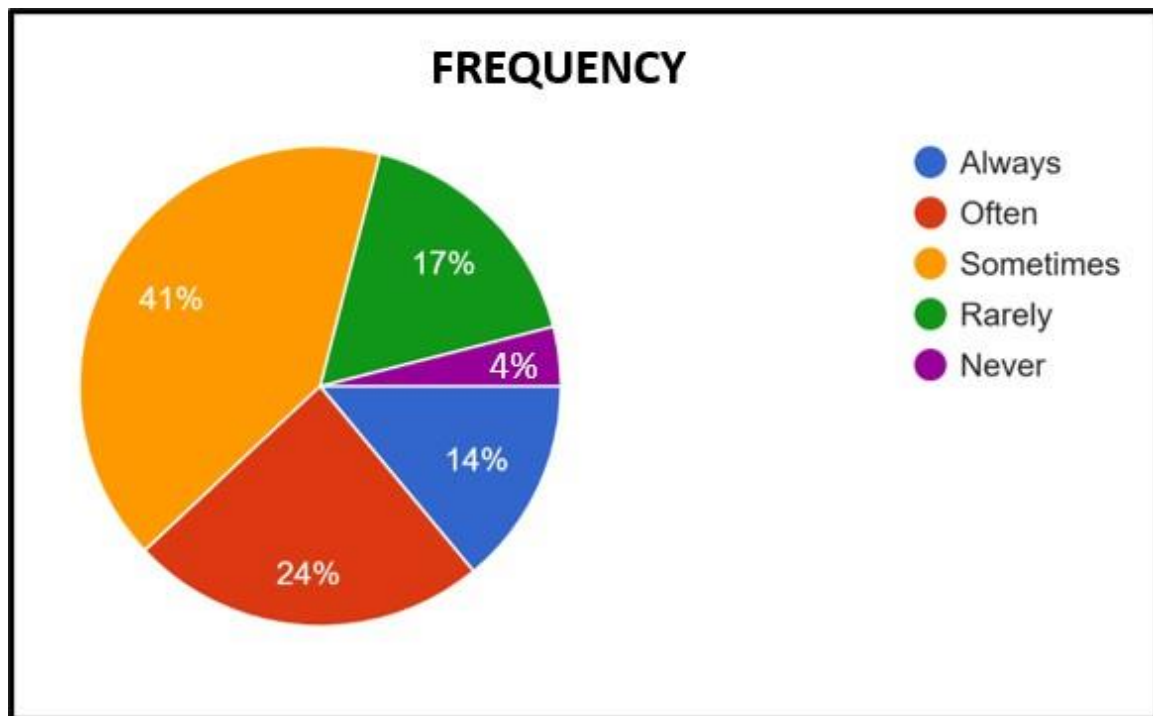
### INTERPRETATION:

The above given chart no. 7 represents types of sustainable products that respondents have adopted. Respondents may have also adopted multiple products. Out of 100 respondents 46 have adopted clothing i.e. 46%, 36 have adopted food products i.e. 36%, 35 have adopted household products i.e. 35%, 38 have adopted personal care items i.e. 38%, 26 have adopted electronic or appliances i.e. 26% and 3 have adopted other products i.e. 3%.



## 8. FREQUENCY OF PURCHASING SUSTAINABLE PRODUCT.

CHART NO. 8



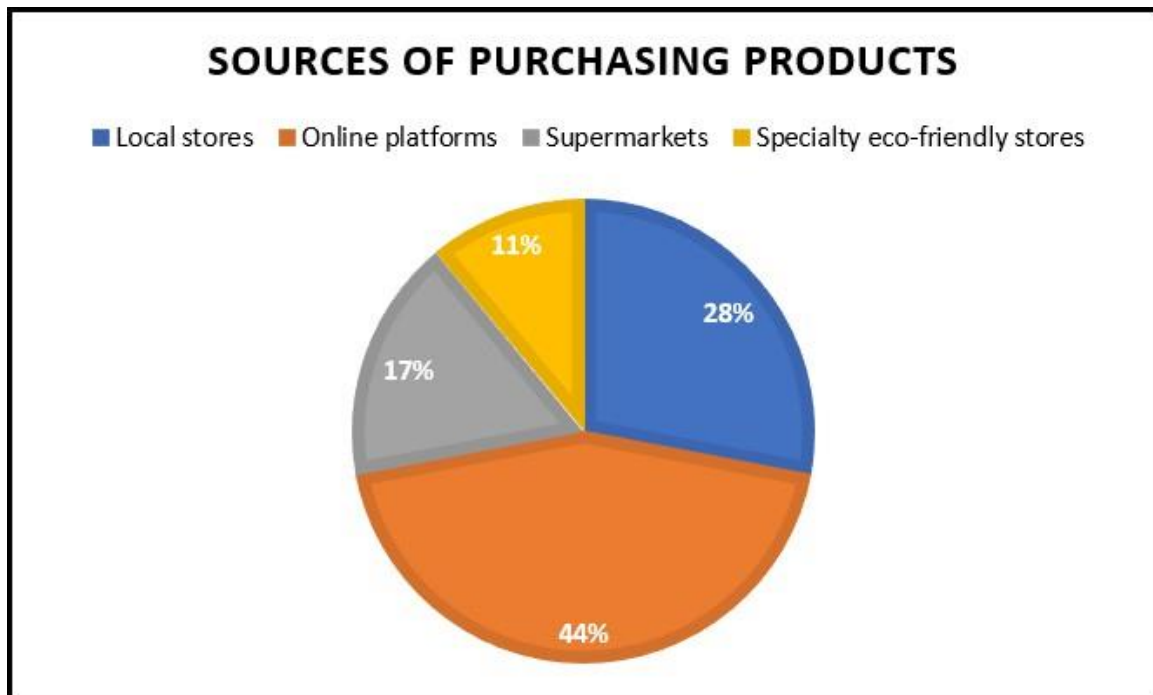
Source: Primary Data

### INTERPRETATION:

The above given chart no. 8 represents frequency of respondents purchasing sustainable products. Out of 100 respondents 14 always purchase sustainable products i.e. 14%, 24 often purchases i.e. 24%, 41 purchases sometimes i.e. 41%, 17 purchases rarely i.e. 17% and 4 never purchases i.e. 4%.

## 9. SOURCES OF PURCHASING SUSTAINABLE PRODUCT.

CHART NO. 9



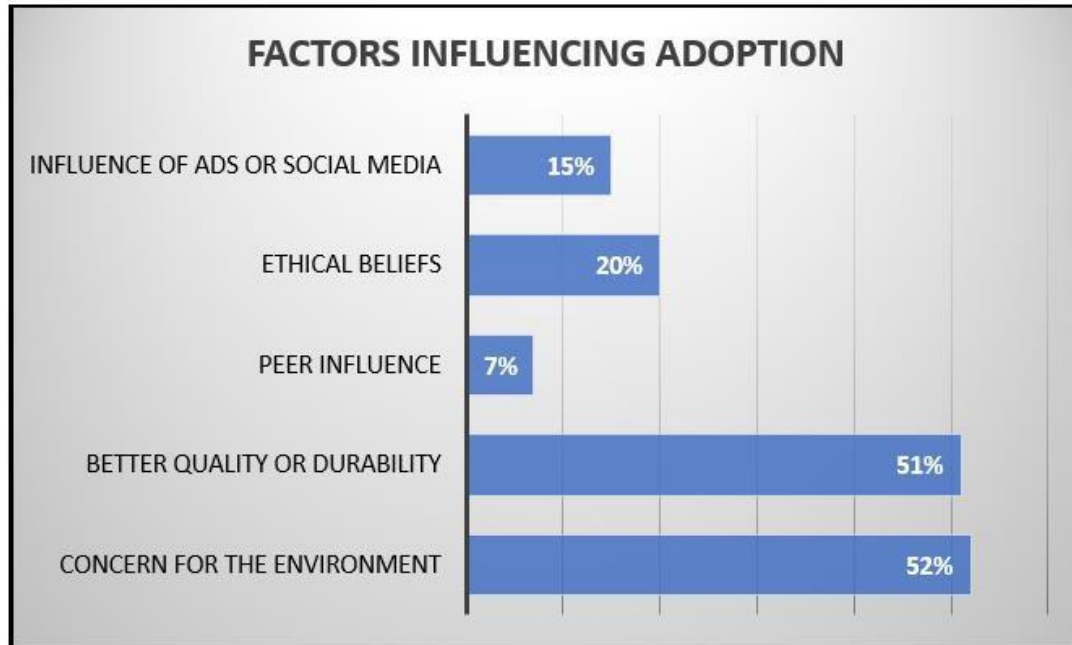
Source: Primary Data

### INTERPRETATION:

The above given chart no. 9 represents sources from where the audience purchases sustainable products. Out of 100 respondents 28 purchases from local stores i.e. 28%, 44 purchases from online platforms i.e. 44%, 17 purchases from supermarkets that is 17% and 11 purchases from specialty eco-friendly stores i.e. 11%.

## 10. FACTORS INFLUENCING SUSTAINABLE PRODUCTS AWARENESS & ADOPTION.

CHART NO. 10



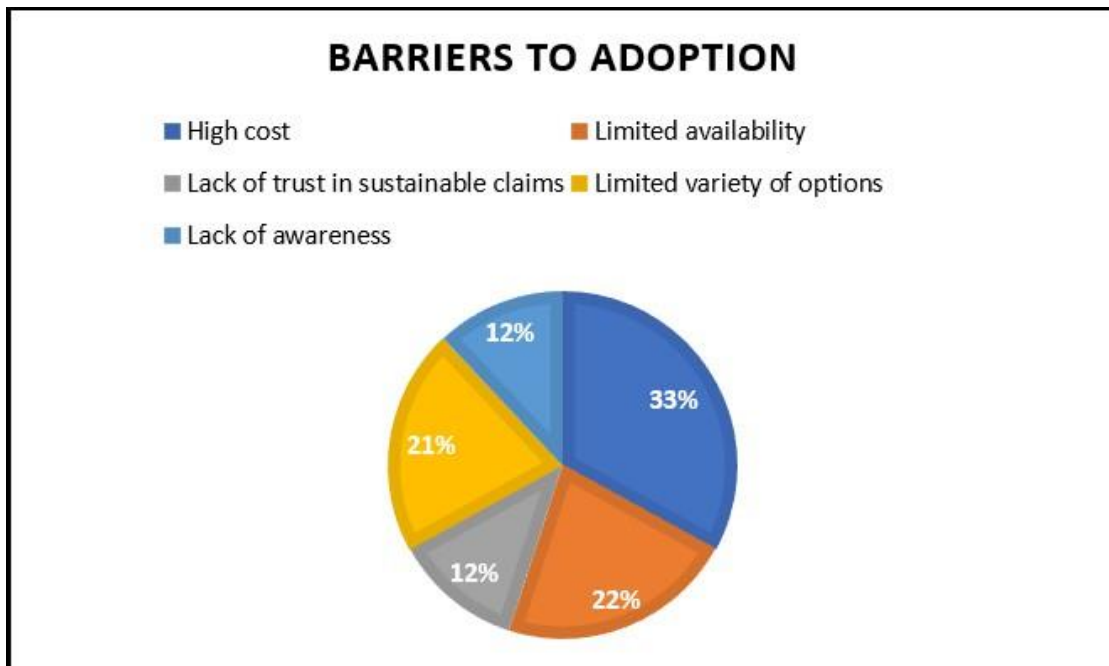
Source: Primary Data

### INTERPRETATION:

The above given chart no. 10 represents factors influencing consumers to adopt sustainable products. Some respondents are getting influenced with more than one factor. Out of 100 respondents 52 adopts sustainable products i.e. 52% because of their concern for the environment. 51 adopts sustainable products i.e. 51% because of its better quality or durability. 7 adopts sustainable products i.e. 7% because of the peer influence. 20 adopts sustainable products i.e. 20% because of their ethical beliefs. 15 adopts sustainable products i.e. 15% because of the influence of Ads or social media.

## 11. BARRIERS TO SUSTAINABLE PRODUCT ADOPTION.

CHART NO. 11



Source: Primary Data

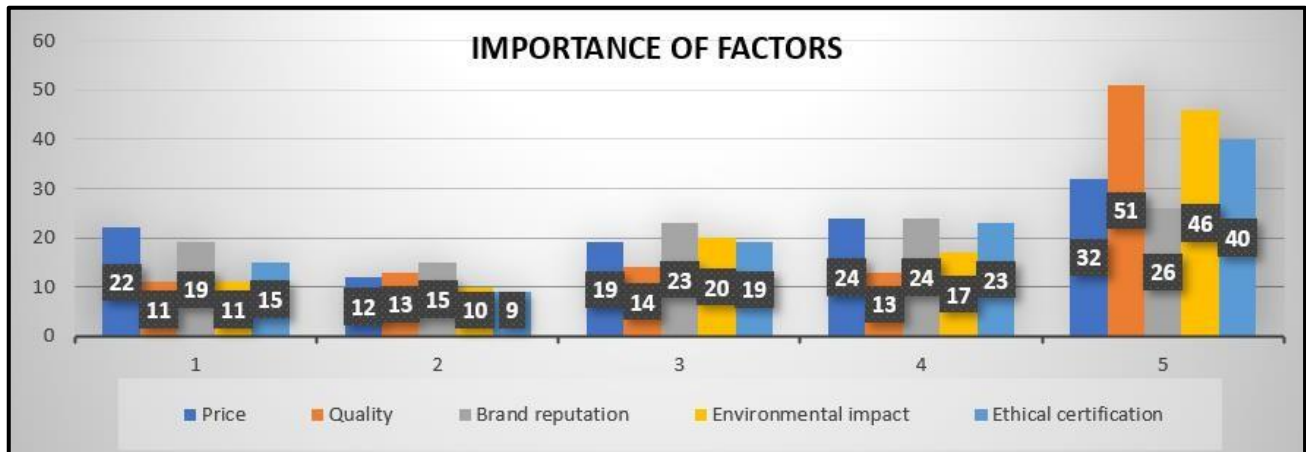
### INTERPRETATION:

The above given chart no. 11 represents barriers to adoption of sustainable products. Out of 100 respondents 33 respondents i.e. 33% finds that high cost is a barrier for adoption of sustainable products. 22 respondents i.e. 22% finds limited availability of products as barriers to adoption. 12 respondents i.e. 12% lacks trust in sustainability claims, 21 respondents i.e. 21% finds limited variety of options as barriers to adoption and 12 respondents i.e. 12% are having lack of awareness which leads in barriers to adoption.

## 12. IMPORTANCE OF FACTORS IN SUSTAINABLE PRODUCT SELECTION.

[1 to 5 - 1=not important, 5=very important]

CHART NO. 12



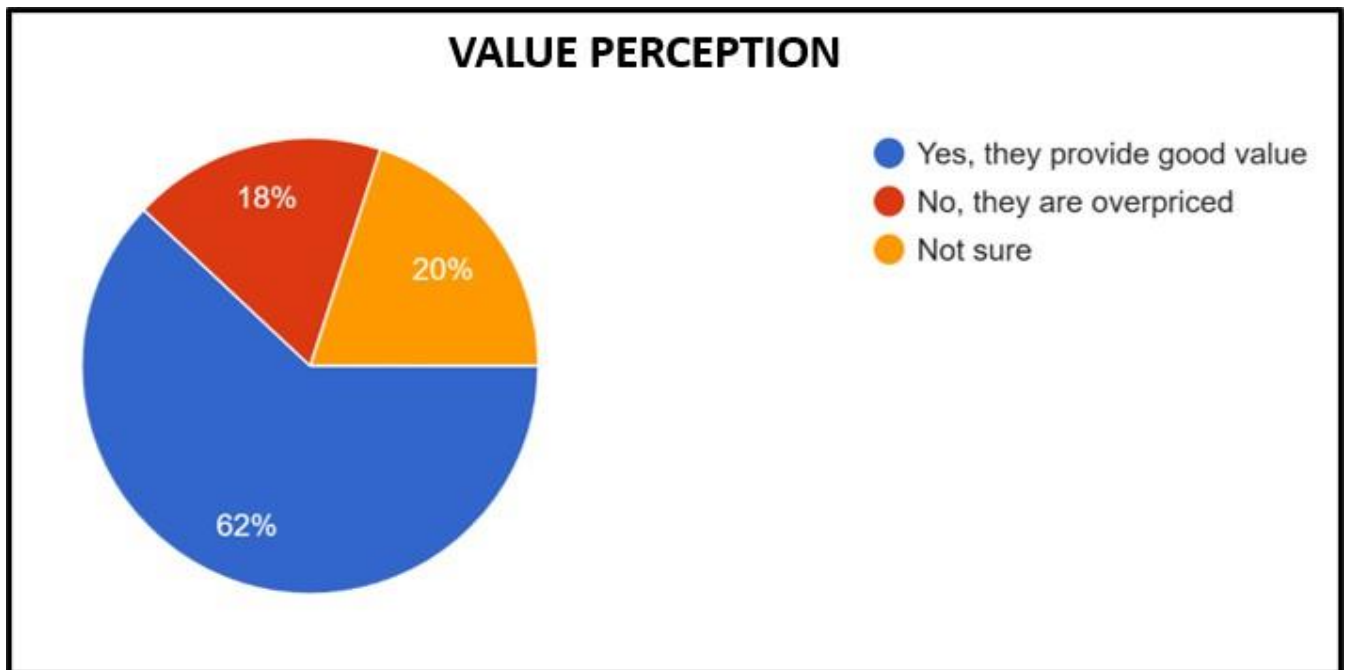
Source: Primary Data

### INTERPRETATION:

The above given chart no. 12 represents importance of factors in selecting sustainable products. 32 respondents find price a very important factor in selection of sustainable products. 51 respondents find quality very important in selection of sustainable products. 26 respondents find brand reputation is also a very important in the selection of sustainable products. 46 respondents find environmental impact a very important factor when selecting a sustainable product. 40 respondents find ethical certification also a very important factor in selection of sustainable products.

### 13. VALUE PERCEPTION OF SUSTAINABLE PRODUCTS.

CHART NO. 13



Source: Primary Data

#### INTERPRETATION:

The above given chart no. 13 represents value perception of sustainable products. Out of 100 respondents 62 respondents i.e. 62% thinks that sustainable products provide good value, 18 respondents i.e. 18% thinks that sustainable products are overpriced and 20 respondents i.e. 20% are not sure whether sustainable products provide good value or are they overpriced.

## **OBJECTIVE WISE FINDING**

Objective of the study	Findings
1. To assess the level of consumer awareness and adoption of sustainable products.	The above chart no. 3 represents awareness about sustainable products among 100 respondents out of which 96 respondents i.e. 96% are aware of sustainable products and 4 i.e. 4% are not aware about sustainable products and the above given and chart no. 6 represents adoption of sustainable products among 100 respondents out of which 85 have adopted sustainable products i.e. 85% and 15 have not adopted i.e. 15%.
2. To identify the factors influencing consumer awareness and adoption of sustainable products.	The above given chart no. 10 represents factors influencing consumers to adopt sustainable products. Some respondents are getting influenced with more than one factor. Out of 100 respondents 52 adopts sustainable products i.e. 52% because of their concern for the environment. 51 adopts sustainable products i.e. 51% because of its better quality or durability. 7 adopts sustainable products i.e. 7% because of the peer influence. 20 adopts sustainable products i.e. 20% because of their ethical beliefs. 15 adopts sustainable products i.e. 15% because of the influence of Ads or social media.

## **CONCLUSION**

This study provides insights into consumer perceptions, adoption patterns, and barriers to sustainable products. While **96% of respondents (aged 18–28) are aware** of sustainable products, adoption is slightly lower at **85%**, indicating that factors beyond awareness influence purchasing. **Females (63%)** show a higher inclination toward sustainability than **males (37%)**, reflecting differences in environmental concern. **Students (55%)** form the largest consumer segment, followed by professionals (25%), with higher-income individuals (above ₹45,000) constituting the majority of adopters (39%), highlighting affordability as a key factor.

Despite familiarity with **sustainable clothing (69%)** and household products (57%), adoption rates remain lower at **46% and 35%**, respectively. **Social media (58%)** plays a major role in shaping awareness, while traditional sources like TV and news (7%) have minimal impact. Key adoption drivers include **environmental concern (52%)** and **product quality (51%)**, while barriers include **high cost (33%)**, **limited availability (22%)**, and **trust issues (12%)**.

Consumers prioritize **quality (51%)**, **environmental impact (46%)**, and **price (32%)** when selecting sustainable products. Ethical certifications (40%) and brand reputation (26%) also influence decisions. While **62% believe sustainable products provide good value**, **18% find them overpriced**, and **20% are uncertain**, indicating a need for clearer cost-benefit communication.

Overall, while awareness is high, adoption is hindered by affordability, accessibility, and trust issues. Businesses and policymakers must enhance **cost-effectiveness, product availability, transparent labeling, and digital marketing strategies** to drive widespread sustainable consumption.

## **SUGGESTIONS**

- **Enhance Affordability** – Businesses should adopt cost-reduction strategies such as bulk discounts, local sourcing, and economies of scale, while governments can provide tax benefits and subsidies to lower production costs and make sustainable products more competitively priced.
- **Improve Availability** – Expanding retail partnerships with supermarkets and e-commerce platforms, optimizing supply chains, and increasing in-store visibility through targeted promotions can enhance accessibility and encourage consumer adoption.



- **Increase Awareness** – Companies and policymakers should implement digital marketing campaigns, influencer collaborations, and educational workshops to highlight the benefits of sustainable products. Eco-labels and QR codes on packaging can provide transparency on environmental impact.
- **Ensure Product Credibility** – Businesses must adopt recognized certifications (e.g., USDA Organic, Fair Trade, FSC-certified) and use blockchain-based transparency to verify sustainability claims. Third-party endorsements from environmental organizations can further build trust.
- **Strengthen Government Support** – While direct consumer adoption is mainly influenced by price and availability, governments should implement carbon taxes, sustainability regulations, and plastic waste policies to encourage businesses to adopt eco-friendly practices.
- **Integrate Sustainability into Public Infrastructure** – Though not a primary consumer driver, governments should invest in eco-friendly urban development, smart cities, and circular economy initiatives to create a long-term ecosystem that promotes sustainable consumption.

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# **“A Study on Impact of Artificial Intelligence on Small CA firms and Tax Consultants in Mumbai Region”**

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## **Abstract**

This study examines the impact of Artificial Intelligence (AI) on the efficiency, productivity, and service quality of small Chartered Accountant (CA) firms and tax consultants in the Mumbai region. A survey of 60 respondents provides insights into the benefits and challenges of AI adoption in this sector. The findings suggest that AI significantly enhances workflow efficiency, reduces errors, and improves client satisfaction, ultimately contributing to revenue growth. However, the study also highlights the need for awareness, training, and support to address the challenges of AI adoption in small CA firms and tax consultants.

Keywords: Artificial Intelligence, Small CA Firms, Tax Consultants, Mumbai Region, Accounting, Taxation.

## **Introduction**

In today’s time, we all are familiar with term artificial intelligence. The increased penetration of smartphones and access to high-speed internet has led to use of artificial intelligence in almost every field such as social media, science and technology, IIT, Marketing and many more. Impact of ai has been seen in multiple fields and we had also heard about its helpfulness and how it is replacing the multiple human roles with its technology. Let us focus on about its requirement in accountancy field.

**‘THE WORLD’S FIRST AI ACCOUNTANT IS NYRA’.** Nyra assists your dedicated accountant in reconciling accounts, and classifying transactions to keep your books updated in real-time faster and with higher precision. The integration of AI technologies into Chartered

Accountants firms' operations enables them to deliver more efficient, accurate, and value-added services to their clients while improving internal processes and decision-making capabilities AI involves several significant changes for Chartered Accountant (CA) firms. These changes affect various aspects of their operations, from workflows and client interactions to decision-making processes and skill requirements.

AI-Technology such as machine learning, AI cloud computing and data, Automation Repetitive Task, Data entry and reconciliation, Invoice Processing and Document Management helps accountants to ease their regular activities without any error and complications. AI in accountancy can be work as a gamechanger with enhancing technology. Some artificial intelligence tools used by CA firms and tax consultants:

### **Audio and Video AI Tools**

- VoicePen AI: Converts audio content into written text, saving time on transcription tasks.
- Krisp: Eliminates background noise and improves call quality for online meetings.
- Beatoven: Creates custom royalty-free music for presentations or videos.
- Cleanvoice: Edits podcast episodes automatically, removing background noise or echo.
- PodCastle: Records high-quality audio from computers, turning them into professional recording studios.
- Vidyo: Turns long-form content into short-form videos.
- Maverick: Generates personalized videos at scale.
- Soundraw: Creates original music for presentations or videos.

### **Tax and Accounting AI Tools**

- UltraTax CS: Automates tax workflow and provides powerful tools for tax preparation.
- SurePrep TaxCaddy: Automates tax preparation tasks, such as obtaining client data and preparing returns.
- Checkpoint Edge with CoCounsel: Provides AI-powered tax research assistance.
- Practice Forward: Offers advisory services, including proposal templates, pricing calculators, and checklists.

- Wolters Kluwer's AI-enabled solutions: Provides various AI-powered tools for tax and accounting professionals.

## **Problem Of Statement**

Artificial intelligence has brought forth numerous benefits and advancements in various fields, it also presents several risks that needs to be addressed. This problem statement aims to address issues such as impact and access to AI-powered tools, the quality of outcomes achieved through artificial intelligence, and the risk and difficulties of this tools faced and how it helped in enhancing the work load.

The research question as identified are:

- Is there any impact of Artificial Intelligence on small ca firms or tax consultants?
- Does artificial intelligence is useful for you?
- Do you have faced any challenges while adoption of artificial intelligence?

## **Objective of the study:**

- To study the impact of Artificial Intelligence on small ca firms and tax consultants in Mumbai region.
- To study the usefulness of Artificial Intelligence in accounting field.
- To study the challenges faced by accountants with adoption of Artificial Intelligence.

## **Significance of the Study**

This study is significant because it contributes to the existing literature on the impact of Artificial Intelligence (AI) on the accounting and tax consulting profession, particularly in the context of small Chartered Accountant (CA) firms and tax consultants. The findings of this study have practical implications for small CA firms and tax consultants, providing them with insights into the benefits and challenges of AI adoption. Furthermore, the study's findings can inform policymakers and regulators in developing strategies to support the adoption of AI in the accounting and tax consulting profession. Ultimately, the study's results can help small CA

firms and tax consultants to enhance their competitiveness in the market by leveraging the benefits of AI, and improve the quality of services provided to their clients.

## **Review of Literature**

The transformative role of Artificial Intelligence (AI) in elevating the practice of Chartered Accountants (CAs) has been a subject of interest in recent studies. According to **CA Arpit Jain's** study, "The Transformative Role of Artificial Intelligence in Elevating CA Practice," the infusion of AI has emerged as a transformative force, reshaping the landscape for CAs on a global scale. The study concludes that the partnership between human expertise and AI sets a new standard for excellence, fostering success in the evolving landscape. As CAs embrace technology, the future of the profession is likely to be transformative, driven by the partnership between humans and AI.

A similar study by **Dr. Pradip Kumar Das**, "Impact of Artificial Intelligence on Accounting," published on January 28, 2021, aimed to ascertain the impact of AI on accounting operations in various sectors, including financial accounting, management accounting, and effective business. The study concluded that the emergence of AI is an opportunity rather than a challenge in the accounting sector.

Another conceptual paper, "**The Impact of Artificial Intelligence on Accounting Profession**," published in January 2024, emphasized the need for the application of AI in the accounting sector, specifically in areas such as financial accounting, management accounting, early fraud detection, auditing, and cost accounting. The study concluded that the application of AI is becoming increasingly important, particularly in the field of accounting, as the sector needs to step forward with the digital era to survive.

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important, particularly in the field of accounting, as the sector needs to step forward with the digital era to survive.

## **Research Gap and need for present study**

Researchers have come across lots articles and studies relating to the need for a study of impact of ai on accounting fields but there is not much study has been conducted on its practical application of ai on accounting fields. It has been seen there is a need for ai as it would be helpful for the accountants, not only it would support their role but also ease their work. So, this study has focused on practical application of ai by targeting a specific area such as small ca firm and tax consultant within Mumbai region in order to know if there is a practical application of ai and if it is then how it benefits them and what challenges has been faced by them while adoption of such ai technology.

## **Research Methodology**

Introduction: Research methodology is the specific arrangement or strategies used to perceive, select, process, and analyze information regarding a topic. A great research follows a methodical way to deal with catch exact information. . The information should be exact and right. Research begins by representing the right questions and picking an appropriate technique to look at the issue, in process of collecting responses of researcher's questionnaires, the researcher can separate the perceptions to make reasonable judgments.

**Research design:** The research design is descriptive and exploratory in nature.

**Sampling design:** The method of sampling method used in this research are convenience and snowball sampling method.

**Universe of the study:** The universe of this study encompasses all accountants employed in small Chartered Accountant (CA) firms and tax consultants operating within the Mumbai region. The study focuses on accountants who have either adopted Artificial Intelligence (AI) in their work or have not, and explores the benefits and challenges they face in using AI-powered tools and technologies.

**Sample size:** In this study, the researcher has opted for a sample size of 60 Respondents.

**Sources of Data Collection:** This research is based on primary and secondary data.

**Primary Data:** Primary data in this research is collected with the help of well-structured questionnaire, which is designed for CA firms and tax consultants who are aware of AI and how useful it is for them and what are the risks and difficulties they have faced.

**Secondary Data:** In this research, the secondary data is collected from Websites, Thesis, Articles and Journals. Secondary data refers to information that has been collected and compiled by someone else for a different purpose but can be used for new research or analysis.

**Research Instrument:** A research instrument, in the context of scientific inquiry and data collection, refers to a tool or technique used to gather information, data, or evidence for the purpose of conducting research and generating knowledge. The researcher will use online Google form to make the questionnaires and the questionnaires will be in structured form in this study. It is in structured form.

**Statistical Analysis:** The test of significance here used is T-test, ANOVA and Percentage analysis.

### **Hypothesis of the study**

H0 1: There is no impact of Artificial Intelligence on small CA firms and Tax consultants.

Ha 1 : There is an impact of Artificial Intelligence on small CA firms and Tax consultants.

H0 2: There is no significant difference in the satisfaction of accountants towards artificial intelligence tools on the basis of gender.

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H0 3: There is no significant difference in the satisfaction of accountants towards artificial intelligence tools on the basis of age.

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## Data Analysis and Interpretation

**Figure No. 1**

The Table showing the frequency distribution of age of respondents

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	24	40.0	40.0	40.0
	30-40	24	40.0	40.0	80.0
	40-50	12	20.0	20.0	100.0
	Total	60	100.0	100.0	

**Interpretation:** In the Above Table No. 1, Showing the Age wise distribution of respondents. The data reveals a bimodal distribution of age groups, with 24 individuals (40%) falling between 20-30 years old and another 24 individuals (40%) falling between 30-40 years old. The least common age group is 40-50, with 12 individuals (20%) represented. This suggests that the sample is relatively young, with most individuals falling between 20-40 years old. The cumulative percentage indicates that 40% of the sample is between 20-30 years old, 80% is between 20-40 years old, and 100% is between 20-50 years old.

**Figure No.2**

The Table showing the frequency distribution of gender of respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	36	60.0	60.0	60.0

	<b>Female</b>	<b>24</b>	<b>40.0</b>	<b>40.0</b>	<b>100.0</b>
	<b>Total</b>	<b>60</b>	<b>100.0</b>	<b>100.0</b>	

**Interpretation:** In the Above Table No.2, Showing the Gender wise distribution of respondents. The data showing that out of a total of 60 individuals, 36 (60%) are male and 24 (40%) are female. This indicates that the sample has a slightly higher proportion of males than females.

**Figure No. 3**

The table showing frequency distribution of Occupation of the respondent of the study

<b>Occupation</b>					
		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>Valid</b>	<b>Chartered Accountant</b>	<b>16</b>	<b>26.7</b>	<b>26.7</b>	<b>26.7</b>
	<b>Tax Consultant</b>	<b>24</b>	<b>40.0</b>	<b>40.0</b>	<b>66.7</b>
	<b>Auditor</b>	<b>12</b>	<b>20.0</b>	<b>20.0</b>	<b>86.7</b>
	<b>Other</b>	<b>8</b>	<b>13.3</b>	<b>13.3</b>	<b>100.0</b>
	<b>Total</b>	<b>60</b>	<b>100.0</b>	<b>100.0</b>	

**Interpretation:** In the Above Table No. 3, The data showing the distribution of occupations among the 60 individuals in the sample. The most common occupation is Tax Consultant, with 24 individuals (40%) representing this group. Chartered Accountant is the second most common occupation, with 16 individuals (26.7%). Auditor and Other occupations make up 20% and 13.3% of the sample, respectively. The cumulative percentage showing that 26.7% of the sample are Chartered Accountants, 66.7% are either Chartered Accountants or Tax Consultants, and 86.7% are either Chartered Accountants, Tax Consultants, or Auditors.

**Figure No. 4**

The Table showing frequency distribution of Respondents using AI powered tools in accounting practice

Are you currently using AI-powered tools in your accounting practice?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	49	81.7	81.7	81.7
	No	11	18.3	18.3	100.0
	Total	60	100.0	100.0	

**Interpretation:** In the Above Table No.4, The data reveals a significant trend in the adoption of AI-powered tools in accounting practices. A staggering 81.7% of respondents confirmed that they are currently utilizing AI-powered tools, while only 18.3% reported not using them. This widespread adoption suggests that AI-powered tools have become an essential component of the accounting profession, enabling practitioners to enhance efficiency, accuracy, and productivity.

**Figure No. 5**

The table showing frequency distribution of current level adoption of ai in small ca firms and tax consulting practices.

What is the current level of adoption of AI in small CA firms and tax consulting practices?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High	13	21.7	21.7	21.7
	Medium	31	51.7	51.7	73.3
	Low	14	23.3	23.3	96.7
	Very Low	2	3.3	3.3	100.0
	Total	60	100.0	100.0	

**Interpretation:** In the Above Table No.5, showing frequency distribution of current level adoption of ai in small ca firms and tax consulting practices he current level of adoption of Artificial Intelligence (AI) in small Chartered Accountant (CA) firms and tax consulting

practices reveals a mixed landscape. While a significant proportion (73.3%) of firms have a medium to high level of AI adoption, indicating a growing recognition of AI's benefits, a notable segment (26.6%) reports a low or very low level of adoption.

**Figure No. 6**

The table Showing frequency distribution of respondent's satisfaction with current level of AI adoption.

<b>How satisfied are you with the current level of AI adoption in your accounting practice?</b>					
		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>Valid</b>	<b>Very satisfied</b>	<b>14</b>	<b>23.3</b>	<b>23.3</b>	<b>23.3</b>
	<b>Satisfied</b>	<b>27</b>	<b>45.0</b>	<b>45.0</b>	<b>68.3</b>
	<b>Neutral</b>	<b>17</b>	<b>28.3</b>	<b>28.3</b>	<b>96.7</b>
	<b>Dissatisfied</b>	<b>2</b>	<b>3.3</b>	<b>3.3</b>	<b>100.0</b>
	<b>Total</b>	<b>60</b>	<b>100.0</b>	<b>100.0</b>	

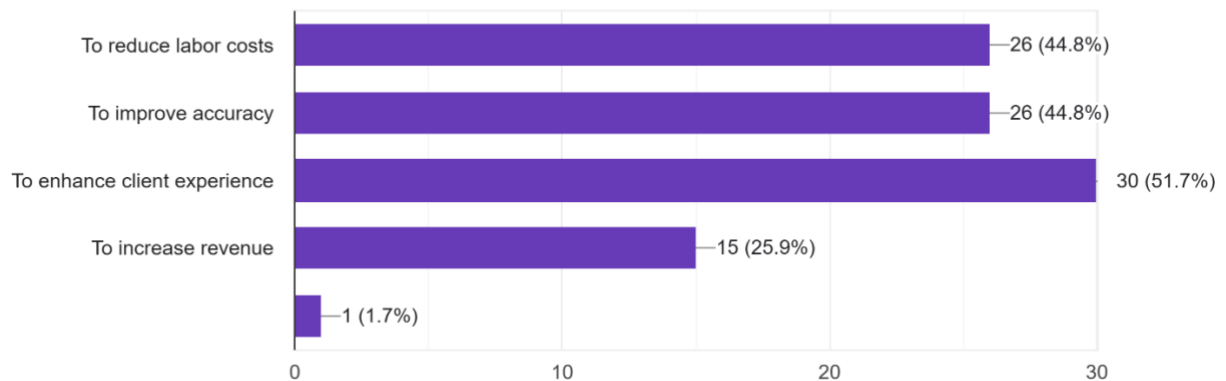
**Interpretation:** In the Above Table No.6, showing frequency distribution of respondent's satisfaction with current level of AI adoption. The majority of respondents (68.3%) expressed satisfaction with the current level of Artificial Intelligence (AI) adoption in their accounting practice, with 23.3% reporting being very satisfied and 45% satisfied. A significant proportion (28.3%) remained neutral, indicating a need for further education or awareness about AI's benefits. Only a small minority (3.3%) expressed dissatisfaction with the current level of AI adoption.

**Figure No.7**

The chart showing the frequency distribution of respondents as per the primary benefit of using ai tools.

### What is the primary benefit of using AI-powered chatbots in accounting?

58 responses



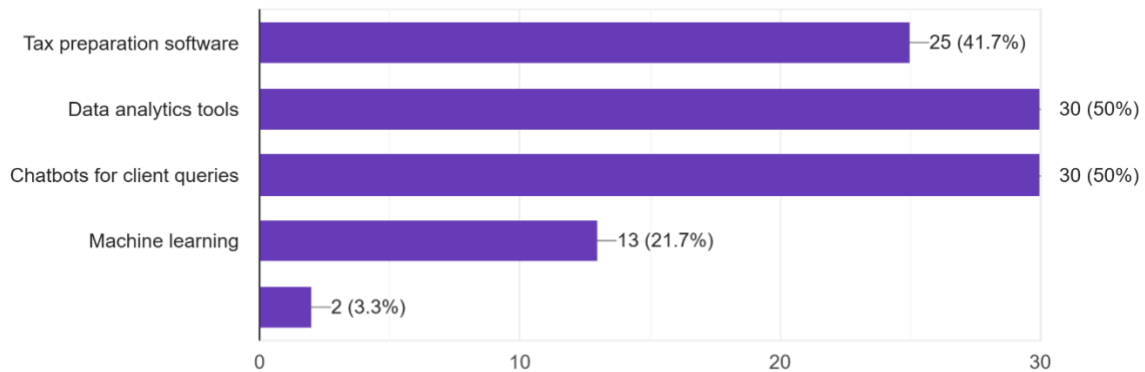
**Interpretation:** In the Above Chart No.7, showing frequency distribution about the primary benefit of using AI-powered chatbots in accounting, according to the respondents, the primary benefits of using AI-powered chatbots in accounting are centred around enhancing client experience and increasing revenue. A significant 51.7% of respondents believe that AI-powered chatbots can greatly improve client experience, providing better support and services, leading to increased satisfaction and loyalty. Closely following, 44.8% of respondents see AI-powered chatbots as a means to increase revenue, generating new business opportunities and improving financial performance through efficient and effective client interactions. Additionally, 25.9% of respondents believe that AI-powered chatbots can help reduce labour costs by automating routine tasks and freeing up staff to focus on higher-value activities. However, only a small minority of 1.7% see improving accuracy as a primary benefit.

**Figure No. 8**

The chart shows the frequency distribution of respondents as per the types of AI tools that are more beneficial to them.

What types of AI tools do you find most beneficial in your work or studies?

60 responses



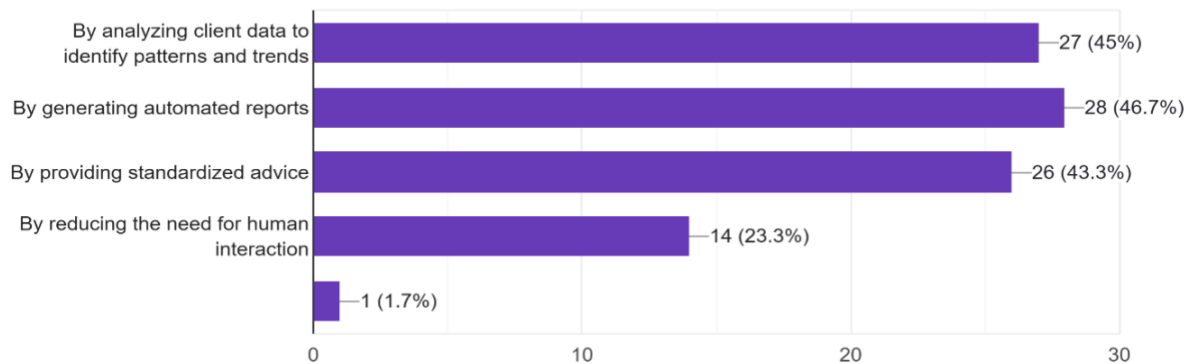
**Interpretation:** In the Above Chart No. 8, It showing the types of AI tools that are beneficial for the respondents in their work, Most widely used AI-powered tools among respondents are Machine Learning (50%), chatbots for client queries (50%), tax preparation software (41.7%). While data analytics tools and other tools are less commonly used with 21.7% and 3.3% adoption rates, respectively.

**Figure No. 9**

The chart showing the frequency distribution of respondents that how AI help them to provide more personalized services to the clients.

How can AI help accountants provide more personalized services to clients?

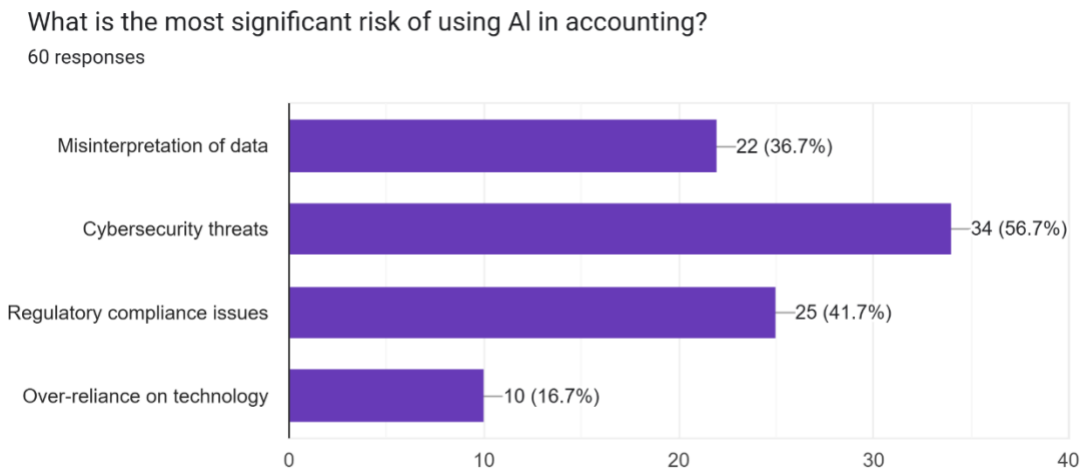
60 responses



**Interpretation:** In the Above Chart No. 9, It showing the frequency distribution of respondents that how AI help them to provide more personalized services to the clients. The most popular AI-powered tools among respondents are dominated by three key technologies: Machine Learning and chatbots for client queries, both with a 50% adoption rate, and tax preparation software, used by 41.7% of respondents. In contrast, data analytics tools and other AI-powered tools are less widely adopted, with usage rates of 21.7% and 3.3%, respectively. This suggests that respondents are primarily leveraging AI to enhance client interactions, automate tax preparation, and apply machine learning capabilities, while data analytics and other tools are still emerging in terms of adoption.

**Figure No.10**

The chart showing the frequency distribution of respondents about the most significant risk of using AI in accounting.



**Interpretation:** In the Above Chart No. 10, showing the frequency distribution of respondents about the most significant risk of using AI in accounting. The adoption of Artificial Intelligence (AI) in accounting raises several key concerns among respondents. The top worries include cybersecurity threats, cited by 56.7% of respondents, who fear that AI systems may be vulnerable to hacking and data breaches. Regulatory compliance issues are also a significant concern, with 41.7% of respondents worried about navigating the complex and evolving regulatory landscape surrounding AI. Additionally, 36.7% of respondents are concerned about the potential for misinterpretation of data, highlighting the need for accurate and reliable data

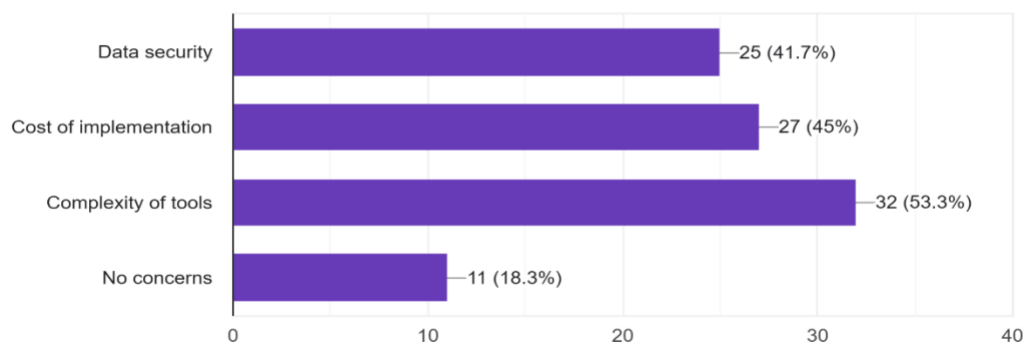
analysis. While a smaller but still notable proportion of respondents (16.7%) expressed concerns about over-reliance on technology, suggesting that some accounting professionals are cautious about relying too heavily on AI and automated systems.

**Figure No. 11**

The chart showing the frequency distribution of respondents about their biggest concern regarding AI implementation.

What is your biggest concern regarding AI implementation?

60 responses



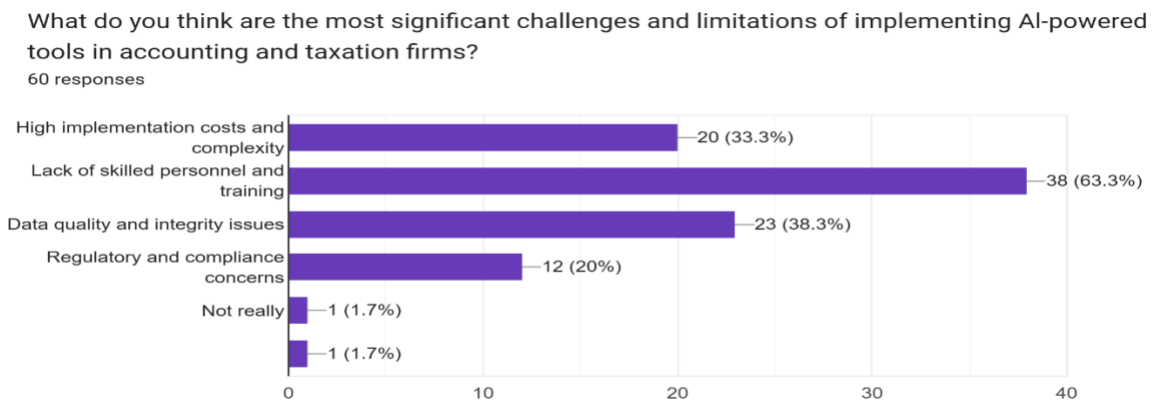
**Interpretation:** In the Above Chart No. 15, showing the frequency distribution of respondents about their biggest concern regarding AI implementation.

The adoption of Artificial Intelligence (AI) in accounting is hindered by several significant barriers, according to the respondents. The top obstacles to AI adoption are the cost of implementation, cited by 53.3% of respondents, who are deterred by the high upfront expenses associated with integrating AI solutions. The complexity of AI tools is another major barrier, with 45% of respondents finding it challenging to navigate and utilize these technologies. Data security concerns also weigh heavily on respondents' minds, with 41.7% worried about protecting sensitive client information. Notably, only a small minority of respondents (18.3%) report having no concerns about AI adoption, highlighting the need for addressing these barriers to facilitate wider adoption.



**Figure No. 12**

The chart showing the frequency distribution of respondents about most significant challenges and limitation they face while implementation of AI tools



**Interpretation:** In the Above Chart No. 16, showing the frequency distribution of respondents about most significant challenges and limitation they face while implementation of AI tools. The implementation of Artificial Intelligence (AI) in accounting is fraught with several significant challenges, according to the respondents. The most pressing concern is the high implementation cost and complexity, cited by 63.3% of respondents, who struggle with the financial and technical demands of integrating AI solutions. Data quality and integrity issues are another major hurdle, with 38.3% of respondents worried about ensuring the accuracy and reliability of data used in AI systems. Regulatory and compliance concerns (33.3%) and the lack of skilled personnel and training (20%) also pose significant challenges. Notably, only a tiny fraction of respondents (1.7%) does not perceive any challenges to AI implementation, underscoring the need for addressing these obstacles to ensure successful adoption.

**Figure No. 13**

The Table showing the Anova test

ANOVA					
How satisfied are you with the current level of AI adoption in your accounting practice?					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.225	2	.113	.169	.845
Within Groups	37.958	57	.666		
Total	38.183	59			

**Interpretation:** The ANOVA table analysis reveals that the level of satisfaction with AI in accounting practice has a p-value of 0.845, which exceeds the significance threshold of 0.05. This suggests that there is no statistically significant difference in the satisfaction of accountants towards artificial intelligence tools based on age. In other words, accountants of different age groups exhibit similar levels of satisfaction with AI tools, indicating that age is not a determining factor in shaping their attitudes towards AI adoption in accounting practices. We accept the Null hypothesis

**Figure No. 14**

T-Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Significance	Mean Difference	Std. Error Difference
						One-Sided p		
How satisfied are you with the current level of AI adoption in your accounting practice?	Equal variances assumed	.733	.396	-3.248	58	<.001	-.639	.197
	Equal variances not assumed			-3.199	46.805	.001	-.639	.200

The Table showing the T-Test

**Interpretation:** The T-TEST table analysis reveals a statistically significant difference in the level of satisfaction with AI tools among accountants based on gender, with a p-value of 0.001 that is less than the 5% significance level ( $\alpha = 0.05$ ). This indicates that there is a significant

difference in the satisfaction of male and female accountants towards artificial intelligence tools. Alternate Hypothesis is Accepted

### **Findings of the study**

In this section researcher has presented objective wise results of the study. Findings of qualitative data and observations will be discussed followed by findings of quantitative data.

#### **Age**

The findings on the basis of age showing that Out of 60 respondents, a maximum of 40% fall in the 20-30 age group another 40% fall in the 30-40 age group a minimum of 20% fall in the 40-50 age group.

#### **Gender**

The findings on the basis of gender showing that Out of 60 respondents, the majority (60%) are Male, while the remaining minority (40%) are Female.

#### **Occupation**

The findings on the basis of occupation showing that Out of 60 respondents, the largest proportion (40%) are Tax Consultants, followed by Chartered Accountants (26.7%), Auditors (20%), and a small proportion (13.3%) are in other occupations.

#### **Current Usage of AI powered tools in Accounting Practice**

The findings on the basis of Current Usage of AI powered tools in Accounting Practice showing that Out of 60 respondents, an overwhelming majority (81.7%) say Yes that they are currently using AI-powered in accounting practice, while a small minority (18.3%) say No.

#### **Current level of adoption of AI tools in small CA firm**

The findings on the basis of Current level of adoption of AI tools in small CA firm showing that Out of 60 respondents the majority (51.7%) report a medium level of AI adoption, followed by High (21.7%), Low (23.3%), and a very small proportion (3.3%) report Very Low AI adoption in small CA firms and tax consulting practices.

#### **Satisfaction with the current level of AI adoption in accounting practice**

The findings on the basis of Satisfaction with the current level of AI adoption in accounting practice showing that Most respondents (68.3%) are satisfied (45%) or very satisfied (23.3%) with the current level of AI adoption in their accounting practice. However, a significant minority (28.3%) remain neutral, and a small proportion (3.3%) are dissatisfied.

#### **Primary benefit of using ai tools**

The findings on the basis of primary benefit of using ai tools showing that the primary benefits of using AI-powered chatbots in accounting are: To enhance client experience (51.7%), To increase revenue (44.8%) These two benefits are the most commonly cited, followed by: To reduce labour costs (25.9%) To improve accuracy (1.7%)

### **Types of AI tools that are beneficial**

The findings on the basis of types of AI tools that are more beneficial showing that Most widely used AI-powered tools among respondents are Machine Learning (50%), chatbots for client queries (50%), tax preparation software (41.7%). While data analytics tools and other tools are less commonly used with 21.7% and 3.3% adoption rates, respectively.

### **AI help to provide more personalized services to the clients**

The findings on the basis of AI help to provide more personalized services to the clients showing that the top ways AI is expected to impact accounting services are: Analysing client data to identify patterns and trends (45%), Generating automated reports (46.7%), Providing standardized advice (43.3%), Reducing the need for human interaction is seen as a benefit by 23.3% of respondents.

### **Most significant risk of using AI in accounting**

The findings on the basis of most significant risk of using AI in accounting showing that the top concerns about AI adoption in accounting are: Cybersecurity threats (56.7%) Regulatory compliance issues (41.7%) Misinterpretation of data (36.7%), Over-reliance on technology is a concern for 16.7% of respondents.

### **Biggest concern regarding AI implementation.**

The findings on the basis of biggest concern regarding AI implementation showing that The top barriers to AI adoption in accounting are: Cost of implementation (53.3%) Complexity of tools (45%) Data security (41.7%), Only 18.3% of respondents report having no concerns about AI adoption.

### **Most signification challenges and limitation they face while implementation of AI tools**

The findings on the basis of Most signification challenges and limitation they face while implementation of AI tools showing that the top challenges to AI implementation in accounting are: High implementation costs and complexity (63.3%), Data quality and integrity issues (38.3%), Regulatory and compliance concerns (33.3%), Lack of skilled personnel and training (20%), Only 1.7% of respondents do not see any challenges.

## **ANOVA**

The ANOVA table analysis reveals that the level of satisfaction with AI in accounting practice has a p-value of 0.845, which exceeds the significance threshold of 0.05. This suggests that there is no statistically significant difference in the satisfaction of accountants towards artificial intelligence tools based on age. In other words, accountants of different age groups exhibit similar levels of satisfaction with AI tools, indicating that age is not a determining factor in shaping their attitudes towards AI adoption in accounting practices. We accept the Null hypothesis

## **T-TEST**

The T-TEST table analysis reveals a statistically significant difference in the level of satisfaction with AI tools among accountants based on gender, with a p-value of 0.001 that is less than the 5% significance level ( $\alpha = 0.05$ ). This indicates that there is a significant difference in the satisfaction of male and female accountants towards artificial intelligence tools. Alternate Hypothesis is Accepted

## **Conclusion Drawn Based on Findings**

1. The majority of accountants have a positive perception of AI-powered tools in accounting, with the most widely used tools being Machine Learning, chatbots for client queries, and tax preparation software.
2. The top benefits of using AI-powered chatbots in accounting include enhancing client experience, increasing revenue, reducing labor costs, and improving accuracy.
3. The primary concerns about AI adoption in accounting are cybersecurity threats, regulatory compliance issues, misinterpretation of data, and over-reliance on technology.
4. The main barriers to AI adoption in accounting are the high cost of implementation, complexity of tools, data security concerns, and lack of skilled personnel and training.
5. There is no significant difference in the satisfaction of accountants towards AI tools based on age.
6. However, there is a significant difference in the satisfaction of accountants towards AI tools based on gender.

Overall, the analysis suggests that accountants recognize the benefits of AI-powered tools in accounting, but also have concerns and face barriers to adoption. Addressing these concerns and barriers is crucial to promoting wider adoption and effective use of AI in accounting practices.

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# **“The Impact of Artificial Intelligence and Human Intelligence Integration on Enhancing Customer Purchasing Decisions in Online Shopping”**

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## **Abstract**

This study explores how the integration of Artificial Intelligence (AI) and Human Intelligence (HI) impact on customer purchasing decisions in online shopping. It recognizes the unique advantages of both AI and HI, with AI excelling in data processing and automation, and HI contributing crucial elements like emotional understanding, adaptability, and complex reasoning.

Structured questionnaire using Google Forms was used by the research to collect the data. Findings reveal that while AI provides benefits like tailored recommendations and effective customer support, there are concerns about the accuracy and relevance of AI-generated suggestions. Additionally, study highlights the ongoing need for human involvement to deliver personalized interactions and foster customer trust. It concludes that successfully integrating AI and HI can enhance online shopping experiences by leveraging AI's efficiency without replacing humans. The research suggests that businesses should focus on creating integrated systems, provide multi-channel support, and adopt human-centered design principles in AI development to maximize the benefits of integrating AI and HI for better customer purchasing decisions and overall business performance.

**Keywords** Human Intelligence, Artificial Intelligence, Online Shopping, consumer purchasing decisions

## **Introduction**

The emergence of online shopping has transformed how consumers acquire goods and services. With e-commerce's growth, shoppers can now explore and buy products from virtually anywhere and at any time, making online shopping a convenient and efficient choice. The integration of Human Intelligence (HI) and Artificial Intelligence (AI) in this context can further improve customers' purchasing decisions. Human Intelligence plays a crucial role in e-commerce, significantly enhancing online shopping platforms by offering support for complex requirements

and expert guidance on specific products. Also HI contributes cognitive, emotional, and social abilities to the online experience, while Artificial Intelligence is the need and demand of the time for the speed and convenience of customer support, to address specific needs or problems of customers quickly. AI offers personalized suggestions, predictive insights, and effective customer support. The integration of Human Intelligence and Artificial Intelligence can overcome the limitations of both, as they complement each other. This integration facilitates services like live chat or virtual customer support, while human experts can enhance AI-assisted decision-making systems. The integration of HI and AI has been proven to boost customer satisfaction, loyalty, and sales, highlighting its significance in contemporary e-commerce.

### **Objectives**

- To understand how Artificial intelligence and Human intelligence integration enhances customer Purchasing Decisions in Online Shopping.
- To examine the Impact of Artificial intelligence and human intelligence integration on customer purchasing decisions in online shopping.
- To propose recommendations for improving Artificial intelligence and Human intelligence integration that enhance customer purchasing decisions in online shopping.

### **Significance**

This research offers practical application for businesses on effectively integrating AI and HI to improve customer purchasing decisions and enhance the online shopping experience. The results of this study can guide other researchers into AI-HI integration, customer behavior, and online shopping, serving as a basis for further studies. By providing businesses understanding of how AI-HI integration impacts customer purchasing decisions, this research can help businesses achieve greater success, enhance customer satisfaction, and boost revenue.

### **Limitations**

- The study was conducted within a limited timeframe.
- The survey questionnaire for study involves only some known fashion platforms.
- The study is based on quantitative data lacking qualitative data.



## **Research Methodology**

To fulfill the objectives of research, analyzing the data to obtain results will help to understand the level of thinking of people about artificial intelligence and human intelligence integration and impact in enhancing customer purchasing decisions.

- **Primary data source:** - The data is collected through a closed questionnaire i.e. online Google form which includes various types of questions ranging from general queries.
- **Secondary data sources:-** This data is collected from existing research papers, books, journals, resources, and online write-ups.
- **Sampling Techniques:** Convenience Sampling
- **Sample Size:** Data was collected from 100 respondents
- **Extent:** Suburban Mumbai
- **Data Analysis Tools-** Pie Charts, and graphs were used in this study.

## **Literature Review**

**Michael Bennett (2024)**, highlighted the differences between Artificial Intelligence (AI) and Human Intelligence (HI), noting that AI excels in data processing, while HI provides generalization, adaptability, and emotional understanding. Combining their strengths can create more effective systems that enhance human abilities.

**Hasan Beyari and Hatem Garamoun (2021)**, found that AI significantly influences online shopping choices through personalization, chatbots, and virtual assistants, enhancing customer experiences and trust. However, limitations include concerns over AI-generated content authenticity and transparency.

**Dr. Gaurav Jangra, (2022)**, Online shopping allows for a customized experience for every customer. Self-learning AI algorithms can evaluate a user's search and purchase history, along with their preferences and browsing habits, to offer personalized suggestions and a unique shopping experience.

**Sharma & Sheth, (2019)**, AI-driven chatbots and virtual assistants are transforming customer service by offering round-the-clock support and addressing customer questions instantly. These technologies utilize natural language processing to comprehend and address customer inquiries efficiently.

**Bhagat et al.,( 2022)**, AI algorithms analyze consumer data to understand individual preferences and behavior patterns, enabling retailers to tailor product recommendations and marketing messages.

**Xiong (2022)**, examined the impact of AI and digital economy on consumer online shopping behavior, finding that AI-driven predictive analytics helps retailers understand market trends and consumer preferences.

**Ruby et al. (2023)**, conducted a bibliometric analysis of online impulse buying behavior, suggesting that AI technologies such as personalized recommendations and targeted promotions play a critical role in influencing impulse buying decisions.

**Tiutiu and Dabija (2023)**, also emphasized the importance of ethical considerations and customer-friendly technology in AI-driven social media engagements. Their study found that consumers are more likely to trust and engage with brands that use AI ethically and transparently.

**Sharma (2023)**, highlighted the need for responsible and transparent use of AI to address these concerns. Consumers are increasingly aware of data privacy issues, and their trust in AI applications depends on how their data is collected, used and protected.

**Jangra and Jangra (2022)**, examined the ethical implications of AI in online shopping, emphasizing the importance of safeguarding consumer data and ensuring transparency in AI-driven decision-making processes.

**Raji et al. (2024)**, in their review of market trends noted AI-driven personalization not only enhances customer engagement but also fosters loyalty and repeat purchases.

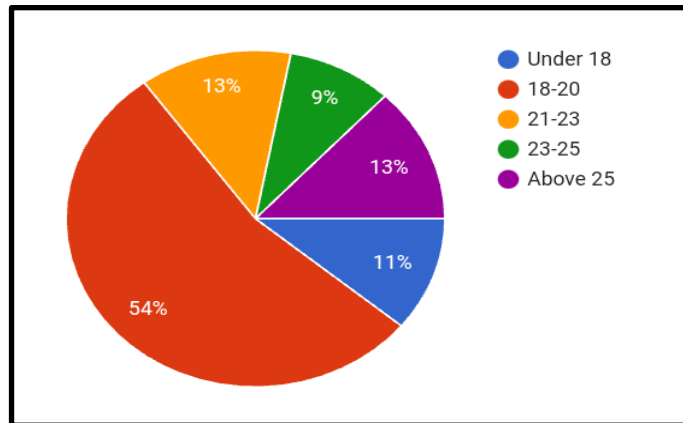
**Wen et al., (2022)**, AI's role in social media engagement strategies has been found to significantly enhance consumer purchase frequency and spending patterns. Underlining the importance of integrating ethical considerations and transparent practices to build consumer trust.

**Sharma (2023)**, highlighted the need for responsible and transparent use of AI to address these concerns. Consumers are increasingly aware of data privacy issues, and their trust in AI applications depends on how their data is collected, used, and protected.

## **Data Collection and Data Analysis**

### **Chart no.1**

#### **AGE**

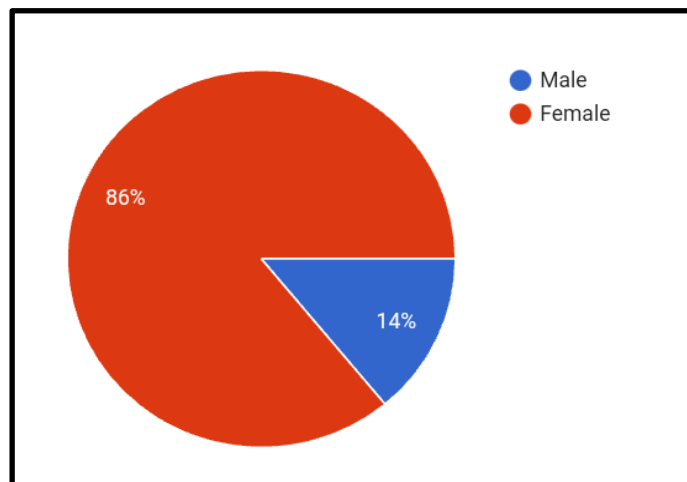


Source: Primary Data

In the above given chart no. 1, the largest age group represented in the data is "Above 25" (54%).

### **GENDER**

**Chart no.2**

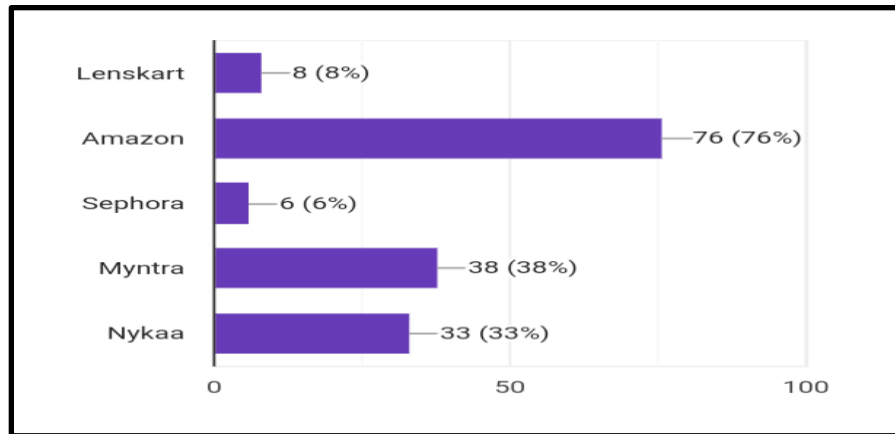


Source: Primary Data

In the above given chart no. 2, the data shows a heavy response of female respondents (86%) compared to male respondents (14%)

### **ONLINE SHOPPING PLATFORMS USED**

**Chart no.3**

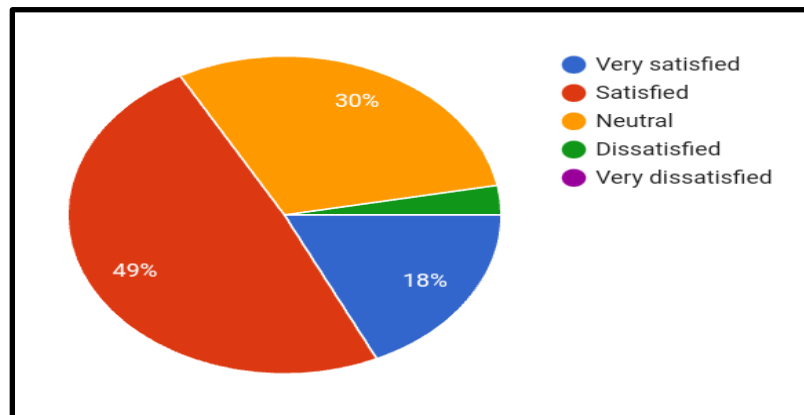


Source: Primary Data

In the above given chart no. 3 Amazon is the most used online shopping platform at 76%. Other platforms mentioned include Myntra (38%), Nykaa (33%), Lenskart (8%), and Sephora (6%).

### **SATISFACTION WITH AI-DRIVEN PRODUCT RECOMMENDATIONS**

**Chart no.4**

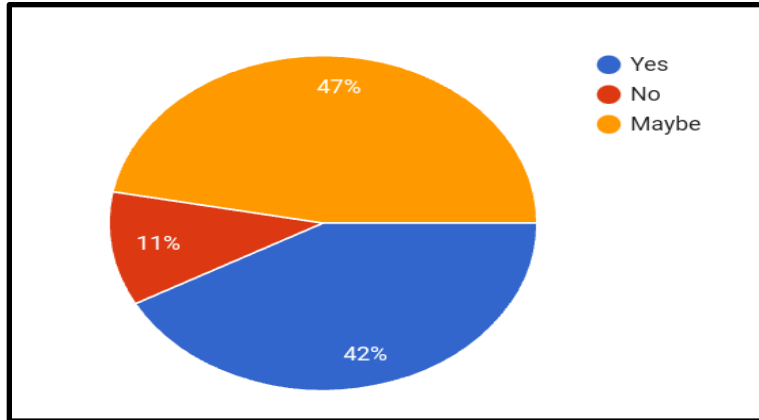


Source: Primary Data

In the above given chart no.4 many respondents expressed neutral to negative feelings about AI-generated product suggestions 30% rated their satisfaction as "Neutral," 18% as "Dissatisfied," and 30% as "Satisfied," with only 49% denoting "Very satisfied".

### **ACCURACY AND RELEVANCY OF AI RECOMMENDED PRODUCTS**

**Chart no.5**

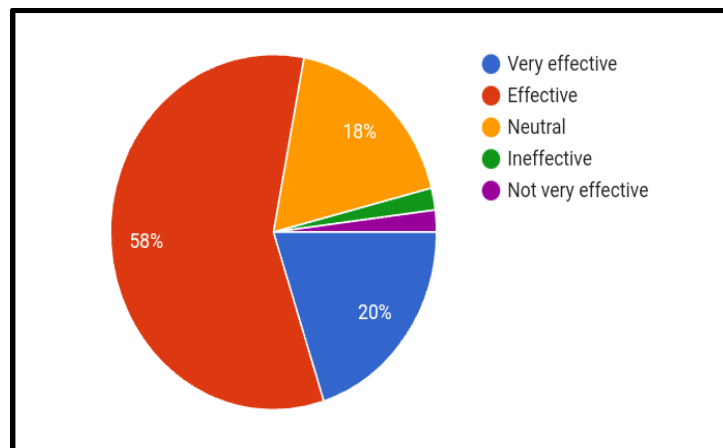


Source: Primary Data

In the above given chart no.5, when asked about the accuracy and relevancy of AI recommendations, 47% of respondents answered "No" and 42% answered "Maybe". This suggests that there are significant concerns about the reliability of AI recommendations. Only 11% answered "Yes."

### **IMPACT OF AI & HI IN ONLINE SHOPPING**

**Chart no. 6**

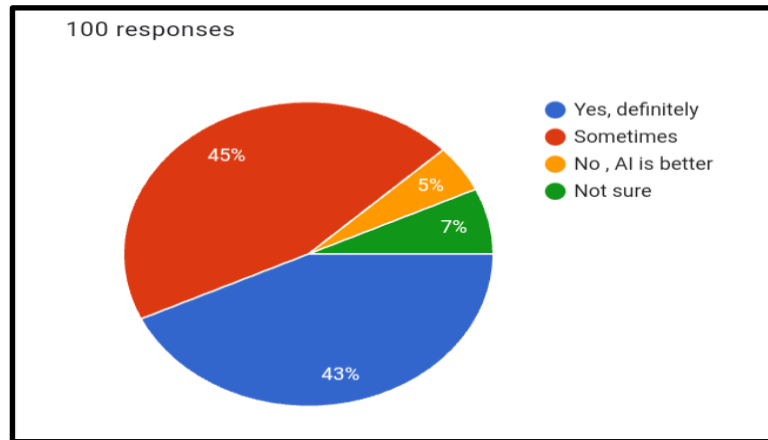


Source: Primary Data

In the above given chart no.6 AI & HI integration is largely viewed as effective for improving the online shopping experience, with 58% rating it as "Effective" and 18% as "Very Effective".

### **COMPARISON BETWEEN AI AND HI PERSONALIZATION OF PRODUCTS RECOMMENDATIONS**

**Chart no. 7**

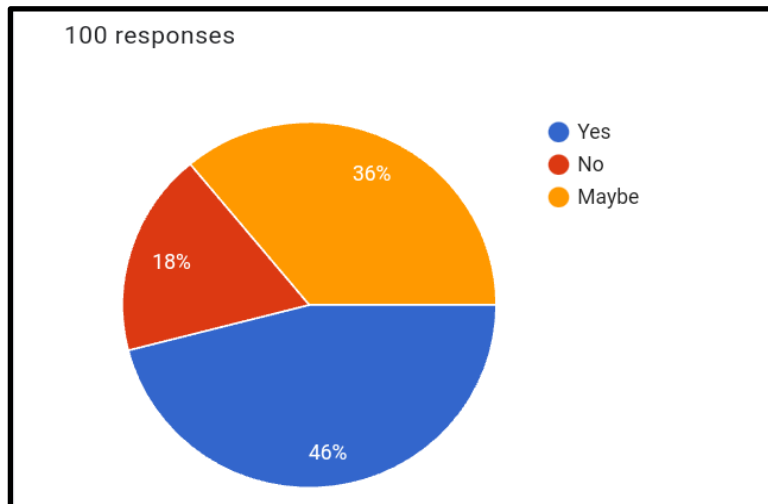


Source: Primary Data

In the above given chart no.7 on comparing personalization capabilities between AI and HI, 45% of respondents affirmed that HI is superior, while 43% said HI is preferable at times. Just 7% believed AI is better.

### **LIKELIHOOD WITH THE PLATFORM THAT USES AI AND HI INTEGRATION**

**Chart no.8**

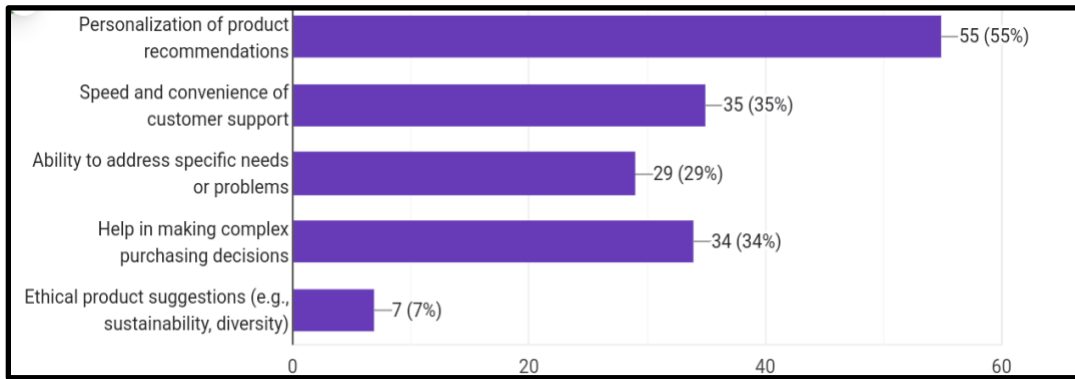


Source: Primary Data

When asked about the likelihood of using a platform that combines AI and HI, 46% replied "Yes," and 36% said "Maybe".

### **WAYS IN WHICH INTEGRATION OF AI AND HI INTEGRATION ENHANCING CUSTOMER PURCHASING DECISIONS**

**Chart no.9**

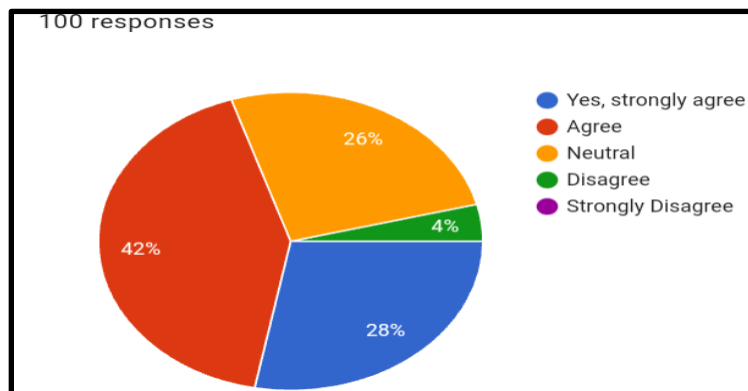


Source: Primary Data

In the above given chart no.9 respondents noted that Integration of HI and AI enhancing purchasing decisions, such as product recommendation personalization (29%), customer support efficiency (55%), addressing specific needs (35%), aiding complex shopping choices (34%), and providing ethical product suggestions (7%). The strongest concerns centered on customer support speed and convenience.

### **BELIEVE THAT INTEGRATING AI AND HI WILL LEAD TO BETTER SHOPPING EXPERIENCE**

**Chart no.10**

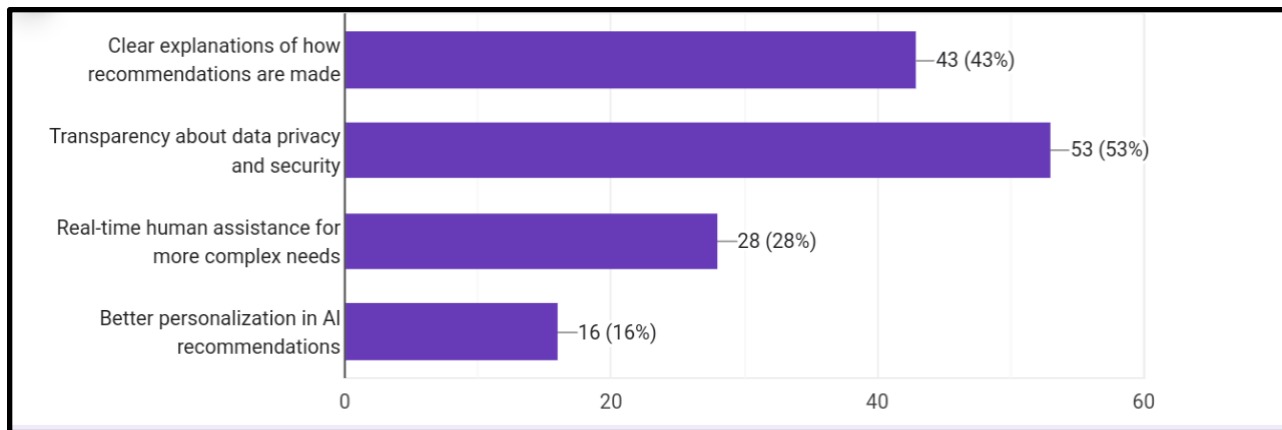


Source: Primary Data

In the above given chart no. 10 ,42% of 100 respondents "strongly agree" that integrating HI and AI will lead to a better overall shopping experience, with 20% "agreeing". This indicates a positive sentiment towards combining both intelligences.

### **THINGS ENCOURAGING TRUST ON AI AND HI INTEGRATION**

**Chart no 11**

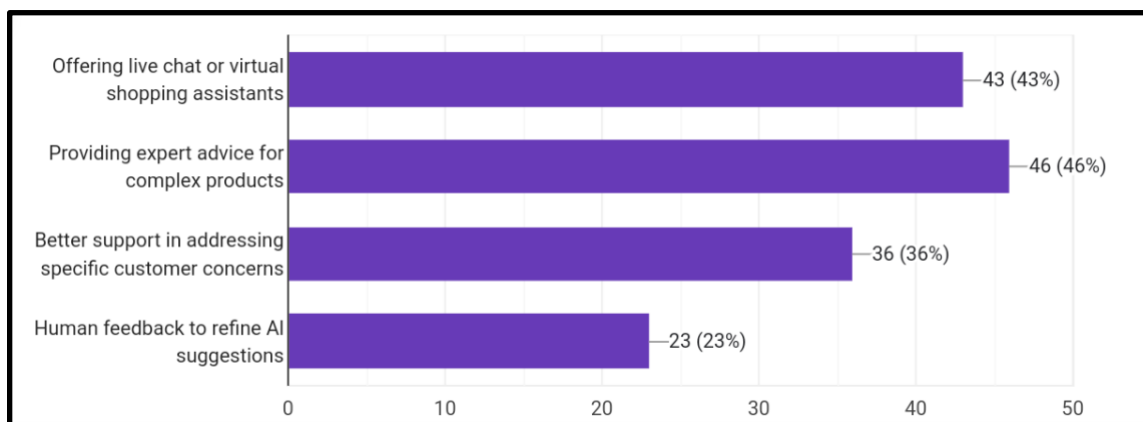


Source: Primary Data

In the above given chart no. 11 respondents indicated trust and clarity about AI generated recommendations (43%) and about data privacy and security (53%). Many consumers feel trusted for real-time human assistance on complex needs (28%).

## **IMPROVEMENT OPPORTUNITIES**

**Chart no.12**



Source: Primary Data

In the above given chart no.12,although AI and HI integration provide quality services still there is a demand for enhanced personalization (16%) and human input to refine AI recommendations (23%). This indicates that AI's personalization capabilities can be improved, and integrating human feedback could boost effectiveness. Also Customers have shown interest in live chat or virtual shopping assistance (23%).

## **Key Findings**



- Many people believe that shopping with AI is a great option but there should not be dependency on AI.
- However, human intelligence is crucial for providing expert advice on complex products and offering real-time assistance. Therefore, integration of human intelligence with artificial intelligence can enhance the overall shopping experience.
- The majority of respondents believe that while AI lacks emotions, human intelligence combined with feelings can improve customer purchasing decisions in online shopping.

### **Recommendations**

- Invest in Platforms for Human-AI integration: Allocate resources to platforms that facilitate integration between humans and allowing individuals to correct AI biases, provide specialized advice, and offer emotional support.
- Provide Multi Channel Support: Offer multiple types of human assistance, including live chat, video calls, phone support, and face-to-face help, to meet the varying preferences and needs of customers.
- Develop Guidelines for Human-Centric AI Design: Formulate design principles for AI that prioritize human needs, values, and emotions, ensuring that AI systems are developed to support and enhance human abilities rather than replace them.
- Create AI systems capable of recognizing and responding to human emotions using natural language processing and sentiment analysis to enrich customer interactions.
- Promote transparency and clarity in AI-driven decisions by sharing clear information with customers about how recommendations are made and how their data is utilized.

### **Conclusion**

In conclusion, the integration of Artificial Intelligence (AI) and Human Intelligence (HI) can enhance customer decision-making in online shopping. The results indicated that AI is proficient at data analysis and performing routine tasks, while HI contributes emotional insight, empathy, and complex decision-making skills. Integrating AI with HI can mitigate their individual shortcomings, leading to tailored product recommendations, effective customer service, and an overall better shopping experience. To maximize the benefits of integrating AI and HI, businesses should invest in systems that promote integration between humans and AI, offer support across

multiple channels, and create standards for AI that prioritize human interests. This approach can enable online retailers to provide seamless, personalized, and user-friendly shopping experiences, boosting customer satisfaction, loyalty, and ultimately, business success. Further studies could involve exploring impact of AI and HI integration on E-commerce and get a deeper insight on the societal effects. Also research can be done on improvement opportunities of AI and HI integration. Each of the above topics can itself offer a lot of opportunities to researchers for further studies.

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# **The Mathematics of Fantasy Sports: Analysing the Probability of Winning Mega Contests**

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## **Abstract:**

This document investigates the mathematics surrounding fantasy sports competitions, particularly the “Mega Contest” type which may have thousands or even millions of participants. We examine how the size of the contest, the strategies used to build lineups, the ability of participants, scoring mechanisms, and other competing factors impact a player's chances of winning. We used concepts of combination, probability, and gaming strategies to create methods for estimating chances of winning and offer guidance on the best approaches to achieve the highest return from these lucrative competitions.

## **Introduction**

### **Fantasy Sports Overview:**

Fantasy sports are online games where participants draft, manage, and compete with virtual teams composed of real-world athletes from sports like cricket, football, basketball, baseball, and more. Each player earns points based on their actual performance in games—rushing yards, goals, runs, wickets, etc. Participants strategize to optimize their rosters, balancing star power with value picks to maximize their scoring potential.

### **Mega Contests:**

Mega Contests are large-scale fantasy competitions with hundreds of thousands or even millions of participants. These contests often feature massive prize pools, sometimes reaching millions of dollars, attracting a global audience. The vast number of entries increases the complexity, as winning requires not only strong player selections but also strategic differentiation from the crowd.

### **Research Motivation:**

Understanding the probability of winning Mega Contests is crucial, especially for those investing significant money or time. With such large participant pools, the probability of success is low, making strategic insights invaluable. Research helps identify patterns, optimize lineups, and manage bankrolls effectively. This analytical approach improves decision-making, enhances competitiveness, and increases the potential for consistent profitability in high-stakes fantasy environments.

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## 2. Key Factors Affecting Probability of Winning

This section covers the main factors that impact the probability of winning a Mega Contest, providing a mathematical and probabilistic analysis for each.

### 2.1 Number of Participants

- Mathematical model for calculating the basic probability of winning based purely on the number of entrants.
- Discussion of the probability of finishing in the top 1% (or another prize tier) in a contest with  $N$  entries.

**Formula:**

$$\text{Odds of Winning} = \frac{1}{N}$$

Where  $N$  is the total number of participants.

### 2.2 Skill Level of Participants

- Differentiating between novice, intermediate, and expert players.
- Probabilistic analysis of how skill-based advantages impact the probability of winning, potentially adjusting the basic probability formula by weighting players' chances based on expertise.

### 2.3 Lineup Constraints

- Explanation of salary caps, positional requirements, and roster constraints (e.g., number of quarterbacks, running backs, etc.).
- Analysis of how these constraints reduce the number of possible lineups and thereby influence player strategy.

### 2.4 Scoring System

- Overview of scoring systems in different fantasy sports (e.g., NFL, NBA).
- Mathematical modeling of how scoring rules affect player choices and the distribution of points across the player pool.

### 2.5 Variance and Randomness

- Explanation of how variance plays a role in fantasy sports outcomes, including the unpredictability of player performance (e.g., injuries, weather, coaching decisions).
- Discussion of the mathematical concept of variance in large contests and its implications for expected outcomes.

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### 3. Lineup Construction and Optimization

#### 3.1 Combinatorics of Lineup Selection

- Mathematical analysis of the number of possible lineups, given the salary cap and player pool.
- Use of **combinatorics** to estimate the number of unique lineups based on constraints (e.g., available positions and salary cap).

**Example Formula for Combinations:**

$$C(n, k) = \frac{n!}{k!(n - k)!}$$

Where **n** is the number of available players and **k** is the number of players to select.

#### 3.2 Exploration of minimizing risk of tying with others by diversifying picks and selecting less popular players who might outperform expectations

- (1) Search for introductory explanations of game theory and its relevance to fantasy sports strategy.
- (2) Find resources discussing the concept of player ownership percentages in fantasy sports and how they influence optimal lineup construction.
- (3) Research strategies for diversifying player selections in fantasy sports to gain an edge over opponents.
- (4) Explore the idea of selecting less popular or "sleeper" players and their potential impact on tournament outcomes in fantasy sports.
- (5) Look for articles or discussions that specifically address minimizing the risk of ties in fantasy sports contests using game theory principles.
- (6) Synthesize the findings from the above searches to create a concise summary explaining how game theory can be used to optimize fantasy sports lineups, focusing on ownership percentages and diversification to reduce the likelihood of ties.

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### 4. Case Study: Probability of Winning in a Fantasy Cricket Game with 10,000,000 Participants

#### **Scenario:**

Consider a fantasy cricket contest with 10,000,000 participants based on an IPL match. Each participant drafts a team of 11 players, earning points from real-time performances (runs, wickets, etc.). The contest offers prizes to the top 100,000 participants.

## Step 1: Basic Probability of Winning

For a single winner:

$$P(\text{Winning}) = \frac{1}{10,000,000} = 0.0000001 \text{ or } 0.00001\%$$

## Step 2: Adjusting for Multiple Prize Tiers

Since 100,000 winners are selected:

$$P(\text{Winning}) = \frac{100,000}{10,000,000} = 0.01 \text{ or } 1\%$$

## Step 3: Considering Skill Factor

If we assume skilled players make up 10% of the participants (1,000,000 people), the effective probability of winning for skilled players becomes:

$$P(\text{Winning for Skilled Players}) = \frac{100,000}{1,000,000} = 0.10 \text{ or } 10\%$$

### Conclusion:

While the raw odds of winning are extremely low (0.00001%) in a massive contest, participants with strong strategies, player analytics, and game insights have a much higher chance (10%) compared to random participants. This highlights the importance of skill in competitive fantasy cricket.

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## 5. Advanced Mathematical Models

### 5.1 Expected Return (ER) Calculation

- Detailed formula for calculating **Expected Value (ER)**, the most important metric for determining the profitability of a contest over time.

**Formula for EV:**

$$EV = \left( \frac{1}{N} \right) \times P - C$$

Where:

- **N** = Total number of entries,
- **P** = Prize for winning,
- **C** = Cost of entry.

## 5.2 The Fundamental Relationship:

The core concept is that higher potential rewards typically come with higher levels of risk. This isn't a universal law in every single instance, but it's a fundamental principle in finance, decision-making, and many other areas.

- **High Reward, High Risk:** Strategies with the potential for significant gains often involve a greater chance of losses. This is because pursuing higher rewards usually means venturing into less certain or more volatile territory.
- **Low Reward, Low Risk:** Conversely, strategies that prioritize safety and stability tend to offer lower potential returns. Think of very low-yield savings accounts – they are extremely safe but don't offer much growth.

Variance as a Measure of Risk:

Variance is a statistical measure of how spread out the possible outcomes of a strategy or investment are. In this context, it directly relates to risk:

- **High Variance:** A high variance strategy means the potential outcomes are widely dispersed. This implies a greater chance of both very high gains *and* very significant losses. It's like flipping a coin where heads wins you a lot of money, but tails loses you a lot too.
- **Low Variance:** A low variance strategy has outcomes clustered closer to the average. This means more predictable results, with less potential for extreme gains or losses.

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## 6. Methodology

### 6.1 Research Design

This study employs a **quantitative research approach** to analyze the probability of winning Mega Contests in fantasy sports. It integrates mathematical modeling, statistical analysis, and simulation techniques to derive insights. The research consists of the following components:

- **Descriptive Analysis:** Understanding the basic structure of Mega Contests, including participant numbers, prize distribution, and scoring systems.
- **Mathematical Modeling:** Applying combinatorics, probability theory, and game theory to model outcomes.
- **Simulation:** Using Monte Carlo simulations to validate theoretical models and assess real-world applicability.

## 7. Strategy: Maximizing Your Probability of Winning

## 7.1 Diversification vs. Leverage

- Explanation of the concepts of **diversification** (spreading out picks across many lineups) and **leverage** (concentrating picks in certain players to gain an edge over competitors).
- Strategy recommendations based on theoretical models and simulation results.

## 7.2 Contrarian and Correlation Strategies

- Analysis of **contrarian strategies** (picking players who are likely to be low-owned) and **correlation strategies** (building lineups that leverage team performance or game scenarios).
- Discussion of how correlation can optimize the outcome (e.g., stacking players from the same team).

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## 8. Conclusion

In conclusion, the exploration of mathematics in fantasy sports reveals its critical role in enhancing strategic decision-making. Key findings highlight how combinatorics, probability theory, game theory, and statistical analysis are fundamental in optimizing team selection, predicting player performance, and managing risks in Mega Contests. These mathematical models allow participants to move beyond intuition, enabling data-driven strategies that improve their chances of success. By applying concepts like Monte Carlo simulations, regression analysis, and probability distributions, players can better assess outcomes, identify value picks, and optimize their lineups under budget constraints. For Mega Contests, where millions of participants compete, these mathematical approaches become even more vital, offering a competitive edge in a high-stakes environment. Future research should focus on integrating advanced machine learning models, such as neural networks and ensemble algorithms, to refine predictive accuracy. Additionally, optimizing strategies for multi-entry contests, where participants can diversify their risk across multiple lineups, remains an area ripe for exploration. Ultimately, the fusion of mathematics, data science, and strategic thinking holds the key to consistent success in the dynamic world of fantasy sports.

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## 9. References

- Include relevant literature on fantasy sports, game theory, combinatorics, Monte Carlo simulations, and statistical analysis in the context of sports contests.
- Reference from Various application Regulations, Terms and Conditions.
- Pointing System of fantasy application.



# Cybersecurity and Ethical Challenges in Norton Antivirus

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## Abstract

Cyber threats such as malware, ransomware, and phishing attacks have surged, making cybersecurity a critical necessity. Norton Antivirus, a well-known security solution, offers AI-powered scanning and real-time threat detection. However, concerns about data privacy, transparency, and business practices raise ethical questions. This paper analyzes Norton's cybersecurity effectiveness, compares it with other antivirus programs, and examines its compliance with privacy laws like the General Data Protection Regulation (GDPR), California Consumer Privacy Act (CCPA), and India's Digital Personal Data Protection Bill (DPDPB). The findings highlight that while Norton provides robust protection, its data collection practices and business strategies require greater transparency. The study emphasizes the importance of ethical cybersecurity solutions that balance innovation with user privacy and regulatory compliance.

## Introduction

The rapid advancement of technology has made cybersecurity an essential aspect of modern life. Cybercriminals use advanced techniques like AI-driven malware and deepfake phishing to exploit vulnerabilities in individuals and organizations. With a growing number of cyberattacks targeting sensitive information, antivirus software has become a necessary defense mechanism. Norton Antivirus is one of the most widely used security solutions, offering protection against malware, phishing, and other cyber threats. According to Statista (2023), Norton holds approximately 13.3% of the global market share in antivirus software, making it a significant player in the industry.

It incorporates features like AI-powered scanning, real-time monitoring, and behavior-based threat detection to provide enhanced security. Despite its effectiveness in guarding users from cyber threats, Norton Antivirus has faced ethical concerns related to data privacy, transparency, and business practices (Cybersecurity Journal, 2023). Users frequently agree to Norton's terms without fully understanding the extent of data collection and how their personal information is managed (ISACA Journal, 2016). Additionally, debates about potential data-sharing with

intelligence agencies and aggressive business strategies such as automatic subscription renewals raise questions about Norton's ethical responsibility (Ahmed, 2023). This research paper aims to analyze Norton's role in modern cybersecurity, compare it with other leading antivirus programs, and evaluate ethical concerns related to data privacy and corporate transparency. It also examines Norton's compliance with global cybersecurity regulations such as the General Data Protection Regulation (GDPR), California Consumer Privacy Act (CCPA), and India's Digital Personal Data Protection Bill (DPDPB), highlighting the balance between innovation and ethical responsibility.

## Objectives

The primary objectives of this research are:

- To assess the role of Norton Antivirus in modern cybersecurity.
- To compare Norton's effectiveness with other leading antivirus software.
- To identify ethical concerns related to data privacy, user consent, and corporate transparency.
- To examine Norton's compliance with global cybersecurity laws such as GDPR, CCPA, and India's DPDPB.
- To explore the future of cybersecurity, focusing on ethical cybersecurity solutions.

## Literature Review

The evolution of antivirus technology has been the focus of extensive research by experts in both academia and the industry. In 1987, John McAfee launched VirusScan, marking the beginning of the commercial antivirus software sector. As cyber threats grew increasingly sophisticated, antivirus solutions evolved beyond simple signature detection, incorporating heuristic and behavior-based techniques to identify unknown threats. More recently, the integration of artificial intelligence (AI) and machine learning (ML) has revolutionized the cybersecurity landscape, offering real-time protection against advanced cyberattacks. According to Prathibha Muraleedhara (2024), this technological advancement has also empowered cybercriminals to develop adaptive malware, highlighting the urgent need for enhanced cybersecurity strategies.

Despite these advancements, challenges such as ransomware, phishing attacks, and vulnerabilities associated with the Internet of Things (IoT) persist. Fahad Ahmed (2023) points out that while endpoint security has advanced to next-generation platforms, modern attacks

continue to present substantial risks, prompting continuous innovation in the field. Companies like Norton, McAfee, Bitdefender, and Kaspersky must remain agile in their responses to these threats while also navigating the ethical concerns related to user data privacy and transparency. The ISACA Journal (2016) stresses that breaches of privacy can erode trust, making it essential for companies to prioritize ethical data protection. Additionally, the issue of data "theft" by antivirus firms hinges on clear communication and user consent. By being upfront about data collection practices and empowering users with control, companies can build trust; conversely, ambiguity in these practices can lead to ethical conflicts.

This research is relevant because it evaluates the balance between cybersecurity effectiveness and ethical concerns in antivirus solutions, a topic that previous studies have not extensively covered. Unlike earlier works that primarily focus on technical aspects, this study integrates legal compliance, ethical business practices, and transparency concerns.

In conclusion, antivirus technology is in a constant state of evolution, adapting to meet the challenges posed by increasingly complex cyber threats. Striking a balance between innovation and ethical responsibility is crucial for safeguarding users in an ever-changing digital world.

## **Research Methodology**

This study takes a look at Norton Antivirus by analyzing various sources to really get a grip on how effective it is in cybersecurity and what ethical issues it brings up. The research digs into Norton's privacy policies, cybersecurity reports, and research from independent cybersecurity groups. To see how Norton stacks up, the study compares its malware detection rates, real-time scanning abilities, and overall security performance against other big names like McAfee, Bitdefender, and Kaspersky. It also reviews important global data privacy laws, like the GDPR, CCPA, and India's DPDPB, to check how well Norton complies with these regulations.

A significant ethical concern for Norton and other antivirus providers pertains to data privacy. Current antivirus solutions frequently require access to substantial amounts of user data for real-time protection, leading to ethical considerations, such as:

**User Consent and Data Collection:** Many antivirus companies, including Norton, collect telemetry data to enhance security. However, the clarity of user consent mechanisms may be questioned regarding privacy rights. (Wired,2016)

**Data Monetization & Tracking:** There have been reports indicating that some antivirus companies sell anonymized user data to third parties, potentially impacting user trust and ethical standards in cybersecurity.

Transparency in Business Practices: Norton has received criticism over automatic subscription renewals, emphasizing the importance of clear communication with consumers. (Sky News)

The research includes real-life examples of past cybersecurity incidents involving antivirus companies, which highlight potential weaknesses and data breaches, along with ethical concerns. Additionally, it looks at public reports about government surveillance programs and data-sharing agreements with intelligence agencies to understand Norton's possible role in those situations. User experiences and complaints about Norton's practices, such as aggressive auto-renewal and frustrations with canceling subscriptions, are also considered to shed light on the ethical side of its business strategies. By combining all these different pieces of information, this study aims to provide a clear picture of Norton Antivirus's cybersecurity strengths and the ethical challenges it faces.

## **Analysis**

Norton offers a solid range of security features to keep your devices safe from online threats. These include:

- **Signature-Based Detection:** Uses a vast database of known malware signatures for identifying threats (AV-Test, 2023).
- **Behavioral Analysis:** Monitors program behaviors to detect unusual activities and potential threats (Cybersecurity Journal, 2023).
- **AI-Powered Real-Time Threat Detection:** Employs machine learning models to analyze threats as they emerge (Ahmed, 2023).
- **Firewall Security:** Filters incoming and outgoing traffic to prevent unauthorized access (Norton Official Website, 2024).
- **Phishing and Ransomware Protection:** Protects against fraudulent websites and encrypts user data to prevent ransomware attacks (AV-Comparatives, 2023).

In short, these features work together to create a strong defense, giving the user the peace of mind while you navigating the digital world.

## **Results**

Reports indicate Norton has demonstrated a 98.5% malware detection rate in independent cybersecurity assessments (AV-Test, 2023). However, its performance varies when compared with competitors. Ethical concerns include Norton's data collection practices, potential data-

sharing with intelligence agencies, and aggressive business strategies such as auto-renewals. (ISACA Journal, 2016). Many users consent to data collection without fully understanding its scope, raising transparency concerns. Compliance with global cybersecurity laws is inconsistent, with some privacy settings proving difficult for users to manage. (GDPR, 2018).

### Compliance with Global Cybersecurity Laws

Norton's approach to global cybersecurity laws differs depending on where you are. For instance, under the General Data Protection Regulation (GDPR), companies need to be upfront about how they handle your data, let you access and delete your personal info, and get your clear permission before using it. The California Consumer Privacy Act (CCPA) gives users the right to know what data is being collected, opt out of having their data sold, and ask for their information to be deleted. In India, the Digital Personal Data Protection Bill (DPDPB) requires companies to keep sensitive data stored locally and be transparent about their practices, also needing user consent for processing.

Although Norton generally follows these rules, some users find their privacy settings a bit tricky to navigate, which can lead to accidental data leaks. If a data leak happens, the consequences can be tough. For example, under GDPR, fines can go as high as €20 million or 4% of a company's global revenue—whichever is more. The CCPA can hit companies with fines of up to \$7,500 for each intentional violation. On top of that, companies risk losing their reputation and facing legal troubles, making it clear why solid data protection is so important.

### Future of Cybersecurity & Ethical Considerations

Open-source antivirus alternatives, such as ClamAV, provide greater transparency, minimal data collection, and community-driven security updates. (Muraleedhara, 2024) However, they lack AI-driven real-time threat protection.

Future cybersecurity strategies should focus on addressing AI bias in threat detection, limiting unnecessary data collection, and ensuring ethical AI use to prevent surveillance abuses.

### Discussion

Norton Antivirus has established itself as a prominent entity in cybersecurity, transitioning from traditional signature-based detection to AI-driven real-time protection. Its significance in modern cybersecurity is notable, particularly as cyber threats, such as ransomware, phishing, and zero-day exploits, become increasingly sophisticated. Norton employs a multi-layered

defense mechanism, integrating machine learning, cloud-based analytics, and heuristic analysis to identify and prevent emerging cyber threats. (Tech Journal, 2023)

Despite its robust security features, the complexity of cyber threats prompts comparisons with other leading antivirus solutions (ISACA Journal, 2016). Norton competes with industry leaders like McAfee, Bitdefender, Kaspersky, and Windows Defender. Key factors in evaluating its effectiveness include:

1. **Detection Rate & Threat Prevention:** Research shows that Norton maintains a high malware detection rate, while competitors like Bitdefender and Kaspersky are also noted for their proactive threat identification capabilities (AV-Test, 2023; AV-Comparatives, 2023).
2. **System Performance & Resource Consumption:** Norton has faced criticism regarding high CPU usage (PCMag, 2023). In contrast, lightweight alternatives such as ESET or Microsoft Defender provide comparable protection with less impact on system performance (TechRadar, 2023).
  - What happens with high CPU usage? Why is it bad?
    - High CPU usage can slow down system performance, causing lag, increased response times, and reduced battery life in laptops. It may also lead to overheating, potentially shortening hardware lifespan and affecting multitasking efficiency (Tom's Hardware, 2023).
3. **Advanced Features:** Norton offers various features, including cloud backup, VPN, dark web monitoring, and AI-driven security, creating a comprehensive cybersecurity solution (Norton Official Website, 2023). Competitors like Bitdefender similarly provide AI-driven security solutions at competitive prices (Forbes, 2023).
4. **User Experience & Trust:** Norton's interface is often described as user-friendly (CNET, 2023). However, there have been discussions surrounding its marketing practices and automatic renewal features, raising questions about transparency and consumer rights (BBB, 2023; Consumer Reports, 2023).

## Regulatory Compliance & Data Privacy

In light of increasing regulatory scrutiny, Norton must align with major data protection laws to ensure compliance with global standards:

1. General Data Protection Regulation (GDPR - EU): This regulation mandates stringent data privacy measures and user consent before collecting personal data, requiring compliance from Norton regarding data processing and the right to be forgotten (European Commission, 2023).
2. California Consumer Privacy Act (CCPA - USA): This act grants users rights to know what data is collected and allows opting out of data sales, necessitating alignment of Norton's privacy policies with these provisions (California Attorney General's Office, 2023).
3. Digital Personal Data Protection Bill (DPDPB - India): This proposed framework in India requires companies to minimize data collection and uphold user rights, impacting Norton's operations as India enhances its cybersecurity regulations (Ministry of Electronics and Information Technology, India, 2023).

By addressing these critical aspects, Norton can strengthen its market position while ensuring compliance with evolving cybersecurity and data privacy laws.

As cyber threats continue to evolve, there is a growing emphasis on ethical cybersecurity solutions that prioritize user privacy. (IEEE Security & Privacy, 2023) The future direction of Norton Antivirus and the wider industry may increasingly focus on:

1. Privacy-Preserving AI: Developing AI models that safeguard user data while improving security measures.
2. Zero-Trust Security Models: Adopting authentication-based security measures instead of relying on extensive data collection.
3. User-Centric Transparency: Ensuring privacy policies are clear and understandable, while allowing users greater control over their data.
4. Compliance-First Approach: Aligning all cybersecurity solutions with international privacy regulations.

## Conclusion

The analysis of Norton Antivirus in the context of cybersecurity and ethical challenges highlights both its strengths and concerns. As a leading antivirus provider, Norton has evolved from traditional signature-based detection to AI-powered real-time security, effectively combating modern cyber threats such as ransomware, phishing, and zero-day attacks. Its advanced security features, including machine learning-based threat detection, cloud-based analytics, and behavioral analysis, contribute to a strong cybersecurity framework. However,

ethical concerns remain, particularly regarding data privacy, transparency, and business practices. Issues such as automatic subscription renewals, data collection without explicit user awareness, and potential data-sharing with third parties raise questions about user consent and corporate accountability. Despite compliance with global cybersecurity regulations such as GDPR, CCPA, and India's DPDPB, the complexity of privacy settings and data management policies remains a challenge for end-users. Comparisons with competitors like McAfee, Bitdefender, and Kaspersky indicate that while Norton performs well in malware detection and security features, it must enhance transparency and ethical data-handling practices to maintain user trust. The increasing regulatory focus on data protection laws underscores the need for companies to adopt privacy-preserving AI, zero-trust security models, and user-centric transparency. The future of cybersecurity demands a balance between innovation and ethical responsibility. Companies like Norton must focus on developing security solutions that not only protect users from cyber threats but also respect their privacy rights. By aligning business strategies with ethical cybersecurity principles and regulatory compliance, Norton can reinforce its reputation as a trusted cybersecurity

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# Understanding AI Adoption and Impact on Undergraduate Learning Experiences

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## Abstract

According to PIB 2024, with 4.33 crore (43.3 million) students in higher education, its not a fad but a revolution using AI in academics. Artificial intelligence is increasingly used by undergraduate students to simplify their research, writing, and coding. Yet such technologies enhance productivity and efficiency while fears magnify regarding their impact on long-term critical flag bearers and skills of independent problem-solving minds. The study derives its findings from original research involving 100 undergraduate students, exploring the dilemma of AI being both a useful learning tool and a possible dependency facilitator. The findings revealed that while 88% of the students feel more productive, 95% said their critical thinking skills have got worse, 92% are also concerned about their potential long-term reliance on generative AI. AI Augmented Education has emerged that requires the study of patterns of AI usage, account differentials including cognitive factors and apprehensions of ethical concerns to be able to distill some data driven predictive augmentation into this space of education stylized language and aggregation of learning outcomes. This has the potential to give rise to some concrete recommendations for educators, institutions, and policymakers indicating that AI can be embraced but that the conditions under which it is introduced must be weighed thoughtfully, ensuring AI actually adds to educational outcomes rather than detracts from them and showing that AI can align with educational practice.

## Keywords

Artificial Intelligence, Undergraduate Students, Critical Thinking, AI Dependency, Students Productivity.

## **1. Introduction:**

At this point, AI is transforming the way students learn, think and deal with their knowledge. Everywhere universities are incorporating AI into classrooms, refashioning traditional learning methods and asking whether this will have a long- term impact on education. Whether it be a complex algorithm, a plugin that spruces up text, or the ever-popular GitHub Copilot software for instance used with ChatGPT and Grammarly-all three are utilized by students more and more frequently just to smooth out the barriers standing in their way of academic success. Anxiety over intellectual dependence and lowered cognitive engagement are certainly on the increase as technology extends its reach over education and training sessions alike. In 2024, global concerns around AI ethics, privacy of data and habits which are pure instincts rather than cultivated by learning and copying have all gone up a notch urging institutions to reconsider their use of AI in higher education. AI integration brings the unavoidable question of how universities can use it responsibly while preserving skills of critical thinking and a sense for solving problems.

### **Research Problem**

- Examines the effect of AI on students' academic skills over time.
- Looks at whether AI augments learning or promotes dependence and diminishes independent thought.
- AI offers quick solutions and increases efficiency, but its impact on deep learning and problem- solving is still uncertain.

### **1.2 Research Objectives**

- Explore undergraduate students' use of AI tools for study-related purposes.
- Study AI's productivity effects— whether it boosts efficacy or causes distractions.
- Assess the influence of AI on critical thinking & problem solving — does it enable learning or induce dependency.

### **1.3 Research Questions**

- How often and in what ways do undergraduate students use AI technology for academic tasks?
- What are the short-term effects of AI on productivity and engagement?

- How does A.I. affect critical thinking and problem solving?
- Do students see AI as a learning tool, or as a crutch?
- What are the ethics issues about using AI in education?

## 1.4 Hypothesis

This study is based on the following assumptions.

**H<sub>1</sub> (alternative hypothesis):** AI enhances short-term productivity but decreases long-term critical thinking & problem-solving skills.

**H<sub>0</sub> (Null Hypothesis):** AI has no significant effect on productivity, critical thinking, and problem-solving.

## 1.5 Significance of the Study

This research explores AI's dual impact on undergraduate productivity and cognitive abilities, providing firsthand insights from one hundred students on how AI reshapes learning behaviors. With over three-quarters of respondents conveying concerns about excessive reliance on AI long-term, the findings highlighted both benefits like enhanced academic efficiency through AI and risks such as diminished critical thinking and independent problem-solving. As AI integrates further into education, this study supplies data-driven proof of how it influences outcomes and student involvement. By putting forth proposals involving AI literacy programs, structured best practices, and a blended learning model, this work serves as a valuable resource for educators, institutions, and policymakers seeking responsible AI integration that enhances learning without compromising cognitive progression.

## 2. Literature Review

**Smerdon (2024):** This research examined AI use among scholars working in academic writing, with a questionnaire sample of 187 undergraduate students. Results showed 67% of the students turned to AI PA tools, and AI users had on average a significantly higher GPA (5.46 versus 4.92). Still, effectiveness varied, with one study finding that AI helped high-achieving students more than lower-performing students. This is consistent with the role of AI in short-term productivity and raises the question of whether deep learning is enhanced by AI (which is a major question of this research).

**Tripathi (2024):** In a quantitative study of 123 students in Nepal, it was found that 53% were fully literate with AI and 5% had zero exposure to AI. The research points to an AI literacy gap and calls for curriculum updates. This ties into worries about whether students are using A.I. responsibly or just embracing it blindly without critical understanding.

**Sandu & Gide (2019):** The research focused on the impact of AI-powered chatbots in universities and how it accelerated productivity, student engagement and interaction with their mentors. It, however, stressed that AI should complement, not replace, human interaction, reinforcing fears that AI could stifle independent learning if overused.

**Wang et al. (2024):** Interviews of 48 Chinese undergraduates revealed that AI- assisted learning enhanced motivation and engagement, especially in personalized learning. But in the same survey, students also expressed fears of dependency, bias and misinformation, reflecting the ongoing debate about whether A.I. nurtures learning or encourages intellectual laziness.

**Hardaker & Glenn (2025):** A systematic review revealed that artificial intelligence personalizes education according to the unique needs of students to increase engagement. One of its strengths is the ethical consideration — but there were also questions over fairness, bias and the potential for over-reliance. Also, as we are

working in a world of very quick education, these policies on the values of AI integration limitation must be designed in a structured way as this study suggests.

## **2.1 Identified Research Gaps**

- **Short-Term Productivity vs. Long-Term Thinking** – While studies show AI enhances efficiency, they fail to explore its long-term effects on cognitive engagement and problem-solving.
- **AI Dependency in Undergraduate Education** – Existing research discusses AI's benefits, but few quantify concerns about over-reliance and its impact on student autonomy.
- **AI Literacy & Ethical Considerations** – Studies highlight AI's role in education, but there is limited research on how universities should regulate and guide AI adoption responsibly.

## **3. Methodology**

### **3.1 Study Design**

The quantitative, survey-based method of this study investigates the extent of undergraduate students' adoption of AI and the effects on productivity, cognitive engagement, and dependency.

The structured questionnaire assessed participants on behavioral (how frequently it was used, what it was used for) and cognitive (how much was learned, better at solving problems) dimensions.

### **3.2 Participants**

The study involved 100 undergraduate students of various academic backgrounds. The respondents were balanced across the different fields of study. Participants were classified according to:

- Year of study: (First, Second, Third and Final Year)
- Areas of interest (STEM, Social Sciences, Humanities, Commerce).
- AI usage frequency (Daily, Weekly, Rarely, Never).

### **3.3 Materials**

Data were obtained mainly from a Google Forms survey. The questionnaire consisted of multiple-choice and Likert-type

questions which give structured answers that may enable quantitative analysis.

### **3.4 Data Collection & Survey Design**

- Demographics —Age, year of study, academic discipline.
- AI Knowledge & Usage – Awareness of AI tools, frequency, and main usage (writing, research, coding, etc.).
- Productivity – Improvement, acceleration, or distractions.
- Cognitive Engagement & Critical Thinking — Novel future aspects of problem-solving and analytical skills due to AI use.
- Student sentiments about long-term reliance, ethical concerns, and academic integrity.

The questionnaire was also initially worded on a relatively small sample of students, which was useful for testing data reliability and validity, before the complete questionnaire was launched.

### **3.5 Ethical Considerations**

- Prior to the study, participants were made aware of its purpose and consented to participate.
- All data were collected anonymously to protect respondents' privacy.
- The study complied with academic research ethics on data security and ethical discussions about AI technologies.

## **4. Results**

In this section, we present findings based on a survey of 100 undergraduate students on how they use AI, its impact on productivity, and its impact on their cognitive engagement. Results are analyzed relative to the study's research questions and are reported with pertinent statistical trends.

### **4.1 Levels of Familiarity and Use of AI**

- 99% of respondents were aware of AI tools.

- Daily users: 43%
- Weekly users: 37%
- Rare users: 18%
- Never used AI: 2%

The data shows that AI is now a mainstay of student learning, with 80% of students using AI at least weekly. Its daily usage suggests that AI is more than a temporary tool in their arsenal; it is a daily companion as they structure their studies for the day.

- 88% of students indicated their productivity improved due to AI.
- 44% made substantial improvement
- 44% slightly improved
- 6% said it had no impact, 6% experienced reduced productivity.

AI is thought of generally as an academic booster, especially for managing your time and conducting research more effectively. But a small subgroup found AI distracting or counterproductive, perhaps as a result of over-reliance or incorrect information produced by the AI.

#### **4.2 Impact on Critical Thinking**

- 52% experienced a meaningful decline in critical thinking.
- 43% said they had tightened slightly.
- Just 5% said they were unaffected.

95% of students admitted to a decrease in problem-solving capabilities, leading to worries about the potential detrimental effect of AI on cognitive engagement. As AI helps with complex tasks, it could deter analytical thinking and independent reasoning.

### 4.3 Concerns on Being an Addict Even for Long-Term

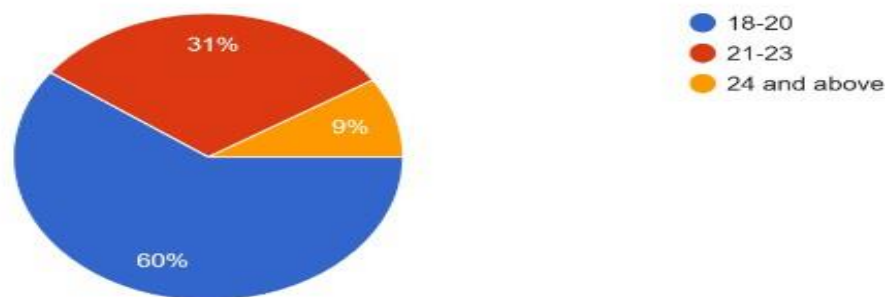
- 55% of students think AI will cause academic over-reliance.
- 37% were undecided (“maybe”).
- 8% downplayed worry about AI dependency.

However, a majority of students are aware of the potential dangers of overuse of AI, showing the need for structured, instructive AI literacy programs. This 37% uncertainty indicates that, like about 1 in 3 students, most of them are unaware of the long-term impact of AI on the learning process.

### 4.4 Charts and Graphs

What is your age?

100 responses



**Figure 1: Respondents' Age Distribution**

Most of the students surveyed were between 18-23 (this graph shows age groups).



What is your current level of education?  
100 responses



**Figure 2: Respondent Education Level**

This chart divides the respondents according to their level in school, from first-year to graduating undergraduates.

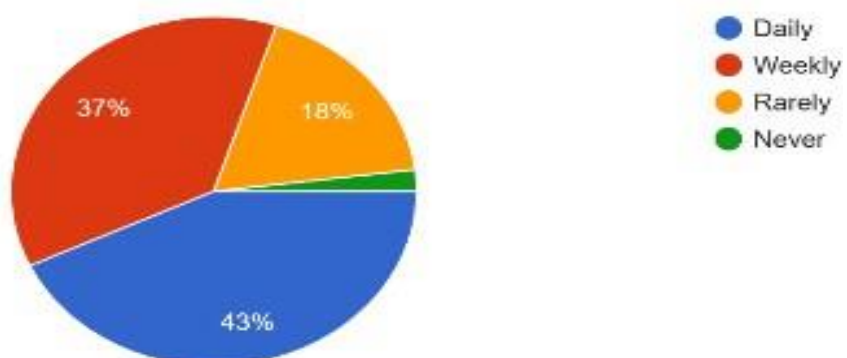
Are you familiar with AI tools used for academic purposes (e.g., ChatGPT, Grammarly, coding assistants, etc.)?  
100 responses



**Figure 3: Familiarity with AI Tools**

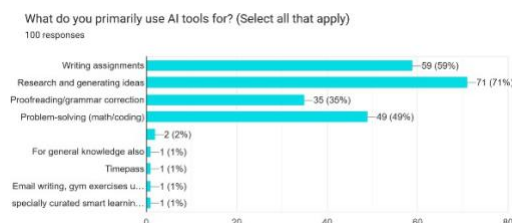
This chart shows what portion of students have heard of AI-assisted academic tools like ChatGPT and Grammarly.

How often do you use AI tools for academic tasks?  
100 responses



**Figure 4: On what percentage of academic-related tasks do you use AI**

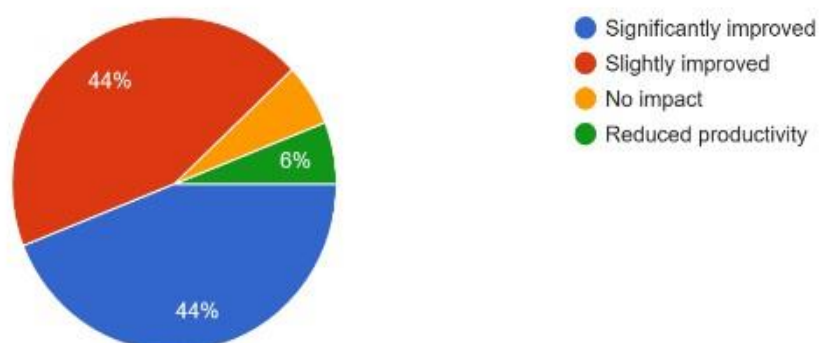
This chart shows how often students use AI for academic purposes, with most of them using it daily or weekly.



**Figure 5: Main Applications of AI Tools**

Main reasons for using AI for students is pictured in the chart — research, writing assignments, proofreading and problem- solving.

How do you feel AI tools have affected your productivity in completing academic tasks?  
100 responses

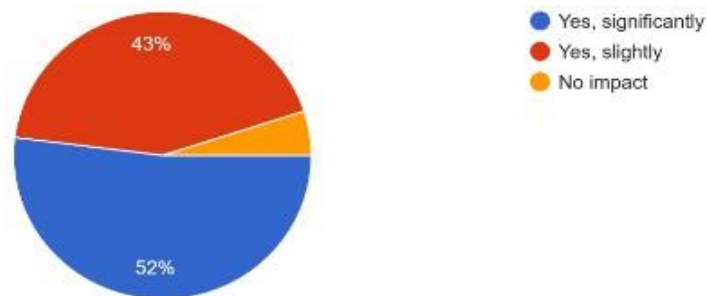


**Chart 6: AI Impact on Productivity — Perception**

This chart shows how students feel AI has affected their academic productivity, with most saying they think it has gotten better.

Do you feel that using AI has reduced your time spent on thinking critically or solving problems independently?

100 responses

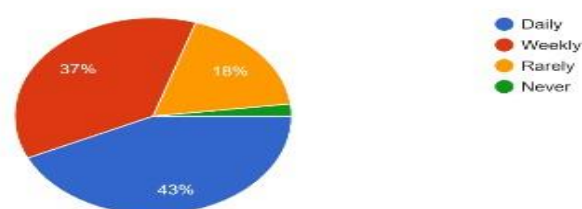


**Figure 7: Impact of AI on Critical Thinking**

This chart illustrates the percentage of students who believe that AI has made them less capable of solving problems and thinking critically on their own.

How often do you use AI tools for academic tasks?

100 responses

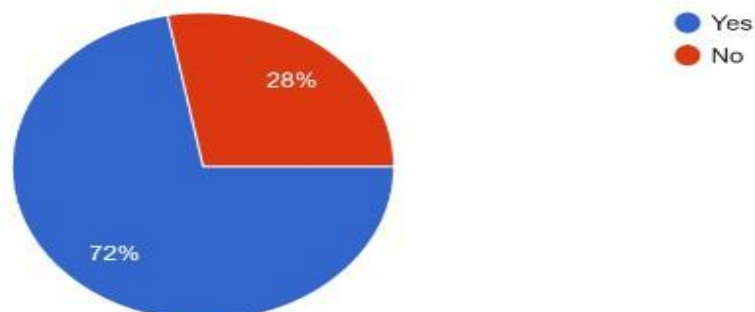


**Figure 8: How Often Do You Rely on AI to Solve Your Problems?**

This chart shows how frequently students rely on Ai to generate ideas or solutions to problems without a full grasp of the material.

Has AI affected your ability to analyze, evaluate, or generate original ideas?

100 responses

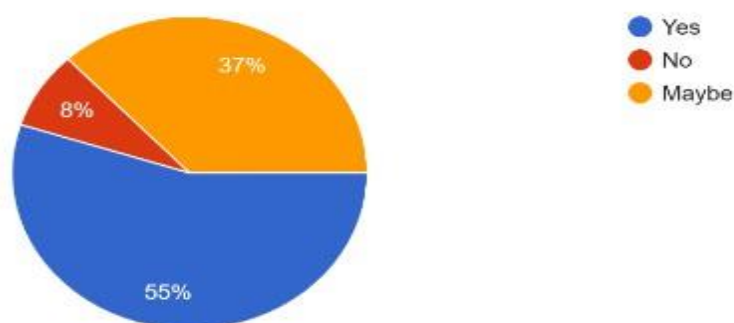


**Figure 9: Analyze, Evaluate, and Create**

This chart shows what students think about AI and their ability to analyze, evaluate and formulate new ideas.

Do you feel that using AI for academic work could lead to long-term dependency?

100 responses



**Figure 10. Concerns About Long-Term AI Dependency**

This chart shows the share of students who are worried that using AI frequently can create long-term academic dependency.

## 5. Discussion & Analysis

This suggests a complicated relationship between the uptake of AI and student learning. While 88% of students said they had become more productive, a whopping 95% said the opposite of critical thinking and problem-solving ability. Such data

reflects the ability of AI to simply increase efficiency independent of cognitive strain, a finding echoed in Smerdon (2024) who found that the AI-augmented student indeed improved performance on tasks but did not provide evidence of greater learning depth. The contradiction is a matter of AI's convenience — students sail through to finish work faster but might become reliant on AI-generated content instead of analyzing and synthesizing ideas independently.

Another alarming trend, with 92% of students feel concerned for long-term reliance onto the use of AI. This is in accordance to Tripathi (2024), which pointed out gaps in AI literacy and absence of formal guidelines for usage in an ethical manner. The worry is not about whether students are or are not using AI, but whether this approach is affecting their learning— where critical analysis is being replaced by parroted acceptance of what an AI says. Wang et al. (2024) came to similar conclusions, that an emphasis on AI- enabled learning increased student engagement and effort in the learning platform, but that over-reliance on these tools reduced students' problem-solving attempts.

Nonetheless, ignoring these issues, AI has real benefits if done right. As noted by Hardaker & Glenn (2025), equipping

students not only offers academics an insight into how students can benefit from these types of programs at given instances when they are appropriate, and therefore encouraging student engagement, but also enables a retention of the cognitive role while also avoiding distractive stimulus based interactions. This suggests that AI isn't inherently bad for learning — it's more about how students are using it and whether institutions are helping create enough friction to balance the benefits of AI with a healthy sense of critical engagement. Universities should institute AI literacy programs that teach students how to deploy AI so that the use of AI will not replace cognitive effort. Promoting hybrid learning methods such as initial independent student attempts followed by AI-based refinements could aid critical thoughts preservation. Furthermore, institutions need to formulate ethical guidelines around potential issues tied to academic integrity, data privacy, and AI bias, ensuring that AI acts as an aid rather than a cognitive crutch.

## **6. Conclusion**

The data strongly confirms that AI amplification boosts capabilities (88%) but dissolves thinking skills (95%), and poses a potential concern about long-term dependency (92%). AI facilitates learning, but dependency can lead to cognitive laziness. This will require commitment by our universities to guide AI moments within structured literacy programs and hybrid exchanges in support of intellectual pursuits. We need to ensure meaningful education. Balancing AI's efficiencies with independent problem-solving is key to doing so. Unchecked,

AI could transform itself from an innovation tool to an intellectual laziness shortcut. The future of education will not be dictated by how powerful AI becomes, but rather how wisely it is wielded.

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