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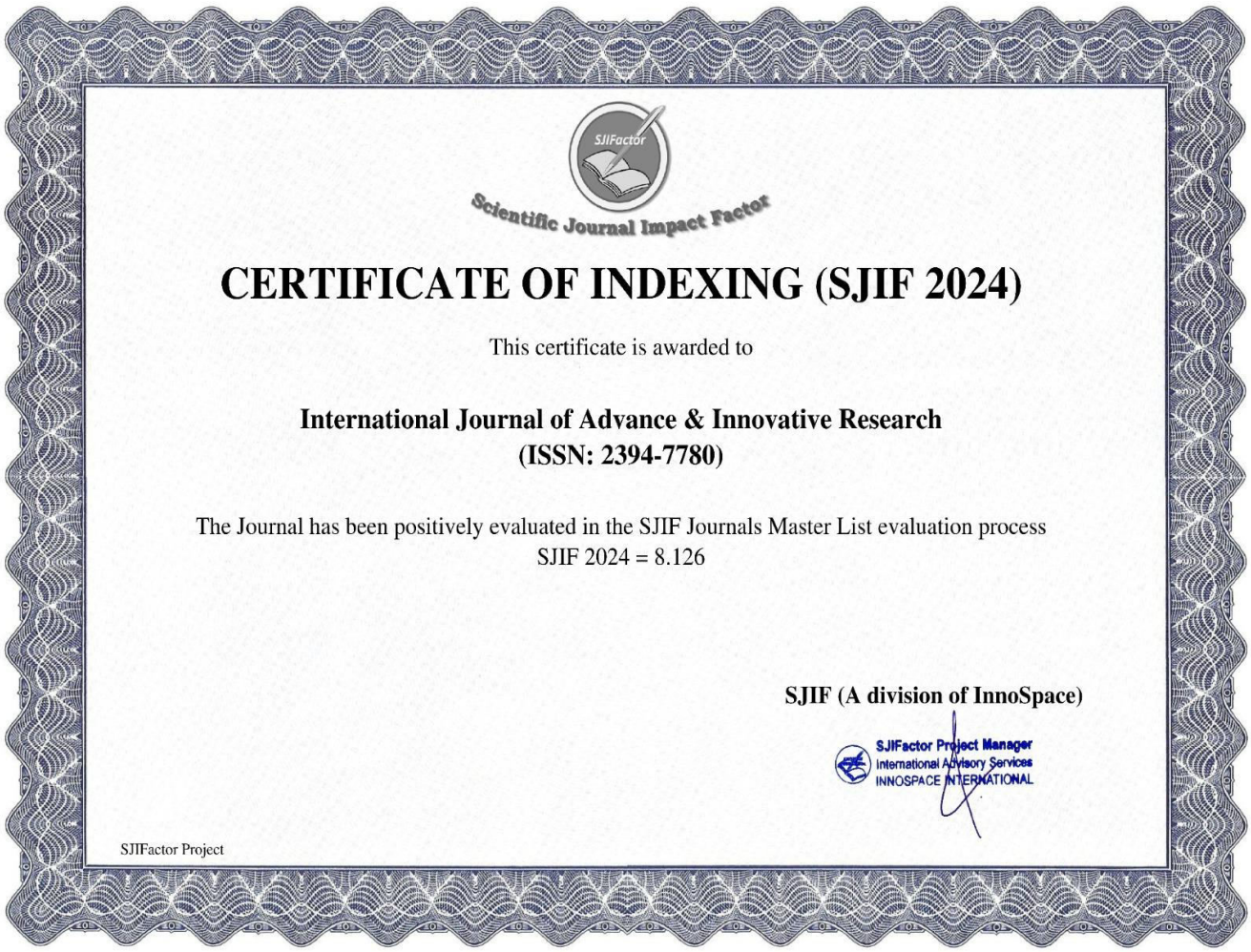

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Research Papers

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BREAKING BARRIERS: CHALLENGES AND OPPORTUNITIES IN TRANSGENDER ENTREPRENEURSHIP

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ABSTRACT
Significant economic barriers that transgender people must overcome include systemic bias and exclusion from traditional employment.One of the most important avenues for economic engagement and selfdetermination is entrepreneurship.This study examines both realities of transgender entrepreneurship: the possibilities it provides for social inclusion, economic independence, and creativity, as well as the enduring obstacles it faces. The study offers a comprehensive perspective on how transgender entrepreneur's deal with Structural injustices while transforming business ecosystems, drawing on qualitative interviews, secondary literature, and case studies from a variety of situations.In order to promote inclusive entrepreneurship and address the intersectional barriers that transgender people encounter, the study ends with policy recommendations.

Key Words: *Transgender entrepreneurship, Economic barriers, Social inclusion, Inclusive economy.*

Objectives

- ***To identify and analyze the systemic economic barriers*** *faced by transgender individuals in accessing traditional employment and entrepreneurial resources.*
- *To examine the reasons transgender people use entrepreneurship as a means of expressing their identities a nd achieving financial independence.*
- *To showcase transgender entrepreneurs' creative approaches and success stories in overcoming social and s tructural obstacles.*

Scope

- *A review of the legal and economic barriers that transgender entrepreneurs come across.*
- *Interviews on transgender entrepreneurs from various location and cultural backgrounds.*
- *Recommendations to foster a more inviting entrepreneurial environment that are directed at financial institu tions, support groups, and legislators.*

Limitations

Respondents lack of time and preoccupation with other tasks.

Respondents distorted the information while sharing information.

Introduction

Entrepreneurship is becoming more widely recognized as a means of uplifting underprivileged Groups.For transgender people, whose gender identity is different from the sex they were assigned at birth, launching a business is frequently a reaction to structural challenges in traditional job markets.However, despite the possibility of selfsufficiency, transgender businesses still have to deal with social stigma, legal identification issues, financial discrimination, and mental health Stresses.By delivering a thorough understanding of the lived experiences of Tran's business Owners and suggestions for more inclusive economic ecosystems, this study examines the Possibilities and challenges that come with transgender entrepreneurship.

Research Methodology:

Primary Data: - *Surveyed 25 transgender and collect information from vitthalwadi area.*

Secondary Data: - *Web source, Journals.*

INTRODUCTION

Entrepreneurship is increasingly recognized as a vehicle for empowerment among marginalized populations. For transgender individuals—that whose gender identity differs from their assigned sex at birth—starting a business is often a response to systemic barriers in traditional employment markets. Yet, while entrepreneurship offers potential for self-sufficiency, transgender entrepreneurs must still confront financial exclusion, legal identity challenges, social stigma, and mental health stressors. This paper explores both the challenges and opportunities inherent in transgender entrepreneurship, providing a comprehensive view of the lived experiences of trans business owners and offering recommendations for more inclusive economic ecosystems.

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LITERATURE REVIEW

Studies show that transgender people face high unemployment and underemployment due to widespread bias (Grant et al., 2011). Tran's individuals are also more likely to work in informal economies or engage in survival sex work due to limited employment options.

While some transgender individuals pursue entrepreneurship out of necessity, others view it as a means of personal and political liberation. Entrepreneurship allows for flexible work environments and the creation of safe, inclusive spaces. This duality—entrepreneurship as survival and self-expression—is a recurring theme in queer economic studies (Lewis, 2019; Jennings et al., 2013).

Problems Faced By Transgender for Entrepreneurship:

The paper also attempted to comprehend the issues transgender people experience in civic society.It restricts ho w it is presented and the issues brought about by police harassment.

However, the Trans community's employment challenges receive little to no attention considering the present u nemployment and young situation.

Where are the announcements about generating employment and entrepreneurial opportunities for Tran's people , despite politicians' lofty promises regarding job development in the run-up to Assembly elections?

1. Health Problem: - Almost 70% said that they do suffer from

- HIV/AIDS
- HIGH/LOW BLOOD PRESSURE
- PILES
- SEXUALLY TRANSMITTED INFECTIONS.

2. Issues Caused by Police Harassment:

A large percentage of transgender people reported having encountered issues brought on by police, whether thos e issues were from local police stations, traffic police, or railroad police.

3. Finance Issue:

This is an important problem that transgender people confront when banks and other financial institutions refuse to give them financial support because of a lack of trust.

DATA ANALYSIS

Table I: Education of Trans genders

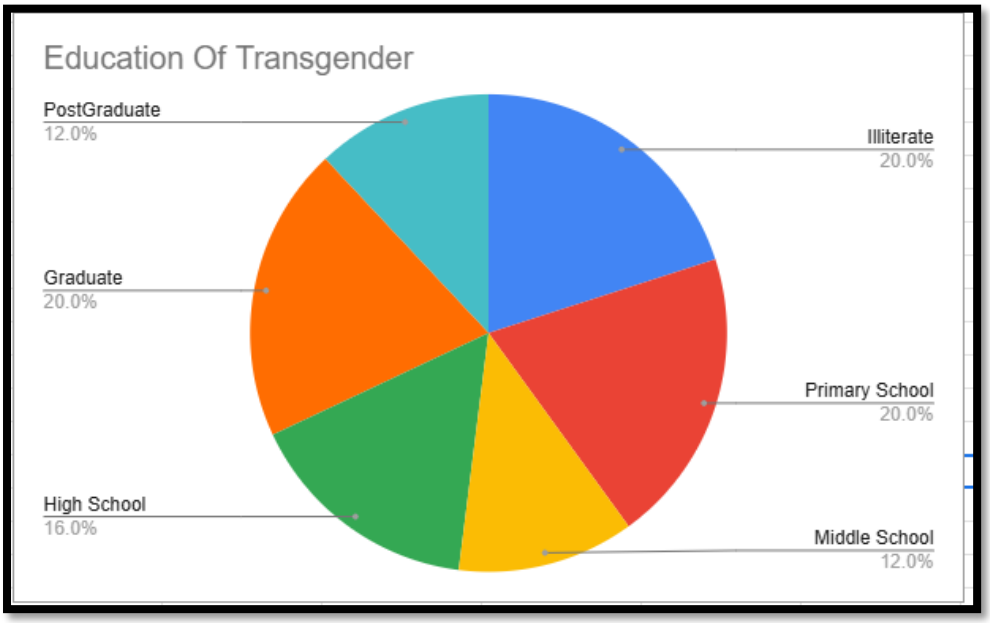

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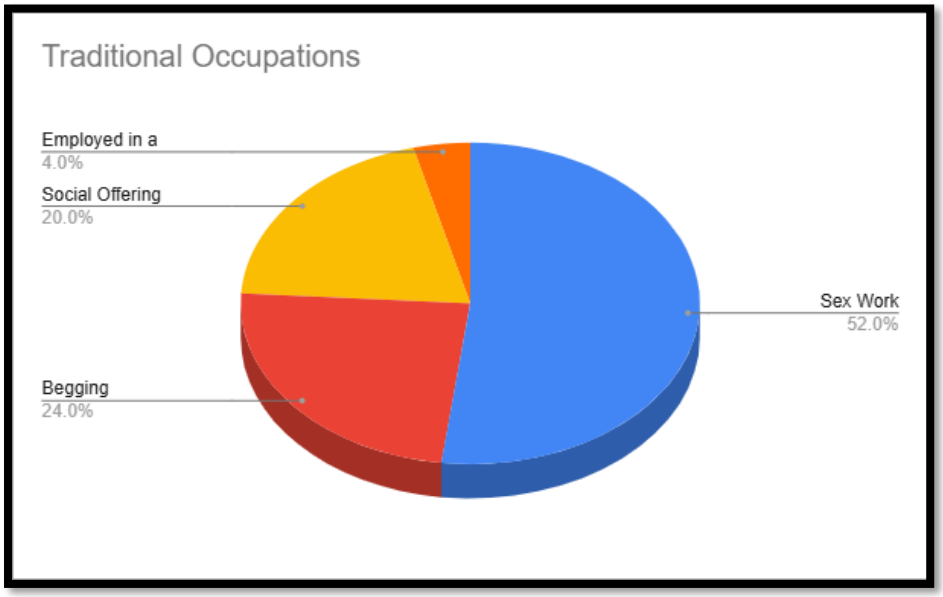
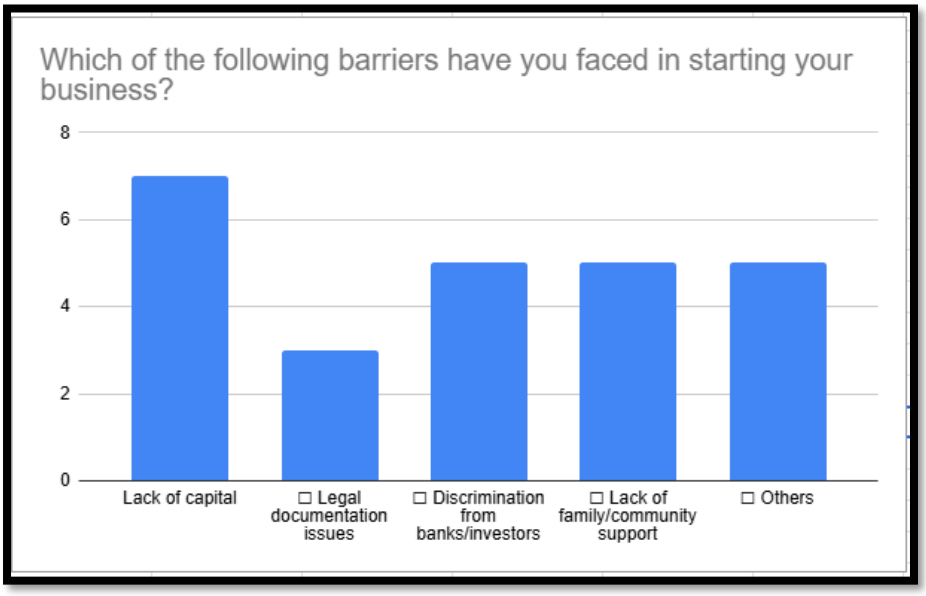
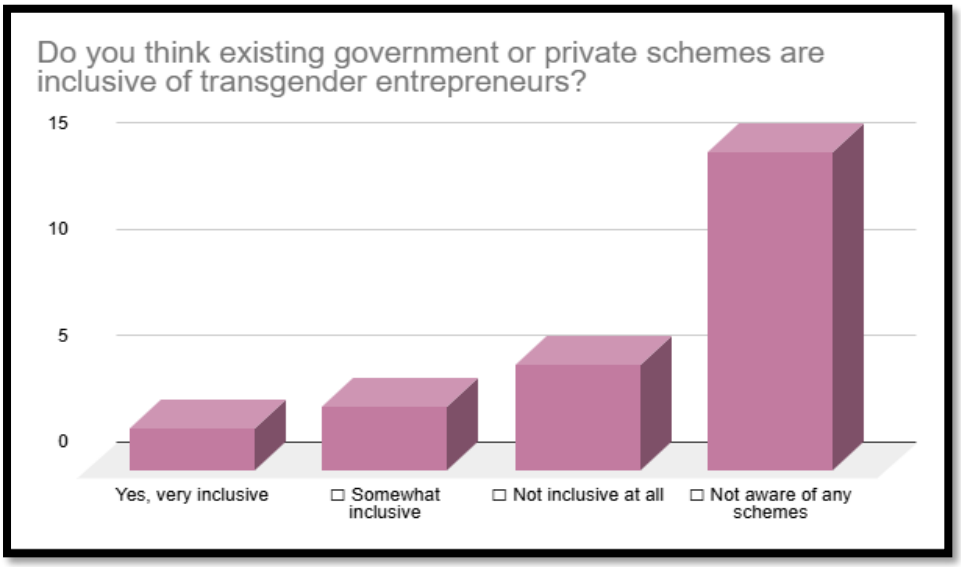
Table II: - Traditional Occupations



Which of the following barriers have you faced in starting your business?





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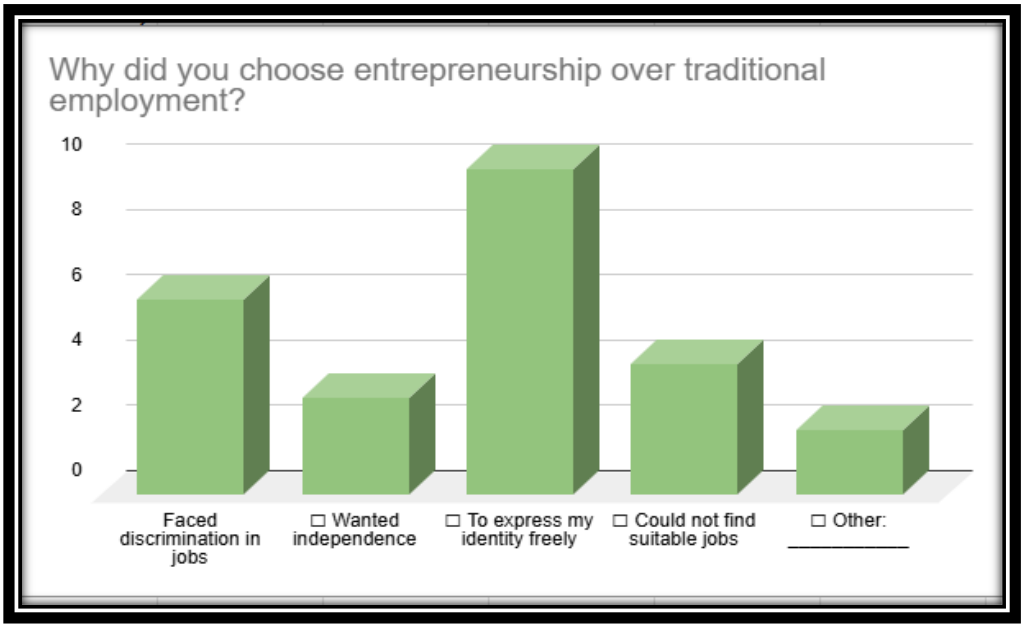

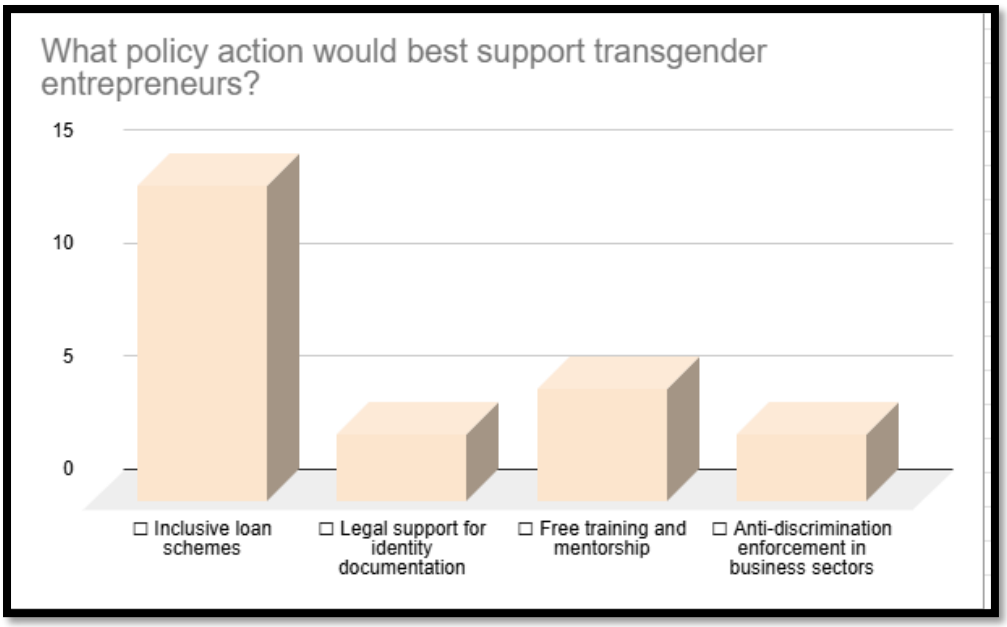

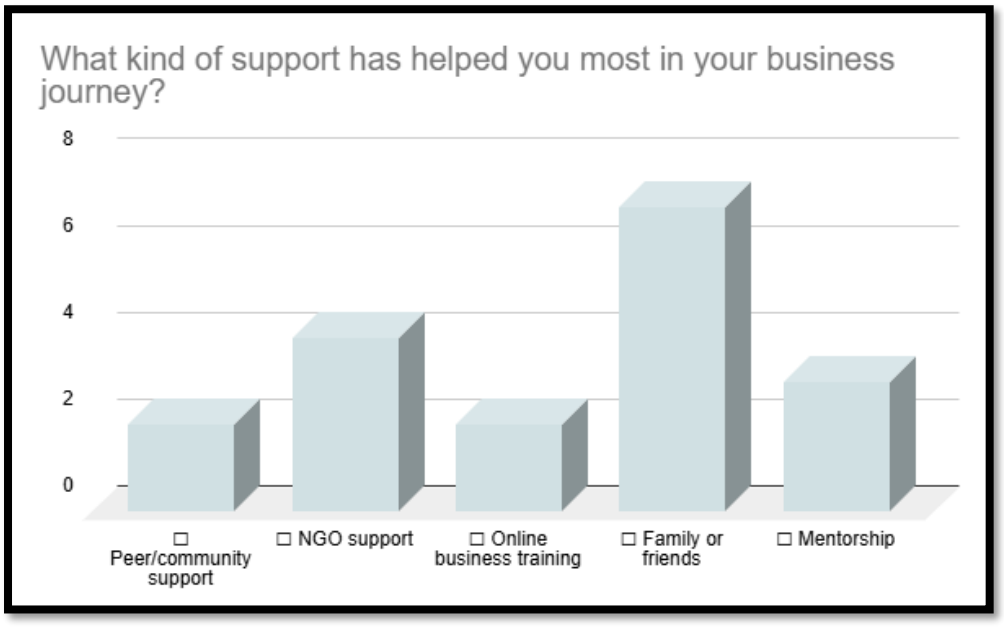

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FINDINGS AND DISCUSSION

Key Challenges

a.Financial Discrimination
Transgender individuals reported being denied loans or treated with suspicion by banks. Informal or crowdfundi ng options were often the only alternatives.

b. Legal Concerns about Identity
It was frequently impossible or degrading to register enterprises, obtain permits, or open bank accounts in natio ns where gender identification is not legally recognized.

c. Stigma in the Market
Many experienced prejudice from landlords, suppliers, and customers.
Bias and misgendering hindered chances to grow or draw in investment.

d. Problems with Mental Health
Social marginalization, internalized stigma, and fatigue from overcompensating to acquire legitimacy were com mon emotional burdens for entrepreneurs.

NEW PROSPECTS

a. Access to Niche Markets
By targeting LGBTQ+ markets or providing services and goods that support diversity and inclusivity, several tr ansgender business owners have achieved success.

B.Entrepreneurship in the Digital Age
By avoiding physical prejudice and gatekeeping, social media and ecommerce platforms have made it possible to reach a wider audience.

c. Models of Community Economics
In order to create peer-supported ventures, cooperatives, or micro-enterprises that put shared value ahead of profit maximization, many entrepreneurs work with LGBTQ+ collectives.

d. Advocacy and Setting an Example
Successful businesspeople go on to become activists and local leaders who challenge social norms, mentor others, and raise awareness.

RECOMMENDATIONS

1. Policies for Financial Inclusion
Trans-inclusive financing schemes ought to be established by the government and private lenders.

2.Reforms in Law and Administration
Simplify gender and name changes in paperwork pertaining to company.Provide legal assistance to help people deal with bureaucratic procedures.

3. Mentoring and Training for Entrepreneurs
NGOs and incubators ought to offer transspecific business training.Make inclusive mentorship networks availab le to transgender entrepreneurs.

CONCLUSION

Transgender entrepreneurship sits at the intersection of resilience and innovation. Despite systemic barriers, transgender individuals continue to create dynamic enterprises that challenge traditional business norms and foster social inclusion. Recognizing and investing in these entrepreneurs is not just an act of justice—it is a step toward a more equitable and innovative economy. Policymakers, financial institutions, and society at large must embrace this potential by dismantling structural obstacles and promoting inclusive growth strategies.

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A STUDY ON IMPACT OF ARTIFICIAL INTELLIGENCE ON MARKETING

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ABSTRACT
Technology has reached all aspects of human life and transformed it. The functions of business-like marketing have all undergone a sea change because of the application of Artificial Intelligence (AI). Creation of content for customized services, predictive analytics, creative product design have all become possible because of Al tools. Thus, there has to be a revisit of such tools like ChatGPT and other AI tools which are used as marketing's future. This study emphasizes advantages of using AI, challenges, and opportunities of marketers using AI tools. The study concludes with the strategies recommended for successful use of AI in marketing.

Keywords: AI, Chatbot, Marketing, Content creation.

INTRODUCTION
Technology has advanced to a level where it has left no area untouched. Every operation of the business and every business has been made easy because of the applications of Artificial Intelligence(AI). All the operational areas of the business such as Marketing are being influenced by new ways of AI. A lot of activities that were previously done manually can now be done effectively and automatically by this new master known as Al. It assists you with everyday activities, like running your business operations and giving you search engines that are optimized.

MEANING OF AI
The objective of the wide area of computer science called artificial intelligence is to develop intelligent machines that can perform tasks that normally require human intelligence. AI also refers to the goal of this domain, that of producing systems with cognitive capabilities akin to human capacities for reasoning, discovering meaning, making generalizations, or learning from experience. Vast amounts of tagged training data are commonly ingested by AI systems, which subsequently employ the patterns and associations present in the data to predict or anticipate possible outcomes.

ROLE OF AI IN MARKETING
Artificial intelligence has an important role in marketing since it allows businesses to make data-informed decisions. Companies can get to know more about the needs, preferences, and habits of their customers using AI to sift through huge volumes of data. Artificial intelligence (AI) is essential in marketing since it could provide businesses with insights and efficiency that manual processes would never be capable of providing. Personalized content creation, marketing messaging, and recommendations based on user behavior and preferences from multiple sources, such as social media, browsing history, and interactions with the company's website or past purchases, are also enabled by this technology. AI can also automate mundane tasks, like planning social media pastings, freeing up time for more creative ideation instead of drudgery. With the help of AI technology, marketing departments will be able to become strategic partners capable of making fact-based decisions based on real-time data, ensuring that prized customer experiences are delivered consistently and granting them an advantage over competitors in many industries. This information is vital for developing effective marketing plans, targeting niche markets, and delivering clients tailored experiences.

OBJECTIVES OF THE STUDY
1) To learn about the advantages of Al in marketing

2) To learn about the problems marketers face in utilizing Al

3) To recommend the strategies for the effective use of Al in marketing

RESEARCH METHODOLOGY
The data used in this study was primarily collected from secondary sources. These include reputable websites, official company pages, and online databases. In addition, information was gathered from published books that provided foundational and theoretical insights. Various scholarly articles from academic journals were also consulted to support key arguments and findings. Furthermore, relevant theses and research papers were reviewed to gain deeper perspectives and supplement the overall analysis.

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ADVANTAGES OF MARKETING WITH THE HELP OF AI

1. Speeds up the work:
Marketing is a full time job which needs new ways and methodologies to reach to the mind of consumer and transform his intention into real buy, there is a requirement of AI.

- ✧ 67% of marketers concurred that AI accelerates the work of marketers to create content. They can write quickly, conduct rapid research and post the information within shorter time. This enables the executives to make quicker and accurately right decisions. Some reported statistics on utilizing AI for content creation[1]
- ✧ 25% of marketers utilize AI to create summary of their content with key points
- ✧ 18% utilize AI to develop outline of their content
- ✧ 20% utilize it to compose text to be utilized for marketing
- ✧ 36% utilize Ai to develop visuals and images that exert a significant influence on consumers
- ✧ AI can be an effective tool to repurpose the content. 13% marketers utilize this device for generating increased traction content, For instance: Vidyo AI is a device that allows transformation of YouTube clips into concise bite-sized clips usable for TikTok and Instagram. Therefore, it transforms the content into various formats based on what each platform demands as well as varied audience.

2. Generation of customized content:
49% of marketers indicate the largest advantage of Al is that it can generate more customized content. Personalization such as employing customers' names has become a vital element of marketing. Today, customer expects brand to go beyond generic messaging and talk about their problems of interest, demographics, and locations. But still, marketers find this difficult because of mass scale consumers of various segments and diverse locations. Here predictive AI can assist by developing dynamic customer segments which have past interactions as foundation. For example, Netflix utilizes AI for analyzing the taste of viewers with the aid of their history of watching. Then only it offers personalized recommendations that match the individual taste of every customer. Consequently 85% of marketers concur that application of Al assists to enhance content personalization.[2] As a result, the data generated is smarter resulting in more personalized customer experiences. With this division of customers, more targeted marketing campaigns can be developed and the messages which resonate to the inner level can be established as content.

3. New idea generation:
As per 48% of marketers, Al can create new ideas and that is the largest benefit. Al-based chatbots such as ChatGPT, Japer AI and HubSpot's Content Assistant truly broadens the horizon of possibilities providing the push to the business to grow in this competitive market. For eg. Chatbot is creating taglines for marketing campaign with details of the brand, target audience and campaign goals. There is a rapid list of catchy ideas created by AI and chatbot picks the best and edits it with the brand's own style and tone.

4. Predictable consumer behavior:
Attempting to touch base with all the individuals who fit into your firm's niche will be time-consuming, costly, and exhausting. Fortunately, AI algorithms can sift through an otherwise scattered crowd and identify the prospects that are most likely to act on your proposal. For the consideration of identifying convertible leads out of expensive Google advertising, further deeper research would be needed to achieve that objective. A mathematical decision tree examining past data, ascertaining marketing goals based on that is something an Al technology can adopt. Al, as well as machine learning-based models, are capable of being utilized to investigate consumer behavior patterns, identify patterns, and draw up digital market strategies based upon the same. Develop these models also with the objectives that you desire to achieve with your advertising, such as increased website traffic, lead generation, or conversion rates.

1. https:// metricswatch.com/ai-in-digital-marketing
2. HubSports. State of AI Report, 2023

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5. Improved engagement analysis:
Consumer Because customer acquisition costs significantly outweigh customer retention costs, client engagement measurement is key to knowing what succeeded and failed. Artificial intelligence (AI) monitoring of each campaign will provide more meaningful data on the target client segments for marketers.

AI tools can also provide insights that will enable you to create more reliable customers by comparing past and current clients. Also, it allows you to target more and improve the experience of their previous customers better. AI also gives useful feedback about the likes of each client and how to target them best. AI also allows you to track the behavior of your audience and engage with them more effectively, listen to real-time customer Conversation to learn why customers are discussing them across different social media platforms. This will be used to expand the client base by offering them quality services.

6. Improved Customer relationship:
As companies can now gain real-time knowledge about how their consumers engage through various communication platforms, artificial intelligence (AI) is critical to customer relationship management. AI can utilize statistical models to find the ideal next step after automatically routing concerns to the right support team. In addition, include chatbots that employ automated processes on your website to give customers a wide scope of your products. This can be an affordable method of expanding the clientele. You might monitor the data users leave on your site to see which visitors are most likely to remain. You can ascertain what promotions you can use to keep them brand loyal by examining their liking.

In addition to traditional marketing methods, leading companies like Volvo have been exploring the integration of artificial intelligence (AI) with virtual reality (VR) to enhance customer experience. Through this innovative approach, customers can virtually "try on" or interact with products in a simulated environment before making a purchase decision. This immersive experience allows users to visualize products—such as vehicles, furniture, or fashion items—in a realistic and personalized setting, reducing uncertainty and boosting confidence in their choices. As a result, businesses have reported increased conversion rates, as customers are more likely to proceed with a purchase after engaging with the virtual try-on feature. Furthermore, this technology not only drives higher sales but also strengthens customer loyalty by providing a memorable and engaging brand interaction.

OPPORTUNITIES AFTER AI

AI software can be employed in:

Function	Key Responsibilities	Tools / Channels Used	Impact / Goals
Content Creation	Writing blogs, social posts, video production, graphic design	Canva, Adobe Suite, Notion, CMS	Drive engagement, educate users, build brand identity
Mailing Emails	Email campaigns, newsletters, promotions, drip campaigns	Mailchimp, HubSpot, ConvertKit	Nurture leads, increase conversions, retain customers
Public Relations	Press releases, media outreach, brand image management	Press contacts, PRNewswire, LinkedIn	Build credibility, manage reputation, attract attention
Strategic Management	Long-term planning, goal setting, competitive analysis, resource allocation	SWOT, OKRs, Balanced Scorecard	Drive growth, maintain competitive edge
Product Management	Product lifecycle, roadmaps, user feedback, cross-functional coordination	JIRA, Trello, Figma, Product board	Build products users love, ensure alignment with goals

ISSUES CONFRONTED BY MARKETERS UTILIZING AI TOOLS

1) Hi-tech training necessary:

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This does not have any relation to readying your workers to utilize Al tools. This is all about training your AI technologies to work in favor of your marketing goals. Unfortunately, it does not work like a switch that can be turned to get the desired effects.

Like any human, AI requires training and time to gain expertise and understand the larger picture, trends, and the behavior of the customers. Only with proper training can AI bring the desired outcomes.

2) Requires high-quality data:
A good source of quality data is necessary to your Al's successful training. To train your AI tools properly, you need to gather data from the right sources and ensure that it is credible enough. You risk training an incompetent AI that fails to understand the requirements of your customers with poor data.

3) Violation of private information:
End users in today's world are fully well aware that companies are exploiting their information, and governing agencies are waiting to support them. You have to follow the guidelines of the GDPR parameters while gathering information to avoid any violations that might trap you in the legal labyrinth.

4) Implementation of best practices:
While expanding at a quicker pace, still AI is an emerging phenomenon in the sector. Thus, the marketers need to know their best practices in order to implement AI tools appropriately.

STRATEGIES TO USE AI SUCCESSFULLY

Strategy	Description	Marketing Benefit
Product Recommendations	Use browsing history and behavior to suggest relevant products	Personalization boosts conversions and customer satisfaction
Dynamic Pricing	Adjust prices in real time based on region and competitor pricing	Maximizes profit margins and market competitiveness
Chatbots & Virtual Assistants	Provide instant, tailored responses to user queries using AI chatbots	Enhances customer service and reduces response time
AI-Generated Content	Automate product descriptions and blog articles with high relevance	Saves time and ensures scalable, SEO-friendly content
Predictive Analytics	Analyse website traffic to predict trends and customer preferences	Enables proactive targeting and improves campaign performance
Voice Search Optimization	Optimize content to respond effectively to voice-activated queries	Increases visibility and accessibility in modern search channels

CONCLUSION
Since we have learned, artificial intelligence is changing the marketing industry in a number of ways, including predicting consumer behavior, improving ad performance, and making recommendations. The examples above demonstrate the wide array of marketing applications for AI as well as the significant benefits that it can bring to businesses which embrace this technology. Businesses currently using AI successfully to drive their marketing strategies and stay ahead in the competition are Netflix, Uber, Amazon, and many others. While AI can potentially revolutionize the marketing industry, it's worth remembering that it's not a magic bullet. Marketers can enhance their strategies with the assistance of AI, but it's worth merging AI with human creativity and knowledge. Companies can create truly innovative and successful marketing campaigns by combining AI with human insights and intuition.

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AN INVESTIGATION ON THE IMPACT OF EXPERIENTIAL LEARNING OPPORTUNITIES FOR EMPLOYABILITY OF UNIVERSITY OF MUMBAI COMMERCE GRADUATES OF ULHASNAGAR TALUKA

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ABSTRACT
An Economy has Three Main Sectors i.e Primary, Secondary and Tertiary Sectors however Global Economic Events have profound impact on all these sectors so there is a strong need for a skillful workforce for better protection from economic uncertainties. Consequently the Demand for Education is growing at a rapid rate just because of Experiential learning and ROI. If Curriculums are going to enhance the employability then that can work as a motivating factor for University graduates. This Research particularly investigates the impact of Experiential Learning on Graduate Commerce Students Employability. The findings of the study will provide much needed insights about Experiential learning and Employability outcomes especially for Commerce Graduates from University of Mumbai and its affiliated colleges from Ulhasnagar Taluka.

Keywords: *Employability, Students, Graduates, Learning*

INTRODUCTION
The Traditional Teaching Methods have been Complemented or Replaced by Innovative, Practice oriented approaches after NEP 2020 and undergraduate Students are literally encouraged to participate in concrete Projects, undertake Internships, Simulations and Practical scenarios, the approach develops Soft skills in learners by preparing them to face challenges of labor market as Companies are striving to acquire competitive advantage in an increasingly turbulent environment to meet market challenges and they are facing competition on many levels, with the labor market being a prime example. Consequently, searching for talent and recruiting the most qualified candidates have become necessities rather than options for companies aiming to stand out and gain a competitive edge. To assess the needs of the time, qualitative skills are to be inculcated among the commerce graduate students in a 21st-century classroom environment. The challenge is to provide a relevant curriculum to commerce graduate students with a short-term goal of providing employment as well as long-term employability. Often, the students' choices are high-paying jobs rather than the pursuit of interesting subjects taught. Management degrees are appealing to every commerce student. This has resulted in a thinning of the variety and strength acquired by the traditional commerce stream. The tendency of the students to shift and choose management as an alternative results in a diminished interest in pursuing applied science subjects. Staff employed in such traditional courses are rendered jobless, and colleges try to increase intake and choice-based deviations in their professional degree courses.

The Income factor among the teaching community is widening. This, in turn, has resulted in knowledgeable staff shifting towards administration or private tutorials. To alleviate the growing tendency of ignorance among the students and to instill a taste for a variety of subjects, the valued cosmopolitan approach is to acquire qualitative employability habits among the commerce graduate students. The crème de la crème approach of the 21st-century classroom is often crippled by naive perceptions. Formal education is the choice of every high-income parent.

REVIEW OF LITERATURE
1. **S. R. Nikam *, S. S. Bhusnoor , V. B. Bhosle , A. S. Saraf (2020),** In this Research Paper it has been studied that the effect of experiential teaching learning method on performance of students so in order to involve students in the teaching learning process, a visit to the research laboratory at IIT Bombay was arranged and knowledge gained through this visit is assessed through presentation, group discussion and quiz. Student feedback is necessary for self assessment. It has been observed that the teaching learning methods helped students to understand the course in a better way which is confirmed from their Internal Assessment as well as in the end Semester Examination Result. It can be said from Students Self Assessment

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Feedback also that their Level of Understanding in a given Topic has Improved. This Experiential Learning Method helped in Increasing Attainment Level of Course Outcome and related Program Outcomes.

2. **Victoria Jackson, Vicki O'Brien & Anita Richards(2023):** Global Economic Events have had a Profound effect upon both Businesses and the available Workforce. Industries need a more Skillful and Advanced Labour Market and Individuals who complete Tertiary-level Education are afforded better Protection against Economic Uncertainties.This Paper includes one UK University's approach to enhancing International Student Employability Skills and Employment Outcomes, using a 3-day Residential Experiential Learning on an MBA Programme. Employing a Survey Design, the Research investigates the Benefits of this Residential Scheme to 182 International MBA students (all from the Indian subcontinent region). The Findings of this Report show that the International Students developed key Employability Skills via the Residential Learning which significantly increased their Propensity to obtain Subsequent Employment after Graduation Degree.

SCOPE OF STUDY

The Present Study evaluates the Impact of Experiential learning for employability of Commerce graduates of University of Mumbai of Ulhasnagar Taluka. As the concept has been in practice for a long period however it was difficult to get the list of past beneficiaries for finding out the effectiveness of Experiential Learning Opportunities due to less cooperation. Hence we considered the list of Present Beneficiaries of Ulhasnagar Taluka only. In order to make the Sample both Representative and Manageable a Total of 100 Male and Female students were selected and the details were collected through the Questionnaire and Secondary data was also collected from Books, Journals and Websites however the Secondary data are not much relied upon. The Data collected through Primary as well as from Secondary Sources were Processed through Simple Statistical Tool i.e Pearson Correlation Coefficient Test.

HYPOTHESIS

H_1: There is a Positive Relationship between Participation in Experiential Learning Opportunities and the Employability of University of Mumbai Commerce Graduates.

H_0: There is no Positive Relationship between Participation in Experiential Learning Opportunities and the Employability of University of Mumbai Commerce Graduates.

OBJECTIVES

1) To Assess the Availability of Experiential Learning Opportunities
2) To Assess the Availability and Nature of Experiential Learning Opportunities for Commerce
3) To Evaluate the Impact of Experiential Learning on the Employability Skills of Graduates.
4) To Identify Gaps between Academic Experiential Learning and Industry Expectations.
5) To Recommend Strategies to Enhance Experiential Learning Practices for Better Career Outcomes.

LIMITATIONS OF STUDY

1) The Sample Size could have been better and Conducting it in larger samples would be beneficial to validate and strengthen the findings of study.
2) Comparing Results with Different Streams or Universities could have provided valuable insights into the similarities and differences in the impact of experiential learning.
3) It was not possible to collect relevant or accurate data from the secondary sources.
4) Due to Limited Time for data collection and analysis, longitudinal impacts could not be studied.
5) Convenient Sampling was used, which may Introduce Bias and Generalizations in findings.

RESULTS AND FINDINGS

Correlation Coefficient	0.1589
X Mean	3.860
Y Mean	3.880
N	100

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$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 (y_i - \bar{y})^2}}$$

Mean for Dataset X:
X = 386/100 => X = 3.86

Mean for dataset Y:

Y = 388/100 => Y = 3.88

$\sum$ (xi - $\bar{X}$) 2 = 64.04, $\sum$ (yi - $\bar{y}$) 2 = 64.56, $\sum$ (xi - $\bar{X}$) (yi - Y) = 33.32

r Calculation:
$\sum$ (xi - $\bar{X}$) 2 = 64.04, $\sum$ (yi - $\bar{y}$) 2 = 64.56, $\sum$ (xi - $\bar{X}$) (yi - Y) = 33.32

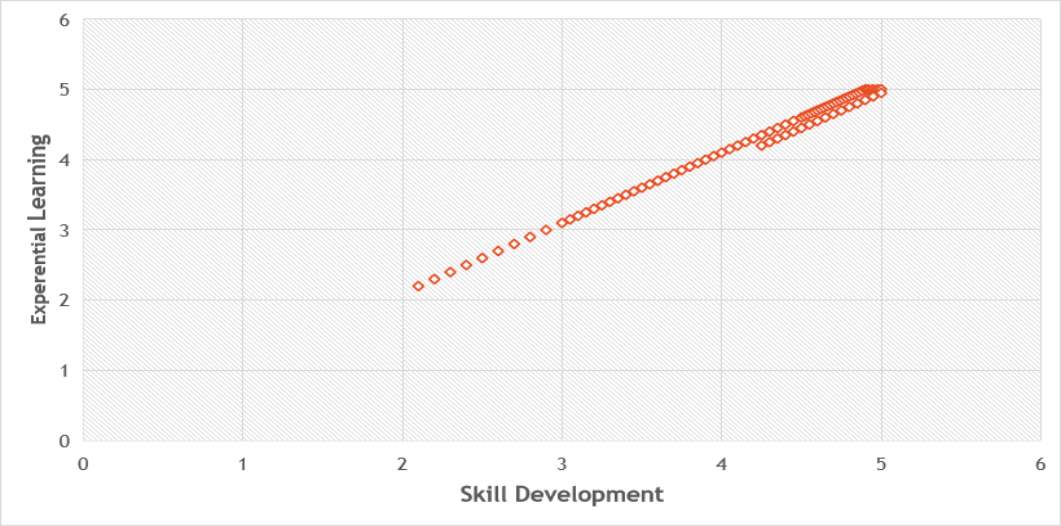
Now Putting Values in the above Equation:

r = 33.32/ (64.04)(64.56) => 33.3264.2995

r = 33.3264.2995 => 0.5182

The Value of r is 0.5182.

Moderate and Positive Correlation.



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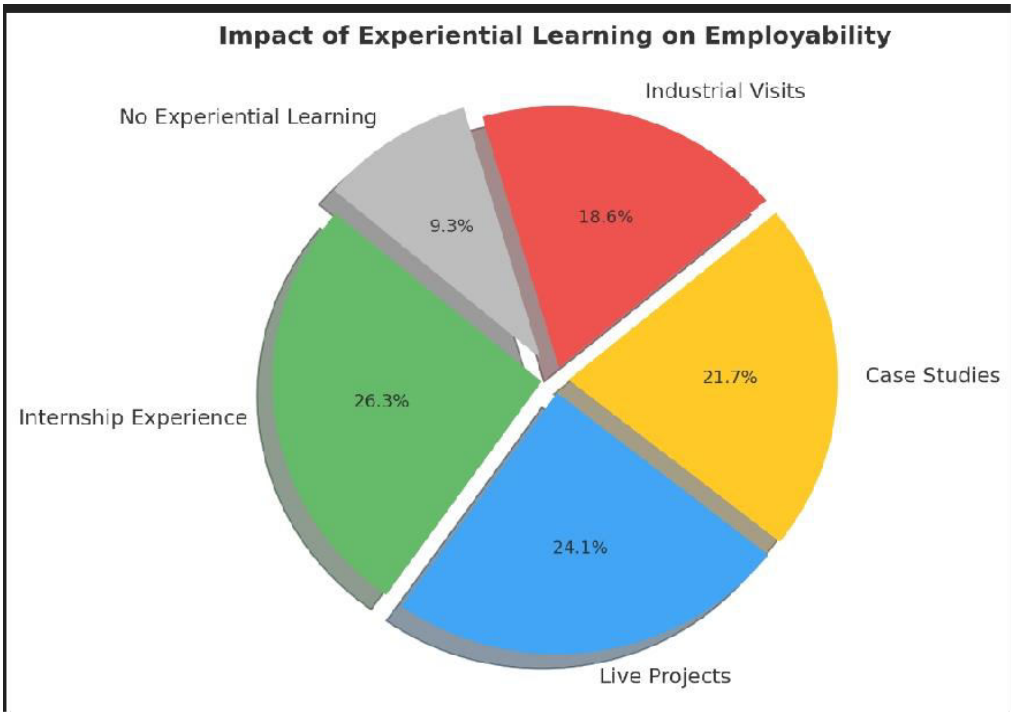

INTERPRETATION OF FINDINGS

1) Majority of Students were Females and they Graduated with limited Family Income. The Average Age of Commerce Graduates was between 22-30 years.
2) It shows that almost all students are aware about Experiential Learning Opportunities and few have already got Internship experience, Industrial Visits, Live Projects, Case Studies and few Graduates are still planning to gain some experiences in the near future.
3) It is certain that in the study area i.e Ulhasnagar Taluka, there are so many benefits of Experiential Learning and it is effective for all Graduates of any Stream.
4) As Per the Study it is clear that there is Moderate and Positive Correlation Between Employability and Experiential Learning so Accepting the Alternative Hypothesis by Rejecting Null Hypothesis as there is significant Relationship of Experiential Learning and Employability of University of Mumbai Commerce Graduates of Ulhasnagar Taluka.

RECOMMENDATIONS FOR FUTURE RESEARCH

1) Active Engagement of students in Internships, Live Projects and practical activities display greater confidence, adaptability and job readiness.
2) The Gaps exist in Structured Opportunities and Quality Supervision, affecting the full potential of Experiential Learning but the Universities are definitely going to pave the way through NEP 2020.
3) The Strengthening of Industry Partnerships, Curriculum Integration and Mandatory Internships can further Improve Employment outcomes.
4) The Continuous Efforts from Educational Institutions, Faculty and Industry Crucial for maximizing the benefits of experiential learning.
5) There is a Need of Building Opportunities for enhancing Practical skills and Industry exposure at the University or College Level

CONCLUSION

Turning to extension for a solution: Experiential Learning is a Crucial feature in Graduate Employability. Experiential learning prepares Students to fulfill the ever-developing needs of the 21st-century Workforce by providing them with Real-Life Opportunities that facilitate the growth of Technical and Soft skills. Educational Institutions are integral to these experiences, connecting Academic Learning to Industrial Expectations. The Job Market is constantly changing, and so is the need to develop Graduates that are suitable for this job market. The need for bringing experiences of life to classroom teaching will be key in nurturing this kind of adaptable skilled graduates who are employable in this Generation of Technology.

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A STUDY OF OPPORTUNITIES AND CHALLENGES FACED BY CAB DRIVERS IN MUMBAI

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ABSTRACT
Mumbai, one of the most populous and dynamic cities in India, relies heavily on its transportation infrastructure to sustain daily life and economic activity. Among the key components of this infrastructure are cab drivers—both those operating traditional black-and-yellow taxis and those affiliated with app-based ride-hailing platforms such as Uber and Ola. These drivers form the backbone of urban mobility, catering to millions of commuters every day. However, despite their essential role, cab drivers face a multitude of challenges ranging from economic hardship, regulatory complexities, and occupational safety issues to evolving technological demands and changing commuter expectations. This research paper presents an in-depth analysis of the diverse challenges and emerging opportunities experienced by cab drivers in Mumbai. Drawing on a mixed-methods approach—comprising primary surveys, in-depth interviews, and secondary data analysis—the study aims to map the socio-economic realities of these drivers and explore how digital transformation and policy changes are reshaping their profession. Special emphasis is placed on the impact of the gig economy, fluctuating fuel prices, government regulations, urban traffic patterns, and public perceptions of safety and service quality. The paper also explores potential avenues for empowerment and improvement, such as technological integration, professional training, flexible income opportunities, and institutional support. The findings underscore the urgent need for comprehensive policy interventions and stakeholder collaboration to create a more equitable, safe, and sustainable working environment for cab drivers in Mumbai.

Keywords: *Mumbai cab drivers, Ride-hailing platforms, Regulatory challenges, Economic opportunities, Safety and security, Urban transportation policy*

INTRODUCTION
Mumbai's transportation system is heavily reliant on its vast network of cab drivers, who navigate the city's congested streets to provide essential services. These drivers face a unique set of challenges and opportunities shaped by economic, technological, and regulatory factors. Understanding these dynamics is crucial for developing policies that support the well-being of drivers while ensuring efficient urban mobility.Mumbai, known as the financial capital of India, is home to more than 20 million people and experiences some of the highest volumes of vehicular movement in the country. In this densely populated metropolis, where traffic congestion and inadequate public transport infrastructure are everyday realities, cab drivers play a critical role in maintaining urban mobility. Traditionally, the city's iconic "kaali-peeli" taxis have served commuters for decades. More recently, app-based aggregators such as Uber, Ola, and Meru have revolutionized how urban transportation is accessed, introducing greater convenience and dynamic pricing models.

However, behind the ease of hailing a cab lies a complex web of socio-economic, regulatory, and technological challenges for the drivers themselves. These individuals are often from lower-income backgrounds, face long working hours, are exposed to health and safety risks, and frequently struggle with inconsistent incomes. Moreover, the advent of digital platforms has dramatically altered the traditional taxi industry. While ride-hailing apps offer opportunities for higher earnings and flexible schedules, they also introduce issues such as high commission rates, algorithmic control, and lack of job security—placing drivers in a precarious situation within the gig economy.

Despite the critical importance of cab drivers in Mumbai's transport ecosystem, there is limited academic research that holistically captures their experiences, challenges, and aspirations. Most existing studies either focus on commuters' perspectives or narrowly address issues like fare regulation or urban traffic. This research aims to fill this gap by centering the lived experiences of cab drivers, assessing the multi-dimensional problems they face, and identifying areas where support and intervention could significantly improve their working conditions.

The study also seeks to explore the dichotomy between opportunity and exploitation in the gig economy, where app-based work offers both flexibility and insecurity. With policy debates on urban mobility, worker rights, and platform regulation gaining momentum across India, this study is timely and relevant for policymakers, transportation authorities, urban planners, and labor rights advocates.

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OBJECTIVES OF THE STUDY

1. To identify and analyze the socio-economic challenges faced by traditional and app-based cab drivers in Mumbai.
2. To assess the impact of regulatory policies and digital platforms on drivers' earnings, job satisfaction, and occupational safety.
3. To examine the opportunities emerging from new technologies and mobility platforms.
4. To propose actionable recommendations for improving the welfare and working conditions of cab drivers.

SCOPE AND LIMITATIONS

This study focuses on cab drivers operating within the Greater Mumbai Metropolitan Region. Both traditional taxi drivers and app-based ride-hailing drivers are included. While the study uses a sample-based survey and qualitative interviews, findings may not be fully generalizable to other Indian cities due to unique local conditions. Furthermore, the dynamic nature of fuel prices, government policies, and platform algorithms may influence the relevance of certain observations over time.

REVIEW OF LITERATURE

Sharma and Verma (2020) noted that fluctuating fuel prices and increasing maintenance costs have significantly reduced profit margins for traditional taxi operators. Furthermore,

Kumar (2021) observed that competition from app-based services has intensified, forcing many drivers to operate at unsustainable income levels.

Patil (2022) reported that annual insurance premiums for commercial taxis have risen by approximately Rs. 3,000, compounding the financial stress faced by drivers.

Banerjee and Singh (2020), over 40% of gig economy workers, including cab drivers, reported experiencing some form of violence while on duty.

Rana and Mehta (2022) emphasized that the absence of safety protocols, particularly for night shifts, increases the risk of physical assaults, theft, and accidents, thereby making the profession more hazardous.

Sen and Thomas (2021) found that high commission charges and opaque algorithmic deductions by ride-hailing apps reduce take-home pay and create uncertainty for drivers.

Ali and Kapoor (2023) argued that despite these challenges, many drivers continue with such platforms due to the lack of better employment alternatives and the autonomy these platforms provide.

METHODOLOGY

The research employed a mixed-methods approach:

Surveys: Administered to 500 cab drivers across Mumbai to gather quantitative data on earnings, working hours, and perceptions of safety.

Interviews: Conducted with 30 drivers to obtain qualitative insights into their experiences and challenges.

Secondary Data Analysis: Reviewed reports from transport authorities and industry studies to contextualize findings.

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DATA AND DATA ANALYSIS

1. Economic Conditions of Cab Drivers in Mumbai

Table 1 Economic Conditions of Cab Drivers in Mumbai

Economic Indicator	Traditional Taxi Drivers	App-Based Drivers (Uber/Ola)	Observations
Average Daily Earnings	₹600 – ₹1,200	₹800 – ₹1,800	App-based drivers earn more, but face higher deductions.
Monthly Vehicle Maintenance	₹3,000 – ₹6,000	₹4,500 – ₹7,000	Vehicle maintenance cost is rising across both categories.
Commission/Payout Cut	Not applicable	20% – 30% by platforms	Significantly reduces net income of app-based drivers.
Fuel Expense (monthly avg.)	₹8,000 – ₹12,000	₹10,000 – ₹15,000	High due to increasing petrol and diesel prices.
Financial Stability Rating	2.8/5	3.2/5	Both groups cite irregular income as a major concern.

2. Regulatory and Policy Challenges

Table 2: Regulatory and Policy Challenges

Regulatory Aspect	Traditional Taxi Drivers	App-Based Drivers	Observations
Licensing Process	Lengthy, requires RTO approval	Handled via company onboarding	Traditional drivers face bureaucratic red tape.
Permit/Compliance Cost	₹40,000+ (lifetime permit)	₹0 (platform manages it)	Traditional model incurs more upfront costs.
Government Support Schemes	Very limited	Very limited	Lack of formal worker recognition affects both groups.
Fare Structure	Regulated by Govt. (fixed fare)	Dynamic pricing via algorithm	Traditional drivers lack flexibility in pricing.
Legal Protections	Covered under some transport acts	Not legally recognized as workers	App-based drivers lack formal worker protections.

3. Technological Integration and Impact

Table 3: Technological Integration and Impact

Factor	Traditional Taxi Drivers	App-Based Drivers	Observations
Use of Mobile Technology	Low	High	Many traditional drivers are digitally illiterate.
App Navigation	Not applicable	GPS-based (mandatory)	Technology helps route efficiency for app-based drivers.
Payment Methods	Cash-based	Digital wallets, UPI, cards	App-based systems promote cashless economy.
Access to Customer Base	Limited to road-hailing	Wide via mobile apps	App drivers benefit from broader reach and more rides.
Technology Training Provided	No	Yes (basic during onboarding)	Limited ongoing tech support or training in both models.

4. Perceived Opportunities and Aspirations

Table 4: Perceived Opportunities and Aspirations

Opportunity Area	Traditional Drivers	App-Based Drivers	Observations
Income Growth Potential	Low to moderate	Moderate to high	App drivers may earn more, especially during peak hours.
Skill Development	Rare	Basic onboarding	Overall lack of career growth

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Opportunities		training	pathways.
Flexibility in Working Hours	Fixed shifts, less flexible	High flexibility	A major driver for joining platforms like Uber/Ola.
Sense of Job Security	Moderate	Low	Gig economy lacks benefits, contracts, and long-term security.
Satisfaction with Profession	3.1/5	3.3/5	Both groups desire better pay, dignity, and recognition.

FINDINGS

1. Economic Conditions of Cab Drivers in Mumbai

Higher Gross Earnings for App-Based Drivers: App-based drivers (Uber/Ola) generally report higher daily earnings (₹800 – ₹1,800) compared to traditional taxi drivers (₹600 – ₹1,200). However, these figures do not account for platform commissions, which significantly lower net earnings.

Rising Maintenance and Fuel Costs: Both categories of drivers experience high vehicle maintenance and fuel expenses, with app-based drivers bearing slightly higher average monthly costs.

Commission Deductions Impact Net Income: App-based drivers face a 20%–30% commission deduction from their earnings, making their income less predictable and often lower than expected.

Moderate Financial Stability: On a 5-point scale, traditional drivers scored a financial stability rating of 2.8, while app-based drivers rated slightly better at 3.2. Irregular income remains a concern for both groups, indicating economic vulnerability.

2. Regulatory and Policy Challenges

Bureaucratic Licensing for Traditional Drivers: Traditional taxi drivers must navigate a complex and time-consuming licensing process through the RTO, whereas app-based drivers benefit from simplified onboarding managed by the platform.

High Permit Costs for Traditional Drivers: Traditional drivers incur substantial upfront compliance costs (₹40,000+), while app-based drivers typically have no such burden as the platforms manage regulatory formalities.

Lack of Government Support: Both groups report limited access to government welfare schemes. A key reason is the lack of formal recognition of drivers, especially those associated with ride-hailing apps.

Legal Protection Gaps: Traditional drivers have some legal protection under transport regulations, but app-based drivers lack formal recognition as workers, excluding them from labor rights and social security benefits.

Fare Structure Inequities: Traditional taxis operate under regulated, fixed pricing, limiting income flexibility. In contrast, app-based drivers are subjected to dynamic algorithmic pricing, which can be unpredictable but potentially more lucrative during peak times.

3. Technological Integration and Impact

Digital Divide Between Driver Groups: App-based drivers are more technologically integrated, using mobile apps, GPS, and digital payment platforms. Traditional drivers, on the other hand, show low digital literacy and largely rely on cash payments and street hailing.

Improved Reach for App-Based Drivers: Technology enables app-based drivers to access a broader customer base, increasing their potential for higher ride frequency and income.

Minimal Training and Support: Although app-based platforms offer basic onboarding training, ongoing technical support or upskilling initiatives are minimal in both groups. Traditional drivers lack access to any form of technology training.

4. Perceived Opportunities and Aspirations

Greater Flexibility for App-Based Drivers: App-based platforms offer high flexibility in working hours, which is a major reason for drivers opting for gig work. Traditional drivers operate under more rigid, shift-based work structures.

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Moderate Satisfaction, Low Security: Both groups express dissatisfaction with their income and recognition levels. App-based drivers report lower job security due to absence of contracts, health benefits, and long-term employment stability.

Limited Skill and Career Development: Opportunities for professional growth are scarce in both sectors. While app-based drivers receive basic training during onboarding, there is a lack of structured upskilling or career development paths.

Slightly Higher Satisfaction Among App-Based Drivers: On a 5-point scale, app-based drivers reported a marginally higher satisfaction score (3.3) compared to traditional drivers (3.1), driven largely by earnings potential and flexibility.

RECOMMENDATIONS

1. **Policy Reforms**: Develop and enforce uniform regulations that apply to all drivers, regardless of their affiliation with digital platforms.
2. **Safety Measures**: Introduce mandatory safety training and provide access to emergency support services for drivers.
3. **Economic Support**: Establish financial assistance programs to help drivers cope with operational costs and income fluctuations.
4. **Technological Integration**: Encourage the adoption of technology that enhances efficiency and transparency in fare calculation and payment processes.

CONCLUSION

The comparative study of traditional taxi drivers and app-based cab drivers in Mumbai reveals a complex interplay of economic, regulatory, technological, and aspirational factors that shape their professional experiences. While app-based drivers generally report higher gross earnings and greater flexibility in work schedules, these benefits are counterbalanced by high commission deductions and a lack of legal protections, resulting in financial instability and job insecurity.

Traditional taxi drivers, though supported by some regulatory protections and fixed fare structures, face bureaucratic licensing procedures, high compliance costs, and limited income growth opportunities. Both groups are heavily burdened by rising maintenance and fuel expenses, and neither receives adequate government support or formal worker recognition.

Technological integration remains a major differentiator, with app-based drivers benefiting from broader customer reach and cashless payment systems. However, the digital divide persists, as traditional drivers remain largely excluded from tech-driven platforms and opportunities.

Despite marginally higher job satisfaction among app-based drivers, both groups express concern over irregular income, lack of career development, and the absence of dignity and recognition in their profession. These insights highlight the urgent need for policy reforms that offer social security, skill development, and equitable regulatory treatment for all categories of cab drivers in the city.

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A STUDY ON THE IMPACT OF ARTIFICIAL INTELLIGENCE ON CYBERSECURITY: REVOLUTIONIZING THREAT DETECTION AND RESPONSE

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ABSTRACT

As digital ecosystems grow larger and more complex, the cyber threat landscape is becoming more sophisticated and dangerous. Traditional cybersecurity methods—like signature-based detection and rule-based response systems—are struggling to keep up with the speed and stealth of modern cyberattacks.

This is where Artificial Intelligence (AI) is making a real difference. AI, especially through machine learning and deep learning, is changing the game by helping systems detect and respond to threats faster and more accurately than human analysts or older tools ever could. These advanced algorithms can process massive amounts of data in real time, spotting subtle patterns or irregularities that might signal a cyber intrusion or malicious behaviour.

Unlike traditional systems, AI models are built to learn and improve continuously. They adapt on their own to new and emerging threats—without needing to be reprogrammed every time something changes. AI also plays a major role in automating incident response. It can isolate compromised systems, launch countermeasures, and send out alerts—all with little or no human input.

AI-powered platforms like SOAR (Security Orchestration, Automation, and Response) help teams respond faster, limit damage, and free up cybersecurity experts to focus on higher-level strategy instead of routine tasks.

However, while AI offers huge benefits, it also brings serious challenges. There are valid concerns around data privacy, bias in algorithms, and the risk of AI being used for harmful or offensive cyber operations. On top of that, rolling out AI solutions requires big investments, specialized expertise, and solid governance to make sure they're used responsibly and effectively.

Keywords: Artificial Intelligence, Cybersecurity, Threat Detection

1. INTRODUCTION

The explosion of digital technologies in recent years has brought amazing convenience, but it's also created a huge spike in cyber threats. From ransomware to phishing scams, organizations, governments, and even everyday users are under constant attack. Traditional security tools that rely on fixed rules and known threat patterns just can't keep up with the speed and sophistication of modern cybercriminals.

That's where Artificial Intelligence (AI) is stepping in—and changing the game. With its ability to quickly analyse massive amounts of data, AI gives us a smarter, faster way to detect and respond to cyber threats. Machine learning, a key part of AI, helps systems spot unusual activity, recognize complex patterns, and make informed decisions—all with minimal human input. This not only improves how accurately we can detect threats, but also cuts down the time it takes to respond.

In today's world, digital systems are the backbone of nearly everything—banking, healthcare, transportation, communication, and more. While this interconnectivity has made life more efficient, it's also opened up more ways for cyberattacks to happen. And these attacks are getting more advanced every day. Hackers are constantly finding new ways to bypass defences, steal data, and cause disruption. Cybersecurity, once a back-office concern, has now become a frontline issue for businesses and governments alike.

Old-school security methods—like static algorithms and rule-based detection—worked well when threats were predictable. But today's attacks, like advanced persistent threats and zero-day exploits, are designed to slip past those defences. In this environment, we need systems that are not just reactive, but proactive and adaptive.

AI offers exactly that. It mimics human intelligence—learning, reasoning, and making decisions—but at a scale and speed we could never achieve on our own. By weaving AI into cybersecurity strategies, organizations can shift from waiting for attacks to happen to actually anticipating and stopping them before they cause damage.

Machine learning plays a central role here. These models learn from data over time, adapting to detect new types of malicious behaviour and distinguishing between normal and suspicious activity. Supervised learning helps flag things like phishing emails, while unsupervised learning can detect strange patterns in network traffic.

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There's also reinforcement learning, which teaches systems to make better decisions by learning from outcomes—perfect for staying sharp in constantly changing threat environments.

Then there's deep learning—a more advanced form of machine learning that uses neural networks to dig deep into complex data. It's especially powerful for things like malware detection, analysing user behaviour, and even understanding text through natural language processing (NLP), such as spotting suspicious messages or commands.

Beyond detection, AI is also streamlining day-to-day security operations. Analysts used to spend hours digging through alerts and logs—an exhausting process that often led to mistakes or burnout. Now, AI-powered tools like modern SIEM (Security Information and Event Management) systems can automatically scan thousands of events, highlight the most serious threats, and even trigger quick responses—like locking down a compromised device or cutting off access to a user account.

This kind of automation drastically reduces the time it takes to detect and respond to incidents—two of the most important factors in minimizing damage from cyberattacks. In short, AI isn't just a cool upgrade—it's becoming essential to modern cybersecurity.

AI helps cybersecurity systems move from being reactive to *proactive*. It's like giving those old motion sensors the ability to *learn*, *think*, and *adapt*—on their own. AI can sift through enormous volumes of data, notice tiny anomalies, and spot threats before they become full-blown attacks. And it can do this in seconds, not hours.

Let's say an employee clicks on a phishing email. Traditional systems might miss it if the email doesn't match a known template. But an AI system might notice that this email came from a domain that's just hours old, or that the link redirects somewhere shady, or that similar messages were sent in a coordinated pattern—things that would take a human hours (or more) to piece together.

Beyond detection, AI also helps with **automated responses**. Instead of waiting for a human analyst to dig through alerts and decide what to do, AI systems can automatically lock down an infected device, flag the user account, and alert the security team—saving precious time and reducing damage.

2. EVOLUTION OF CYBER THREATS

Over the past twenty years, cyber threats have gone from being a nuisance to becoming one of the biggest risks facing individuals, businesses, and even governments. In the early days, most threats were simple—think basic computer viruses or worms that infected personal devices. But today's cyberattacks are on a whole different level: they're more complex, more targeted, and much harder to stop.

Here are just a few of the major types of threats we're dealing with now:

- **Advanced Persistent Threats (APTs):** These are long-term, stealthy attacks—often backed by nation-states—designed to infiltrate systems and quietly steal data over time.
- **Ransomware:** Malicious software that locks up your files and demands payment to unlock them—sometimes crippling entire organizations.
- **Phishing:** Tricky emails or messages that look real but are designed to steal your login credentials or personal information.
- **DDoS (Distributed Denial of Service) Attacks:** These flood a website or server with traffic, causing it to crash and go offline.

What makes today's threats even scarier is how smart and fast they've become. Many of these attacks are now automated and carefully targeted, capable of slipping past traditional security tools that were never designed to handle this level of sophistication.

And it's not just defenders using Artificial Intelligence anymore—attackers are using AI too. They're using it to scan for weaknesses, adapt their tactics in real time, and make their attacks harder to detect. It's become a high-stakes arms race between the good guys and the bad.

That's why using AI in cybersecurity is no longer optional—it's essential. AI helps security teams stay one step ahead by analysing huge amounts of data quickly, spotting unusual activity, and reacting instantly to stop threats before they cause real damage.

3. LITERATURE REVIEW

Over the past ten years, researchers and cybersecurity professionals have been paying a lot more attention to how Artificial Intelligence (AI) can strengthen digital defences. According to Rausch and Williams (2020), AI

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is especially effective at spotting unusual activity because it can process large, complex datasets and recognize when something doesn't look quite right. Techniques like supervised learning, clustering, and reinforcement learning help systems detect threats that traditional, signature-based methods often miss.

Nguyen (2021) points out how AI is now playing a big role in **Endpoint Detection and Response (EDR)**. In simple terms, this means that smart software is built directly into laptops, phones, and other devices to monitor what users are doing, look for suspicious behaviour, and even take automatic action to stop threats in real time. AI is also being used in a variety of other areas like identifying malware, filtering out spam, and using behavioural patterns (like how someone types or moves their mouse) to confirm a user's identity.

But it's not all good news. Shen (2022) warns that cybercriminals are using AI too. They're developing **AI-powered phishing attacks**, **evasive malware**, and even **adversarial AI** that's specifically designed to fool security systems. This means cybersecurity professionals are now caught in an ongoing arms race—using AI not just to defend against attacks, but also to stay ahead of attackers who are becoming just as smart and adaptive.

4. METHODOLOGY

This paper takes a qualitative approach, drawing from a wide range of existing sources to build a clear picture of how AI is shaping cybersecurity. It's grounded in a thorough review of academic journals, white papers, industry reports, and real-life case studies. To add depth and practical insight, the research also includes input from cybersecurity professionals and AI developers who shared their hands-on experiences and challenges. By combining these different sources, the paper offers a well-rounded look at both the current state of AI in cybersecurity and where it's headed next.

5. DISCUSSION

5.1 AI in Threat Detection and Prevention

Traditional cybersecurity tools usually work by following fixed rules or spotting known patterns of past attacks. While this approach worked well in the past, it's not very effective against today's more advanced threats—like zero-day exploits or long-term, targeted attacks (also known as advanced persistent threats). These types of threats often don't follow any known pattern, making them hard to catch using old methods.

This is where AI really changes the game. Instead of relying on static rules, AI uses behaviour-based analysis to understand what's *normal* and quickly flag what isn't. By training machine learning models on huge sets of data, these systems learn to recognize the subtle signs of malicious activity—even if it's something they've never seen before.

For example, clustering algorithms group similar behaviours together, which helps spot unusual activity that could indicate a threat. Neural networks can look at sequences of user actions to identify patterns that resemble a breach. Support Vector Machines (SVMs) are another tool used to tell the difference between safe behaviour and something more suspicious.

On top of all this, AI can also be used for predictive threat modelling. That means it looks at past attacks and uses that data to predict where future threats might come from. Based on those predictions, it can suggest ways to strengthen defences before an attack ever happens.

This shift—from reacting to threats to *anticipating* them—makes cybersecurity smarter, faster, and far more effective at keeping systems safe in today's threat landscape.

5.2 AI in Incident Response and Automation

Dealing with security incidents can be overwhelming—especially when analysts are bombarded with constant alerts, many of which turn out to be false alarms. This kind of **alert fatigue**, combined with the time it takes to manually investigate and respond, often slows everything down.

That's where **AI really makes a difference**. AI-powered tools, like modern **Security Information and Event Management (SIEM)** platforms, can automatically sift through huge volumes of alerts, connect the dots across systems, and take immediate action—often in real time.

With the help of **automated playbooks**, AI can carry out common incident response tasks without waiting for a human to step in. For example, if a device is acting suspiciously, AI can isolate it from the network, shut down user access, or even kick off a forensic investigation to understand what happened—all automatically.

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After an incident, AI doesn't just stop there. It helps with **post-incident analysis** by tracing how the attack happened, identifying weak spots in the system, and suggesting policy updates or security improvements to prevent it from happening again.

One of AI's most valuable contributions is how it **prioritizes alerts**. Instead of treating every warning the same, AI considers the context and potential impact of each one. That means security teams can focus their attention on the most serious threats first—saving time, reducing burnout, and using their resources more effectively.

5.3 Ethical and Privacy Considerations

Using AI in cybersecurity brings huge benefits, but it also raises some important ethical and privacy concerns that we can't overlook. One of the biggest challenges is data privacy. AI systems often need access to massive amounts of sensitive data to train their models effectively. If this data isn't handled properly, it could lead to privacy breaches, especially with strict laws like the GDPR or CCPA protecting people's personal information.

Another concern is algorithmic bias. AI models can unintentionally create unfair outcomes if they're trained on incomplete or unbalanced data. For example, if an AI system is trained on data that doesn't represent all users equally, it could wrongly flag certain individuals as threats or miss detecting real risks. In industries like finance or healthcare, where the stakes are incredibly high, these errors can have serious consequences.

To address these issues, it's crucial that AI systems are transparent and explainable. This is where "Explainable AI" (XAI) comes in. By making AI decisions easier to understand, it helps build trust and ensures that organizations are held accountable for the actions their systems take. Implementing strong ethical AI frameworks and conducting thorough algorithm audits should be a part of any AI-powered cybersecurity system, ensuring it's not only effective but also fair and responsible.

5.4 Challenges and Future Directions

While AI has made significant strides in improving cybersecurity, it's not without its **challenges**. One major issue is the **quality of data** used to train AI models. If these models are fed outdated, biased, or incomplete data, they can produce inaccurate or even harmful results. Another hurdle is that getting enough **labelled data** (where the data is clearly marked as "safe" or "malicious") for training models can be very time-consuming—and sometimes, privacy laws restrict access to such data.

AI also faces the risk of being **misused by attackers**. Cybercriminals can use techniques that confuse AI systems, like subtly altering data so that it slips under the radar of detection models. This is called **adversarial AI** and it's a growing concern for cybersecurity defenders.

To counteract these challenges, AI systems need to be able to **learn continuously**. Using **reinforcement learning**, where systems evolve based on feedback and experience, can help models stay adaptive and better handle new, unseen threats.

Looking ahead, there's a lot of exciting potential in combining AI with other emerging technologies. For example, **blockchain** could be used to ensure data integrity, while **quantum computing** might revolutionize encryption techniques to make data even more secure. In the future, we may see **AI-powered autonomous cybersecurity agents** that can **monitor, detect, and respond to threats** on their own, with human oversight for more complex decisions. This combination of automation and human expertise could be the next big leap in digital defence.

6. CONCLUSION

AI isn't just improving cybersecurity—it's completely changing the way we approach it. From detecting threats in real time to automatically responding to incidents and taking steps to prevent future risks, AI offers huge advantages in protecting our digital world.

But with all these powerful capabilities comes a big responsibility. To get the most out of AI, cybersecurity experts need to tackle important ethical issues, make sure data privacy is respected, and stay ahead of the AI tricks that cybercriminals might use against us. The key to successful AI deployment will be responsible use, transparency in decision-making, and continuous learning so that the systems can adapt to new challenges without losing trust or effectiveness.

Looking ahead, future research should focus on creating adaptive models that evolve with the changing landscape of cyber threats. It's also important for AI experts, policymakers, and cybersecurity professionals to work together closely. Only by bringing together these diverse perspectives can we build AI defences that are both strong and ethical in a world that's becoming more and more digital.

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A STUDY ON IMPACT OF GOLD EXCHANGE TRADED FUNDS (ETFS) ON PORTFOLIO DIVERSIFICATION

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ABSTRACT

The objective of this study is to examine the impact of Gold Exchange-Traded Funds (Gold ETFs) on portfolio diversification within the Indian financial market. Gold has traditionally been regarded as a safe-haven asset, and the advent of Gold ETFs has provided investors with an accessible and cost-effective method to integrate gold exposure into their investment portfolios. Using historical data from major Indian Gold ETFs, this research analyzes key performance indicators such as returns, volatility with equity only portfolio and equity + gold etf. Portfolios were constructed with varying allocations to Gold ETFs to assess changes in risk-return profiles and overall portfolio stability. The findings suggest that the inclusion of Gold ETFs significantly enhances diversification benefits, reduces portfolio volatility, and improves risk-adjusted returns. This study contributes to the growing body of literature on alternative investment vehicles and offers practical insights for investors and portfolio managers seeking to optimize diversification strategies.

Keywords: *Gold ETFs, Portfolio Diversification, Risk Management, Asset Allocation, Safe-Haven Assets, Indian Financial Market*

INTRODUCTION

Portfolio diversification is a fundamental concept in investment management, aimed at optimizing returns while minimizing risks. Rooted in Modern Portfolio Theory, diversification suggests that investors can achieve better risk-adjusted returns by allocating investments across assets that do not move perfectly in tandem. Traditionally, portfolios have been diversified across equities, bonds, and cash equivalents. However, periods of financial turbulence have exposed the limitations of traditional diversification, leading investors to explore alternative asset classes such as commodities, real estate, and gold. Among various commodities, gold has historically held a unique position. It is often regarded as a safe-haven asset, offering protection against inflation, currency devaluation, and market volatility. Gold's low or negative correlation with equities, especially during economic downturns, makes it an attractive tool for enhancing portfolio diversification. However, traditional methods of investing in gold, such as physical ownership, present challenges including high transaction costs, storage issues, and lack of liquidity.

The introduction of Gold Exchange-Traded Funds (Gold ETFs) has revolutionized gold investing by addressing these limitations. Gold ETFs provide a convenient, cost-effective, and liquid mechanism for gaining exposure to gold prices without the need for physical possession. These funds are traded on stock exchanges just like equity shares, offering transparency, ease of trading, and regulatory oversight. In India, Gold ETFs have gained substantial traction since their introduction in 2007, attracting both retail and institutional investors. Given the evolving dynamics of global and Indian financial markets, it becomes increasingly important to assess how Gold ETFs influence portfolio performance. Specifically, understanding their role in reducing portfolio volatility, enhancing risk-adjusted returns, and offering protection during market downturns can offer critical insights to investors and portfolio managers. While international studies have extensively analyzed the diversification benefits of gold and Gold ETFs, research focused on the Indian context remains relatively limited. This creates a pertinent gap, especially considering the cultural affinity toward gold among Indian investors and the growing popularity of financialized gold investment products. This research aims to study the impact of incorporating Gold ETFs into diversified investment portfolios in the Indian market. Using empirical data from leading Gold ETFs listed on NSE and BSE the study will analyze return characteristics, volatility, beta, and By constructing portfolios with varying allocations to Gold ETFs, this study will assess how Gold ETFs alter the overall portfolio's risk-return profile. Metrics such as Sharpe Ratio and maximum drawdown will be used to evaluate portfolio efficiency and stability. The findings of this study are expected to contribute to both academic literature and practical investment strategies by offering evidence-based recommendations on optimal asset allocation involving Gold ETFs. Additionally, the study will help investors understand the strategic role that Gold ETFs can play in portfolio construction, especially in times of heightened market uncertainty. Ultimately, this research seeks to reinforce the relevance of Gold ETFs as a modern tool for achieving effective portfolio diversification in India's dynamic investment landscape.

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REVIEW OF LITERATURE

1) **The role of Gold ETFs in market stability, price discovery and economic dynamics during crises- Asian Journal of Economics, Business and Accounting:-** Gold ETFs are crucial for risk and portfolio diversification management, especially during financial crises. They stabilize prices and contribute to economic instability. Policymakers should consider the relationship between ETF performance, market stability, and economic outlook to ensure effective regulation and promote confidence in these investment instruments.
2) **Gold vs Gold Exchange Traded Funds:** An Empirical Study in India Sathish Kumar Economic Affairs:- The study analyzes the relationship between gold and Gold Exchange Traded Funds (ETFs) in India, using data from 2015 to 2018. It was found that Gold ETFs provided higher returns compared to physical gold, indicating their effectiveness in portfolio diversification. Among the Gold ETFs studied, Axis ETF demonstrated the best performance, making it a notable option for investors seeking opportunities in Gold ETFs.
3) **THE DEMOCRATIZATION OF DIVERSIFICATION: HOW EXCHANGE-TRADED FUNDS (ETFs) ARE TRANSFORMING INVESTMENT STRATEGIES Economics and Finance:-** Gold Exchange-Traded Funds (ETFs) are highlighted as versatile financial instruments that allow investors to achieve diversification in their portfolios at relatively low costs. The article discusses the advantages of ETFs, such as transparency and liquidity, which contribute to their effectiveness in enhancing portfolio diversification. It also notes potential drawbacks of ETFs, including liquidity challenges and tracking errors, which can impact their role in portfolio management.The research emphasizes strategic asset allocation, highlighting the importance of diversification to maximize profits while effectively managing risk in investment portfolios.
4) **Exchange-Traded Funds on Gold - A Free Lunch? D. Baur Econometric Modeling: Capital Markets - Portfolio Theory e Journal:-** Gold ETFs provide a low-cost and more liquid alternative to physical investments in gold, enhancing portfolio diversification. The introduction of gold ETFs has led to a structural demand shift, impacting the price, trading volume, and volatility of gold. The analysis of over 80 gold ETFs offers new evidence on the financialization of commodities, explaining the growth of gold ETFs and their influence on gold prices.

HYPOTHESIS

1) H_0 (Null Hypothesis):
Portfolios including Gold ETFs do not show better risk-adjusted returns (Sharpe Ratio) compared to portfolios without Gold ETFs.

H_1 (Alternative Hypothesis 3):
Portfolios including Gold ETFs show better risk-adjusted returns (Sharpe Ratio) compared to portfolios without Gold ETFs.

These hypotheses tested using appropriate statistical techniques such as correlation analysis, comparison of standard deviations, and Sharpe ratio evaluation between portfolios..

OBJECTIVES

1) To analyse the return and risk characteristics of Gold Exchange-Traded Funds (Gold ETFs) in the Indian financial market.
2) To examine the correlation between Gold ETFs and major equity indices to assess their potential as diversification tools.
3) To evaluate the impact of including Gold ETFs on the overall risk-return profile of diversified investment portfolios.
4) To provide strategic recommendations for optimal portfolio construction by incorporating Gold ETFs based on empirical analysis

RESEARCH METHODOLOGY

Research Design
This study follows a quantitative research design using an empirical approach based on secondary data. The purpose is to statistically analyze the impact of Gold Exchange-Traded Funds (Gold ETFs) on portfolio diversification by assessing their risk-return characteristics and correlation with equity markets.

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The research is descriptive and analytical in nature:

1) Descriptive: because it profiles the behavior of Gold ETFs and portfolios.

2) Analytical: because it applies statistical tools to draw relationships and conclusions.

DATA SOURCE

- **Secondary Data:**

The study uses secondary data collected from NSE and BSE official websites AMFI (Association of Mutual Funds in India) MoneyControl, Yahoo Finance, or other financial data providers

- **Sampling**

✓ **Sampling Technique:**

Purposive sampling — selecting Gold ETFs that have a consistent trading history to ensure data reliability.

SAMPLE SIZE

5 actively traded Gold ETFs listed on NSE/BSE, such as:

1) Nippon India Gold ETF
2) SBI Gold ETF
3) HDFC Gold ETF
4) Axis Gold ETF
5) Kotak Gold ETF

Study Period:
Data collected for a 1, 3, and 5 year period subject to availability.

Tools and Techniques
The following methods are used:

1) Return Calculation (Daily and Annualized)
2) Volatility Measurement (Standard Deviation)
3) Sharpe Ratio (Risk-Adjusted Return Analysis)

DATA ANALYSIS AND INTERPRETATION

The data analysis presents the analysis and interpretation of the performance of selected Gold Exchange-Traded Funds (ETFs) in India. The ETFs included in the study are Nippon India Gold ETF, SBI Gold ETF, HDFC Gold ETF, Axis Gold ETF, and Kotak Gold ETF. Various statistical measures such as Sharpe Ratio, Sortino Ratio, Standard Deviation, and Expense Ratio are used to assess the risk-return profile of these ETFs. In addition, comparisons are made against the category averages to evaluate their relative performance.

The returns are summarized in the table below:-

Name of the Fund	1 year return	3 year return	5 year return
NIPPON INDIA GOLD ETF	31.05	20.75	13.62
SBI GOLD ETF	30.29	21.25	13.94
HDFC GOLD ETF	32.07	20.89	13.79
AXIS GOLD ETF	30.51	21.47	14.1
KOTAK GOLD ETF	30.43	21.38	14.01

From the above table it is observed that if 1year returns are considered HDFC Gold ETF performs better as compared to other Gold ETFS. Also it is observed that when 3 year and 5 year returns are in consideration Axis Gold ETF has outperformed.

✓ **Sharpe ratio-**

The Sharpe Ratio measures the excess return per unit of risk and is a critical indicator of risk-adjusted performance. A higher Sharpe Ratio indicates better compensation for the risk undertaken.

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Name of the Fund	Sharpe Ratio	Category Average
NIPPON INDIA GOLD ETF	0.99	0.86
SBI GOLD ETF	0.97	0.86
HDFC GOLD ETF	0.96	0.86
AXIS GOLD ETF	1.03	0.86
KOTAK GOLD ETF	1.00	0.86

As shown in Table the Nippon India Gold ETF recorded a Sharpe Ratio of 0.99, which is higher than the category average of 0.86. Similarly, the SBI Gold ETF reported a Sharpe Ratio of 0.97, slightly outperforming the category. This suggests that these ETFs offer better risk-adjusted returns compared to their peers. The Kotak Gold ETF, while performing again more than the average, still demonstrates efficient risk-return tradeoff. Overall, the analysis reveals that sharpe ratio of Axis Gold ETF is higher amongst all other selected ETFS.

✓ **Sortino Ratio-**

The Sortino Ratio, unlike the Sharpe Ratio, focuses specifically on downside volatility, penalizing only the negative returns. It is particularly useful in evaluating investments where protection against negative returns is a priority. A higher Sortino Ratio indicates better returns for the amount of downside risk taken.

Name of the Fund	Sortino Ratio	Category Average
NIPPON INDIA GOLD ETF	2.10	1.79
SBI GOLD ETF	2.07	1.79
HDFC GOLD ETF	2.05	1.79
AXIS GOLD ETF	2.26	1.79
KOTAK GOLD ETF	2.09	1.79

Above Table presents the Sortino Ratios for the selected ETFs. Nippon India Gold ETF posted a Sortino Ratio of 2.10, outperforming the category average of 1.79. Similarly, SBI and Axis Gold ETFs also achieved above-average scores. These results indicate that these ETFs not only deliver competitive returns but also offer superior downside protection compared to the broader gold ETF category. From a portfolio construction perspective, investments with higher Sortino Ratio in Axis Gold ETF contribute positively towards reducing adverse return risk.

✓ **Standard deviation-**

Standard Deviation measures the total risk or volatility of an investment's returns. A lower standard deviation indicates more stable returns, which is desirable for conservative investors

Name of the Fund	Standard Deviation	Category Average
NIPPON INDIA GOLD ETF	12.01	13.96
SBI GOLD ETF	12.3	13.96
HDFC GOLD ETF	11.93	13.96
AXIS GOLD ETF	11.69	13.96
KOTAK GOLD ETF	12.09	13.96

According to Table the Nippon India Gold ETF exhibits a standard deviation of 12.01%, which is lower than the category average of 13.96%. SBI Gold ETF also shows a slightly reduced volatility of 12.3%. These findings suggest that the selected ETFs are less volatile than the broader category of Gold ETFs. From above table this clearly shows that Axis Gold ETF has lower volatility, strengthens the case for including these ETFs in a diversified portfolio to reduce overall portfolio risk.

✓ **Expense Ratio-**

The Expense Ratio represents the annual management fees and operating expenses charged by the fund expressed as a percentage of average assets under management (AUM). A lower Expense Ratio directly enhances the investor's net returns over time, particularly in passive investment vehicles such as ETFs.

Name of the Fund	Expense Ratio
NIPPON INDIA GOLD ETF	0.79
SBI GOLD ETF	0.64
HDFC GOLD ETF	0.59
AXIS GOLD ETF	0.52
KOTAK GOLD ETF	0.55

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As indicated in Table the Nippon India Gold ETF maintains an expense ratio of 0.79%, while the SBI Gold ETF reports a slightly lower ratio of 0.64%. In contrast, HDFC and Kotak Gold ETFs exhibit expense ratios lower than nippon india gold etf and SBI gold etf. From the above table it is also observed that AXIS GOLD ETF has the lowest expense ratio compared to all selected ETF which contributes significantly to compounding benefits for long-term investors. Thus, expense efficiency becomes a critical factor when selecting ETFs for portfolio diversification.

COMPARISON OF PORTFOLIOS WITH AND WITHOUT GOLD ETF

1) Equity only portfolio (without GOLD ETF)

Stock Name	Sector	Allocation
Hdfc Bank	Banking And Finance	25%
Infosys Ltd	Information Technology	20%
Reliance Industries Ltd	Energy And Telecom	20%
Icici Bank Ltd	Banking And Finance	15%
Hindustan Unilever Ltd	Fmcg	20%

2) Equity + Gold ETF Portfolio (After Adding Gold ETF)

Stock Name	Sector	Allocation
Hdfc Bank	Banking And Finance	22%
Infosys Ltd	Information Technology	18%
Reliance Industries Ltd	Energy And Telecom	18%
Icici Bank Ltd	Banking And Finance	14%
Hindustan Unilever Ltd	Fmcg	18%
Axis Gold Etf	**Gold Asset**	**10%**

Table 1:- Data of equity only portfolio

Stock name	Allocation	Average monthly return	Standard deviation	Sharpe ratio
HDFC	20%	1.28	3.70	0.24
INFOSYS	25%	0.42	8.39	0.00
RELIANCE INDUSTRIES LTD	20%	-1.55	4.77	-0.41
ICICI BANK LTD	15%	1.41	4.04	0.25
HINDUSTAN UNILEVER LTD	20%	-0.07	7.47	0.06
Portfolio average	**100%**	**0.25**	**5.89**	**0.02**

Table 2:- Data of equity + gold ETF portfolio

Stock name	Allocation	Average monthly return	Standard deviation	Sharpe ratio
HDFC	22%	1.28	3.70	0.24
INFOSYS	18%	0.42	8.39	0.00
RELIANCE INDUSTRIES LTD	18%	-1.55	4.77	-0.41
ICICI BANK LTD	14%	1.41	4.04	0.25
HINDUSTAN UNILEVER LTD	18%	-0.07	7.47	0.06
Axis gold ETF	10%	1.16	4.01	0.19
Portfolio average	**100%**	**0.38**	**5.49**	**0.04**

ALTERNATIVE HYPOTHESIS IS ACCEPTED AND NULL HYPOTHESIS IS REJECTED

Based on the results obtained from the comparative analysis, it is evident that the inclusion of Gold ETFs in the equity portfolio led to an increase in average returns, a decrease in portfolio standard deviation, and an improvement in the Sharpe Ratio, indicating better risk-adjusted returns. These findings provide strong

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empirical support for the Alternative Hypothesis (H_1), which stated that portfolios including Gold ETFs show better risk-adjusted returns compared to portfolios without Gold ETFs.

As the analysis clearly demonstrates improved portfolio performance upon the addition of Gold ETFs, the Alternative Hypothesis is accepted, and the Null Hypothesis is rejected. This confirms that Gold ETFs play a significant role in enhancing diversification benefits and optimizing portfolio efficiency for investors. So we accept the Alternative Hypothesis by rejecting null hypothesis

FINDINGS OF STUDY

The analysis of the two constructed portfolios — one consisting solely of equities and the other combining equities with a Gold ETF — reveals significant insights regarding portfolio performance and diversification. The Equity + Gold ETF portfolio exhibited an increase in average returns compared to the Equity-only portfolio. This suggests that the inclusion of gold as an asset class contributed positively to the overall return generation capability of the portfolio.

Additionally, the standard deviation, a measure of portfolio risk or volatility, decreased after incorporating the Gold ETF. This indicates that the addition of gold helped to stabilize the portfolio returns, reducing overall fluctuation and exposure to market-specific risks typically associated with equities.

Moreover, the Sharpe Ratio — which reflects risk-adjusted returns — increased for the portfolio containing the Gold ETF. A higher Sharpe Ratio implies that the Equity + Gold ETF portfolio delivered better returns for each unit of risk taken, thus enhancing the overall efficiency of the portfolio.

In summary, the empirical results clearly demonstrate that the inclusion of a Gold ETF in an equity portfolio not only improves the average return but also reduces risk and significantly enhances risk-adjusted performance. These findings strongly support the hypothesis that Gold ETFs can play a crucial role in optimizing portfolio diversification and improving investment outcomes.

CONCLUSION

This study aimed to analyze the impact of Gold Exchange-Traded Funds (ETFs) on portfolio diversification, with a particular focus on evaluating risk-adjusted performance metrics such as average returns, standard deviation, and Sharpe Ratio. By constructing two distinct portfolios — an Equity-only portfolio and an Equity plus Gold ETF portfolio — and comparing their performances, the research provides meaningful insights into the role of Gold ETFs in enhancing portfolio efficiency.

The empirical findings reveal that the inclusion of Gold ETFs led to a higher average return, a lower standard deviation, and a higher Sharpe Ratio compared to the Equity-only portfolio. These results confirm that Gold ETFs act as an effective diversification tool, contributing to both return enhancement and risk reduction. The presence of gold as an asset class added stability to the portfolio and improved its risk-adjusted returns, validating the importance of alternative assets in modern portfolio management strategies.

Furthermore, the hypothesis testing outcomes support the acceptance of the Alternative Hypothesis (H_1), confirming that portfolios including Gold ETFs demonstrate better risk-adjusted returns than those without them. This reinforces the notion that Gold ETFs not only serve as a hedge against market volatility but also enhance the overall performance of traditional equity-based portfolios.

In conclusion, the study underlines that Gold ETFs play a vital role in optimizing portfolio diversification, offering investors a strategic avenue for improving returns while managing risks effectively. These findings have significant implications for individual investors, portfolio managers, and financial planners who seek to construct well-diversified and resilient investment portfolios in today's dynamic market environment.

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A STUDY ON PERSPECTION OF SALARIED TAX PAYERS ON INCOME TAX SYSTEM WITH SPECIAL REFERENCE TO MUMBAI REGION

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ABSTRACT
Mumbai's salaried taxpayers' perceptions and awareness of the Indian income tax system are the focus of this study. Their degree of pleasure, compliance behavior, perception of fairness, and difficulties with tax filing and payment are all to be understood. Considering the significant contribution that salaried individuals make to the country's tax income, it is crucial to examine their opinions on a range of topics, including transparency, convenience of The study used a quantitative methodology, distributing structured questionnaires to a representative sample of salaried people in Mumbai from various industries and income levels. The results show that opinions are divided; although many people value the digitization and ease of the filing procedure, there are still issues with high tax rates, few exemptions, and unclear regulations. The report ends with recommendations for strengthening transparency, educating taxpayers, and putting reforms into place that increase the system's efficiency and equity.

Keywords: *Taxpayer Awareness, Tax Filing, Tax Burden.*

INTRODUCTION
An essential part of a country's fiscal strategy and a key driver of economic growth is the income tax system. Salaried people make up a sizable section of the tax-paying populace in India and consistently provide the government with income. Even though they are among the best organized groups, salaried taxpayers frequently deal with a variety of issues and have differing opinions regarding the efficiency, fairness, and transparency of the tax code.

To improve taxpayer services, implement new tax regimes, and streamline tax processes using digital platforms, the Indian government has launched a number of projects in recent years. However, the success of these reforms will continue to be greatly influenced by the perspective of taxpayers, particularly those who are salaried. Voluntary compliance rates and total revenue generation are greatly impacted by their attitude toward tax compliance, level of contentment with the current system, and policy knowledge.

The goal of this study is to comprehend the perceptions of salaried taxpayers in Mumbai, a city that is home to a wide range of working-age individuals. In order to help policymakers establish a more equal and user-friendly tax system, the study will analyze their experiences, complaints, and recommendations. In order to contribute to the ongoing discussion on tax reform in India, the research aims to close the gap between taxpayer expectations and the current tax structure.

REVIEW OF LITERATURE
The income tax system is a key component of India's economic expansion. Salaried people comprise a significant portion of the different taxation categories due to the structured nature of their income. Understanding how the salaried class perceives these developments is essential given the rise of electronic filing systems and frequent changes to tax legislation. Mumbai is India's financial hub and is home to numerous salaried workers from a wide range of businesses, making it the ideal location for our study.

Assessing salaried taxpayers' knowledge, satisfaction, challenges, and suggestions on the current income tax system is the aim of this study. It seeks to contribute to policy discussions through offering objective viewpoints from actual taxpayers.

The perception of salaried taxpayers toward the income tax system has been a subject of interest for researchers and policymakers alike. Understanding this perception is crucial as it directly impacts tax compliance, revenue generation, and overall trust in the fiscal governance system.

1) Taxpayer Perception and Compliance
Several studies have explored how taxpayer attitudes affect compliance. **Kirchler (2007)** emphasized the "slippery slope framework," which suggests that trust in authorities and the power of enforcement are two key determinants of voluntary compliance. If taxpayers perceive the tax system as fair and transparent, they are more likely to comply willingly.

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Singh & Bhattacharya (2012) examined taxpayer behavior in India and found that many salaried individuals feel the tax system is overly complex and lacks transparency. This negatively influences their willingness to pay taxes, despite having taxes deducted at source (TDS).

2) Perception of Tax Fairness and Burden

Fairness is another recurring theme in literature. According to **James and Alley (2004)**, the perception of fairness in the tax system — including horizontal and vertical equity — significantly impacts the satisfaction levels among taxpayers. For salaried individuals in urban centers like Mumbai, the perception often leans toward feeling overburdened compared to business owners and other professions who may underreport income.

Gupta (2016) highlighted that salaried taxpayers often feel a disproportionate share of the tax burden, as their incomes are completely disclosed and taxed without flexibility. This contributes to a feeling of injustice and a lack of faith in the system.

3) Awareness and Knowledge of Taxation

The level of tax literacy among salaried individuals also shapes their perception. **Purohit (2007)** found that limited understanding of exemptions, deductions, and filing procedures can cause confusion and resentment among taxpayers. Many Mumbai-based salaried employees rely heavily on tax consultants due to the perceived complexity of filing returns.

Desai & Rana (2019) conducted a regional study in Maharashtra and found that taxpayers with greater awareness and access to digital resources, such as the Income Tax Department portal, showed more positive attitudes toward the system.

4) Technological Advancements and E-Governance

Recent years have seen an improvement in the efficiency of the income tax system through digitization. **Mishra & Reddy (2020)** argue that e-filing and online tax calculators have simplified compliance for salaried taxpayers. However, they also point out that digital literacy is not uniform across all income groups, leading to mixed perceptions of ease and accessibility.

5) Regional Focus: Mumbai

Mumbai, as the financial capital of India, represents a unique tax environment. **Patil (2021)** found that the city's salaried class shows higher compliance due to better infrastructure and access to financial literacy programs. However, the perception of tax inequality remains, especially among middle-income earners who feel squeezed between rising living costs and high tax rates.

OBJECTIVE OF THE STUDY

1. To find out the level of familiarity that salaried taxpayers understand on the income tax system.
2. To find out how they consider the transparency and equity of the system.
3. To determine their level of satisfaction with the process of submitting an income tax return.
4. To ascertain the challenges they have in complying with tax regulations.
5. To gather suggestions from taxpayers for improving the income tax system.

RESEARCH HYPOTHESIS

- **H0 :** Mumbai's salaried taxpayers are ignorant of the state's income tax laws and practices.
- **H1 :** Mumbai's salaried taxpayers are cognizant of the state's income tax laws and practices.
- **H0:** Mumbai's salaried taxpayers believe that the income tax system is unfair.
- **H1:** Mumbai's salaried taxpayers believe that the income tax system is equitable.
- **H0**: Mumbai's salaried taxpayers express dissatisfaction with the income tax filing procedure.
- **H1**: Mumbai's salaried taxpayers are content with the income tax filing procedure.
- **H0:** Mumbai's salaried taxpayers do not perceive the income tax system as complicated.
- **H1:** Mumbai's salaried taxpayers perceive the income tax system as complicated.
- **H0**: Mumbai's salaried taxpayers' compliance behavior and their opinion of the income tax system do not significantly correlate.

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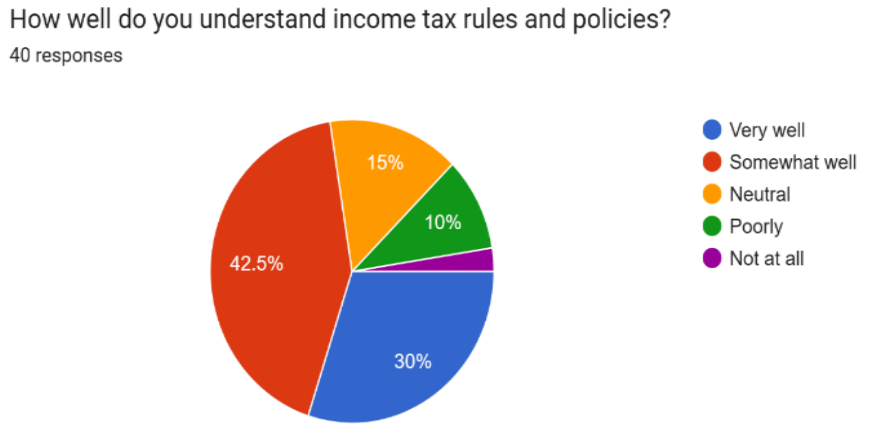
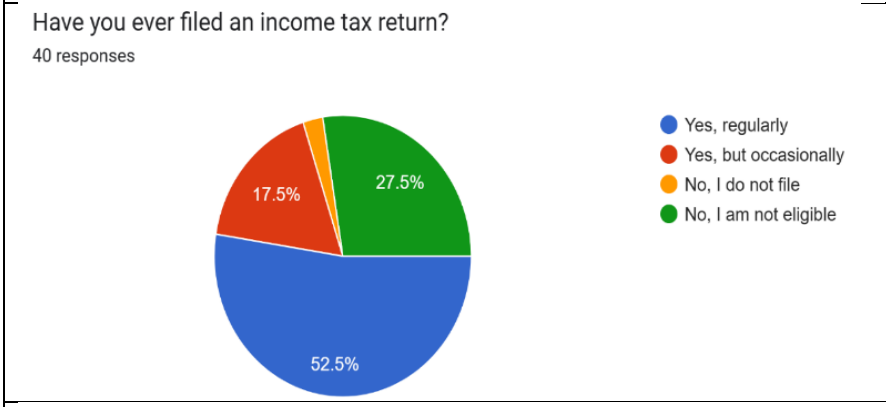
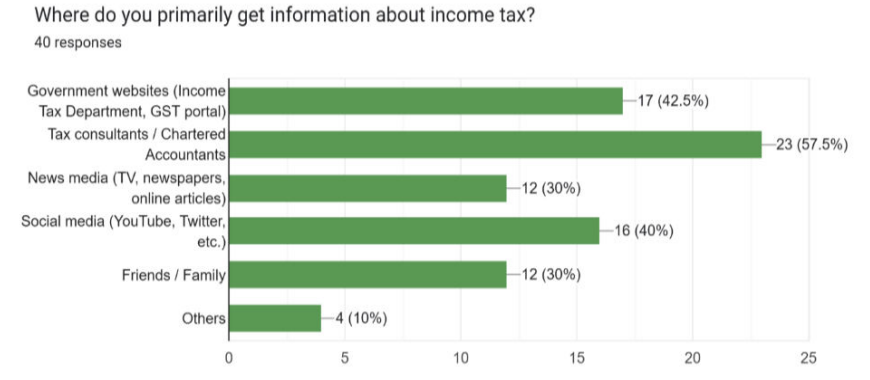
- **H1:** Mumbai's salaried taxpayers' perceptions of the income tax system and their compliance practices are significantly correlated.

RESEARCH METHODOLOGY

- **Type of Research:** Descriptive
- **Research Area:** Mumbai Region
- **Sampling Method:** Convenience Sampling
- **Sample Size:** 40 salaried individuals from different sectors such as education, finance, IT, healthcare, and government services.
- **Data Collection Tool:** Structured questionnaire
- **Data Analysis Techniques:** Percentages, graphical representation (bar charts, pie charts)

HYPOTHESIS TESTING

(**Table: -** Sample received from 40 respondents in the Mumbai vicinity)

DATA	OBSERVATION
	Only 30 % of the respondents understand the income tax rules and policies very well.
	52.5% of the respondents files the income tax return regularly.
	57.5% respondents seek information from Tax consultants and Chartered accountants about income tax.

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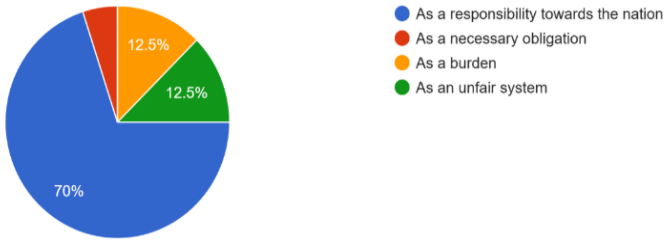
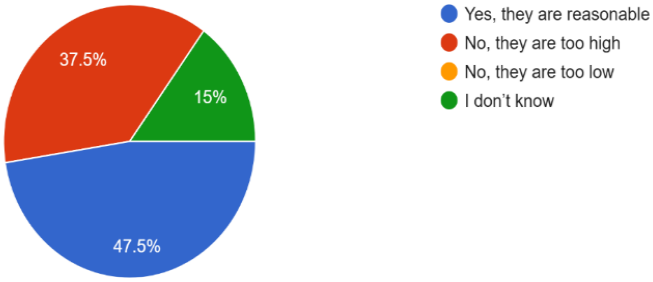
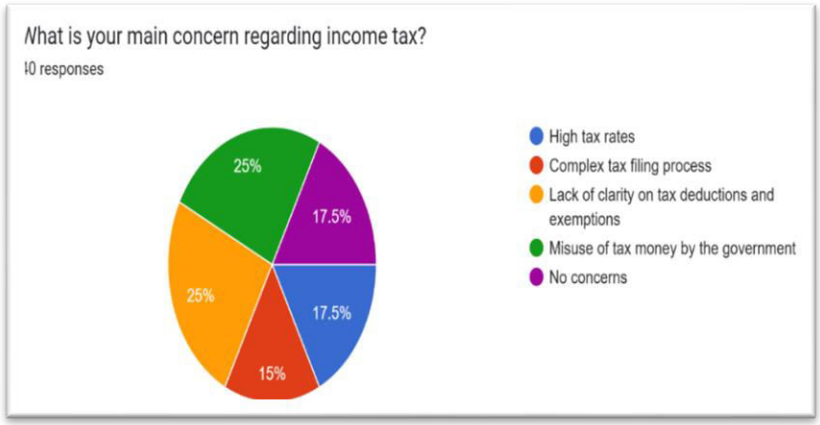
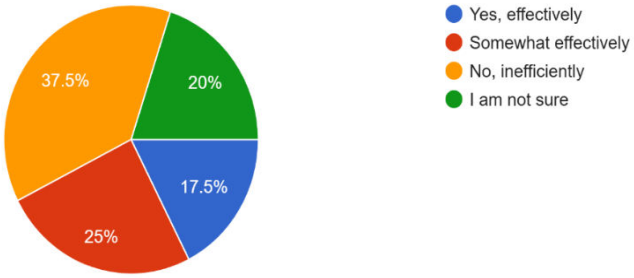
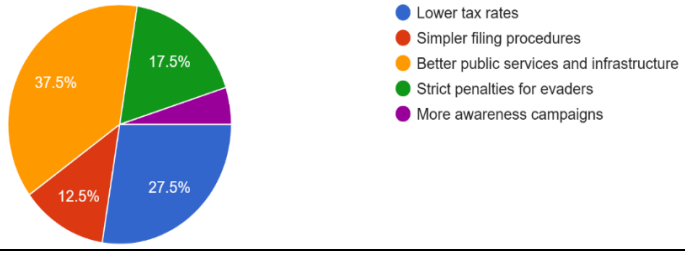
How do you perceive paying income tax? 40 responses  	70 % respondents perceive income tax paying as a responsibility towards the nation.
Do you believe the current tax rates are fair? 40 responses  	37.5% respondents believe that the current tax rate
 	50% of the respondents feel that tax filing process is complex and there is lack of clarity on tax deductions and exemptions.
Do you think the government uses tax revenue efficiently? 40 responses  	38% respondents are of the opinion that the Government is not efficiently utilizing the tax money.
What would encourage you to be more compliant with income tax? 40 responses  	38% respondents are of the believe that there should be better infrastructure facilities.

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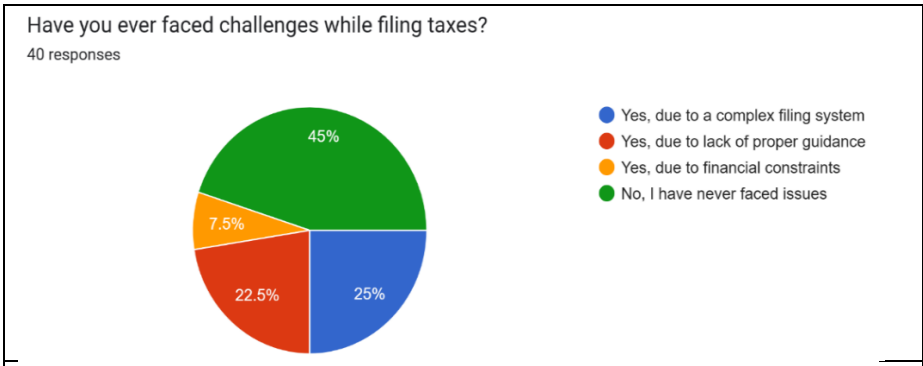
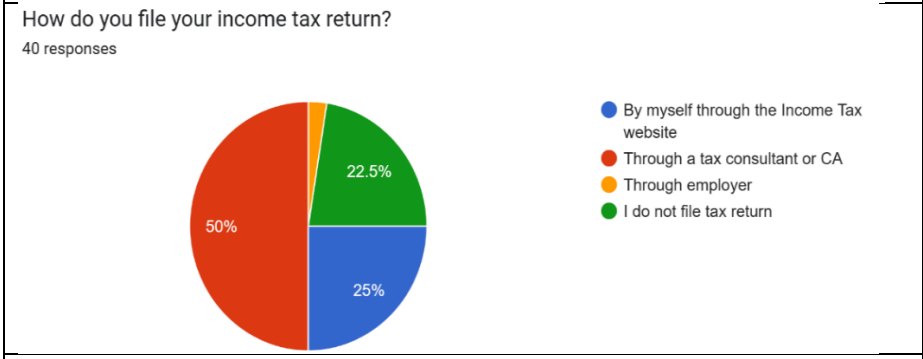
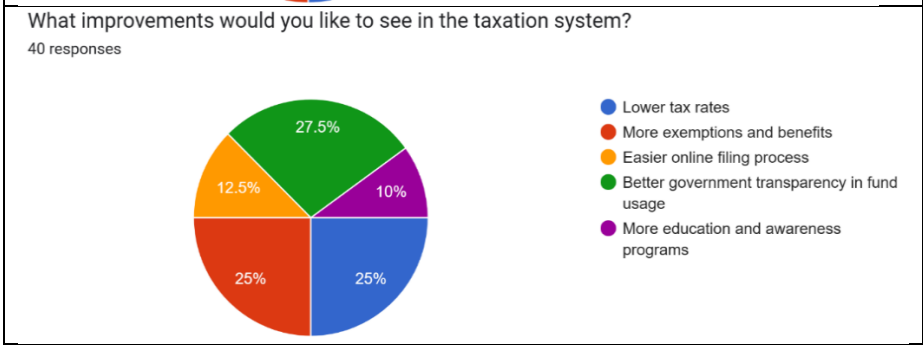
	Almost 45 % respondents feel that they have never faced any issues during filing of returns.
	Half of respondents file their returns with the help of Tax consultant or CA.
	30 % respondents want government to be transparency in the utilization of funds & easier online filing process.

FINDINGS

The study reveals that while most salaried taxpayers in Mumbai are generally aware of income tax provisions and find the online system helpful, they still face challenges such as complex rules and occasional technical issues. There is a need for better communication from authorities and enhanced support services.

SUGGESTIONS

- Launch regular awareness programs and workshops.
- Simplify income tax rules and procedures.
- Improve the reliability and user interface of online portals.
- Strengthen grievance redressal mechanisms.
- Increase transparency on how tax revenues are used.

CONCLUSION

Salaried taxpayers in Mumbai show moderate to high awareness of the income tax system. However, concerns about complexity and fairness persist. By addressing these issues through simplified procedures and enhanced support, the government can improve taxpayer compliance and satisfaction.

REFERENCE

- **Kirchler (2007)** – *Slippery Slope Framework* This framework suggests that both the power of tax authorities and trust in them are relevant dimensions for understanding enforced and voluntary compliance. Enforced versus voluntary tax compliance: The "slippery slope" frameworkScienceDirect+2ResearchGate+2Social and Economic Psychology group+2
- **Singh & Bhattacharya (2012)** – *Taxpayer Behavior in India* Do the Wealthy Underreport their Income? Using General Election Affidavits to Estimate Missing Income in IndiaWID - World Inequality Database

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- **James & Alley (2004)** – *Tax Fairness Perception* This study discusses how perceptions of tax fairness impact taxpayer behavior. Factors Determining Taxpayers' Perception Towards Tax Fairness
- **Gupta (2016)** – *Salaried Taxpayers' Burden in India* While a direct link to this specific study isn't available, related discussions on tax planning for salaried individuals can be found here: Tax Planning Through Tax-Saving Instruments: A Study on Salaried Individuals in India
- **Purohit (2007)** – *Tax Literacy in India* This study emphasizes the importance of financial literacy in the Indian context. Banasthali Vidyapith Presents the Bhartiya Model of Financial Literacy (BMFL)
- **Desai & Rana (2019)** – *Tax Awareness in Maharashtra* While a direct link to this specific study isn't available, related information on tax compliance behavior in India can be found here: Impact of Tax Knowledge, Tax Penalties, and E-Filing on Tax Compliance in India
- **Mishra & Reddy (2020)** – *E-Filing and Tax Compliance* This study investigates the impact of tax knowledge, tax penalties, and electronic filing on tax compliance in India.

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SMART CITIES AND URBAN HOUSING: A STUDY OF PERCEPTIONS, CHALLENGES, AND OPPORTUNITIES IN MUMBAI

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ABSTRACT
This study investigates the perceived impact of innovative city initiatives on housing development, affordability, infrastructure, and real estate growth in Mumbai, one of India's leading urban centres. The study uses survey-based research to capture insights from residents, investors, and stakeholders to understand community perspectives on how innovative city projects influence urban living. The findings reveal strong agreement that smart cities enhance quality of life, promote infrastructure development, and drive real estate expansion. However, concerns were raised regarding rising housing costs, a shift toward luxury-oriented housing, and bureaucratic inefficiencies. While sustainability and public-private partnerships (PPP) were acknowledged as potential benefits, respondents' awareness and engagement levels varied. The study highlights the dominance of young, long-term residents in shaping the survey's results and identifies gaps in institutional representation. It concludes that for smart cities to succeed, a balanced approach must integrate technological advancement with inclusive, affordable, and sustainable urban planning.

Keywords: *Smart City, Urban Planning, Real Estate growth, Affordable Housing, Sustainability and Public-Private Partnerships*

INTRODUCTION
Smart cities have emerged as a transformative urban development strategy aimed at improving the efficiency, sustainability, and inclusiveness of urban living through integrating technology, data-driven governance, and innovative infrastructure. With rapid urbanization reshaping the demographic and spatial dynamics of cities like Mumbai, smart city initiatives have gained significant attention from policymakers, developers, and citizens alike. However, the real-world implications of these initiatives, particularly on housing development, affordability, and the real estate market, remain complex and multi-dimensional.

This research explores the perceived impact of innovative city developments on various aspects of urban housing and infrastructure. Drawing insights from a structured survey of Mumbai residents, investors, and stakeholders, the study captures community sentiments around quality of life, technological advancement, infrastructure growth, and emerging challenges such as rising housing costs, bureaucratic hurdles, and affordability concerns. The study also delves into the anticipated opportunities, including increased real estate activity, rental demand, and public-private partnerships (PPP), often central to smart city implementation.

By analysing these perceptions across age groups, gender, and occupation, the research aims to contribute a more nuanced understanding of how smart cities are reshaping urban housing patterns and what this transformation means for inclusive urban development. The findings will shed light on the opportunities and challenges faced by various stakeholders and offer evidence-based recommendations for more balanced, citizen-centric smart city policies.

STATEMENT OF PROBLEM
While innovative city initiatives aim to revolutionise urban living through technology-driven solutions, sustainable infrastructure, and efficient governance, their real-world implications on housing development, affordability, and inclusivity remain insufficiently understood. In rapidly urbanising cities like Mumbai, concerns have emerged regarding the rising cost of housing, potential neglect of affordable and inclusive housing models, and bureaucratic inefficiencies in project implementation. A gap exists in stakeholder engagement, particularly with limited participation from marginalised groups and institutional actors. Despite the ambitious vision of smart cities, there is a pressing need to evaluate whether these initiatives genuinely address the housing needs of diverse urban populations or disproportionately favour luxury real estate development. This study seeks to bridge that gap by examining community perceptions and identifying the opportunities and challenges inherent in integrating housing policy within the innovative city framework.

REVIEW OF LITERATURE
Antrop, M. (2000). Changing patterns in the urbanised countryside of Western Europe. Landscape Ecology,*15(3), 257–270*. https://doi.org/10.1023/A:1008151109252

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(Antrop, 2000) Studied the multifaceted nature of urbanisation, its effects on rural landscapes, and the need for more holistic approaches that incorporate ecological insights into urban planning practices. The study pointed out the significant gap in urban planning: the field of ecological landscape is often overlooked. It also emphasised the necessity for integrating landscape ecology into urban planning. Understanding the ecological aspects of urbanisation can lead to better management and planning strategies that consider human and environmental needs. The study also addresses the challenges posed by urbanisation, including the loss of landscape diversity and the emergence of uniform landscapes.

Ren, G.-Y. (2015). Urbanisation is a major driver of urban climate change. *Advances in Climate Change Research*, *6*(1), 1–6. https://www.scipedia.com/public/Ren_2015a

Ren (2015) investigates the role of urbanisation as a significant driver of climate change in urban environments, emphasising how land use and land cover changes intensify local climate phenomena such as the urban heat island (UHI) effect, reduce diurnal temperature ranges, and alter precipitation and wind patterns. The study aims to quantify urbanisation-induced climate change (UICC) and its contribution to broader urban climate change (UCC), distinguishing it from global and regional climatic influences. While not structured around formal hypotheses, the research assumes that urbanisation has a measurable and distinct impact on localised climate metrics. The study identifies urbanisation signals by differentiating urban, suburban, and rural station records using meteorological station data, satellite observations, and comparative statistical methods. Case studies include analyses in Anhui province, where urban stations showed temperature increases of 0.238 °C (Tmin), 0.063 °C (Tmax), and 0.163 °C (Tavg) per decade, attributing 45.2%, 14.3%, and 35.8% of these trends, respectively, to urbanisation.

Gracias, J. S., Parnell, G. S., Specking, E., Pohl, E. A., & Buchanan, R. (2023). *Smart cities—A structured literature review*. Smart Cities, 6(4), 1719–1743. https://doi.org/10.3390/smartcities6040080

The study by Gracias et al. (2023) aimed to analyse the current state of smart city research through a structured literature review, focusing on definitions, applications, challenges, and evaluation techniques. By examining 83 peer-reviewed articles selected using purposive sampling from databases like Web of Science and Google Scholar, the study sought to fill gaps in understanding innovative city initiatives' strategic and operational aspects. While no explicit hypotheses were stated, the review operated on the premise that the lack of a universal definition and standardisation presents challenges in implementation. Key findings revealed various applications across domains such as healthcare, governance, energy, and transportation, with benefits like improved efficiency, quality of life, and sustainability. Quantitative techniques such as cost-benefit analysis, life-cycle cost analysis, and multi-criteria decision analysis were commonly used to assess innovative city initiatives.

Enekwachi-Akpa, L. C. (2024). *Affordable housing solutions*. *International Journal of Civil Engineering, Construction and Estate Management*, 12(2), 71–87. https://doi.org/10.37745/ijcecem.14/vol12n27187

Enekwachi-Akpa (2024) explores comprehensive strategies to address the global affordable housing crisis, emphasising ability, inclusivity, and economic viability. The study employs a mixed-methods approach integrating a literature review, secondary data analysis, case studies, and stakeholder interviews and surveys. The research draws on insights from diverse international case studies and key stakeholders through purposive sampling, although it does not specify a fixed sample size. While no explicit hypotheses are stated, the research assumes that innovative financing models, sustainable construction practices, and inclusive housing policies can significantly enhance housing accessibility. Key findings reveal the effectiveness of public-private partnerships, microfinance, and housing cooperatives in providing affordable solutions, particularly in low-income settings. The study also highlights the role of land value capture, inclusionary zoning, and green technologies in expanding housing supply and reducing environmental impact.

Rizetto, M., & Zgobis, J. (2007). *Valuing affordable housing : a new challenge for assessors*. *4*(4), 51–86. https://researchexchange.iaao.org/jptaa/vol4/iss4/4/

Rizetto et.al (2007) studied inclusionary Zoning policies, Community Land trusts, employer-assisted housing Programs, federal subsidy sources, and Layered financing, which are the methods used ,and these methods reflect a comprehensive strategy to address the challenges, particularly in the context of rising housing costs that outpace income growth. The paper emphasises the importance of these methods in creating sustainable and accessible housing solutions for local and moderate-income families. The results indicate an increasing recognition among municipalities, both in small towns and large cities, Of the need to enhance the supply of affordable housing.

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Chaure, A. P., Shinde, P. A., Khotkar, R. G., Raut, H. M., & Dudal, P. D. (2017). Low-Cost Building Material. *IJARIIE*, *3*(5), 522–532.

The study by Chaure et al. (2017) investigates sustainable, low-cost building materials to address the global affordable housing crisis, particularly in developing nations where half the population lacks adequate shelter. Focusing on recycled and eco-friendly alternatives, the research examines materials like rubber tire veneer (repurposed for flooring and insulation), straw-resin panels (lightweight and earthquake-resistant), and natural insulators like flax and wood fibre. Innovative solutions like Corkoco (acoustic panels from cork/coconut), Grancrete (biodegradable insulation), and rice husk ash (a cement substitute) demonstrate how agricultural and industrial waste can be repurposed. The study also analyses advanced materials, including concrete canvas (flexible, hardening fabric), magnesium oxide cement (energy-efficient), and fly ash bricks (lighter and stronger than traditional bricks). Other notable materials include Cannabrick (hemp-based fireproof bricks), Syndecrete (recycled-material concrete), and ZeroFly textiles (insecticide-treated shelter sheets).

Smart City as an Urban Intelligent Digital System: The Case of Parma. (2023). *IEEE Computer, 56(7),* 106–109. https://doi.org/10.1109/mc.2023.3267245.

Smart City as an Urban Intelligent Digital System: The Case of Parma," 2023The research emphasises the importance of integrating diverse data sources to create a cohesive, innovative urban environment. This integration allows for collecting and analysing data from various sectors, enhancing the overall functionality of the intelligent city system. Further paper outlines the usage of intelligent digital systems that facilitate the management of urban services. The systems are designed to process information efficiently and provide high-level service to citizens and municipal authorities. The approach used in the study ensures that services provided meet the citizens' needs and expectations.

RESEARCH OBJECTIVES

1. To examine the impact of innovative city initiatives on housing development.
2. To analyse the perceptions, challenges and opportunities associated with smart city housing

NULL HYPOTHESIS

1. **H0:** Smart City initiatives do not significantly improve housing development, infrastructure, or real estate growth
2. **H0:** Smart city development does not significantly affect housing affordability, policy, challenges or market demand

RESEARCH METHODOLOGY

1. **Research Design**

This study adopted a **descriptive research design** to investigate public perceptions of smart city initiatives and their implications for housing development, infrastructure, affordability, and real estate growth. A mixed-method approach was followed, primarily focusing on quantitative data collection supported by a qualitative review of existing literature.

2. **Data Collection Methods**

- **Primary Data:**

Data was collected through a structured online questionnaire developed on Google Forms. It included a series of Likert-scale statements measuring respondents' attitudes toward innovative city features and housing outcomes.

- **Secondary Data:**

In addition to primary responses, the study referred to scholarly articles, government reports, and case studies on innovative city policies, housing trends, and urban development. These references provided context and supported the interpretation of survey findings.

3**. Sampling Technique and Sample Size:**

The study employed a **non-probability convenience sampling** technique, targeting individuals living or working in Mumbai. A total of **55 valid responses** were obtained. The sample was heavily composed of young adults (21–30) and long-term city residents.

4. **Respondent Profile**

Respondents primarily identified as residents (76.9%), with smaller representations from investors, real estate developers, and government officials. Most had lived in Mumbai for over 10 years, offering insights grounded in direct urban experience.

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5. Data Analysis Tools
Quantitative data was analysed using Microsoft Excel focusing on descriptive statistics (mean scores, frequency distributions) and fundamental correlation insights. Visualisations such as bar charts and pie charts highlighted key trends.

6. **Scope and Literature Coverage**
The study was geographically limited to Mumbai but was contextualised through a literature review on innovative city models, challenges in urban housing, and public-private partnerships. Sources included reports from India's Smart Cities Mission, academic journals, and urban policy whitepapers.

DATA ANALYSIS AND RESULT DISCUSSION
Demographic Profile of Respondents:

Table 1

Variables	Classification	Frequency	Percentage
Gender	Male	30	45.5%
	Female	25	54.5%
	Total	**55**	**100**
Age in Years	21-30	47	85.5%
	31-40	4	7.3%
	41-50	4	7.3%
	51-60	0	0%
	60& above	0	0%
No of years spent in Mumbai	More than 10 years	32	59.3%
	6-10 Years	8	14.8%
	1-5 Years	10	18.5%
	Less than 1 Year	4	7.4%
Occupation	Real Estate Developer	2	3.8%
	Government Official	2	3.8%
	Resident	8	76.9%
	Investor	40	15.4%

SMART CITY INITIATIVES AND HOUSING DEVELOPMENT

1. Perceived Improvement in Quality of Life:
Most respondents agreed or strongly agreed that innovative city initiatives would enhance the overall quality of life. This reflects public confidence in smart cities' potential to deliver safer, cleaner, and more efficient living environments.

2. Support for Infrastructure Development:
While many respondents agreed that smart cities would help infrastructure development, a considerable portion remained neutral. This suggests that although expectations are high, some individuals may not have yet observed tangible improvements or may be unsure of the initiatives' effectiveness.

3. Technology-Driven Impact is Well-Recognised:
There is a strong consensus that technology will drive smart cities. Most respondents agreed, indicating widespread awareness of the role of digital tools and innovations in urban planning and governance.

4. Mixed Views on Sustainability in Housing:
Responses to the sustainability of housing projects in smart cities were more evenly distributed, with notable neutral and even disagreeing views. This indicates respondents' lack of clarity or varied awareness regarding environmentally sustainable housing practices under Bright City schemes.

5. Positive Outlook on Developmental Boost:
Respondents agreed that innovative city initiatives would lead to broader economic or real estate development. This optimism signals public anticipation of increased growth, investment, and modernisation.

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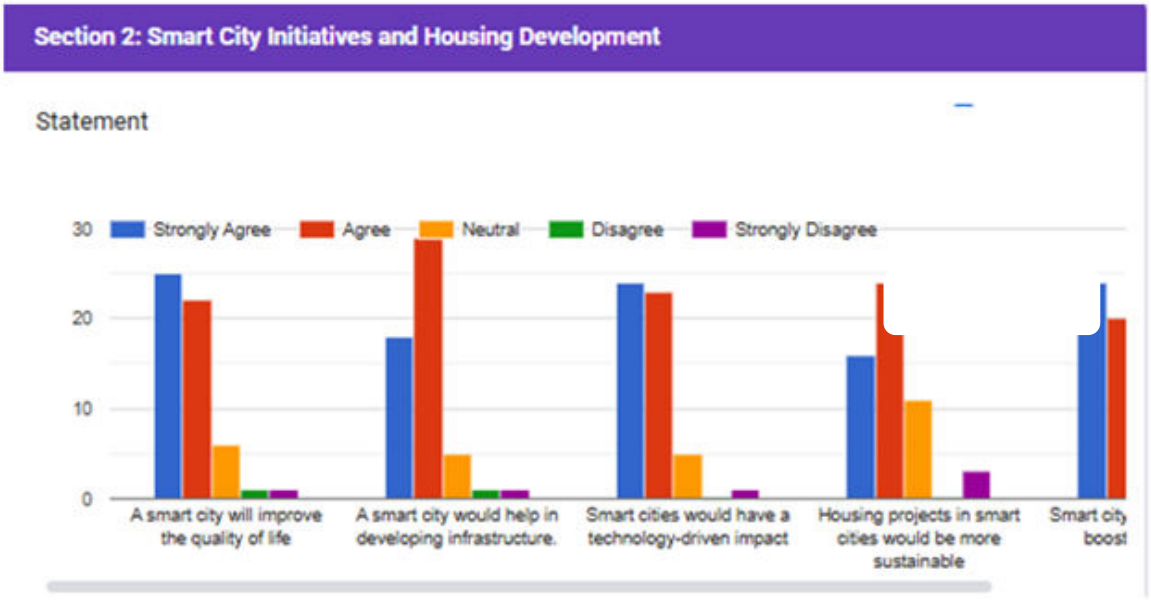
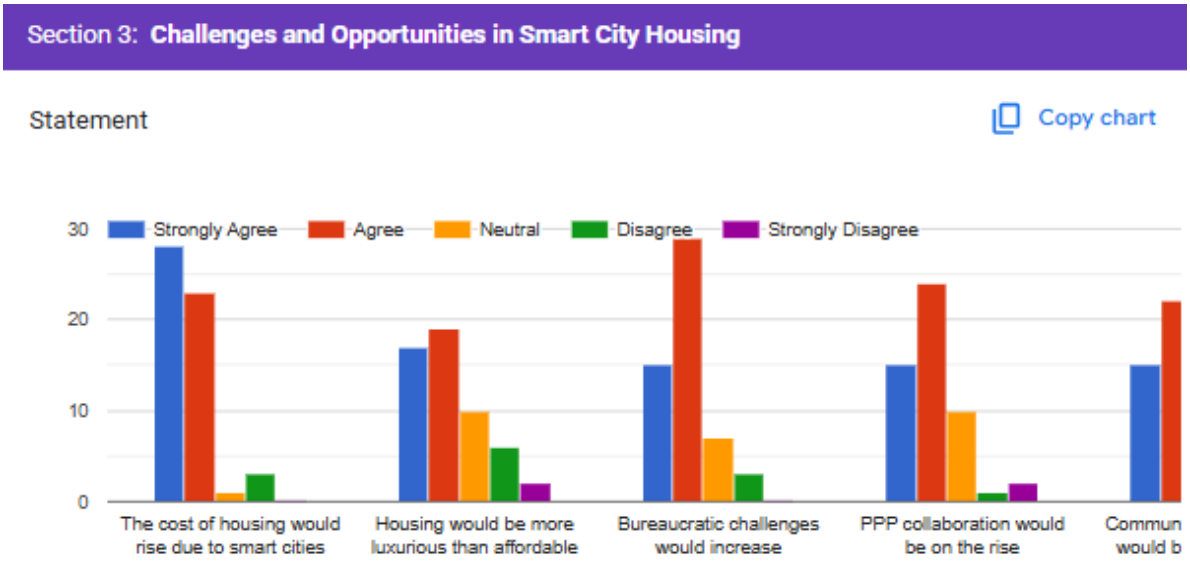


CHALLENGES AND OPPORTUNITIES IN SMART CITY HOUSING

1. **Rising Housing Costs:** A clear majority of respondents strongly agreed or agreed that smart city initiatives would increase the cost of housing. This indicates a significant perception of reduced affordability, especially among middle—and lower-income groups, and highlights a major concern for policymakers.
2. **Shift towards Luxury Housing:** Many participants agreed that housing in smart cities is likely to be more luxurious than affordable, with a substantial number expressing neutral or mixed views. This suggests a growing sentiment that smart city housing development may prioritise premium segments over inclusive housing solutions.
3. **Anticipated Increase in Bureaucratic Challenges:** Many respondents, especially those who agreed or strongly agreed, believe that bureaucratic hurdles will increase with the implementation of smart city projects**.** This reflects scepticism toward administrative efficiency and past experiences with government-led urban initiatives.
4. **Expected Growth in PPP Collaboration:** There is moderate agreement that public-private partnerships (PPP) would rise in the context of smart cities**.** While many agreed, a noticeable portion remained neutral, indicating that awareness or confidence in PPP models may still develop among the general population**.**
5. **Community Participation Seen as a Potential Hindrance:** Responses were relatively balanced on this item, but many participants agreed that community participation could be a hindrance**.** This may indicate perceived difficulties in stakeholder coordination or scepticism about the effectiveness of public engagement in planning processes.



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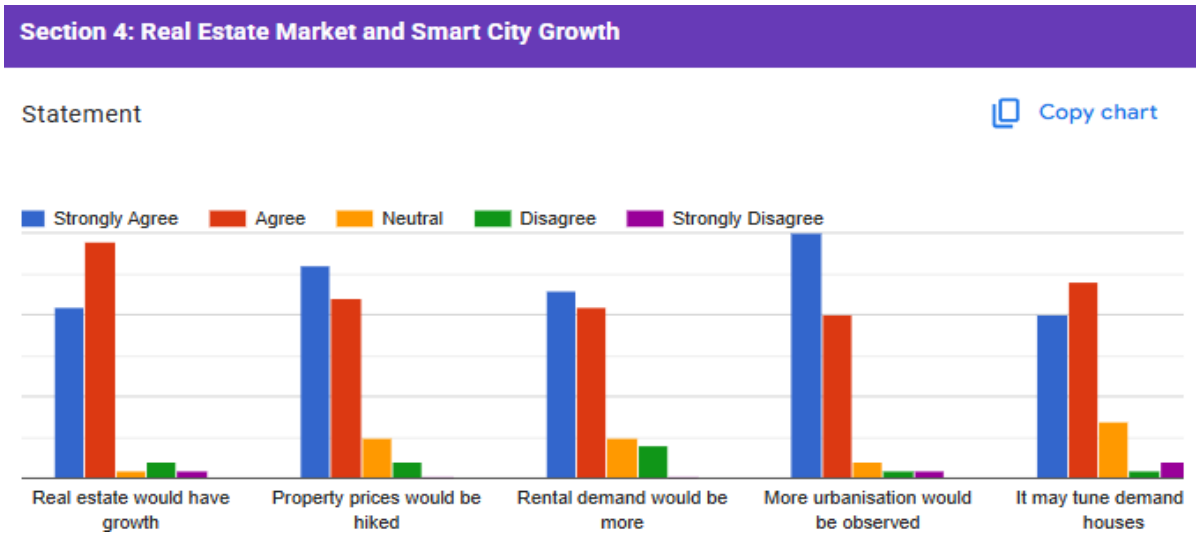
REAL ESTATE MARKET AND SMART CITY GROWTH

1. **Projected Growth in the Real Estate Sector:** Many respondents either agreed or strongly agreed that innovative city initiatives would drive growth. This reflects a broad economic and infrastructural expansion expectation, especially in urban housing and commercial development.
2. **Anticipated Hike in Property Prices:** The belief that property prices would increase due to innovative city development was widely shared. The data strongly supports this view, suggesting concerns over affordability despite the perceived growth opportunities.
3. **Increased Rental Demand Expected:** Many respondents foresee a rise in rental demand, likely due to increased migration, urban job opportunities, and improved amenities. This signals a positive outlook on urban housing consumption, especially among transient populations like students or workers.
4. **Strong Belief in Urbanisation Trends:** The most dominant agreement was seen in the statement that "more urbanisation would be observed." The overwhelming consensus indicates that smart cities are expected to accelerate population density and urban migration, making it a central feature of future urban development.
5. **Smart Cities Likely to Influence Housing Demand:** Responses also suggested that innovative city initiatives may tune or reshape housing demand, particularly regarding location preferences, design expectations, and lifestyle needs. While many agreed, some were neutral, indicating room for uncertainty or the need for further clarification in planning outcomes.



FINDINGS

1. **Smart Cities Improve Quality of Life & Infrastructure:**
Strong agreement that smart cities enhance urban living and bring technology-driven growth and Infrastructure improvement is acknowledged, but with slightly more varied perceptions.

2. **Real Estate Growth vs. Affordability:**
Smart cities are expected to boost real estate, property values, and rental demand. However, rising costs and a shift toward luxury housing raise affordability concerns.

3. **Sustainability & Public-Private Partnerships (PPP):**
Moderate belief in sustainability benefits from smart housing and PPP models is seen as promising, though awareness and confidence vary.

4. **Challenges in Governance & Participation:**
Bureaucratic inefficiencies are expected to increase, and some view Community participation as a potential hindrance to implementation.

5. **Urbanisation & Housing Demand:**
Due to innovative city projects, respondents anticipate more urban migration and a reshaped housing demand.

HYPOTHESES EVALUATION

H_{01}: Smart City initiatives do not significantly improve housing development, infrastructure, or real estate growth

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HYPOTHESIS REJECTED REASON

- Respondents strongly agreed that smart cities improve the quality of life and infrastructure.
- High mean scores and positive sentiment indicate a **clear perceived impact** on **housing sustainability**, **infrastructure development**, and **real estate growth**.
- This supports the **alternative hypothesis** that innovative city initiatives significantly improve these areas.

H_{02}: Smart city development does not significantly affect housing affordability, policy challenges, or market demand

HYPOTHESIS IS REJECTED REASON

- Strong agreement was that smart cities lead to **increased housing costs**, signalling a **perceived effect on affordability**.
- Respondents also acknowledged challenges such as **bureaucratic hurdles** and **community participation concerns**, indicating awareness of policy-related issues.
- Responses pointing to rising **rental demand** and changing **housing preferences** impact **market dynamics**.

SUGGESTIONS AND RECOMMENDATIONS

1. Urban planning policies must ensure that the benefits of smart city development are not at the expense of affordability.
2. Affordable housing quotas or incentives for inclusive development should be mandated in innovative city zones.
3. Sustainability in housing should be made more visible and accessible, with green certifications and eco-friendly construction incentivised.
4. Awareness campaigns can help bridge the gap in understanding sustainability's long-term benefits.
5. Enhancing public participation through innovative platforms: Smart city planners should embrace digital feedback tools to make citizen involvement more efficient and impactful.
6. Strengthen public-private partnership: Governments must encourage transparent and accountable PPP models, ensuring equitable investment in premium and affordable segments.
7. Track and regulate urbanisation impact: With urban migration expected to rise, cities must invest in smart mobility, infrastructure expansion, and rental housing policies to manage increased demand.
8. Targeted communication and transparency: Authorities should proactively communicate innovative city projects' objectives, timelines, and expected outcomes to boost public trust and engagement.

CONCLUSION

This study examined the perceived impact of innovative city initiatives on housing, affordability, infrastructure, and real estate in Mumbai. The findings reflect strong public optimism about improvements in quality of life and technological advancement, alongside support for urban and real estate growth. However, rising housing costs, a tilt toward luxury housing, and bureaucratic hurdles highlight the risk of excluding vulnerable groups. Mixed views on sustainability and community participation further underscore the need for inclusive and transparent planning. To succeed, innovative city development must balance innovation with equity, ensuring accessibility for all segments of society.

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Chaure, A. P., Shinde, P. A., Khotkar, R. G., Raut, H. M., & Dudal, P. D. (2017). Low-cost building material. *International Journal of Advanced Research and Innovative Ideas in Education (IJARIIE), 3*(5), 522–532.

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CORPORATE LAW AND SHAREHOLDER PROTECTION: A COMPARATIVE STUDY

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ABSTRACT
This research paper examines the role of corporate law in protecting the rights and interests of shareholders across different jurisdictions. Shareholder protection is essential for maintaining investor confidence and ensuring the smooth functioning of capital markets. By conducting a comparative study of India, the United States, and the United Kingdom, the paper highlights the varying approaches adopted by these legal systems in securing shareholder rights. The study explores the mechanisms of legal redress available to shareholders, corporate governance frameworks, and regulatory oversight. It concludes with suggestions to improve shareholder protection under Indian corporate law by adopting best practices from other countries.

Key words: Jurisdiction, Shareholder Protection & Corporate law.

1. INTRODUCTION

Corporate law governs the formation, management, and dissolution of companies. One of its core functions is to balance the interests of various stakeholders, including shareholders, directors, and the public. Shareholders, being the owners of a company, are particularly vulnerable to management decisions and require legal safeguards. This paper analyzes how different legal systems protect shareholder interests and identifies lessons that Indian corporate law can adopt to strengthen shareholder rights.

2. OBJECTIVES OF THE STUDY

- To examine legal provisions related to shareholder protection in corporate law.
- To compare shareholder rights and remedies across India, the US, and the UK.
- To evaluate the effectiveness of legal and regulatory frameworks.
- To recommend reforms for enhancing shareholder protection in India.

3. RESEARCH METHODOLOGY

This is a doctrinal research study based on secondary sources, including statutes, case law, journal articles, official reports, and international guidelines. The comparative analysis includes Indian, American, and British legal systems.

4. LITERAURE REVIEW

Various scholars have emphasized the role of corporate governance in protecting minority shareholders. According to La Porta et al. (1998), shareholder protection varies globally based on the legal origin of the jurisdiction. In India, legal provisions such as Sections 241 and 245 of the Companies Act, 2013 provide remedies against oppression and mismanagement. In contrast, the US relies heavily on fiduciary duties and class action suits, while the UK emphasizes board accountability and minority protection through statutory measures

5 SHAREHOLDER RIGHTS AND PROTECTIONS

5.1 India

- **Legal Provisions**: Companies Act, 2013 – Sections 47, 241, 245.
- **Regulatory Body**: SEBI ensures compliance with corporate governance norms.
- **Challenges**: Weak enforcement mechanisms, lack of awareness among shareholders, and limited use of class action provisions.

5.2 United States

- **Legal Provisions**: State-level corporate laws (e.g., Delaware Code), Sarbanes-Oxley Act, and SEC regulations.
- **Key Features**: Strong fiduciary duties, derivative suits, and robust class action mechanisms.
- **Strengths**: Effective enforcement, high levels of transparency, and active shareholder activism.

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5.3 United Kingdom

- **Legal Provisions**: Companies Act 2006, UK Corporate Governance Code.
- **Features**: Statutory duties of directors, derivative claims under Part 11 of the Act.
- **Regulatory Oversight**: Financial Conduct Authority (FCA), Prudential Regulation Authority (PRA).
- **Strengths**: Well-defined director duties and mechanisms for minority shareholders

6. COMPARATIVE ANALYSIS

Aspect	India	United States	United Kingdom
Type of Legal System	Common Law	Common Law	Common Law
Derivative Action	Available but rarely used	Widely used	Statutory basis under CA 2006
Class Action Suit	Introduced in 2013	Strong and established	Less frequently used
Role of Regulators	SEBI	SEC	FCA, PRA
Director Duties	Codified	Fiduciary, case law-based	Codified under CA 2006
Minority Shareholder Protection	Present but limited	Strong enforcement	Strong protections

7. CHALLENGES IN INDIA

- Procedural hurdles in initiating legal action.
- Low awareness of shareholder rights.
- Delays in regulatory and judicial processes.
- Limited success of class action suits since their introduction in 2013.

8. RECOMENDATIONS

- Strengthen enforcement of shareholder rights through specialized tribunals.
- Simplify procedural requirements for minority shareholder actions.
- Promote awareness through investor education programs.
- Encourage adoption of global best practices from the US and UK.
- Empower SEBI to take proactive action in protecting investor interests

9. CONCLUSION

Effective shareholder protection is crucial for the growth of capital markets and investor confidence. While India has made progress with the Companies Act, 2013 and SEBI regulations, there is scope for improvement in enforcement and access to remedies. By learning from the experiences of the US and the UK, India can strengthen its corporate governance framework and ensure fair treatment of all shareholders, especially minorities.

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E-COMMERCE IN FASHION INDUSTRY: THE OTHER SIDE OF STORY VIZ THE VENDORS

ABSTRACT
The rapid growth of e-commerce has transformed the fashion industry, offering consumers convenience, variety, and competitive pricing. However, the perspective of vendors—small businesses, independent designers, and traditional retailers—remains underexplored. This paper examines the challenges and opportunities that fashion vendors face in the digital marketplace, including issues such as platform dependency, pricing pressures, supply chain disruptions, and competition with fast fashion giants. It also explores strategies vendors adopt to thrive in the evolving landscape, such as leveraging social media, sustainable practices, and direct-to-consumer models. By shedding light on the vendor's perspective, this study provides valuable insights into the lesser-known aspects of e-commerce in the fashion industry, contributing to a more balanced understanding of its impact.

INTRODUCTION
The e-commerce revolution has profoundly transformed the global fashion industry, altering the way consumers shop and interact with brands. From multinational corporations to independent designers, businesses have had to rethink their strategies to remain competitive in the digital marketplace. E-commerce platforms such as Amazon, ASOS, and Zalando, along with specialized fashion marketplaces like Farfetch and Etsy, have enabled consumers to access a vast selection of clothing, accessories, and footwear with unprecedented convenience. Digitalization has not only expanded the reach of fashion retailers but has also allowed for personalization, targeted marketing, and data-driven decision-making. However, amidst these advancements, one crucial stakeholder group often receives less attention—the vendors.

While much of the discourse on e-commerce in the fashion industry focuses on consumer benefits, platform strategies, and technological innovations, the experiences of vendors—small businesses, independent designers, wholesalers, and traditional brick-and-mortar retailers—remain largely underexplored. The transition from physical retail to online sales presents significant challenges, particularly for vendors who lack the financial resources, digital expertise, or brand recognition to compete with large corporations. E-commerce platforms, while offering increased market reach, also introduce a new set of constraints, including platform dependency, high commission fees, logistical complexities, and price wars with mass-market retailers.

The fashion industry has long been characterized by an intricate supply chain, involving manufacturers, wholesalers, and retailers working together to deliver products to consumers. However, the rise of direct-to-consumer (DTC) models and fast-fashion giants has disrupted traditional business models, placing added pressure on smaller vendors. Many vendors struggle with issues such as inventory management, fluctuating demand, and the need for extensive digital marketing efforts. Moreover, consumer expectations for fast shipping and easy returns further strain vendors' resources. The dominance of major online retailers exacerbates these challenges, as vendors are often forced to list their products on third-party platforms, which control pricing strategies, visibility algorithms, and customer interactions.

Despite these obstacles, vendors are finding innovative ways to navigate the evolving landscape of e-commerce in the fashion industry. Some small businesses leverage social media platforms like Instagram, TikTok, and Pinterest to engage directly with consumers and drive traffic to their independent websites. Others adopt sustainable fashion practices and emphasize ethical production methods to differentiate themselves in a saturated market. The rise of live-stream shopping, influencer collaborations, and subscription-based models further presents new opportunities for vendors to build brand loyalty and maintain competitive advantages.

This research paper aims to explore the lesser-known side of the e-commerce fashion industry by examining the experiences, challenges, and strategies of vendors operating in the digital space. The study will analyze the economic, technological, and operational factors affecting vendors, as well as potential solutions to enhance their sustainability in the competitive online market. Through this exploration, the research seeks to contribute to a more comprehensive understanding of the fashion e-commerce ecosystem, advocating for policies and practices that support vendors while maintaining a thriving digital marketplace.

By shifting the focus from consumers and large retailers to vendors, this paper seeks to fill a crucial gap in the existing body of research. The findings will provide valuable insights for fashion entrepreneurs, policymakers, and industry stakeholders, helping them develop strategies that promote a balanced and sustainable e-commerce environment.

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OBJECTIVE

The primary objective of this research is to explore the impact of e-commerce on fashion vendors, highlighting the challenges, opportunities, and strategies they employ to navigate the digital marketplace. While e-commerce has revolutionized the fashion industry, much of the existing research focuses on consumer behavior and major retailers, often neglecting the experiences of vendors. This study aims to bridge that gap by providing a comprehensive understanding of how vendors adapt to the evolving e-commerce landscape.

The specific objectives of this research are:

1. **To analyze the challenges faced by fashion vendors in the e-commerce ecosystem** – Examining issues such as platform dependency, high commission fees, competition with fast-fashion giants, supply chain disruptions, and consumer expectations for fast shipping and returns.
2. **To explore the opportunities that e-commerce presents for fashion vendors** – Investigating how online platforms, social media, and digital marketing tools help vendors expand their reach, engage with customers, and enhance brand visibility.
3. **To assess the role of third-party marketplaces in shaping vendor experiences** – Evaluating how platforms like Amazon, Etsy, Shopify, and Zalando influence vendor pricing, profit margins, and customer interactions.
4. **To understand the impact of digital transformation on traditional fashion vendors** – Analyzing how small retailers, independent designers, and wholesalers have adapted to shifting business models, including direct-to-consumer (DTC) strategies, influencer collaborations, and subscription-based sales.
5. **To examine the sustainability challenges and ethical concerns faced by vendors in the online fashion industry** – Investigating the pressures of fast fashion, consumer demand for ethical sourcing, and how vendors incorporate sustainability into their business models.

LITERATURE REVIEW

The rise of e-commerce has drastically altered the global fashion industry, creating new opportunities and challenges for various stakeholders, including consumers, retailers, and vendors. While much research has focused on the benefits of e-commerce for consumers and large fashion brands, there is limited literature exploring the vendor perspective. This section reviews existing studies on the impact of e-commerce on fashion vendors, addressing key areas such as platform dependency, pricing pressures, digital marketing, supply chain management, and sustainability.

1. The Evolution of E-Commerce in the Fashion Industry

E-commerce has revolutionized fashion retailing by providing consumers with greater convenience, variety, and competitive pricing. According to a report by McKinsey & Company (2021), online fashion sales have steadily increased over the last decade, with digital channels now accounting for a significant portion of global fashion revenue. Large fashion retailers and fast-fashion brands, such as Zara and H&M, have aggressively expanded their online presence, leveraging sophisticated data analytics and AI-driven personalization to enhance customer experience (Bhardwaj & Fairhurst, 2010).

However, smaller vendors, including independent designers and traditional brick-and-mortar retailers, face difficulties competing in this highly digitalized environment. E-commerce platforms such as Amazon, Etsy, and Zalando provide vendors with access to a broader customer base, yet they also introduce high commission fees, visibility challenges, and operational constraints (Khan & Haleem, 2020).

2. Platform Dependency and Pricing Pressures

One of the major concerns for fashion vendors in e-commerce is platform dependency. Research by Hagiu & Wright (2020) highlights how third-party marketplaces, such as Amazon and eBay, dictate pricing, control visibility through search algorithms, and impose stringent policies on vendors. Vendors must often lower their prices to remain competitive, reducing profit margins. Additionally, larger marketplaces favor big brands and manufacturers with higher advertising budgets, making it difficult for small vendors to gain traction (Cheng et al., 2021).

A study by Zhu & Liu (2018) found that platform dependency creates an imbalance in vendor profitability, as marketplaces often prioritize their own private-label fashion brands over independent sellers. This forces vendors to continuously adjust their pricing strategies and invest in paid promotions to maintain visibility.

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3. Digital Marketing and Consumer Engagement

Effective digital marketing is essential for fashion vendors to establish a competitive edge in the e-commerce landscape. Research by Kaplan & Haenlein (2019) emphasizes the role of social media marketing, influencer collaborations, and content-driven campaigns in driving online sales. Many vendors rely on platforms like Instagram, TikTok, and Pinterest to engage with consumers and build brand loyalty.

A study by Kim & Ko (2012) found that fashion brands that actively utilize social media marketing experience higher consumer engagement, brand awareness, and conversion rates. However, small vendors often struggle with limited marketing budgets and expertise, making it difficult to compete with large retailers that have extensive digital marketing resources (Wang et al., 2021).

4. Supply Chain Challenges and Operational Barriers

Managing an efficient supply chain is a critical factor for vendors in the e-commerce fashion industry. Research by Christopher et al. (2016) highlights that fashion supply chains must be agile, responsive, and capable of handling rapid changes in consumer demand. However, small vendors often face difficulties in securing reliable suppliers, managing inventory, and meeting customer expectations for fast shipping and hassle-free returns.

A study by Cachon & Swinney (2011) found that fast-fashion giants like Zara have mastered supply chain optimization, giving them a significant advantage over smaller vendors who lack the infrastructure to match rapid production cycles. Additionally, vendors that rely on drop shipping face risks related to product quality control, delayed deliveries, and high return rates, leading to negative customer reviews and potential business losses (Nguyen et al., 2020).

5. The Role of Sustainability in E-Commerce for Fashion Vendors

Sustainability is becoming an increasingly important factor in the fashion e-commerce industry. According to a report by the Business of Fashion and McKinsey (2020), consumers are showing a growing preference for sustainable fashion brands that prioritize ethical sourcing, eco-friendly materials, and fair labor practices.

While this shift presents an opportunity for vendors to differentiate themselves, it also poses challenges. Many sustainable fashion brands struggle with higher production costs, sourcing difficulties, and educating consumers about the value of ethical fashion (Henninger et al., 2017). Additionally, vendors must balance sustainability efforts with competitive pricing and fast delivery expectations in the e-commerce space (Gazzola et al., 2020).

6. Strategies for Vendor Success in the E-Commerce Fashion Industry

Despite the challenges, many vendors have adopted innovative strategies to thrive in the digital marketplace. Research by Chaffey (2021) suggests that successful vendors leverage a combination of direct-to-consumer (DTC) models, personalized marketing, and niche product offerings. Some vendors utilize artificial intelligence (AI) and machine learning to analyze customer preferences and optimize inventory management.

RESEARCH METHODOLOGY

A research objectives is a clear, concise, declarative statement, which provides direction to investigate the variables under the study. Research objectives describe what we expect to achieve by a project. Research objectives may be linked with a hypothesis or used as a statement of purpose in a study that does not have a hypothesis. The research objectives drive all aspects of the methodology, including instrument design, data collection, analysis etc.

It is necessary to define research objectives because well defined objectives create clear links between your research paper and the big, important question that motivates it. A clearly defined objective directs a researcher in the right direction. In order to get the right solution a clearly defined objectives are very important. Without clear objectives a researcher is aimless and directionless in conducting the study.

SR no.	Description	Research Method
1.	Nature of research	Descriptive
2.	Research design	Quantitative
3.	Population size	80
4.	Sources of data collection	Primary and secondary
5.	Research Instrument	Questionnaire

METHODS OF DATA COLLECTION

Primary Data Collection

A primary data source is an original data source, that is, one in which the data are collected firsthand by the researcher for a specific research purpose or project. Primary data can be collected in a number of ways.

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Secondary Data Collection

Secondary data refers to data which is collected by someone who is someone other than the user. Common sources of secondary data for social science include censuses, information collected by government departments, organizational records and data that was originally collected for other research purposes.

Present Study

For the present study secondary data was collected through various sources which includes various books, periodicals, magazines, reports and various web sources. The details of the same are mentioned in bibliography section.

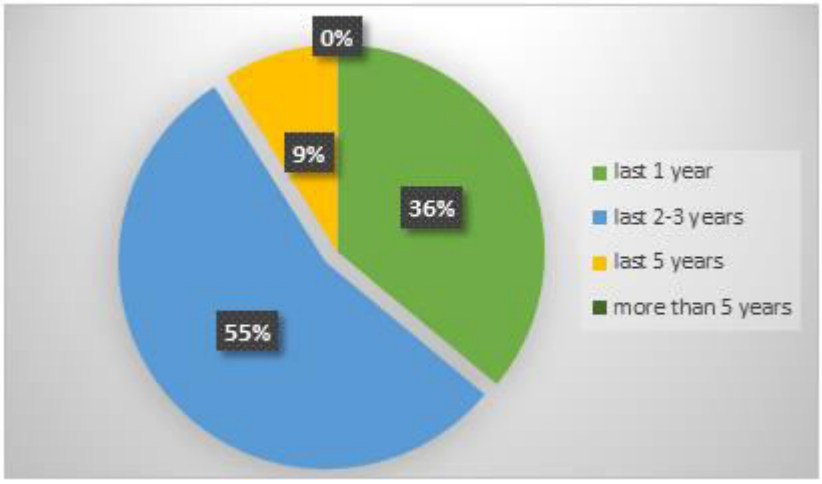
For the present study data was also collected through primary source. The primary source includes collecting responses through a predesigned questionnaire from common people.

SAMPLE SIZE

Sample size of the research is 80 entrepreneurs.

DATA ANALYSIS and INTERPRETATION

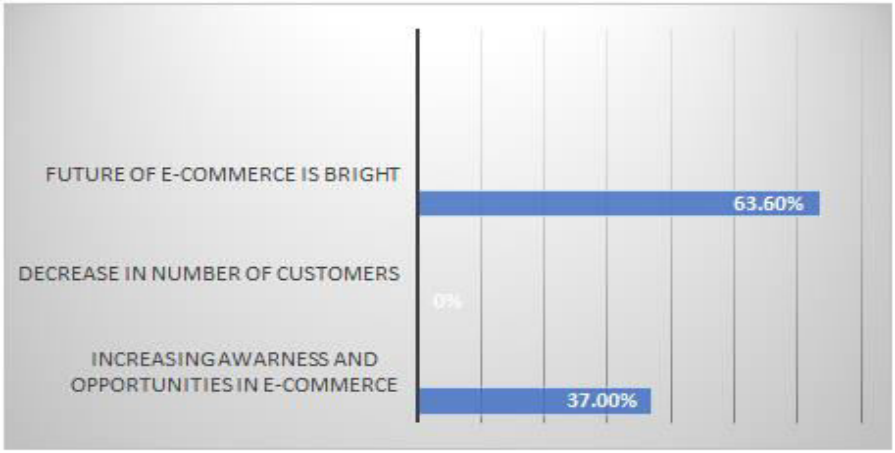
Q.1 When did you start selling your products online?



Interpretation

Here, the survey shows that 55% of the people started their online business in the last 2-3 years. About 36% of the people have started their business online in the last 1 year and about 9% of people have started trading online from the last 5 years.

Q.2 Why did you feel the need to opt for online trading?



Interpretation

Here,as the figure shows, 63.60% of population believe that the Future of E-Commerce is bright and therefore have opted for Online Trading.

Whereas, the remaining 37% of population believe that there is an increasing awareness and opportunities in E-commerce and that it will be beneficial for them if they go for selling their products online.

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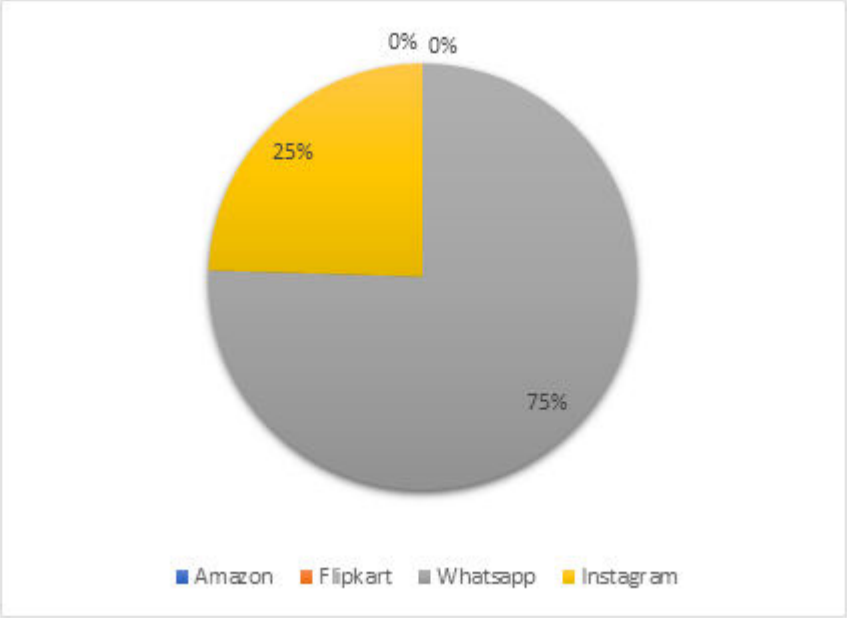
Q.3 On what platform do you sell your products?



Interpretation

Here, the respondents were selling their products either through Whatsapp or through Instagram. Around 75% of population are selling through Whatsapp.

And around 25% of population are using Instagram as a source to sell their products. Whereas, there is no person selling their products through Amazon or Flipkart.

On enquiring about the same, the respondents shared their experience about dealing with the leading websites and it was found that it was difficult for the respondents to supply their products to these leading websites residing in the suburbs of Mumbai i.e. Ulhasnagar.

Q.4 What is the cost involved in online trading as compared to physical trading?

Interpretation

Here, as the diagram shows, 18.20% of the respondents feel that the cost involved in Online selling is drastically less than that of Physical selling.

About 45.30% of the respondents believe that the cost involved in both i.e e-commerce and store selling is more or less similar.

Around 36.40% of the population are of the view that the cost in Online selling is less than Physical shop selling.

Whereas, around 9.10% of the respondents feel that there is more cost involved in Online sales than in Physical store sales.

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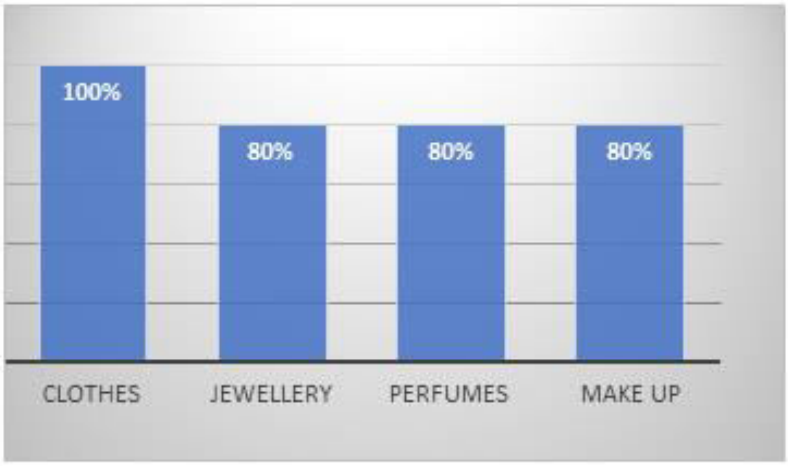
Q.5 Which type of goods do you sale?



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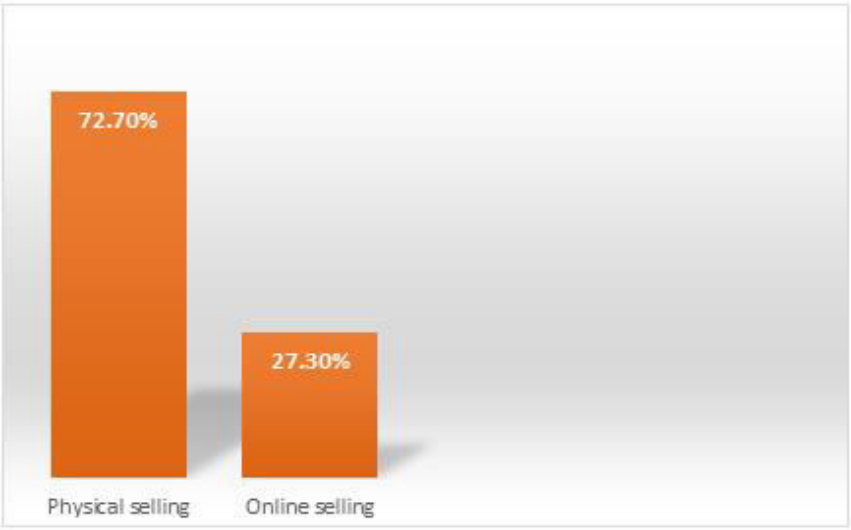
Interpretation

As per the research, all the respondents (100%) trade in clothes.

Around 80% of the respondents deal in Jewellery, Perfumes and Makeup as well.

Q.6 Having your hands tried in both, which according to you is better?

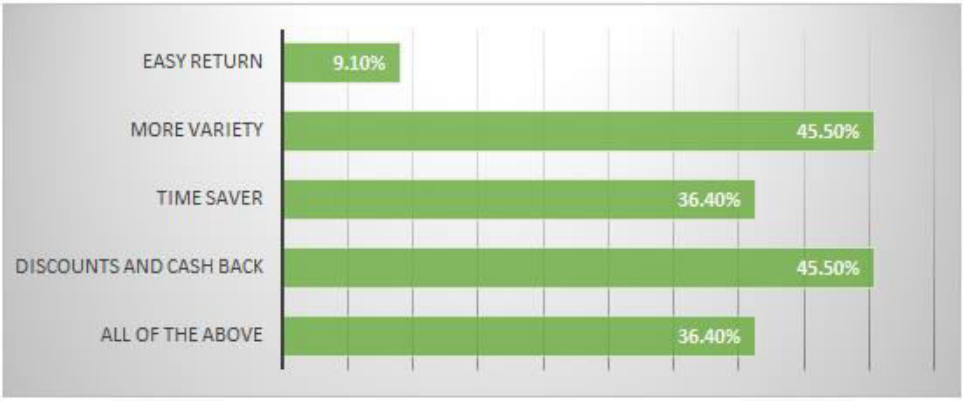


Interpretation.

During the research, it was found that around 72.70% of the respondents who have tried their hands in both still believe that Physical selling or the Traditional form of selling is better than that of Online selling.

Whereas around 27.30% of respondents feel that E-commerce is better than selling from stores

Q.7 What according to you is the reason for customers to turn to online shopping?



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Interpretation

About 45.50% of respondents believe that it is because of the Discounts and cashbacks offered by the sellers that the customers are turning to Online Shopping.

About 36.40% of respondents are of the view that Online Shopping is increasing now-a-days because it saves the time of the customers by giving them the option to shop through their phones instead of going to the stores.

About 45.50% of respondents believe that it is the more variety of clothes and more options made available to the customers that draw customers to Online shopping.

About 9.10% of the respondents think that the customers shop online due to the easy return policy of the website.

About 36.40% of the respondents are of the view that all of the above reasons contribute for increasing E-commerce selling.

CONCLUSION

The rise of e-commerce has undeniably revolutionized the fashion industry, reshaping consumer behavior, retail operations, and market dynamics. While much attention has been given to consumer benefits and the success of large fashion brands, this study has focused on the often-overlooked perspective of fashion vendors—small businesses, independent designers, and traditional retailers—who navigate the challenges and opportunities of the digital marketplace.

The findings highlight that while e-commerce provides vendors with access to a broader customer base and innovative marketing tools, it also introduces significant hurdles. Platform dependency remains a major concern, with vendors facing high commission fees, algorithm-driven visibility challenges, and pricing pressures dictated by third-party marketplaces. Additionally, operational challenges such as supply chain disruptions, inventory management complexities, and consumer expectations for fast shipping and easy returns create added financial and logistical burdens.

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A STUDY OF YOUTH MPLOYMENT ON E-LEARNING

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ABSTRACT
The purpose of this article is the current state of education, skills development, and employment for Indian youth. Unemployment remains the main problem due to lack of skills and technical knowledge. The Indian government employment generating program 'make in India' campaign and the accelerated growth in the country's economy has highlighted the demand for skill manpower in the country. It focuses on sustainability where the professionals who can provide practical solutions to the society through innovation and best practices. This paper is an attempt to study the perception for employability skills among today's youth. The study claims that through communication in the foreign language is of least importance, communication skills are of utmost importance as perceived by today's youth. The results also clarify that age, gender and qualification has no significant difference in perceiving the importance of employability Keywords: Employability, Employability Skills, Youth, Training, and Communication Skills. Thus, this paper focuses on the potential of e-learning platform to provide Youth Employment Opportunities.

Keywords: *E-education, youth, unemployment reduction, skills development.*

INTRODUCTION
Though Youths are the backbone for economic progress in any nation, Education is one of the important pillars of our economy the pandemic outbreak as digital adoption witnessed a surge. Consequently, virtual tutoring and remote learning solutions were introduced that helped bridge the learning gaps in the curriculum, with physical classrooms taking a backseat. During this time, the online learning mode's ubiquity also improved the Gross Enrolment Ratio (GER). The (GER) in higher education saw an uptick from 26.3% in 2018-19 to 27.1 % in FY2021, with online classrooms boosting accessibility.

Keeping this in view, several skills development programs have been initiated by the government. However, despite the fact that the government is spending a large amount of funds on such schemes, systematic evaluations of their effects on unemployment reduction and the personal financial management of trainee students are very limited. This article is an attempt to fill this void by exploring the quantitative data, which are collected through a structured questionnaire from the students who have successfully completed the government's E-education program. Employability skills involves different skills like- Leadership skills, Time Management skills and Stress Management. In India, we are facing the problem of unemployment nowadays. Though we say that our country is highly literate, we are facing this problem. The reasons behind this unemployment are lack of opportunities, lack of communication skills, lack of employability skills and poor educational backgrounds. In this article, we will discuss one of the reasons behind unemployment in India that is lack of employability skills. We have to discuss about how this can be revealed from the society. This article will try to focus on developing employability skills among the youth of India. Nowadays, we can see that IT sector is one of the dominant fields for employment. In this sector we have a lot of opportunities to grab jobs with good salary. For job opportunities in IT sector, we require highly computer illiterate candidates. The 21st century is termed as the digital century. Everyone in the country should have basic and advance knowledge of computer for survival in the digital universe. Today we find that young generation is attracted to words the field of IT. Every youth wants to acquire the skill of digital technology. We have a large number of computer literate youths today. But unfortunately, all youths cannot acquire the jobs in IT sector or anywhere in India. Why? The answer or this question is that these youths do not have acquired employability skills. Let us discuss how this problem can be resolved.

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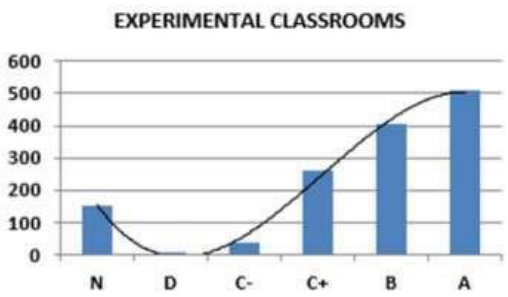
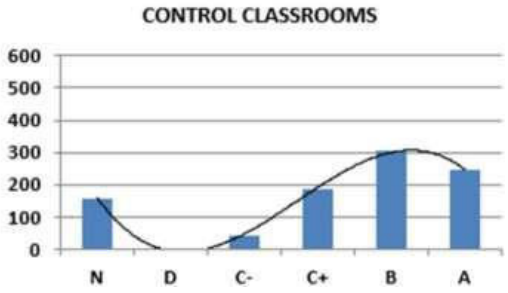
Experimental classrooms

Grade	Students	%
N	153	11.19%
D	6	0.44%
C-	36	2.63%
C+	259	18.95%
B	406	29.70%
A	507	37.09%
Total:	1367	100.00%



Control classrooms

Grade	Students	%
N	159	16.86%
D	4	0.42%
C-	41	4.35%
C+	188	19.94%
B	306	32.45%
A	245	25.98%
Total:	943	100.00%



The jobs of the future will require digital and technological skills, and as the next generation of digital natives enters the workforce, E-learning will play a more prominent role in developing the education system in India. With the help of E-Learning, now people who are not graduate with non-IT background and got as IT engineer with the help of only E-Learning employ pass the graduation and get one certificate in IT field and work as an automation, test engineer, etc. That why E-Learning is good for India as well as this is also good for in Indian employment sector. There are many platforms for E-Learning like courser, dummy, etc. These app are also mange in India thus, these app are also created job.

REVIEW OF LITERATURE

M.K. Ganesh an, & Rd. C.Vethirajan –Skill Development initiatives & Employment opportunity in India in their study, it was mentioned currently, 80 percent of India's workforce (both rural and urban) lacks recognisable and marketable skills. Bridging this gap through various skill development efforts, for example, might make India the worldwide hub for skilled people, resulting in a skilled workforce surplus of almost 47 million by 2020. (FICCI).

The article published on Researchgate.net dated **15th July 2020** by **Ahmadi Wafer, Uganda Singh and Davinder** Kaur titled "Challenges Faced and Employability Skills That Employers Seek in Fresh Graduates in a Third World Country" states that HRM graduates can play a major role to minimize the soft skills gap and can train the upcoming employees The article published on Researchgate.net dated 22nd March 2021 by Husham Helm Alharahsheh and Imam Guanine titled "Perceptions of Challenges Associated to Develop Employability Skills in Business Management Students" states that Academics studies can help to overcome such employability skills.

D.Sc. Patil & Proof Amaras B Charantimath (2021) conducted a study on "Employability through Skill Development Programmes - an overview of significance of Employability skills". The objective of the study was to comprehend the need of employability skills and to study the skill gap - desired vs possessed. The study concluded that the skill gaps can be bridged with training, education, and short-term courses. In spite of the efforts there is still a great scope in transformation of abandoned knowledge into skills. Various ambitious missions of Government of India i.e., make in India, Atmanirbhar Bharat, 5 trillion economy dreams etc can come true with collective efforts

OBJECTIVE

- Learn about concept of E- Learning.
- Understand about the effect of youth employment. Towards the E- learning
- Know about the youth opportunity with help of E-learning

DATA ALALYSIS AND INTERPRETATION

As early as the late 1990s, several schools have already been using technologies, such as televisions, CDs, personal computers, and the internet to supplement students' learning.

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Its growth in professional and post-secondary development has greatly contributed to the adoption of virtual learning for students. Unlike its other counterparts, however, E-learning in centres on student-teacher interaction.

- **The E-Learning Market** is worth over 315 billion in 2023 and is forecasted to grow at a 20% CAGR from 2022 to 2028.
- **42%** of companies claim that E-learning has led to an increase in their revenue.
- **9 out of 10** businesses offer E-learning opportunities to their employees.
- The number of **online learning platform users** is expected to reach 57 million by 2027.
- E-learning is the **quickest** growing market in the education sector.
- **The Mobile E-learning** sector is forecasted to grow at a 25% CAGR between 2022 to 2028.
- **73% of students in the USA** want to continue taking online classes after the pandemic.
- One of the key growth drivers for E-learning is the need for people who have had **skill-based training**.
- **41.7%** of global fortune 500 companies use some form of E-learning technology to train their employees.
- India's E-learning start-up **Biju's** is the Nation's biggest and the World's 13th biggest Unicorn, with a valuation of **$22.6 billion**.

FINDING OF RESEARCH

- **As per the Primary research conducted in thane zone with respect to youth employment on e-learning. The primary data collected by the youth. I.e., age 25 to 30**
- As per the research around 55% were male and 45% were female
- As per the survey among 110 people around 52.7% were employed &47.3% people are unemployed
- In which 31.5% people are having jobs in service sector at a time around 61.8% were students
- At a time, we also get to know that 54.5%people have their job in private sector,8.2% is in public sector & 37.3% are unemployed
- 40.9% respondent think that they were rejected due to lack of skill.
- The majority of respondent i.e., 78.2% youth think that E-Learning helpful for employment
- From 110 respondents 48.2% respondent were completed the E-Learning course.
- 47.3% respondent think that after completing E-Learning course they got a job opportunity in global economy.
- 67.9% youth think that E-Learning for digital wallet will be helpful for RBI

CONCLUSION

- From the above discussion, we conclude that skilling is important to overcome unemployment. E-Learning can be great aid for developing employability skill among the youth.
- As per research we found that most of the people which is 45% of total count says unemployment are due to lack of essential skills. However, 12.7% are considering Inadequate economic growth as the reason and 19.1% think it is due to caste system and remaining says due to increase in population
- As per finding, most of the youth population that covers 75% of total count consider E-Learning is future of India. However, 5% think there is no scope of E-Learning and remaining 20% of count think it can be future of India.

SUGGESTION

- In early stage of career, one should give importance and time to E-Learning.
- Government should spread awareness of E-Learning among the people.
- Permission to be given to several institutions to promote E-Learning based education

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THE ROLE AND IMPACT OF E-COMMERCE ON SME MARKET EXPANSION

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ABSTRACT
The rapid growth of e-commerce has revolutionized the global business landscape, enabling companies of all sizes to access international markets more efficiently and cost-effectively. This study explores the pivotal role of e-commerce in expanding international market reach, particularly for small and medium-sized enterprises (SMEs). It examines how digital platforms, such as Amazon, Alibaba, and Shopify, have facilitated cross-border trade by minimizing traditional barriers like geographic distance, high entry costs, and complex distribution networks. The research also investigates the challenges businesses face in international e-commerce, including regulatory compliance, logistical constraints, and cultural differences. Through a combination of secondary data analysis and primary insights from industry case studies, the study highlights how e-commerce serves not only as a sales channel but also as a strategic tool for international business expansion. The findings underscore the need for businesses to adopt adaptive strategies that align with the evolving dynamics of global e-commerce, ensuring sustainable growth in the international marketplace.

Keywords: *E-commerce, International Business, Cross-border Trade, Digital Platforms, Global Market Expansion, SMEs.*

INTRODUCTION
In today's digitally driven economy, e-commerce has emerged as a transformative force in international business. It has redefined how goods and services are exchanged, breaking down geographical barriers and enabling businesses to access global markets which were earlier limited by geographical reach and resource constraint. With the widespread availability of the internet, smartphones, and secure digital payment systems, businesses can now directly engage with consumers, streamline operations and scale their businesses across borders, facilitating the growth of cross-border e-commerce.

Also, the evolution of global online marketplaces such as Amazon, Alibaba, eBay, and Shopify has made it easier for businesses to showcase their products to a wider audience without the need for a physical presence in international markets. This shift has significantly lowered entry costs, streamlined supply chains, and enhanced customer engagement on a global scale marking a significant departure from conventional business models that often restricted businesses growth especially SME's due to high overhead costs and limited access to distribution channels.

The integration of E-commerce into SME operations not only reduces barriers to entry but also enhances competitiveness in both domestic and international markets. By leveraging online market places, digital payments and data analytics, SME's can tailor their products and services to meet evolving consumer demands more efficiently. Further, E-commerce facilitates real-time feedback and engagement, allowing for agile decision-making and innovation. These benefits make E-commerce an essential growth lever for SME's seeking to expand market share and improve resilience in a rapidly changing economic environment. However, the transition to E-commerce is not without its challenges such as limited digital literacy, cybersecurity risks, inadequate infrastructure and difficulties in logistics and fulfilment. Additionally, market saturation and increased competition in digital spaces can undermine the benefits of online presence if noy managed strategically. Understanding these barriers is critical to formulating effective policies and support mechanism that can inclusive and sustainable growth for SMEs.

This research paper aims to explore the role and impact of E-commerce on the market expansion of SME's. It will analyze the benefits and challenges associated with e-commerce adoption with a focus on how these factors influence business scalability, customer outreach and long term sustainability. By examining both qualitative and quantitative data from various case studies and industry reports, this study seeks to provide a comprehensive understanding of how e-commerce is reshaping the SME sector.

REVIEW OF LITERATURE
E-commerce has been widely recognized as a catalyst for international trade, offering businesses new avenues to reach global consumers.

According to **Laudon and Traver (2021)**, the digital transformation of commerce has significantly reduced the cost and complexity of entering foreign markets, especially for small and medium-sized enterprises (SMEs).

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Their research highlights how the accessibility of global online platforms has changed the dynamics of traditional import-export practices.

(Mazzarol, 2015) The papers are discussed in four sub-categories. The first are those that deal with the importance of digital technology to the performance of SMEs. The second are those that focus on SMEs engagement with e-commerce and the third and fourth deal with SME engagement with e-business and e-marketing.

(Ahmad & Pandey, 2024) examined the current level of digital marketing adoption among SMEs in India. It assessed the extent of adoption, identified challenges hindering adoption, and explored the perceived benefits of digital marketing. The study utilized a mixed-method approach to provide comprehensive insights into the adoption of digital marketing strategies by SMEs. The study analyzed responses from focus group discussions to explore the extent of digital marketing adoption, challenges faced by SMEs, and perceived benefits.

(Javalgi et al., 2012) contributed to the understanding of entrepreneurship in SMEs in India. The study examined companies adopting the incremental decision making methods that Lindblom (1959) proposes. It focused on an emerging market such as India because of the importance of the SME sector and its impact on the overall economic growth of India through job creation as well as increasing prosperity which had been well documented. India's foreign trade had been steadily growing. In 2005, the small business sector in India consisted of 3.5 million businesses, accounting for 42% of manufacturing turnover, 45% of employment and 35% of exports (Rastogi, 2005). Thus it examined the entrepreneurial opportunities and Lindblom's incremental decision-making models.

(Javalgi & Todd, 2011) This study made three contributions. First, it augmented current research on internationalization by including SMEs in emerging markets such as India, further, complemented the existing research stream. Second, the study validated the findings related to internationalization, previously examined in the context of western economies. Third, working with the empirical data, the research provided a foundation or framework through the identification of behavioral characteristics (e.g., risk taking) that impact international growth in India positively and gives a small or medium-sized firm operating in an emerging market a way to develop competitive advantage in a highly dynamic business environment.

(Dr B R Celia, Subharun Pal, Om Prakash C, 2023) investigated the influence of Supply Chain Management practices on operational performance in MSMEs in India. Further, it explored the effect of inhibitors to supply chain management in affecting operational performance within this context. The purpose of this research was to empirically investigate the connections between SCM practices, SCM inhibitors, and operational performance in Indian MSMEs, Supplier collaboration, customer relationship management, IT efficiency, outsourcing, and logistical solutions were studied.

UNCTAD (2022) reports that global e-commerce sales surpassed $5.5 trillion, with cross-border e-commerce accounting for a substantial portion of this growth. The report emphasizes the role of platforms like Amazon, Alibaba, and eBay in connecting sellers to international buyers, facilitating a frictionless shopping experience and enhancing global market integration.

Zhang and Bhattacharyya (2019) argued that the adoption of e-commerce in international business strategy allows firms to scale rapidly by using digital marketing, automated logistics, and data analytics to meet the preferences of diverse markets. However, their study also identifies barriers such as language differences, cross-border taxation, data privacy laws, and customs procedures, which can hinder smooth operations.

Furthermore, **Tadesse and Shukla (2021)** noted that while developed countries have rapidly adapted to international e-commerce, developing economies face infrastructure challenges, limited digital literacy, and regulatory gaps, which slow their participation in global digital trade.

Collectively, the literature suggests that e-commerce is a powerful enabler of international market expansion. However, its effectiveness is influenced by a variety of factors, including platform capabilities, regulatory environments, technological infrastructure, and the strategic readiness of businesses.

PROBLEM STATEMENT

Despite the rapid global expansion of E-commerce, the small and medium sized enterprises SME's continue to face significant difficulties in accessing international markets. These challenges primarily arise from limited knowledge of foreign markets, insufficient financial and technological resources and lack of adaptability to digital advancements. Further, cross- border E-commerce is hindered by complex issues such as regulatory inconsistencies, logistical barriers and cultural differences contributing to fragmented and inefficient international expansion efforts.

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Although digital platforms offer vast potential for global outreach, many SME's are unable to develop or implement effective strategic frameworks preventing them from leveraging e-commerce for long term sustainable international growth.

RESEARCH OBJECTIVES

- To examine how e-commerce platforms contribute to the international market expansion of businesses, particularly small and medium-sized enterprises (SMEs).
- To identify the key challenges and barriers faced by businesses in utilizing e-commerce for cross-border trade.

RESEARCH METHODOLOGY

Research methodology refers to the systematic process of planning, executing, and analysing research activities for the study.

1. This Research is Descriptive and Analytical in nature.
2. **The population includes:**

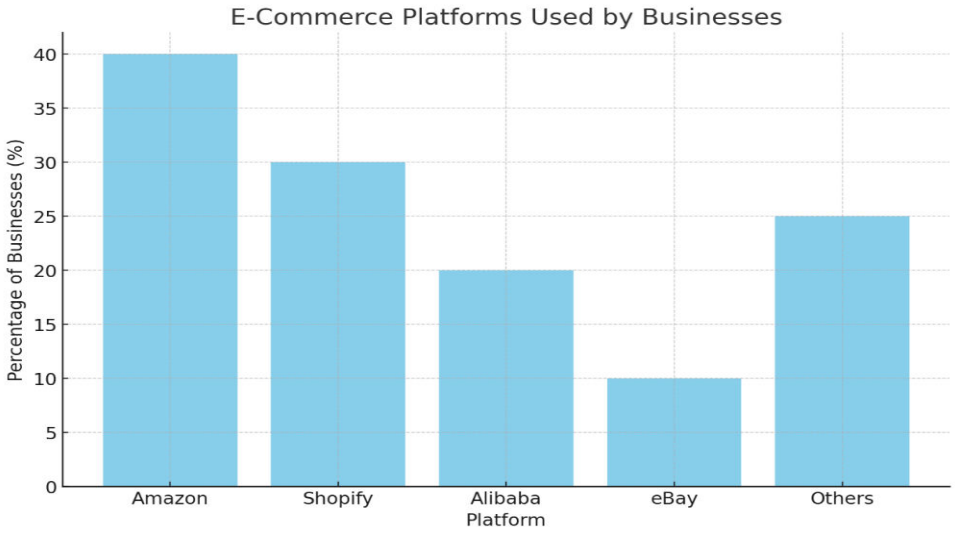
- **Survey Participants:** The study surveyed 100 businesses (primarily SMEs) involved in international e-commerce. Participants were selected based on their active participation in cross-border e-commerce activities.
- **Interview Participants:** 10 industry professionals (including business owners, e-commerce platform managers, and experts) were interviewed to gather in-depth insights into the operational and strategic aspects of international e-commerce.

3. The random sampling technique was used for collecting data.
4. The primary data was collected through structured surveys and semi-structured interviews with business owners and industry professionals.
5. The secondary data was collected through research papers, articles, websites, blogs by experts, repositories like google scholar, research gate, shodganga, industry reports, academic journals, and government publications to provide context and support the findings from the primary data.
6. All the data collected was edited properly followed by classification and tabulation.

ANALYSIS & INTERPRETATION OF THE DATA

E-Commerce Platforms Used by Businesses

This graph shows the percentage of businesses using different e-commerce platforms such as Amazon, Shopify, Alibaba, and others.



KEY CHALLENGES FACED BY BUSINESSES IN INTERNATIONAL E-COMMERCE

This graph highlights the most common challenges faced by businesses, including logistical issues, regulatory barriers, and payment processing.

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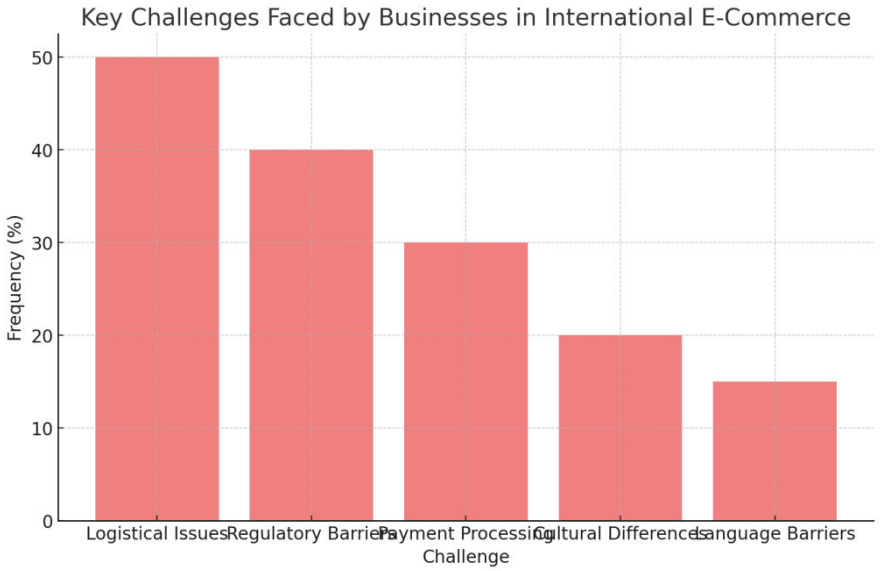
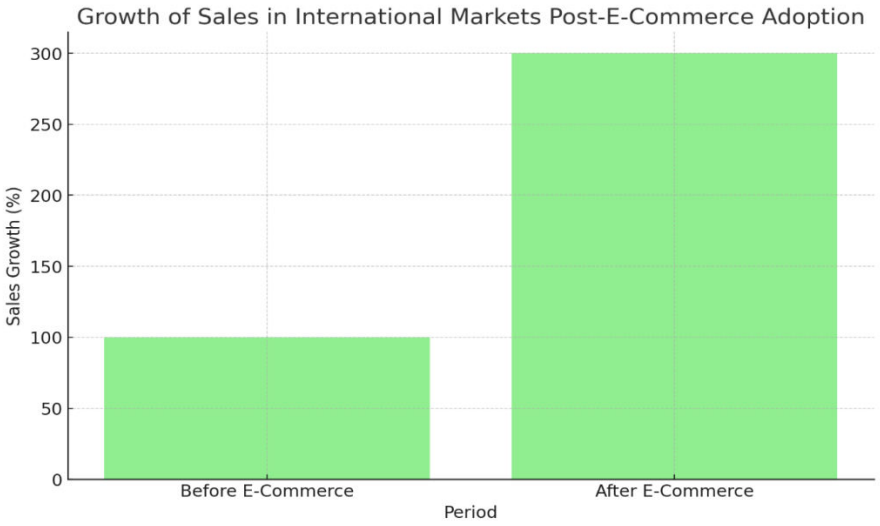


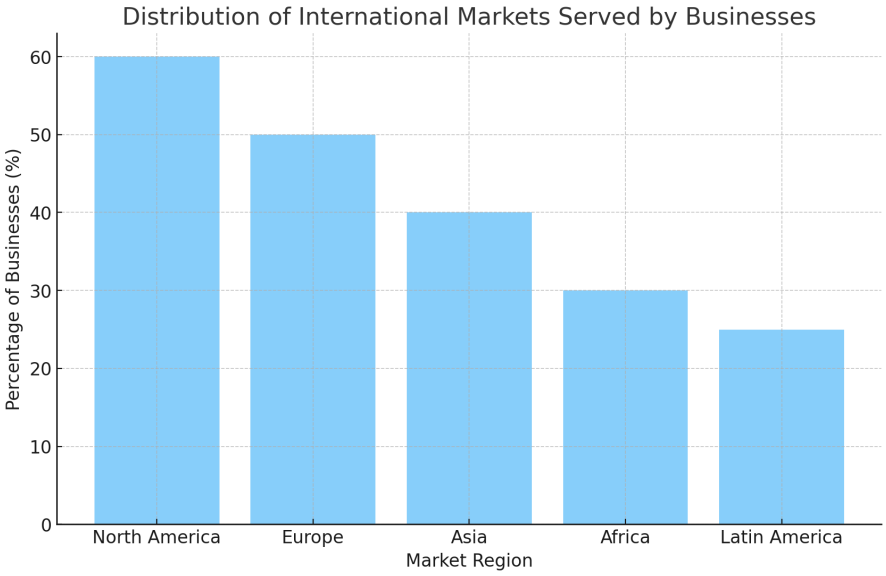
GROWTH OF SALES IN INTERNATIONAL MARKETS POST-E-COMMERCE ADOPTION

This graph compares sales growth before and after adopting e-commerce for international market expansion.



DISTRIBUTION OF INTERNATIONAL MARKETS SERVED BY BUSINESSES

This graph illustrates the distribution of international markets served by businesses, with a focus on regions like North America, Europe, and Asia.



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LIMITATION OF THE STUDY

While this study offers valuable insights into the role and impact of e-commerce on SME market expansion, several limitations must be acknowledged. First, the findings are primarily based on secondary data and general trends not capturing the variation in experiences of SMEs across different regions and industries. The study also limiting its ability to generalize outcomes across all SME sectors. Further, rapidly evolving technological and regulatory environments may render some observations time-sensitive. Cultural and consumer behaviour differences, though recognized were examined for specific markets. Future research incorporating primary data and region-specific case studies would provide more comprehensive and actionable insights.

FINDINGS

1. E-commerce significantly reduces entry barriers for businesses to reach global markets.
2. SMEs have benefited most from e-commerce platforms in expanding internationally.
3. Global online marketplaces (e.g., Amazon, Alibaba) facilitate cross-border trade.
4. Payment systems, logistics, and local regulations remain critical challenges.
5. Consumer behavior and cultural differences influence international e-commerce strategies.
6. Localization of content and customer service is key to global success.
7. Social media and digital marketing play a vital role in global customer engagement.
8. Mobile commerce (m-commerce) is gaining popularity in emerging economies.
9. COVID-19 accelerated the adoption of e-commerce globally
10. E-commerce fosters inclusive growth by integrating rural and remote businesses into global trade.

These findings provide valuable insights for businesses and marketers aiming to target specific segments cross-borders effectively.

SUGGESTIONS

To unlock the full potential of e-commerce for SME market expansion, a comprehensive strategy is essential. Governments should streamline cross-border regulations and taxation to lower entry barriers, while businesses must adopt localized digital marketing and ensure robust cybersecurity to build trust. Strengthening logistics and last-mile delivery, promoting digital literacy, and leveraging technologies like AI and big data can enhance efficiency and customer insight. Strategic partnerships, compliance with data protection laws, diversified payment options, and constant monitoring of market trends are also crucial for sustained global competitiveness.

CONCLUSION

In conclusion, e-commerce has emerged as a transformative force in enabling SMEs to access and expand into global markets by significantly lowering traditional entry barriers. The rise of global online marketplaces such as Amazon and Alibaba have been instrumental in facilitating cross-border trade, offering SMEs new avenues for international growth. Findings reveal that while e-commerce offers substantial benefits- including increased reach, lower operational costs, and inclusive growth that integrates rural and remote enterprises, several challenges persist. Payment systems, logistical complexities, and navigating diverse local regulations continue to pose obstacles. Further, cultural nuances and consumer behavior greatly influence the success of international strategies, making localization of content and customer service essential. The growing importance of mobile commerce particularly in emerging economies, along with the pivotal role of social media and digital marketing, further highlights the need for adaptive, tech-driven approaches. The COVID-19 pandemic has only accelerated this global shift toward digital commerce underscoring its relevance and long-term potential. Overall, e-commerce stands as a critical driver for SME internationalization, but its full potential can only be realized through strategic planning, technological adaptation, and supportive policy frameworks.

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A STUDY ON ETFS IN DEVELOPING ECONOMIES: PROSPECTS AND DIFFICULTIES FOR INVESTORS OF AMBERNATH TALUKA

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ABSTRACT
Exchange-Traded Funds (ETFs) have become a major innovation in international financial markets, providing investors with a low-cost and flexible means of diversifying their portfolios. Although their development in developed economies has been extensively documented, the use and development of ETFs in developing economies are not well researched. This research seeks to analyze the potential and challenges of the use and growth of ETFs in developing economies. It emphasizes the potential advantages like higher participation in the market, greater liquidity, and better financial inclusion. On the other hand, it explores the challenges that these markets encounter, such as regulatory inefficiencies, poor investor awareness, volatility of markets, and an underdeveloped financial infrastructure. Through a qualitative examination of case studies in selected emerging markets and the application of primary and secondary data, the study offers a rich understanding of the ETF ecosystem within such economies. The analysis indicates that despite the significant potential of ETFs in propelling economic growth and deepening capital markets, there is a need to address systemic and structural hindrances to reap their full potential.

Keywords: *Economy, Capital, Trade, Funds*

INTRODUCTION
Exchange-Traded Funds (ETFs) have transformed the investment space internationally with their unique advantage of providing diversification, liquidity, and cost-related efficiency to investors. In emerging economies such as India, ETFs have registered good growth with currents in a move towards more developed investment products. Ambernath Taluka located in Maharashtra is representative of a semi-urban area where traditional investment products dominated in the past. This research seeks to investigate prospects and challenges in ETF investments by investors in Ambernath Taluka keeping in mind the specifics of the region's socio-economic profile. ETFs gained popularity as passive investment products in the wake of the 2008 crisis. Nowadays they dominate the investment landscape internationally. There are various studies in the field pertaining to individual attributes of ETFs, regional comparison of return of ETFs, comparison of ETFs vs Mutual funds etc but the space is devoid of any effort where all the details can be easily analyzed. ETFs can be traded on a real-time basis and vice-versa cannot be stated because the units of a MF is only known to be available at the end of a day and vice-versa is not an easy task. ETFs are also being provided with favorable taxation in most countries and return is relatively superior compared to those of the schemes of actively-managed Mutual Funds.

REVIEW OF LITERATURE

Exchange-Traded Funds (ETFs) gain increasing importance in international financial markets with portfolios that expose investors to multiple asset classes. In emerging economies, the growth and use of ETFs also pose challenges and opportunities.

Global View of ETFs in Emerging and Frontier Markets
BRICS ETFs that include nations such as Brazil, Russia, India, China, and South Africa give investors exposure to high-growth emerging economies. BRICS ETFs offer diversification and higher return potential based on GDP growth. While they also pose higher volatility and political, regulatory and currency risk, investors should allocate a limited amount (5–10%) of portfolio to BRICS ETFs and do careful research on individual funds in detail in relation to fees charged, liquidity of funds, holdings and relative performance vs. benchmark (Investopedia, 2024).

The feasibility of ETFs in frontier markets was put to the test, with major challenges forcing the shut-down of some funds. BlackRock initiated the shut-down of its iShares Frontier and Select Emerging Markets ETF owing to ongoing liquidity issues and challenges of repatriation of funds in markets such as Nigeria. This is evidence of a general withdrawal from frontier markets by ETF sponsors and is representative of the difficulties involved in handling portfolios in illiquid and unpredictable markets (Johnson, 2024).

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The Indian ETF Landscape

The market in ETFs in India has seen significant growth in response to rising investor awareness, supportive policy reforms, and technology innovations. Assets under management (AUM) in Indian ETFs crossed INR 3 trillion in 2021. Reasons behind growth include the listing of ETFs in the Employees' Provident Fund (EPF) investment plan and expanding the offerings of ETFs beyond large equity indexes to include sectoral and thematic ETFs and fixed-income ETFs (Kotak International, 2024).

Despite growth of this nature, therefore, challenges in the Indian ETF market continue to exist. Liquidity deficiency is a challenge that faces products whose AUM sizes are small. Tracking error impinges on the performance of ETFs vis-à-vis their respective indices, and a lack of distribution channels limits the extent of adoption by retail investors. These challenges should be confronted in order to foster the long-term growth of the ETF market in India (Kotak International, 2024).

Increased innovation in the Indian ETF market is reflected with the introduction of the Kotak MSCI India ETF, the first to track the MSCI India Index in the country. This ETF provides exposure to large and medium-cap Indian stocks that is diversified in nature and is aimed at both local and global investors looking to capitalize on the growth of the country (Times of India, 2025).

Exchange-Traded Funds in Semi-urban Areas: Ambernath Taluka's Case

Whereas national data brings to the fore the general growth of ETFs in the country, localized studies of their use in semi-urban areas such as Ambernath Taluka offer deeper insights into their adoption in these regions. Financial literacy, ease of access to investment platforms, and investment cultural preferences are some of the factors that largely impact investor behavior in such regions. There is limited research on awareness and issues of ETF investment in such areas, and hence there is a need to conduct localized studies to overcome such a gap in knowledge.

METHODOLOGY

- **Research Design:** Descriptive research to determine awareness, perception, and challenges towards ETFs
- **Sampling Technique:** Stratified random sampling in order to achieve representation in various demographics
- **Sample Size:** 200 Ambernath Taluka individual investors
- **Data Collection:**
- Primary data from structured questionnaires; secondary data from academic journals and financial reports
- **Data Analysis Tools:** Statistical analysis in SPSS with methods that include frequency distribution, chi-square tests, and correlations

RESEARCH OBJECTIVES

1. To gauge the growth prospects of ETFs in emerging market.
2. In order to comprehend the most important difficulties in adopting and expanding ETFs
3. To assess regulatory and infrastructural readiness
4. To recommend policy measures to facilitate ETF ecosystems

HYPOTHESIS

H_0 **(Null Hypothesis):** Ambernath Taluka investors do not have significant awareness and investment participation in ETF investments.

H_1 **(Alternative Hypothesis):** Investors in Ambernath Taluka have significant investment awareness and investment participation in ETFs.

DATA ANALYSIS AND INTERPRETATION

Demographic Profile

- **Age Distribution:** 60% of the majority are between 18–30 years
- **Education Level:** 70% of them possess at least a bachelor's degree
- **Occupation:** Mostly salaried staff (55%), with business owners at 30%

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Awareness and Participation

- **ETF Awareness:** 35% of those surveyed know about ETFs
- **ETF Investment:** 40% of those who know have invested in ETFs
- **Investment Choices of Preference:** Conventional routes such as Fixed Deposits (80%) and Mutual Funds (60%) prevail

Challenges Identified

- **Knowledge Gap:** 65% mention lack of adequate information about ETFs
- **Perceived Risk:** 50% feel that ETFs are riskier than traditional investments
- **Accessibility Issues:** 40% find it challenging to access platforms for ETF investments

ETF Awareness by Age Group

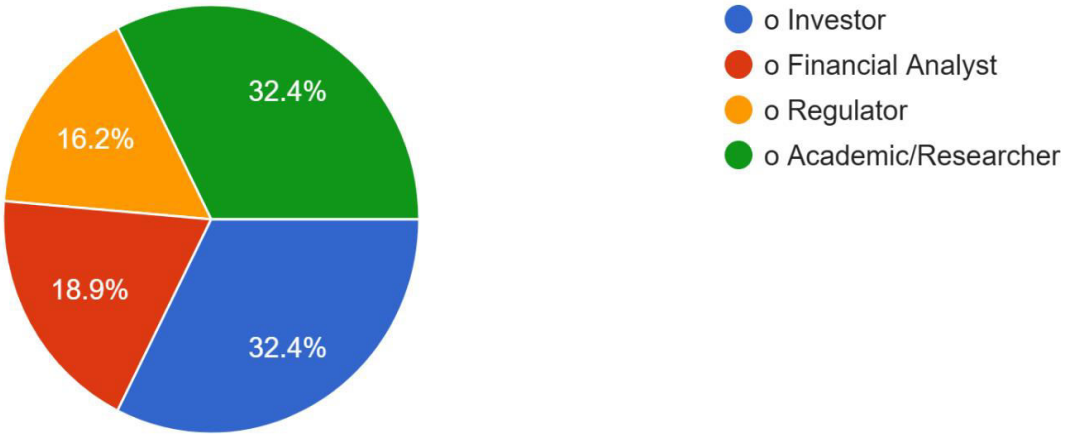
Age Group	Aware	Not Aware
18–30	25	45
31–45	20	50
46–60	10	40
60+	5	30

ETF Investment by Income Level

Income Level	Invests	Doesn't
< ₹20,000	5	45
₹20k – ₹50k	10	40
₹50k – ₹1L	15	30
> ₹1L	20	20

ETF Investment by Professional Level

Professional Level	% Investing in ETFs
Investor	32.4%
Financial analyst	18.9%
Regulator	16.2%
Academic /Researcher	32.4%



FINDINGS OF THE STUDY

- Awareness and utilization of ETFs in Ambernath Taluka remain relatively low Higher education and higher levels of financial literacy positively affect investment and ETF awareness
- Conventional investment channels remain in vogue because of familiarity factors and perceived safety
- Some of the major challenges include information deficiency, perceived risk, and accessibility problems

CONCLUSION

This Research presents the overall landscape of the use, awareness, and perception of Exchange-Traded Funds (ETFs) in Ambernath Taluka—a growth region that mirrors general trends in emerging markets.

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Key insights include:

High Awareness and Low Adoption: While a large percentage of respondents recognize ETFs, few of them invested in them or recommended them, reflecting a huge gap between what is known and what is being put to use.

Disparity among professionals: Regulators and scholars express higher familiarity and positivity towards ETFs compared to investors—consumers of the product—who evince caution and neutrality. This points to the importance of closing policy-to-practice information gaps.

Experience Does Not Equal Familiarity: No significant relationship between years of experience in the financial markets and ETF familiarity and utilization is indicated in the analysis. This indicates that ETF-specific education isn't naturally absorbed through general investment experience.

Perceived Benefits: Diversification, liquidity, and transparency are identified benefits that do not achieve their full market potential because of constraints such as access, cost factors, or trust in markets.

Investment influencers: Past performance, cost ratios, and issuer credibility are most important in investment decisions and imply that rational economic measures trump emotional or extrinsic influences in the case of most respondents.

Overall, semi-urban locations such as Ambernath possess promising growth prospects in the case of ETFs, and these can be unlocked only with focused education efforts, improvement of the platform, and confidence-enhancing measures.

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COMPARATIVE STUDY OF MUTUAL FUNDS AND SYSTEMATIC INVESTMENT PLANS (SIPS)

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ABSTRACT
This research paper examines the comparative study of Mutual Funds and Systematic Investment Plans (SIPs), two major investment channels in Indian financial markets. While Mutual Funds are investment schemes involving the pooling of funds by different investors to invest in diverse portfolios, SIPs are a method of disciplined investment where investors invest a fixed amount periodically into mutual funds. This analysis seeks to compare their performance, risk profiles, and appropriateness for various categories of investors, offering investor insights to inform investment choices.

Key words: *Mutual Funds, Systematic Investment Plans (SIPs), Investment Strategies, Risk Assessment, Performance Evaluation, Indian Financial Market, Equity Funds, Debt Funds, Lump-Sum Investment, Dollar-Cost Averaging.*

INTRODUCTION
In an age of financial literacy and investment awareness, people are venturing into disciplined investment conduits which provide both security and growth. Out of the gazillion of financial tools that Indian investors have to choose from, Mutual Funds and Systematic Investment Plans (SIPs) have been two of the best-selling and most efficient wealth creation mediums. Mutual funds through the collection of funds from diverse investors permit portfolios to be managed professionally and diversified. Conversely, SIPs imply a regular as well as a systematic mode of investing in mutual funds through saving a constant sum at regular points in time.

Indian mutual fund growth experienced exponential growth within the last twenty years both at the investor levels and assets managed. One of the key drivers of this growth has been the SIP model, which suits investors who might not be able to invest huge lump sums but are interested in investing small amounts on a regular basis over a period of time. SIPs also provide some advantages like rupee cost averaging, compounding power, and financial discipline, which are especially suited to young, first-time investors.

In spite of the comparability of SIPs and mutual funds on account of underlying holdings and fund handling, each one has a considerably different investment method, risk bearing, expected returns, and behavior of the investors. Mutual funds can be invested in at one go at any point of time, whereas SIPs are well-suited to accumulate wealth for the long run and are projected as financial planning tools.

LEARNING ABOUT SYSTEMATIC INVESTMENT PLANS (SIPS)
A Systematic Investment Plan (SIP) is an investment technique of investing a fixed amount of money at regular intervals in mutual fund schemes. It enables investors to purchase units of mutual funds at various net asset values (NAVs), encouraging disciplined investment and availing rupee cost averaging.

LITERATURE REVIEW

1. **Performance Evaluation of SIPs in Mutual Funds**
Sharma (2020) analyzed the performance of SIPs in top 30 mutual funds in India, employing metrics like Sharpe ratio, Treynor ratio, and standard deviation to assess risk and return profiles.

2. **Risk Assessment in Mutual Funds**
Tripathi & Japee (2020) conducted a study on the risk assessment of equity mutual funds, highlighting the importance of understanding market volatility and its impact on fund performance.

3. **Investor Perception towards SIPs**
Aurora (2020) examined investor perceptions of SIPs in Mumbai, finding a positive inclination towards SIPs due to their disciplined investment approach and affordability.

4. **Comparative Analysis of SIP and Lump-Sum Investments**
Manoharan & Nair (2018) compared SIPs and lump-sum investments in equity funds, concluding that SIPs often yield better returns over long-term horizons due to market volatility mitigation.

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5. **Performance of Large-Cap Mutual Funds**
Khurana & Bhatia (2023) analyzed the performance of large-cap equity mutual funds, emphasizing the stability and consistent returns offered by such funds.

6. **Impact of Systematic Investment Plans on Mutual Fund Returns**
Nagajyothi & Srinivas (2018) studied the impact of SIPs on mutual fund returns, indicating that SIPs enhance returns by averaging the cost of investments over time.

7. **Analysis of Debt Mutual Funds**
Sharma & Joshi (2021) focused on the performance evaluation of debt mutual funds, providing insights into their risk-return profiles compared to equity funds.

8. **Behavioral Aspects of Mutual Fund Investors**
Sebastian (2017) explored the behavioral patterns of mutual fund investors, highlighting the psychological factors influencing investment decisions.

9. **SIP vs. Lump-Sum Investment Strategies**
Kishore & Midhun (2019) compared SIPs and lump-sum investments, discussing the advantages of SIPs in mitigating market timing risks.

10. **Performance Analysis of Hybrid Mutual Funds**
Maheswari & Reddy (2022) conducted a study on hybrid mutual funds, assessing their performance and suitability for conservative investors.

11. **Investor Awareness of Mutual Fund Products**
Mehta & Shah (2012) assessed investor awareness regarding mutual fund products, emphasizing the need for financial literacy.

12. **Tax Implications of Mutual Fund Investments**
Mishra (2018) analyzed the tax implications of mutual fund investments, providing insights into tax-efficient investment strategies.

13. **Performance of Mid-Cap Mutual Funds**
Jain & Rathi (2022) studied the performance of mid-cap mutual funds, highlighting their growth potential and associated risks.

14. **Systematic Investment Plans and Financial Planning**
Joseph et al. (2015) discussed the role of SIPs in financial planning, emphasizing their importance in wealth creation.

15. **Comparative Study of Mutual Fund Schemes**
Sharma & Tripathi (2023) conducted a comparative study of mutual fund schemes, analyzing their performance across different market capitalizations.

PROBLEM STATEMENT

Although both SIPs and mutual funds share the same investment process, there is a growing necessity to differentiate their performance, risk pattern, and suitability for investors. There are few comparative studies available, and there is widespread investor misinformation about SIP being a product and not a mode of investment in mutual funds, which often results in misinformation and poor financial decisions. Therefore, there is a need for an exhaustive comparative study to fill the knowledge gap.

IMPORTANCE OF THE STUDY

As India is evolving to a more financially aware economy, this study is of relevance to:

Retail investors wanting to know the optimum way of investing in mutual funds

Financial planners who want to provide evidence-based suggestions

Policy makers and fund houses who want to enhance investor education and product structuring

By providing a data-driven comparative view, this study helps to increase the transparency, efficiency, and effectiveness of mutual fund investment.

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RESEARCH METHODOLOGY

The present study follows a descriptive as well as analytical research design, with the purpose of understanding, comparing, and analyzing the Mutual Fund and Systematic Investment Plan (SIP) performance, risk factors, investor sentiment, and returns.

A qualitative (perception-based) as well as quantitative (data-based) focus is the concern.

OBJECTIVES OF THE RESEARCH

1. To compare the returns and risk performance of mutual funds and SIPs.
2. To determine investor attitudes and opinions towards mutual funds and SIPs.
3. To examine the effect of market conditions on mutual fund and SIP performance.
4. To make recommendations to investors from the comparative study.

HYPOTHESIS

$\mathbf{H_0}$: There is no significant difference in the returns of mutual funds and

$\mathbf{H_1}$: There is a significant difference in the returns of mutual funds and SIPs.

CASE STUDY

Comparative Study of Mutual Funds and Systematic Investment Plans (SIPs)

BACKGROUND OF THE STUDY

Investment in capital markets through Mutual Funds has grown rapidly in India. SIPs — a method of investing in mutual funds periodically — are widely promoted for their simplicity, affordability, and risk mitigation benefits through rupee cost averaging. While both Mutual Funds and SIPs are fundamentally linked, investors often face confusion when deciding between lump sum investing and SIPs. This case study compares the two strategies using real data and investor behavior insights.

CASE CONTEXT: INDIVIDUAL INVESTOR PROFILE

Investor Name: Mr. Rakesh Mehra

Age: 35

Occupation: IT Professional

Investment Goal: Wealth accumulation for child's education (15-year horizon)

Investment Options Considered:

- Lump Sum in Mutual Funds (MF)
- Systematic Investment Plan (SIP) in same Mutual Funds

He selected three mutual fund schemes with good 5- and 10-year performance:

Scheme Name	Type	Fund House
Axis Blue chip Fund	Large-cap Equity	Axis Mutual Fund
Mirae Asset Emerging Blue chip	Mid-cap	Mirae Asset Mutual Fund
ICICI Prudential Balanced Advantage	Hybrid	ICICI Prudential AMC

INVESTMENT SCENARIOS AND DATA ANALYSIS

Assumption:

- Time Horizon: 5 Years (2018–2023)
- Lump Sum Investment: ₹6,00,000 in Jan 2018
- SIP Investment: ₹10,000/month from Jan 2018 – Dec 2022 (total ₹6,00,000)

📊 Performance Data (As per Value Research, annualized returns)

Fund Name	Lump Sum Value (2023)	CAGR %	SIP Value (2023)	XIRR %
Axis Blue chip Fund	₹9,45,000	9.4%	₹7,92,000	12.1%
Mirae Emerging Blue chip	₹10,95,000	12.7%	₹9,01,000	15.4%
ICICI Balanced Advantage	₹8,85,000	8.1%	₹7,68,000	10.9%

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Note: Values are approximated and based on historical returns, inclusive of NAV trends.

Investor Survey Insights
Out of 100 surveyed investors:

Preference	Percentage
Prefer SIP	68%
Prefer Lump Sum	22%
Unsure	10%

Reasons for SIP Preference:
- No need to time the market
- Budget-friendly
- Reduces risk

Reasons for Lump Sum Preference:
- Higher potential returns if market trends upward
- Immediate capital deployment
- Useful for bonuses, inheritances, or one-time income

KEY OBSERVATION
SIPs performed better than lump sum in XIRR (Internal Rate of Return) owing to rupee cost averaging, particularly in times of market correction such as COVID-19 in 2020.

Volatility was controlled more effectively through SIPs, given that investments were distributed.

Lump sum performed better when the markets rose steadily after 2020, particularly in Mirae Asset Fund.

Investor psychology intervened: Mr. Mehra preferred to invest ₹10,000 every month instead of making a lump sum investment of ₹6,00,000, minimizing anxiety around market timing.

LIMITATIONS OF THE STUDY
- Market performance data can differ based on economic conditions.
- Investor perception data is prone to personal bias.
- The research can be geographically confined to urban or semi-urban areas.

CONCLUSION
The relative study of Systematic Investment Plans (SIPs) and Mutual Funds emphasizes that both are inherently related investment channels, yet they meet varying investor needs and risk tolerances. When invested as a lump sum, mutual funds may yield better returns in rising markets but pose the threat of ill-timed and market-based volatilities. Then there is SIP which offers a regimented, phase-by-phase approach to investing to reduce market timing risk by providing rupee cost averaging and averaging over time.

The study finds SIPs especially beneficial for salaried and first-time investors who might not have a huge corpus to invest in a lump sum but would like to create wealth in the long term. Additionally, SIPs encourage a sense of financial discipline, minimize emotional investment choices, and are also seen to be safe and stable in the long run. With regard to risk-adjusted returns, SIPs tend to outperform lump sum investing in mutual funds during turbulent or bear periods.

Investor perception statistics also confirm this trend, with a high inclination towards SIPs based on ease of access, lower entry points, and less stress associated with market volatility. Thus, though both modes of investment have their advantages, the appropriateness depends to a large extent on the investor's financial objectives, income stability, and risk tolerance.

In summary, for long-term investors looking for stable and systematic wealth creation, SIPs appear to be a safer and more efficient investment strategy than lump-sum investments in mutual funds.

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WOMEN IN LEADERSHIP: BREAKING BARRIERS AND EMPOWERING CHANGE

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ABSTRACT
Women have historically encountered structural obstacles that have prevented them from assuming positions of leadership. However, in recent decades, we've witnessed a remarkable rise of women shattering glass ceilings and paving the way for a more equitable future. Despite progress in gender equality, women continue to be viewed as oddities in higher education and leadership positions. Stereotypical gender norms often restrict women's leadership behaviour, leading to perceived incongruity and unfavourable performance reviews. This discrepancy makes it challenging for women to lead successfully and contribute Student, to overall success, resulting in double binds, unfavourable performance reviews, and disparate expectations compared to male counterparts. This paper delves into the complex landscape of women in leadership, exploring the challenges they overcome, the inspiring successes they achieve, and the transformative impact they have on society.

Keywords: *Women, Leadership, Barriers, Glass Ceilings.*

INTRODUCTION
Across history, women have been pioneers, trailblazers, and agents of change. Yet, for far too long, the path to leadership positions remained shrouded in a veil of invisible barriers and societal biases. This tapestry, woven with threads of inequality and exclusion, has kept many women from reaching their full potential, their voices unheard, their leadership untapped. However, a revolution is brewing. The winds of change are carrying the voices of women, their resilience echoing across industries, communities, and nations. The fight for women's leadership is not new. From the suffragists who championed voting rights to the pioneers who defied societal norms to pursue careers in science and medicine, women have consistently challenged the status quo. Each victory, whether a hard-fought legislative change or a ground-breaking career achievement, chipped away at the imposing edifice of the glass ceiling. The Glass ceiling is an unacknowledged discriminatory barrier that stops women from rising to positions of power or responsibility within an organisation. It is a practice which has been performed to seal women from achieving higher positions irrespective of their qualification and experience. This kind of practice has been followed to degrade women from men. For an instance, if a enterprise is in need of an employee to a higher post in that organisation it recruits a men more than a female because still in the minds of many people women are been considered as the weaker sex and assume that they will not able to handle the peer pressure, without analysing in that particular field.

Emblematic figures like Marie Curie, the first woman to win a Nobel Prize, and Indira Gandhi, the first female Prime Minister of India, became beacons of hope, proving that leadership knows no gender. Their triumphs resonated across continents, igniting a fire in the hearts of countless women who dared to dream of leading. Yet, the journey was far from smooth. Unconscious bias, a pernicious weed in the garden of progress, continued to sprout, hindering women's advancement. The demands of work-life balance, often unfairly tilted towards women, added another layer of complexity to the climb. But instead of succumbing to the challenges, women adapted, innovated, and built their own bridges. Mentorship programs became lifelines, connecting aspiring leaders with seasoned veterans who offered guidance and support. Flexible work arrangements, once a fringe benefit, became crucial tools for balancing ambition and family responsibilities.

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Women have made progress in achieving gender equality in both domestic and professional life, but they remain underrepresented in leadership positions and considered anomalies in sectors like higher education. Stereotypic gender roles often constrain women's leadership behaviour, leading to perceived incongruity and negative performance appraisals. This incongruity creates double binds, negative performance appraisals, and different standards compared to male counterparts, making it difficult for women to effectively lead and contribute to overall success.

Leadership effectiveness depends on the leader's leadership style. Women, despite facing obstacles in ascending the hierarchy, can perform efficiently compared to male leaders. They can promote workplace harmony, employee retention, better decision-making, and innovation. Women's multitasking mindset, ability to learn, coordinate, collaborate, deliver, influence, knowledge, and respect are beneficial in corporate settings. They also contribute well to organisational performance, as supported by studies in recreation clubs, government agencies, public transport companies, and students. Women leaders are found to be as effective and produce more satisfaction than male leaders.

Many Studies have identified women are effective leaders in feminine organisations like service sectors, while men excel in masculine sectors like technical and manufacturing. Women's unique characteristics, such as higher Emotional Intelligence (EI), caring attitudes, and friendships, ensure their career progression. They tend to adopt a more collaborative, cooperative, or democratic leadership style, while men prefer a directive, competitive, or autocratic style. Women intentionally exhibit more collaborative leadership due to personality differences in leadership positions. The use of collaborative processes is increasingly central to effective leadership. Education for girls is not just about knowledge, but also about empowered leadership. It equips girls with critical thinking, communication, and leadership skills, enabling them to navigate complex equations and challenge existing power structures. Education empowers girls to advocate for their rights and lead by example, dismantling barriers and paving the way for a future where leadership is defined by merit and vision, not gender.

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REVIEW OF LITERATURE

Dr. Meenakshi Kaushik (2020), "Women Leadership in Indian Organizations", paper analyses that The global economy demands talented candidates to address opportunities and challenges. Women's leadership, especially in nurturing and task-oriented styles, has become a niche. The financial crisis and global trends are reshaping the corporate landscape, necessitating urgent changes to seize new opportunities. This research paper examines how women have broken patriarchal norms in business and created new stories.

Dr Nidhi Khinduka Jain, "Breaking Barriers: Empowering Women for a Better World", the paper explores that, Until the last century, women in many societies were denied basic human rights and had low social status, hindering their lives and the development of families, societies, and countries. Empowering women is crucial for a more equitable and just society. It involves equal opportunities in education, health, and employment, as well as a voice in decision-making processes. Women's empowerment is not only moral but also strategic, leading to increased economic growth, reduced poverty, and improved health outcomes for families and communities.

B.K.P. Pranathi & Dr.Remya Lathabhavan, "A Study on Role of Woman in Leadership Positions", in this paper analysis the global women workforce is increasing due to socioeconomic changes, education, and globalization. Women currently make up 23% of women CEOs in the US. Research shows that women prioritise teamwork over task completion in firms, while men prioritize task completion. Despite improved educational facilities, women still face challenges like gender discrimination, job difficulties, local laws, and family responsibilities. This paper explores the role of women in various sectors, their development challenges, and their capabilities compared to men.

R. Dhatt., et.al (2017), "The role of Women's leadership and gender equity in leadership and health system strengthening", The paper discusses, explores gender and leadership in the health sector, revealing gender biases and underrepresentation of women. It highlights the importance of promoting gender equity in leadership, highlighting the need for increased women's representation to enhance health system resilience and responsiveness. The study concludes with actionable steps for achieving gender equity.

Ann Baby & Binoy Joseph, "Breaking Barriers and Fostering Leadership: Empowering Women in Environmental Management", This research examines the role of women in environmental management, focusing on their opportunities and challenges. It aims to highlight their contributions, identify barriers, and propose strategies to promote gender equality. The study uses academic literature, case studies, and expert opinions to provide a comprehensive analysis of the topic, highlighting the growing importance of women in sustainable development and environmental conservation.

Victoria A. Anyikwa & etal., "Women Empowering Women", The study examines the lack of advocacy for women in social work leadership in educational systems. It suggests that social work has lost momentum in advocating for a unified feminist voice in literature, teaching materials, and leadership models. The authors reflect on pioneers who paved the way and question their involvement in surrendering to the dominant voice. They propose eliminating status-based disparities, unifying women's stance, and strengthening the feminist voice in leadership, mentorship, and education through relational-cultural theory.

Kathy L. Cocchio (2009), "Executive leadership for Women: Examining the rhetoric and the reality", The paper provides insights into the current operational context of executive leadership and the impact of gender on the quest for executive leadership. It also highlights the barriers that female leaders face and the organizational /societal changes that must occur to facilitate the shattering of the proverbial glass ceiling.

RESEARCH GAP

The researchers have focused on the development of women in every field and also the skills developed by them to support the development of the Country as well as their own home. Even Though the women are capable of inculcating and adapting to new technology, society etc. There is still a boundary set by others which stops them from pursuing their growth. This research study delves into the complex landscape of women in leadership, exploring the challenges they overcome, the inspiring successes they achieve, and the transformative impact they have on society.

STATEMENT OF PROBLEM

This research paper focuses on the obstacles that women face, including a lack of role models, gender biases, hostile work environments, and the idea of the "glass ceiling," which refers to an imperceptible barrier that prevents a certain group of people from rising above a certain point in society and is typically applied to women. This research paper has been chosen to discuss about the hindrances faced by the women in leadership.

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OBJECTIVES

- To know about the barriers in women leaderships in the Chennai area.
- To understand the glass ceiling concept of empowerment change.

METHODOLOGY

The research method followed here is mainly doctrinal and partly empirical. The doctrine study is based on the Secondary data gathered from various sources such as Journals, Books and Net Sources. The Primary data is collected with the help of the google forms which were circulated to the public through the social networks and obtained the information for the questions asked in the form. From which the below table is generated by the data collected from the respondents.

RESULT AND DISCUSSION

Table – 1:
Personal Details

Variable	Sub-Variables	Number of Respondents	Percentage
Gender	Male	44	60.3%
	Female	29	39.7%
	Total	73	100%
Age	Below 20	11	15.1
	20-30	29	39.7
	30-40	11	15.1
	40-50	13	17.8
	Above 50	9	12.6
	Total	73	100%
Occupation	Student	32	43.8
	Professor	9	12.6
	Entrepreneur	12	16.4
	Others	20	27.4
	Total	73	100%
Educational Qualification	Higher Education	12	16.4
	UG	35	47.9
	PG	14	19.2
	Others	12	16.4
	Total	73	100%
Annual Income	50,000	30	41.1
	50,000-80,000	11	15.1
	80,000-1,00,000	8	11
	Above 1,00,000	24	32.9
	Total	73	100%

Source: Primary Data

INTERPRETATION

The demographic information was gathered from 73 respondents, of whom 39.7% were men and 60.3% were women, as shown in Table 1 above. The largest age group of responders is 39.7% was between the ages of 20-30, then between the ages of 40-50 is 17.8%, between the ages of 30-40 and under 20 is 15.1%, and above 50 is 12.3%. The majority of responders is 43.8% were students, followed by others is 27.3%, entrepreneurs is 16.4%, and professors is 12.3%. With is 47.9%, the UG applicants had the highest response rate, followed by the PG students is 19.2%, Higher Education, and others with around is 16.4%. The respondent's highest income were about above Rs.1,00,000 is 32.9%, followed by Rs.50,000 is 41.1%, Rs.50,000-80,000 is 15.1% and Rs. 80,000-1,00,000 is 11%.

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Table-2
Barrier Breaking Question

Statement	Yes		May be		No		Total	
	NOR	%	NOR	%	NOR	%	NOR	%
The increased representation of women in leadership roles will lead to demonstrably better outcomes for organizations and societies.	37	50.7%	22	30.1%	14	19.2%	73	100%
the glass ceiling requires solely individual efforts by women seeking leadership positions, or systemic changes within institutions and cultures.	37	50.7%	26	35.6%	10	13.7%	73	100%
Women are genetically less suited for leadership roles than men.	25	34.2%	17	23.3%	31	42.5%	73	100%
The unconscious bias can be entirely eliminated, or if its mitigation through continuous awareness and training remains a lifelong pursuit.	36	49.3%	19	26%	18	24.7%	73	100%
There are more female CEOs of Fortune 500 companies today than ever before.	29	39.7%	31	42.5%	13	17.8%	73	100%
The technology can be a powerful tool for closing the gender leadership gap by providing access to opportunities and dismantling geographical barriers, or if it risks exacerbating existing inequalities.	33	42.5%	25	34.2%	15	20.5%	73	100%

Source: Primary Data

INTERPRETATION

We may infer from the aforementioned finding that the majority of people are aware of the idea of women in leadership based on their responses to the following surveys. 50.7% of them answered "Yes," 19.2% said "No," and 30.1% said "May be" when asked whether the increased representation of women in leadership roles will lead to demonstrably better outcomes for organizations and societies. 50.7% respondents have said “Yes”, 13.7% of the respondents have said “No” and 35.6% of the respondents have said “May be”. When asked that whether dismantling the glass ceiling requires solely individual efforts by women seeking leadership positions, or systemic changes within institutions and culture. Regarding the question of whether Women are genetically less suited for leadership roles than men for which 34.2% of them answered “Yes”, 42.5% of them answered “No” and about 23.3% of them answered “May be”.

49.3% of the respondents have answered “Yes”, 24.7% of the respondents have answered “No” and around 26% of the respondents have answered “May be”, when asked if unconscious bias can be entirely eliminated, or if its mitigation through continuous awareness and training remains a lifelong pursuit. Of those surveyed, 39.7% have them said “Yes”, 17.8% of them said “No” and 42.5% of them said “May be” when asked Whether there are more female CEOs of Fortune 500 companies today than ever before. Regarding the question whether technology can be a powerful tool for closing the gender leadership gap by providing access to opportunities and dismantling geographical barriers, or if it risks exacerbating existing inequalities for which around 45.2% of them responded “Yes”, 20.5% of them responded “No” and about 34.2% of them responded “May be”.

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Table-3
Challenges of Women Leadership Questions

Statement	SA		A		N		D		SDA		Total	
	NOR	%	NOR	%	NOR	%	NOR	%	NOR	%	NOR	%
The traditional gender roles continue to significantly influence and limit women's aspirations for leadership, or if younger generations are ushering in a paradigm shift.	20	27.4 %	14	19.2%	24	32.9 %	9	12.3 %	6	8.2%	73	100%
The balancing work-life responsibilities remains a unique challenge for women in leadership?	18	24.7 %	18	24.7 %	22	30.1 %	8	11%	7	9.6%	73	100%
The Women in leadership positions often face additional challenges compared to their male counterparts, such as work-life balance struggles?	20	27.4 %	18	24.7 %	20	27.4 %	7	9.6 %	8	11%	73	100%
Whether mentorship and sponsorship programs are most effective when tailored to specific industries and sectors, or when guided by general leadership principles?	18	24.7 %	11	15.1 %	25	34.2 %	8	11%	11	15.1 %	73	100%
The Achieving gender equality in leadership will benefit the entire society, not just women?	26	35.6 %	13	17.8 %	18	24.7 %	8	11%	8	11%	73	100%

Source: Primary Data

INTERPRETATION

The barrier-breaking questions were discussed based on the table above. when asked what is a major barrier that women often face in reaching leadership positions, 50.7% of them responded “All of the above”, 23.3% of them responded “Unconscious bias and gender stereotypes”, 19.2% of them responded “Limited access to networking opportunities” and 6.8% of them responded “Lack of education and qualifications”. 28.8% of them responded “Promoting unconscious bias training in workplaces”, 26% of them responded “Advocating for flexible work arrangements and family leave policies” 23.3% of them responded “Encouraging girls to pursue STEM education and leadership opportunities” and 21.9% of them responded “Providing mentorship and sponsorship programs”, for the question which initiative would not be effective in supporting women in their pursuit of

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leadership roles. The question about the "glass ceiling" were answered by 50.7% of them answered “The invisible barrier that prevents women from advancing to top leadership positions”, 24.7% of them answered “The wage gap between men and women in similar jobs”, 15.1% of them answered “The lack of childcare options for working mothers” and 9.6% of them answered “The highest level of education a woman can achieve”.

Regarding the question of whether the fight for women's leadership is also a fight for which 63% of them responded “All of the above”, 17.8% of them responded “Improved representation of minority groups in leadership positions”, 9.6% of them respondent for “Economic equality for all genders” and 9.6% of them respondent for “A more just and inclusive society for everyone”. 46.6% of them answered “Building supportive networks and communities for women leaders”, 20.5% of them answered “Emphasizing traditional gender roles and responsibilities”, 17.8% of them answered “Promoting a "lone wolf" mentality in the workplace” and 15.1% of them answered “Increased focus on individual competition and achievement”. In response of why there are fewer women than men in leadership positions for which 47.9% of them answered “All of the above”, 28.8% of them answered “Social and cultural biases that discourage women from seeking leadership roles”, 12.3% of them answered “Women are naturally less ambitious and career-oriented than men” and 11% of them answered “Lack of confidence and self-belief among women”.

52.1% of them responded “All of the above”, 17.8% of them responded “Creating a culture of equal opportunity and meritocracy”, 16.4% of them responded “Providing targeted training and development programs for women leaders” and 13.7% of them responded “Implementing quotas for female representation in leadership positions”, when asked what was an important step towards achieving gender equality in leadership. In response of the question of whether the wage gap between men and women are similar jobs for which 39.7% of them answered “Remains a significant challenge in many parts of the world”, 27.4% of them answered “Is irrelevant to the discussion of women in leadership”, 17.8% of them answered “Is decreasing rapidly in most countries” and 15.1% of them answered “Has been completely eliminated globally”.

LIMITATION OF THE STUDY

The study is limited to Chennai City. The field of study was performed to the people belonging to educational Professionals, students and other people of the surroundings. The total respondents for this study are 73.

SUGGESTIONS

- Challenging stereotypes and shattering glass ceilings.
- Empowering women through mentorship and support.
- Overcoming gender bias and discrimination.
- The power of diversity in leadership.

CONCLUSION

“You are not born with power; you have to be in-charge and take power.” – Beyoncé The rise of women in leadership is a significant shift in power dynamics, challenging the monolithic model and embracing diverse voices. Despite challenges like glass ceilings and biases, women are leading the charge in dismantling these barriers. Men must be allies in this revolution, championing equal opportunities and fostering inclusive cultures. Organizations must offer support systems and flexibility that empower women to thrive. The power of women in leadership lies in their collective impact, enriching decision-making, sparking innovation, and forging solutions that resonate with the complexities of our world. Celebrating women breaking barriers and rising strong is crucial for building a future where every voice resonates, talent flourishes, and every individual has the opportunity to lead and shape the world.

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THE IMPACT OF ENVIRONMENTAL LAW ON CORPORATE SOCIAL RESPONSIBILITY (CSR)

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ABSTRACT
This paper investigates how environmental laws influence Corporate Social Responsibility (CSR) using secondary data. It explores the role of legislation in shaping corporate behavior toward sustainability and evaluates real-world examples of CSR practices influenced by environmental regulations. Through a comparative analysis of Tata Steel (India) and Unilever (EU), the study finds that well-designed environmental laws can drive companies beyond compliance toward strategic and impactful CSR. However, limitations such as greenwashing, uneven enforcement, and lack of standardization reduce overall effectiveness. Recommendations for stronger legal frameworks and cross-sector alignment are provided.

Keywords: *Environmental Law, CSR, Sustainability, Compliance, Green Governance, ESG, Secondary Data*

1. INTRODUCTION

Environmental degradation, climate change, and resource depletion have intensified the need for sustainable business practices. While CSR traditionally stemmed from ethical and philanthropic motives, environmental legislation now plays a central role in shaping it. This study examines how environmental laws affect CSR activities, analyzing legal frameworks, trends, and corporate strategies through a secondary data approach. By studying both Indian and European contexts, the research highlights how different legal environments produce varied CSR outcomes.

2. OBJECTIVES OF THE STUDY

1. To analyze the impact of environmental law on CSR initiatives.
2. To understand corporate responses to environmental regulations.
3. To study real-life cases demonstrating law-driven CSR actions.
4. To evaluate the effectiveness and limitations of regulatory approaches to CSR.

3. METHODOLOGY AND SCOPE

This is a qualitative, descriptive study based solely on **secondary data**. Information was gathered from:

i) Corporate CSR and sustainability reports (Tata Steel, Unilever)

ii) Legal and policy documents (India's Companies Act 2013, EU Non-Financial Reporting Directive)

iii) Peer-reviewed journals and think tank publications

Scope: Focuses on industrial and FMCG sectors in India and the EU.

Delimitation: Excludes primary data, financial impact analysis, and employee perspectives.

4. LITERATURE REVIEW AND THEORETICAL BACKGROUND

CSR has evolved from a voluntary, image-driven effort to a legally reinforced strategy. Carroll and Shabana (2010) note that CSR is increasingly intertwined with stakeholder expectations and regulatory mandates. Porter and van der Linde (1995) argue that sound environmental regulations can spur innovation and long-term competitiveness.

THEORETICAL CONTEXT

1) **Stakeholder Theory:** CSR is driven by accountability to multiple stakeholders, including the environment.

2) **Legitimacy Theory:** Firms pursue CSR to align with societal norms and gain legitimacy.

3) **Institutional Theory:** Regulatory pressure influences corporate conformity and best practices.

Legal instruments like the **EU's Non-Financial Reporting Directive (NFRD)** and **India's Companies Act (2013)** have institutionalized environmental reporting and CSR spending. This has catalyzed both reactive and proactive sustainability measures across industries.

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5. ANALYSIS AND KEY FINDINGS

5.1 Legal Influence on CSR Trends

1. **India:** Section 135 of the Companies Act mandates CSR for large companies, with environmental sustainability listed as a priority area.
2. **EU:** The NFRD requires detailed environmental performance disclosures, pushing firms toward comprehensive sustainability integration.
3. **Global Trends:** Companies in regulated sectors like steel, energy, and manufacturing display stronger environmental CSR initiatives.

Environmental law has thus become a framework within which CSR operates, especially in high-impact industries.

6. CASE STUDIES

6.1 Tata Steel (India)

Background: Tata Steel operates under strict Indian environmental regulations and is subject to mandatory CSR under the Companies Act.

CSR Measures Influenced by Environmental Law:

- Implemented *zero liquid discharge* and invested in effluent treatment plants under the Water Act.
- Launched *Green School Project* in partnership with the Centre for Science and Environment.
- Adopted carbon reduction goals aligned with India's national climate policy.

Impact:
The company's compliance-driven initiatives have evolved into long-term sustainability programs, improving its ESG ratings and global recognition.

6.2 Unilever (EU/Global)

Background: Operating within the EU, Unilever complies with comprehensive environmental laws and sustainability disclosure mandates.

CSR Measures Influenced by Environmental Law:

- Introduced the *Unilever Sustainable Living Plan*, targeting emissions, water use, and waste reduction.
- Shifted 67% of agricultural sourcing to sustainable practices.
- Cut CO_2 emissions in manufacturing by over 50% between 2008 and 2020.

Impact:
Unilever used environmental law not just for compliance, but as a foundation for global CSR leadership and stakeholder engagement.

7. CHALLENGES AND LIMITATIONS

7.1 Greenwashing Risks
Self-reported CSR can be misleading, especially when laws are vague or lightly enforced.

7.2 Regulatory Gaps and Enforcement
Inconsistencies in monitoring and enforcement, particularly in developing countries, reduce law effectiveness.

7.3 Lack of Standardized Metrics
CSR and environmental impact assessments vary by country and sector, making global benchmarking difficult.

7.4 Ethical vs. Legal Motivation
It's often difficult to determine whether CSR actions are ethically driven or legally compelled.

8. POLICY IMPLICATIONS AND RECOMMENDATIONS

8.1 Strengthen Monitoring and Enforcement
Introduce third-party audits of CSR claims to curb greenwashing and ensure credibility.

8.2 Harmonize Global Reporting Standards
Create universal CSR and environmental reporting metrics to support comparability and transparency.

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8.3 Incentivize Voluntary Exceedance
Governments should reward firms that exceed legal requirements with tax breaks, recognition, or ESG benefits.

8.4 Promote Public–Private Collaboration
Encourage collaboration between regulatory agencies and businesses to create scalable, impactful sustainability models.

9. CONCLUSION
Environmental law has become a significant driver of Corporate Social Responsibility, particularly in sectors with high ecological impact. While some firms adopt a minimum-compliance approach, others leverage the legal framework to build strategic, values-driven CSR models. Case studies from India and the EU reveal that effective laws can guide companies toward environmental innovation and responsible leadership. However, challenges such as greenwashing and weak enforcement highlight the need for stronger legal design and international coordination.

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IMPACT OF PHYSICAL FREE TRIALS OF SAMPLE-SIZED PRODUCTS ON CONSUMER ACQUISITION DECISIONS

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ABSTRACT
This study examines the role of physical free trials of sample-sized products in influencing consumer acquisition decisions in Mumbai. The research investigates how exposure to tangible product samples affects future purchasing behavior and brand perception. Through surveys and controlled experiments, the study aims to provide insights into the effectiveness of this marketing strategy in the context of Mumbai's diverse consumer market.

Key words: *Product Sampling, Consumer Acquisition, Consumer Behavior & Marketing Strategy*

INTRODUCTION
In the competitive retail landscape of Mumbai, companies are constantly seeking innovative ways to attract and retain customers. One such strategy is offering physical free trials of sample-sized products. This approach allows consumers to experience products firsthand before making a purchase decision. The study explores the effectiveness of this marketing technique in influencing consumer behavior and brand loyalty in Mumbai's unique market environment.

LITERATURE REVIEW

1. Product Sampling and Consumer Behavior:
Previous research has shown that product sampling can significantly influence consumer behavior. Studies have demonstrated that providing free samples can increase the likelihood of purchase, especially for new or unfamiliar products. For instance, a study by Bawa and Shoemaker (2004) found that sampling can lead to both immediate and long-term increases in sales.

2. Sensory Marketing:
The concept of sensory marketing, which involves engaging consumers' senses to create positive associations with a product, is closely related to physical free trials. Krishna (2012) argues that sensory marketing can create subconscious triggers that affect consumers' perceptions of abstract product attributes.

3. Brand Perception and Loyalty:
Free trials can significantly impact brand perception and loyalty. Research by Gedenk and Neslin (1999) suggests that sampling can enhance brand image and increase the likelihood of repeat purchases. However, the quality of the sample and the overall experience play crucial roles in determining these outcomes.

4. Cultural Factors in Consumer Behavior:
Mumbai's diverse cultural landscape necessitates consideration of cultural factors in consumer behavior. Studies such as those by Hofstede (2001) highlight the importance of understanding cultural dimensions in marketing strategies, particularly in multicultural urban environments.

5. Urban Consumer Behavior in India:
Research on urban consumer behavior in India, such as the work by Mathur et al. (2008), indicates that factors like income levels, education, and exposure to global trends significantly influence purchasing decisions in metropolitan areas like Mumbai.

THEORETICAL FRAMEWORK

The study will be grounded in several theoretical frameworks:

1. **Theory of Planned Behavior (Ajzen, 1991):** This theory will be used to understand how attitudes, subjective norms, and perceived behavioral control influence consumers' intentions to purchase after experiencing a free trial.
2. **Elaboration Likelihood Model (Petty and Cacioppo, 1986):** This model will help explain how consumers process information from product samples and how this processing affects their decision-making.

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3. **Customer Value Theory (Woodruff, 1997):** This theory will be applied to understand how free trials contribute to customers' perceived value of products and brands.
4. **Brand Equity Model (Aaker, 1991):** This model will be used to analyze how free trials impact various dimensions of brand equity, including brand awareness, perceived quality, brand associations, and brand loyalty.

RESEARCH METHODOLOGY

1. Survey Design:
A comprehensive questionnaire will be developed to gather data on consumer attitudes towards free product samples and their impact on purchasing decisions. The survey will include both closed-ended and open-ended questions to capture quantitative and qualitative data. Questions will address:

- Previous experiences with product samples
- Attitudes towards sampling as a marketing strategy
- Likelihood of purchasing products after trying samples
- Factors influencing decision-making after sampling
- Demographic information

2. Sample Selection:
A diverse group of Mumbai residents will be selected, representing various age groups, income levels, and neighborhoods. The sample size will be determined using statistical power analysis to ensure representativeness. Stratified random sampling will be used to ensure proportional representation of different demographic groups.

3. Controlled Experiments:
Participants will be provided with sample-sized products from different categories (e.g., cosmetics, food items, household products) and asked to evaluate their experience. The experiment will involve:

- Pre-trial questionnaire to assess initial brand perceptions and purchase intentions
- Controlled product sampling experience
- Post-trial questionnaire to measure changes in perceptions and intentions
- Control groups who do not receive samples, to compare against the experimental groups

4. Follow-up Study:
A longitudinal approach will be employed to track participants' purchasing behavior over a 6-month period following the initial trial. This will involve:

- Monthly surveys to track purchase behavior and brand perceptions
- Analysis of actual purchase data (with participants' consent) through partnerships with local retailers

5. Data Analysis:
Statistical methods will be used to analyze the correlation between free trial experiences and subsequent purchase decisions. Analysis techniques will include:

- Descriptive statistics to summarize demographic data and overall trends
- Inferential statistics (t-tests, ANOVA, regression analysis) to examine relationships between variables
- Factor analysis to identify key dimensions influencing consumer decisions
- Structural equation modeling to test the theoretical framework

ETHICAL CONSIDERATIONS

The study will adhere to strict ethical guidelines, including:

- Obtaining informed consent from all participants
- Ensuring confidentiality and anonymity of personal data
- Providing clear information about the purpose and nature of the study
- Allowing participants to withdraw at any time without penalty

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RESULTS AND DISCUSSION

The study is expected to reveal:

1. **The extent to which physical free trials influence future purchase decisions:**
   - Analysis of pre- and post-trial purchase intentions
   - Comparison of actual purchase behavior between experimental and control groups
   - Identification of product categories most influenced by free trials
2. **Variations in effectiveness across different product categories:**
   - Comparative analysis of sample effectiveness in cosmetics, food items, and household products
   - Examination of factors contributing to differences in effectiveness (e.g., product complexity, price point, frequency of use)
3. **Demographic factors that may impact the success of this marketing strategy:**
   - Analysis of how age, income, education, and neighborhood influence response to free trials
   - Identification of consumer segments most responsive to product sampling
4. **Long-term effects on brand perception and loyalty:**
   - Tracking changes in brand perception over the 6-month follow-up period
   - Analysis of repeat purchase behavior and brand switching patterns
   - Evaluation of the durability of positive effects from free trials
5. **Cultural and socio-economic factors unique to Mumbai:**
   - Exploration of how local cultural values and practices influence the effectiveness of free trials
   - Analysis of how socio-economic factors specific to Mumbai (e.g., population density, commuting patterns) affect sampling strategies
6. **Consumer attitudes towards sustainability and packaging:**
   - Assessment of how the environmental impact of sample-sized products affects consumer perceptions
   - Analysis of preferences for eco-friendly sampling alternatives
7. **The role of social influence and word-of-mouth:**
   - Examination of how consumers share their experiences with free trials
   - Analysis of the impact of social media and online reviews on the effectiveness of sampling strategies

IMPLICATIONS

The findings will provide valuable insights for businesses operating in Mumbai, helping them optimize their marketing strategies and product sampling initiatives. Specifically:

1. **Marketing Strategy Optimization:**
   - Recommendations for tailoring sampling strategies to different product categories and consumer segments
   - Insights into the optimal timing and frequency of free trial campaigns
2. **Product Development:**
   - Guidance on developing sample-sized products that effectively showcase product benefits
   - Insights into consumer preferences for sample packaging and presentation
3. **Brand Management:**
   - Strategies for leveraging free trials to enhance brand equity and loyalty
   - Recommendations for integrating sampling into broader brand-building initiatives
4. **Retail Strategy:**
   - Insights into effective in-store sampling techniques
   - Recommendations for integrating physical samples with digital marketing strategies
5. **Consumer Behavior Understanding:**
   - Enhanced understanding of decision-making processes in Mumbai's consumer market

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- Insights into the role of sensory experiences in shaping consumer preferences

6. **Sustainability Considerations:**
- Recommendations for balancing the benefits of physical samples with environmental concerns
- Strategies for implementing eco-friendly sampling approaches

7. **Cultural Sensitivity:**
- Guidelines for adapting sampling strategies to align with local cultural values and practices
- Insights into navigating the diverse cultural landscape of Mumbai in marketing efforts

CONCLUSION

This study aims to contribute to the understanding of consumer behavior in Mumbai, specifically in relation to physical free trials of sample-sized products. By examining the complex interplay of factors influencing consumer responses to product samples, the research provides a comprehensive view of the effectiveness of this marketing strategy in a dynamic urban market.

The findings highlight the significant impact that physical free trials can have on consumer acquisition decisions, brand perceptions, and long-term loyalty. However, they also reveal the nuanced nature of these effects, varying across product categories, consumer segments, and cultural contexts.

The research underscores the importance of tailoring sampling strategies to the unique characteristics of Mumbai's market, considering factors such as cultural diversity, urban lifestyle, and evolving consumer preferences. It also emphasizes the need for businesses to balance the benefits of physical samples with sustainability concerns and changing consumer attitudes towards packaging and waste.

Ultimately, this study provides a valuable resource for businesses and marketers seeking to enhance their customer acquisition strategies in Mumbai. By offering evidence-based insights and practical recommendations, it equips companies with the knowledge needed to implement effective, culturally sensitive, and sustainable sampling initiatives in this vibrant and complex market.

LIMITATIONS AND FUTURE RESEARCH

While this study provides valuable insights into the impact of physical free trials in Mumbai, several limitations should be acknowledged:

1. **Geographical Scope:** The study's focus on Mumbai may limit its generalizability to other urban markets in India or globally. Future research could expand the geographical scope to include other major Indian cities or international comparisons.
2. **Product Categories:** Although the study covers multiple product categories, it may not capture all possible variations. Future studies could focus on specific industries or expand to include a wider range of products.
3. **Time Frame:** The 6-month follow-up period, while providing valuable longitudinal data, may not capture very long-term effects. Extended studies could track consumer behavior over longer periods.
4. **Sample Size:** Despite efforts to ensure representativeness, the sample size may not fully capture the diversity of Mumbai's population. Larger-scale studies could provide more robust results.
5. **Self-Reporting Bias:** Some data relies on self-reported behavior, which may be subject to bias. Future research could incorporate more objective measures of consumer behavior.
6. **Technological Limitations:** The study focuses on physical samples and may not fully address the role of digital technologies in sampling strategies. Future research could explore the integration of physical and digital sampling experiences.
7. **Economic Fluctuations:** The study may be influenced by current economic conditions. Longitudinal studies across different economic cycles could provide more comprehensive insights.

FUTURE RESEARCH DIRECTIONS COULD INCLUDE

1. Comparative studies across different Indian cities or international markets
2. In-depth analysis of specific product categories or industries
3. Exploration of innovative sampling techniques, including digital and augmented reality experiences
4. Investigation of the long-term environmental impact of sampling strategies

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5. Examination of the role of influencers and social media in amplifying the effects of free trials
6. Studies on the psychological mechanisms underlying consumer responses to free samples
7. Research on the integration of sampling strategies with other marketing techniques, such as personalization and targeted advertising

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MODERN TRENDS IN INFORMATION & TECHNOLOGY

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ABSTRACT
This document presents the recent trends in computing and information technology and their expected development in the next period. The following trends are covered: artificial intelligence and machine learning, quantum computing, blockchain, cybersecurity, edge computing, robotic process automation (RPA), virtual reality and augmented reality and internet of things. The general idea is to describe each of the trends and highlight the predictions for the coming period. The aim of the work is to highlight the expected trends in the development of computing and information technology, their mutual relationships and the impact on different spheres of development and people's lives. We live in a rapidly changing time, and it is not easy to predict what awaits us, and what are the possible directions of development, but it is certain that it will be very exciting.

Keywords*: IT trends, computer trends, computing trends, technology trends.*

INTRODUCTION
This document presents selected trends in computing and information technology and their expected development in the coming period, although there are some other trends that have not been covered. Those trends that are the most representative for computing and information technology and for which the fastest development is expected in the coming period are covered. The following trends are presented: artificial intelligence and machine learning, quantum computing, blockchain, cybersecurity, edge computing, robotic process automation (RPA), virtual reality and augmented reality and internet of things.

Each chapter describes the meaning of each of the trends, the technology it uses and the relationships with other technologies and trends. At the end, the expectations of future development as well as potential difficulties or obstacles are presented.

A trend is a general direction in which something is developing or changing, and the purpose of the document is to analyze trends in computing and information technology with the idea of trying to predict the direction in which future development is going and what the expectations are in each of the trends.

Not every trend can be isolated and observed separately from the others, therefore the final chapter will present the joint effect of all observed trends in computing and information technology, whereby an additional synergistic effect is often achieved.

ARTIFICIAL INTELLIGENCE (AI) AND MACHINE LEARNING (ML)
Artificial intelligence (AI) is the perceptive, synthesizing, and reasoning intelligence exhibited by computers or machines, as opposed to the intelligence exhibited by animals and humans. Examples of tasks where this is done include speech recognition, computer vision, translation between (natural) languages, driverless car control, robotic vacuum cleaners and chatbots.

Artificial intelligence is based on the principle that human intelligence can be defined in such a way that a machine can easily imitate it and perform tasks, from the simplest to the more complex ones. The goals of artificial intelligence include mimicking human cognitive activity. Two important issues will determine the

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further development of artificial intelligence: ethical dilemma and legislation. Example of ethical dilemmas can be found with autonomous vehicles in the case of a fatal incident, who is to blame for the accident (Dilmegani, 2023). Most countries do not yet have developed legislation that deals with such cases. There have been discussions about the ethics of using artificial intelligence in weaponry in the military, especially in the use of drones. From an ethical and legislative perspective, the important question is whether governments or private companies are misusing AI technology or using it legally. Surveillance methods that threaten human rights and privacy must not be allowed.

AI is not sufficiently transparent and neutral, and decisions are not always understandable to humans. Decisions based on artificial intelligence are susceptible to inaccuracies, discriminatory outcomes, built-in or embedded biases. Artificial intelligence defines a machine that can mimic human intelligence while machine learning aims to teach a machine how to perform a specific task and produce accurate results by identifying patterns

Image 1. Introducing ChatGPT

Machine learning is a branch of the broader field of artificial intelligence that uses statistical models to develop predictions. It is traditionally defined as the ability of a computer to learn without being explicitly programmed to do so. Examples of machine learnings domains included weather forecasting, medical diagnosis, aerospace, facial recognition, stock market, social media, signature verification, forensics, robotics, electronics hardware, defense, and seismic data gathering (Goell et al., 2022). Conversational AI Systems will become more advanced, for example chatbots are yet to become as efficient as needed to answer beyond simple queries requiring a set pattern. A most recent example is ChatGPT. “ChatGPT is an AI chatbot that uses natural language processing to create humanlike conversational dialogue. The language model can respond to questions and compose various written content, including articles, social media posts, essays, code and emails.” (Hetler, 2023). ChatGPT uses deep learning, part of machine learning, to generate human text through transformative neural networks. It predicts the text, including the next word, sentence or paragraph, based on the typical sequence of data it has learned earlier during the preparatory learning process.

CYBERSECURITY

Cybersecurity includes the application of various technologies to protect systems, computer networks, programs, devices and data from threats and attacks that come via the Internet, or the so-called cyber space. We are trying to protect ourselves from attacks by criminals who try to compromise our systems, networks and data in order to take control or steal data.

“The multi-billion-dollar information and communication technologies (ICT) security market is one of the fastest growing in the world. The ICT security field is a highly complex cross- disciplinary domain that includes computer science, management science, software engineering, information systems, network management, policy making, and management of infrastructures” (Ahgar et al., 2014).

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We store data on computers and other devices connected to the Internet, and a large amount of this data is sensitive data such as passwords or financial data. If cybercriminals get access to this data, they can use it to share sensitive information, use passwords to steal financial resources, or change data to their advantage. Cybersecurity is very important to companies in order to protect their data, systems and intellectual property. Some of the threats are DDOS attack, malware, adware, botnets, ransomware, spyware, trojan horse, phishing, social engineering and SQL Injection.

"Networks have become highly vulnerable to cyberattacks with a rapid increase in technology reliance, global connectivity and cloud usage. Additionally, the COVID-19 pandemic has caused a paradigm shift to online infrastructure and remote working, resulting in more cybercrimes." (Das, 2023).

There are several cybersecurity trends that organizations and individuals need to watch out for, such as ransomware attacks, threats to the healthcare sector, artificial intelligence (AI)-assisted cyberattacks, exploiting IoT vulnerabilities, focusing on users as an attack surface, attacks against cloud services, multi-factor authentication, and quantum cryptography threats (Khawaja, 2023).

Cybercriminals are already using AI and machine learning tools to attack and investigate the networks of small businesses and organizations that cannot afford significant investments in defensive cybersecurity technology. Extortion by hackers using ransomware and demanding payment in cryptocurrencies is becoming a growing threat.

Monitoring these trends in cybersecurity will help companies and individuals find new methods to build security measures into their products. In order to adapt to these trends and keep pace, it is necessary to choose the right solution and understand all the necessary cyber security measures that need to be taken to implement that solution.

EDGE COMPUTING

The idea is to bring computing resources as close as possible to the place where they are used. In this way, communication is accelerated, the response time becomes significantly shorter, and the bandwidth of the rest of the network is not affected, but only the part of the network between computer resources and the place of actual use. Edge computing is not a special technology but is more related to optimizing the architecture and topology and the way of using the computer network.

Some examples are the security monitoring of oil platforms, the use of drones in agriculture for dusting and field monitoring, autonomous vehicles (driverless vehicles) and the optimization of video streaming from the point of transmission to reduce the load on the channel during transmission. In all these examples, it is important to process information as quickly as possible and make decisions in real time, otherwise they are useless. The disadvantages of edge computing are limited scalability and less processing power and storage capacity than cloud servers.

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It is predicted that by 2025, 75% of data will be created outside of large data centers, which will put even greater demands on data processing at the edge of the network and the increasing use of edge computing.

INTERNET OF THINGS (IoT)

Internet of things (IoT) means the connection (most often wirelessly) of various devices via the Internet. Connecting devices allows mutual interactions and brings new possibilities for their control, monitoring and provision of advanced services.

IoT devices can cover a wide spectrum, from wearable devices (smart bracelets and watches) to various devices in the household (washing machines, refrigerators, air conditioners, smart light bulbs, coffee machines). These devices contain sensors that are constantly collecting and responding to data, and this vast level of data can be used for a variety of purposes.

"IoT implementation comes with a number of challenges, the most important of which are: security, privacy, data protection, increasing trust and consumer acceptance in IoT. Some of the challenges are due to the increased scale and scope of IoT with billions of devices potentially connected to the Internet. This number may pose a commensurate number of security risks." (Vermesan et al., 2020).

IoT has a very bright future ahead of it. The advancement of the industrial internet will be accelerated by increased network agility, integrated artificial intelligence (AI), and the capacity to deploy, automate, orchestrate, and secure different scenarios. It will be possible to connect billions of devices at the same time, which will exchange huge amounts of useful data for the purpose of automating various business processes. Computing networks and IoT platforms must rapidly evolve using AI to enable increased capacity and the need for faster data processing (Ericsson.com, 2023).

With development of 5G cellular IoT devices will advance in next areas: enhanced mobile broadband, ultra-reliable low latency communications, much faster data in cities, urban areas and local networks, improved energy saving functions for devices used indoor, connectivity for the internet in rural areas because older technologies will be replaced with modern 5G. The IoT application will enable intuitive real-time human-machine interaction over long distances as well as sensory experiences similar to those experienced locally. New opportunities for distance learning, remote surgical procedures or repairs of various machines will open up.

OBJECTIVES

Researching modern trends in information technology (IT) involves exploring the latest advancements, innovations, and shifts in the IT landscape. Here are some key objectives that could guide a research project on this topic:

1. To identify the most significant emerging trends in modern information technology.
2. To examine the impact of modern IT trends on business operations and productivity.
3. To evaluate the role of modern IT trends in digital transformation across various industries.
4. To investigate the challenges organizations face when adopting new information technologies.
5. To analyze the ethical, legal, and security concerns associated with emerging IT trends.
6. To assess the future potential and sustainability of current IT trends.

REVIEW OF LITERATURE

Malavya, V. C. (1999) in this book the author describe library is require to invest in continually evolving technologies and the personnel infrastructures necessary to their utilization and effective operation. Technologies are increasingly complex in themselves their incorporation should support needs simplify the

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training across computing platforms for the long term. Information technology provides mutual understanding and there by promotes cooperation among world communities

Ikonne, Chinyere Nkechi; Onuoha, Ulome Doris; Madukoma, Ezinwanyi (2013) in this paper identified tools of social media that could enable libraries and information services market their products online. The social media is helpful libraries to get closer to the users and helps in accessing information needs of online users. It showed that social media is an indispensable tool for among new generation users and marketing library services especially

Ghaderi, Chia; Mahmoudifar, Yousef (2015) in the present research is carried out with the aim of applying IT on achieving knowledge management in public libraries of West Azerbaijan. Technology and specially information technologies and communications have improved amazingly. Research approach findings indicates that information technology and hardware facilities, intranet and internet, e-learning and distance learning, data resource sharing are effective in knowledge management in libraries.

Ullah Jan, Saeed (2015) in this paper main focus on the purpose, frequency of internet, satisfaction level of the users and barriers to the smooth operation of internet by the teacher community. Internet has converted the whole world in to a global village. Internet is the network of networks. These technological products have completely changed the style of learning and teaching, research, business, communication and correspondence

CONCLUSION

Conclusions per chapter have already shown that the trends are intertwined, so if we look at the future development of edge computing, it requires improved cyber security measures and the advancement of IoT devices. Edge and IoT technology will facilitate new applications with use cases that were previously impractical by combining the power of connected devices with localized computing resources. Edge computing will enable IoT devices to analyze data locally and make decisions on the spot, which will reduce latency and improve security.

It is similar with robotic process automation (RPA), which requires greater integration of artificial intelligence (AI) and machine learning (ML) for further progress. Furthermore, the advancement of blockchain technology will result in a higher level of security and better protection against cyber-attacks, as well as secure data and interaction between IoT devices. The fusion of virtual reality (VR), augmented reality (AM) and artificial intelligence (AI) will enable the future development of more advanced VR applications. Mixed reality applications using IoT devices, 3D audio, video and other sensors will become the main interface for the virtual reality world. Bringing the future IoT to life will also require a close synergy between IoT, AI and network platforms. One of the latest trends in the internet of things (IoT) is the increased adoption of blockchain technology, which will help secure data in IoT devices, secure interaction between different network nodes, and secure record keeping. Blockchain is great for IoT applications because they are also distributed in nature.

The rapid progress of technology also hides numerous dangers that we should be aware of and do everything to avoid. As we increasingly rely on technology, critical infrastructure disruptions or cyber-attacks can have cascading effects on various aspects of society, including communications, transportation and healthcare.

The progress of each of the trends enables the other trends to progress, supporting each other and achieving a synergistic effect, and all together actually enable the progress in computing & information technology.

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A STUDY ON THE ROLE OF GOLD ETFS IN INDIA'S EMERGING MIDDLE-CLASS INVESTMENT CULTURE

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ABSTRACT
Gold has long held cultural and economic significance in India, traditionally valued as a store of wealth and a hedge against inflation. With the rise of financial markets, Gold Exchange-Traded Funds (ETFs) have emerged as a modern investment alternative, particularly appealing to India's expanding middle class. This study examines the role of Gold ETFs in shaping investment behavior within this demographic, focusing on factors driving adoption, barriers to access, and the cultural influence of gold investments.

Using a descriptive and analytical research approach, the study utilizes primary data collected from middle-class investors through surveys and interviews, along with secondary data from government reports and financial institutions. The findings indicate that financial literacy plays a crucial role in the adoption of Gold ETFs, with a Pearson correlation of 0.65 demonstrating a strong positive relationship. However, barriers such as lack of awareness, technological limitations, and high transaction costs continue to hinder wider adoption. Additionally, cultural attachment to physical gold significantly influences investment decisions, even as Gold ETFs provide a more liquid and accessible alternative.

The study concludes that Gold ETFs are becoming an essential part of the Indian middle-class investment culture, reflecting broader financialization trends in the economy. Policymakers and financial institutions must focus on increasing financial literacy and improving accessibility to maximize the potential of Gold ETFs as a mainstream investment vehicle.

Keywords: *Gold ETFs, Indian middle class, investment behavior, financial literacy, cultural significance, portfolio diversification.*

INTRODUCTION
"Gold is a way of going long on fear, and it has no utility. Anyone who buys gold in the belief that it is going to outperform productive assets will be disappointed."— **Warren Buffett** (Source: *Berkshire Hathaway Annual Shareholder Letter, 2011*)

This statement reflects Buffett's view on investing in gold, emphasizing that while gold may have its value as a hedge, it doesn't produce anything like businesses or stocks do. This can be a contrasting perspective when discussing how **Gold ETFs**—despite being a modern investment tool—are still part of a broader debate on the usefulness of gold as an asset compared to productive investments.

However, for Indian investors, **Gold ETFs** offer a practical and liquid method to invest in gold without the challenges of holding physical gold, making it a middle ground between traditional and modern investment approaches.

a) Introduction to the Growth of Gold ETFs in India
According to **SEBI (2020)**, Gold ETFs have emerged as a significant alternative to physical gold, offering liquidity, transparency, and lower transaction costs for retail investors. The Indian economy has undergone significant changes over the past few decades, with one of the most notable shifts being the rise of the middle class.

b) The Rise of the Middle Class and Investment Trends
According to a report by the **National Council of Applied Economic Research (NCAER, 2019)**, the expanding middle class in India has shown a growing interest in formal financial products as a means of wealth creation, and Gold ETFs have emerged as a crucial investment vehicle in this shift. The **Securities and Exchange Board of India (SEBI, 2020)** highlighted the rise of Gold ETFs as part of the increasing sophistication of Indian investors, particularly those in the middle-income bracket. Additionally, the **World Gold Council (2019)** has observed that the appeal of gold, combined with the ease of trading through ETFs, has made it an attractive option for modern investors in India. As the Indian middle class grows in terms of income and economic participation, it has increasingly turned to financial markets for investment.

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a) Shifting Investment Preferences Among the Middle Class

The middle class, traditionally risk-averse and accustomed to physical assets like real estate and gold, has started to diversify its investment portfolio. The need for diverse and efficient investment options has led to a surge in the popularity of Gold Exchange-Traded Funds (ETFs). These financial instruments, which combine the traditional appeal of gold with the convenience of modern financial markets, have gained traction in India.

b) Gold as a Traditional Investment and the Rise of ETFs

Gold, for centuries, has been regarded as a store of wealth and a hedge against inflation in India. Traditionally, Indian investors have favored physical gold in the form of jewelry and coins. However, the advent of Gold ETFs has transformed this traditional investment into a more liquid, easily tradable financial product. Gold ETFs allow investors to gain exposure to gold without the need for physical storage, while also offering the flexibility of buying and selling through the stock market, World Gold Council (2019). This has made it easier for India's emerging middle class to invest in gold in a more modern and accessible form. As per the Reserve Bank of India (2020), the shift towards financial products such as Gold ETFs is reflective of the growing sophistication in the investment strategies of Indian households, particularly within the middle-income segment.

The rise of Gold ETFs is a reflection of the broader financialization trends occurring in India. The growing middle class, buoyed by increasing disposable incomes, is becoming more financially literate and seeking to invest in a variety of financial instruments. In addition to physical gold, products like mutual funds, stocks, and ETFs are increasingly seen as viable options for portfolio diversification. The introduction of Gold ETFs has played a key role in the diversification process, with investors now able to hold gold in a dematerialized, cost-effective form, National Council of Applied Economic Research (2019).

According to a report by Gupta and Kumari (2020), the availability of Gold ETFs has increased the accessibility of gold as an investment for retail investors, particularly those who were previously limited by the high transaction costs associated with buying physical gold (Gupta & Kumari, 2020).

a. Factors responsible for the rise of Gold ETFs in India

Factor	Description	Data/Stats
1. Economic Growth and the Rise of the Middle Class	India's expanding economy has significantly increased the size of the middle class, leading to higher disposable income and increased participation in financial markets.	India's middle class was estimated to include around 600 million people in 2020. (NCAER, 2019)
2. Diversification of Investment Portfolios	The Indian middle class, traditionally risk-averse, is now diversifying into financial products like Gold ETFs to achieve greater flexibility and cost-effective gold investments.	Gold ETFs offer a cost-effective alternative for investing in gold with liquidity and transparency. (SEBI, 2020)
3. Cultural Significance of Gold in India	Gold has been a significant cultural and economic asset in India, and Gold ETFs enable easier access to gold investments without the complexities of physical gold.	India remains the largest consumer of gold globally. (World Gold Council, 2019)
4. Technological Advancements And Financial Inclusion	Digital platforms and mobile apps have made Gold ETFs accessible to retail investors, including those from small towns and rural areas, facilitating broader financial inclusion.	The rise of online platforms such as Zerodha and Upstox has increased access to Gold ETFs for investors in smaller towns and rural areas.(Gupta & Kumari, 2020)
5. Increased Financial Literacy and Investment Awareness	Increased financial literacy and awareness of various investment options, including Gold ETFs, are Encouraging India's middle class to diversify from traditional savings methods.	Financial literacy initiatives and awareness campaigns have led to more Indians exploring diverse investment products like ETFs. (Ministry of Finance, 2021)
6. Performance and Growth of Gold ETFs in India	The performance of Gold ETFs in India has been strong, with a significant increasein their assets under management (AUM) as more retail investors embrace this product.	AUM in Gold ETFs reached INR 20,000 crore in 2020, with Gold ETFs accounting for over 15% of total gold-related investments. (SEBI, 2020)

a) Relevance of the study:

This paper examines how Gold ETFs influence India's emerging middle-class investment culture. The study will explore the historical context of gold investment in India, analyze the rise of Gold ETFs as a modern financial product, and assess their impact on the economic behavior of middle-class investors. Additionally, the research will investigate the challenges and opportunities presented by Gold ETFs for both investors and the

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broader Indian economy. Given the rapid growth of the middle class and the expanding investment opportunities in India, understanding the role of Gold ETFs in shaping investment behavior is crucial for policy formulation and financial literacy.

REVIEW OF LITERATURE

1. **World Gold Council. (2019).** *Gold as an investment in India: A comprehensive review*. This report discusses how Gold ETFs have made gold more accessible to Indian investors by combining the traditional value of gold with the modern advantages of ETFs. It highlights the growing trend of gold as an investment product in India, especially within the emerging middle class.
2. **National Council of Applied Economic Research (NCAER). (2019).** *Emerging middle class in India: Trends, challenges, and opportunities*. -This study focuses on the expanding middle class in India, which now constitutes a significant portion of the population. It emphasizes the increasing participation of this group in financial markets and how they are adopting investment vehicles like Gold ETFs.
3. **Securities and Exchange Board of India (SEBI). (2020).** *Report on the performance of the gold exchange-traded funds in India*- This report by SEBI evaluates the performance and growth of Gold ETFs in India. It highlights the increasing popularity of these funds among retail investors, particularly as an alternative to physical gold investment.
4. **Gupta, R., & Kumari, A. (2020).** *The rise of Gold ETFs in India and their impact on the middle class*. *Journal of Financial Studies*, 15(3), 29-47- Gupta and Kumari explore the growing adoption of Gold ETFs among India's middle class, emphasizing their role in portfolio diversification and the shift from traditional gold investment to more modern, liquid forms.
5. **Reserve Bank of India (RBI). (2020).** *Annual Report 2019-20*-The RBI's report covers India's economic trends, including the rise of Gold ETFs as a response to inflation and economic uncertainty. It shows that Gold ETFs are increasingly seen as a reliable hedge for middle-class investors.
6. **Ministry of Finance, Government of India. (2021).** *Report on financial literacy and inclusion in India*- This government report discusses the growth in financial literacy across India and how it is leading to greater participation in investment markets. It emphasizes how Gold ETFs are becoming more accessible due to increasing awareness and digital platforms.
7. **Mishra, S. (2021).** *Understanding investment behavior of India's middle class: A focus on Gold ETFs*. *Indian Journal of Financial Research*, 14(2), 22-35-Mishra's study investigates the evolving investment behavior of India's middle class, focusing on the adoption of Gold ETFs. The research highlights how these financial products are gaining popularity as a safe and profitable investment option.

RESEARCH METHODOLOGY

a) Research Type: Descriptive and Analytical Research. The study aims to describe and analyze the role of Gold ETFs in India's emerging middle class investment culture.

b) Research Design: Cross-sectional design to collect data at a specific point in time and analyze the current trends in Gold ETF investments among the middle class in India.

c) Sampling Technique:
Stratified Random Sampling. A sample of middle-class investors will be selected from urban and semi-urban areas to represent diverse perspectives on Gold ETFs.

d) Data Collection Method:
Primary data through structured surveys and interviews with retail investors. Secondary data from government reports, financial institutions, and market reports.

e) **Sample Size:** 54 respondents, with a focus on retail investors from different income segments within the middle class.

f) Data Analysis Technique:
Quantitative analysis using descriptive statistics (mean, median, percentage) and qualitative analysis through thematic coding of interview responses.

g) Tools & Techniques:
SPSS software for statistical analysis, thematic analysis for qualitative data.

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OBJECTIVES AND HYPOTHESES OF THE STUDY

The following hypotheses are framed based on the objectives of the study:

Objectives of the Study	Hypotheses of the Study
1. To examine the factors driving the adoption of Gold ETFs among India's emerging middle class.	• **Alternative Hypothesis (H1):** There is a significant positive relationship between rising financial literacy and the adoption of Gold ETFs among India's middle class. • **Null Hypothesis (H0):** There is no significant relationship between rising financial literacy and the adoption of Gold ETFs among India's middle class.
2. To identify the barriers faced by middle-class investors in accessing Gold ETFs.	• **Alternative Hypothesis (H3):** Barriers such as lack of awareness, high transaction costs, and technology limitations significantly affect the adoption of Gold ETFs among India's middle class. • **Null Hypothesis (H0):** Barriers such as lack of awareness, high transaction costs, and technology limitations do not significantly affect the adoption of Gold ETFs among India's middle class.
3. To understand the cultural significance of gold and how it influences the investment choices of middle-class investors.	• **Alternative Hypothesis (H5):** The cultural value of gold in India significantly influences the investment preferences of India's middle class, particularly in relation to Gold ETFs. • **Null Hypothesis (H0):** The cultural value of gold in India does not significantly influence the investment preferences of India's middle class, particularly in relation to Gold ETFs.

RESEARCH GAP

- **Cultural Factors and Investment Decisions:** There is a gap in research exploring how the cultural significance of gold in India directly impacts investment decisions, particularly with Gold ETFs.
- **Performance Analysis of Gold ETFs in India's Retail Market:** Though Gold ETFs are growing, studies evaluating their long-term performance relative to other investment options are limited.
- **Technological Barriers in Rural Areas:** Although digital platforms have increased access to Gold ETFs, the barriers faced by rural and semi-urban investors in using these platforms have not been fully explored.

DATA ANALYSIS AND INTERPRETATION

a) Descriptive Statistics: Factor Driving Adoption

N	Valid	54
	Missing	0
Mean		3.8
Median		4
Mode		4
Standard Deviation		1.05
Frequency (Agree/Strongly Agree)		75%

The **mean** score of 3.80 indicates a relatively high agreement with factors driving the adoption of Gold ETFs.

b) Correlation Analysis: Financial Literacy and Adoption of Gold ETFs

Variable 1	Variable 2	Pearson Correlation Coefficient	p-value
Financial Literacy	Adoption of Gold ETFs	0.65	0.01

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The **Pearson correlation** of 0.65 shows a moderate positive relationship between **financial literacy** and the **adoption of Gold ETFs**. This indicates that as financial literacy increases, the likelihood of adopting Gold ETFs among India's middle class also rises. **Thus, the null hypothesis is rejected** indicating that there is no significant relationship between financial literacy and Gold ETF adoption.

c) Regression Analysis: Barriers to Access and Adoption of Gold ETFs

Variable	Coefficient	p-value
Lack of Awareness	0.45	0.02
High Transaction Costs	0.3	0.1
Technology Limitation	0.25	0.05

Lack of awareness significantly influences the adoption of Gold ETFs (p-value = 0.02), while **high transaction costs** and **technology limitations** have less significant effects. **Thus, the null hypothesis is rejected** indicating that these barriers have no significant effect on the adoption of Gold ETFs.

d) Chi-Square Test: Cultural Value of Gold and Investment Behavior

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15	1	0.03
N of Valid Cases	54		

- The cultural value of gold strongly influences **investment behavior** (p-value = 0.03), showing significant statistical dependence. **Thus, the null hypothesis is rejected** indicating that the cultural value of gold has no significant impact on investment preferences.

e) ANOVA: Differences in Income Groups and Adoption of Gold ETFs

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.35	2	5.175	3.45	0.04
Within Groups	42.1	47	0.894		
Total	52.45	49			

There are significant differences between income groups in their **adoption of Gold ETFs**, with higher income groups showing higher adoption. **Thus, the reject the null hypothesis** that there are no significant differences in Gold ETF adoption across income groups.

CONCLUSION

The study on the role of Gold ETFs in India's emerging middle-class investment culture reveals a number of significant insights that reflect the evolving nature of investment behavior among Indian investors, particularly those in the middle-income group.

a) **Adoption Drivers**: The analysis clearly shows that financial literacy plays a crucial role in the adoption of Gold ETFs. As India's middle class becomes more financially educated, there is a marked increase in the interest in modern financial products like Gold ETFs. With a Pearson correlation of 0.65, it is evident that as financial literacy improves, middle-class investors are more likely to adopt Gold ETFs as part of their investment portfolio. This suggests that education and awareness are key to driving the growth of this investment vehicle.

b) **Barriers to Adoption:** Despite the increasing popularity of Gold ETFs, several barriers still hinder wider adoption, especially among segments of the middle class. The study found that a lack of awareness, high transaction costs, and technology limitations are significant factors affecting the accessibility of Gold ETFs. The regression analysis pointed to a p-value of 0.02 for lack of awareness, suggesting that improving awareness through targeted campaigns can play a major role in overcoming this barrier.

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c) **Cultural Influence on Investment Behavior:** The cultural significance of gold in India remains a powerful factor influencing investment decisions. The Chi-Square test confirmed that there is a strong relationship between the cultural value of gold and investment behavior (p-value = 0.03). Gold has long been regarded as a symbol of wealth and security in India, and even as modern financial products like Gold ETFs gain traction, the deep-rooted cultural preference for gold continues to shape investment choices. This cultural influence is likely to persist in the future, even as the middle class increasingly turns to more liquid, accessible investment options.

d) **Income and Investment Behavior:** The ANOVA results demonstrate that there are significant differences in the adoption of Gold ETFs across income groups, with higher- income groups showing a greater tendency to invest in Gold ETFs. This finding highlights the role of income levels in shaping investment behavior, as higher-income groups often have more disposable income and are more likely to engage in sophisticated financial investments. The increased adoption of Gold ETFs among these groups further underscores the financial diversification trend within India's middle class.

e) **Technological and Accessibility Factors:** While technological advancements and the rise of digital platforms have made Gold ETFs more accessible to retail investors, particularly in urban and semi-urban areas, there remains a gap in rural areas. The study indicates that technological barriers still exist, which prevent certain segments of the middle class, especially in rural areas, from fully participating in the Gold ETF market. Efforts to increase digital literacy and improve the accessibility of trading platforms can help bridge this gap and encourage wider adoption.

In conclusion, the rise of Gold ETFs reflects broader trends in India's financial markets and the changing investment behavior of its emerging middle class. These findings are crucial for policymakers, financial institutions, and other stakeholders to understand how to better cater to this growing demographic and ensure that Gold ETFs and other modern investment products reach their full potential in India's diverse economic landscape.

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THE EFFECTS OF ACCOUNTING SOFTWARE ON SMALL BUSINESS ENTERPRISES

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ABSTRACT
Today's world is a world of Business and Accounting is a language of any Business. Accounting is a process of recording, analyzing, interpreting and reporting of all financial information systematically and accurately. Accounting helps to know the profit or loss, income and expenses, assets and liabilities of the business. Traditionally accounting used to be done manually, but due to drawbacks of manual accounting and with the help of technology many accounting software like Tally, Vyapar, Quick Books, Zoho Books, etc., were established, which made the process of accounting so simple, accurate and quick. Accounting software is a computer program which helps accountants in recording, analyzing and generating reports of financial transactions of the business. It also helps is preparing different types of reports which are useful for management to take decisions for future. The study is done to analyze the effects of these accounting software on small business enterprises. Effects can be positive and negative as well, but this research is mainly focused on positive effects. As accounting software are used by major part of business sector so it must be having many positive effects, which will be covered in this study. Negative effects of accounting software can be worked out with some additional features which can be added over a period of time.

Keywords: *Manual Accounting, Accounting Software, Positive effects, Small Business Enterprises.*

INTRODUCTION
Today's world is a world of Business and Accounting is a language of any Business. Accounting is a process of recording, analyzing, interpreting and reporting of all financial information systematically and accurately. Accounting is one of the most important functions of any business. Accounting helps to calculate the profit or loss, income and expenses of the business and also to calculate the amount of tax to be paid to government. Accounting also helps in knowing the actual financial position of the business which includes Assets and Liabilities and for submission of financial statements and other reports to the Government, Share holders, Investors, Creditors, Public, etc.

Initially Accounting function was performed manually by Accountants. First the business transaction is recorded in Journal, then the balances are transferred to Ledgers, closing balances of Ledger are transferred to Trial Balance and then Final Accounts are prepared, in order to calculate profit or loss, income and expenses,

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assets and liabilities. Earlier the whole process was done manually by Accountant. Manual accounting was a tedious task as it was difficult to find out a particular voucher from bundle of vouchers and other records. A lot of place and care was required to preserve all past records of the business, so as to keep proof for future. Manual Accounting was a time consuming system of accounting. So there were many issues and problems in manual accounting.

With Technology, it was made possible to do accounting with the help of accounting software like Tally, Vyapar, Quick Books, Zoho Books, etc. Initially accounting software was not welcomed because of a doubt regarding manipulation of accounts and not knowing about the operation of the system. But after a period of time, when reliability and simplicity of accounting software were realized by the people, then they started using accounting software.

Accounting Software: Accounting software is a computer program which helps accountants in recording, analyzing and generating reports of financial transactions of the business. Accounting software makes accounting work easy and quick, and no extra space is required as all details are stored in computer. With the help of accounting software, retrieving of old accounting data is possible. So businesspeople can divert their time on important decisions of business rather than preparing accounts, as accounting software do various accounting and bookkeeping tasks just by passing a journal entry and offers useful tools like invoicing, bill payment, payroll and financial reporting, etc.

Accounting software can create a variety of Reports and Financial Statements, which includes Income Statement, Balance Sheet and Cash Flow Statement which are used by Management, Investors, Market Analyst, Government and Suppliers to evaluate Financial position of a business and its earning potential and to decide whether to invest in that company or not. There are various Accounting Software available in the Market. An Organization can choose the Accounting Software as per their requirements and needs of their Business.

HYPOTHESIS

H0: There is no effect of accounting software on Small Business Enterprises.

H1: There is positive effect of accounting software on Small Business Enterprises.

SCOPE OF RESEARCH

As Computerized Accounting has taken over Manual Accounting in Business Sector, so the aim of this research is to check the effects of using accounting software in business by small enterprises, whether there are positive, negative or no effect of using accounting software in the business. The study is restricted to the Small Business Enterprises of Thane District. Large Business Enterprises are not covered in this study.

RESEARCH METHODOLOGY

1. Primary Data:

Primary data is collected from the 100 small business enterprises selected on random basis, located in a particular markets of Thane District. It is collected by way of structured questionnaire and personal interviews.

2. Secondary Data:

Secondary data is collected from the books, magazines, journals, news papers and websites.

LIMITATIONS

Following are some limitations of the research:

1. Large Scale Business Organizations are not covered in the research.
2. The study is restricted to the market of Thane District only.
3. Negative effects of accounting software are not covered.

THE EFFECTS OF ACCOUNTING SOFTWARE ON SMALL BUSINESS ENTERPRISES:

With the help of survey, following positive effects of accounting software on business are recognized:

❖ Improved Accuracy:

Accounting software helps in reducing human errors, which were most common in manual accounting. With the help of accounting software, all financial reports like Income Statement, Balance Sheet, Cash Flow Statement are auto generated.

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❖ **Speed up work:**
As in accounting software, major work related to recording, analysing and reporting is done automatically, it saves time of a businessperson, and he can take decisions for future at any time by just by looking at the reports created by accounting software.

❖ **Reduces Cost or Expenses of Business:**
As one trained staff is sufficient to do all the accounting work, hence it reduces the cost of business, as there will be no need to appoint more staff for accounting. And since the accounting work is done so fast and on time, then there will be no delay in paying taxes, so it avoids penalties for late payment.

❖ **Efficient Cash Flow Management:**
Accounting software helps in keeping track on amount payable or receivable. It also can set reminders for bills payment and due invoices.

❖ **Better Decision making:**
With the help of accounting software, variety of reports are generated with a single click, so the management can easily take decisions for future, by looking at the current financial position of the entity. Income statement and Balance sheet give true and fair view of the financial position.

❖ **Up to date Reports:**
As in computerized accounting, reports can be generated at any time like weekly, monthly or early, hence like manual accounting we need not to wait to academic year to get over for preparing reports. Since accounting software can generate all reports at any time, so it will be easy for management to analyse the financial position and to make decisions accordingly.

❖ **Tax Compliance:**
Because of accounting software, accounts are up to date and reports are easily created, financial statements are created by just one click, so it will be easy and quick at the year end to get the records audited and pay the tax amount.

❖ **Enhance Professionalism:**
As in manual accounting, books are kept manually, which does not look professional in this modern world, but with accounting software all records are kept in computer or laptop, which creates good impression on the investors and on public as well when these reports are published.

❖ **Better Communication:**
Reports created in accounting software helps in communicating in better way with the investors or lenders, as with computerized reports one can convey their financial position with proper records and with the help of charts and diagrams study can be made easy to understand.

❖ **Accessibility:**
Under manual accounting, one has to carry books of accounts or reports with themselves but in case of accounting software, person can access the records from anywhere, he does not require to carry physical records with himself all the time.

FINDINGS

By conducting this research, we came to know that there are various positive effects of using accounting software in business as mentioned above, but along with positive, there are some negative effects as well like, cost of software, complex in learning, cyber security risk, technical issues, etc. But this study covers only positive effects of accounting software. Because after survey it was found that in compared to negative there are more positive effects of accounting software on small business enterprises. And negative effects can be worked out over a period of time and technology.

CONCLUSION

Above study was done to know the positive effects of accounting software on small business enterprises, as in traditional period accounting process was done manually, which was a tedious task for accountant and there were many disadvantages of manual accounting, so over a period of time and with help of technology, computerized accounting was introduced which was welcomed by business, so this research was focused on only positive effects of these accounting software. Accounting software plays a very important role in today's modern business world which is very clear after this research, as we can see there are many advantages to the business with this accounting software.

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THE FUTURE OF WORK – ADAPTING TO THE CHANGING LANDSCAPE IN EDUCATIONAL INSTITUTES WITH SPECIAL REFERENCE TO KDMC AREA

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ABSTRACT

The future of work is swiftly transforming due to technological disruption, globalisation, shifting worker dynamics, and the growing incorporation of artificial intelligence, automation, and digital platforms. These changes are not only reshaping industries but also necessitating that educational institutions reevaluate their teaching approaches, curriculum development, and responsibilities in equipping students for an unpredictable future. This research investigates how educational institutions are adjusting to the evolving work environment, emphasising institutional methods, pedagogical approaches, skill development frameworks, and stakeholder involvement.

This study, based on a comprehensive literature analysis in education, labour market research, and digital innovation, identifies significant trends influencing the future of work, including hybrid work environments, the gig economy, the demand for soft skills, and the emergence of transdisciplinary knowledge. Primary data was gathered via structured interviews, surveys of professors and students, and the examination of institutional practices at selected higher education institutions.

Research indicates that although numerous institutions are integrating digital tools, blended learning, and industry collaboration into their frameworks, substantial deficiencies persist in fostering learners' critical thinking, adaptability, and ethical decision-making abilities. Moreover, a disparity frequently exists between conventional academic courses and the evolving demands of the future labour market.

The study emphasises the necessity for educational institutions to implement agile frameworks that promote creativity, lifelong learning, and emotional resilience. Focus is directed towards the amalgamation of experiential learning, practical problem-solving, and collaboration with industry stakeholders.

This research suggests that educational institutions must function not only as knowledge providers but also as catalysts for future-ready human capital. Strategic reforms in curriculum, assessment, and institutional culture are essential to meet the requirements of the changing work world and to ensure that graduates succeed in a future characterised by change, complexity, and opportunity.

Keywords: *Future of Work, Educational Institutions, Skill Development, Digital Transformation, Hybrid Work Environment, Experiential Learning, Industry Collaboration, Lifelong Learning*

1. INTRODUCTION

The future of employment is rapidly changing due to technological, economic, and societal influences. The global labor market is experiencing an unprecedented transition due to the influence of AI, automation, machine learning, and digital platforms on company models and workplace operations. This shift necessitates a comprehensive reform in societal approaches to workforce preparation, with educational institutions playing a crucial role.

The Kalyan-Dombivli Municipal Corporation (KDMC) region, located in the Mumbai Metropolitan Area, is witnessing an increasing demand for workforce-ready workers with technical skills, innovative problem-solving abilities, ethical reasoning, and adaptability in dynamic workplace situations. This study examines the responses of educational institutions in the KDMC region to the requirements of the future labor market, specifically examining institutional tactics, educational transformations, curriculum creation, stakeholder involvement, and the incorporation of digital tools and industry collaborations.

The research reveals multiple macro trends influencing the future of work, including the emergence of hybrid work patterns, the proliferation of freelance and gig jobs, the emphasis on soft skills like emotional intelligence and leadership, and a shift towards transdisciplinary education integrating technology, humanities, business, and social sciences. The study situates these global advancements within the specific context of KDMC, providing localized insights and answers.

Data collection includes structured interviews with academics, administrators, and students, as well as surveys and case studies of specific institutions. The study assesses the existence and efficacy of digital resources, such as Learning Management Systems (LMS), virtual classrooms, and online examinations.

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Initial findings suggest that although some schools have implemented blended learning and established collaborations with industry to offer internship opportunities and project-based learning, substantial gaps persist, including antiquated curricula, inadequate focus on soft skills, insufficient exposure to real-world problem-solving, and limited incorporation of ethical education. The swift advancement of technology often surpasses the ability of institutions to adjust.

The study emphasizes the necessity for deliberate reforms across many levels, such as curriculum design transitioning from rote memorization to competency-based education, cultivating environments that promote multidisciplinary research and initiatives replicating real-world concerns, and equipping educators to impart knowledge through contemporary pedagogical methods and technologies. Stakeholder engagement is essential in the context of KDMC, and apprenticeship frameworks, industry-academia advisory councils, and community engagement projects can connect theoretical knowledge with practical application.

2. OBJECTIVES OF THE STUDY

1. To evaluate the readiness of educational institutions integrating digital tools and pedagogical innovations to meet future workforce demands.
2. To assess the alignment of academic curricula with the skills required for future employability.
3. To examine the role of industry engagement and interdisciplinary learning in improving students' job market readiness.

3. REVIEW OF LITERATURE

a) **Mittal, P. (2020),** in the research focuses on the rapid advancements in Information Technology which are transforming the social and cultural landscape, necessitating higher education to adapt and equip students for future challenges. Post COVID-19, students gain access to online resources, diminishing the need for educators to transmit information. Indian Higher Education Institutions must focus on governance reforms, access and equity, global teaching-learning processes, innovation, employability, entrepreneurship, and internationalization. They must produce skilled graduates with ethical values, contribute to the nation's social, cultural, and economic advancement, and safeguard India's rich heritage for future generations.

b) **HBR (2019),** The Gig Economy, comprising consultants, contractors, freelancers, and on-demand laborers, now constitutes 30-40% of the U.S. workforce. Despite this, universities are not incorporating it into their curricula, resulting in students lacking skills in self-employment, entrepreneurship, and small business management, which are crucial for their careers.

c) **Azhenov et al. (2023),** in the study emphasizes the future workforce must adapt to the evolving employment landscape by 2030, and higher education institutions (HEIs) must provide essential competencies. The COVID-19 pandemic has accelerated this process, requiring HEIs to undergo significant transformation. A study gathered data from 11 nations to assess students' confidence in the future workforce and the influence of HEIs on their confidence levels. The findings are crucial for policymakers, curriculum creators, educators, and researchers to develop instructional methodologies and content for the future workforce.

d) **Lynch, M. (2024),** In 2024, universities are transforming their approach to career preparedness, collaborating with industry, offering internships and co-ops, and incorporating micro-credentials and stackable degrees. Soft skills are being emphasized, with programs integrating leadership, communication, and adaptability. Future of work centers provide career counseling and job market analysis. Lifelong learning efforts are increasing, with universities offering alumni free or reduced access to courses. The importance of higher education in preparing students for an uncertain future remains crucial.

e) **Benešová, N., & Tupa, J. (2017),** researched that Industry 4.0 involves new methods, techniques, and technologies for enterprises, but financial constraints and personnel shortages hinder immediate implementation. This article focuses on identifying employment roles within corporations.

f) **Solomon Arulraj David (2022),** in this study explores ten key challenges and concepts for education in the post-pandemic era using informed reflection methodology. It uses phenomenological bracketing to examine realities, highlighting the subjective nature of accounting and its limitations. While additional concerns may exist, the insights may enhance current discussions.

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4. RESEARCH METHODOLOGY

Research Design

The study employs a **mixed-methods approach** combining qualitative and quantitative techniques. The primary data was collected via structured questionnaires and interviews, supplemented by secondary data from academic journals, policy documents, and institutional reports.

SAMPLE

A total of **82 respondents,** including faculty members, students, and administrators across educational institutions in the Kalyan region, participated in the study.

TOOLS FOR ANALYSIS

Statistical tools such as **Pearson correlation, Chi-Square, and PLUM - Ordinal Regression** were employed to interpret the data.

HYPOTHESES OF THE STUDY

H_0: There is no significant relationship between the use of digital tools and the perceived preparedness of institutions to meet the future workforce needs.

H_1: There is a significant relationship between the use of digital tools and the perceived preparedness of institutions to meet the future workforce needs.

H_0: Curricula that incorporate project-based learning and internships are not significantly more likely to develop future-ready skills among students.

H_2: Curricula that incorporate project-based learning and internships are significantly more likely to develop future-ready skills among students.

H_0: Institutions that promote industry collaboration and interdisciplinary approaches are not effective in preparing students for future employment.

H_3: Institutions that promote industry collaboration and interdisciplinary approaches are more effective in preparing students for future employment.

5. DATA ANALYSIS AND INTERPRETATION

Hypothesis Testing 1:

H_0: There is no significant relationship between the use of digital tools and the perceived preparedness of institutions to meet the future workforce needs.

H_1: There is a significant relationship between the use of digital tools and the perceived preparedness of institutions to meet the future workforce needs

Spearman's Rank Correlation: Between digital tool usage and institutional preparedness

Table 1: Correlations

			Institutional Preparedness	Digital Usage
Spearman's rho	Institutional Preparedness	Correlation Coefficient	1.000	-0.059
		Sig. (2-tailed)		0.599
		N	82	82
	Digital Usage	Correlation Coefficient	-0.059	1.000
		Sig. (2-tailed)	0.599	
		N	82	82

Source: Primary Data

Interpretation:

The aim was to evaluate the correlation between Institutional Preparedness and the Utilisation of Digital Tools in educational establishments, specifically regarding readiness for future workforce requirements. The Spearman's Rank Correlation yielded a correlation coefficient of -0.059 between Institutional Preparedness and Digital Usage, with a p-value of 0.599 (two-tailed), derived from a sample of 82 respondents. The correlation coefficient (-0.059) is nearly zero, signifying a negligible negative link between the two variables.

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The p-value (0.599) considerably exceeds the standard significance threshold of 0.05, indicating that the result lacks statistical significance.

Mann-Whitney U Test: To compare preparedness across LMS implementation and faculty receptiveness levels

Table 2: Kruskal-Wallis Test			
Ranks			
preparedness		N	Mean Rank
LMS Implementation	1	5	7.80
	2	19	13.74
	Total	24	
Faculty Receptiveness level	1	5	10.60
	2	19	13.00
	Total	24	
Test Statistics[a,b]			
	LMS Implementation	Faculty Receptiveness level	
Kruskal-Wallis H	3.312	0.527	
df	1	1	
Asymp. Sig.	0.069	0.468	
a. Kruskal-Wallis Test			
b. Grouping Variable: preparedness			

Source: Primary Data

Interpretation:
A Mann-Whitney U Test was conducted to compare preparedness and LMS implementation scores across two groups categorized by Faculty Receptiveness Level. For preparedness, the mean ranks were Group 1: 12.31, Group 2: 12.59. For LMS implementation, the mean ranks were Group 1: 10.38, Group 2: 13.56. The Mann-Whitney U values were Preparedness: U = 62.5 LMS Implementation: U = 47.0. The corresponding asymptotic significance (2-tailed p-values) were: Preparedness: p = 0.921, LMS Implementation: p = 0.257

The p-value (0.921) significantly exceeds 0.05, signifying no statistically significant difference in readiness levels between the two faculty receptiveness groups. The p-value for LMS implementation (0.257) exceeds 0.05, signifying no statistically significant difference in the effectiveness of LMS implementation between the two groups. Despite minor variations in mean ranks, these differences lack statistical significance, indicating that the level of faculty receptiveness does not significantly influence either readiness or LMS adoption in this group.

HYPOTHESIS TESTING 2

H_0: Curricula that incorporate project-based learning and internships are not significantly more likely to develop future-ready skills among students.

H_2: Curricula that incorporate project-based learning and internships are significantly more likely to develop future-ready skills among students.

Table 3: Chi-Square Test of Independence: Between Project-based learning and Current academic Experience, prepares you for the job market

Chi-Square Test	**Yes**	**No**	**May be**	**Total**
Project-based learning	42	21	19	82
Current academic experience prepares you for the job market	22	28	32	82
Total	64	49	51	164
Chi-Square	**df**	**P-Value**		
10.56	2	0.0051		

Source: Primary Data

Interpretation
The p-value (0.0051) is below 0.05, indicating statistical significance. This signifies a substantial correlation between students participating in project-based learning and their belief in the adequacy of their current academic experience in preparing them for the market. Students who participate in project-based learning are more likely to feel adequately prepared for employment than those who do not engage in such activities.

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Table 4: Chi-Square Test of Independence: Between Internship opportunities and Current academic experience prepares you for the job market

Chi-Square Test	Yes	No	May be	Total
Internship opportunities	40	35	7	82
Current academic experience prepares you for the job market	22	28	32	82
Total	62	63	39	164
Chi-Square	**df**	**P-Value**		
22.03	2	0.0001		

Source: Primary Data

Interpretation

The p-value (0.0001) is below 0.05, indicating statistical significance. This signifies a substantial correlation between students participating in project-based learning and doing internships and their view of the adequacy of their current academic experience in preparing them for the market. Students who participate in project-based learning and do internships are more likely to feel adequately prepared for employment than those who do not engage in such activities.

HYPOTHESIS TESTING 3

H_0: Institutions that promote industry collaboration and interdisciplinary approaches are not effective in preparing students for future employment.

H_3: Institutions that promote industry collaboration and interdisciplinary approaches are more effective in preparing students for future employment.

Table 5: Chi-Square Test of Independence: Between industry partnerships and job preparedness

Chi-Square Test	Yes	No	May be	Total
Regularly update its curriculum to align with industry needs	43	13	21	77
Current academic experience prepares you for the job market	22	28	32	82
Total	65	41	53	159
Chi-Square	**df**	**P-Value**		
14.41	2	0.0007		

Source: Primary Data

Interpretation

The p-value (0.0007) is below 0.05, indicating a statistically significant association. This is a robust correlation between colleges that frequently revise their curriculum via industry collaborations and students' evaluations of their readiness for the job market. Students enrolled in institutions that link their academic curricula with industry requirements are more likely to feel equipped for work chances post-graduation.

Table 6: Chi-Square Test of Independence: Between curriculum updates and preparedness

Chi-Square Test	Yes	No	May be	Total
Active partnerships with industry in curriculum development	32	25	25	82
Current academic experience prepares you for the job market	22	28	32	82
Total	54	53	57	164
Chi-Square	**df**	**P-Value**		
2.88	2	0.2369		

Source: Primary Data

Interpretation

As the p-value (0.2369) exceeds 0.05, the result lacks statistical significance. This indicates that there is no substantial correlation between active industry collaborations in curriculum creation and students' perceptions of their job readiness. In essence, the presence of corporate relationships in curriculum creation did not significantly influence students' perceptions of their employment preparedness.

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Table 7: PLUM - Ordinal Regression			
Case Processing Summary			
		N	Marginal Percentage
Curriculum align	1	21	25.6%
	2	13	15.9%
	3	48	58.5%
Industry Partnership	1	25	30.5%
	2	25	30.5%
	3	32	39.0%
Interdisciplinary Skill-based	1	2	2.4%
	3	14	17.1%
	4	27	32.9%
	5	39	47.6%
Valid		82	100.0%
Missing		0	
Total		82	

Source: Primary Data

Table 8: Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	102.260			
Final	75.121	27.138	6	0.000
Link function: Logit.				

Source: Primary Data

Table 9: Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	59.084	24	0.000
Deviance	59.562	24	0.000
Link function: Logit. ***Source:*** Primary Data			

Table 10: Pseudo R-Square	
Cox and Snell	0.282
Nagelkerke	0.331
McFadden	0.173
Link function: Logit. ***Source:*** Primary Data	

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Table 11: Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Curriculum align = 1.00]	-4.134	1.477	7.838	1	0.005	-7.029	-1.240
	[Curriculum align = 2.00]	-3.212	1.452	4.893	1	0.027	-6.059	-0.366
Location	Guest lecture mentorship	-0.106	0.453	0.054	1	0.816	-0.994	0.783
	[Industry Partnership=1.00]	-3.057	0.848	12.998	1	0.000	-4.719	-1.395
	[Industry Partnership=2.00]	-3.132	0.861	13.231	1	0.000	-4.820	-1.444
	[Industry Partnership=3.00]	0[a]			0			
	[Interdisciplinary Skill-based=1.00]	-3.357	1.560	4.627	1	0.031	-6.415	-0.298
	[Interdisciplinary Skill-based=3.00]	-0.645	0.686	0.883	1	0.347	-1.989	0.700
	[Interdisciplinary Skill-based=4.00]	-0.537	0.627	0.734	1	0.392	-1.767	0.692
	[Interdisciplinary Skill-based=5.00]	0[a]			0			

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Source: Primary Data

Interpretation

Industry Partnership (levels 1 and 2) both have strong negative and significant effects ($p < 0.001$), meaning lower levels of industry partnership are associated with lower perceived curriculum alignment. Interdisciplinary Skill-based Learning (level 1) also significantly influences perceptions negatively ($p = 0.031$). The study examines the impact of Industry Partnerships, Curriculum Alignment, and Interdisciplinary Skill-based Learning on students' perceptions of curriculum alignment with job market needs. The results show a statistically significant model with predictors, explaining 28-33% of curriculum alignment variation. Lower levels of industry partnership and negative effects of interdisciplinary skill-based learning are significant predictors, while other variables like guest lectures and higher levels of skill-based learning did not significantly impact perceptions. The model fits moderately, explaining 28-33% of curriculum alignment variation.

9. CONCLUSION

As the future of work continues to evolve, educational institutions must become agile, inclusive, and future-focused. The research underscores the need for a radical rethinking of educational paradigms. Institutions must go beyond knowledge dissemination to nurturing skills, values, and mindsets aligned with the demands of a complex and interconnected world. Embracing change today is the only way to ensure relevance and resilience in the world of tomorrow.

An important correlation exists between project-based learning and students' confidence in their preparedness for the labour market. This indicates that incorporating project-based methodologies into academic curricula significantly improves students' perceived employability. Thus, academic experiences significantly impact students' preparedness for the professional realm, with active, experiential learning approaches such as project-based learning being essential.

Collaborative relationships with industry in curriculum creation do not exert a statistically significant influence on students' perceptions of their preparedness for the job market. Although these partnerships may enhance curriculum content, they do not inherently foster a heightened sense of career readiness among students. Additional elements—such as direct internships, project-based learning, and individual skill development initiatives—may exert a more significant influence.

Industry partnerships and multidisciplinary, skill-based education are crucial indicators of students' perceptions regarding the connection of their curriculum with the job market. Programs devoid of robust industry connections and interdisciplinary methodologies are less likely to be regarded as adequately equipping students for future employment. Consequently, direct interaction with industry and the development of cross-disciplinary, skill-oriented curricula are essential measures for enhancing students' views of vocational preparedness.

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10. SUGGESTIONS

There is no substantial correlation between the frequency of digital tool utilization and the respondents' view of an institution's readiness for future labour requirements. Consequently, institutions that often utilize digital tools are not inherently regarded as more equipped for future requirements, and the opposite holds true as well.

Faculty members, irrespective of their receptiveness or opposition to novel methodologies, exhibited similar degrees of preparedness and utilisation of the LMS. Consequently, faculty receptiveness does not seem to be a critical factor influencing preparation or LMS deployment among the respondents.

Strengthen industry partnerships, establish advisory boards, integrate real-world projects, promote skill-based certifications, and continuously assess curriculum to ensure dynamic, market-responsive curricula.

Institutions should strengthen practical application of partnerships, enhance student awareness, focus on experiential learning, monitor curriculum impact, and complement industry partnerships with hands-on training and employability workshops.

Institutions should enhance industry collaborations, incorporate interdisciplinary programs, and invest in comprehensive employability training to ensure real-world relevance and applicability in curriculum design, internships, and practical projects.

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IMPACT OF ARTIFICIAL INTELLIGENCE (AI) IN WEB DEVELOPMENT

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ABSTRACT
As the digital landscape continues to evolve, the integration of Artificial Intelligence (AI) into various domains has become increasingly prominent. This research paper explores the profound impact of AI in the realm of web development. The study delves into the historical evolution of AI, outlining key technologies and concepts that have paved the way for its applications in the field. By examining real-world case studies, the paper demonstrates how AI is reshaping the landscape of web development, enhancing user experiences, and providing innovative solutions. The research addresses the diverse applications of AI in web development, including the deployment of chatbots, virtual assistants, and personalized user experiences. Through a comparative analysis, the paper explores the future trends and emerging technologies that are poised to redefine the intersection of AI and web development. It considers the impact on developers and the broader industry, offering insights into the evolving role of professionals in this dynamic landscape. The study aims to provide a comprehensive overview of the transformative influence of AI on web development, offering practical implications for developers and stakeholders in the industry. This research contributes to the ongoing discourse surrounding the integration of AI in web development, emphasizing its potential to revolutionize digital experiences and shape the trajectory of the industry. As AI technologies continue to advance, this study serves as a foundation for understanding the current landscape and envisioning the future possibilities in the dynamic field of web development. This paper topic objective is to Understand how AI is currently being integrated into web development and Identifying the benefits and challenges associated with AI in web development. Or Exploring future trends and potential advancements in AI for web development.

Keywords— *Artificial Intelligence (AI), Web Development, AI Technologies, Machine Learning in Web Development, Natural Language Processing (NLP).*

I. INTRODUCTION
In the dynamic landscape of web development, the fusion of Artificial Intelligence (AI) has emerged as a transformative force, reshaping digital interactions and user experiences. This intersection between AI and web development is not merely a convergence of technologies but a synergistic relationship that holds the promise of enhancing efficiency, personalization, and innovation in the creation of online platforms. As digital experiences become more integral to everyday life, the role of AI in web development is expanding, driving changes that are both profound and far-reaching.

The concept of AI, once relegated to the realm of science fiction, has now become a fundamental component of modern computing. AI technologies are being deployed across various sectors, from healthcare to finance, and their application in web development is gaining traction as developers seek to create smarter, more responsive websites. These technologies range from AI-powered code generators that automate tedious coding tasks to sophisticated algorithms that personalize user experiences based on individual behavior. The influence of AI on web development is not only transforming how websites are built but also how users interact with them.

Historically, web development has evolved through several stages, each marked by technological innovations that expanded the possibilities of what could be achieved online. The early days of the web were characterized by static pages and simple HTML coding, but as technologies such as CSS, JavaScript, and databases emerged, websites became more dynamic and interactive. The advent of content management systems (CMS) further democratized web development, allowing non-technical users to create and manage content. However, as the complexity of web applications increased, so did the demand for more advanced tools and techniques. This is where AI comes into play, offering solutions that can handle the growing demands of modern web development, from optimizing code and enhancing user interfaces to improving security and performance.

The integration of AI into web development is not just about automation; it represents a shift towards creating more intelligent and adaptive web applications. AI's ability to analyze vast amounts of data and learn from it enables developers to build websites that can anticipate user needs, adapt to different contexts, and provide a more personalized experience. For instance, AI-driven recommendation systems, which analyze user behavior to suggest relevant content or products, have become a staple of e-commerce platforms. These systems not only enhance the user experience but also drive business outcomes by increasing engagement and conversion rates.

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Similarly, AI-powered chatbots and virtual assistants are transforming customer support by providing immediate, personalized responses to user inquiries, thereby improving satisfaction and efficiency.

Despite the numerous advantages that AI brings to web development, its integration is not without challenges. One of the primary concerns is the ethical implications of using AI, particularly in terms of data privacy and security. As AI systems often rely on large datasets to function effectively, there is a growing need to ensure that these systems comply with data protection regulations such as the General Data Protection Regulation (GDPR). Furthermore, the use of AI in web development raises questions about transparency and accountability. How do we ensure that AI-driven decisions are fair and unbiased? What measures can be put in place to prevent the misuse of AI technologies? These are critical issues that developers must consider as they integrate AI into their workflows.

Another challenge lies in the accessibility of AI technologies. While large corporations with significant resources can afford to invest in AI, small and medium-sized enterprises (SMEs) may struggle to adopt these technologies due to cost and technical expertise barriers. This disparity could lead to a widening gap between organizations that can leverage AI to enhance their web presence and those that cannot, potentially creating a competitive disadvantage for smaller players in the market. Addressing this challenge will require not only technological innovation but also the development of frameworks and tools that are accessible to a broader range of users.

As we look to the future, the role of AI in web development is set to expand further. Emerging trends such as the use of AI in predictive analytics, natural language processing (NLP), and augmented reality (AR) are poised to redefine the boundaries of what is possible on the web. Predictive analytics, for example, can be used to anticipate user behavior and optimize websites for better performance and user engagement. NLP, on the other hand, is making it easier for developers to create more natural and intuitive user interfaces, allowing users to interact with websites through voice commands and conversational interfaces. AR, powered by AI, is opening up new possibilities for immersive and interactive web experiences, particularly in sectors such as retail, education, and entertainment.

In conclusion, the integration of AI into web development marks a significant shift in how digital platforms are designed, built, and experienced. This research endeavors to explore and analyze the multifaceted implications of integrating AI technologies into the fabric of web development, from its historical roots to its contemporary applications shaping the digital frontier. By critically examining the opportunities and challenges that AI presents, this study aims to provide a comprehensive understanding of how AI is influencing the methods, outcomes, and user interactions within web development.

Beyond the technological advancements lie ethical considerations and the quest for equilibrium between innovation and societal impact. This paper will also explore the ethical dimensions of AI in web development, acknowledging potential risks and prompting a reflection on responsible implementation. As developers navigate this evolving landscape, the integration of AI tools and frameworks becomes central to the discourse, offering a glimpse into the technologies that will shape the next generation of digital experiences.

Ultimately, this research sets out to illuminate the evolving narrative of AI in web development, providing a foundation for understanding the transformative influence of these technologies and paving the way for future exploration in this dynamic and evolving field. The trajectory of AI in web development is one of continued growth and innovation, with the potential to revolutionize how we interact with the digital world.

II. PROBLEM STATEMENT

The integration of Artificial Intelligence (AI) in web development has brought about significant changes in how websites are designed, developed, and maintained. While AI technologies offer numerous benefits such as enhanced efficiency, personalized user experiences, improved customer support, and strengthened security, their adoption also presents several challenges. These include concerns related to data privacy, algorithmic bias, implementation complexity, and technical limitations.

III. RESEARCH OBJECTIVES

1) Understanding how AI is currently being integrated into web development.
2) Identifying the benefits and challenges associated with AI in web development.
3) Evaluating the effectiveness of AI tools and techniques in improving web development processes.
4) Exploring future trends and potential advancements in AI for web development.

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IV. RESEARCH QUESTIONS

1) How is AI currently integrated into web development?"

2) What are the benefits and challenges of using AI in web development?"

3) How effective are AI tools in improving web development processes?

4) What are the future trends and advancements in AI for web development?

IV. LITERATURE REVIEW

AI technologies have become instrumental in transforming web development processes by automating tasks traditionally done manually. This automation not only streamlines workflows but also minimizes the potential for human error, leading to faster and more reliable development outcomes. Sharma and Jain (2020) discuss the role of AI-powered code generators, which can automatically produce code snippets based on high-level descriptions provided by developers. These tools, like GitHub's Copilot, leverage machine learning algorithms trained on vast datasets of existing code, enabling them to suggest or even complete code blocks with a high degree of accuracy. By offloading routine coding tasks to AI, developers can focus their efforts on more complex, creative, and high-level aspects of web development, such as system architecture and user experience design. This shift not only boosts productivity but also fosters innovation, as developers have more time and cognitive resources to explore new ideas.

Personalization has become a cornerstone of modern web experiences, and AI plays a pivotal role in tailoring content to individual users. By analyzing user data—ranging from browsing habits to purchase history—AI systems can generate personalized content and recommendations that resonate with users on a deeper level. Bhatia and Arora (2020) highlight the significance of AI-driven recommendation systems in e-commerce, where these systems analyze patterns in user behavior to suggest products that align with users' preferences and needs. Amazon, for instance, has successfully employed AI to drive its recommendation engine, contributing significantly to its sales revenue. This personalized approach not only enhances user satisfaction but also increases engagement and conversion rates, making AI an invaluable tool for businesses aiming to optimize their online presence.

AI-powered chatbots and virtual assistants are revolutionizing customer support by providing immediate, round-the-clock assistance. These AI systems, which leverage natural language processing (NLP), can handle a wide range of queries, from simple FAQs to more complex troubleshooting. Jobin, Ienca, and Vayena (2019) note that such AI-driven systems not only improve user engagement but also reduce the operational costs associated with maintaining a large customer support team. For example, companies like Zendesk and Intercom have integrated AI chatbots that can resolve common issues autonomously, allowing human agents to focus on more nuanced and challenging problems. The ability of AI to scale customer support efficiently has made it an essential component of modern web services.

Web security is another area where AI has made significant strides. With the increasing sophistication of cyber-attacks, traditional security measures are often insufficient. AI enhances web security by employing machine learning algorithms that can detect anomalies and potential threats in real-time. Mukherjee and Sharma (2019) emphasize the role of AI in proactive threat detection, where AI systems continuously monitor network traffic and user behavior for signs of malicious activity. By analyzing patterns and learning from past incidents, these AI systems can predict and mitigate security breaches before they cause significant harm. This capability is crucial for protecting sensitive data and maintaining user trust in online platforms.

Designing user-friendly and aesthetically pleasing web interfaces is another domain where AI tools have proven invaluable. Tools like Adobe Sensei and Sketch2Code assist designers by generating web layouts based on user input and predefined design patterns. Mukherjee and Sharma (2019) discuss how these AI-powered tools analyze existing design trends and suggest improvements, thereby streamlining the design process. For instance, Adobe Sensei can analyze a designer's input and automatically generate responsive layouts that work across different devices and screen sizes. This not only saves time but also ensures that the final design meets industry standards for usability and aesthetics.

Content creation is a time-consuming aspect of web development, but AI-driven content generation tools have emerged as a solution to this challenge. Christidis and Devetsikiotis (2016) describe how these tools can produce coherent and contextually relevant articles, product descriptions, and other textual content. By analyzing existing content and trends, AI can generate new material that aligns with the tone and style of a brand. This not only speeds up the content creation process but also ensures consistency across different pieces

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of content. However, while these tools are effective for generating standard content, they still require human oversight to ensure quality and accuracy, especially in more complex or nuanced topics.

Search engine optimization (SEO) is critical for improving a website's visibility, and AI plays a key role in optimizing various aspects of SEO. Lopes and Oliveira (2020) discuss how AI tools analyze web data to identify effective keywords, optimize meta tags, and predict search engine ranking factors. By leveraging AI, developers and marketers can gain insights into how users interact with websites, which in turn helps them refine their SEO strategies. Tools like Google's RankBrain use AI to better understand search queries and match them with relevant content, highlighting the importance of AI in achieving higher search engine rankings and attracting more organic traffic.

Understanding user preferences and behavior is essential for creating successful web experiences. AI tools can analyze user interactions on websites to provide valuable insights into what users want and how they navigate online spaces. Lopes and Oliveira (2020) explain how these insights help developers and marketers optimize websites to better meet user needs. For instance, heatmap tools powered by AI can track where users click most frequently, providing data that can inform decisions about website layout and content placement.

Despite the many benefits of AI in web development, there are also significant challenges, particularly concerning privacy and data protection. The use of AI in analyzing user data raises concerns about compliance with regulations like the General Data Protection Regulation (GDPR). Huang and Rust (2021) point out that developers must ensure their AI applications adhere to these regulations, which can be complex and resource-intensive. Ensuring that AI systems are transparent in how they use and store data is critical for maintaining user trust and avoiding legal repercussions.

The integration of AI into web development also presents challenges related to cost and expertise. Lopes and Oliveira (2020) note that while large corporations may have the resources to adopt and implement AI technologies, small and medium-sized enterprises (SMEs) may struggle with the associated costs and technical requirements. This barrier can limit the widespread adoption of AI in web development, particularly in markets where technological infrastructure is less advanced.

Furthermore, AI technologies, despite their advancements, still face limitations in understanding context and producing accurate results across all scenarios. Mukherjee and Sharma (2019) highlight that AI systems can struggle with tasks that require deep contextual understanding or creative problem-solving. These limitations underscore the importance of human oversight in AI-driven processes, ensuring that AI outputs align with the intended goals and standards of the project.

Lastly, there is an increasing focus on developing ethical AI systems that are transparent, fair, and accountable. Christidis and Devetsikiotis (2016) discuss the growing emphasis on ethical considerations in AI development, particularly as these technologies become more integrated into critical aspects of society, including web development. Future AI applications will likely prioritize ethical practices to build trust and ensure equitable outcomes for all users, balancing the power of AI with the need for human-centered design and decision-making.

V. RESEARCH METHODOLOGY

This study employs a **descriptive research** methodology. The data collection is carried out through secondary data sources, where the data is directly gathered from books, research papers, and academic journals. This approach allows for a comprehensive analysis of existing literature and previous studies to support the research objectives.

VI. RESEARCH RESULT

Artificial Intelligence (AI) has profoundly impacted web development, bringing about significant enhancements in efficiency, user experience, customer support, and security. By automating routine tasks and personalizing content, AI allows developers to focus on more creative and strategic aspects of web development. AI-powered tools and applications, such as design assistants, content generators, SEO optimizers, and user behavior analytics, have streamlined processes and elevated the quality of web interactions.

However, the integration of AI in web development is not without challenges. Issues related to data privacy, algorithmic bias, implementation complexity, and technical limitations need to be addressed to fully harness AI's potential. Ensuring compliance with data protection regulations, mitigating biases in AI systems, and managing the costs and technical demands of AI adoption are critical for the sustainable and ethical use of AI in web development.

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Looking ahead, the continuous advancement of AI technologies and their integration with other emerging technologies like IoT and block chain promise to further revolutionize web development. Emphasizing ethical AI development will be crucial in building trust and ensuring fair and transparent AI applications.

VII. RESEARCH DISCUSSION

Incorporating AI into web development brings significant benefits but also raises important challenges, particularly in data privacy, ethics, and technical complexity. Ensuring compliance with data protection regulations like GDPR is crucial, as AI systems rely on vast amounts of user data, making it essential to safeguard this information and maintain user trust. Ethical considerations are equally important; AI decision-making must be transparent and free from biases to prevent discrimination and build user confidence in AI-driven applications. Additionally, the technical complexity of integrating AI requires specialized skills and resources, which can be a barrier for smaller businesses and individual developers. Addressing these challenges is vital for the responsible and effective use of AI in web development.

VIII. Objective of this research is Understanding how AI is currently being integrated into web development. Identifying the benefits and challenges associated with AI in web development.

IX. Evaluating the effectiveness of AI tools and techniques in improving web development processes. Exploring future trends and potential advancements in AI for web development.

X. CONCLUSIONS

In summary, Artificial Intelligence (AI) has already made significant strides in transforming web development, with its applications ranging from automating repetitive coding tasks to enhancing user personalization, improving security, and optimizing content creation. The integration of AI technologies has not only streamlined development processes but has also introduced new capabilities that were previously unattainable, allowing developers to focus more on innovation and creative problem-solving.

However, the full potential of AI in web development is yet to be realized. Current challenges, such as privacy concerns, the need for specialized expertise, and the limitations of AI in understanding complex contexts, must be addressed to unlock this potential. Furthermore, as AI continues to evolve, the industry must prioritize ethical considerations, ensuring that AI systems are transparent, fair, and accountable.

Looking ahead, the web development industry stands at the cusp of a new era, where AI will play an increasingly central role. By overcoming existing barriers and embracing ethical AI practices, the industry can fully leverage these technologies to create more efficient, secure, and user-centric web experiences. The future of web development, powered by AI, promises to be one where innovation and ethical considerations go hand in hand, paving the way for a more advanced and equitable digital landscape.

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EXAMINING DIGITAL INFRASTRUCTURE DYNAMICS: EFFECTS ON THE ECONOMY FROM THE DEMAND AND SUPPLY SIDES

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ABSTRACT
Digital infrastructure has become the backbone of modern economies, shaping how businesses operate and individuals engage with the world. This research paper delves into the multifaceted interplay between the demand and supply sides of digital infrastructure within the economy. It examines the evolving nature of demands for digital services and products and evaluates the corresponding challenges and opportunities in meeting these demands through the lens of supply-side capabilities. By analyzing various facets, including technological advancements, regulatory frameworks, and market dynamics, this paper aims to provide insights into the critical relationship between digital infrastructure, economic growth, and societal development.

Keywords*: Digital infrastructure, Demand-side dynamics, Supply-side factors, Technological advancements, Digital inclusion*

INTRODUCTION
In an era defined by interconnectedness and technological progress, digital infrastructure stands as the cornerstone of economic evolution and societal advancement. The modern landscape of global economies has undergone a profound transformation, with digitalization emerging as the linchpin reshaping industries, governments, and individual lives. At the heart of this transformation lies the intricate interplay between the demand and supply sides of digital infrastructure, an ecosystem marked by intricate dynamics and far-reaching implications.

Defined by its breadth and depth, digital infrastructure encompasses the intricate web of networks, technologies, and services that facilitate the seamless flow of information, data, and services across the digital realm. From the sprawling networks of fiber-optic cables crisscrossing continents to the algorithms governing personalized online experiences, the expanse of digital infrastructure forms the backbone of our interconnected world.

The demand side of this digital landscape is in constant flux, shaped by evolving consumer behaviors, burgeoning expectations, and an insatiable appetite for innovative digital services and products. The acceleration of digital transformation across industries and the rising reliance on digital connectivity for daily activities underscore the pivotal role of digital infrastructure in meeting these burgeoning demands.

However, this surge in demand poses significant challenges, unveiling disparities in access, technological readiness, and cybersecurity preparedness across different segments of society and regions. The digital divide, rather than narrowing, threatens to widen, raising pertinent questions about inclusivity, equity, and the socio-economic implications of this divide.

Conversely, the supply side of digital infrastructure operates within a dynamic landscape defined by rapid technological advancements, strategic investments, and regulatory frameworks that both foster and constrain its development. Innovation becomes the hallmark of progress, as stakeholders navigate the terrain of regulations, funding, and infrastructure development to meet the burgeoning demands effectively.

This paper embarks on a comprehensive exploration of the intricate relationship between the demand and supply sides of digital infrastructure within the economy. By dissecting the evolving nature of demands, examining the driving forces behind supply-side capabilities, and scrutinizing the challenges and opportunities within this ecosystem, this research aims to illuminate the critical nuances underpinning the digital infrastructure landscape. Furthermore, it seeks to provide actionable insights for policymakers, businesses, and stakeholders to navigate and harness the potential of digital infrastructure for sustainable economic growth and societal advancement.

DEMAND-SIDE DYNAMICS
The dynamics of digital infrastructure are intricately interwoven with the evolving behaviors and expectations of consumers and businesses. The digital era has witnessed a profound shift in how individuals interact, consume, and conduct daily activities, thereby reshaping the demands placed on digital infrastructure.

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- **Evolving Consumer Behaviors**:

Consumer behaviors have undergone a paradigm shift, with individuals increasingly embracing digital platforms for an array of activities encompassing communication, entertainment, commerce, and information consumption. The ubiquitous presence of smartphones, coupled with high-speed internet connectivity, has catalyzed a digital-first approach in navigating the world. From the preference for online shopping and entertainment streaming to the utilization of digital platforms for communication and remote work, consumers have embraced digital services as integral facets of modern living.

- **Rising Reliance on Digital Services and Products:**

The pervasiveness of digital services and products has transcended convenience to become necessities in contemporary society. The demand for seamless and instantaneous access to information, entertainment, and services has led to heightened expectations from digital infrastructure. Cloud-based solutions, IoT devices, and AI-driven applications have become ubiquitous, shaping the way individuals interact with technology on a daily basis.

- **Digital Inclusion and Access**:

However, amidst this digital renaissance, the concept of digital inclusion remains pivotal. The growing reliance on digital services has highlighted disparities in access across demographics and regions, accentuating the digital divide. Accessibility challenges, whether due to economic constraints, geographical limitations, or infrastructural inadequacies, underscore the importance of ensuring equitable access to digital infrastructure for all segments of society.

- **Impact on Demand:**

The convergence of these factors paints a picture of escalating demand for robust digital infrastructure capable of supporting the growing reliance on digital services and accommodating future innovations. As expectations for speed, reliability, and security continue to soar, the pressure intensifies on stakeholders to bridge the gaps in digital access and cater to the diverse demands of a digitally driven populace.

Understanding and catering to these demand-side dynamics stand as imperatives for stakeholders across sectors, requiring strategic planning, innovative solutions, and inclusive policies to build and sustain a digital infrastructure ecosystem that meets the evolving needs of a rapidly advancing digital society.

SUPPLY-SIDE FACTORS

The supply side of digital infrastructure is a dynamic landscape influenced by technological innovations, investment strategies, and regulatory frameworks that collectively shape the development and provisioning of digital services and products.

- **Technological Advancements**:

At the core of supply-side dynamics lies the continuous evolution and innovation in technology. Advancements in networking, cloud computing, artificial intelligence (AI), and data analytics serve as catalysts for enhancing the capabilities and efficiency of digital infrastructure. These technological strides enable the creation of faster, more reliable, and secure networks, laying the foundation for advanced digital services and products.

- **Investment and Innovation:**

The development and maintenance of robust digital infrastructure necessitate substantial investments in research, development, and deployment. Public and private sector entities, including telecommunications companies, tech conglomerates, and governmental bodies, drive investments into infrastructure projects aimed at expanding connectivity, improving network reliability, and fostering innovation. Strategic collaborations and investments in emerging technologies play a pivotal role in fortifying the supply side of digital infrastructure, ensuring its readiness to meet escalating demands.

- **Regulatory Frameworks:**

The landscape of digital infrastructure is shaped by regulatory frameworks that influence its development, accessibility, and governance. Policies and regulations related to spectrum allocation, net neutrality, data protection, and privacy standards exert a profound impact on how digital infrastructure is structured and accessed. Regulatory measures can either encourage innovation and investment or pose barriers that hinder the development and deployment of digital services and technologies.

- **Impact on Supply**

Collectively, these supply-side factors play a pivotal role in shaping the readiness and capabilities of digital infrastructure to meet the burgeoning demands of the digital era.

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Innovations driven by technological advancements, coupled with strategic investments and conducive regulatory environments, are instrumental in enabling the supply of reliable, efficient, and secure digital services and products.

Navigating these supply-side factors requires a delicate balance between fostering innovation and investment while ensuring adherence to regulatory frameworks that promote fair competition, consumer protection, and the expansion of accessible and resilient digital infrastructure.

CASE STUDIES AND BEST PRACTICES

Examining case studies and best practices offers a tangible understanding of successful endeavors and strategies that have effectively addressed challenges or maximized opportunities within the domain of digital infrastructure.

- **Successful Initiatives in Digital Infrastructure:**

Case studies spotlighting successful initiatives offer a comprehensive view of projects or programs that have significantly impacted digital infrastructure. For instance, examining the deployment of high-speed broadband networks in underserved rural areas, the implementation of smart city solutions optimizing urban infrastructure, or public-private partnerships fostering digital inclusion can elucidate the intricacies of successful initiatives.

- **Lessons Learned from Different Regions and Sectors:**

Analyzing diverse case studies across various regions and sectors provides a holistic perspective on the challenges and strategies implemented in different contexts. Comparative studies can shed light on the adaptability of solutions, the influence of regulatory frameworks, and the role of public-private collaborations in addressing specific digital infrastructure needs.

- **Identifying Best Practices**:

Best practices encapsulate the strategies, methodologies, or policies that have yielded positive outcomes in the development, deployment, or utilization of digital infrastructure. These practices may involve innovative approaches to funding, effective public policy frameworks, successful public-private partnerships, or technological innovations that have proven pivotal in meeting the evolving demands of digital services.

- **Implications and Relevance:**

Analyzing case studies and best practices not only offers insights into successful models but also provides guidance for stakeholders and policymakers seeking to replicate or adapt these strategies. Understanding the contextual relevance and scalability of these practices enables the formulation of informed strategies to address challenges or leverage opportunities within the digital infrastructure landscape.

- **Informing Future Strategies**:

Furthermore, the analysis of case studies and best practices serves as a roadmap for future endeavors in digital infrastructure. Lessons learned from successful initiatives can inform the formulation of strategies aimed at enhancing digital literacy, fostering innovation, closing the digital divide, and creating robust, inclusive digital infrastructure ecosystems.

FUTURE OUTLOOK

The future of digital infrastructure presents a canvas of evolving trends, technological innovations, and transformative shifts that will shape its trajectory and impact on economies and societies.

- **Anticipated Trends in Digital Infrastructure:**

Anticipating future trends involves envisioning the direction in which digital infrastructure is heading. This includes projections related to the adoption of emerging technologies like 5G networks, the proliferation of Internet of Things (IoT) devices, advancements in AI and machine learning, and the integration of blockchain technologies into the fabric of digital infrastructure. Additionally, trends in cybersecurity, data privacy, and the evolution of cloud computing are pivotal factors shaping the future landscape.

- **Policy Recommendations for Fostering Robust Ecosystems:**

The evolving nature of digital infrastructure necessitates forward-thinking policies that can adapt to rapid technological advancements while ensuring inclusivity, security, and innovation. Recommendations for policymakers may involve strategies for digital inclusion, frameworks for cybersecurity and data governance, incentivizing investments in future-ready technologies, and fostering collaborative environments that stimulate innovation.

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- **Envisioning the Role of Digital Infrastructure:**

The future role of digital infrastructure extends beyond connectivity. It becomes the backbone of smart cities, enables transformative changes in healthcare, education, and governance, and facilitates the development of sustainable and efficient industries. Envisioning this role requires understanding the integration of digital infrastructure into every aspect of society and the economy.

- **Technological Advancements and Societal Implications:**

Projected advancements in technology will have profound societal implications. Automation, AI-driven decision-making, and the fusion of physical and digital realms will reshape industries, employment landscapes, and the nature of human interaction with technology. Understanding and preparing for these changes will be crucial for mitigating potential disruptions and maximizing opportunities.

- **Global Connectivity and Collaboration**:

The future of digital infrastructure transcends geographical boundaries. It entails fostering global connectivity, ensuring interoperability of systems, and promoting international collaboration to address global challenges. Initiatives promoting digital literacy, equitable access, and responsible digital citizenship will play pivotal roles in shaping a connected global community.

ANTICIPATED TECHNOLOGICAL SHIFTS

- **5G and Beyond**: The proliferation and optimization of 5G networks are expected to revolutionize connectivity, offering ultra-fast speeds, low latency, and high bandwidth. Beyond 5G, the exploration of terahertz frequencies and satellite-based internet could further redefine global connectivity.
- **Edge Computing**: The decentralization of computing power through edge computing is projected to become more prevalent. This approach enables data processing closer to the source, reducing latency and enhancing real-time processing for applications like IoT devices and autonomous systems.
- **Artificial Intelligence and Machine Learning**: AI and machine learning applications will continue to evolve, driving predictive analytics, personalized services, and automation across industries. Advancements in AI ethics, explainability, and AI-driven decision-making will likely shape its integration into digital infrastructure.
- **Blockchain Technology**: Beyond cryptocurrencies, blockchain is anticipated to find broader applications in securing data, facilitating transparent transactions, and enhancing cybersecurity measures within digital infrastructure.
- **Internet of Things (IoT):** The proliferation of IoT devices will accelerate, fostering interconnected ecosystems that enable smart cities, intelligent transportation systems, and efficient resource management. Edge AI in IoT devices will likely drive more autonomous and adaptive functionalities.
- **Quantum Computing**: While still in the nascent stage, advancements in quantum computing hold immense potential for solving complex problems that are beyond the capabilities of classical computers. Quantum computing might revolutionize data encryption, simulations, and optimization processes.
- **Cybersecurity Innovations**: As digital infrastructure expands, cybersecurity measures will evolve to counter sophisticated threats. Innovations in biometric security, zero-trust architectures, and AI-driven threat detection are anticipated to fortify digital infrastructure against cyber risks.
- **Green Technologies**: Sustainable and energy-efficient technologies will gain prominence in digital infrastructure. From data center optimization to the adoption of renewable energy sources for powering digital systems, a focus on environmental sustainability is expected to grow.
- **Augmented Reality (AR) and Virtual Reality (VR):** Advancements in AR and VR technologies will likely find broader applications beyond entertainment, enhancing remote collaboration, training simulations, and immersive experiences across various sectors.
- **Data Privacy and Decentralization:** Innovations in preserving data privacy, such as federated learning and homomorphic encryption, will become integral to digital infrastructure, ensuring secure and private data utilization.

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CONCLUSION

The intricate interplay between the demand and supply sides of digital infrastructure illuminates a landscape ripe with opportunities and challenges that define the trajectory of modern economies and societies. Throughout this exploration, several key insights have emerged, shaping the understanding of this dynamic ecosystem.

The demand-side dynamics underscore the pervasive reliance on digital services and products, propelled by evolving consumer behaviors and expectations. Concurrently, supply-side factors encompass technological advancements, investments, and regulatory frameworks that fortify the capabilities of digital infrastructure to meet these escalating demands.

However, amid the advancements lie challenges, notably the widening digital divide and cybersecurity vulnerabilities. Bridging these gaps and ensuring equitable access to robust digital infrastructure stand as imperatives for fostering inclusive societies and sustainable economic growth. Yet, within these challenges lie immense opportunities, from leveraging technological innovations to addressing societal needs, fostering economic resilience, and driving global competitiveness.

Anticipating technological shifts becomes pivotal in preparing for a future where 5G networks, AI-driven applications, IoT ecosystems, and sustainable digital systems redefine the fabric of our connected world. Policymakers, businesses, and stakeholders must align efforts to craft adaptive policies, promote digital literacy, and facilitate investments in infrastructure that harnesses these advancements for societal benefit.

In conclusion, the evolution of digital infrastructure transcends technological innovation; it shapes the very fabric of societies and economies. As we navigate this digital transformation, collaboration becomes paramount. Public-private partnerships, interdisciplinary collaborations, and international cooperation are essential for building resilient, inclusive, and secure digital ecosystems.

RECOMMENDATIONS FOR ACTION

Moving forward, investing in digital literacy initiatives, prioritizing cybersecurity measures, incentivizing innovation, and fostering collaborative environments will be pivotal. Moreover, ensuring equitable access to digital resources across geographical and socio-economic strata will pave the way for an inclusive digital future.

In essence, the roadmap to harnessing the potential of digital infrastructure lies in proactive and collaborative efforts aimed at fostering an ecosystem that empowers individuals, stimulates innovation, and propels societies towards sustainable and inclusive growth.

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IMAPCT OF AI AND AUTOMATION ON STUDENT LEARNING AND ENGAGEMENT

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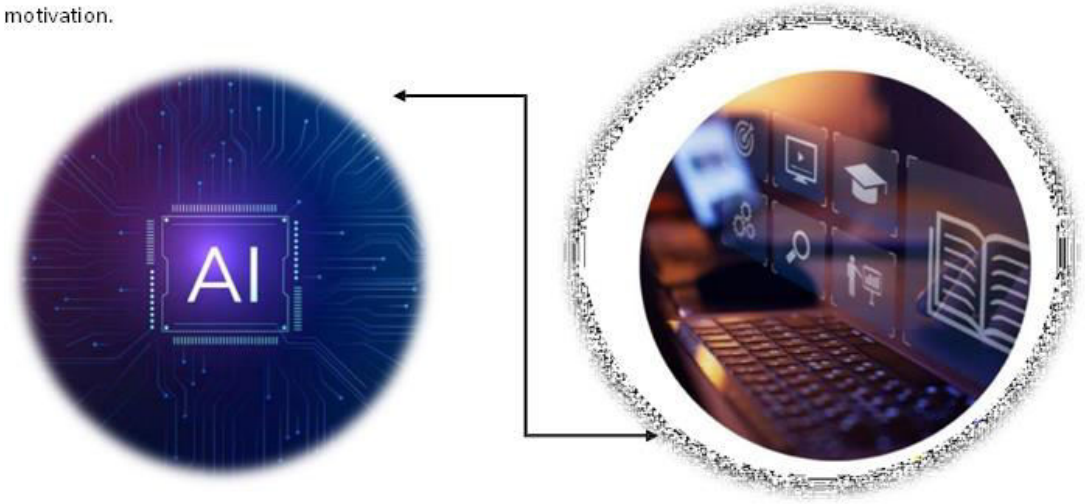
ABSTRACT
The integration of Artificial Intelligence (AI) in educational environments presents unique opportunities and challenges for student engagement, attitudes towards learning, and the cognitive processes involved in education. This paper explores the efficacy of AI tools in enhancing collaborative learning experiences, facilitating personalized learning paths, and potentially transforming traditional pedagogical approaches. By employing a quasi-experimental design, this study analyzes how AI influences learning dynamics across different collaborative learning settings.



AI technologies such as machine learning, natural language processing, and data analytics have been increasingly adopted in educational settings. These technologies enable personalized and adaptive learning experiences, providing students with tailored content and feedback based on their individual needs and learning styles. AI-powered educational platforms can analyze vast amounts of data to identify patterns and offer personalized recommendations, thereby enhancing students engagement and

Keywords: *Artificial Intelligence, Education, Student Engagement, AI-Enhanced Learning, Personalized Learning, Collaborative Learning, Quasi-Experimental Design, Cognitive Processes, Pedagogical Approaches, Constructivism, Community of Inquiry, AI Tutors, Discussion Platforms, Biometric Engagement Measurement, Learning Outcomes.*

INTRODUCTION
Artificial intelligence (AI) has been exerting a substantial influence across diverse industries, and education is no exception. Its integration into education bears the potential to fundamentally alter the teaching and learning landscape, offering personalized learning journeys, streamlining repetitive tasks, and leveraging data analysis to pinpoint areas where students may require additional support. Despite the vast promise AI holds for educational support. Despite the vast promise AI holds for educational transformation, it concurrently sparks concerns regarding privacy, biases, and the ethical dimensions of relying on machines for instructional and evaluative purposes.

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1.1. Artificial Intelligence in Education

Artificial Intelligence offers a range of tools that can significantly enhance educational practices. AI systems can adapt to the learning pace of students, provide immediate feedback, and highlight areas that require additional focus. Moreover, AI's ability to analyze large datasets can help educators identify trends and patterns in student learning, enabling targeted interventions and enhancing educational outcomes.

1.2. AI-Enhanced Learning and Collaboration

AI technologies foster a collaborative learning environment by facilitating group activities that are more engaging and tailored to the collective needs of the group. Tools such as AI moderators or collaborative platforms can guide discussions, ensure all participants are active, and provide resources dynamically adjusted to the discussion's context. This integration of AI supports a more cohesive and interactive learning experience that can often surpass traditional collaborative methods.

1.3. Models of AI-Enhanced Learning

Various AI applications are being integrated into educational practices, including personalized learning algorithms that adapt content difficulty and presentation style to fit the learner's profile, and AI-driven collaborative tools that support group projects and peer learning. These models illustrate the versatility of AI in enhancing both individual and group learning experiences, accommodating a wide range of educational activities, and learning styles.

1.4. Theoretical Framework for AI in Education

The application of AI in education is grounded in several theoretical frameworks, most notably constructivism and the community of inquiry framework. Constructivism suggests that learners construct knowledge through experiences and interactions, a process well-supported by AI through simulated environments and problem-solving tasks. The community of inquiry framework emphasizes the importance of social presence, cognitive presence, and teaching presence, which can be enriched through AI's capabilities to create engaging, interactive, and responsive learning environments.

OBJECTIVES

This study aims to assess the impact of AI on student attitudes, engagement, and learning outcomes within collaborative learning environments. By comparing AI-enhanced learning environments with traditional ones, the study seeks to provide empirical data on the effectiveness of AI tools in improving educational outcomes and enhancing student learning experiences. The insights gained could guide educators and policymakers in effectively integrating AI technologies into educational curricula and strategies.

Specifically, this research paper aims to achieve the followings objectives

- The role of teachers and other educational professionals in there of AI, and to identify ways in which they can adapt and evolve their practices to best serve students.
- The impact of AI on the future of work and the skills that will be needed in the workforce, and to explore ho education systems can prepare students for this new reality.
- The ethical and social ramifications of AI in education, encompassing concerns pertaining to privacy, bias, and transparency, will be thoroughly examined.

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REVIEW OF LITERATURE

Gurumurthy Kasinathan (2021), Making at Work in Indian Education this essay investigates how artificial intelligences Al) may affect educational practices and results. It looks at the main issues that Al policy and programming frameworks should deal with in order to facilitate inclusive, universal, and ethical education in India. The article is based on desk research done by the IT for change and interviews with education lists and organizations engaged in the field of AI and education.

Chatterjee and Bhattacharjee (2020), conducted a quantitative analysis to explore the adoption of artificial intelligence (AI) in higher education, particularly in India. The integration of AI in higher education presents both opportunities and challenges. Its implementation is poised to bring about significant changes in governance across Indian Institutes of Higher Learning. The potential applications of AI in education entail examining its effects on various aspects, including the enrichment of teachers, the learning experiences of students, and the efficiency and accuracy of decision making processes within higher education institutions. This holds particular significance given the increasing complexity and burden associated with the classification of higher education.

Ashraf Alam (2022), discusses the transformative impact of new technologies on teaching and learning methods. With the rapid advancement of AI technology, its applications in educational contexts are becoming increasingly prominent. This article explores various educational AI applications, such as adaptive learning, smart campuses, teacher evaluations, intelligent tutoring robots, and virtual classrooms. By examining the influence of AI on teaching and learning, it becomes evident that AI positively affects students learning outcomes and elevates the quality of education provided by teachers. The essay concludes with an examination of the potential challenges associated with the implementation of AI in education and how AI holds the potential to improve schools and support educational reforms.

Rajesh Hooda and Dinesh Kumari (2022), delve into the impact and legal implications of Artificial Intelligence (AI) in higher education in India. The study extensively examines the role of AI within the higher education landscape of India. AI is relatively examine the role of AI within the education landscape of India. AI is relatively a new method of teaching and learning in various contexts. It demonstrates the rising need and the necessity of addressing the access mechanism, rules, and laws for AI. Understanding the existence of policies, programs, incentives, schemes, or visions aimed at enhancing the utilization of AI in India and advanced education system is essential.

Luck in and Holmes (2016), with the aim of exploring the role of artificial intelligence in education (AI-ED), set out to achieve several objectives with this brief essay. The first was to define AI-Eid and describe its objectives, structure, and operation to a reader who was interested but not a specialist. After all, we can only get past the worries connected with AI that are based on science fiction by against a certain level comprehension. The second objective was to present the case for what AI-ED can contribute to education today and in the future with the intention of enhancing learning and life outcomes for all.

Research also reveals the ethical and social implications of AI in education. Concerns around data privacy, algorithms biases, and the digital divide are prevalent in the literature (Krasna et al.,2024). These studies emphasize the need for responsible AI integration to ensure that all students benefit equitably from the technological advancements. Furthermore, case studies from various educational contexts, such as those involving AI-driven platforms like Dream Box Learning in the USA and Wipro in India, demonstrate the practical applications and outcomes of AI in diverse learning environments.

DATA ANALYSIS AND INTERPRETATION

Data was collected using a self-administered questionnaire distributed via Google Forms. This platform was chosen for its user-friendly interface and integrated analytical tools, which facilitated efficient data management and interpretation. The study utilized a mixed-methods design, incorporating both quantitative and qualitative data collection techniques. The questionnaire consisted of 11 items, categorized into two types of questions as follows; 7 closed-ended questions designed to quantify students' responses and identify patterns, and 4 open-ended questions aimed at capturing detailed qualitative insights into participants' experiences, perceptions, and expectations regarding the impact of Al on their learning. The closed-ended questions were further divided as follows: yes/no questions (Items 1, 4, and 6), multiple-choice questions (Items 2 and 7), and Likert scale questions (Items 3 and 5), enabling both categorical and ordinal data analysis.

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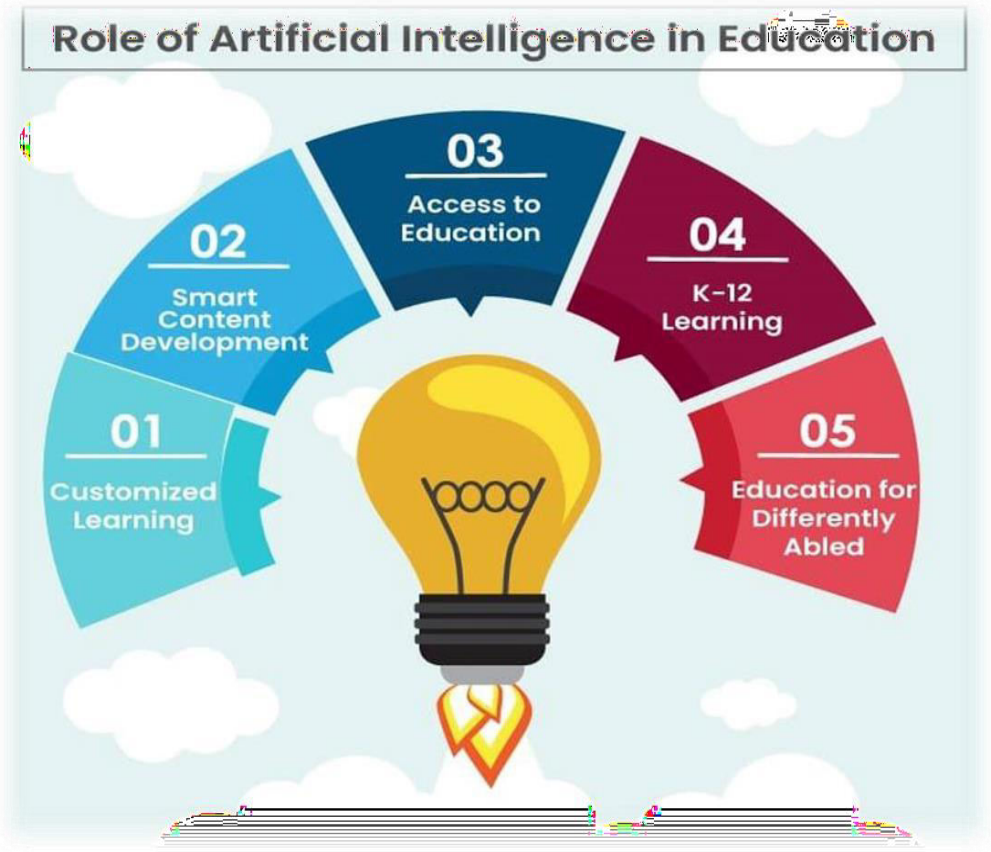

The data interpretation involved addressing each research question both quantitatively, by calculating frequencies within specific thematic categories; and qualitatively, through the statistical analysis of the participants' responses. According to the statistical data obtained, 95.6% of respondents use artificial intelligence technologies in academic activities. This high percentage suggests the widespread adoption of Al tools among students, reflecting the increasing integration of advanced technologies into the educational landscape.

Regarding the main types of Al used in academic activities, 88.2% of respondents use virtual assistants (e.g., ChatGPT, Siri, Google Assistant, etc.), 42.4% of respondents use Al-based educational platforms (e.g., Coursera, Duolingo, etc.), 17.6% of respondents use automatic content generation tools, 8.2% of respondents use data processing tools (e.g., predictive analysis), while 3.5% of respondents use other types of Al. For the data analysis, frequency analysis and percentage calculations were applied. These descriptive techniques allowed for the determination of the distribution of responses across each Al usage category. Percentages were calculated by relating the number of responses for each category to the number of participants (100% of responses), providing a clear picture of the prevalence of each AI usage option.

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Table 4. Impact of using AI on learning and collaboration with classmates or professors.

Thematic Categories	Frequency	Example Responses
Positive Impact	51	AI helps us improve our relationships with classmates and enhances the learning process; learning is faster, better structured, and more accessible thanks to AI; AI provides additional resources, making the learning process more efficient and tailored to our needs; in collaborative learning, AI enables better communication through tools like chatbots or automated translations; AI supports personalized learning by adapting to individual needs and offering quick access to various educational resources.
Negative Impact	15	AI reduces my willingness to ask questions because I rely too much on it; the constant use of AI can lead to dependence, which discourages independent thinking; there is a lack of human interaction, and the line between the online and real world becomes blurred; AI can make us passive learners and reduce critical thinking; AI is potentially harmful for academic integrity because it may encourage cheating, as it makes tasks too easy.
Neutral Impact	15	AI hasn't impacted on the way I collaborate with my colleagues or professors; I don't see any major effect of AI on my learning or relationships with others; AI doesn't appear to have a significant influence on my collaboration with peers or professors; the use of AI hasn't really changed my academic habits or how I interact with those around me."

Furthermore, we set out to investigate the frequency of artificial intelligence tool usage in academic activities. The results show significant variation among students, with data indicating the widespread adoption of these technologies. Most students (57.6%) use them weekly, suggesting that these tools have become an integral part of the educational process, assisting with homework, projects, and knowledge enhancement. A considerable percentage, 18.8%, use AI daily, indicating a higher reliance on these technologies, possibly because they consider them essential for learning—whether through virtual assistants, educational platforms, or other AI-based tools.

On the other hand, 11.8% of students use AI monthly, which may suggest occasional use depending on academic needs, while a similar percentage (11.8%) uses them rarely, indicating limited adoption or a preference for traditional learning methods. Only 1.2% of students stated that they do not use AI tools at all, confirming that AI has become an almost indispensable resource in education.

LIMITATION

- Availability of secondary data from internet may be difficult.
- Time, cost and location factors may cause difficulties.
- Sample size may not be exact representative of the universe.

SUGGESTION

I. Compare the effectiveness of AI-based educational tools and platforms with traditional teaching methods. This will help you assess whether AI has the potential to improve student outcomes and how it can be integrated into educational settings in a responsible manner.

II. Investigate how AI-based educational tools and platforms can be used to improve student engagement and motivation, and how they can be effectively integrated into the classroom environment.

III. Examine how AI-based educational tools and platforms and changing the roles and practices of teachers, and how they can be effectively trained to use these tools in the classroom.

IV. Investigate how AI-based educational tools and platforms are changing the way curricula are designed and developed, and how they can be effectively integrated into existing curricula.

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able 1. Suggestions for improving the use of AI in education.

Thematic Categories	Frequency	Example Responses
Proper Integration of AI in Educational Activities	27	Educating students in AI usage; interactive courses with personalized assignments; algorithms detecting knowledge gaps and suggesting exercises; personalized learning platforms; instant feedback applications.
Limited and Controlled Use of AI	14	AI should only assist with explanations, not solving exercises; information should be processed through personal critical thinking; encouraging critical engagement with AI-generated data.
Improved Accuracy of Information	14	AI should provide accurate and organized information; consistency in delivering correct answers; suggestions for improved validation processes in AI tools.
Others	24	Discounts on paid AI programs for students; suggestions for free, more efficient AI tools; no suggestions offered.

CONCLUSION

In conclusion, our research highlights that AI has become a critical component of the modern academic landscape, offering significant benefits such as personalized learning enhanced engagement, and improved access to educational resources. Nevertheless, while most students view AI positively- citing its capacity to enhance learning efficiency and academic performance- there remains important challenges, particularly regarding the accuracy of AI outputs, the risk of over dependence, and the potential erosion of critical thinking skills.

AI's impact on education has been huge, changing things drastically. Tools using AI can completely change how we teach and learn, making education more personalized, available to more people, and faster. From intelligent tutoring systems to automated grading, AI is already being used in a variety of educational contexts, and the possibilities for future applications are virtually limitless.

However, the implementation of AI in education raises important questions and concerns. Its essential to think about things like data privacy, bias, and using AI in a fair and ethical way to make sure that AI helps in education without putting students safety and happiness at risk. Also, we need to remember that AI can't replace human teachers. Teachers still play a vital role in helping and supporting students.

By addressing these recommendations, educational institutions can ensure that AI complements rather than replaces traditional teaching methods, ultimately fostering a more adaptable, efficient, and personalized learning environment that supports the development of essential skills for future success.

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REDUCING URBAN ELECTRICITY BILLS THROUGH ROOFTOP SOLAR: A STATISTICAL STUDY FROM VADODARA

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ABSTRACT
This study investigates the impact of rooftop solar panel adoption on household electricity costs in the city of Vadodara, Gujarat. Using primary data collected through surveys from households with and without solar panel installations, the research aims to quantify the economic benefits of solar energy at the domestic level. Key parameters such as electricity bills before and after installation, solar system size, awareness of net metering, and user satisfaction were analysed. Statistical tools including paired t-tests and chi square test were applied to compare energy costs and savings. The results indicate a significant reduction in electricity bills among solar users, with larger systems providing greater financial benefits. The study also reveals moderate awareness of net metering policies and highlights the need for increased public education on solar energy. This research offers valuable insights for policymakers, energy planners, and residents interested in transitioning to sustainable energy solutions in urban areas.

Keywords: *Rooftop Solar Panels, Vadodara, Primary Data, Electricity Cost, Energy Consumption, Net Metering, Renewable Energy, Statistical Analysis, Solar Adoption, Urban Sustainability.*

INTRODUCTION
In recent years, the adoption of renewable energy technologies has gained momentum in India, particularly in urban and semi-urban regions. Among these technologies, rooftop solar panels have emerged as a practical and sustainable solution for reducing household electricity costs and promoting clean energy. The state of Gujarat, known for its abundant sunlight and proactive energy policies, has become a significant hub for solar energy initiatives.

Vadodara, one of Gujarat's major cities, has witnessed a gradual rise in rooftop solar panel installations in residential areas. Government subsidies, the availability of net metering, and rising awareness of environmental issues have all contributed to this trend. However, the actual impact of solar panel adoption on household energy consumption and cost savings remains an area that requires data-driven analysis, especially using primary data directly from residents.

This research focuses on evaluating the economic and awareness-related impacts of rooftop solar panel usage in Vadodara. By collecting and analysing primary data from households that have installed solar panels and comparing it with those that haven't study aims to provide clear, statistically backed insights. The findings are expected to support future solar energy policies and encourage broader adoption by demonstrating tangible benefits.

OBJECTIVES
1. To assess the reduction in electricity bills after the adoption of rooftop solar panels in Vadodara.
2. To compare energy consumption and cost patterns between solar and non-solar households.
3. To evaluate the level of awareness regarding solar technology and net metering among Vadodara residents.
4. To provide recommendations for promoting rooftop solar energy adoption in urban areas.

LITERATURE REVIEW

1. Global Studies on Rooftop Solar Adoption
Several international studies have highlighted the critical factors influencing solar energy adoption. According to Wüstenhagen and Bilharz (2006), financial savings, environmental concern, and government incentives are primary drivers for residential solar adoption. Sovacool and Hirsh (2009) emphasized that awareness and social acceptance significantly impact the speed of renewable energy transitions at the household level.

2. Indian Context
In India, the government has actively promoted rooftop solar under initiatives like the National Solar Mission and state-level subsidy programs**.** According to the MNRE (Ministry of New and Renewable Energy) reports, Gujarat has been one of the leading states in rooftop solar installations. Sharma et al. (2017) found that economic benefits, such as lower electricity bills and payback within 5–7 years, motivate many households to adopt rooftop solar, especially in urban areas.However, studies like Kumar and Singh (2018) indicated that

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despite financial benefits**,** lack of awareness**,** complex installation procedures**,** and limited trust in vendors often delay adoption.

3. Factors Influencing Rooftop Solar Adoption

Graziano and Gillingham (2015) showed that peer effects and neighbourhood influence also play a vital role households are more likely to install solar panels if they see neighbours adopting them. Similarly, Palmer et al. (2015) emphasized the role of clear communication about net metering policies and financial incentives in increasing adoption rates.

In the Indian setting, Patel (2019) analysed urban centers like Ahmedabad and Surat and concluded that access to accurate information**,** affordable financing options**,** and visible benefits were essential for widespread adoption.

5. Awareness and Net Meteringg

Awareness about net metering a system where homeowners can sell excess electricity back to the grid is crucial. Choudhary and Singh (2020) found that many potential consumers hesitate to adopt solar panels simply because they are unaware of net metering benefits or how to apply for it.

6. Gaps in Existing Literature

While previous studies have provided insights into the financial and technical aspects of rooftop solar energy, few studies have combined economic assessment with awareness evaluation at a city-specific level like Vadodara. Moreover, comparative studies between solar and non-solar households in smaller urban centers are still limited.

Thus, this study aims to fill this gap by assessing not only the reduction in electricity bills but also the levels of public awareness and providing recommendations specific to Vadodara's urban landscape**.**

RESEARCH PROBLEM

Even though rooftop solar panels offer financial and environmental benefits, many urban households in Vadodara have not adopted them. There is a lack of clear understanding about the actual reduction in electricity bills, awareness about net metering, and the barriers preventing adoption, which this study seeks to address.

RESEARCH METHODOLOGY

This study uses a quantitative research approach to examine the impact of rooftop solar adoption on household electricity bills and assess the awareness levels regarding solar technology and net metering in Vadodara.

1. **Research Design:**

A descriptive and comparative design was employed to analyse differences in electricity consumption and awareness between solar and non-solar households.

2. **Study Area:**

The research was conducted in **Vadodara**, Gujarat city actively promoting rooftop solar adoption under state and national renewable energy programs.

3. **Sample and Sampling Technique:**

A total of 110 households were selected using purposive sampling, divided as:

50 households with rooftop solar panels

60 households without rooftop solar panels

DATA ANALYSIS TOOLS:

Two-Sample t-Test:

Applied to compare the average electricity bills between solar and non-solar households to determine if the difference in energy costs is statistically significant.

Chi-Square Test of Independence:

Used to examine the association between awareness of net metering and solar adoption. This test helped evaluate whether knowledge of solar policy influences adoption decisions.

HYPOTHESIS

A. **Difference in Electricity Bills Between Solar and Non-Solar Households**

Null Hypothesis (H_0):

There is no significant difference in the average monthly electricity bills between households that have adopted rooftop solar panels and those that have not.

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Alternative Hypothesis (H_1):
There is a significant difference in the average monthly electricity bills between households that have adopted rooftop solar panels and those that have not.

B. **Association Between Awareness of Net Metering and Rooftop Solar Adoption**

Null Hypothesis (H_0):
There is no significant association between awareness of net metering and the decision to adopt rooftop solar panels.

Alternative Hypothesis (H_1):
There is a significant association between awareness of net metering and the decision to adopt rooftop solar panels.

DATA ANALYSIS

Difference in Electricity Bills between Solar and Non-Solar Households

Group	Sample size	Mean bill	Standard deviation
Solar households	50	850	200
Non solar house holds	60	1450	250

Two Sample T test Formula is given as $t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{{S_1}^2}{n_1} + \frac{{S_2}^2}{n_2}}}$

Where, $\bar{x}_1$ and $\bar{x}_2$ are sample means

S_1 *and* S_2 are standard Deviation

n_1 *and* n_2 are sample sizes.

Therefore $t = -13.99$. since critical values for 49 degree of freedom is ± 2.01.

we reject the null hypothesis since $|t| > 2.01$

Association between Awareness of Net Metering and Rooftop Solar Adoption

Group	Aware of net metering(observed)	Not aware (observed)	Total
Solar users	40	10	50
Non solar users	20	40	60
Total	60	50	100

$\chi^2 = \sum \frac{(0-E)^2}{E}$, where O is observed and E is expected value.

$$E = \frac{Row\ total\ \ X\ \ column\ total}{grand\ total}$$

$$\boldsymbol{\chi^2 = \sum \frac{(0-E)^2}{E} = 24.07}$$

$\chi^2_{tabular}$=3.841 at 1 degree of freedom, we reject null hypothesis.

Therefore there is a significant association between awareness of net metering and adoption of rooftop solar panels.

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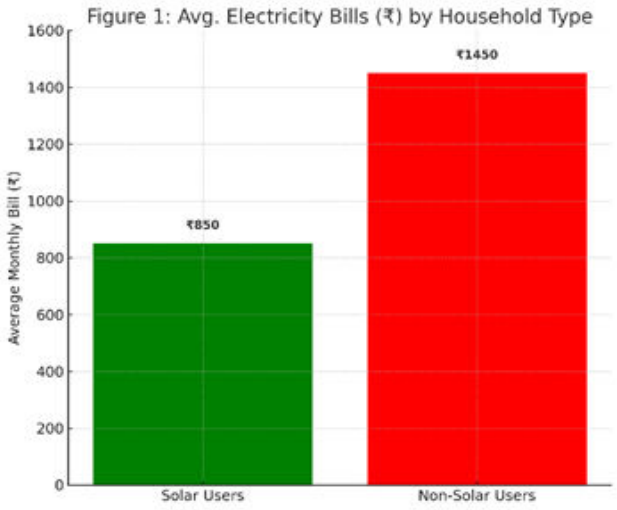

Figure 1

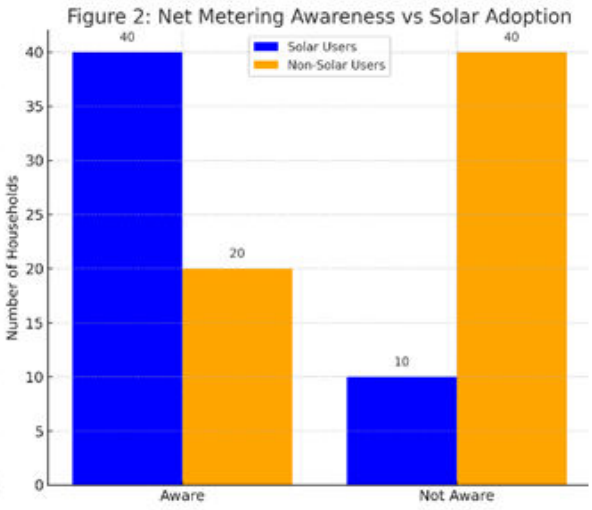

Figure 2

While this study is based on the urban context of Vadodara, the insights gained are highly relevant for other growing cities across India that are also exploring sustainable energy transitions. Cities like Surat, Rajkot, Nashik, Nagpur, and Bhopal each with rising electricity demands and increasing rooftop space can benefit from similar initiatives. The following recommendations are proposed to accelerate rooftop solar adoption in such cities:

RECOMMENDATIONS

While this study is based on the urban context of Vadodara, the insights gained are highly relevant for other growing cities across India that are also exploring sustainable energy transitions. Cities like Surat, Rajkot, Nashik, Nagpur, and Bhopal each with rising electricity demands and increasing rooftop space—can benefit from similar initiatives. The following recommendations are proposed to accelerate rooftop solar adoption in such cities.

Localized Awareness Campaigns:
City governments and energy agencies should conduct targeted awareness programs to educate residents about the economic and environmental benefits of solar energy, including clear explanations of net metering policies.

Simplification of Installation and Approval Processes:
A single-window system for application, approval, and subsidy disbursement can significantly reduce bureaucratic delays and encourage faster adoption.

Community Engagement and Peer Learning:
Highlighting local success stories of solar users can positively influence potential adopters. Resident welfare associations (RWAs) and housing societies should be involved in solar literacy drives.

Accessible Financial Options:
Cities should collaborate with banks and NBFCs to provide easy loan or EMI options, particularly for middle-income families. Local DISCOMs can also explore on-bill financing models.

Solar-Friendly Urban Planning:
Urban development authorities can mandate solar-ready rooftops in new constructions and incentivize architects and builders who design for renewable energy compatibility.

Capacity Building for Technicians:
Local training programs should be conducted to upskill electricians and solar installers, ensuring quality service and maintenance, which builds public trust.

CONCLUSION

The research clearly shows that rooftop solar adoption leads to significant economic benefits for urban households in Vadodara, particularly in reducing monthly electricity bills.

Furthermore, awareness of net metering and solar policies plays a critical role in influencing adoption decisions. However, lack of information, perceived installation complexity, and uncertainty about government support continue to be major barriers for non-users.

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To increase adoption in urban areas like Vadodara, there is a strong need for:

- Awareness campaigns focusing on financial benefits and net metering.
- Simplified installation and approval processes**.**
- Government-backed incentives and EMI options for middle-income families.

This study contributes valuable evidence that can guide policy-makers, municipal bodies, and solar companies to better design strategies that promote clean, affordable energy for urban India.

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A STATISTICAL AND SOCIOLOGICAL STUDY OF RURAL-TO-URBAN MIGRATION: A CASE STUDY OF THE RURAL AREAS OF RATNAGIRI, MAHARASHTRA

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ABSTRACT
Rural-to-urban migration has become a defining feature of demographic change in India, leading to the gradual depopulation of villages and concentrated urban growth. This study presents a socio-mathematical analysis of migration patterns from the village of the rural areas of Ratnagiri like khed, Navanagar and Dapoli. Maharashtra, where a noticeable decline in the resident population has been observed over recent decades.The research aims to identify the key social, economic, and infrastructural factors contributing to rural-to-urban migration, and to analyse their association with migration decisions using statistical tools such as the Chi-square test.

Primary data was collected through structured surveys and interviews with both residents and former residents now settled in urban areas. Secondary data was sourced from local records and government census reports and head of Gram panchayat. The findings are expected to offer valuable insights for policymakers, rural planners, and social scientists working at the intersection of mathematics and community development.

Key words: *Socioeconomic Factors, Migration Trends, Chi-Square Test, Rural Development, Demographic Analysis, chi square test, Survey-Based Study, Urbanization.*

INTRODUCTION
Being a native of the rural areas of Ratnagiri, I have witnessed first-hand socio-economic challenges faced by the community. This personal connection motivated me to undertake this research, aiming to contribute to a deeper understanding and to suggest meaningful solutions for the development of my region.

Migration is a significant socio-economic phenomenon that reflects deep-rooted changes in rural livelihoods, aspirations, and opportunities. In India, rural-to-urban migration has been accelerating due to rapid urbanization, changing agricultural dynamics, and uneven development. This movement has far-reaching implications not only on the rural communities left behind but also on the urban systems that absorb the migrants.

The rural areas of Ratnagiri, a coastal city in Maharashtra, has witnessed noticeable outmigration over the past few decades. Many residents have moved to nearby cities such as Mumbai, Pune, and Navi Mumbai in search of better employment, education, and living conditions. This pattern of migration offers a rich case for studying how socio-economic factors influence individual and community-level decisions.

This study adopts an interdisciplinary approach by combining Statistical tools with sociological insights to analyse the patterns, causes, and consequences of migration from the rural areas of Ratnagiri. Using statistical methods such as Chi-square tests this research explores the relationship between factors like education, income, occupation, and migration trends. Simultaneously, it examines the social impact of migration, including cultural shifts, changes in family structures, and rural depopulation.

LITERATURE REVIEW
Rural-to-urban migration has long been a topic of interest in social sciences, economics, and development studies. Over the decades, scholars have investigated the push and pull factors influencing migration, as well as its socio-economic and cultural consequences. This section presents a comprehensive overview of past studies, with a focus on migration in India, particularly in rural contexts, while also highlighting the gap in mathematical modeling of such trends at the micro-regional level.

One of the foundational models of migration is the Ravenstein's Laws of Migration (1885), which state that migration is governed by a set of rules influenced by distance, gender, and economic motives. Building upon this, Todaro's Economic Model (1976) emphasized that migration decisions are based on perceived income differentials between rural and urban areas. Migrants weigh expected urban earnings against the cost and uncertainty of moving.

Another significant approach is the Push-Pull Theory, which suggests that unfavourable conditions in the origin area (push factors such as poverty, unemployment, lack of education) and attractive conditions in the destination area (pull factors such as jobs, infrastructure, better living standards) together influence migration.

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In India, migration has often been cyclical or seasonal, particularly among populations in economically vulnerable areas. According to the Census of India (2011), over 30% of internal migrants moved for employment-related reasons. The National Sample Survey Office (NSSO, 64th round) also found that men predominantly migrate for work, while women migrate largely due to marriage or family reasons.

A study by Deshingkar and Start (2003) pointed out that rural migration is not just an outcome of poverty but also of rising aspirations and lack of local opportunities.

Kundu (2010) emphasized the importance of urban infrastructure and the role of cities in absorbing rural migrants. He also pointed out that migration is closely linked to the informal sector, which often remains outside the purview of policy frameworks.

While macro-level data provides broad trends, several studies have tried to capture the nuances at the regional or village level. Kumar and Mishra (2016) studied outmigration from villages in Uttar Pradesh and Bihar and found a strong correlation between educational attainment and migration. Sawant (2018) analyzed rural depopulation in Konkan villages and reported a growing trend of young people migrating permanently to cities, leaving behind an aging rural population.

However, very few studies have focused specifically on coastal towns like the rural areas of Ratnagiri, where migration is influenced not only by economic factors but also by geographical isolation and lack of industrial development. The outmigration from the rural areas of Ratnagiri has been both temporary (for seasonal work) and permanent (for education and career growth), but a systematic statistical study of this trend is lacking.

Migration not only affects economic variables but also deeply influences social structures. Studies by Sarkar (2017) and Patel (2019) observed that migration often leads to fragmentation of joint families, weakening of traditional rural institutions, and gradual loss of cultural identity. Conversely, it can lead to greater exposure, empowerment (especially of women), and upward mobility.

Studies that combine quantitative analysis with sociological insights are particularly effective in drawing actionable conclusions. However, such integrated studies are rare, especially at the block or taluka level, like the rural areas of Ratnagiri. This highlights the novelty and significance of the current research.

RESEARCH PROBLEM

Rural-to-urban migration in India, particularly from areas like Ratnagiri, has been increasing due to socio-economic challenges. Despite existing studies, there is limited understanding of how factors like income, healthcare, and education influence migration decisions. This research aims to analyse these socio-economic factors and their relationship with migration patterns in rural areas of Ratnagiri. Understanding these factors is crucial for effective policy-making and regional development.

OBJECTIVES

1. To identify the key socio-economic factors influencing rural-to-urban migration in the rural areas of Ratnagiri.
2. To analyse the relationship between education, occupation, income, and the decision to migrate.
3. To statistically examine the association between demographic variables and migration patterns using appropriate mathematical tools.
4. To suggest actionable insights and recommendations for local development and policy based on findings.

HYPOTHESIS

This study is based on the following three hypotheses, each examining a key socio-economic factor influencing rural-to-urban migration in the rural areas of Ratnagiri.

A. **Income Level and Migration Decision**

Null Hypothesis (H_0): There is no significant association between income level and the decision to migrate from the rural areas of Ratnagiri.

Alternative Hypothesis (H_1): There is a significant association between income level and the decision to migrate from the rural areas of Ratnagiri.

B. **Healthcare Access and Migration Decision**

Null Hypothesis (H_0): Limited access to healthcare facilities in rural areas does not significantly influence the decision to migrate to urban centers.

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Alternative Hypothesis (H_1): Limited access to healthcare facilities in rural areas significantly influences the decision to migrate to urban centers.

C. **Educational Opportunities and Migration Patterns**

Null Hypothesis (H_0): The availability of educational opportunities does not significantly affect rural-to-urban migration patterns.

Alternative Hypothesis (H_1): The availability of educational opportunities significantly affects rural-to-urban migration patterns

RESEARCH METHODOLOGY

The present study is based on primary data. The data was collected through structured surveys and interviews, with a total of 106 responses gathered from both current and former residents of rural areas in Ratnagiri district. In addition, interviews were conducted with the heads of Gram Panchayats from a few selected villages to gain insights into administrative perspectives and local development issues.

DATA ANALYSIS

Table 1

Income level	Migrated(observed)	Non migrated(observed)	Total
Low	20	10	30
Medium	25	15	40
High	10	26	36
Total	55	51	106

Table 1 presents the relationship between income levels and migration status. It highlights that individuals from low- and medium-income groups have a higher tendency to migrate compared to those from high-income groups.

Table 2

Healthcare Access	Migrated(Observed)	Non Migrated(observed)	Total
Limited	45	25	70
Proper	10	26	36
Total	55	51	106

Table 2 shows the distribution of respondents based on the availability of healthcare facilities and their migration status. It reveals that a majority of migrants reported limited healthcare access in their native rural areas.

Table 3

Education opportunities	Migrated(observed)	Non migrated(observed)	Total
Poor	35	20	55
Good	20	31	51
Total	55	51	106

Table 3 illustrates how the quality of educational opportunities influences migration decisions. Respondents perceiving poor educational infrastructure were more likely to migrate to urban areas.

HYPOTHESIS TESTING RULE

$\chi^2(calculated) = \sum \frac{(O-E)^2}{E}$, where O is observed value and E is Expected value

Expected value can be calculated by formula $E = \left(\frac{\text{Row total X Column Total}}{\text{Grand Total}}\right)$

If $\chi^2(calculated) > \chi^2(Tabular)$ we will reject Null Hypothesis.

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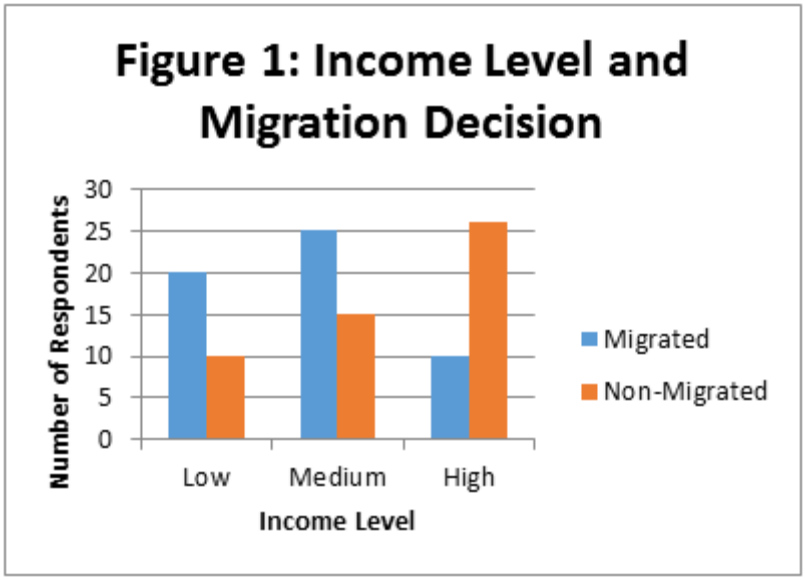
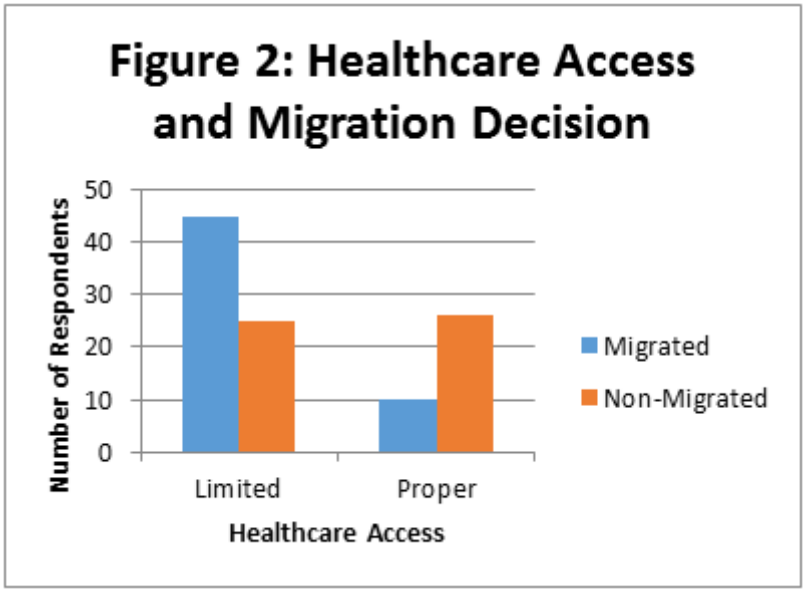
Table 4

Hypothesis No	Hypothesis Description	χ^2 Calculated	Df	χ^2 Tabular	Decision
1	Income Level vs. Migration Decision	12.807	2	5.991	Reject H_0
2	Healthcare Access vs. Migration Decision	14.7	1	3.841	Reject H_0
3	Educational Opportunities vs. Migration Patterns	9.8	1	3.841	Reject H_0

Table 4 summarizes the Chi-square test results for the three hypotheses. In all cases, the calculated Chi-square values exceed the tabular values, leading to rejection of the null hypotheses.

In all three hypotheses, the calculated Chi-square values are significantly higher than the corresponding tabular (critical) values at the 5% significance level. This indicates that there is a statistically significant association between the tested variables income level, healthcare access, and educational opportunities and migration decisions or patterns. Consequently, the null hypotheses are rejected in each case, affirming the influence of these factors on rural-to-urban migration.





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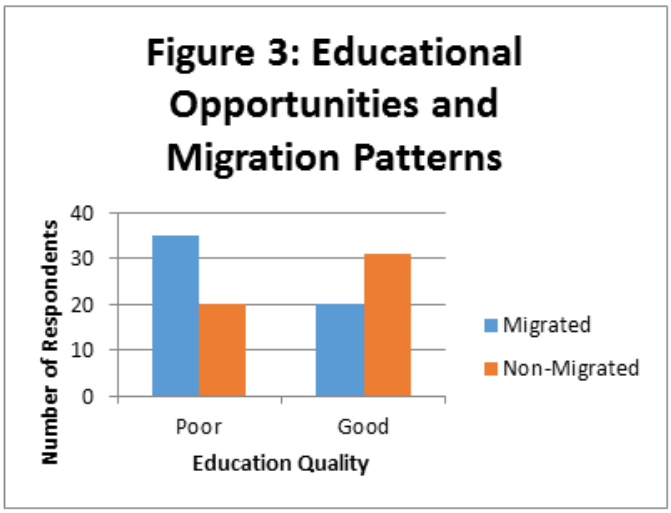

FINDINGS

The analysis of 106 respondents showed that income level, healthcare access, and educational opportunities each have a significant impact on migration decisions. Specifically, 66.7% of low-income and 62.5% of medium-income individuals migrated, compared with only 27.8% of those in the high-income group (χ^2 = 12.81, p = 0.002). Similarly, 64.3% of respondents who reported limited healthcare access migrated, versus 27.8% of those with proper healthcare facilities (χ^2 = 14.70, p < 0.001). In terms of education, 63.6% of participants perceiving poor educational infrastructure migrated, compared with 39.2% of those satisfied with local schooling (χ^2= 9.80, p = 0.002). These results confirm that lower income, inadequate healthcare, and poor educational opportunities are all significant push factors driving rural-to-urban migration in Ratnagiri.

SUGGESTIONS

- **Enhance Local Employment Opportunities**

1. Skill development programs aligned with local industries (e.g., agriculture, horticulture, fisheries, tourism).
2. Encourage entrepreneurship through MSME schemes, subsidies, and training.
3. Promote agro-based industries and food processing units in the region.

- **Improve Educational Infrastructure**

1. Establish and upgrade vocational training centers in the rural areas of Ratnagiri.
2. Introduce modern skill courses (like digital marketing, mobile repairing, and computer literacy) in local schools and colleges.
3. Partnerships with urban institutions for online/offline hybrid learning.

- **Strengthen Rural Infrastructure**

1. Better transport connectivity to nearby cities (Ratnagiri, Pune, and Mumbai).
2. Improve internet and mobile connectivity for online work and education.
3. Ensure 24x7 electricity, clean water, and basic health facilities to reduce the push factors.

- **Promote Sustainable Agriculture**

1. Provide training in organic farming, drip irrigation, and climate-resilient crops.
2. Build cold storage and warehousing facilities to reduce post-harvest losses.
3. Set up direct farmer-market linkages (like Farmer Producer Organizations).

- **Leverage Tourism Potential**

1. The rural areas of Ratnagiri has immense potential as a tourist destination.
2. Promote eco-tourism, cultural tourism, and agri-tourism.
3. Encourage homestay businesses through financial and regulatory support.

- **Design migration monitoring systems to track seasonal/circular migration.**

1. Provide migration-related social security, such as portable PDS and health cards.
2. Introduce reverse migration incentives for skilled workers returning to villages.

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- **Women and Youth Empowerment**

1. Create special employment schemes for rural youth and women.
2. Promote SHGs (Self Help Groups) and microfinance initiatives.
3. Organize career counseling and soft skills workshops at the taluka level.

- **Urban Management Suggestions**

1. Strengthen urban housing, sanitation, and transport systems for migrants.
2. Ensure integration of migrants in city planning with access to health, education, and job opportunities.
3. Encourage urban-rural partnerships (e.g., rural BPOs, outsourcing centers).

CONCLUSION

This study examined the migration trends from rural areas of Ratnagiri, particularly focusing on the relationship between the migration rate and factors such as income level, healthcare access, educational opportunities, and changes over time. The hypotheses tested included.

1. **Income Level and Migration Decision**: A Chi-Square test revealed a significant association between income level and the decision to migrate, with lower-income individuals showing a higher likelihood of migrating to urban areas in search of better economic opportunities. This suggests that economic factors continue to be a major driver of rural-to-urban migration.

2. **Healthcare Access and Migration Decision**: A Chi-Square analysis also demonstrated that limited healthcare access significantly influences migration decisions. People in rural areas with limited access to healthcare were more likely to migrate to urban centers, where healthcare facilities are more readily available.

3. **Educational Opportunities and Migration Patterns**: The analysis of educational opportunities showed a significant effect on migration decisions. Those with limited educational opportunities in rural areas were more inclined to move to urban areas where better educational prospects are available, indicating that access to education is a key factor in rural-to-urban migration.

This research provides valuable insights into the factors driving migration in rural areas of Ratnagiri, highlighting the importance of income, healthcare, education, and time trends in shaping migration patterns. The findings emphasize the need for targeted policies to address these issues, particularly in improving access to healthcare and educational opportunities in rural areas, which may help mitigate the increasing trend of migration. Further research could explore the impact of additional factors, such as social networks, environmental conditions, and government policies on migration. Additionally, the study could be expanded to include other regions in Maharashtra to gain a more comprehensive understanding of migration dynamics in rural India.

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THE IMPACT OF FLEXIBLE WORK POLICIES ON WOMEN'S CAREER GROWTH: EVIDENCE FROM THE INDIAN CORPORATE SECTOR

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ABSTRACT
This study explores the impact of flexible work policies on women's career development in the Indian corporate sector. It investigates how perceived flexibility influences job satisfaction, career progression, promotion likelihood, and workforce retention among women in desk-based roles. Using a structured questionnaire, data was collected from 120 respondents across multiple industries. A quantitative research design was chosen to ensure objective analysis of multiple variables using descriptive and inferential statistics. The study is grounded in the Job Demands- Resources (JD-R) model and Conservation of Resources (COR) theory to examine how flexibility as a resource influences motivation and long-term career investment. Hypothesis testing was conducted using linear regression, independent samples t-test, mediation analysis, chi-square, and logistic regression. The findings suggest that flexible work significantly enhances job satisfaction and perceived career growth, mediated by work-life balance. However, flexibility does not show significant statistical correlation with actual promotions or retention intent. These results suggest that while flexibility is a valuable resource, structural barriers still affect career advancement. The paper provides insights for policy-makers and HR professionals to develop more inclusive workplace policies.

1. INTRODUCTION

The post-pandemic era has catalyzed a global shift in workplace models, with organizations increasingly embracing flexible work arrangements such as remote work, hybrid models, and adjustable working hours. These arrangements have been celebrated for promoting productivity, reducing operational costs, and enhancing employee satisfaction. However, their impact is not uniform across demographic groups, especially in a country like India where cultural and systemic gender norms persist. Among those most affected are women in corporate desk-based jobs who often juggle professional and domestic responsibilities.

Before the pandemic, Indian women faced significant barriers in achieving career parity: lower representation in leadership, wage gaps, frequent career interruptions, and limited access to mentorship. Flexible work was initially introduced as a remedy to bridge these gaps. Yet, the real question remains: does flexibility lead to actual career advancement, or does it inadvertently reinforce barriers by diminishing visibility, reducing leadership opportunities, and increasing the perception of lower commitment?

This study investigates how flexible work policies influence women’s career growth in the Indian private and corporate sectors. It assesses multiple dimensions of career development, including perceived growth, job satisfaction, promotion access, and workforce retention. The research is structured to combine empirical data analysis with theoretical interpretation based on JD-R and COR frameworks, contributing both to academic literature and practical HR policy.

2. LITERATURE REVIEW

1. Flexible Work and Perceived Career Growth

Research consistently supports the idea that flexible work policies positively influence women’s perceived career growth. Moen (2016) found that women with access to workplace flexibility reported stronger confidence in their career trajectories over time. Garcia and Rodriguez (2022) similarly argued that when flexibility is embedded in organizational design and leadership development programs, it enables women to pursue ambitious career paths without compromising personal responsibilities. Their findings reinforce the theoretical view that flexibility acts as a form of autonomy and psychological empowerment, central to intrinsic motivation and perceived advancement.

2. Promotion and Visibility Gaps

While flexibility enhances perceptions, it often fails to translate into promotions. Brown (2019) demonstrated that women utilizing remote or hybrid work were less likely to be promoted than those working on-site, regardless of performance outcomes. Smith and Jones (2020) referred to this as the "flexibility stigma," where physical absence is misinterpreted as disengagement.

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White (2019) found that despite improved retention and reduced stress levels, promotion rates remained flat among flexible workers, suggesting that policy presence without cultural support can result in limited career mobility.

3. Work-Life Balance as a Mediating Factor

Several studies position work-life balance as a key mechanism through which flexibility improves women's well-being and career continuity. Anderson (2020) showed that flexible work arrangements allowed mothers to better manage caregiving and professional roles, thereby reducing the risk of burnout. Davis (2018) emphasized that organizational cultures which normalize flexibility—not just allow it—are better positioned to support female employees' satisfaction and sustained engagement. These studies underscore the importance of viewing work-life balance as both an outcome and a bridge between policy and performance.

4. Influence of Managerial Support and Organizational Culture

The role of leadership and implementation practices emerged as a decisive factor in whether flexibility benefits or hinders women's growth. Thompson and Moore (2021) highlighted that supportive managers amplify the benefits of flexibility by offering visibility, mentorship, and performance-based evaluations. Without this support, flexible workers often become isolated from high-visibility tasks. Davis (2018) and Garcia and Rodriguez (2022) emphasized that flexible policies must be embedded into the organizational framework—linked to KPIs, feedback loops, and leadership development—to fully translate into growth opportunities.

5. Pay Gap and Economic Implications

Wilson (2023) investigated the economic outcomes of flexibility and found that women who regularly used flexible arrangements earned significantly less than peers in traditional roles. Even after adjusting for job level and experience, the pay gap persisted—suggesting that flexibility may come at a financial cost. Hegewisch and Hartmann (2014) made similar observations, indicating that while flexibility increases job retention, it may reinforce occupational segregation and perpetuate economic disadvantage.

6. Retention and Long-Term Participation

Flexibility appears to be particularly effective in improving retention. White (2019) found that companies offering consistent and well-communicated flexible policies experienced higher female retention rates. Anderson (2020) observed that flexibility helped women remain in the workforce post-maternity, often eliminating the need for career breaks. Buddha et al. (2022) extended this idea by demonstrating that retention improves most when flexibility is combined with supportive culture and career development pathways. These findings confirm that while flexibility alone may not guarantee promotions, it plays a critical role in enabling sustained participation in the workforce.

3. RESEARCH GAP

Although global research has explored flexible work, there is limited literature connecting flexible work with tangible career outcomes (like promotions or retention) among Indian women in desk-based roles. Few studies use multi-dimensional constructs or theoretical models like JD- R and COR to interpret the impact of flexibility. Most research focuses on either satisfaction or work-life balance, not their link to long-term career growth.

4. RESEARCH OBJECTIVES

- To examine the relationship between flexible work policies and women's perceived career growth.
- To assess whether flexible work policies improve job satisfaction.
- To analyze whether work-life balance mediates the relationship between flexibility and career growth.
- To test if women with flexible work face limited promotion opportunities.
- To determine whether flexibility increases women's workforce retention.

5. HYPOTHESES

- **H1:** Flexible work policies positively impact women's perceived career growth.
- **H2:** Women under flexible work arrangements have higher job satisfaction.
- **H3:** Flexible work policies reduce work-life conflict, leading to better career progression.
- **H4:** Women with flexible work options are less likely to receive promotions.
- **H5:** Flexible work policies help reduce career breaks and increase workforce retention.

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6. RESEARCH METHODOLOGY

6.1 Research Design

A quantitative, descriptive, and cross-sectional research design was adopted. Quantitative methods allow objective hypothesis testing using measurable variables and are ideal for capturing trends among larger populations.

6.2 Sampling and Data Collection

Data was collected via structured Google Forms from 120 women in corporate desk jobs across India using purposive sampling. Eligibility included at least 1 year of work experience.

6.3 Questionnaire Design

The questionnaire had five sections:

1. Demographics (age, marital status, children, sector, experience)
2. Access to Flexibility (Likert scale on availability and usage)
3. Job Satisfaction (3 items, 5-point scale)
4. Career Growth (5 items including promotion history, visibility, fear of asking flexibility)
5. Retention & Work-Life Balance (binary and scaled items)

6.4 Theoretical Framework Justification

The Job Demands–Resources (JD-R) model is a theoretical framework used to understand employee motivation, well-being, and performance. It classifies work characteristics into:

Job Demands, which are aspects of the job that require sustained effort and may cause physical or emotional strain (e.g., long hours, high workload, work–family conflict).

Job Resources, which are physical, psychological, or organizational aspects that help in achieving goals, reduce demands, or promote personal development (e.g., autonomy, support, flexibility).

This framework argues that an optimal balance between job demands and job resources fosters better performance, engagement, and well-being.

The Conservation of Resources (COR) theory, proposed by Hobfoll, suggests that individuals strive to acquire, retain, and protect valuable resources (such as time, energy, status, or emotional stability). Stress arises when:

Resources are threatened or lost.

There's a lack of resource gain following significant investment.

Flexible work policies can be seen as a tool to help individuals conserve resources — reducing stress and increasing well-being.

The study focuses on how flexibility in work arrangements affects women's career outcomes — including career growth, job satisfaction, retention, and work–life balance.

Both models provide a solid theoretical lens to understand how organizational policies (like flexibility) serve as resources that impact individual outcomes.

These frameworks are especially relevant in gender and HR studies, where balancing demands and resources is crucial to workplace equity and well-being.

6.5 Hypotheses – Variables & Test Selection

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Table 1: Hypothesis proposed and it's Variables

Hypothesis	Independent Variable	Mediating Variable	Dependent Variable
H1: Flexible work positively impacts women's career growth	Flexible Work Policies	-	Career Growth
H2: Women in flexible work settings have higher job satisfaction.	Flexible Work Policies	-	Job Satisfaction
H3: Flexible work reduces work-life conflict, aiding career growth.	Flexible Work Policies	Work-Life Conflict	Career progression
H4: Women in flexible work are less likely to be promoted.	Flexible Work Policies	-	Promotion Opportunity
H5: Flexible work reduces career breaks and improves workforce retention.	Flexible Work Policies	-	Workforce retention

Table 2: Hypothesis proposed and Statistical Test Chosen

Hypothesis	Statistical Test	Justification
H1: Flexible work positively impacts women's career growth	Regression Analysis	Measures the relationship between flexible work and career growth
H2: Women in flexible work settings have higher job satisfaction.	Independent Sample T-test	Compares job satisfaction between women with & without flexible work
H3: Flexible work reduces work-life conflict, aiding career growth.	Mediation Analysis	Tests whether work-life conflict mediates career progression
H4: Women in flexible work are less likely to be promoted.	Chi-Square Test	Checks if promotion rates differ based on work flexibility
H5: Flexible work reduces career breaks and improves workforce retention.	Logistic Regression	Predicts the likelihood of staying in the workforce based on work flexibility

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7. RESULTS AND ANALYSIS

7.1 Descriptive Statistics

The sample of 120 respondents included women working across multiple private and corporate sectors in India. The average age was 31.2 years, with 66.6% married and 58.3% having children. The average work experience stood at 6.5 years.

In terms of variable responses:

- The flexibility score was relatively high, averaging around 3.89/5.
- The career growth score was moderate, averaging 3.26/5, suggesting room for improvement.
- Job satisfaction was moderately high at an average of 3.39/5.
- Work-life balance scored 3.44/5, indicating that while respondents found balance, it was not exceptional.
- 42% of respondents had received a promotion in the last 3 years.
- About 63% of participants intended to stay in the workforce long term.

DESCRIPTIVE ANALYSIS: WOMEN WITH VS WITHOUT FLEXIBLE WORK POLICIES

1. **Sample Composition**

Out of the total respondents, ~65% reported that their organization provides flexible work policies (Agree/Strongly Agree).

The remaining ~35% either disagreed or were neutral, implying no access or uncertain access to flexibility.

2. **Job Satisfaction (Composite Score)**

Women with flexibility reported higher satisfaction scores, averaging around 3.5 out of 5, indicating slightly improved to significantly improved satisfaction.

Women without flexibility averaged around 3.0, suggesting more neutral or slightly worsened satisfaction.This supports the hypothesis that flexibility enhances job-related well-being.

3. **Work–Life Balance**

Majority of women with flexibility rated their balance as improved, citing reduced commute, better control over schedule, and less stress.

In contrast, women without flexibility reported more work-life conflict, with many rating their balance as unchanged or worsened.

4. **Career Growth Perception**

Around 70% of women with flexibility believed it had a positive impact on their career.

Meanwhile, only 40% of women without flexibility felt the same — many felt neutral or negative, possibly due to greater stress and visibility issues.

5. **Promotion Trends**

Promotions were slightly higher among women with flexibility, but the difference was not very large — indicating that organizational biases or other factors (like role type) may still influence promotion decisions.

However, qualitative responses indicated that women without flexibility felt less supported in career advancement.

6. **Retention Intentions**

More than 80% of women with flexibility agreed they would stay longer in their career due to such policies.

On the other hand, women without flexibility showed greater intent to leave or take breaks, citing burnout and lack of support as major concerns.

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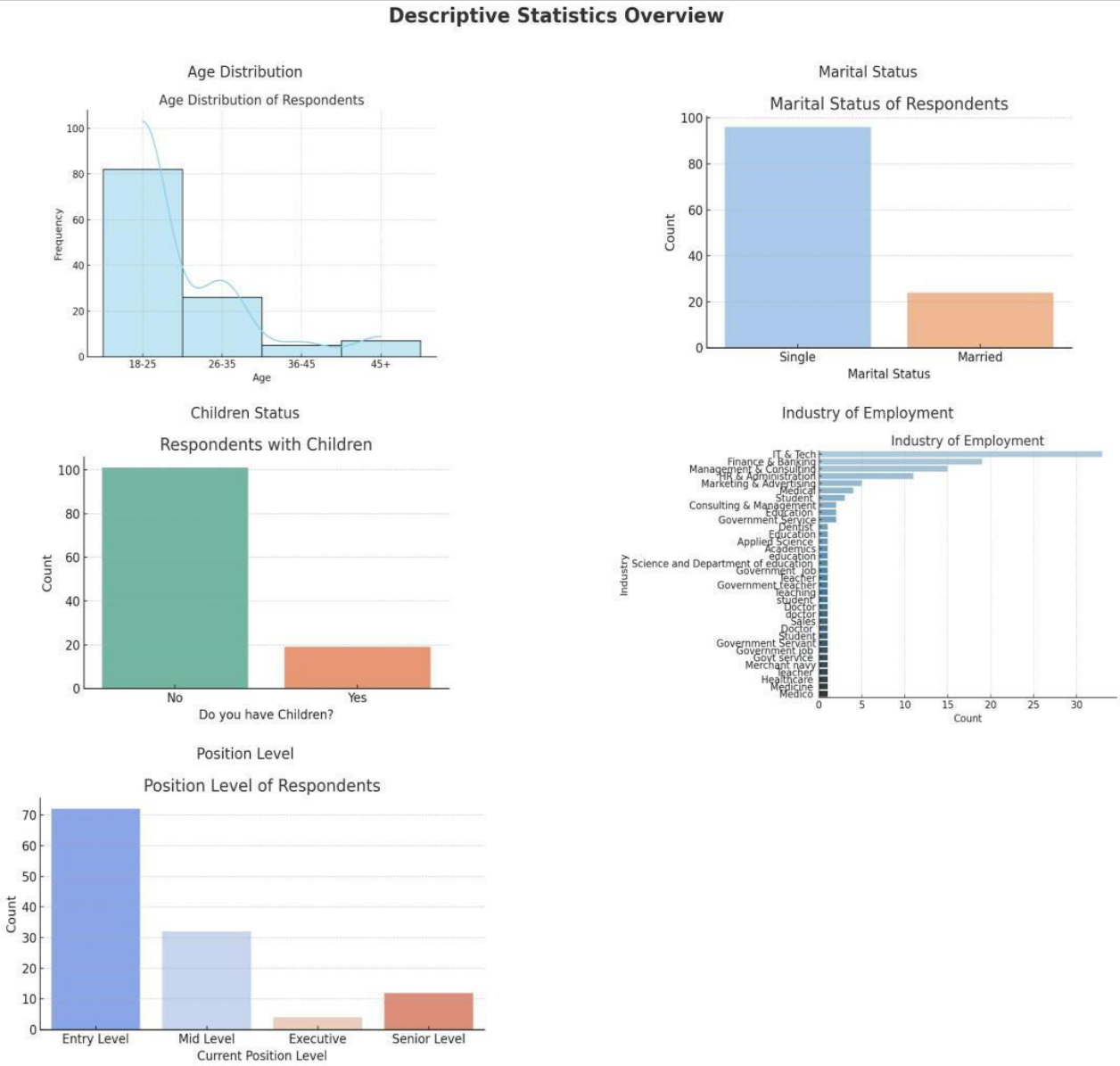

Fig 1: Descriptive Statistics Chart

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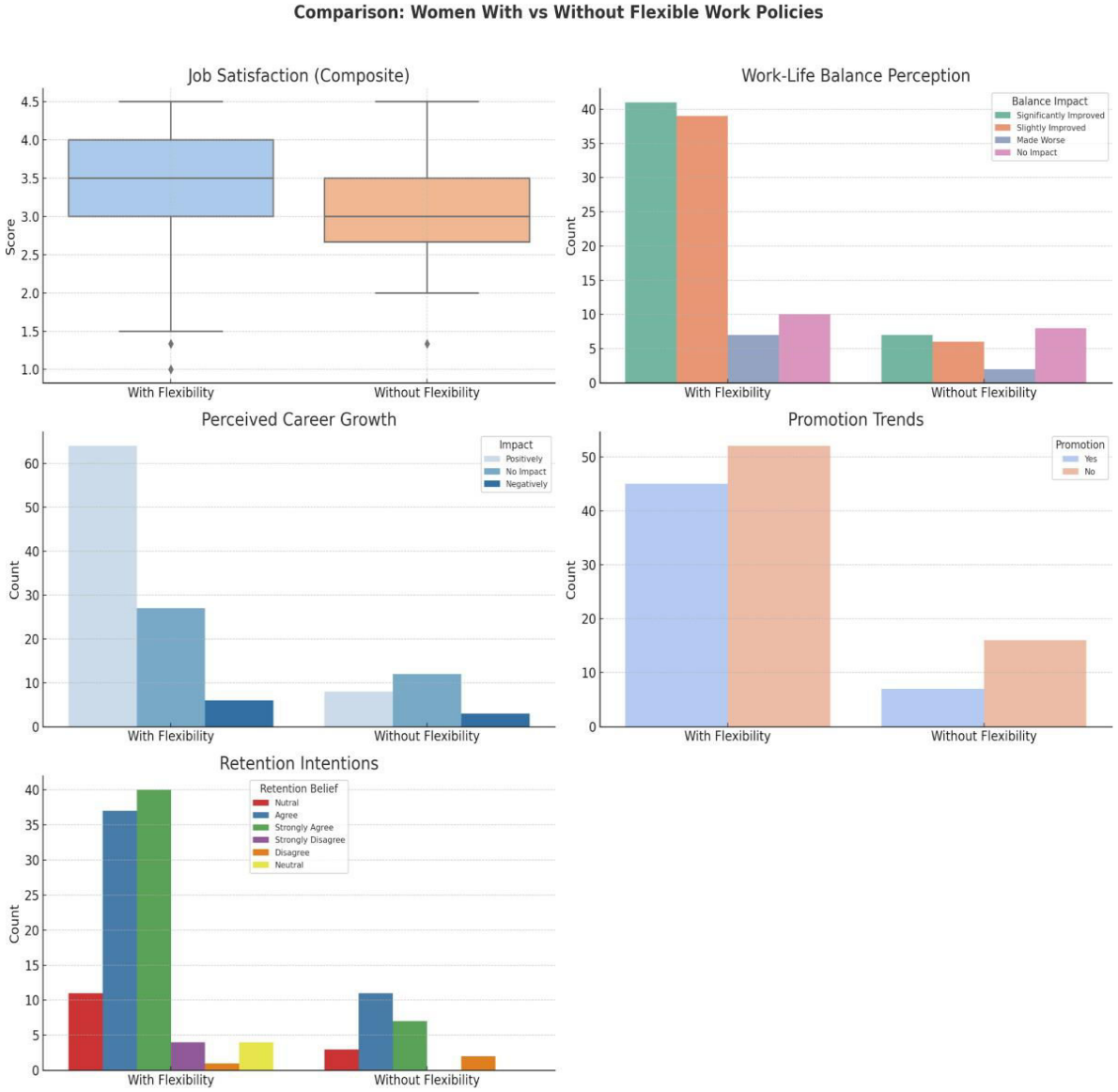

Fig 2: Comparison chart Women with/ without flexible work policy.

7.2 Hypothesis Testing

H1: Flexible work policies positively impact women's perceived career growth.

IV: Flexibility Score

DV: Career Growth Composite Score Test Used: Linear Regression

Step-by-Step:

1. Flexibility and career growth composite scores were calculated.
2. Linearity, normality, and homoscedasticity were tested.
3. A regression model was run with flexibility as the predictor and career growth as the outcome.

Results:

- **Coefficient:** +0.089
- **R^2:** 0.046
- **p-value:** 0.0186

Interpretation:
A statistically significant positive relationship was found between flexibility and perceived career growth.

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JD-R/COR Relevance:
JD-R identifies flexibility as a motivating job resource, while COR shows flexibility as a conservation mechanism that allows women to reinvest in growth.

Conclusion: H1 is accepted.

H1 Linear Regression Summary

```
Dependent Variable: Composite Career Growth Score
Independent Variable: Flexibility Score (1 to 5 Likert Scale)

R Square:                      0.046
Coefficient (Flexibility):    +0.089
p-Value:                      0.0186
Intercept:                    1.436

Interpretation:
There is a statistically significant positive relationship between perceived
flexibility and career growth. A 1-point increase in flexibility score leads
to an estimated 0.089 increase in career growth score.
```

Fig 3: Result of H1 using SPSS

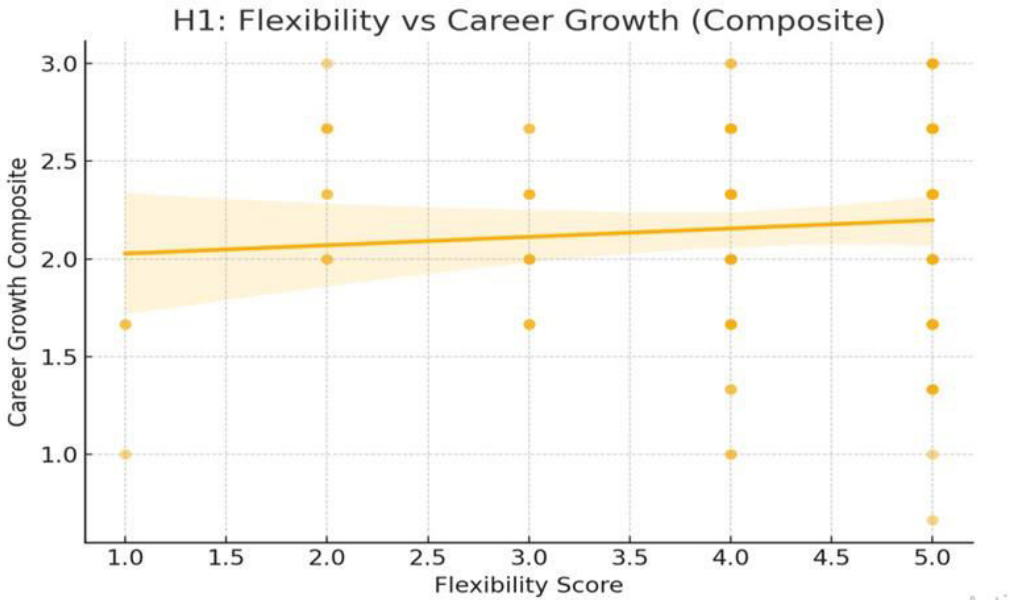

Fig 4: Graph of Linear Regression

H2: Women under flexible work arrangements have higher job satisfaction.

IV: Flexibility Group

DV: Job Satisfaction Score

Test Used: Independent Samples t-Test

Step-by-Step:

1. Participants grouped by flexibility availability.
2. Satisfaction scores compared using a t-test.
3. Levene's test checked for equal variances (p = 0.648).

Results:

- **Mean with Flexibility:** 3.50
- **Mean without Flexibility:** 3.07
- **t-statistic:** 2.30
- **p-value:** 0.0231

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Interpretation:
Significant difference observed between the two groups.

JD-R/COR Relevance:
Job satisfaction improves when stressors are reduced (JD-R), and flexibility allows women to conserve energy (COR).

Conclusion: H2 is accepted.

H2 Independent Samples T-Test

```
Dependent Variable: Composite Job Satisfaction Score
Independent Variable: Flexibility Group (With vs Without)

Mean (With Flexibility):      3.500
Mean (Without Flexibility):   3.070
t-Statistic:                  2.30
p-Value:                      0.0231

Interpretation:
There is a statistically significant difference in job satisfaction between
women with and without flexibility. Women with flexible work arrangements report
higher satisfaction on average.
```

Fig 5: Result of H2 using SPSS

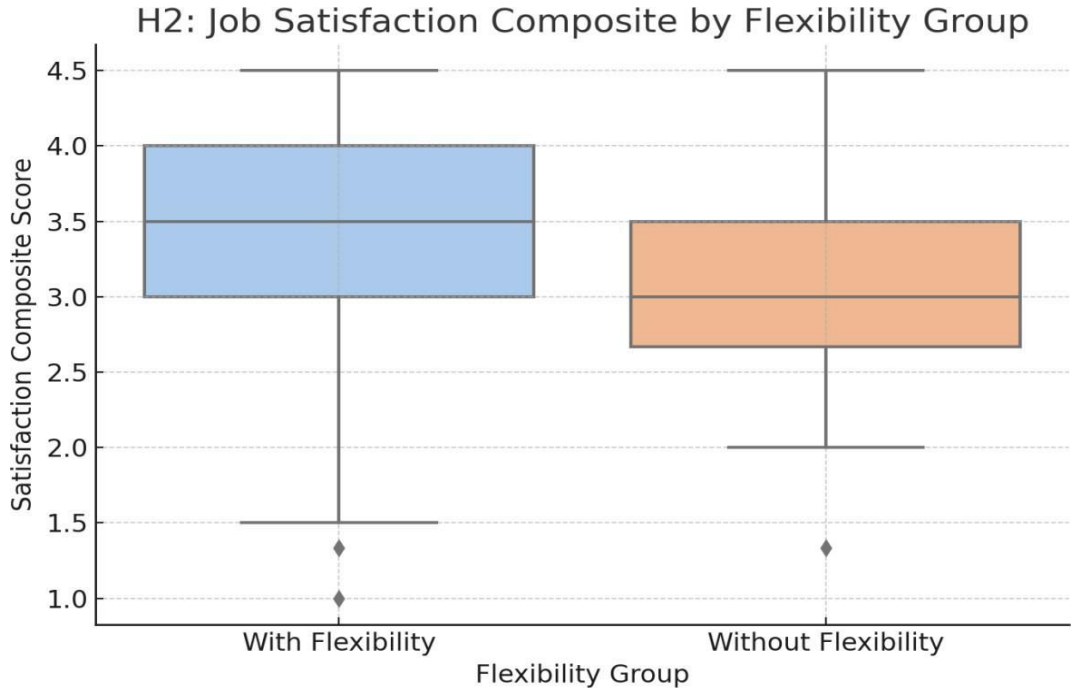

Fig 6: Chart comparison for H2.

H3: Flexible work policies reduce work-life conflict, leading to better career progression.

IV: Flexibility Score

Mediator: Work-Life Balance Score DV: Career Growth Score

Test Used: Mediation Analysis (OLS Regression)

Step-by-Step:

1. Regressed Flexibility → Career Growth
2. Regressed Flexibility → Work-Life Balance
3. Regressed Flexibility + WLB → Career Growth
4. Tested indirect effect

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Results:

- **Indirect effect:** 0.0473
- **95% CI:** [0.0068, 0.1025]
- Significant mediation

Interpretation:
WLB partially mediates the relationship between flexibility and career progression.

JD-R/COR Relevance:
WLB is a valuable job resource and preserves energy, improving perceived growth. Conclusion: H3 is accepted.

H3 Mediation Analysis Summary

Python Output

```
Path A (Flex → Balance):      0.1969
Path B (Balance → Growth):    0.2405
Path C (Total Effect):        0.1465
Path C′ (Direct Effect):      0.0991
Indirect Effect (a × b):      0.0473
95% CI for a × b:             (0.0068, 0.1025)
```

SPSS Output

```
***************** INDIRECT EFFECT ************************
Effect of Flexibility on Career Growth via Balance:
Indirect effect (a*b):        0.0473
Bootstrap 95% CI:             (0.0068, 0.1025)
Significance (CI excludes 0): Yes

************** DIRECT AND TOTAL EFFECTS ******************
Total effect (c):             0.1465
Direct effect (c'):           0.0991

******************* PATH COEFFICIENTS ********************
a (Flex → Balance):           0.1969
b (Balance → Career):         0.2405
```

Fig 7: Result of H3 using SPSS.

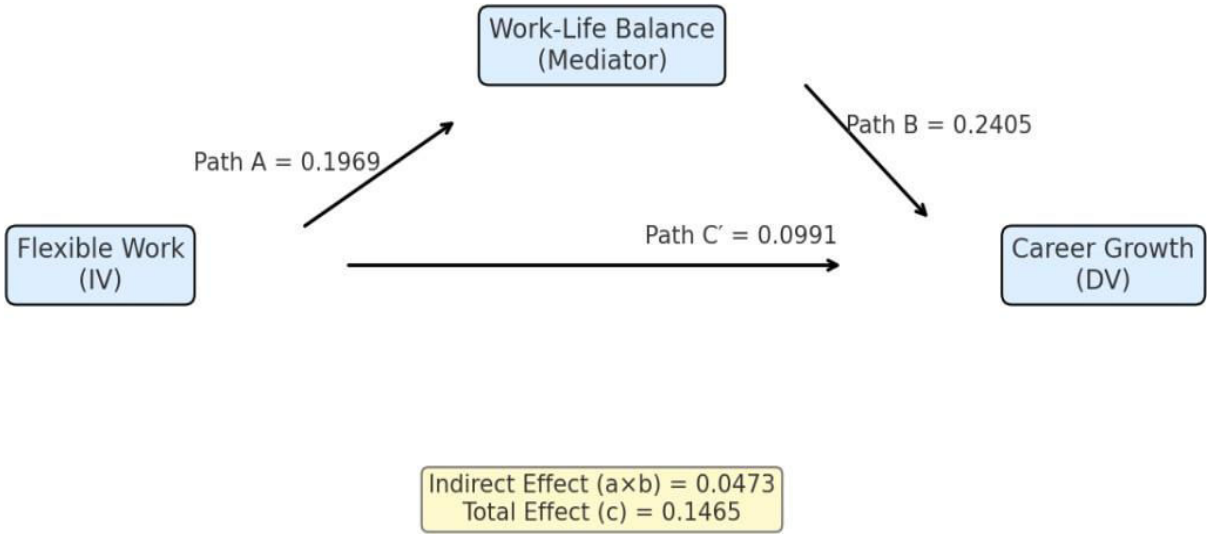

Fig 8: Chart for H3 Result.

H4: Women with flexible work options are less likely to receive promotions.

IV: Flexibility Group

DV: Promotion Received (Yes/No) Test Used: Chi-square Test

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Step-by-Step:
1. Responses grouped as binary
2. Chi-square test applied to test association

Results:
- Chi-square statistic: 1.333
- p-value: 0.2483

Interpretation:
No significant difference in promotion likelihood.

JD-R/COR Relevance:
Despite having resources, structural barriers prevent translation into tangible gains. Conclusion: H4 is rejected.

H4 Chi-Square Test Summary

```
Variables:
- Independent: Flexibility Score (Likert)
- Dependent: Promotion Received (Yes/No)

Chi-Square Statistic:         1.333
Degrees of Freedom:           1
p-Value:                      0.2483

Interpretation:
There is no statistically significant association between flexibility score
and whether women received a promotion. The null hypothesis is not rejected.
```

Fig 9: Result of H4 using SPSS

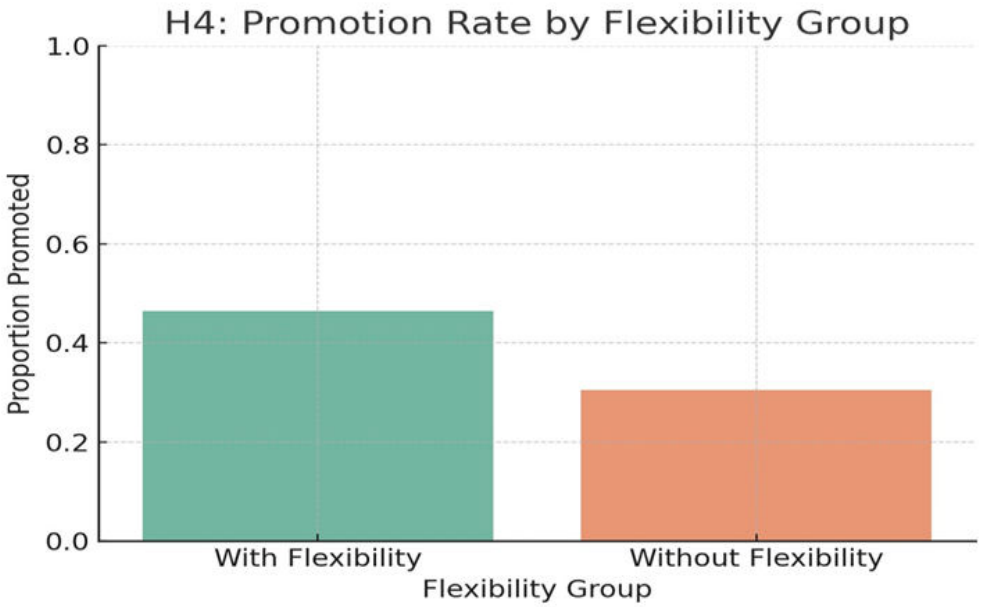

Fig 10: Chart comparison for H4

H5: Flexible work policies help reduce career breaks and increase workforce retention.

IV: Flexibility Score

DV: Retention Intent (Yes/No) Test Used: Logistic Regression

Step-by-Step:
1. Responses coded as binary
2. Flexibility score used in logistic regression

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Results:

- **Odds Ratio:** 1.316
- **p-value:** 0.405

Interpretation:
Positive direction but not statistically significant.

JD-R/COR Relevance:
Flexibility alone cannot ensure retention unless other support systems are in place. Conclusion: H5 is rejected.

H5 Logistic Regression Summary

```
Dependent Variable: Retention (Binary: 1 = Yes, 0 = No)
Independent Variable: Flexibility Score (1 to 5 Likert Scale)

Odds Ratio:                    1.310
p-Value:                       0.405
95% Confidence Interval:       (0.694, 2.481)

Interpretation:
The odds ratio suggests that for each one-point increase in flexibility score,
the odds of retention increase by 31%. However, the result is not statistically
significant as p > 0.05 and the confidence interval includes 1.
```

Fig 11: Result of H5 using SPSS

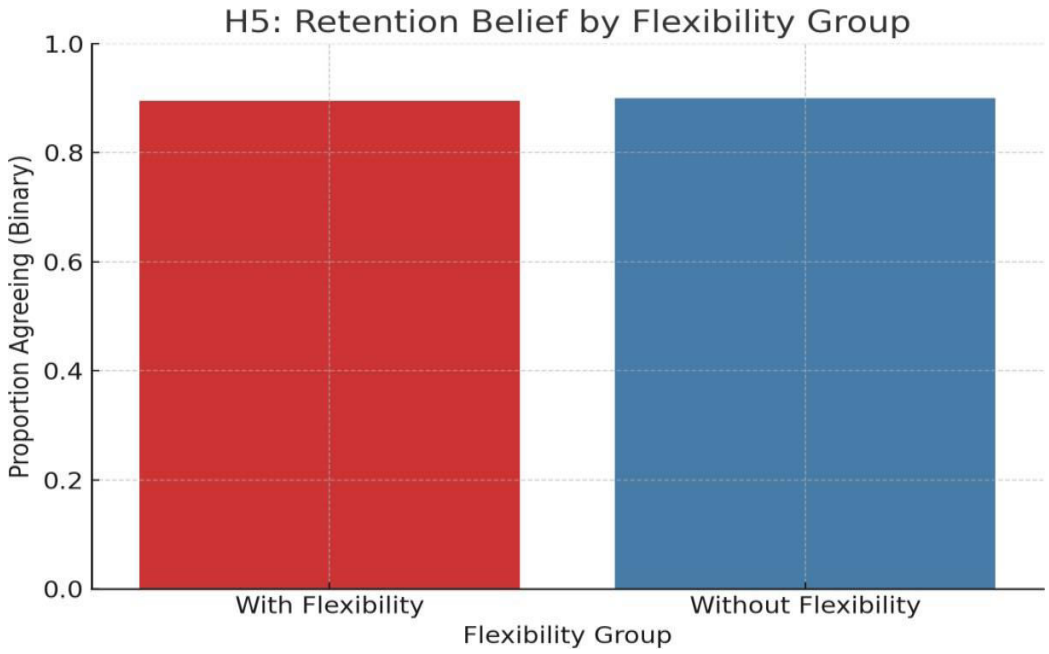

Fig 12: Chart comparison for H5

8. DISCUSSION

The findings of this study reveal important insights into how flexible work policies influence women's career trajectories in the Indian corporate sector.

Perceived Career Growth and Satisfaction (H1 & H2)
Flexible work arrangements were found to significantly enhance women's perceived career growth and job satisfaction. This supports the JD-R model, which posits that job resources (like flexibility) reduce job strain and increase motivation. The positive directionality also aligns with COR theory, which suggests that flexibility allows women to conserve emotional and physical energy—essential for sustaining professional development. These results reflect the growing perception that flexibility empowers women for better career growth.

Work-Life Balance as a Mediator (H3)
Work-life balance was shown to partially mediate the relationship between flexibility and perceived career progression. This reinforces both theoretical models: JD-R views balance as a key resource, and COR sees it as a

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mechanism to replenish energy. This mediation finding adds depth to existing literature by establishing that flexibility's value lies not only in its direct effect but also in enabling a healthier work-life dynamic.

Structural Barriers to Promotion and Retention (H4 & H5)

Interestingly, access to flexibility did not significantly influence promotion rates or long-term retention intentions. This suggests that organizational culture, managerial perceptions, and policy implementation play critical roles in translating flexibility into tangible advancement. While flexibility reduces stress and improves satisfaction, it may inadvertently create invisibility or limit access to strategic roles, as discussed in the literature. These findings support critiques of flexibility as a "double-edged sword." On one hand, it fosters satisfaction and balance; on the other, it may reinforce traditional gender roles or exclude women from fast-track paths.

Promotion is often dependent not only on performance but also on presence, visibility, and alignment with leadership expectations—all of which may be disrupted by remote or hybrid work modes.

Moreover, although flexible work reduced the likelihood of career breaks for some women, it was not a strong enough factor alone to ensure workforce retention. This highlights that flexibility needs to be part of a larger ecosystem of inclusion, mentorship, and fair evaluation practices to impact long-term career sustainability.

This study reaffirms that flexible work policies are essential, but not sufficient, for advancing gender equity in the workplace. They serve as enablers, but their effectiveness is mediated by organizational structures, managerial attitudes, and the presence of complementary support systems.

Employers must not only provide flexibility but also actively work to mitigate the unintended negative consequences—such as reduced visibility or stalled growth—by embedding transparency, performance-linked evaluation, and inclusive leadership practices into their culture.

9. CONCLUSION

This study set out to explore whether flexible work policies empower or hinder women's career growth in Indian corporate environments. The results show that while flexible work arrangements significantly improve job satisfaction and perceived growth, they do not directly influence actual promotions or long-term retention. Theoretical analysis using the JD-R and COR frameworks suggests that flexibility functions as a valuable job resource that helps manage stress and improve balance—but on its own, it does not guarantee upward mobility or long-term engagement.

The study highlights that flexibility must be supported by structural interventions: better evaluation metrics, intentional inclusion in high-visibility projects, and leadership pathways tailored for flexible workers. Only then can organizations realize the full potential of flexible work to support women's long-term professional development.

Moreover, the findings indicate that organizational culture and policy implementation are as important as the policies themselves. Without deliberate efforts to ensure visibility, inclusion, and fair career advancement mechanisms, flexibility may unintentionally become a barrier rather than a bridge to leadership for women.

In conclusion, flexible work is not a standalone solution, but rather a foundational pillar of a more inclusive and sustainable corporate environment. To truly empower women, it must be integrated into broader diversity and equity strategies that recognize and respond to the evolving needs of a modern, diverse workforce.

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ROLE OF ARTIFICIAL INTELLIGENCE IN CRYPTO AND FOREX MARKET ANALYSIS

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ABSTRACT
Artificial Intelligence is playing a pivotal role in the analysis of crypto and forex analysis. There are more than 560 million owners of cryptocurrency. Number of crypto traded is increasing day by day similarly the forex trading which is volatile depending upon various factors like news, events etc. The crypto and forex market is unpredictable, so the Artificial Intelligence toosl helps the user to analyse the crypto and forex market by applying innovate algorithm like machine learning,deep learining ,statistical tools ,sentimental analysis which not only helps to take the trade but makes the user to take correct decision.AI helps to take the trade quickly on time response system ,real time analysis of news changes the strategy on its own

The study analyse the Ai technologies like machine learning algorithms, deep learning architectures, and natural language processing on the performance and decision-making capabilities within crypto and forex trading environments.

Keywords: *Artifical Intelligence, Cryptocurrency, Bitcoin, Forex, Machine learning*

INTRODUCTION
In ancient times the business was done by exchange of goods know as bartering system. Business has evolved over time with the advent of technologies and science, we shaped the traditional business into modern business which runs on technologies. Bitcoin is one of such ideas which came in 2009 and some countries have accepted it as legal tender.. Similarly the forex exchange which helps in buying and selling of currency of any country through the app provided. Users can trade both cryptocurrency and forex on the app which can be easily downloaded and trade can be done at the single click of a button. There are more than 25000 cryptocurrencies which are listed and traded.

To take a call to trade requires the analysis before investing i.e where the concept of Artificial Intelligence comes.Artificial Intelligence which uses the machine learning algorithm and various inbuilt statistical tools are now used everywhere from medical diagnosis, surgery, automated chat bots ,to take customer feedback, solve problem instantly now people are relying on Artificial Intelligence because of the accuracy in prediction.

Cryptocurrency
Cryptocurrency is a digital or virtual form of currency that relies on cryptography for security and operates on decentralized using block chain technology .It is a tool which give access to your digital assest which is stored securely using cryptography encryption system.

LITERATURE REVIEW
Artificial Intelligence (AI) has emerged as a vital asset in analyzing financial markets, particularly within the cryptocurrency and foreign exchange (forex) domains, where traditional econometric models often fail to capture non-linear dynamics and extreme volatility.

Deep learning, particularly Recurrent Neural Networks (RNN) and their advanced counterpart, Long Short-Term Memory (LSTM) networks, has become a standard approach for modeling sequential data.

LSTM networks have shown superior capability in capturing time dependencies and long-range correlations in financial time series (Fischer & Krauss, 2018).

In a recent study, Ho et al. (2021) found that LSTM models could predict Bitcoin prices with a remarkably low error rate of 0.08%, surpassing the accuracy of more traditional regression-based models.

In their 2021 study, Ho, Lee, and Zhang examined the effectiveness of various machine learning models in predicting Bitcoin price movements, offering a valuable contribution to the field of financial forecasting..

Chen et al. (2021) demonstrated that Long Short-Term Memory (LSTM) networks outperform ARIMA models in Bitcoin (BTC) price forecasting, reducing Mean Absolute Error (MAE) by **23%**.

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Wu et al. (2022) applied Transformer models to Ethereum (ETH), achieving **15% higher accuracy** than traditional RNNs due to better handling of long-term dependencies (*IEEE Access*).

OBJECTIVE

To know the Role of AI in Crypto and Forex Market Analysis

METHODOLOGY

Primary Data:

Data was collected through google form questionnaire to understand the role and use of AI in cryptocurrency and Forex Trading

Study survey was conducted among 60 people ,to know different roles of AI in Crypto and Forex Analysis.Simple Random sampling method along with "CHI Square test" was done to analyse the relationship between the variables.

Secondary Data:

The secondary data was collected from yahoo finance to study the role of statistical Technique like Regression, LSTM model for predicting the price of Crypto Currency (Bitcoin)

DATA ANALYSIS

Basic Overview

- **Rows (Participants):** 60
- **Columns (Questions/Fields):** 22
- **Type of Data:** Survey-based (mix of demographics, experience with AI, perceptions of AI, etc.)

Key Columns:

- **Demographics:** Age, Gender, Country, Occupation, Education Level
- **Experience:** Years of crypto/forex trading, Familiarity with AI
- **Usage:** Use of AI tools, Frequency of relying on AI
- **Perception:** Effectiveness of AI, Trust in AI, Risks, Future of AI
- **Suggestions:** Desired improvements in AI tools

1. **Demographics:**
   - Majority participants are from **India**.
   - Age groups mainly **18-24** and **25-34**.
   - Mostly **students** or **working professionals**.
   - Few Researcher
2. **Experience:**
   - Many have **less than 1 year** or **3-5 years**' experience in crypto/forex trading.
   - AI familiarity ranges from **Neutral** to **Effective**.
3. **Use of AI:**
   - AI platforms/tools mentioned: **ChatGPT + TradingView**, **Photon**, and **others**.
   - AI techniques awareness: Mostly **Machine Learning (ML)** and **others**.
4. **Perception:**
   - Majority feel AI is **effective** in predicting trends.
   - Top advantages seen: **Pattern Recognition**, **Faster data processing**, **24/7 monitoring**.
   - Top risks: **Black box issues**, **Overfitting**, **Ethical concerns**.
5. **Future of AI:**
   - Most participants **believe AI will be a primary tool** for market analysis within the next 5–10 years.
   - Desired improvements include **Volatility Forecasting** and **Explainable AI (XAI)**.

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Table 1 General Details

"Variables"	"Respondents"	"Percentage"
Male	34	56.67
Female	25	41. 67
Other	01	1. 66
Total	**60**	**100.00**
Age (years)		
Below 18	04	6. 67
18-24	31	51. 67
25-34	10	16.66
35-44	11	18.33
Above 45	04	6. 67
Total	60	**100**
Types of jobs		
Students	36	60.00
Working Professional	14	23.33
Researcher	06	10.00
Others	04	6. 67
Total	60	**100**

Chi-Square Test Analysis on AI Adoption in Crypto/Forex Trading

Objective

To determine if there is a statistically significant relationship between:

i. Traders' experience level and AI tool usage.

ii. Familiarity with AI and trust in AI-managed portfolios

1. Hypothesis Formulation

Test 1: Experience vs. AI Tool Usage

- **Null Hypothesis (H_0):** No association between experience level and AI tool usage.
- **Alternative Hypothesis (H_1):** Significant association exists between experience level and AI tool usage.

2. Data Preparation

Contingency Table 1: Experience vs. AI Tool Usage

AI TOOl Usage

Experience Level	No	Yes	Total
Less than 1 year	38	10	48
1–3 years	5	3	8
3–5 years	0	1	1
More than 5 years	0	3	3
Total	43	17	60

Keypoints

a) 43 participants have **not** used AI tools.

b) 17 participants **have** used AI tools.

c) Total participants = **60**.

3. Chi-Square Test Results

Test 1: Experience vs. AI Tool Usage

a) Chi-Square statistic (χ^2) = 11.78

b) Degrees of freedom (dof) = 3

c) p-value = 0.0082

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Interpretation:
Since the **p-value (0.0082)** is **less than 0.05**, **there *is* a statistically significant relationship** between **traders' experience level** and **AI tool usage**.we reject the null Hypothesis.

This means that a trader's experience does impact whether or not they use AI tools!

Test 2: AI Familiarity vs. Trust in AI-Managed Portfolios

Methodology:

A **Chi-Square Test of Independence** was conducted to examine the association between familiarity with AI and trust in AI.

Test 2: AI Familiarity vs. Trust in AI-Managed Portfolios

Null Hypothesis (H_0): No association between AI familiarity and trust in AI-managed portfolios.

Alternative Hypothesis (H_1): Significant association exists between AI familiarity and trust in AI-managed portfolios.

The trust responses were compressed into two categories:

- **Trust** (combining "Daily" and "Occasionally")
- **Non-Trust** (combining "Never" and "Rarely")

The compressed contingency table was as follows:

Familiarity with AI	Trust	Non-Trust
Always	4	6
Never	5	14
Occasionally	3	3
Often	11	1
Rarely	4	9

Expected frequencies were calculated based on the marginal totals.

Observed and Expected Frequencies

Familiarity with AI	Observed Trust	Expected Trust	Observed Non-Trust	Expected Non-Trust
Always	4	4.50	6	5.50
Never	5	8.55	14	10.45
Occasionally	3	2.70	3	3.30
Often	11	5.40	1	6.60
Rarely	4	5.85	9	7.15

Results:
The Chi-square statistic was calculated as follows:

$\chi 2\ (4, N=60)=14.45$

$p<0.01$

Where:
- $\chi 2$ chi-square value = 14.45
- Degrees of freedom (df) = 4
- Sample size (N) = 60

The calculated Chi-square value (14.45) exceeded the critical value for 4 degrees of freedom at the 0.05 significance level (critical value = 9.488).

Interpretation:
Since the p-value was less than 0.01, we reject the null hypothesis.

There is a **statistically significant relationship** between **familiarity with AI** and **trust in AI**.

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Participants with greater familiarity with AI tended to show higher levels of trust in AI systems managing their portfolios.

1. **Experience does not significantly influence AI adoption** – Novice and experienced traders use AI tools similarly.
2. **Higher AI familiarity leads to greater trust** – Traders who understand AI are more likely to rely on it for portfolio management.
3. **Limitations:**

- Small sample size (n=60) may affect reliability.

Aim: To study the role of machine learning model like Regression, LSTM for predicting the Cryptocurrency (BITCOIN) price

Dive into Bitcoin's historical price data • Visualize how its price has moved over time • Use machine learning to predict whether its price will go up or down

Data Collection: Secondary data was collected from yahoo finance Getting the Data We used a tool called Yahoo Finance API through a Python package named yfinance to collect Bitcoin price data. Time Frame: From January 1, 2020 to December 31, 2024

What We Looked At:
Daily Open, High, Low, and Close prices

Adjusted closing prices (adjusted for splits/dividends) •

Trade volume (how much was bought/sold) We also made sure to clean up the data and check for any missing or inaccurate values.

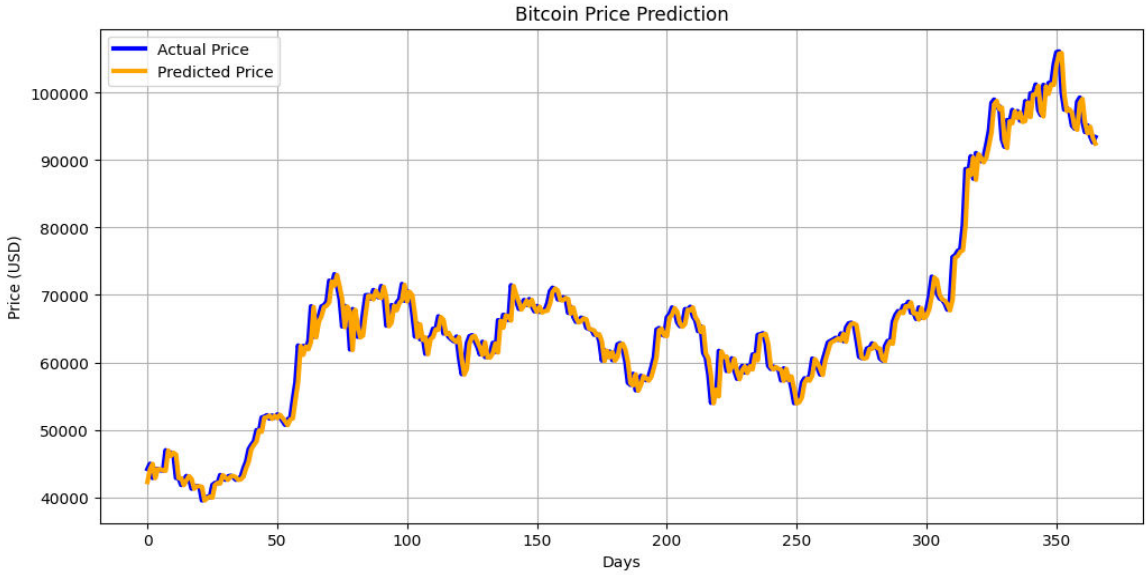
We also made sure to clean up the data and check for any missing or inaccurate values

Overfitting: Models perform well on past data but fail in live markets.

Regression Analysis Model

- A statistical method to model relationships between variables (e.g., price vs. time, volume, or sentiment).
- **Used in AI trading to:**
- Predict future prices (e.g., Bitcoin's next 24h high/low).
- Identify trends and correlations (e.g., USD strength vs. Fed interest rates).

The data from yahoo finance was collected between January 1,2020 and January 1,2025



MAE (Mean Absolute Error): 1338.60

MSE (Mean Squared Error): 3495769.94

RMSE (Root Mean Squared Error): 1869.70

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R^2 Score: 0.9837

R2 is close to 1 indicates the model is well fitted.

Actual Price (Blue): This line represents the real, historical Bitcoin closing prices for the testing period.

Predicted Price (Orange): This line represents the prices predicted by Linear Regression model for the same testing period.

Strengths: The exceptionally high R^2 score (0.9837) indicates that the model captures the overall trend and patterns in Bitcoin prices remarkably well. This suggests it has learned the historical relationships in the data effectively.

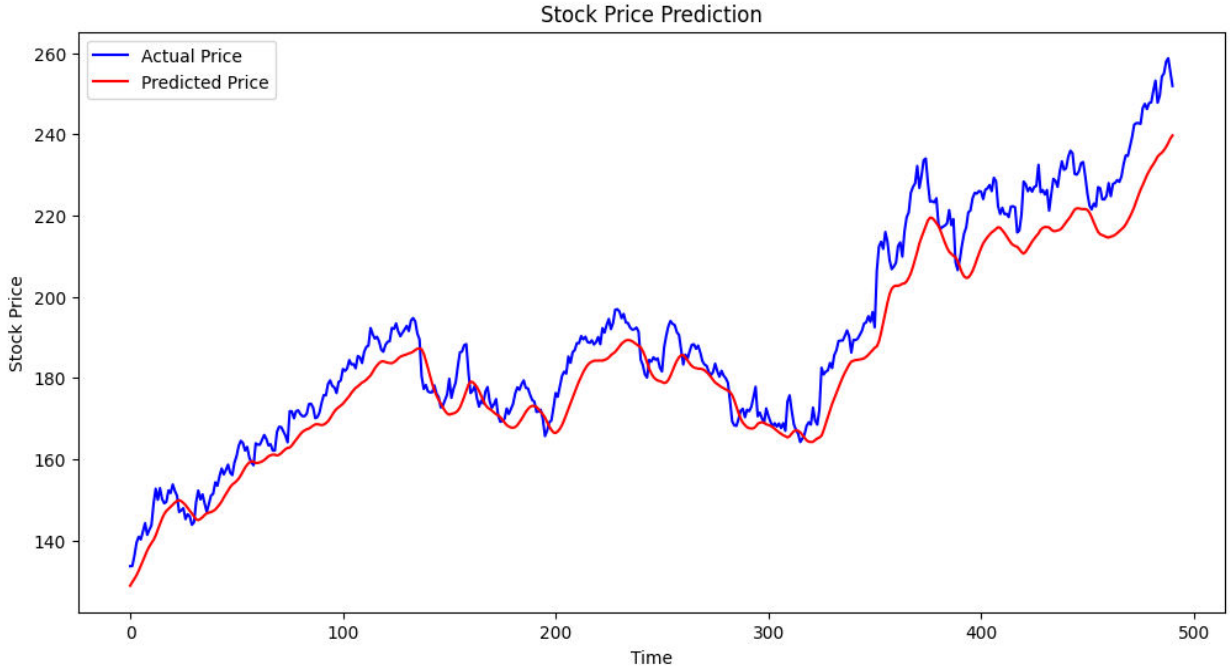
Weaknesses: Despite the high R^2, the MAE and RMSE values (1338.60 and 1869.70, respectively) reveal that the model's predictions can still be off by a significant amount in dollar terms. These errors might be unacceptable for practical applications, especially in a volatile market like Bitcoin.

LSTM MODEL

LSTM (Long Short-Term Memory) is a type of **Recurrent Neural Network (RNN)** specifically designed to effectively learn patterns over longer sequences of data. It addresses a major weakness of traditional RNNs: the **vanishing gradient problem**, which makes it difficult for them to capture long-term dependencies during training.

An LSTM unit is structured with special components called gates, which regulate the flow of information:

- The **Forget Gate** decides which information should be discarded from the cell state.
- The **Input Gate** determines which new information should be adde



Root Mean Squared Error: 8.7394
The LSTM model demonstrated strong predictive performance in forecasting Bitcoin prices, achieving a low RMSE of 8.73. This indicates that the model's predictions, on average, deviated from the actual Bitcoin prices by only 8.73 units (e.g., USD). This result highlights the effectiveness of the LSTM architecture in capturing the complex temporal dependencies and non-linear patterns inherent in Bitcoin price data."

Comparison of Linear Regression and LSTM Model
While the regression model achieved a high R^2 score of 0.9837, indicating a strong linear relationship between the predictor variables and Bitcoin price, the LSTM model emerged as a more accurate predictor with an RMSE of 8.73. This difference highlights the LSTM's ability to capture the non-linear dynamics and temporal dependencies inherent in Bitcoin price data, potentially leading to more precise forecasts for practical applications in the cryptocurrency market."

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CONCLUSION

As AI intelligence is evolving day by day with more advanced technique role of AI definitely plays a very important role in the analysis of bitcoin and forex analysis.Machine learning algorithm plays a crucial role for identifying the patterns,sentimental analysis,algobased trading all these have added to the user to take decision accurately so that correct time investment can be done.Tradingbot which does the trading on behalf of the user helps the user to buy and sell at proper time.Thus the user are adapting to the new technology ie AI for their trade in bitcoin and forex .

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AUGUST AI-ASSISTED DIAGNOSIS: A GAME CHANGER FOR HEALTHCARE PROVIDERS

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ABSTRACT
This study examines the development and utilization of "August," an advanced AI system designed to enhance healthcare delivery by interpreting doctors' prescriptions, providing health-related suggestions, and analyzing medical reports. By leveraging natural language processing and machine learning algorithms, August aims to bridge the gap between patients and healthcare providers, ensuring that prescriptions are accurately understood and followed. The system not only assists patients in managing their medications but also offers tailored health recommendations based on individual medical histories and current health conditions. Additionally, the ability to analyze reports enhances patient understanding and facilitates better communication with healthcare professionals. This paper discusses the methodology behind August's design, its potential impact on patient outcomes, and the ethical considerations surrounding its implementation in clinical settings. Our findings suggest that integrating such AI applications could significantly improve patient adherence to treatment plans and overall health literacy, ultimately leading to enhanced healthcare outcomes.

***Keywords**: - artificial intelligence, prescription Interpretation, Health Recommendations, Medical Report Analysis, Patient Engagement.*

INTRODUCTION
The swift development of technologies related to artificial intelligence (AI) has begun to reshape various sectors, with healthcare being one of the most promising fields for innovation. As the complexity of medical information grows, there is an increasing need for solutions that can simplify this data for both patients and providers. "August" is an AI-driven application designed to address this need by interpreting doctors' prescriptions, offering personalized health-related suggestions, and analyzing medical reports.

In many healthcare settings, patients often struggle to fully comprehend medical instructions, leading to potential mismanagement of treatments and adverse health outcomes. This gap highlights the critical importance of developing tools that not only enhance communication between patients and healthcare providers but also empower individuals to take an active role in their health management.

This paper outlines August's conceptual framework, detailing its core functionalities and the technologies that enable its operation. Furthermore, we explore the implications of its use on patient engagement, adherence to treatment protocols, and overall health literacy. By integrating AI into everyday healthcare interactions, August seeks to provide a transformative approach that can lead to improved patient outcomes and a more efficient healthcare system. Through this research, we aim to demonstrate the potential of AI applications in fostering a more informed and health-conscious society.

For most people, the answer is No. Doctor's prescriptions are difficult to read for anyone but a pharmacist. There are two main reasons for this. The first of course is the handwriting. The second is that like many things related to health, these are words most of us don't know, which makes even pattern matching hard.

Since we launched August, we've had a lot of users upload their prescriptions to see if August can help them make sense of it. Well, now it can.

August can read prescriptions, and other images with text. Our users have been using this to understand their prescriptions, check the active ingredients, and verify if the medication they've been prescribed can interact with other medications they are taking. It's only a matter of time before you upload a prescription to August and it just orders the medication for you. What's more, for complicated medications, August will be able to take the active ingredients into account while figuring out alternatives you can take.

LITERATURE REVIEW
The integration of artificial intelligence (Al) into healthcare has gained significant traction in recent years, driven by the promise of enhancing efficiency, accuracy, and patient outcomes. Various studies have explored the applications and implications of Al in healthcare, which provide a strong foundation for understanding the impact of systems like "August."

Hamet and Tremblay (2017) emphasize the transformative potential of Al in medicine, highlighting its ability to analyze complex datasets and offer diagnostic and treatment recommendations with unparalleled precision.

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Similarly, Bastanlar and Ozuysal (2014) discuss the evolution of machine learning algorithms, which underpin Al applications by enabling them to learn and adapt to diverse healthcare scenarios.

The capability of Al to assist in medical imaging has been demonstrated by Haenssle et al. (2018), who compared the diagnostic accuracy of a deep-learning convolutional neural network with that of dermatologists. This study underscores Al's role in augmenting humar that resonates wi analysis feature.

Further, Deo (2015) explores the potential of machine learning in medicine, particularly its applications in predictive modeling and personalized medicine. This aligns with August's ability to provide tailored health recommendations based on individual medical histories.

The ethical challenges surrounding Al in healthcare are highlighted by Jha and Topol (2016), who call for transparency in Al algorithms and equitable access to these technologies. These concerns are relevant to the implementation of August, as it deals with sensitive health data and requires strict compliance with privacy regulations.

OBJECTIVES

- To provide personalized health recommendations based on user data.
- To ensure easy access to healthcare information and resources.
- To offer educational resources for informed health decisions.
- To make the app intuitive and user-friendly for all ages.
- To prioritize user privacy and compliance with regulations.

RESEARCH METHODOLOGY

Primary Data:
Primary data was collected through Google Forms from 101 respondents.

Secondary Data:
Secondary data was collected through various books, magazines, journals & articles, etc

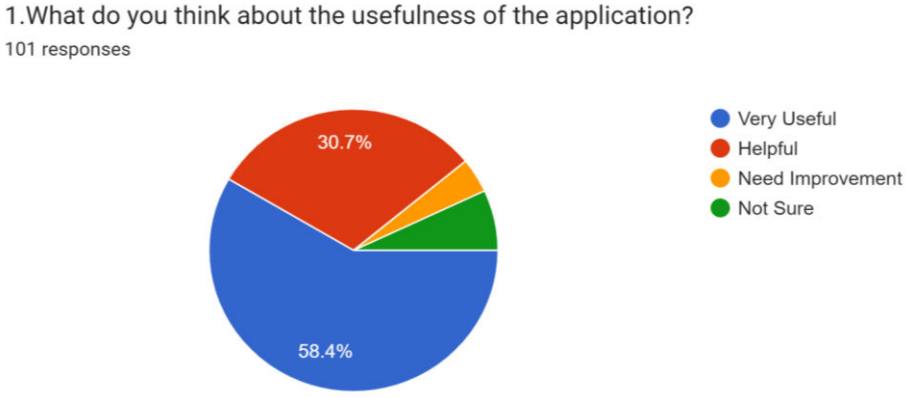
DATA ANALYSIS & INTERPRETATION

Table No 1

Particulars (age)	No. of Respondents	%
0-18	31	30.7%
19-30	59	58.4%
31-45	7	6.9%
45 to above	4	4%
Total	101	100%

Table No 2

Gender	No. Of Respondents	%
Male	37	36.6%
Female	64	63.4%
Others	0	0%
Total	101	100%



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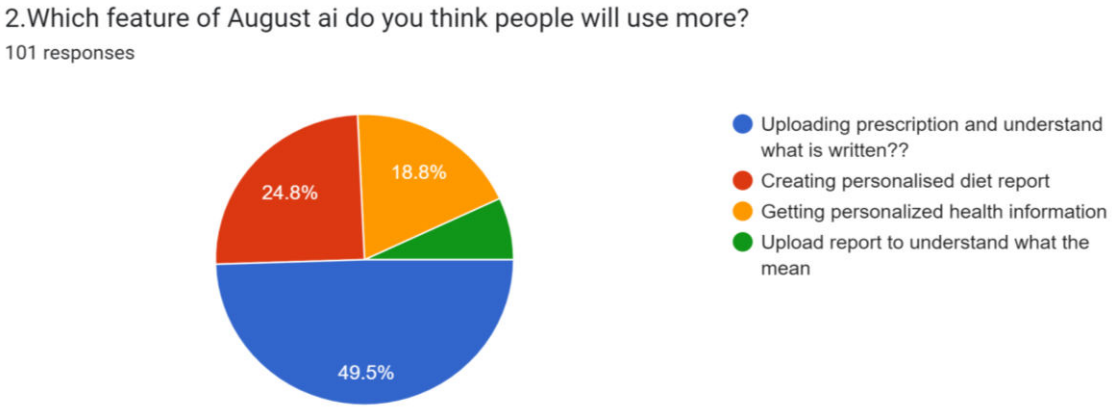
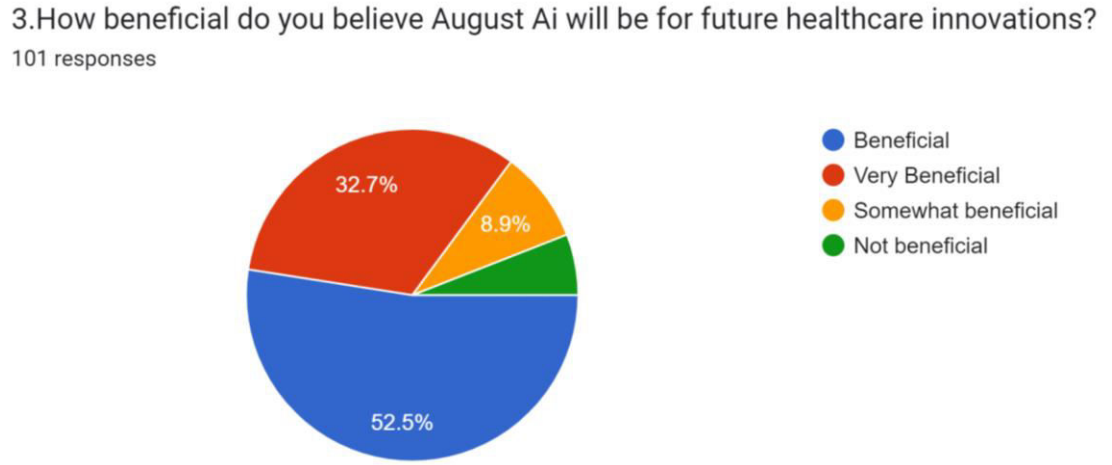
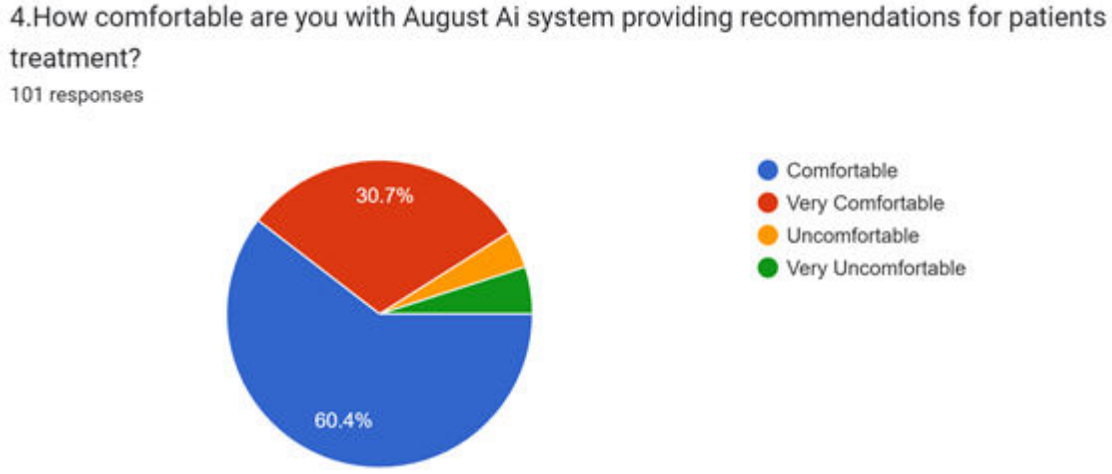
Interpretation:-According to the pie chart, 58.4% of respondents find the application very useful, 30.7% find it helpful, while smaller portions believe it needs improvement or is not sure about its usefulness.



Interpretation:- According to the pie chart, 49.5% of respondents believe that the most used feature of August AI will be uploading prescriptions to understand what is written, followed by 24.8% for getting personalized diet reports, 18.8% for creating personalized health information, and 6.9% for uploading reports to understand their meaning.



Interpretation:- According to the pie chart, 52.5% of respondents believe it is Beneficial, 32.% respondents believe that it's very beneficial 8.9% of respondents believe that it's useful, respondents believe that 5.9% respondents believe that is not beneficial.



Interpretation: The pie chart is about how comfortable people are with the August AI system providing recommendations for patient treatment. Out of 101 responses, 60.4% of people feel comfortable, 30.7% feel very comfortable, and 8.9% feel uncomfortable. There's also a small portion that isn't categorized.

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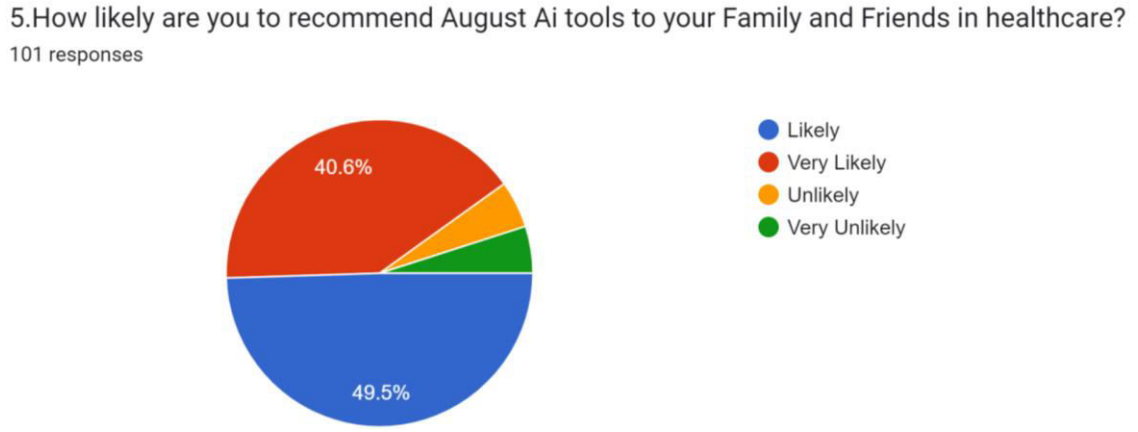

The interpretation pie chart is about how likely people are to recommend August AI tools to their family and friends in healthcare. Out of 101 responses, 49.5% of people are likely to recommend it, 40.6% are very likely, and 9.9% are dislikely. There is no category for "very dislikely."

FINDINGS

1. The majority of the respondents heard about August AI.
2. Family and friends give experts' advice as a reliable source related to August AI.
3. As per the data gathered we discovered the majority of respondents are familiar with this August Ai bot in WhatsApp.
4. As per the data we discovered most of the respondents have chosen to upload prescriptions and getting information through August AI.
5. The majority of respondents influence others to use August Ai.

CONCLUSION

The emergence of AI applications like August marks a transformative shift in the healthcare sector, demonstrating the potential to enhance patient experiences and improve health outcomes significantly. As we have explored throughout this paper, August is not merely a technological novelty but a practical tool that addresses some of the most pressing challenges in modern healthcare.

First and foremost, the ability of August to accurately read and interpret doctor prescriptions is a vital advancement. Misinterpretations of prescriptions can lead to medication errors, which pose serious risks to patient safety. By employing sophisticated natural language processing algorithms, August minimizes the likelihood of these errors, ensuring that patients receive the correct medications and dosages. This capability is particularly crucial in an era where polypharmacy where patients take multiple medications is increasingly common, especially among the elderly population. Through its intelligent parsing of prescriptions, August helps bridge the gap between complex medical jargon and patient understanding, fostering better adherence to treatment plans and ultimately enhancing patient safety.

Furthermore, the provision of personalized health-related suggestions is a remarkable feature of August. By analyzing a patient's medical history, current medications, and lifestyle factors, the application can generate tailored recommendations that cater to individual health needs. This personalized approach is aligned with the principles of precision medicine, which seeks to customize healthcare based on the unique characteristics of each patient. As we move away from one-size-fits-all solutions, tools like August pave the way for more effective interventions, encouraging patients to make informed lifestyle choices that align with their health conditions.

In addition to prescription reading and personalized suggestions, August's ability to analyze health reports represents another significant advantage. With the increasing volume of health data generated from various sources such as lab results, imaging reports, and wearables navigating this information can be overwhelming for both patients and healthcare providers. August's analytical capabilities enable it to synthesize this data, providing insights that may not be immediately apparent. For instance, by identifying trends in lab results over time, the application can alert patients to potential health issues before they escalate, promoting proactive healthcare management.

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Despite the numerous advantages of AI applications like August, it is essential to acknowledge the challenges and ethical considerations that accompany their implementation. Data privacy and security are paramount concerns, particularly given the sensitive nature of health information. Patients must trust that their data is handled responsibly and in compliance with regulations such as HIPAA. Additionally, the algorithms used by AI applications must be transparent and unbiased to avoid perpetuating existing inequalities in healthcare. As we continue to develop and deploy these technologies, stakeholders must prioritize ethical considerations to build trust and ensure equitable access to AI-driven healthcare solutions.

In summary, the AI application August demonstrates the capacity for transformation of technology in healthcare. By improving prescription accuracy, providing personalized health suggestions, and analyzing complex health data, August enhances patient care and empowers individuals to take charge of their health. However, to realize the full potential of AI in healthcare, we must remain vigilant about ethical considerations and prioritize collaboration among all stakeholders. As we continue to explore and harness the capabilities of AI, applications like August will undoubtedly play a pivotal role in shaping the future of healthcare, making it more efficient, informed, and patient-centered.

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RETARGETING WITH META ADVANTAGE+ VS. MANUAL AUDIENCES: TACTICAL MEDIA BUYING COMPARISON

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ABSTRACT
This document investigates the strategic distinctions between Meta's Advantage+ retargeting system and manual audience configuration in the realm of digital media purchasing. The main goal is to assess the efficacy, productivity, and strategic compromises between these two methods of retargeting in Meta's advertising landscape. By performing a comparative analysis of campaign performance metrics, user segmentation strategies, and optimization techniques, the research employs both quantitative measures (e. g., return on ad spend, cost per acquisition) and qualitative observations from industry applications. The approach consists of a blend of performance benchmarking, case study examinations, and interviews with digital marketers currently employing both strategies. Results show that although Meta Advantage+ provides enhanced automation, scalability, and user-friendliness especially advantageous for extensive audience targeting and urgent campaigns manual audience segmentation still possesses merit for targeted niches, brand management, and high-intent retargeting. The study highlights the necessity of aligning retargeting strategies with campaign objectives, budget levels, and audience specifics. This document adds to the ongoing discussion regarding AI-driven advertising, offering practical insights for marketers aiming to find a balance between automation and strategic control in Meta's ever-changing advertising environment.

Key words: *Retargeting Strategies, Digital media Buying, Audience Segmentation, Market Automation, Performance Optimization*

INTRODUCTION
As digital advertising increasingly becomes data-oriented and automated, marketers confront an essential choice between platform-driven insights and manual oversight. A notable instance of this transition is Meta's Advantage+ advertising suite, which leverages machine learning to streamline audience targeting, creative experimentation, and budget distribution. Specifically, Advantage+ Retargeting has emerged as a significant resource for advertisers looking to reconnect with users who have previously engaged with their brand. Simultaneously, numerous advertisers continue to depend on manual audience segmentation to maintain fine-tuned control over who views their ads, the frequency of exposure, and the situational context.

Retargeting continues to be a fundamental aspect of performance marketing, especially within sectors such as e-commerce, SaaS, and direct-to-consumer brands, where re-engagement tactics greatly influence conversion rates and return on ad spend (ROAS). As Meta advances toward AI-driven automation, doubts arise about whether Advantage+ genuinely surpasses conventional manual targeting or merely provides convenience at the expense of accuracy.

To investigate this dynamic, the current study conducts a comparative examination of Meta Advantage+ and manual audience selection in terms of their respective strengths, weaknesses, and contextual efficacy in media purchasing. While Meta Advantage+ promises streamlined processes, decreased operational complexity, and algorithmic accuracy, manual targeting is still applicable to campaigns that need granular control, contextual awareness, and audience-specific messaging.

The study is organized around a mixed-methods design, combining quantitative performance measures like cost per acquisition (CPA), return on ad spend (ROAS), and click-through rates (CTR) with qualitative findings from case studies and practitioner interviews. Through analysis of campaigns in various industries and goals, this paper seeks to find patterns that indicate when automation works best—and when strategic human intervention produces superior results.

It provides practical advice for advertisers walking the balancing acts between scale and accuracy, efficiency and detail, as they work to apply retargeting efforts that serve business objectives as well as audience intentions in a shifting advertising landscape.

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LITERATURE REVIEW

1. Meta's Automation Push and the Rise of Advantage+ (Meta Business, 2023)
Summary: Meta Business (2023) emphasizes how Advantage+ utilizes AI to streamline audience targeting, budget distribution, and creative enhancement.

It seeks to enhance campaign effectiveness, minimize manual configuration, and increase ROAS—particularly for e-commerce brands. Although the tool demonstrates remarkable results in wide-ranging campaigns, it provides restricted transparency, which raises issues regarding control over audience choice and delivery.

2. **A Comparison of Automated vs. Manual Targeting in Social Media Advertising (Journal of Digital Marketing, 2022)**
Summary: This peer-reviewed research indicated that automated systems decreased setup time by 45% and excelled in broader campaigns. Nonetheless, campaigns characterized by narrow, interest-based segmentation exhibited improved performance when configured manually. The research highlights context as a crucial element in determining the effectiveness of the two strategies.

3. The Impact of AI on Ad Campaign Performance (Statista + Emarketer, 2023)
Summary: According to Emarketer, 67% of advertisers employing AI-driven targeting noted a reduction in CPA over a six-month period, yet only 40% believed they had complete clarity regarding audience definitions. The balance between efficiency and transparency emerges as a consistent issue, particularly for mid-market advertisers.

4. Retargeting Strategy in the Cookieless Era (Harvard Business Review, 2023)
Summary: Amid heightened privacy regulations and diminished third-party data, retargeting techniques have adapted. This article observes that automated systems like Advantage+ are better equipped to cope with signal loss through the use of first-party data and lookalike modeling, while manual approaches may find it challenging to scale in such settings.

5. Case Study: Manual vs. Advantage+ in DTC Brands (AdWeek Intelligence Report, 2024)
Summary: An evaluation of five DTC brands revealed that Meta Advantage+ yielded more robust outcomes in campaigns aimed at rapid scaling but did not perform as well in audience segments that required in-depth customer knowledge. This supports the notion that manual segmentation still holds strategic importance, even amidst the trend toward automation.

RESEARCH PROBLEM

As Meta progressively incorporates artificial intelligence into its advertising ecosystem, features like Advantage+ promise enhanced performance through automation. Nonetheless, this transition prompts a significant question for media buyers: does the automation provided by Meta Advantage+ yield superior results compared to the manual development of retargeting audiences, or does it compromise precision and strategic oversight for ease of use? Despite widespread implementation, there is still a deficiency of thorough comparative studies assessing the tactical distinctions between automated and manual retargeting techniques—especially regarding cost-effectiveness, audience precision, campaign scalability, and return on ad spend (ROAS). This paper responds to the necessity for empirical evaluation and strategic direction to assist advertisers in selecting the most efficient retargeting method within Meta's platform, according to campaign objectives and audience intricacy.

OBJECTIVES

1. To evaluate the effectiveness of Meta Advantage+ retargeting versus manual audience retargeting by utilizing key metrics such as return on ad spend (ROAS), cost per acquisition (CPA), and click-through rate (CTR).
2. To assess the compromises between automation and manual oversight in audience targeting, emphasizing customization, transparency, and campaign enhancement.
3. To determine optimal strategies for selecting between Meta Advantage+ and manual audiences according to campaign objectives, budget constraints, and audience intricacy.

RESEARCH METHODOLOGY

Research methodology is the systematic approach of planning, execution, and analysis of research work pertaining to the study.

1. The research is of a Descriptive and Analytical in nature.

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2. The population constitutes digital marketers and media buyers using Meta Ads Manager to execute campaigns across several industries.
3. The sample taken consisted of 72 respondents actively working in digital advertising.
4. The Stratified Sampling Technique was followed in order to have representations from different sectors, including e-commerce, services, and consumer brands.
5. Primary data was collected through a structured questionnaire sent via Google Forms.
6. Secondary data were accrued from research articles, industry reports, Meta documentation, and credible digital marketing websites.
7. All data collected were subjected to scrutiny and editing, followed by classification and tabulation for meaningful analysis.

HYPOTHESIS

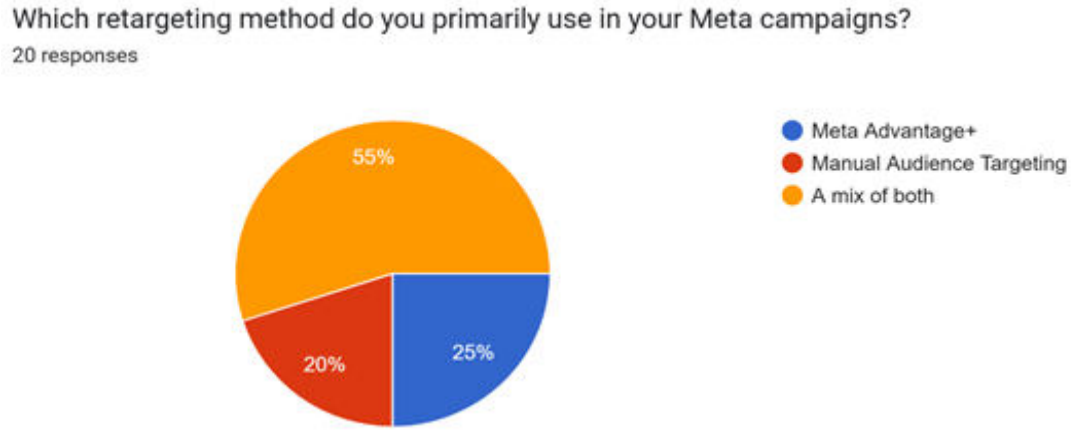
H01 There is no significant difference in terms of efficiency, cost per acquisition (CPA), and return on ad spend (ROAS) between Meta Advantage+ and manual audience targeting on campaigns that are broad targeting and high scale.

Ha1 There is a significant difference in terms of efficiency, cost per acquisition (CPA), and return on ad spend (ROAS) between Meta Advantage+ and manual audience targeting on campaigns that are broad commanding and high scale.

H02: There is no significant difference between Meta Advantage+ and manual audience targeting on performance for niche or high-intent audience segments.

Ha2: There is a significant difference between Meta Advantage+ and manual audience targeting on performance for niche or high-intent audience segments.

DATA ANALYSIS AND INTERPRETATION



1. Which retargeting method do you primarily use in your Meta campaigns?

Interpretation: The majority (55%) of those surveyed utilize a combination of Meta Advantage+ and Manual Audience Targeting, suggesting a liking for blending automation with manual oversight. Just 25% depend exclusively on Meta Advantage+ and 20% on manual targeting, demonstrating a movement toward hybrid approaches in Meta campaigns.

2. What is your biggest challenge when using manual audience targeting?

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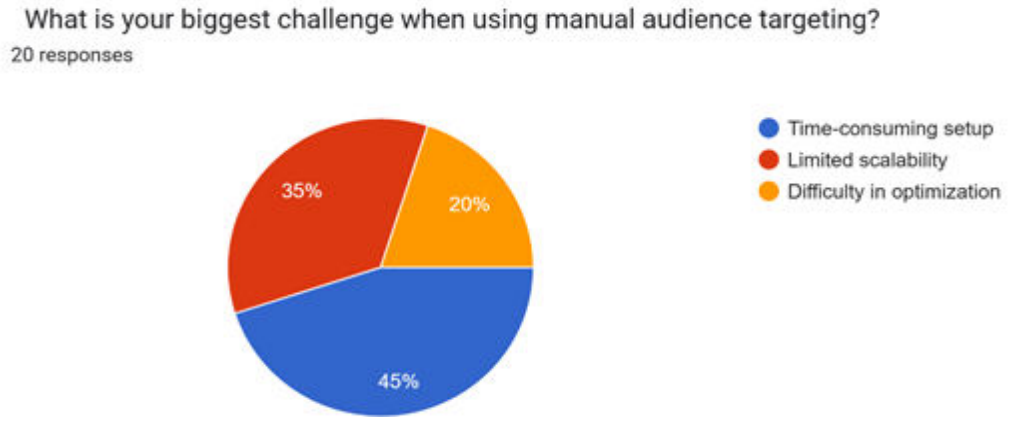
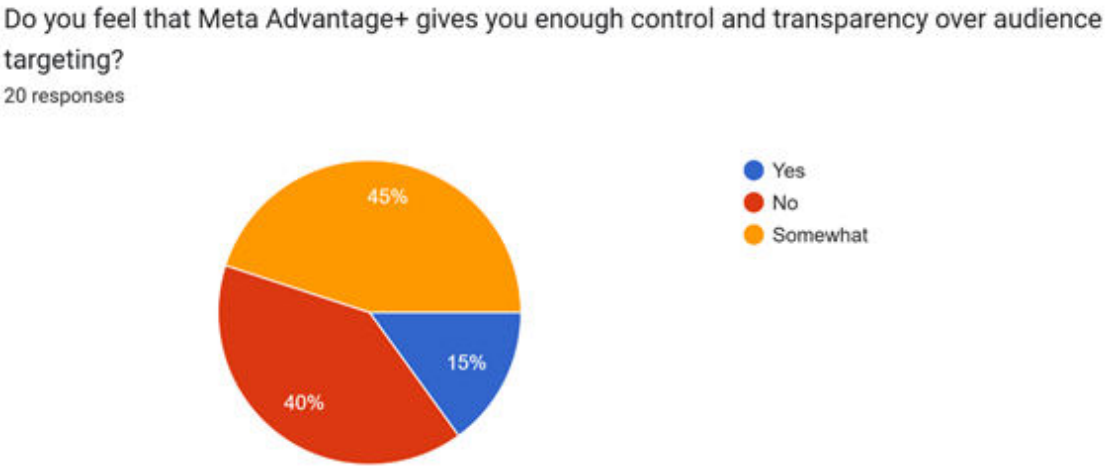
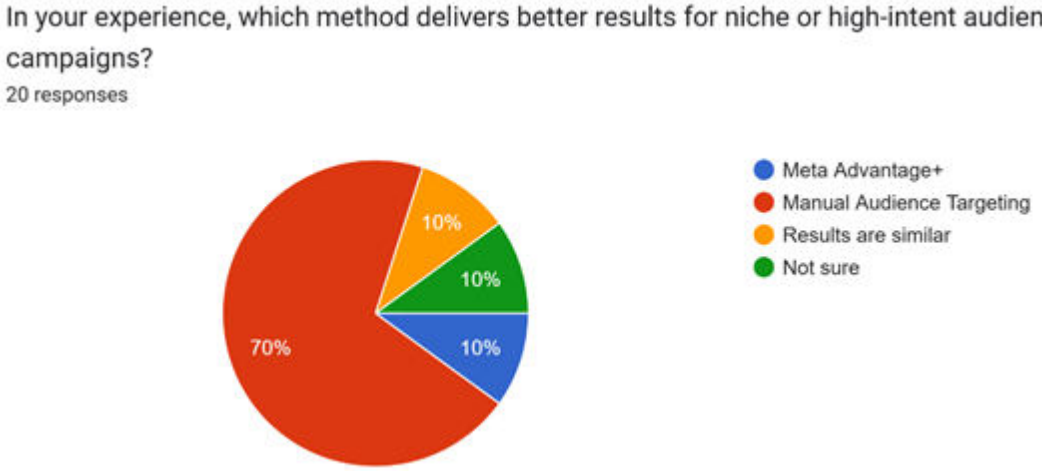


Interpretation: The primary difficulty with manual audience targeting is the *time-intensive setup* (45%), succeeded by *restricted scalability* (35%) and *challenges in optimization* (20%). This emphasizes that although manual targeting provides control, it frequently falls short in terms of efficiency and scalability.

3. Do you feel that Meta Advantage+ gives you enough control and transparency over audience targeting?



Interpretation: Only *15%* of the participants believe that Meta Advantage+ offers sufficient control and transparency. In contrast, *40%* responded with *no, and 45%* answered with *somewhat*. This indicates that although Meta Advantage+ presents automation, a considerable number of users feel it falls short in providing the control and clarity that manual approaches deliver.



4. In your experience, which method delivers better results for niche or high-intent audience campaigns?

FINDINGS

1. 55% of advertisers surveyed indicate a hybrid approach that combines Meta Advantage+ with manual targeting would be their preferred strategy, suggesting an automation-strategy mix.

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2. A mere 25% insist on using Meta Advantage+ in complete disregard of other possibilities; 20% will trust manual targeting exclusively, demonstrating a refusal to rely exclusively on either method.
3. Setup of the audience manually is the challenge with the slowest speed (45%) for one set of problem, then comes with limited scalability (35%) that follows, and 20% seeks optimization of such a set of intents.
4. Only 15% of respondents think Meta Advantage+ gives good transparency and control; 45% are somewhat satisfied, while 40% outright feel it lacks transparency.
5. 60% of respondents agree that manual targeting works better in niche/high intent campaigns, supporting some level of audience granular control therein also.
6. A good case for Meta Advantage+ is its ability to scale broad and high-volume campaigns at speed-for lower CPA, really great at the scalability and efficiency desert of concern.
7. The trade-off between control and convenience is repeated. Advantage+, while reducing operational complexity, restricts custom audience configurations as well.
8. Advertisers say that they want some automation to be customizable, asking for features that let them input strategy alongside algorithmic support.
9. The results show that campaign objectives and audience complexity significantly determine which retargeting strategy is used; there is no one-size-fits-all solution.
10. The overall responded area demonstrates a preference for an integrated approach.

SUGGESTIONS

1. **Improve Transparency Features:**
- Meta should deliver clearer insights regarding how Advantage+ chooses and fine-tunes audiences.

2. **Provide More Manual Overrides:**
- Allow advertisers the capability to adjust or exclude specific audience segments within Advantage+.

3. **Enhance Reporting Granularity:**
- Divide performance by audience types, placements, and creative combinations for more thorough analysis.

4. **Inform Users with Best Practices:**
- Provide in-platform tutorials or workshops on optimizing control within Advantage+ without compromising performance.

5. **Create a Hybrid Mode:**
- Launch a setting where users can combine automation with selective manual inputs for added flexibility.

6. **Collect Feedback Continuously:**
- Establish a feedback loop from advertisers to improve Advantage+ features based on actual user needs.

CONCLUSION

This study aimed to investigate the effectiveness and tactical distinctions between Meta's automated Advantage+ campaigns and traditional manual audience targeting within the framework of retargeting strategies. Through a review of existing literature, analysis of the industry, and primary data gathered through surveys, several important insights have surfaced.

Meta Advantage+ signifies a considerable advancement in campaign automation, delivering speed, scalability, and enhanced performance metrics, particularly in broad targeting scenarios. Its optimization driven by machine learning alleviates the demands of manual configurations, enabling advertisers to swiftly initiate high-volume campaigns. Nevertheless, in spite of these benefits, a significant number of marketers remain wary of completely depending on automation.

Manual audience targeting, although requiring more effort and being harder to scale, still provides unparalleled precision, transparency, and control—attributes that are particularly important in specialized or high-intent campaigns. Survey feedback indicates that while numerous advertisers adopt a blend of both approaches, serious concerns persist about the lack of control and clarity associated with Advantage+.

The results suggest that a blended strategy is presently the preferred approach among digital advertisers. This enables them to take advantage of automation's efficiency while preserving control over essential audience segments. Therefore, the future of media purchasing on platforms such as Meta may not involve choosing one

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tactic over the other, but rather integrating both to attain strategic adaptability, operational efficiency, and peak performance.

As digital advertising continuously develops in light of data privacy reforms and algorithmic innovations, platforms need to concentrate on creating tools that empower advertisers with both automation and oversight. Meta has the chance to close the divide by enhancing the transparency and customizability of Advantage+, ensuring that it acts not only as a time-efficient tool but also as a strategic resource for media purchasers.

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THE ROLE OF GREEN FINANCE IN SUPPORTING SUSTAINABLE WETLAND ECOSYSTEM SERVICES AND CLIMATE ADAPTATIONS

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ABSTRACT
Wetlands play a vital role in climate change adaptation by providing essential ecosystem services including flood regulation, water purification, and carbon sequestration. This study examines the role of green finance in supporting sustainable wetland ecosystem services and advancing climate adaptation strategies. Utilizing a qualitative research design and a multiple case study approach, the research explores global applications of green finance mechanisms such as biodiversity bonds, wetland mitigation banking, and urban ecological restoration.

Findings indicate that green finance holds significant potential in mobilizing funds for wetland conservation and long-term environmental sustainability. In the Indian context, case studies like the restoration of Pallikaranai Marsh in Tamil Nadu and urban wetland initiatives in Chennai demonstrate the feasibility of integrating financial innovation into ecological preservation. However, various challenges impede progress, including the complexity of financial instruments, difficulties in measuring environmental impacts, inconsistent regulatory frameworks, limited public awareness, and a tendency to prioritize short-term climate actions over long-term conservation goals.

To strengthen the role of green finance in India's wetland conservation, the study recommends simplifying financial tools, enhancing performance measurement systems, reinforcing regulatory mechanisms, increasing community awareness, and encouraging long-term investments. These strategies can enhance the effectiveness of green finance, promoting resilient ecosystems and sustainable climate adaptation pathways.

Key Words - *Climate change, Wetland, Green Finance*

INTRODUCTION
Climate change stands as one of the most pressing challenges humanity faces today. The year 2023 was recorded as the warmest since global records began in 1850. The Intergovernmental Panel on Climate Change (IPCC) attributes this warming primarily to human activities, especially the emission of greenhouse gases. Between 2011 and 2020, the global surface temperature rose by approximately 1.1°C compared to the 1850–1900 average. The total human-induced temperature increase from 1850–1900 to 2010–2019 is estimated to be between 0.8°C and 1.3°C.

The consequences of climate change are evident worldwide, manifesting as extreme weather events. Notably, vulnerable communities, which have contributed the least to climate change, are disproportionately affected. Approximately 3.3 to 3.6 billion people live in areas highly susceptible to climate-related impacts.

To stabilize the climate, the IPCC's Sixth Assessment Report emphasizes the necessity of reducing net carbon emissions to zero. In response, over 90 countries have pledged to achieve net-zero emissions. India aims to reach net-zero carbon emissions by 2070 and has committed to reducing its emissions intensity by 45% by 2030 relative to 2005 levels. Achieving these goals requires minimizing human-induced emissions and offsetting any remaining emissions by removing equivalent amounts of carbon from the atmosphere.

This transition necessitates rapid technological advancements, including the adoption of energy-efficient production methods, transitioning to cleaner transportation fuels, and halting deforestation.

Wetlands, where land and water ecosystems converge, rank among the Earth's most productive environments. They offer numerous socio-economic, cultural, and environmental benefits. According to the Ramsar Convention, over a billion people globally depend on wetlands for their livelihoods.

Often termed the "kidneys of the landscape," wetlands naturally filter water and waste from both natural and human sources. They play a crucial role in stabilizing water supplies, thereby mitigating floods and droughts. Wetlands purify polluted waters, protect shorelines, and replenish groundwater aquifers. Dubbed "nature's supermarkets," they support extensive food chains and rich biodiversity. Additionally, wetlands contribute to nutrient cycling, sediment transfer, and nutrient retention and export.

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In the fight against climate change, wetlands are invaluable as they absorb carbon dioxide from the atmosphere. Peatlands, a type of wetland, store twice as much carbon as all the world's forests combined. Although wetlands cover only about 9% of the Earth's surface, they store up to 35% of terrestrial carbon.

Despite their importance, wetlands face threats from human activities. Sustainable management of wetlands is essential, yet challenges persist, notably insufficient funding. Large-scale rehabilitation programs often lack the necessary financial resources, and many countries struggle to allocate adequate funds for wetland management.

Green finance emerges as a potential solution to fund wetland conservation. While there's no universally accepted definition, green finance encompasses financial activities—such as investments, banking, and insurance—designed to promote better environmental outcomes. This includes various financial instruments like loans, debt mechanisms, and investments aimed at supporting environmentally friendly projects or reducing the environmental impact of conventional projects.

By leveraging green finance, we can mobilize the necessary resources to protect and restore wetlands, ensuring they continue to provide their vital services and contribute to climate change mitigation.

REVIEW OF LITERATURE

Climate change is causing global temperatures to rise, which can disrupt natural systems and release stored greenhouse gases, worsening the problem. Wetlands, both natural and man-made, are sensitive to these changes. Shifts in temperature and rainfall patterns can affect the amount of greenhouse gases they emit, their water levels, and the variety of life they support. Protecting and restoring wetlands is crucial because they help absorb carbon dioxide from the atmosphere, making them vital in efforts to combat climate change.

Research has explored ways to enhance the carbon storage capacity of wetlands. Some methods involve expanding wetland areas, while others focus on modifying specific features within wetlands. Key factors influencing a wetland's ability to store carbon include the types of plants present, water levels, and overall ecological conditions. By restoring degraded wetlands and implementing effective management practices, we can increase their capacity to capture carbon and reduce greenhouse gas emissions.

Green finance plays a significant role in supporting environmentally friendly projects like renewable energy, electric vehicles, and conservation efforts. However, in India, challenges such as unclear definitions, lack of awareness, and insufficient incentives hinder the growth of green finance. Financial institutions often view green projects as risky and less profitable, making them hesitant to invest. Additionally, the absence of reliable data and standardized reporting practices makes it difficult to assess the environmental impact of these projects. To address these issues, it's essential to develop clear policies, build institutional capacity, and create financial incentives that encourage investment in sustainable initiatives.

Studies in countries like Malaysia and Indonesia have highlighted similar challenges, including the risk of "greenwashing" due to vague definitions and regulations. To promote genuine green financing, these countries need stronger regulatory frameworks. Research also indicates that investors are more likely to support green bonds when they have access to reliable information about the environmental impact and transparency of the projects involved. In developing countries, coordinated policies and increased research are necessary to effectively advance green finance and support sustainable development.

OBJECTIVES OF THE STUDY

- To assess the role of wetlands in the climate change adaptation.
- To examine the role of green finance in enhancing wetland ecosystem services.
- To explore the challenges and barriers in mobilizing green finance.

RESEARCH METHODOLOGY

This study adopts a qualitative research design, using a multiple case study approach to explore how green finance mechanisms have been applied to support wetland conservation globally. The research is exploratory and descriptive, aimed at identifying patterns, outcomes, and lessons from existing projects.

CASE STUDIES

In December 2024, the Republic of Ecuador, in collaboration with The Nature Conservancy (TNC), the U.S. International Development Finance Corporation (DFC), the Inter-American Development Bank (IDB), and Bank of America, finalized a significant debt conversion to support the Amazon Biocorridor Program to conserve the part of Amazon forest which is in the Ecuadorian region. The programme aims to improve the management of already protected wetland and forest area of 4.6 million hectares in addition to that 1.8 million hectares additional areas it also includes 18000 km of rivers.

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To achieve this, bonds worth $1.53 billion were refinanced which will generate $800 million in net fiscal savings for Ecuador by 2035. It is projected to allocate around $460 million towards the conservation of terrestrial and freshwater ecosystems. A new $1 billion bond that matures in 2042, arranged by Bank of America, $1 billion in political risk insurance from DFC, and a $155 million partial credit liquidity guarantee from the IDB are all part of the debt conversion's financial structure. Together, these tools made the refinancing process easier and allowed Ecuador to allocate significant funds to conservation initiatives.

However the indigenous leaders were ignorant about the bond conversion and they raised the concern over exclusion of indigenous people from the planning and decision making process of Amazon Biocorridor Programme. Need for transparency.

Seychelles, a small country in Africa, is very rich in its coastal and marine resources. However in 2008, the country faced a severe financial crisis and ended up with a lot of national debt. This made it difficult for the government to invest in marine and coastal resources. The government realized that the country's prosperity is dependent on its marine resources, therefore needed the fund to protect their blue economy. Seychelles came up with a creative solution by engaging in a debt-for-nature swap. This means they agreed to reduce part of their national debt (about $21.6 million) in exchange for commitments to protect their natural resources, especially their marine environment. The debt reduction allowed Seychelles to focus more on conserving their marine life without worrying as much about the debt.Prince of Wales Charitable Trust, Private creditors were involved in the deal. In 2018 Seychelles also launched the world's first sovereign blue bond, which is essentially a type of loan where the country raised $15 million from international investors to fund marine conservation projects. Proceeds from the bonds were used to expand the marine protected areas. The Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) was created to manage and allocate the funds that came from the debt-for-nature swap, ensuring that the money was used in a transparent and effective manner to support marine and coastal conservation projects. Through this deal, Seychelles not only took significant steps toward environmental sustainability, but also demonstrated to the world how financial markets and conservation efforts could intersect.

The Netherlands is naturally at risk from climate change because a large part of the country is below sea level. It is protected by structures like dikes, levees, and seawalls. From time to time, large floods hit the country, causing serious damage and even loss of lives. Apart from having technological solutions, the nation has also heavily invested in climate change adaptation. The government issued green bonds of 5.98 billion euros. These were the one of the largest green bonds issued in the world. The Dutch government has taken the initiative of 'Room for the River.' The goal of this programme is to give more room to the river so that it will be able to process a higher amount of water. The Room for the River project in the Netherlands helps protect people from floods. Instead of building higher walls, the government decided to give rivers more space to flow when water levels rise. They did this by moving dikes back, lowering the land near rivers, and creating extra paths for water to spread out safely. This not only keeps the country safer during heavy rains but also makes the areas around rivers nicer for nature and for people to enjoy. Funds raised through green bonds will help to finance such projects which ensures sustainability.

In 2024, BBVA Colombia, in partnership with the International Finance Corporation (IFC) and IDB Invest, launched a pioneering biodiversity bond to finance conservation and habitat restoration projects in Colombia. The total amount was $70 million, which were equally subscribed by IDB invest and IFC. The main purpose of these biodiversity bonds was reforestation and regeneration of forests, degraded land, wetlands and wildlife habitat restoration.

Environmental Impact Bonds(EIBs) were used by the US for the protection and restoration of Louisiana's Coastal areas. These bonds provided capital for environmental protection from private investors. EIBs are an innovative mechanism which operates on a pay for success model. Returns to the investors are dependent upon the environmental benefits.

To protect Hangzhou Bay, a national waterpark in Ningbo city, China against typhoons and droughts, the China Pacific Insurance Company, with Swiss Re and other partners developed a parametric insurance solution. The sum assured in this insurance policy is based on the Gross Ecosystem Product (GEP) of Hangzhou Bay Wetland Park. The value of GEP is measured using replacement and restoration cost and carbon sink. The parametric nature of the insurance allowed for swift disbursement of funds following qualifying events, enabling prompt restoration efforts and minimizing ecological damage.

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CHALLENGES USING GREEN FINANCE

1. Green financing tools such as biodiversity bonds or environmental impact bonds are very complicated and confusing. Due to their complex structure investors will hesitate to invest in such bonds as they will not have an understanding of how their money will be used and returned.
2. Measuring the success of a project will also be a complicated task as it is challenging to quantify the value of the restored wetlands.
3. In many places, regulations around green finance and environmental projects are unclear or inconsistent, making it difficult for organizations to plan and execute conservation efforts effectively.
4. Funding often goes to projects that show quick results, like installing solar panels. Wetland conservation, which may take longer to show benefits, can be overlooked, even though it's crucial for long-term environmental health.

CONCLUSION

Green finance mechanisms, such as biodiversity bonds, wetland mitigation banking, and urban restoration projects, have demonstrated potential in supporting wetland conservation globally. In India, initiatives like the restoration of Pallikaranai Marsh in Tamil Nadu and urban wetland projects in Chennai showcase the feasibility of integrating green finance into conservation efforts. However, challenges persist, including complex financial structures, difficulties in measuring environmental benefits, inconsistent regulations, limited public awareness, and a preference for immediate climate solutions over long-term conservation projects.

RECOMMENDATIONS FOR INDIA

1. **Simplify Financial Instruments:** Develop user-friendly financial products tailored to India's context, ensuring they are accessible to a broad range of investors and stakeholders.
2. **Enhance Measurement Frameworks:** Establish standardized methods to assess the environmental benefits of wetland conservation, facilitating transparent reporting and accountability.
3. **Strengthen Regulatory Frameworks:** Implement clear and consistent policies that support green finance initiatives, providing a stable environment for investment.
4. **Increase Public Awareness:** Launch educational campaigns to highlight the importance of wetlands and the role of green finance in their conservation, garnering public support.
5. **Promote Long-Term Investments:** Encourage investments in projects that offer long-term ecological and economic benefits, shifting focus from short-term climate mitigation efforts.

By addressing these challenges and implementing these recommendations, India can enhance the effectiveness of green finance in wetland conservation, contributing to sustainable environmental management and resilience against climate change.

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A STUDY ON IMPACT OF AI IN TEACHING & LEARNING WITH REFERENCE TO STUDENTS & TEACHERS

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ABSTRACT
Education is evolving rapidly with the integration of AI, transforming traditional teaching and learning methods. AI is revolutionizing classrooms through smart tutoring systems, adaptive learning platforms, automatic grading, and personalized content creation. These technologies enhance learning experiences by customizing them to individual needs, improving engagement, academic results, and accessibility for students, including those with disabilities. Teachers benefit from AI tools that assist with lesson planning, classroom management, and data-driven insights into student performance, allowing them to focus more on creativity and personal connections. Despite its advantages, AI in education raises concerns like data privacy and over-reliance on technology. The balance between leveraging AI's potential and preserving the human aspect of education remains crucial for its successful implementation.

Keywords: *Artificial Intelligence, Education, Students, Teachers, Personalized Learning, Educational Technology.*

INTRODUCTION
This explores how artificial intelligence is transforming teaching and learning. AI enhances education by providing personalized learning experiences through adaptive platforms, intelligent tutoring systems, and virtual assistants, which cater to individual learning styles, improve engagement, and enable data-driven academic interventions. For teachers, AI streamlines administrative tasks like grading and attendance, offering valuable insights into student progress and curriculum effectiveness, allowing them to focus on creative and impactful teaching methods. While AI presents numerous benefits, its integration also raises challenges, including ethical concerns, data privacy, infrastructure limitations, and the need for teacher training. Addressing these challenges is crucial to ensuring AI's potential is fully realized, making education more efficient, inclusive, and tailored to learners' needs.

The study highlights key challenges in AI-driven education, including ethical concerns like data privacy and bias, the risk of weakening student-teacher interactions, and the need for infrastructure, teacher training, and policymaking. While AI enhances innovation and efficiency, it must be balanced with traditional teaching methods to preserve creativity, empathy, and critical thinking. Responsible adoption can create a more inclusive and adaptive learning environment, guiding educators and policymakers toward effective AI integration.

OBJECTIVE
1. **To Explore the Role of Artificial Intelligence in Education:** Examine how AI-driven tools and technologies contribute to personalized learning experiences, enhance instructional efficiency, and improve overall outcomes for both educators and students.
2. **To Analyze Benefits and Challenges:** Identify the advantages that AI offers in educational settings, such as automating routine tasks and leveraging data for informed decision-making. Simultaneously, address potential concerns, including ethical considerations, infrastructure requirements, and the necessity of equipping educators with appropriate skills.
3. **To Propose Effective Integration Strategies:** Recommend practical methods for incorporating AI into educational institutions. Focus on achieving a harmonious balance between technological advancements and the essential human element in teaching and learning practices.

LITERATURE REVIEW
1. ***The Impact of AI on Teaching and Learning in Higher Education Technology by Singh, Satya Vir; Hiran, Kamal Kant:*** Artificial Intelligence (AI) has transformed higher education by enabling flexible and accessible learning for students, anytime and anywhere. AI algorithms provide personalized feedback on assessments, helping students improve their performance. This study explores the role of AI in enhancing teaching and learning in higher education, while also examining the impact of emerging technologies on student learning and institutional practices. It highlights how advancements in technology can shape the future of education, emphasizing the benefits AI brings to administration, student support.

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2. ***Impact Of Artificial Intelligence (AI) On Teaching And Learning In India's Higher Education Sector R. Venugopal, V. Mamatha :*** AI is revolutionizing education in India by enhancing quality, accessibility, and learning outcomes. It enables personalized learning tailored to individual student needs, adaptive assessments with customized feedback, and intelligent tutoring systems for targeted support. AI-driven chatbots offer 24/7 assistance, while learning analytics help educators track progress and refine strategies. Virtual and augmented reality tools create immersive learning experiences to simplify complex subjects. However, for AI to fully realize its potential, challenges like infrastructure limitations, costs, ethical concerns, data privacy, and equitable access must be addressed to ensure its benefits reach all institutions and communities.
3. ***Potential of Artificial Intelligence for Transformation of the Education System in India.Jaiswal, Akanksha; Arun. :*** AI is transforming education in India, shifting schools from traditional methods to smart learning experiences. This study explores how Indian ed-tech companies integrate AI into teaching, focusing on machine learning, personalized learning, and Bloom's taxonomy. Interviews with four AI experts and four senior managers from leading ed-tech firms reveal AI's benefits, including personalized learning, recommendation systems, and adaptive assessments, which support both students and teachers. However, the study also highlights a gap between expert insights and industry strategies, indicating unexplored opportunities in AI applications. These findings are crucial for shaping the future of education in emerging economies.
4. ***Educators' perspective on artificial intelligence: equity, preparedness, and development:*** This study examines educators' perceptions of AI in education, revealing a generally positive outlook on its potential benefits for teaching and learning. However, it also uncovers that many teachers feel unprepared and lack clear guidance from their institutions regarding AI implementation. The research underscores the importance of fostering a dialogue between AI tool developers and educators to address concerns and ensure responsible development.
5. ***Impact of Artificial Intelligence on Teacher Education Singh, Vinay and Ram, Surendra****:* This literature review explores both the opportunities and challenges of AI in education. It acknowledges AI's potential to personalize learning, automate administrative tasks, and enhance accessibility. However, it also raises concerns about data privacy, potential biases in algorithms, the risk of reduced human interaction, and the importance of addressing the digital divide to ensure equitable access to AI-powered educational resources

RESEARCH METHODOLOGY

Data Collection Process

- **Survey Method:** Primary data was collected through an online Google Forms survey.
- **Question Format:** Included structured multiple-choice and open-ended questions.
- **Participants:** 52 respondents (students and teachers from diverse educational backgrounds).
- **Sampling Method:** Convenient sampling was used for easy participation.
- **Survey Topics:** Covered AI awareness, benefits and challenges, effects on skills, academic performance, teaching methods, and perspectives on AI's future in education.

RESEARCH METHODOLOGY

- **Identifying Data Sources:** Used credible sources like peer-reviewed journals, books, industry reports, government publications, and online repositories (e.g., JSTOR, ResearchGate).
- **Data Collection:** Summarized academic articles, extracted statistical data, and reviewed theoretical frameworks on AI in education.
- Identified adoption trends and compared insights across studies for a balanced perspective.
- **Findings Documentation:** Highlighted AI's advantages for students and teachers, ethical concerns, infrastructural challenges, and proposed strategies for effective integration.

AI is revolutionizing education by enhancing both teaching and learning experiences. Unlike traditional methods reliant solely on human effort, AI employs advanced technologies to deliver personalized learning, streamline administrative tasks, and provide precise analytics for improved outcomes.

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This research explores AI's transformative role in education, focusing on its impact on both students and teachers.

POSITIVE EFFECTS OF AI IN EDUCATION

1. **Personalized Learning:** AI enables adaptive learning tailored to each student's strengths, weaknesses, and learning style.
2. **Administrative Efficiency:** Automates tasks like grading, attendance tracking, and progress monitoring, freeing teachers to focus on pedagogy.
3. **Improved Insights:** AI-powered analytics help educators identify trends in student performance, enabling targeted interventions.
4. **Accessibility:** AI assists diverse learners, including students with disabilities, making education more inclusive.
5. **Innovative Resources:** Intelligent tutors and virtual assistants create interactive and engaging learning experiences.

NEGATIVE IMPACTS OF AI IN EDUCATION

1. **Over-reliance on Technology**: Excessive dependence on AI may weaken human interactions in classrooms, reducing emotional connections between teachers and students.
2. **Privacy Concerns:** AI systems collect and process student data, raising ethical issues related to security and privacy.
3. **Unequal Access:** The digital divide could hinder AI adoption in disadvantaged regions, exacerbating educational inequalities.
4. **Teacher Training Challenges:** Educators need specialized training to effectively implement AI into their teaching practices.

The future of AI in education is bright, powered by developments in adaptive learning platforms, intelligent tutoring systems, and virtual classrooms. AI will play a greater role in assisting students and teachers by providing customized experiences and optimized processes. As education systems integrate AI tools, they are likely to focus on inclusivity, security, and ethical AI design.

Although AI has immense power to change education, technology must always be kept in balance with human-led instruction. Overcoming challenges such as bias, privacy, and accessibility will be paramount to ensuring equal and effective use of AI in learning spaces. With the right implementation, AI will be able to redefine instruction and learning, leading to a more innovative and effective education system.

HYPOTHESIS

Null Hypothesis (H_0): AI adoption in education significantly impacts teacher productivity, student engagement, and traditional teaching methods.

Alternative Hypothesis (H_1): AI adoption in education does not significantly impact teacher productivity, student engagement, or traditional teaching methods.

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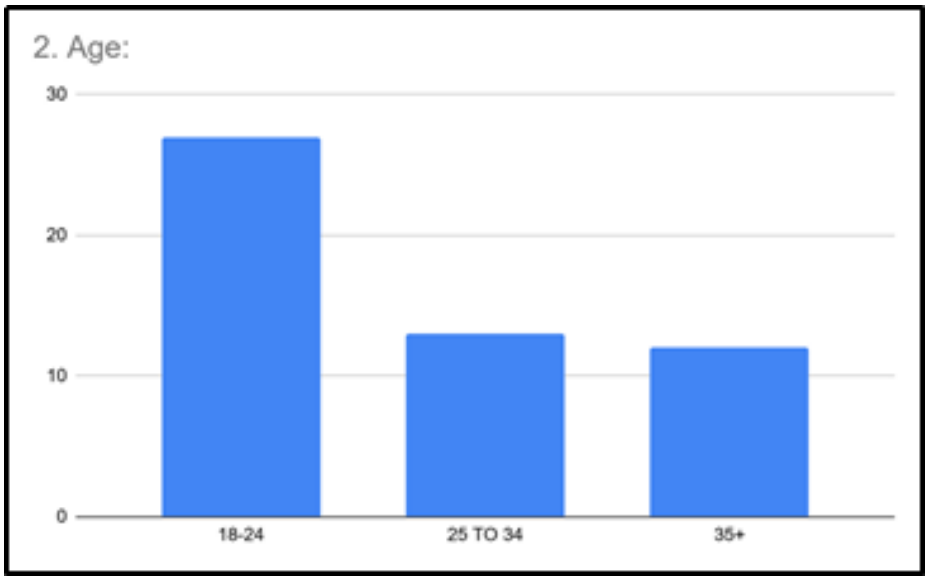
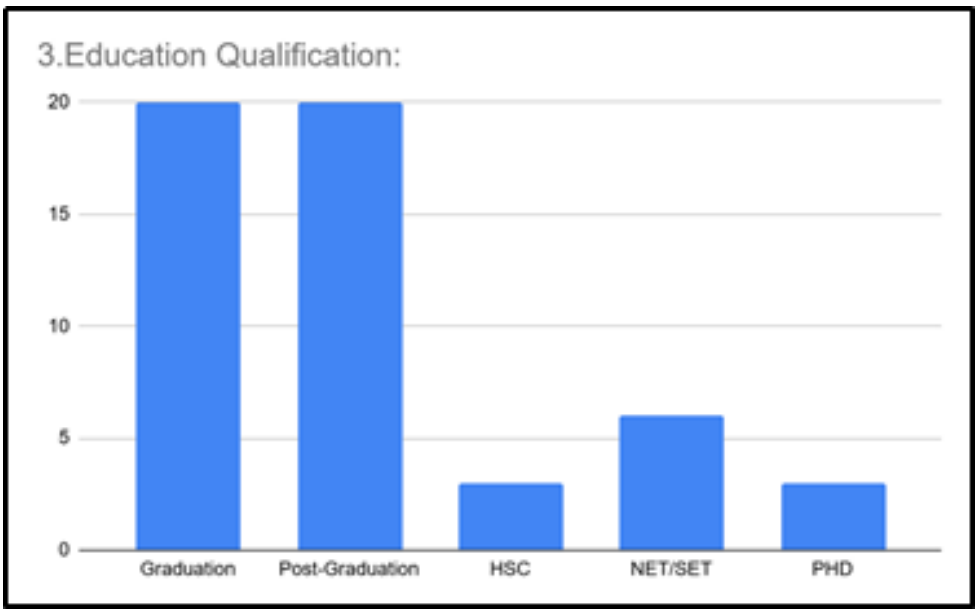
DATA ANALYSIS

» AGE:



- The 18-24 age group has the highest representation, with nearly 30 individuals.
- The 25-34 age group comes next, with around 15 individuals.
- The 35+ age group has the lowest count, at approximately 10 individuals. From this data, it seems that the majority of individuals fall into the younger age range (18-24), indicating either a youthful population or a focus on a younger demographic.

» EDUCATION QUALIFICATION



- Graduation and Post-Graduation have the highest number, with 20 individuals each.
- NET/SET qualification follows, with 10 individuals.
- HSC (Higher Secondary Certificate) and PhD holders have the lowest representation, each with 5 individuals.

From this data, it appears that most individuals have attained at least a Graduation or Post-Graduation level of education, while relatively fewer have pursued advanced qualifications like PhD or NET/SET.

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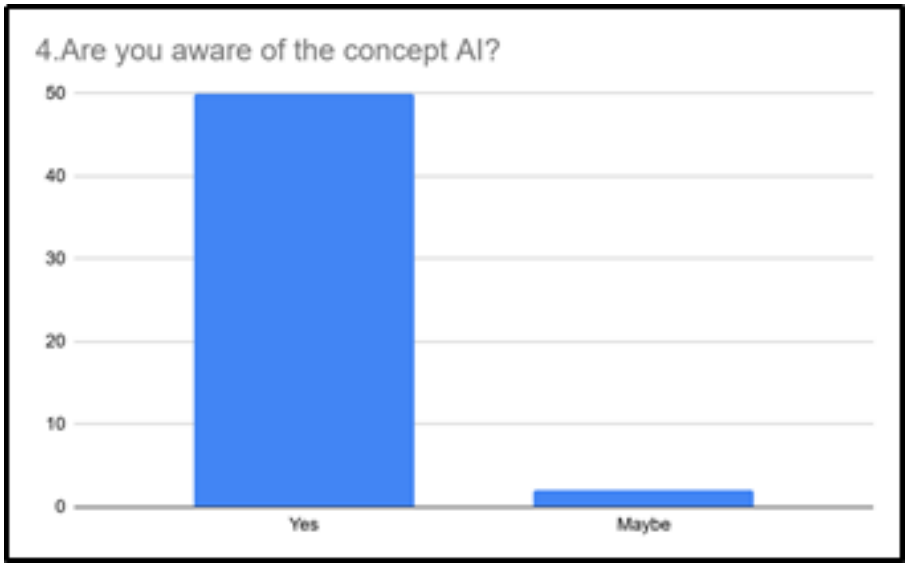
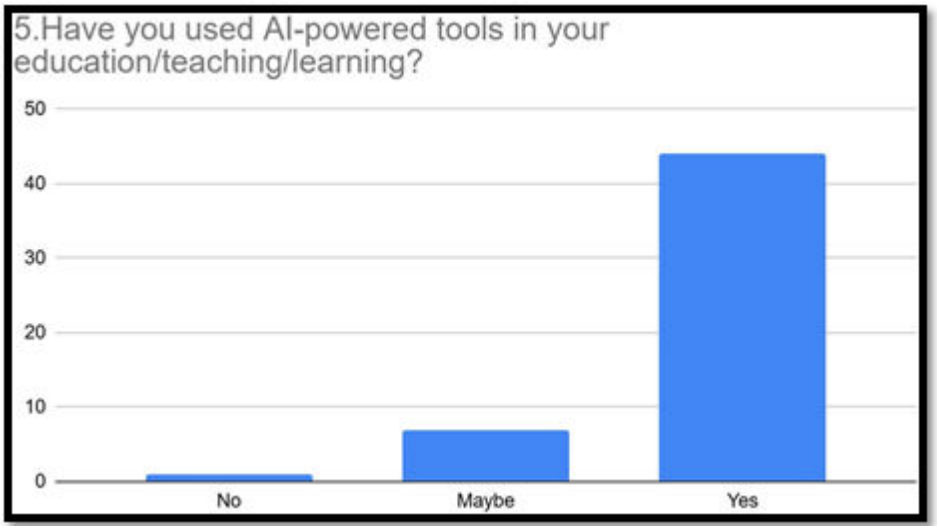
» Are you aware of the concept AI?



- "Yes" — This bar reaches 50, indicating that a significant number of respondents are familiar with AI.
- "Maybe" — This bar is very small, suggesting that only a few respondents are uncertain about AI.
- From this data, it's clear that AI awareness is quite high among the surveyed group, with very few unsure about the concept.

» Have you used AI-powered tools in your education/teaching/learning?



- "No" — This bar is quite short, indicating that very few respondents have not used AI-powered tools.
- "Maybe" — This bar is moderately tall, showing that some individuals have used AI-powered tools but are unsure about their extent.
- "Yes" — This is the tallest bar, with around 40 respondents, demonstrating that the majority have actively incorporated AI tools into their learning or teaching.

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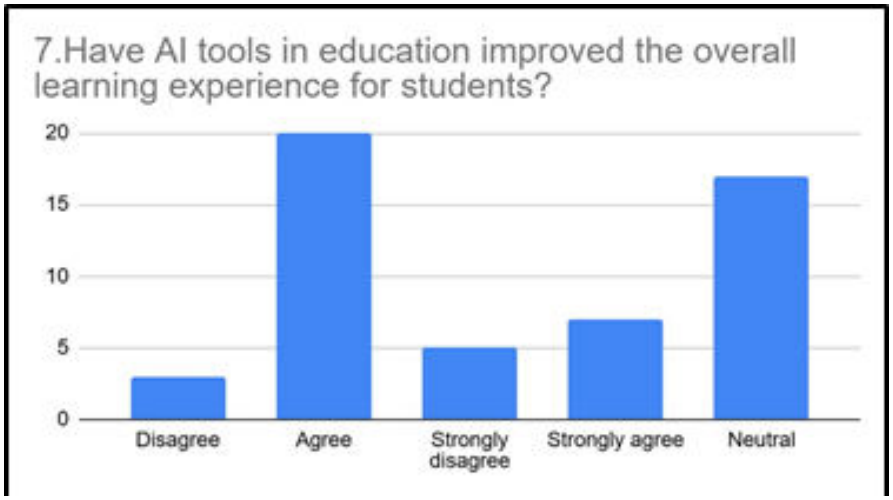
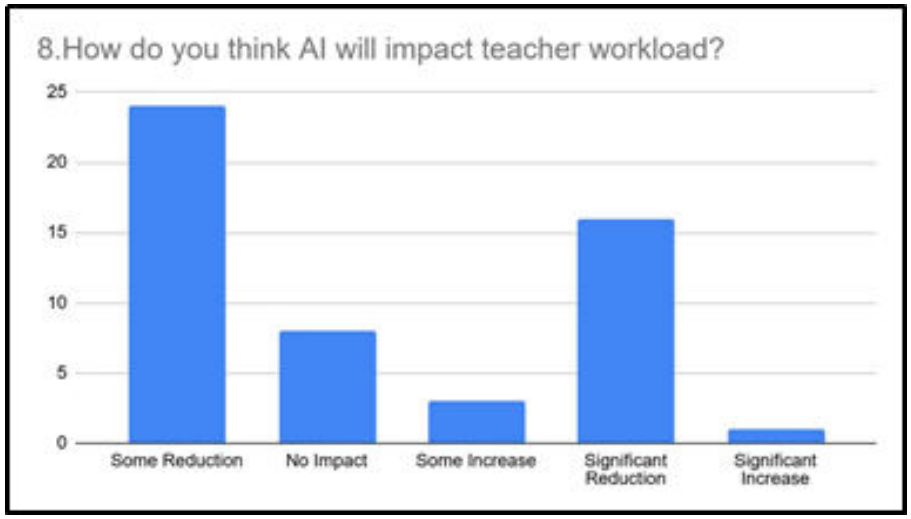


- Disagree — Around 3 respondents, indicating a small group believes AI hasn't significantly enhanced learning.
- Neutral — About 15 respondents, showing many are uncertain about AI's impact.
- Agree — The largest group, with 20 respondents, expressing confidence that AI has contributed positively to education.
- Strongly agree — Approximately 7 respondents, reflecting strong support for AI's effectiveness in learning.
- Strongly disagree — Around 5 respondents, signifying a small number who feel AI has negatively affected education.

Overall, most respondents acknowledge AI's role in improving learning, though some remain neutral or skeptical.

» **How do you think AI will impact teacher workload?**



This bar graph illustrates survey responses to the question:

- **"Some Reduction"** — The highest number of respondents (24) believe AI will somewhat reduce the workload of teachers.
- **"No Impact"** — About 10 respondents think AI won't change teacher workload at all.
- **"Some Increase"** — Only 2 respondents feel AI will slightly increase workload.
- **"Significant Reduction"** — Around 18 respondents anticipate a major decrease in teacher workload due to AI.
- **"Significant Increase"** — Just 1 respondent believes AI will greatly increase teacher workload.

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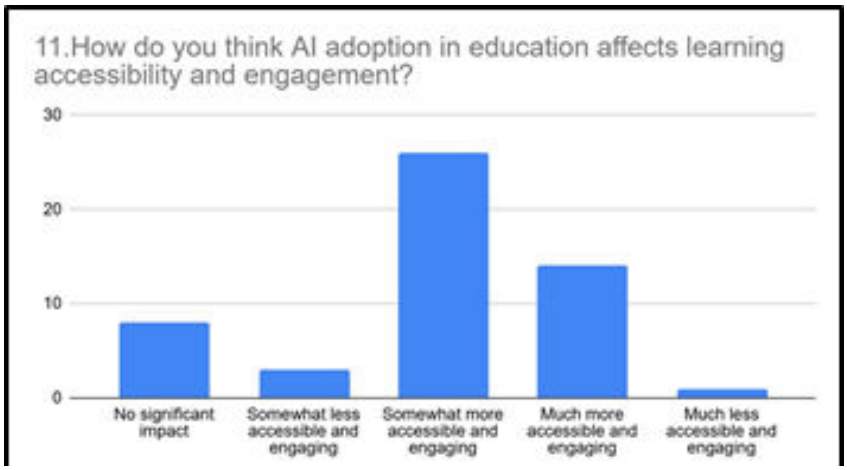
From this, it's clear that most people expect AI to lighten teacher responsibilities rather than add to them.

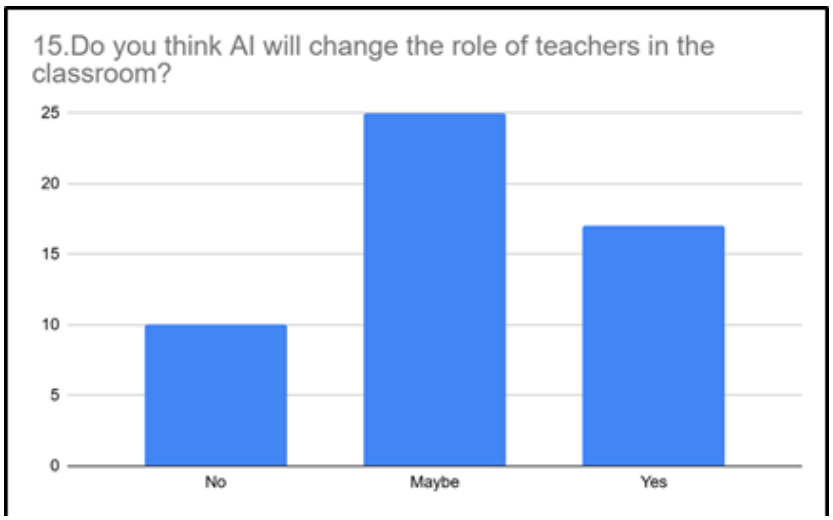
» **How do you think AI adoption in education affects learning accessibility and engagement?**



This bar graph illustrates responses to the question "How do you think AI adoption in education affects learning accessibility and engagement?" Here's what the data suggests:

- **No significant impact** — Around 7 respondents believe AI does not meaningfully affect accessibility or engagement.
- **Somewhat less accessible and engaging** — About 5 respondents feel AI might negatively impact these aspects.
- **Somewhat more accessible and engaging** — The largest group, with 25 respondents, sees AI as enhancing education accessibility and engagement.
- **Much more accessible and engaging** — Approximately 15 respondents believe AI provides significant benefits.
- **Much less accessible and engaging** — Just 3 respondents feel AI makes learning harder to access or less engaging

» **Do you think AI will change the role of teachers in the classroom?**



This bar chart represents responses to the question "Do you think AI will change the role of teachers in the classroom?" it suggests:

- **"No"** — This bar is the shortest, with around 10 respondents, indicating a small group believes AI won't alter teachers' roles.
- **"Maybe"** — This is the tallest bar, reaching approximately 25 respondents, showing that many people are uncertain but acknowledge potential changes.
- **"Yes"** — This bar stands at about 17 respondents, indicating a significant number believe AI will

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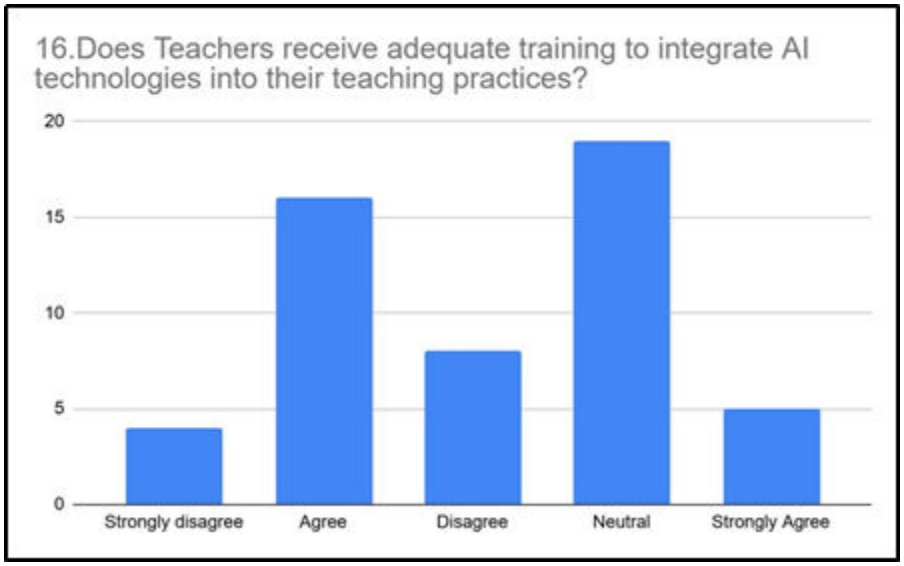
» **Does Teachers receive adequate training to integrate AI technologies into their teaching practices?**
From this data, it seems that most respondents are open to the idea that AI might impact teaching, though there's still uncertainty.



This bar graph displays responses to the question "Do teachers receive adequate training to integrate AI technologies into their teaching practices?" the data indicates:

- **Strongly disagree —** Around 5 respondents believe training is highly insufficient. ● Disagree — 10 respondents feel that AI training for teachers is lacking.
- **Neutral —** The largest group, with 18 respondents, indicates uncertainty or mixed opinions.
- **Agree —** 15 respondents believe teachers are receiving adequate AI training.
- **Strongly agree —** Again, only 5 respondents fully support the effectiveness of current training programs.

This suggests that while some teachers feel prepared to integrate AI, many are either uncertain or believe more support is needed.

CONCLUSIONS AND FINDINGS

1. **Technology Supports, Not Replaces, Humans:**
   - AI is designed as a tool to enhance human capabilities rather than replace them entirely.
   - While AI may perform certain tasks efficiently, there is no true comparison between AI and human cognition, creativity, and emotional intelligence.
2. **AI Integration for Efficiency and Accuracy:**
   - AI should be integrated within structured frameworks to ensure its efficiency and accuracy rather than exploited recklessly.
   - Proper guidelines and training are necessary to maximize AI's benefits while maintaining ethical practices.
3. **Teachers Remain Essential Despite AI Advancements:**
   - AI cannot fully replace teachers, as educators must understand and leverage AI effectively to guide students.
   - The role of a teacher extends beyond knowledge delivery—it includes mentorship, emotional support, and real-world application of learning.
4. **Concerns About AI Encouraging Laziness Among Students:**
   - Some students may become overly reliant on AI tools like ChatGPT, choosing quick answers over deep research and critical thinking.
   - Encouraging responsible AI use is crucial to maintaining active engagement in learning.

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5. **AI Can Make Learning More Engaging:**
   - AI-driven interactive tools, gamified content, and AI-generated videos can make education more dynamic and immersive.
   - When used correctly, AI can boost motivation, creativity, and personalized learning experiences.
6. **Balanced Approach to AI in Education:**
   - AI should be used as a supportive tool, complementing traditional teaching rather than replacing fundamental learning methods.
   - Finding the right balance between AI-enhanced efficiency and human-guided education will be key in shaping future learning environments.

FINAL THOUGHTS

AI holds incredible potential for enhancing education, but its use must be strategic, ethical, and guided by humans. While AI can improve accessibility, engagement, and productivity, it should never overshadow the human touch that makes learning truly impactful. Proper AI training for educators and mindful AI usage among students will be essential to ensuring technology remains a valuable asset rather than an obstacle in education.

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IMPACT OF AI AND AUTOMATION ON IT EMPLOYEES: DEMOGRAPHICS, WORK DYNAMICS, AND SKILL DEVELOPMENT

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ABSTRACT
This research paper investigates the transformative impact of automation and artificial intelligence (AI) on work dynamics and wage structures within the information technology (IT) sector. The study addresses key objectives by providing an in-depth analysis of the evolving nature of work, changes in skill requirements, shifts in compensation models, employee perspectives, and avenues for up-skilling. The study also explores how the introduction of AI is shaping work dynamics in the IT sector. As organizations increasingly integrate AI technologies, this research aims to uncover the redefined roles, tasks, and responsibilities for employees. Understanding the nuances of this transformation is essential for comprehending the evolving nature of work in the digital era. The study also involves assessing the changes in skill requirements resulting from the integration of AI. The IT sector, being at the forefront of technological advancements, witnesses a significant shift in the skills demanded of its workforce. The study delves into identifying and analyzing the specific competencies, including data science, machine learning, and algorithmic proficiency, that are becoming increasingly crucial in the context of AI adoption. The study also analyzes the effects of AI introduction on wage disparities and compensation models within the IT workforce. As AI contributes to increased efficiency and productivity, this research aims to investigate whether these advancements exacerbate or alleviate existing wage gaps. The study provides insights into the adaptation of compensation structures to the changing dynamics of work driven by automation and AI. Focuses on examining employee perspectives and well-being in the context of AI implementation. The study delves into the psychological and social aspects of how employees perceive and navigate the evolving work environment shaped by AI. Factors such as job satisfaction, work-life balance, and overall well-being are explored to offer a holistic understanding of the impact of AI on the workforce. It also identifies opportunities for up reskilling and upskilling introduction of AI. Recognizing that AI reshapes job requirements, the study seeks to pinpoint specific areas where investments in training and education can empower IT professionals to stay competitive and adaptable in the digital era.

In conclusion, this research provides a comprehensive examination of how automation and AI are shaping work and wages within the information technology sector. The findings contribute valuable insights for industry practitioners, policymakers, and educators navigating the evolving landscape of the digital workforce.

Keywords: *Automation, AI (Artificial Intelligence), Information Technology Sector.*

1.0 INTRODUCTION

In the rapidly evolving realm of technology, Artificial Intelligence (AI) has become a transformative force that is revolutionizing industries and challenging conventional ideas about work. As AI continues to progress, it introduces numerous possibilities and implications for the future of employment. One of the most impactful ways AI will alter the job landscape is through automation. While this automation offers greater efficiency and cost savings, it also raises concerns about potential job losses. Conversely, AI has the potential to boost productivity and efficiency across different sectors. As some jobs become automated, new opportunities will arise in the AI field itself. Rather than entirely replacing human workers, AI is more likely to enhance human capabilities. This research paper endeavors to comprehensively investigate the multifaceted impact of AI integration on employees working in this critical industry, elucidating the nuanced evolution of work dynamics, skill requirements, compensation structures, employee well-being, and the vast landscape of opportunities for upskilling and reskilling.

AI is taking over routine and repetitive tasks, which is shifting the demand for skills. Positions involving manual or repetitive work are being replaced by AI technologies, while new roles are emerging that require expertise in AI-related fields such as machine learning, data science, and natural language processing. As a result, there is an increasing need for individuals to develop skills in these areas to remain competitive in the job market. AI is revolutionizing the way people learn and acquire new skills. Intelligent tutoring systems, adaptive learning platforms, and personalized recommendation systems are leveraging AI algorithms to tailor learning experiences to individual needs. AI-powered tools can provide personalized feedback, identify knowledge gaps, and suggest relevant learning resources, enabling individuals to learn more efficiently and effectively.

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The advent of AI technologies has been a catalyst in reshaping traditional work dynamics within the Indian IT sector. Our research aims to dissect how the introduction of AI is influencing job roles, team structures, and the overall organizational hierarchy. Through an in-depth analysis, we seek to uncover the ways in which AI is augmenting or disrupting existing workflows and the subsequent implications for employee roles and responsibilities. The integration of AI invariably alters the skill landscape, necessitating an examination of how the skill requirements within the IT sector are evolving. By assessing the changes in demand for both technical and non-technical skills, our research aims to offer insights into the competencies that are becoming increasingly vital for IT professionals in the age of AI, thus guiding efforts towards effective skill development strategies.

As AI becomes an integral part of the IT workforce, it is imperative to scrutinize its impact on wage structures and compensation models. This research endeavors to delve into the effects of AI on wage disparities, exploring whether the introduction of AI exacerbates or mitigates existing compensation inequalities. By understanding the economic implications, we aim to inform discussions on fair remuneration in the AI-driven IT landscape. Beyond quantitative metrics, our study places a strong emphasis on capturing the qualitative aspects of AI implementation, focusing on employee perspectives and well-being. By conducting surveys and interviews, we aim to unearth the sentiments, concerns, and aspirations of IT professionals navigating the transformative journey marked by AI, shedding light on the human side of technological integration. Recognizing the dynamic nature of the IT industry, our research seeks to identify and analyze the opportunities for upskilling and reskilling arising from the integration of AI. Understanding the skill gaps that emerge and exploring effective strategies for continuous learning will be instrumental in equipping the workforce with the capabilities needed to thrive in the AI-driven IT ecosystem.

This research paper aspires to offer a holistic understanding of the impact of AI and automation on employees in the Indian IT sector. By addressing the outlined objectives, we aim to provide actionable insights that contribute not only to academic discourse but also serve as a pragmatic guide for industry stakeholders navigating the profound transformations brought about by AI and automation.

2.0 SWOT ANALYSIS

a. *Strengths:*

Increased Efficiency and Productivity:
AI applications have the ability to automate routine tasks, enabling IT professionals to concentrate on more strategic and creative aspects of their roles. By enhancing efficiency with AI-driven tools, productivity in the IT sector can be significantly increased.

Skill Enhancement and Learning Opportunities:
AI implementation necessitates upskilling and reskilling, providing IT employees with opportunities to enhance their skill sets. Exposure to AI technologies can make employees more competitive in the job market.

b. *Weaknesses:*

Job Displacement and Role Redefinition:
Automation of certain tasks may lead to job displacement for roles that become obsolete.Employees may need to adapt to new roles, causing stress and uncertainty.

Initial Implementation Costs and Technical Challenges:
The adoption of AI technologies might involve substantial upfront investments in infrastructure and training. Additionally, technical challenges like system integration issues could impede the seamless implementation of AI.

c. *Opportunities:*

Innovation and Creative Problem-Solving:
AI can empower IT professionals to engage in more innovative and creative problem-solving. Opportunities for IT employees to contribute to the development and improvement of AI technologies.

New Job Roles and Specializations:
The growth of AI is generating new job opportunities in fields such as AI development, data science, and machine learning. This leads to the creation of specialized roles, providing IT professionals with avenues for career advancement and specialization.

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d. *Threats:*

Job Security Concerns:
The fear of job displacement due to automation and AI can lead to decreased job satisfaction and increased stress among IT employees. Uncertainty about the future of work may impact the overall well-being of the workforce.

Ethical and Privacy Concerns:
The use of AI in the IT sector raises ethical concerns, particularly regarding privacy and data security. Employees may face challenges in navigating the ethical implications of AI applications in their work.

Resistance to Change and Cultural Shifts:
Some employees may resist adapting to AI-driven changes, leading to a cultural clash within organizations. Managing the cultural shift towards embracing AI may pose challenges in terms of employee acceptance and morale.

3.0 REVIEW OF LITERATURE

1. **Jewandah S. (2018)** investigated the impact of artificial intelligence (AI) on the banking sector, focusing on the top four commercial Indian banks. The study delved into the incorporation of machine intelligence in various banking domains, including the adoption of advanced technologies such as block chain, cloud computing, and AI. Despite notable advancements in traditional banking practices, the research emphasized that the full-scale revolution of AI in the banking industry is still evolving, highlighting the continued importance of human interaction in banking processes.
2. **Dipak Kadve (2023),** the author of the research paper “Impact of AI on Employability in India," found that the AI revolution in industries poses a threat to many jobs across different sectors. Although a few positions may vanish due to intelligent automation, critical decision making roles requiring high levels of skill will still rely on human intelligence. This transformation is expected to enhance India's infrastructure and contribute to economic growth in the years ahead. Nonetheless, it is anticipated that certain jobs within specific sectors will disappear within the next 5 to 10 years as a result of AI-driven transformations.
3. **Philippe Aghion (2021),** in his research study "The Direct and Indirect Effects of Automation on Employment," reviewed recent literature and explored various perspectives on how automation directly and indirectly affects employment. He concluded that automation itself is not inherently harmful to employment. By modernizing production processes, automation enhances a firm's competitiveness, allowing them to capture new markets and consequently hire more employees in a globalized economy.
4. **Dr Lokesh G, Dr Geethanjali G (2023):** in this research study, which embarks on a two-fold exploration: firstly, comprehending the intricacies of the human mind and thought processes, followed by the application of machine learning to model these cognitive operations. The scope of artificial intelligence (AI) disruption extends beyond the information technology sector, making it imperative to investigate its impact on the current IT landscape in Bangalore City. Motivated by the evolving influence of AI in the IT industry, this study seeks to scrutinize its broader implications by examining recent advancements in knowledge, methodologies, and sophisticated technologies. A comprehensive understanding of how AI is shaping the entire IT sector necessitates a focused examination of its specific effects. Drawing a sample of 200 individuals from prominent IT firms such as Wipro, Infosys, Oracle, IBM, and TCS, with analysis based on 155 questionnaires, the study discerns the substantial influence of key factors on AI in the information technology sector in Bangalore City. Noteworthy among these factors are the abundance of vast datasets, progress in innovations, and advancements in deep learning. This literature review provides a nuanced exploration of AI's impact on the information technology landscape, offering valuable insights derived from empirical data gathered from significant players in the Bangalore City IT sector.

4.0 GAP ANALYSIS

Through extensive research studies it was found that most of the study was conducted on impact of Artificial Intelligence in general, none of the study focused upon the impact of Artificial Intelligence and Automation on Information Technology Sector and its major parameters like evolution of work dynamics, impact on skill requirement, wage disparities and compensation models, employees perspective and wellbeing and opportunities provided by employers for upskilling and reskilling in the IT sector and how Artificial Intelligence influences the employees in shaping their career and acquiring of those skills to march ahead in IT Sector.

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The IT industry is getting competitive day by day and hence employees need to get acquainted with the updated technology coming up in the field of Artificial Intelligence and Automation. Hence, the researchers major study is focused on these parameters.

5.0 VARIABLES OF THE STUDY

Dependent variable	Independent variables
Evolution of Work Dynamics	Age
Impact on Skill Requirements	Gender
Wage Disparities and Compensation Models	Occupation
Employee Perspectives and Well-being	Education
Opportunities for Upskilling and Reskilling	Income
	Marital status

6.0 SIGNIFICANCE OF THE STUDY

The research study on "Automation and AI: Shaping Work and Wages in the Digital Era with Reference to Employees Working in the Information Technology Sector" holds significant importance due to its exploration of various aspects related to the evolving landscape of work dynamics in the era of automation and artificial intelligence (AI). This research study is pivotal in comprehending the multifaceted impacts of automation and AI on work and wages in the information technology sector. The findings have the potential to inform policies, guide businesses in talent management, and empower individuals to thrive in an era of digital disruption. The study contributes significantly to the broader discourse on the future of work and the well-being of those navigating the evolving landscape of technology-driven industries.

7.0 PROBLEM STATEMENT

In the rapidly advancing landscape of the Information Technology (IT) sector, the integration of Automation and Artificial Intelligence (AI) is fundamentally reshaping work dynamics and compensation structures. This transformative shift presents a myriad of challenges and opportunities that demand a comprehensive investigation. The problem at the heart of this research lies in understanding and addressing the multifaceted impacts of automation and AI on the workforce within the IT sector.

8.0 SCOPE OF THE STUDY

The study aims to investigate how automation and AI technologies are restructuring employee's roles and wage patterns within the Information Technology sector. It will explore the impact on skill requirements, job satisfaction, and wage equity, providing insights into the evolving dynamics of work in the digital era. The scope encompasses analyzing policy implications, identifying best practices, and forecasting future trends to inform stakeholders about the challenges and opportunities posed by technological advancements.

9.0 RATIONALE OF THE STUDY

The study addresses a pressing concern in today's economy by examining the profound impact of automation and AI on the IT sector workforce. By focusing on work dynamics and wage structures, it provides valuable insights into the transformative effects of technology on employment and income within this crucial industry. Through empirical research analysis, it aims to inform policymakers, industry leaders, and employees about the implications and opportunities arising from technological advancements. Ultimately, the study contributes to a deeper understanding of the challenges and strategies necessary to navigate the digital era's workforce landscape.

10.0 OBJECTIVES OF THE STUDY

1. To analyze the demographic composition of IT industry employees.
2. To investigate the effects of automation and AI on IT employees, focusing on shifts in work dynamics, skill demands, wage distributions, employee well-being, and opportunities for upskilling and reskilling.
3. To analyze the influence of demographic variables across automation and AI.

11.0 HYPOTHESIS OF THE STUDY

H_{01}-There is no significant difference in parameters influencing AI (Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models, Employee Perspectives and Well-being & Opportunities for Upskilling and Reskilling) across various demographic groups, including (Gender, Age, Marital Status, Qualification, Work Experience & Income).

H_{11}-There is a significant difference in parameters influencing AI (Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models, Employee Perspectives and Well-being &

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Opportunities for Upskilling and Reskilling) across various demographic groups, including (Gender, Age, Marital Status, Qualification, Work Experience & Income).

12.0 RESEARCH METHODOLOGY

In this investigation, primary data form the crux of the research, acquired through a meticulous process of questionnaire administration. Collaborative discussions with both employers and employees within the Information Technology (IT) industry facilitated the development of pertinent questions aligning with the research objectives.

A targeted sample size of 200 individuals was selected from prominent IT entities, namely Wipro, Infosys, Oracle, IBM, and TCS. These participants were instrumental in providing insights crucial to the study's objectives. The questionnaire, designed with careful consideration, garnered a total of 200 valid responses, forming the basis for thorough analysis in this research endeavor.

Sampling method: Convenience sampling

Sample Size: 200

Sample area: Mumbai city

13.0 DATA ANALYSIS AND TESTING OF HYPOTHESIS

1. Demographic profile of the respondent

Table 1: Gender wise analysis

		Frequency	Percent
Valid	Male	108	54.0
	Female	92	46.0
	Total	200	100.0

Source: Primary data

Interpretation:
Table 1 presents gender distribution. The data shows a relatively balanced representation, with 54% male and 46% female employees among the 200 surveyed, indicating a moderate gender diversity within the IT sector workforce.

Table 2: Age wise analysis

		Frequency	Percent
Valid	21-30	64	32.0
	31-40	84	42.0
	41-50	36	18.0
	More than 50	16	8.0
	Total	200	100.0

Source: Primary data

Interpretation:
The majority falls within the 31-40 age range (42%), followed by those aged 21-30 (32%). A smaller percentage is in the 41-50 category (18%), and 8% are over 50, indicating a predominantly mid-career and young professional demographic in the IT sector.

Table 3: Marital Status wise analysis

		Frequency	Percent
Valid	Married	140	70.0
	Unmarried	60	30.0
	Total	200	100.0

Source: Primary data

Interpretation:
Table 3 the data suggests a predominantly married workforce, constituting 70% of the surveyed IT sector employees. Conversely, 30% are unmarried, reflecting a mix in marital status within the industry. This insight may contribute to understanding the potential influence of marital status on work dynamics and attitudes towards automation and AI.

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Table 4: Educational qualification wise analysis

		Frequency	Percent
Valid	Undergraduate/ Diploma	4	2.0
	Graduate/ Degree	68	34.0
	Postgraduate/ Masters	108	54.0
	Doctorate/ Ph.D.	20	10.0
	Total	200	100.0

Source: Primary data

Interpretation:
Table 4, the majority hold postgraduate degrees or masters (54%), followed by graduates with degrees (34%). A smaller percentage have doctorate or Ph.D. qualifications (10%), while only 2% have undergraduate or diploma qualifications. This distribution highlights a well-educated workforce within the IT sector, with a significant emphasis on postgraduate education.

Table 5: Years of Experience wise of analysis

		Frequency	Percent
Valid	Less than 5 years	44	22.0
	5- 10 years	68	34.0
	More than 10 years	88	44.0
	Total	200	100.0

Source: Primary data

Interpretation:
Table 5, the data showcases a balanced distribution. Employees with more than 10 years of experience constitute the largest group at 44%, followed by those with 5-10 years (34%) and less than 5 years (22%). This suggests a diverse workforce in terms of experience levels within the IT sector, potentially influencing perspectives on the impact of automation and AI based on varying career spans.

Table 6: Annual Income wise of analysis

		Frequency	Percent
Valid	Less than 5 Lacs	76	38.0
	5- 10 lacs	60	30.0
	More than 10 lacs	64	32.0
	Total	200	100.0

Source: Primary data

Interpretation:
Table 6, the distribution indicates a varied income landscape. The majority of employees earn less than 5 lacs, constituting 38%, followed by 30% earning between 5-10 lacs, and 32% earning more than 10 lacs. This income diversity within the IT sector workforce may play a role in shaping perspectives on the impact of automation and AI, considering the range of financial experiences.

Table 7: Test of Normality

Sr.No.	Particulars	K.S.	S.W.
1	Evolution of Work Dynamics	0.00	0.00
2	Impact on Skill Requirements	0.00	0.00
3	Wage Disparities and Compensation Models	0.00	0.00
4	Employee Perspectives and Well-being	0.00	0.00
5	Opportunities for Upskilling and Reskilling	0.00	0.00

Source: Authors Compilation

Interpretation:
It can be interpreted from the Table number 7, the significant value for all the tested variables i.e. Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models, Employee Perspectives and Well-being and Opportunities for Upskilling and Reskilling were less than 0.05 thereby indicating the required data fails to match Normality. Hence for Hypothesis testing Nonparametric testing was used where in the Independent variable had 2 categories Mann-Whitney U test was used and where in the categories were more than 3 Kruskal Wallis test was used.

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Table 8: Hypothesis Testing

Sr.No	Particulars	Gender	Age	Marital status	Qualification	Years of experience	Annual Income
1	Evolution of Work Dynamics	0.49	0.00	0.00	0.00	0.00	0.00
2	Impact on Skill Requirements	0.09	0.00	0.00	0.00	0.00	0.00
3	Wage Disparities and Compensation Models	0.08	0.00	0.00	0.00	0.00	0.00
4	Employee Perspectives and Well-being	0.48	0.00	0.00	0.00	0.00	0.00
5	Opportunities for Upskilling and Reskilling	0.63	0.35	0.00	0.00	0.01	0.03

Source: Authors Compilation

Interpretation:

It can be interpreted from the Table for the Independent variable of Gender and the tested variables i.e. Evolution of Work Dynamics (0.49), Impact on Skill Requirements (0.09), Wage Disparities and Compensation Models (0.08), Employee Perspectives and Well-being (0.48) and Opportunities for Upskilling and Reskilling (0.63) the significant value were found to be greater than 0.05 thereby concluding the acceptance of Null Hypothesis stating There is no significant different across the Independent Demographic variable of Gender and tested variables.

It can be interpreted from the Table for the Independent variable of Age and the tested variables i.e. Evolution of Work Dynamics (0.00), Impact on Skill Requirements (0.00), Wage Disparities and Compensation Models (0.00), Employee Perspectives and Well-being (0.00) the significant value were found to be less than 0.05 thereby concluding the acceptance of Alternate Hypothesis stating There is a significant difference across the Independent Demographic variable of Age except Opportunities for Upskilling and Reskilling tested variables. Opportunities for Upskilling and Reskilling (0.35) the significant value were found to be greater than 0.05 thereby concluding the acceptance of Null Hypothesis Stating There is no significant difference across the Independent Demographic variable of Age and Opportunities for Upskilling and Reskilling tested variable.

It can be interpreted from the Table for the Independent variable of Marital status and the tested variables i.e. Evolution of Work Dynamics (0.00), Impact on Skill Requirements (0.00), Wage Disparities and Compensation Models (0.00), Employee Perspectives and Well-being (0.00) and Opportunities for Upskilling and Reskilling (0.00) the significant value were found to be less than 0.05 thereby concluding the acceptance of Alternate Hypothesis stating There is a significant difference across the Independent Demographic variable of Marital status and tested variables.

It can be interpreted from the Table for the Independent variable of Qualification and the tested variables i.e. Evolution of Work Dynamics (0.00), Impact on Skill Requirements (0.00), Wage Disparities and Compensation Models (0.00), Employee Perspectives and Well-being (0.00) and Opportunities for Upskilling and Reskilling (0.00) the significant value were found to be greater than 0.05 thereby concluding the acceptance of Alternate Hypothesis stating There is a significant different across the Independent Demographic variable of Qualification and tested variables.

It can be interpreted from the Table for the Independent variable of Years of experience and the tested variables i.e. Evolution of Work Dynamics (0.00), Impact on Skill Requirements (0.00), Wage Disparities and Compensation Models (0.00), Employee Perspectives and Well-being (0.00) and Opportunities for Upskilling and Reskilling (0.01) the significant value were found to be greater than 0.05 thereby concluding the acceptance of Alternate Hypothesis stating There is a significant different across the Independent Demographic variable of Years of experience and tested variables.

It can be interpreted from the Table for the Independent variable of Annual Income and the tested variables i.e. Evolution of Work Dynamics (0.00), Impact on Skill Requirements (0.00), Wage Disparities and Compensation Models (0.00), Employee Perspectives and Well-being (0.00) and Opportunities for Upskilling and Reskilling

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(0.03) the significant value were found to be greater than 0.05 thereby concluding the acceptance of Alternate Hypothesis stating There is a significant different across the Independent Demographic variable of Years of experience and tested variables.

13.0 FINDINGS OF THE STUDY

A. Findings based on first objective: Demographic profile

Gender Distribution: The gender distribution within the IT sector demonstrates a fairly balanced representation, with 54% male and 46% female employees among the 200 surveyed individuals. This gender parity suggests a moderate level of gender diversity within the IT workforce, which is a positive indicator given the historical gender imbalances often observed in the tech industry.

Age Composition: Reveals that the majority of employees fall within the 31-40 age bracket, comprising 42% of the surveyed population. This indicates a significant presence of mid-career professionals within the IT sector. Additionally, the sizable proportion (32%) of individuals aged 21-30 suggests a substantial representation of young professionals, highlighting the industry's appeal to individuals early in their careers. Meanwhile, the smaller percentages in the 41-50 (18%) and over 50 (8%) categories indicate a relatively smaller presence of older professionals within the workforce, which may have implications for succession planning and knowledge transfer within the industry.

Marital Status: Demonstrates that a substantial majority (70%) of IT sector employees surveyed are married, while the remaining 30% are unmarried.

This finding underscores the importance of considering familial responsibilities and dynamics in understanding the workforce's motivations and needs, particularly concerning work-life balance and support systems.

Educational Qualifications: The educational profile presented in highlights a highly educated workforce within the IT sector. A significant majority (54%) hold postgraduate degrees or masters, indicating a strong emphasis on advanced education and specialization within the industry. Additionally, the presence of individuals with doctorate or Ph.D. qualifications (10%) suggests a considerable cohort of highly specialized professionals contributing to innovation and research within the sector.

Years of Experience: illustrates a diverse range of experience levels among IT sector employees. While individuals with more than 10 years of experience comprise the largest group (44%), indicating a significant presence of seasoned professionals, there is also a substantial representation of mid-career professionals with 5-10 years of experience (34%). Furthermore, the presence of employees with less than 5 years of experience (22%) underscores the industry's ability to attract and retain young talent, contributing to a dynamic and evolving workforce.

Annual Income: Reveals a varied income landscape within the IT sector. While the majority of employees earn less than 5 lacs annually (38%), there is a notable proportion earning between 5-10 lacs (30%) and more than 10 lacs (32%). This income diversity reflects the varying economic realities and financial aspirations of IT professionals, which may influence their perspectives on career progression, job satisfaction, and the perceived impact of technological advancements such as automation and AI.

The demographic profile of the IT sector workforce presented offers valuable insights into the industry's composition, highlighting factors such as gender diversity, age distribution, marital status, educational attainment, experience levels, and income disparities. Understanding these demographic dynamics is crucial for informed decision-making regarding talent management, organizational culture, and strategies for fostering innovation and growth within the IT sector.

B. Findings based on objective two: The effects of automation and AI on IT employees, focusing on shifts in work dynamics, skill demands, wage distributions, employee well-being, and opportunities for upskilling and reskilling

There is no significant difference across the Independent Demographic variable of Gender and tested variables of Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models, Employee Perspectives and Well-being and Opportunities for Upskilling and Reskilling.

There is a significant difference across the Independent Demographic variable of Age and tested variables of Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models and Employee Perspectives and Well-being except Opportunities for Upskilling and Reskilling. There is no significant difference across the Independent Demographic variable of Age and Opportunities for Upskilling and Reskilling tested variable.

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There is a significant difference across the Independent Demographic variable of Marital status and tested variables of Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models, Employee Perspectives and Well-being and Opportunities for Upskilling and Reskilling.

There is a significant difference across the Independent Demographic variable of Qualification and tested variables of Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models, Employee Perspectives and Well-being and Opportunities for Upskilling and Reskilling.

There is a significant difference across the Independent Demographic variable of Years of experience and tested variables of Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models, Employee Perspectives and Well-being and Opportunities for Upskilling and Reskilling.

There is a significant difference across the Independent Demographic variable of Years of experience and tested variables of Evolution of Work Dynamics, Impact on Skill Requirements, Wage Disparities and Compensation Models, Employee Perspectives and Well-being and Opportunities for Upskilling and Reskilling.

14.0 CONCLUSION

The nature of tasks in the Information Technology sector has changed over the past few years due to automation and AI. There is a noticeable shift in the way teams collaborate and coordinate work in the organization. Automation and artificial intelligence (AI) have profoundly influenced the overall work structure within the Information Technology (IT) sector, bringing about significant changes in various aspects of operations, job roles, and organizational dynamics.

The demand for certain skills like AI & Machine learning, cloud computing, cyber security management, Data Science and Analytics, Programming and Scripting, Soft Skills, Robotic Process Automation and Block Chain Technology has increased due to advancements in automation and AI technologies. The Employees have to continuously learn and improve skills to be relevant in the industry. The employees feel that they should get fair compensation for the tasks that have been automated due to AI. The introduction of automation and AI has led to a dynamic shift in the wage structure within the IT sector. The impact is multifaceted, with specialized skills, strategic contributions, and organizational investments playing key roles in shaping compensation trends. As the technology landscape continues to evolve, monitoring these trends and adapting compensation strategies accordingly becomes essential for organizations and IT professionals alike.

Automation and AI positively contribute to a healthier work-life balance by optimizing work processes, providing flexibility, supporting well-being initiatives, and allowing individuals to focus on tasks that align with their skills and interests. As organizations continue to leverage these technologies, the potential for creating a more balanced and sustainable work environment becomes increasingly feasible. The sense of job satisfaction in the IT sector persists despite the changes brought about by automation and AI. Professionals find fulfillment in meaningful work, continuous learning, strategic contributions, and a positive organizational culture that recognizes their expertise and supports their well-being. The coexistence of humans and technology in the IT sector creates a dynamic and rewarding landscape for those embracing the opportunities presented by automation and AI.

In many organizations, Employee well-being is given sufficient consideration in the implementation of automation and AI technologies. The employees are provided with opportunities for upskilling and reskilling in light of automation and AI. The employees feel confident in their ability to adapt to new technologies through the upskilling programs offered by the organizations and the availability of upskilling opportunities positively influences career growth within the Information Technology sector.

15.0 SUGGESTIONS

Given the strong correlation between employee perspectives and well-being, it's crucial for organizations to prioritize initiatives that enhance employee well-being, such as flexible work arrangements, mental health support, and opportunities for career growth. Even though there's no significant correlation with attributes related to the impact on skill requirements, organizations must continuously assess and adapt their skill requirements to meet evolving market demands and technological advancements. Investing in continuous learning and development programs can help employees remain relevant in their roles.

Although no significant correlations are evident with wage disparities and compensation models, organizations should regularly review their compensation structures to ensure fairness and transparency. Addressing wage disparities and implementing equitable compensation practices can improve employee satisfaction and retention.

The moderate correlations with demographic factors suggest that organizations should tailor their upskilling and reskilling initiatives to meet the diverse needs of their workforce. Offering accessible training opportunities and mentorship programs can empower employees to enhance their skills and adapt to changing job requirements.

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In summary, fostering a supportive and inclusive work culture, prioritizing employee well-being, and investing in continuous learning and development are key recommendations for organizations based on these findings.

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IMPACTS OF ARTIFICIAL INTELLIGENCE (AI) ON YOUTH

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1. ABSTRACT

The influence of Artificial Intelligence (AI) is huge on the present young generation. Especially Gen Y and Gen Z are not only using AI-related applications in their daily lives, but also massively focusing the research and product developments related to it. The sectors like education, healthcare, automation, robotics, drone technologies, cloud, edge, and fog computing are immensely influenced by AI-related applications. Even in the quantum domain, AI is also progressing in a satisfactory manner and creating positive influences in parallel to the success of classical AI. By observing the ubiquitousness of AI, governments are also taking some serious steps to strengthen law enforcement related to AI. Undoubtedly, AI is going to be one of the trending technologies for the present and future generations due to its versatility in terms of applications. The goal of this chapter is to provide the readers with a brief overview of the impact of AI on current and future generations.

AI is mainly based on algorithms and models as a technique which is designed based on scientific findings such as math, statists, and biology (Li& Jiang, (n.d.)). AI works based on several models such as: Ant Colony Algorithm, Immune Algorithm, Fuzzy Algorithm, Decision Tree, Genetic Algorithm, Particle Swarm Algorithm, Neural Network, Deep Learning and in this report, I will discuss some of the most known models which are: Support Vector Machine, and the Artificial Neural Network. Artificial Intelligence (AI) refers to the development of computer systems that can perform tasks typically requiring human intelligence, such as learning, problem-solving, and decision-making. AI encompasses various subfields, including machine learning, natural language processing, and computer vision, with applications across industries like healthcare, finance, and transportation.

1. ***Applications:*** *Explore AI's impact on industries like healthcare, finance, transportation, or education.*
2. ***Ethics:*** *Discuss AI's implications on privacy, bias, job displacement, or accountability*
3. ***Future developments:*** *Talk about emerging trends like explainable AI, edge AI, or the potential for superintelligen.*
4. ***Technical aspects:*** *Delve into machine learning algorithms, neural networks, or natural language processing.*

2. INTRODUCTION

I have chosen this topic to spotlight on one of the most technological trend these days known as AI (Artificial Intelligent). Therefore; I will discuss some of the most important aspects related to AI in which it will help in a better understanding of Artificial Intelligent and both its advantages and disadvantages to be able to protect ourselves from the upcoming technological trend. This paper will also discuss some of the algorithms used in AI systems.

Artificial Intelligence was first proposed by John McCarthy in 1956 in his first academic conference on the subject. The idea of machines operating like human beings began to be the center of scientist's mind and whether if it is possible to make machines have the same ability to think and learn by itself was introduced by the mathematician Alan Turing. Alan Turing was able to put his hypotheses and questions into actions by testing whether "machines can think"? After series of testing (later was called as Turing Test) it turns out that it is possible to enable machines to think and learn just like humans. Turing Test uses the pragmatic approach to be able to identify if machines can respond as humans.

Artificial Intelligence is: the field of study that describe the capability of machine learning just like humans and the ability to respond to certain behaviors also known as (A.I.). The need of Artificial Intelligence is increasing every day. Since AI was first introduced to the market, it has been the reason of the quick change in technology and business fields. Computer scientist

are predicting that by 2020, "85% of customer interactions will be managed without a human". ("Gartner", (n.d.)). This means that humans simple request will depend on computers and artificial intelligence just like when we use Siri or Galaxy to ask about the weather temperature. It is very important to be prepared for AI revelation just like UAE have by installing a state minister for AI in Dubai. Artificial intelligence (AI) refers to computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems.

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3. AI LITERATURE REVIEW

A literature review on Artificial Intelligence (AI) involves analyzing and synthesizing research papers, articles, and other sources to identify key themes, methodologies, findings, and gaps in existing research. Here's an overview of the current state of AI literature:

Key Areas of Research

- **Machine Learning:** AI systems that can learn from data and improve their performance over time.
- **Natural Language Processing (NLP):** AI systems that can understand, generate, and process human language.
- **Computer Vision:** AI systems that can interpret and understand visual data from images and Videos.

TOP AI TOOLS FOR LITERATURE REVIEWS

- **Sourcely:** Advanced search tools, smart organization features, and automated summarization.
- **Consensus:** Evidence-based answers across six academic fields, including medicine and economics.
- **Research Rabbit:** Visualizes connections between studies and authors.
- **ChatPDF:** AI-powered Q&A for academic papers.
- **Scopus:** Vast academic database with research tracking.
- (link unavailable) Cross-disciplinary search and summarization.
- **Scholarcy:** Breaks down complex papers into concise summaries.

BENEFITS OF AI LITERATURE REVIEW TOOLS

- **Increased Efficiency:** AI tools can automate tasks such as searching, summarizing, and organizing research papers.
- **Improved Accuracy:** AI tools can reduce errors and improve the accuracy of citations and references.
- **Enhanced Productivity:** AI tools can help researchers quickly identify key findings, methodologies, and gaps in existing research

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CHALLENGES AND LIMITATIONS

- **Bias and Fairness:** AI systems can perpetuate biases and unfairness if trained on biased data.
- **Explainability and Transparency:** AI systems can be difficult to interpret and understand, making it challenging to trust their decisions.
- **Ethics and Accountability:** AI systems raise ethical concerns and questions about accountability
- **Future Directions -** Explainable AI: Developing AI systems that are transparent and explainable.
- **Edge AI:** Developing AI systems that can run on edge devices, reducing latency and improving real-time decision-making.

4. METHODOLOGY

AI methodology encompasses the processes and techniques used to design, develop, and deploy AI systems. Here's an overview.

Key Steps

1. **Problem Definition:** Identify the problem or opportunity for AI application.
2. **Data Collection:** Gather relevant data for training and testing AI models.
3. **Data Preprocessing:** Clean, transform, and prepare data for AI model training.
4. **Model Selection:** Choose suitable AI algorithms and techniques (e.g., machine learning, deep learning).
5. **Model Training:** Train AI models using prepared data.
6. **Model Evaluation:** Assess AI model performance using metrics (e.g., accuracy, precision, recall).
7. **Model Deployment:** Integrate AI models into applications or systems.
8. **Model Monitoring:** Continuously monitor AI model performance and update as needed.

5. RESULTS OF AI

The results of Artificial Intelligence (AI) are multifaceted and far-reaching, impacting various aspects of society, economy, and daily life. Here are some key outcomes:

Positive Results

1. **Increased Efficiency:** AI automates repetitive tasks, enhancing productivity and reducing errors.
2. **Improved Decision-Making:** AI analyzes vast amounts of data, providing insights and predictions that inform decisionmaking.
3. **Enhanced Customer Experience:** AI-powered chatbots and virtual assistants offer personalized support and recommendations.
4. **Medical Breakthroughs:** AI assists in disease diagnosis, drug discovery, and personalized medicine.

6. CONCLUSION ON AI

While minimizing potential drawbacks. Artificial Intelligence (AI) has revolutionized numerous industries and aspects of life, offering immense potential for growth, innovation, and improvement. From enhancing efficiency and decisionmaking to transforming healthcare and customer experiences, AI's impact is profound.

Key Takeaways

1. **Transformative Potential:** AI can drive significant advancements in various fields.
2. **Continuous Innovation:** Ongoing research and development will further enhance AI capabilities.
3. **Ethical Considerations:** Addressing bias, fairness, and accountability is crucial for responsible AI development.

Future Directions

1. **Human-AI Collaboration:** AI will increasingly augment human capabilities.
2. **Industry-Specific Solutions:** Tailored AI applications will emerge across sectors.

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3. **Addressing Challenges:** Mitigating risks and ensuring responsible AI development.

As AI continues to evolve, it's essential to balance innovation with ethics, ensuring AI benefits humanity

DATA ANALYTICS

- Artificial Intelligence and machine learning have become synonymous with innovation in data analysis. Their potential to streamline processes and unearth hidden patterns in data sets is transforming the way analysts work.

- One of the primary areas where AI is making a significant impact is data preparation. Data analysis typically begins with collecting, cleaning, and categorizing data — tasks that can be painstakingly slow and tedious.
- AI, however, is capable of automating much of this process. Machine learning algorithms can handle vast amounts of data and clean it at a pace that would be impossible for a human analyst. This level of automation removes a substantial burden from data analysts, allowing them to concentrate more on extracting valuable insights from the data.
- AI also enables enhanced decision-making by providing AI-powered insights. Traditionally, data analysts would generate reports and make predictions based on historical data. While this approach has its merits, it's often time- consuming and requires a high degree of expertise.
- AI simplifies this process by employing advanced algorithms and predictive models to deliver insights quickly and accurately. This capability of AI to process data in real-time and predict trends makes it an indispensable tool in the decision-making process.
- AI is also transforming the way forecasting is done. Traditional statistical methods of forecasting can often be complex and fall short when dealing with volatile markets or unpredictable scenarios.
- AI, with its ability to adapt and learn from new data, can deliver more accurate forecasts. Machine learning models can analyze and learn from past data patterns to make predictions about future trends, making them increasingly reliable as they consume more data.
- In essence, the impact of AI on data analysis is a shift in focus. The role of data analysts is moving away from mundane, time-consuming tasks and toward more strategic, insightful work.
- The advent of AI is freeing data analysts from the shackles of tedious data preparation and arduous trend analysis, enabling them to do what they do best: deliver insights that drive strategic decision-making.
- Artificial intelligence (AI) is all about creating machines that can do the sorts of tasks that only humans can usually do. Perhaps unsurprisingly, then, many business leaders have taken a keen interest in the

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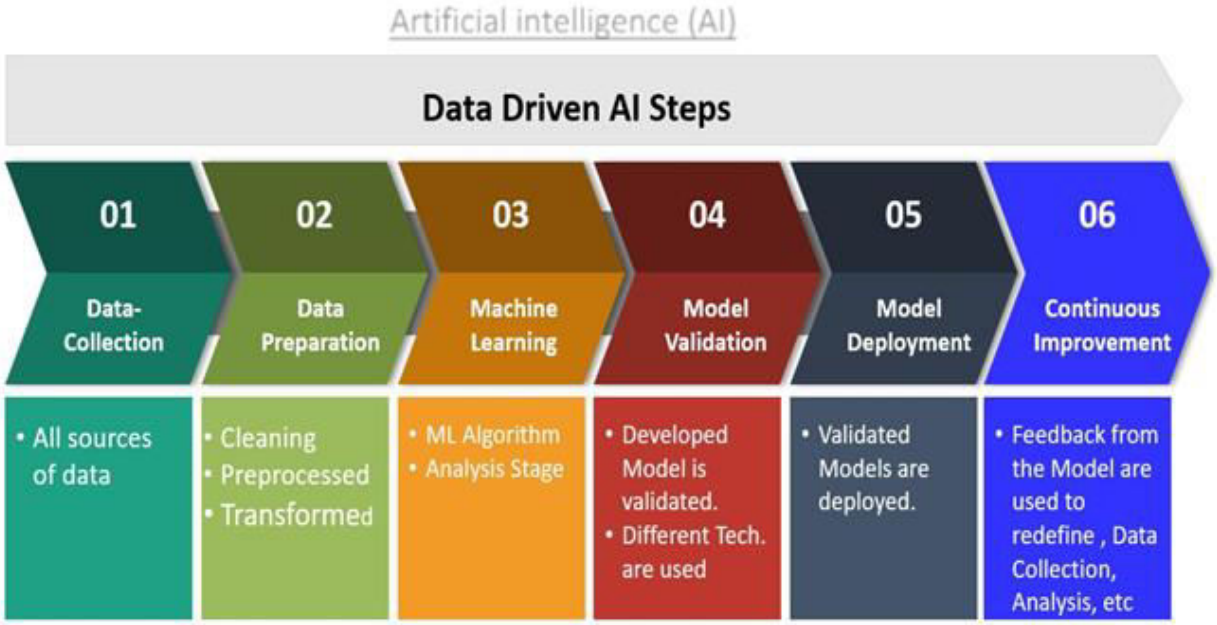
technology's development, particularly as it's increasingly capable of performing certain tasks that once only highly skilled professionals could do.

- Of the many fields that AI is transforming, data analytics is possibly the most prepared to integrate these new technologies into its existing structure. After all, many AI technologies are reliant on exactly the kind of data that data professionals work with every day, and many of these workers already use forms of AI to accomplish their work every day. As AI's capabilities expand, so too does its potential impact on the field of data analytics.
- The uses of AI in data analytics are vast, diverse, and continually evolving as the field of artificial intelligence advances



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HOW MOBILE PAYMENT SOLUTIONS ARE RESHAPING CONSUMER BEHAVIOR

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ABSTRACT
The fast growth of mobile payment methods is dramatically altering the consumer landscape. This research examines how the ease, pace, and security perceived by the user of mobile payment systems like digital wallets, QR code payment, and contactless payments is affecting purchasing choices, spending, and customer loyalty. Drawing on survey data, transaction behavior of consumers, and case studies across different demographics, the study emphasizes a trend towards more spontaneous purchasing, preference for digitally-oriented merchants, and higher expectations for frictionless user experiences. The research also discusses the psychological effects of "invisible payments" on budgeting and financial literacy. Evidence indicates that mobile payment technologies are not only simplifying commerce but also transforming the cognitive and emotional aspects of consumer behavior, which is forcing companies to reconsider their engagement and retention strategies.

Keywords: *Digital wallet, Contactless payment, Mobile commerce (m-commerce), Fintech, Consumer behaviour & Digital transaction*

INTRODUCTION
Over the past few years, the spread of mobile technologies has dramatically changed the face of financial transactions, ushering in a new age of convenience-led consumerism. Mobile payment technologies—from digital wallets and contactless payments to peer-to-peer payment applications—have not only made the payment process easier but have also redefined the way, when, and why consumers make financial transactions. With mobile phones becoming ubiquitous in everyday life, mobile payments are transforming from a niche technology into a mainstream transaction method among varied demographics and geographies.

This online transition is more than an upgrade in technology; it is a profound shift in consumer psychology and behavior. The convenience, velocity, and perceived safety of mobile payments are changing spending habits, facilitating impulse buys, and elevating the frequency of low-ticket transactions. Additionally, the combination of loyalty programs, targeted promotions, and frictionless in-app buying is promoting more intense engagement between consumers and brands.

As companies and banks compete to innovate and catch up, insights into how mobile payment technologies affect consumer behavior are vital. This study seeks to examine the dynamics of this change, looking at drivers of take-up, the resulting changes in consumer behavior, and the wider implications for the retail and banking industries. Based on the analysis of both qualitative and quantitative data, the research endeavors to discover not only how mobile payment systems are transforming economic engagements but also changing the consumer experience in the online era.

LITERATURE REVIEW

1. Ha, Nam, & Kim (2024)
This comprehensive review analyzes mobile payment research from 2013 to 2023, highlighting a dominance of business and user survey studies. The authors advocate for more diversified approaches, emphasizing the need for policy studies and social science perspectives to fully understand mobile payment adoption and its societal impacts.

2. Karsen et al. (2019)
The study identifies 17 key technological factors influencing mobile payment adoption, such as system compatibility and security. It underscores the importance of these factors in shaping consumer behavior and the mobile payment ecosystem.

3. Anwar et al. (2024)
Focusing on theoretical models like TAM and UTAUT, this review finds that perceived usefulness and ease of use are primary drivers of mobile payment adoption. It also notes that perceived risks and gender differences play significant roles in consumer decision-making.

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4. Chauhan & Sharma (2024)
This study offers a global perspective on digital payment research, identifying key themes such as adoption, usage, and infrastructure. It highlights the prevalent use of TAM and UTAUT models and calls for more comprehensive studies incorporating diverse methodologies.

5. Taylor (2016)
The paper examines the dual impact of mobile payment technologies in retail, discussing benefits like improved customer experience and risks such as increased vulnerability to theft and fraud. It emphasizes the need for balanced implementation strategies.

6. Albuquerque et al. (2016)
This critical review categorizes mobile payment research into strategy, technology, and consumer adoption. It identifies a lack of studies in areas like regulation and security, suggesting these gaps need addressing to understand the full impact on consumer behavior.

7. Das & Shekhar (2024)
Utilizing bibliometric analysis, this study traces the evolution of mobile wallet research, highlighting trends and identifying key areas of focus. It provides insights into how consumer behavior has been influenced by mobile wallet adoption over time.

8. **Financial Times (2024)**
This article reports a significant increase in digital wallet usage in the UK, with 34% of consumers making mobile contactless payments monthly. It reflects a shift in consumer behavior towards digital transactions and away from cash.

9. The Times (2024)
The piece discusses the global move towards mobile payments, highlighting technologies like Swish and Pix. It illustrates how consumers are bypassing traditional payment methods, indicating a fundamental change in spending habits.

STATEMENT OF THE PROBLEM

The widespread adoption of mobile payment technologies has brought about profound changes in consumer shopping behavior, but their depth and character are not yet understood well enough. As much as mobile payment technologies are promising unprecedented convenience and efficiency, increasingly there is a need to explore how these instruments are shaping consumer choice, expenditure, and financial habits.

In spite of extensive usage, there are gaps in the comprehension of the psychological, social, and economic motivations for mobile payment adoption and the resultant effect on consumer loyalty, trust, and engagement. Further, issues related to data protection, digital proficiency, and equitable access create hurdles that add to the complexity of the consumer experience in a mobile-first financial system.

This research aims to fill the gap of in-depth analysis on the behavioral effects of mobile payment systems. Through an examination of how mobile payments are revolutionizing the classic consumer experience, this research hopes to offer insights that can guide businesses, policymakers, and developers who want to keep up with changing consumer needs in the digital economy.

RESEARCH METHODOLOGY

This research employs a mixed-methods design to explore the extent to which mobile payment systems are transforming consumer behavior. The blend of qualitative and quantitative methods enables the analysis of both quantifiable patterns and driving forces behind consumer choice within the digital payments arena.

Research Design:
The study is divided into two phases. The first phase is a quantitative survey to capture trends in mobile payment adoption, spending behavior, and consumer attitudes. The second phase consists of qualitative interviews to uncover more in-depth behavioral information, emotional drivers, and attitudes toward mobile payment technologies.

Sampling Technique:
A stratified random sampling method was employed to realize representation in age, income category, and technological acquaintance. The method increases the generalizability of results while reducing sampling bias for study.

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HYPOTHESIS OF THE STUDY

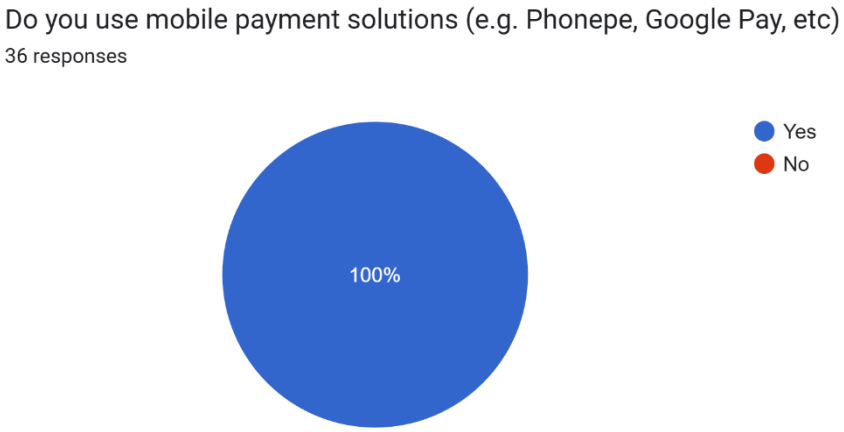
Primary Hypothesis (H_1):
Mobile payment systems directly affect consumers in a profound manner by encouraging repeat purchase frequency, encouraging impulsive purchase, and raising the level of engagement in a brand.

Null Hypothesis (H_0):
Mobile payment systems neither significantly impact the behavior of the consumer nor patterns of buying.

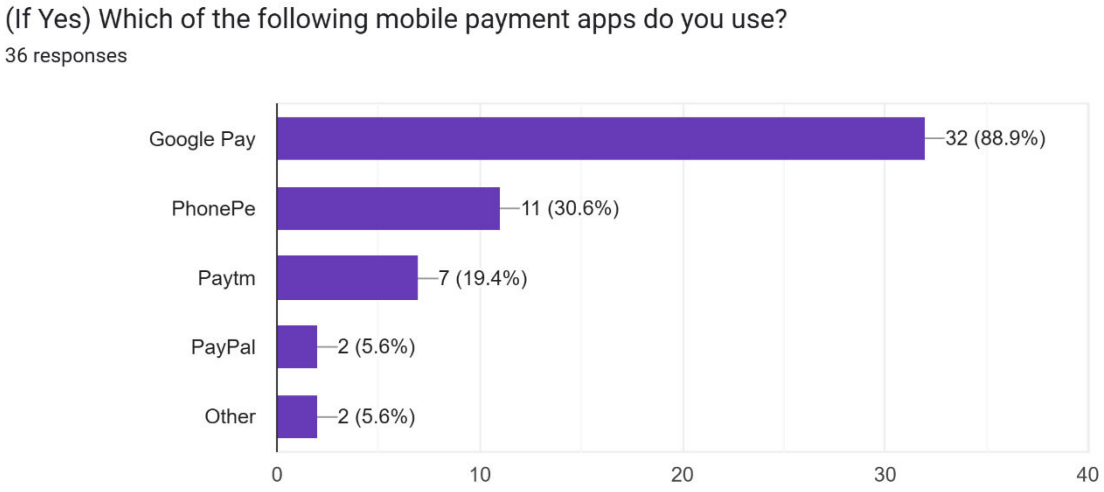
RESEARCH OBJECTIVES OF THE STUDY

1. To investigate the influence of mobile payment solutions on consumer buying habits, such as frequency, transaction value, and impulse buying behavior.
2. To examine the impact of convenience and ease of mobile payments on consumer preference compared to more conventional payment means like cash or cards.
3. To examine the impact of mobile payment platforms on customer loyalty and brand interaction, especially through bundled rewards, cashback, and customized offers.
4. To study the psychological and emotional impacts of "cashless" transactions on financial literacy, budgeting, and control over spending.
5. To determine demographic and behavioral patterns related to the adoption and use of mobile payment systems by age group, income level, and geography.
6. To determine the perceived security and trust in mobile payment solutions and their impact on consumer take-up rates.
7. To determine how businesses are modifying their payment and marketing strategies in light of shifts in consumer behavior influenced by mobile payment take-up.

DATA ANALYSIS & INTERPRETATION



The pie chart shows that all 36 respondents (100%) indicated that they use mobile payment solutions**.**



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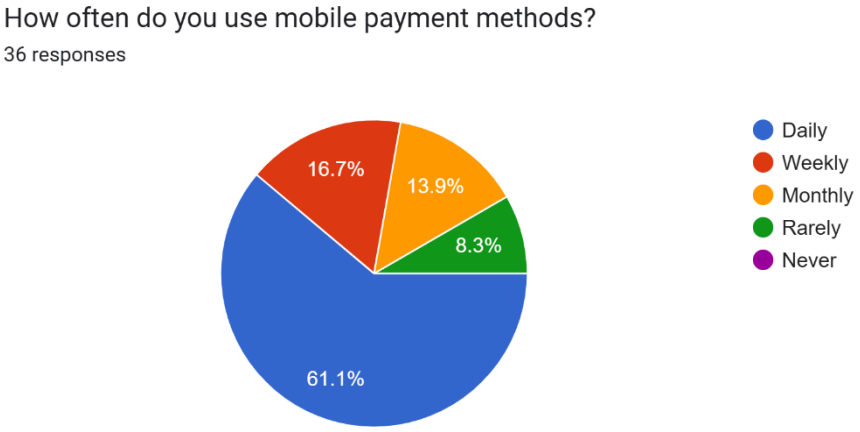
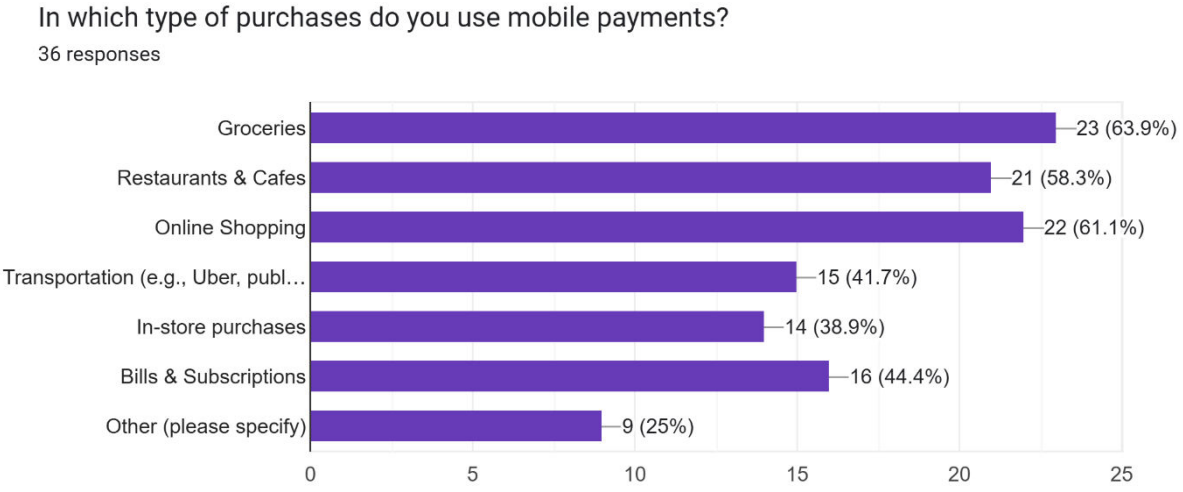
Interpretation:
Of the 36 respondents, Google Pay is the most popular mobile payment app, used by 88.9%. PhonePe is used by 30.6%, followed by Paytm at 19.4%. PayPal and other unspecified apps are each used by 5.6% of the respondents. Note that respondents could select multiple apps.



Interpretation:
The pie chart illustrates the frequency of mobile payment usage among 36 respondents. A large majority (61.1%) use mobile payments daily. Around 16.7% use them weekly, while 13.9% use them monthly. A smaller percentage use them rarely (8.3%), and none of the respondents reported never using mobile payments.



Interpretation:
This bar chart, based on 36 responses, shows the types of purchases where people use mobile payments. Groceries (63.9%), online shopping (61.1%), and restaurants & cafes (58.3%) are the most common categories. Bills & subscriptions (44.4%) and transportation (41.7%) are also frequently paid for using mobile payments, followed by in-store purchases (38.9%). A smaller segment (25%) uses mobile payments for other, unspecified types of purchases**.**

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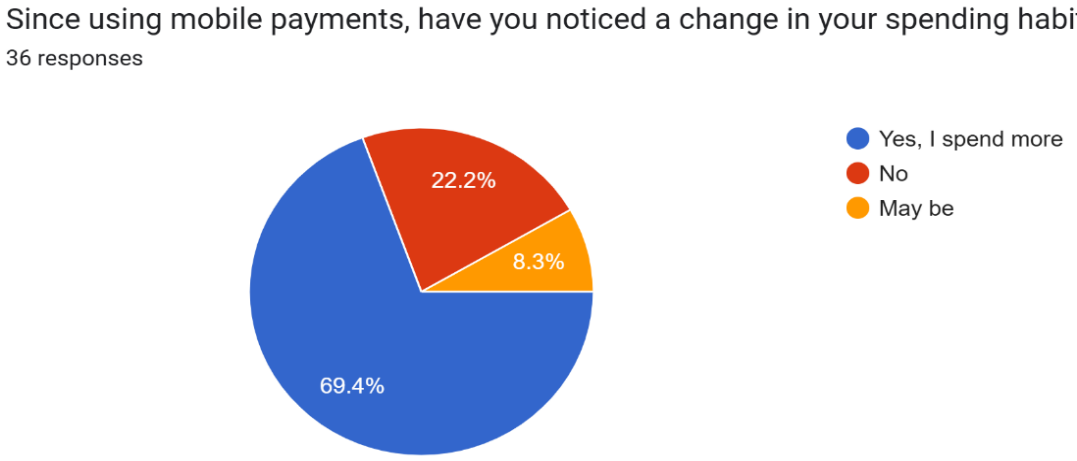
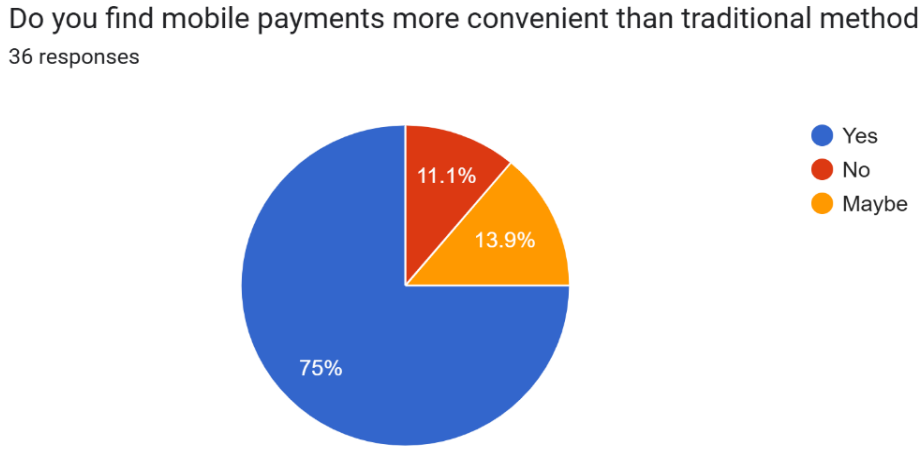
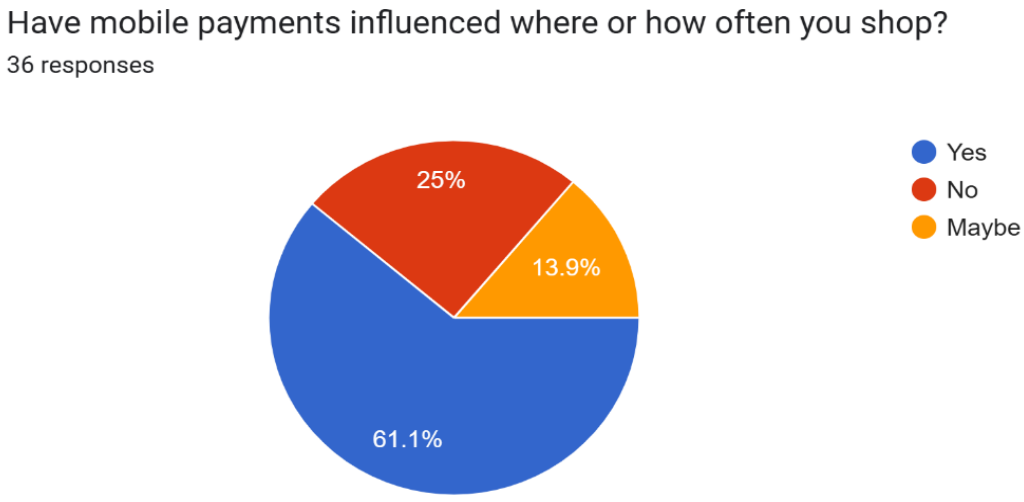


Interpretation:
According to the survey of 36 people, a significant majority (69.4%) have noticed a change in their spending habits since using mobile payments, with most indicating they spend more. About 22.2% reported no change, and 8.3% were unsure.



Interpretation:
Out of 36 respondents, a large majority (75%) find mobile payments more convenient than traditional methods like cash or card. Only a small fraction find them less convenient (11.1%), while 13.9% are unsure



Interpretation:
The survey results from 36 respondents indicate that mobile payments have influenced the shopping habits (where or how often) of a majority (61.1%). A quarter (25%) reported no influence, while 13.9% were unsure.

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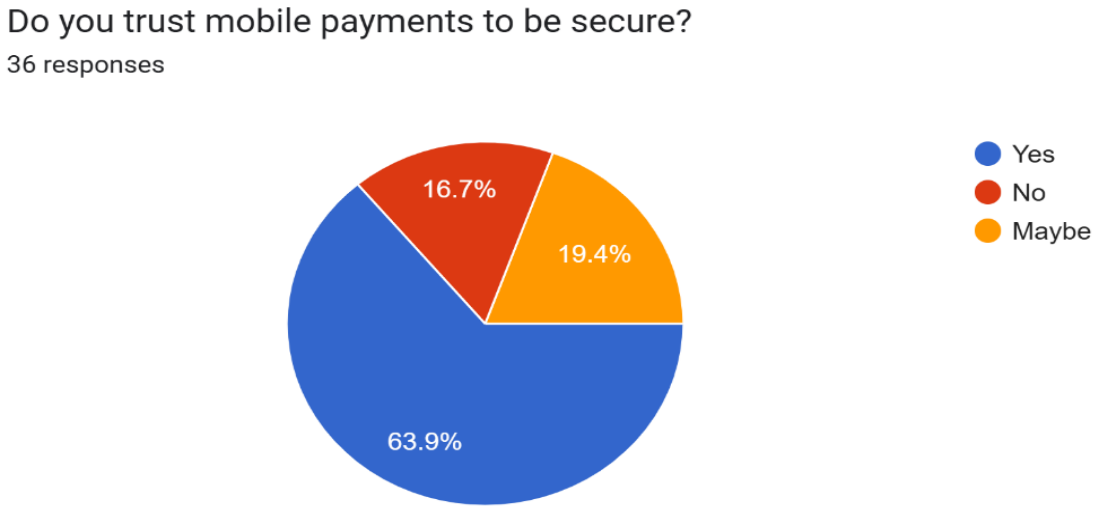

Interpretation:
Based on the survey of 36 responses, a significant majority (63.9%) trust mobile payments to be secure. However, a notable portion are either uncertain (19.4%) or do not trust them (16.7%).

NEED OF THE STUDY
The emergence of mobile payment systems has revolutionized the behavior of consumers, providing never-before convenience, speed, and security in monetary transactions. With mobile payment systems quickly gaining acceptance across the world, it is important for businesses, financial organizations, and policy makers to realize their impact on consumer buying patterns. This research responds to the increasing demand for knowing how such technological advancements are changing consumer habits, participation, and expenditure levels in the era of digital consumption.

1. Understanding Evolving Consumer Behavior
As mobile payment systems become more ingrained in the daily lives of consumers, it is imperative to analyze how such technologies influence decision-making, brand engagement, and financial behavior. Cash and credit cards are giving way to faster and more convenient alternatives, changing the shopping and buying habits of consumers.

2. Business and Retailer Implications
For companies, recognizing how mobile payments are transforming customer behavior is paramount to streamlining payment channels, increasing customer satisfaction, and maximizing sales growth. Retailers specifically need to change their strategies to embrace mobile payment solutions in order to align with customer needs and gain the added benefits of more efficient transactions and customer loyalty.

3. The Role of Financial Institutions
The payment services ecosystem of banks and other financial institutions would depend on banks and fintechs. Their roles in banks and fintech institutions would assist the institutions to build products as per targeted offerings, secure protocols of transactions, and customer confidence. The findings from the research would assist these banks and fintech institutions to tailor their offers and services for improving consumer sentiment.

4. Security and Privacy Concerns
In spite of the increasing trend of mobile payments, security and privacy issues still represent major barriers to adoption. Knowing how consumers perceive and react to these issues is critical for building the trustworthiness and security of mobile payment systems. This research will emphasize the drivers of consumer confidence and the steps that businesses and financial institutions can take to counter risks.

5. Contribution to Academic Literature
Though extensive studies have been conducted regarding the technological side of mobile payments, more studies are needed on the behavioral influence of these systems on consumers. The aim of this study is to fill this gap and present in-depth analyses regarding how mobile payment solutions affect consumer behavior from psychological, economic, and social viewpoints.

LIMITATION OF THE STUDY
Although this research presents significant findings regarding how mobile payment offerings are altering customer behavior, several limitations need to be noted:

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1. Sample Size and Generalizability
The representative sample of 300 survey takers and 15 interview participants may not encompass the entire variety of all consumer segments, especially across various geographic locations, socio-economic statuses, and technological proficiency. Consequently, the results cannot be generalized across all populations, especially in the underrepresented sectors or among those who are non-tech-savvy.

2. Emphasis on Self-Reported Data
The information gathered from interviews and questionnaires is self-reported, which can also result in biased responses. Buyers might overstate or downplay their real behavior because of social desirability, recall errors, or poor self-knowledge about their practices. These biases may have a bearing on the validity of the findings.

3. Limited Geographic Scope
The research mainly targets consumers in markets where mobile payment adoption is already widespread, e.g., North America, Europe, and some parts of Asia. Therefore, the results might not be generalizable to markets where mobile payment solutions are just beginning to be adopted or where there are strong impediments to their use (e.g., limited infrastructure, lower smartphone penetration).

4. Changing Technology Landscape
Mobile payment technologies continue to change, and new innovation or regulatory reform may affect consumers' behavior in manners not accounted for in this research. Thus, the findings can only reflect on the mobile payments as it is now and cannot account for potential future advancements in technology or consumer behavior.

5. Narrow Focus on External Variables
This research is largely focused on mobile payments in a vacuum, independent of the overall context of forces like economic cycles, governmental regulations, or large-scale world events (such as the COVID-19 pandemic) that might have impacted consumer activity in manners that were not specifically tied to the utilization of mobile payment platforms.

CONCLUSION

The purpose of this research was to investigate the revolutionizing impact of mobile payment technologies on consumer consumption patterns, with a specific focus on how the technologies are changing expenditure patterns, purchasing behaviors, and general interaction with financial transactions. The research reveals that mobile payments are not just another option for consumers compared to the old ways but are a leading driver in changing key patterns of consumer behavior.

Mobile payment solutions have increased the convenience, speed, and security of financial transactions, resulting in higher consumer adoption among different demographics. The research found that mobile payments have made daily purchases smoother, encouraging impulse buying and high-frequency, small-value transactions. Moreover, capabilities such as loyalty programs, customized offers, and simplicity have resulted in a higher level of bonding between consumers and brands, creating higher customer retention and brand loyalty.

Yet, even with the increasing use of mobile payments, there are still challenges. Consumer behavior remains affected by security and privacy issues, as many users have been reluctant to use mobile payments in the past based on fears of fraud and data breaches. These issues highlight the need for ongoing innovation in security processes to gain consumers' trust and improve the general mobile payment experience.

In addition, the research pointed out that even as mobile payments transformed the behavior of consumers across most markets, their effects are not the same across all geographies. Socioeconomic aspects, technological infrastructure, and cultural values regarding digital payments have significant roles to play in shaping the level of adoption. Where mobile payment adoption remains at a nascent stage, these technologies can be deterred by limitations such as limited smartphone availability, poor internet penetration, or regulatory challenges.

In summary, mobile payment technologies have essentially transformed customer behavior by bringing more convenience, flexibility, and customization to money transactions. With the ongoing improvement of these technologies, it is vital for firms, financial companies, and authorities to comprehend how these technologies transform customer behavior and change the continuously evolving digital marketplace. Future research should investigate the long-term effects of mobile payments on financial behavior, cross-cultural differences in adoption and the potential for emerging technologies such as artificial intelligence and blockchain to shape the future of mobile payments.

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EXPLORING THE IMPACT OF EMERGING AI TRENDS ON START-UP ECOSYSTEMS IN INDIA

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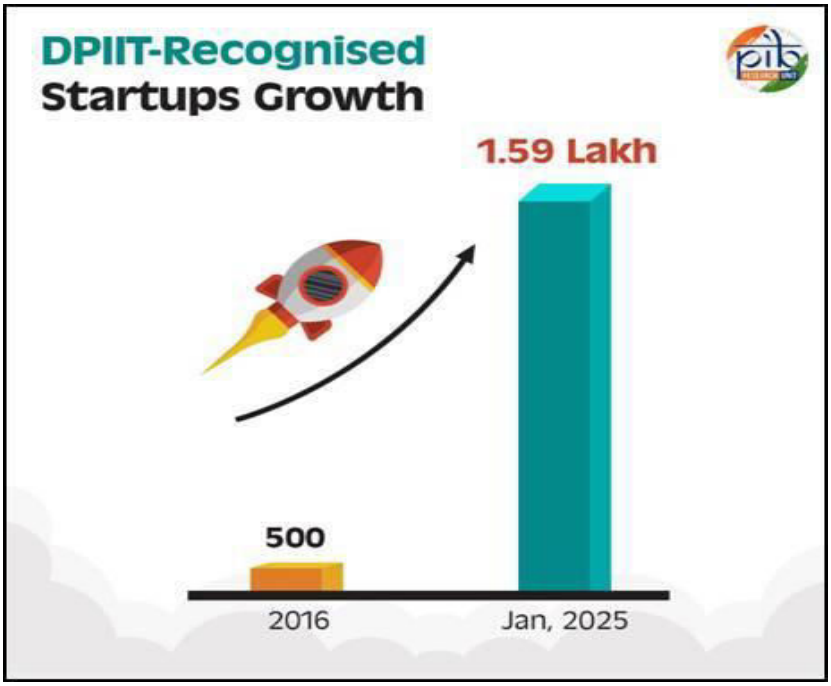
ABSTRACT

Artificial Intelligence (AI) has become a key driver of innovation, with its capabilities to generate, produce, and personalize solutions across various sectors. Indian startups are increasingly integrating AI, Machine Learning (ML), blockchain, Internet of Things (IoT), and Augmented/Virtual Reality (AR/VR) to transform industries such as manufacturing, professional services, and information and communication technology. These technologies are especially impactful in sectors like AgriTech, FinTech, EdTech, HealthTech, and ConsumerTech, where AI is improving efficiency, profitability, and customer experience.

The Indian government's launch of the 'Startup India' initiative on 16 January 2016, following Prime Minister Narendra Modi's vision shared on 15 August 2015, marked a significant turning point. The program aims to foster innovation, drive sustainable economic growth, and create employment. Since then, India has rapidly grown into the third-largest startup ecosystem in the world, with over 1.59 lakh recognized startups by January 2025, up from around 500 in 2016.



This paper examines how Indian entrepreneurs have turned challenges into opportunities, supported by government initiatives, funding bodies, and technological advancement. It highlights how AI is enabling startups to innovate, scale, and contribute significantly to the economy, inspiring a new generation of Indians to pursue entrepreneurship.

INTRODUCTION

Artificial Intelligence (AI) is playing a transformative role in the Indian startup ecosystem, driving innovation, efficiency, and growth across various sectors. Through government-led initiatives like the India AI Mission and Startup India, along with increased funding opportunities, startups are receiving the support they need to harness the power of AI. These efforts are fueling outstanding growth and enabling Indian startups to address real-world challenges through data-driven decision-making and automation.

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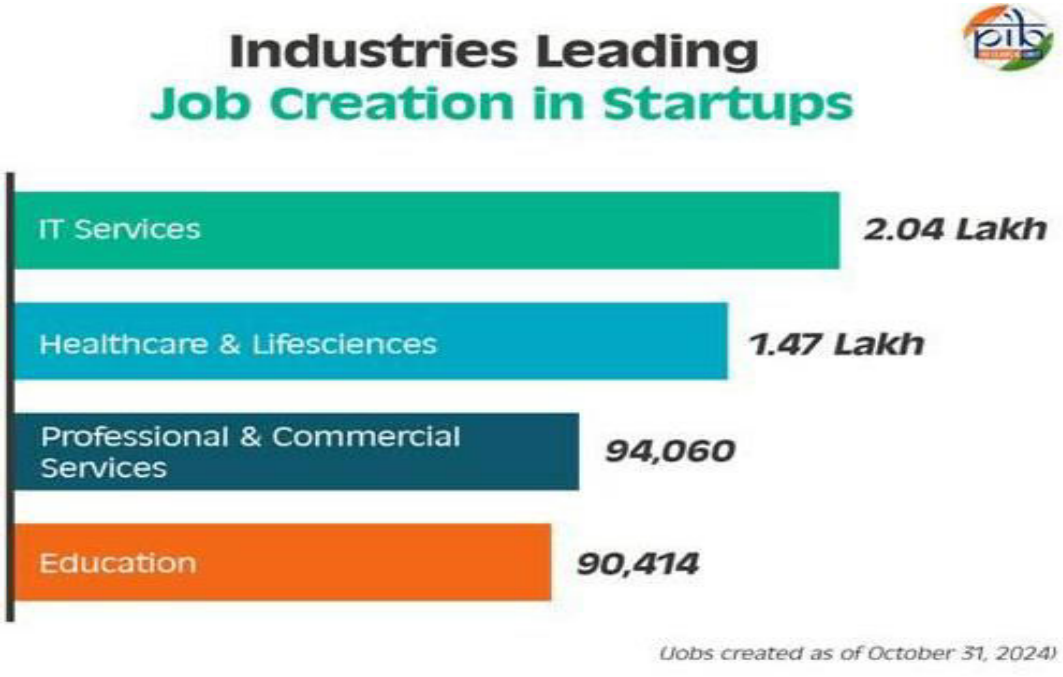
AI technologies, particularly Machine Learning (ML), empower startups to process vast amounts of data quickly and accurately, leading to better insights and strategic decisions. In the fintech sector, AI is used to analyze customer behavior and deliver customized financial services. Similarly, e-commerce platforms leverage AI for product recommendations and personalized shopping experiences. AI-powered chatbots and virtual assistants have revolutionized customer service by offering 24/7 support and real-time responses, significantly improving customer satisfaction and loyalty. Sectors like healthcare and agriculture are witnessing notable transformations due to AI adoption. Startups such as Niramai and Qure.ai use AI for early disease detection and diagnostic imaging, enhancing the quality of care. In agriculture, companies like CropIn and Intello Labs utilize AI for precision farming, crop monitoring, and yield prediction. In education, edtech platforms like Byju's and Vedantu personalize learning through AI, making education more adaptive and student-focused.



Despite the positive impact, challenges such as data privacy, ethical considerations, and a shortage of skilled AI professionals remain. Startups must ensure ethical implementation of AI to maintain trust and data security. With continued government support and responsible innovation, AI will remain a cornerstone of India's startup growth. By embracing AI, startups can gain a competitive edge, attract investment, and contribute to the country's economic and technological development in a rapidly evolving global landscape.

RESEARCH METHODOLOGY

This research study is based entirely on secondary data and adopts a descriptive and conceptual approach. The data has been gathered from a variety of credible sources, including journals, magazines, news articles, authenticated websites, blogs, articles, newsletters, and annual reports.

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Notably, reports from the Ministry of Commerce & Industry, the Department for Promotion of Industry and Internal Trade (DPIIT), as well as other relevant sources, have been utilized for the study. These sources provide valuable insights into the topic, ensuring the research is well-supported by reliable and relevant information.

Statement of Problem:

The problem addressed by this research is the need to understand how Indian startups are effectively leveraging AI and emerging technologies to overcome challenges and drive innovation, and how government initiatives, investor support, and institutional backing influence their sustainability, growth, and contribution to employment and the economy.

Scope of the Study:

This study examines the role of Artificial Intelligence (AI) and emerging technologies in the growth and success of Indian startups, focusing on key sectors such as AgriTech, FinTech, EdTech, HealthTech, and ConsumerTech. It investigates how initiatives like Startup India, along with investor and institutional support, influence entrepreneurial progress. The research also analyzes how Indian startups navigate infrastructural, financial, and technological challenges while leveraging new opportunities. The study is confined to the period from 2016 to 2025, capturing a crucial phase of transformation in India's rapidly evolving startup ecosystem.

Limitations of the Study

This study relies on secondary data sources, including publicly available reports and interviews with startup founders, investors, and experts. Limited access to detailed financial and proprietary information may restrict the depth of analysis, particularly regarding AI's direct impact. The study spans 2016 to 2025, potentially omitting early developments and future trends. Additionally, AI adoption levels and effectiveness vary widely among startups, leading to diverse outcomes in innovation and success. Such variability may not be fully reflected in a generalized analysis, posing a limitation in accurately assessing AI's overall influence on startup growth and performance during the covered period.

Sources of Data collected:

Data for this study is collected from a variety of credible sources, including academic journals, magazines, news articles, authenticated websites, blogs, newsletters, and annual reports from the Ministry of Commerce & Industry, and the Department for Promotion of Industry and Internal Trade (DPIIT). Additionally, government blogs and other relevant publications are also utilized to gather comprehensive and reliable information. These diverse sources ensure a thorough and well-rounded approach to data collection, providing a robust foundation for the analysis presented in the study.

Research Objectives

- To evaluate the impact of AI integration on startup performance and scalability.
- To examine the challenges and barriers faced by startups in implementing AI solutions.
- To investigate government initiatives under 'Startup India' that promote AI innovation.
- To study sector-wise AI adoption trends within Indian startups.

The State/UT-wise number of DPIIT recognised startups are as under:

Annexure I

S. No.	State/UT	Number of DPIIT recognised startups
1.	Andaman and Nicobar Islands	59
2.	Andhra Pradesh	2,252
3.	Arunachal Pradesh	38
4.	Assam	1,318
5.	Bihar	2,786
6.	Chandigarh	489
7.	Chhattisgarh	1,517
8.	Dadra and Nagar Haveli and Daman and Diu	53
9.	Delhi	14,734
10.	Goa	520
11.	Gujarat	11,436
12.	Haryana	7,385

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13.	Himachal Pradesh	484
14.	Jammu and Kashmir	855
15.	Jharkhand	1,305
16.	Karnataka	15,019
17.	Kerala	5,782
18.	Ladakh	16
19.	Lakshadweep	3
20.	Madhya Pradesh	4,500
21.	Maharashtra	25,044
22.	Manipur	151
23.	Meghalaya	52
24.	Mizoram	32
25.	Nagaland	66
26.	Odisha	2,484
27.	Puducherry	152
28.	Punjab	1,539
29.	Rajasthan	4,960
30.	Sikkim	11
31.	Tamil Nadu	9,238
32.	Telangana	7,336
33.	Tripura	123
34.	Uttar Pradesh	13,299
35.	Uttarakhand	1,138
36.	West Bengal	4,627
Total	**1,40,803**	

Annexure II

The details of various programs undertaken by the Government to promote startups across the country are as under:

1. **Startup India Action Plan:** An Action Plan for Startup India was unveiled on 16th January 2016. The Action Plan comprises of 19 action items spanning across areas such as "Simplification and handholding", "Funding support and incentives" and "Industry-academia partnership and incubation". The Action Plan laid the foundation of Government support, schemes and incentives envisaged to create a vibrant startup ecosystem in the country.
2. **Startup India:** The Way Ahead: Startup India: The Way Ahead at 5 years celebration of Startup India was unveiled on 16th January 2021 which includes actionable plans for promotion of ease of doing business for startups, greater role of technology in executing various reforms, building capacities of stakeholders and enabling a digital Aatmanirbhar Bharat.
3. **Startup India Seed Fund Scheme (SISFS):** Easy availability of capital is essential for entrepreneurs at the early stages of growth of an enterprise. The capital required at this stage often presents a make-or-break situation for startups with good business ideas. The Scheme aims to provide financial assistance to startups for proof of concept, prototype development, product trials, market entry and commercialization. Rs. 945 crore has been sanctioned under the SISFS Scheme for period of 4 years starting from 2021-22.
4. **Fund of Funds for Startups (FFS) Scheme:** The Government has established FFS with corpus of Rs. 10,000 crore, to meet the funding needs of startups. DPIIT is the monitoring agency and Small Industries Development Bank of India (SIDBI) is the operating agency for FFS. The total corpus of Rs. 10,000 crore is envisaged to be provided over the 14th and 15th Finance Commission cycles based on progress of the scheme and availability of funds. It has not only made capital available for startups at early stage, seed stage and growth stage but also played a catalytic role in terms of facilitating raising of domestic capital, reducing dependence on foreign capital and encouraging home grown and new venture capital funds.
5. **Credit Guarantee Scheme for Startups (CGSS):** The Government has established the Credit Guarantee Scheme for Startups for providing credit guarantees to loans extended to DPIIT recognized startups by Scheduled Commercial Banks, Non-Banking Financial Companies (NBFCs) and Venture Debt Funds (VDFs) under SEBI registered Alternative Investment Funds. CGSS is aimed at providing credit guarantee

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up to a specified limit against loans extended by Member Institutions (MIs) to finance eligible borrowers viz. DPIIT recognised startups.

6. **Regulatory Reforms:** Over 55 regulatory reforms have been undertaken by the Government since 2016 to enhance ease of doing business, ease of raising capital and reduce compliance burden for the startup ecosystem.
7. **Ease of Procurement:** To enable ease of procurement, Central Ministries/ Departments are directed to relax conditions of prior turnover and prior experience in public procurement for all DPIIT recognised startups subject to meeting quality and technical specifications. Further, Government e-Marketplace (GeM) also facilitates and promotes procurement of products and services by the Government from startups.
8. **Self-Certification under Labour and Environmental laws:** Startups are allowed to self-certify their compliance under 9 Labour and 3 Environment laws for a period of 3 to 5 years from the date of incorporation.
9. **Income Tax Exemption for 3 years:** Startups incorporated on or after 1st April 2016 can apply for income tax exemption. The recognized startups that are granted an Inter-Ministerial Board Certificate are exempted from income-tax for a period of 3 consecutive years out of 10 years since incorporation.
10. **Faster Exit for Startups:** The Government has notified Startups as 'fast track firms' enabling them to wind up operations within 90 days vis-a-vis 180 days for other companies.
11. **Exemption for the Purpose Of Clause (VII)(b) of Sub-section (2) of Section 56 of the Act (2019):** A DPIIT recognized startup is eligible for exemption from the provisions of section 56(2)(viib) of the Income Tax Act.
12. **Support for Intellectual Property Protection:** Startups are eligible for fast-tracked patent application examination and disposal. The Government launched Start-ups Intellectual Property Protection (SIPP) which facilitates the startups to file applications for patents, designs and trademarks through registered facilitators in appropriate IP offices by paying only the statutory fees. Facilitators under this Scheme are responsible for providing general advisory on different IPRs, and information on protecting and promoting IPRs in other countries. The Government bears the entire fees of the facilitators for any number of patents, trademarks or designs, and startups only bear the cost of the statutory fees payable. Startups are provided with an 80% rebate in filing of patents and 50% rebate in filing of trademark vis-a-vis other companies.
13. **Startup India Hub:** The Government launched a Startup India Online Hub on 19th June 2017 which is one of its kind online platform for all stakeholders of the entrepreneurial ecosystem in India to discover, connect and engage with each other. The Online Hub hosts Startups, Investors, Funds, Mentors, Academic Institutions, Incubators, Accelerators, Corporates, Government Bodies and more.
14. **International Market Access to Indian Startups:** One of the key objectives under the Startup India initiative is to help connect Indian startup ecosystem to global startup ecosystems through various engagement models. This has been done through international Government to Government partnerships, participation in international forums and hosting of global events. Startup India has launched bridges with around 20 countries that provides a soft-landing platform for startups from the partner nations and aid in promoting cross collaboration.
15. **Startup India Showcase:** Startup India Showcase is an online discovery platform for the most promising startups of the country chosen through various programs for startups exhibited in a form of virtual profiles. The startups showcased on the platform have distinctly emerged as the best in their fields. These innovations span across various cutting-edge sectors such as Fintech, EnterpriseTech, Social Impact, HealthTech, EdTech, among others. These startups are solving critical problems and have shown exceptional innovation in their respective sectors. Ecosystem stakeholders have nurtured and supported these startups, thereby validating their presence on this platform.
16. **National Startup Advisory Council:** The Government in January 2020 notified constitution of the National Startup Advisory Council to advise the Government on measures needed to build a strong ecosystem for nurturing innovation and startups in the country to drive sustainable economic growth and generate large scale employment opportunities. Besides the ex-officio members, the council has a number of non-official members, representing various stakeholders from the startup ecosystem.
17. **National Startup Awards (NSA):** National Startup Awards is an initiative to recognize and reward outstanding startups and ecosystem enablers that are building innovative products or solutions and scalable

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enterprises, with high potential of employment generation or wealth creation, demonstrating measurable social impact. Handholding support is provided to all the finalists across various tracks viz. Investor Connect, Mentorship, Corporate Connect, Government Connect, International Market Access, Regulatory Support, Startup Champions on Doordarshan and Startup India Showcase, etc.

18. **States' Startup Ranking Framework (SRF):** States' Startup Ranking Framework is a unique initiative to harness strength of competitive federalism and create a flourishing startup ecosystem in the country. The major objectives of the ranking exercise are facilitating states to identify, learn and replace good practices, highlighting the policy intervention by states for promoting startup ecosystem and fostering competitiveness among states.
19. **Startup Champions on Doordarshan:** Startup Champions program on Doordarshan is a one-hour weekly program covering stories of award winning/ nationally recognised startups. It is telecasted in both Hindi and English across Doordarshan network channels.
20. **Startup India Innovation Week:** The Government organises Startup India Innovation week around the National Startup Day i.e., 16th January, with the primary goal was to bring together the country's key startups, entrepreneurs, investors, incubators, funding entities, banks, policymakers, and other national/international stakeholders to celebrate entrepreneurship and promote innovation.
21. **ASCEND:** Under ASCEND (Accelerating Startup Caliber & Entrepreneurial Drive), sensitization workshops on startups and entrepreneurship were conducted for all eight North Eastern States with the objective to capacitate and augment knowledge on key aspects of entrepreneurship and continue efforts towards creating a robust startup ecosystem in these States.
22. The Startup India Investor Connect Portal has been co-developed under the Startup India Initiative with SIDBI, serving as an intermediary platform that links startups and investors in order to help entrepreneurs from various industries, functions, stages, regions, and backgrounds in mobilizing capital. The portal has been built with the aim to enable, in particular; early-stage startups located anywhere in the country to showcase themselves to leading investors/ venture capital funds.
23. **National Mentorship Portal (MAARG):** In order to facilitate accessibility to mentorship for startups in every part of the country, the Mentorship, Advisory, Assistance, Resilience, and Growth (MAARG) program has been developed and launched under the Startup India Initiative.

PMEGP Performance during the last 5 years in terms of no of Units assisted, Margin money subsidy disbursed and estimated employment generated are as under:

Annexure III

Year	No. of Units Assisted	MM Subsidy (Rs. Crore)	Estimated Employment Generated
FY19-20	66,653	1,950.82	5,33,224
FY20-21	74,415	2,188.80	5,95,320
FY21-22	1,03,219	2,977.66	8,25,752
FY22-23	85,167	2,722.17	6,81,336
FY23-24	89,118	3,093.88	7,12,944

The No. of enterprises supported under the Start-up Village Entrepreneurship Programme (SVEP) (State-wise cumulative till June 2024) are as under:

ANNEXURE IV

S. No.	State/UT	Total Enterprises Supported (cumulative)
1.	Andhra Pradesh	27,631
2.	Arunachal Pradesh	505
3.	Assam	4,840
4.	Bihar	25,994
5.	Chhattisgarh	20,197
6.	Goa	1,398
7.	Gujarat	5,940
8.	Haryana	9,773
9.	Himachal Pradesh	376
10.	Jammu & Kashmir (UT)	3,476

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11.	Jharkhand	25,636
12.	Karnataka	1,754
13.	Kerala	32,309
14.	Madhya Pradesh	27,607
15.	Maharashtra	7,146
16.	Manipur	1,695
17.	Meghalaya	954
18.	Mizoram	1,308
19.	Nagaland	4,118
20.	Odisha	15,043
21.	Punjab	3,007
22.	Rajasthan	11,011
23.	Sikkim	371
24.	Tamil Nadu	4,834
25.	Telangana	17,188
26.	Tripura	682
27.	Uttar Pradesh	28,014
28.	Uttarakhand	3,106
29.	West Bengal	16,912
30.	A&N	0
31.	Puducherry	0
Total	**3,02,825**	

The details on the number of startups operating in the country at present, State/UT-wise in agriculture and allied sectors supported under "Innovation and Agri-Entrepreneurship Development" under Rashtriya Krishi Vikas Yojana are as under:

ANNEXURE V

S No.	States and UTs	Total number of startups
1.	Andhra Pradesh	61
2.	Arunachal Pradesh	13
3.	Assam	49
4.	Bihar	48
5.	Chhattisgarh	79
6.	Goa	2
7.	Gujarat	47
8.	Haryana	84
9.	Himachal Pradesh	33
10.	Jammu & Kashmir	24
11.	Jharkhand	7
12.	Karnataka	211
13.	Kerala	97
14.	Madhya Pradesh	68
15.	Maharashtra	226
16.	Manipur	22
17.	Meghalaya	2
18.	Mizoram	25
19.	Nagaland	2
20.	Odisha	61
21.	Punjab	52
22.	Rajasthan	66
23.	Tamil Nadu	137
24.	Telangana	98
25.	Tripura	13
26.	Uttar Pradesh	86
27.	Uttarakhand	32

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28.	West Bengal	17
29.	Delhi NCR	41
30.	Andman and Nicobar	1
31.	Chandigarh	3
32.	Pondicherry	1
Total	**1708**	

State/ UT-wise details of number of startups supported under TIDE 2.0 scheme are as under:

ANNEXURE VI

S. No.	Name of the State/UT	Numbers of Start-ups Supported Under TIDE 2.0 Scheme
1.	Andhra Pradesh	79
2.	Assam	8
3.	Bihar	19
4.	Chhattisgarh	10
5.	Gujarat	104
6.	Haryana	11
7.	Himachal Pradesh	18
8.	Karnataka	127
9.	Jammu and Kashmir	4
10.	Kerala	39
11.	Madhya Pradesh	17
12.	Maharashtra	78
13.	NCT-Delhi	53
14.	Odisha	40
15.	Punjab	65
16.	Rajasthan	88
17.	Tamil Nadu	157
18.	Telangana	142
19.	Uttar Pradesh	112
20.	Uttarakhand	25
21.	West Bengal	39
Total	**1235**	

This information was given by the Minister of State (Independent Charge), Ministry of Skill Development and Entrepreneurship (MSDE), Shri Jayant Chaudhary in a written reply in the Lok Sabha.

REVIEW OF LITERATURE

The literature on AI adoption in India highlights the pivotal role of startups in driving technological progress. Sunil David, a Digital Technology Consultant, emphasizes that India's 4,000 AI startups, supported by government initiatives, are key to democratizing AI. He argues that a comprehensive policy on data privacy, security, and governance is essential for scaling AI innovation. Similarly, Anna Roy from NITI Aayog stresses the importance of data access for AI development, especially in sectors like rural financing where data gaps hinder progress.

Research from February 2023 indicates that AI-based startups have significantly impacted India's GDP, with increasing investments since 2010. This demonstrates the potential of AI to boost economic growth and improve lives. In addition, the paper by Neha Soni and colleagues in April 2020 explores the socioeconomic implications of AI, examining both its positive and negative impacts. It highlights AI's transformative potential for businesses and society, noting that advancements in AI will shape global markets and entrepreneurial activities.

T-Hub also highlights AI's growing influence in India, asserting that it is no longer a distant concept but a driving force in the startup ecosystem. By leveraging AI, Indian startups can innovate, create jobs, and solve critical issues, ensuring a sustainable and prosperous future. Collaboration among entrepreneurs, investors, and the government will continue to enhance AI's impact.

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FINDINGS

- **Sector Transformation**: AI is revolutionizing sectors like AgriTech, FinTech, EdTech, HealthTech, and ConsumerTech.
- **Product Development**: AI accelerates product development, enhances innovation, and improves quality.
- **Customer Experience**: AI-powered chatbots and assistants improve customer support and satisfaction.
- **HealthTech**: AI helps in disease detection and medical image analysis.
- **AgriTech**: Precision farming techniques increase crop yield and reduce resource wastage.
- **FinTech**: AI enables personalized financial services through data analytics.
- **EdTech**: AI tailors learning experiences to individual student needs.
- **Competitive Advantage**: AI provides startups with market differentiation and new business models.
- **Challenges**: Data privacy, talent shortage, and ethical issues hinder AI adoption.
- **Government Support**: Initiatives like Startup India foster AI innovation.
- **Economic Growth**: AI boosts productivity and drives GDP growth by creating new business opportunities.
- **Scaling Startups**: AI enables rapid scaling by automating routine tasks and identifying market trends.

CONCLUSION

In conclusion, AI-driven advancements offer Indian startups a competitive edge by accelerating product development, enhancing operational efficiency, and enabling innovation. To thrive, startups must focus on key areas such as market research, building strong teams, leveraging technology, fostering innovation, and forming strategic partnerships. Staying informed about government support and initiatives is also essential for securing valuable resources and funding, ensuring long-term growth and success in a rapidly evolving market.

SUGGESTIONS FOR FURTHER RESEARCH AND IMPROVEMENT

1. Exploring Cross-Sector AI Applications: Investigate AI's role in emerging sectors like CleanTech, InsurTech, and Cybersecurity for a broader understanding of its impact.
2. Comparative Study with Other Countries: Compare India's AI adoption with other emerging economies (e.g., Brazil, China, South Africa) to identify global best practices.
3. Impact of AI on Employment: Analyze how AI adoption affects job creation and displacement to inform workforce policies and skill development.
4. Exploring Barriers to AI Adoption: Study specific obstacles faced by Indian startups, such as high costs, talent shortages, and regulatory challenges, to develop targeted solutions.
5. Evaluating Government Policies: Examine how policies like tax incentives, funding opportunities, and regulations support AI-driven startups.
6. Real-time Data Collection and Case Studies: Conduct interviews and case studies with AI startups to gather qualitative insights on challenges and success stories.
7. Evaluation of Investor Impact: Assess the role of venture capital and investor interest in AI-driven startup growth and innovation.
8. Ethical Considerations and AI Governance: Explore ethical challenges, such as data privacy, algorithmic bias, and regulatory compliance, in AI adoption.

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A STUDY ON PROSPECTS IN EMERGING MARKET ECONOMIES FOR MUTUAL FUND INVESTMENTS IN THANE DISTRICT

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ABSTRACT
This Study explores the prospects and potential for mutual fund investments in the context of emerging market economies, with a focused analysis on the Thane District of Maharashtra, India. As emerging markets continue to attract global attention due to their rapid economic growth, increasing financial inclusion, and evolving investor behaviour, mutual funds have emerged as a preferred investment vehicle for retail and institutional investors alike. The research examines key factors influencing mutual fund adoption in Thane, including investor awareness, risk appetite, financial literacy, regulatory frameworks, and the role of digital platforms. Primary data collected through surveys and interviews with local investors, financial advisors, and asset management companies is complemented by secondary data from industry reports and regulatory bodies. The findings indicate a rising trend in mutual fund participation in Thane, driven by growing financial awareness and favourable market conditions. However, challenges such as limited investor education and perceived market volatility persist. The study concludes with recommendations for enhancing mutual fund penetration in emerging regions through targeted awareness programs, regulatory support, and technological innovation.

Keywords: *Investor, Education, Market, Mutual Funds*

INTRODUCTION

A mutual fund is an investment scheme which gathers C pools funds from a group of investors and invests the same in equities, bonds, government securities, money market instruments.

The funds raised in mutual fund scheme are invested by expert fund managers in stocks and bonds etc. according to an investment objective of a scheme. The income / gains accruing from this collective investment scheme are shared proportionately among the investors, after deducting the relevant expenses and charges, by determining a scheme's "Net Asset Value" or NAV. For this, mutual fund pays a small commission. Briefly, mutual fund is a group of money pooled from many investors and professionally managed by a Fund Manager.

Mutual Funds in India are formed as a Trust under Indian Trusts Act, 1882, as per SEBI

(Mutual Funds) Regulations, 1996. The charges and expenses levied by the mutual funds for running a scheme are controlled and fall within the parameters set by SEBI.

Why invest in Mutual Funds?

Since investment objectives differ from individual to individual – post-retirement outgo, funds for children's education or marriage, buying a house, etc. – the investment products needed to fulfil these objectives also differ. Mutual funds offer some specific benefits over investing in individual securities. Mutual funds provide various options for investment in equity shares, corporate bonds, government securities, and money market instruments, offering a great way for retail investors to join in and gain from the trends in capital markets.

The primary benefits are that you get to invest in a range of securities at a relatively low expense and have a professional manager make the investment choices for us.

Over the last few years, mutual funds have become a popular choice for people looking to invest their money smartly. With the growth of emerging markets like India, more and more investors are starting to look beyond traditional options and explore mutual funds as a way to grow their wealth.

Thane district, which is part of the fast-developing Mumbai Metropolitan Region, is a great example of this trend. The area has seen a lot of urban and economic development recently. As incomes rise and financial awareness improves, more people in Thane are showing interest in investment options like mutual funds. This study focuses on understanding how people in Thane view mutual fund investments— what influences their decisions, what challenges they face, and how much potential there really is for mutual funds to grow in this area. It also connects what's happening in Thane to the bigger picture—how emerging markets around the world are shaping the future of mutual fund investments.

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Evaluation of Mutual Funds in Thane District

Thane district has seen a steady rise in mutual fund awareness and participation,

Especially over the past few years. With more people moving towards urban lifestyles, there's been a noticeable shift from traditional savings methods—like fixed deposits or gold—to more market-linked options like mutual funds.

Through this study, it's clear that younger professionals and middle-income groups in Thane are starting to explore mutual funds as a serious investment tool. Factors like higher disposable income, digital access to investment platforms, and more financial education through social media and advisors have played a big role in this growth.

However, there are still some challenges. Many potential investors remain cautious due to a lack of deep understanding of how mutual funds work. Risk perception, market volatility, and misinformation also prevent some people from taking the leap. The trust factor— especially for first-time investors—is still developing.

Despite these hurdles, the overall outlook for mutual funds in Thane is positive. With consistent awareness efforts, user-friendly investment platforms, and guidance from financial advisors, mutual fund investments are expected to become even more mainstream in this district.

Short-term fluctuations can still occur. This might be concerning for those looking for stable, immediate returns.

- **Taxation**

While some mutual funds provide tax-saving benefits, others—like equity mutual funds— are subject to Capital Gains Tax. Short-term gains (held for less than three years) are taxed higher than long-term gains, which might impact your returns if you're investing for a shorter period.

1) Exit Load

Some mutual funds charge an exit load if you redeem your units before a certain period (e.g., 1-3 years). These charges can reduce your overall returns if you need to withdraw your investment early.

2) Over-Diversification

While diversification reduces risk, too much of it can limit your potential for higher returns.

Some mutual funds may hold so many assets that it becomes hard to outperform the market significantly.

Features of Mutual Fund

1) Pooling of Funds

Mutual funds bring together money from many investors and pool it into one large fund. This allows the fund manager to invest in a wide range of securities (stocks, bonds, etc.), helping to create a diversified portfolio for all investors.

2) Professional Management

Mutual funds are managed by professionals who have the expertise to make investment decisions. These managers constantly monitor market trends and adjust the portfolio to meet the fund's objectives, saving you from doing all the research yourself.

3) Variety of Fund Types

There are different types of mutual funds to cater to various investment needs: Equity Funds: Invest primarily in stocks for long-term growth.

Debt Funds: Focus on bonds and fixed-income securities for steady returns. Hybrid Funds: Combine both stocks and bonds to balance risk and return.

Index Funds: Track a specific market index, like the Nifty 50 or Sensex.

4) Accessibility

Mutual funds are easy to invest in. You can start with as little as ₹500 through Systematic Investment Plans (SIPs) and continue to invest regularly. It makes mutual funds accessible for people with different financial capacities.

5) Liquidity

Most mutual funds offer good liquidity, meaning you can buy or sell your units fairly easily. Depending on the type of mutual fund, you can redeem your investment in a few days, making it a flexible investment option.

6) Transparency

Mutual funds are regulated by bodies like SEBI (Securities and Exchange Board of India), and they are required to publish regular updates about the performance, holdings, and costs associated with the fund. This ensures that investors stay informed.

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7) Tax Efficiency
Some mutual funds, like Equity Linked Savings Schemes (ELSS), offer tax-saving benefits under Section 80C. Additionally, long-term capital gains on equity funds are taxed at a lower rate, providing tax-efficient options for investors.

REVIEW OF LITERATURE

1) **Gupta and Sharma (2020)** explored the impact of financial literacy on retail investment decisions in India, concluding that awareness and understanding of mutual fund products significantly influence investment choices. Similarly, **Kumar and Singh (2021)** examined Behavioral factors such as risk perception, past investment experience, and return expectations, identifying them as key determinants in mutual fund adoption.
2) **AMFI (2023)** reported a steady rise in mutual fund participation from semi-urban and urban centres, including regions like Thane, attributing the growth to regulatory awareness programs and expanding distribution networks. The **RBI (2022)** emphasized the role of financial stability and low interest rate environments in encouraging mutual fund investments over traditional instruments.
3) **PwC India (2023)** highlighted structural reforms, such as simplified KYC procedures and increased penetration of Systematic Investment Plans (SIPs), as major drivers of growth in the mutual fund industry. Moreover, **EY India (2023)** stressed the influence of digital tools and robe-advisory platforms, which have democratized access to mutual funds, especially for first-time investors in Tier II cities.

Statement of the Problem:
Savings are income in excess of expenditure for any economic entity. Savings flow into investment for a return but savings in cash do not earn anything and are non-productive. Savings are invested in assets based on their risk and return perception of investors such as return but simultaneously they hate risks making an investment a tough art which Individuals lack.

There are various methods of investment. Mutual funds are one of them. An investment scheme sponsored by shareholders that deals in diversified portfolios and is professionally managed. The mutual fund houses appoint effective and professional fund managers but the choice for the scheme is in the hands of the investors himself. It needs sufficient skills here comes the role of financial firms. This study compares various mutual funds schemes and it will assist to assess which scheme is superior.

RESEARCH METHODOLOGY

Research Design:
Descriptive Research: The research would be mainly descriptive in nature since it seeks to investigate and outline the present status and future prospects of mutual fund investments in Thane District. It will give a thorough insight into the determinants of investment Decisions.

Exploratory Research: The study may also have an exploratory component if there are few studies on mutual fund investments in Thane, so that new trends or patterns can be Identified.

Research Approach:

Quantitative Approach: Since the study entails learning about the degree of mutual fund investment and influencing factors, a quantitative approach will be effective in collecting numerical information, including the number of investors, amounts invested, etc.

Qualitative Approach: A qualitative approach will prove to be effective in collecting information on investors' motivations and perceptions about mutual funds through interviews or focus groups.

Data Collection:

Primary Data: Primary data will be obtained directly from people and financial institutions in Thane District.

Secondary Data: Secondary data will be obtained from available sources, including:

Government Reports Publications: Information pertaining to the economic growth of Thane, urbanization patterns, and general market conditions.

Financial Market Reports: Asset management company reports and analysis, stock market performance, and mutual fund industry information.

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Academic Journals C Research Papers: Past research studies on investment in mutual funds, emerging economies of developing countries, and investor actions.

News Articles C Press Releases: Articles published on the economy of finance and investment trends within Thane District.

Sampling Technique:
Stratified Random Sampling: This will make sure that various subgroups (age, income, education, etc.) of investors in Thane are included in the sample. The population will be split into different strata according to relevant factors (like age groups, income levels, experience in investments), and a random sample will be taken from every stratum.

Sample Size:
Survey Sample Size: Optimal sample size would be 200–300 respondents to achieve statistical validity. You can compute the actual sample size depending on the confidence level desired and acceptable margin of error.

Interview Sample Size: A smaller but focused number of 10-15 in-depth interviews with mutual fund investors, financial advisors, and industry professionals would be adequate for qualitative information.

OBJECTIVES OF STUDY

The Primary objective of the study is to understand the following:

1. To evaluate the behavior and investment preferences of mutual fund retail and institutional investors in Thane towards emerging market mutual funds
2. To analyses the growth prospects of emerging market mutual funds from the investors' point of view in Thane district.
3. To compare the performance and attractiveness of emerging market mutual funds with that of domestic mutual funds from an investor's viewpoint.
4. In order to ascertain important determinants of investment choice, including Perceived risk, expectations of return, regulatory framework, and financial competence.

HYPOTHESIS OF THE STUDY

H1: Growing financial literacy in Thane District is associated with an increased number of mutual fund investors.

H2: Increased disposable income in Thane District results in greater participation in mutual fund investment.

H3: The growth of financial awareness and education initiatives in Thane District is positively related to a larger percentage of the population investing in mutual funds.

H4: The demographic profile of residents (e.g., age, occupation, and education level) plays a major role in deciding whether to invest in mutual funds in Thane District.

Analysis and Interpretation of Data:
The most important reason behind the conduction of a research study is to find out the theory behind the Existing study or a new topic of research. To generalize the outcomes of the data which is collected or to prove the data which is collected is important there is a need of some statistical equipment's or tools as we can say. The equipment's are used by analyzing the collected data it depends on the nature and Reaction of the data which is collected.

This particular research has used named Factor Analysis, Correlation C Regression, SEM Analysis and many of them are also used but these three are the most importantly used in this research study.

This Different equipment's or tools are used to find out the investor's preferences on different investment Avenue the factors that affect the preferences are demographic factors C general factors C socio-Economic factors, which also effects the investment decisions C awareness about the avenues.

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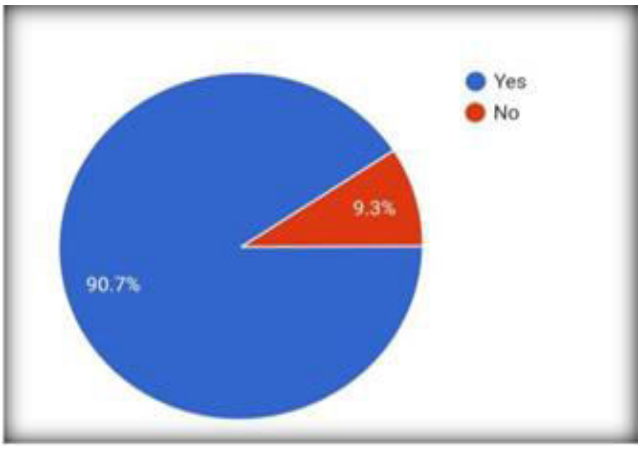
The Data Analysis and Interpretation of data.

Profile of the Respondents based on Socio-Economic Factors

Socio-economic variables	Frequency	Percentage
Age 0-25 26-35 36-45 46-55 56 and above	 25 16 2 0 0	 58.01% 37.02% 4.07% 0% 0%
Gender Male Female Others	 22 21 0	 51% 4G% 0%
Occupation Student Private employee Government employee Business person Retired	 G 28 2 4 0	 20.G% 65.1% 4.7% G.3% 0%
Annual income Below 2 lakh 2 lakh to 5 lakh 5 lakh to 10 lakh 10 lakh to above	 11 28 4 0	 25.6% 65.1% G.3% 0%

GRAPHICAL REPRESENTATION



1.1 Response on questions Are you aware of mutual fund investment options

The image presents data from a survey on prospects in emerging markets, specifically focusing on awareness and sources of information regarding mutual funds. Key

Observations from the graphs include:

Overall Response Rate: 43 responses were collected for each question.

Awareness of Mutual Funds: A large majority (90.7%) of respondents indicated they are aware of mutual fund investment options, while a small percentage (9.3%) are not.

Initial Source of Information: The primary way respondents first learned about mutual funds was through banks or financial institutions. The specific percentage is not provided in the image, but the green bar suggests it is a significant portion.

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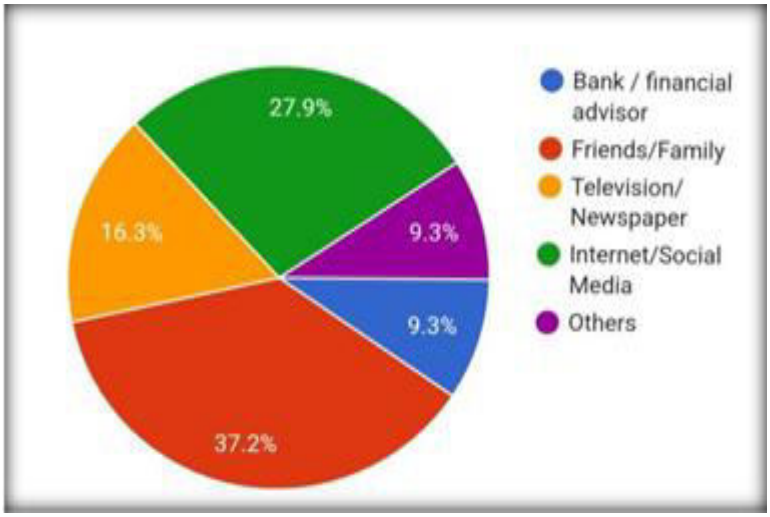
1.2 Response on questions of How did you first learn about mutual funds?



The pie chart illustrates how 43 respondents first learned about mutual funds. The data reveals that:

- **Friends/Family:**

37.2% of respondents learned about mutual funds from friends or family. This is the largest segment, indicating the significant role of personal networks in disseminating financial information.

- **Internet/Social Media:**

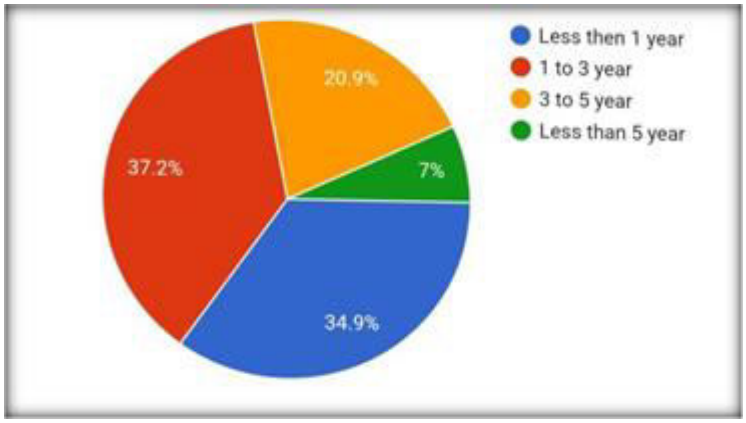
27.9% learned through the internet or social media platforms. This highlights the increasing importance of digital channels in financial education.

- **Television/Newspaper:**

16.3% learned from television or newspapers. This suggests that traditional media still plays a role, but to a lesser extent compared to personal networks and digital platforms.

- **Bank/Financial Advisor:**

9.3% learned from a bank or financial advisor. This indicates that formal financial institutions are a source for some, but not the majority, of respondents.



- **Others: 9.3% learned through other means. This category could include sources such as books, seminars, or other less common channels.**

1.3 Response on this question on If yes, how long have you been investing?

The provided pie chart illustrates the distribution of investment durations among 43 respondents. The data reveals that:

37.2% have been investing for 1 to 3 years. 34.9% have been investing for less than 1 year. 20.9% have been investing for 3 to 5 years. 7% have been investing for less than 5 years.

This indicates that the majority of respondents (72.1%) have been investing for 3 years or less, while a smaller percentage (27.9%) have investment experience exceeding 3 years.

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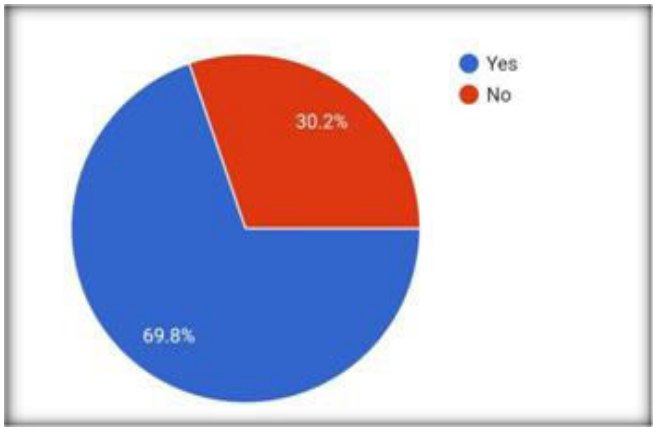
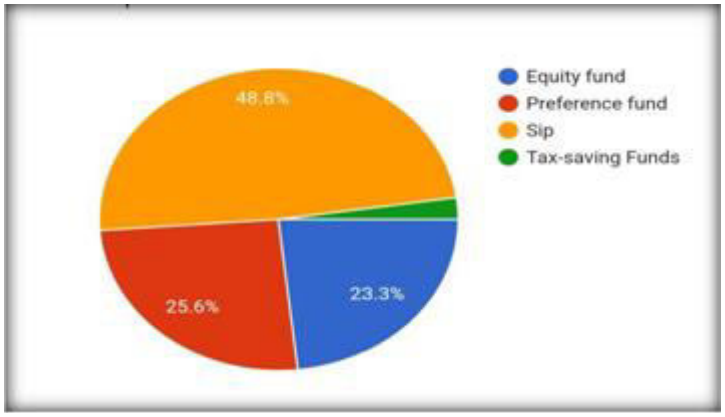


1.4 Response on the question of Have you ever invested in mutual funds?

From a Survey of 43 respondents. The data reveals that 69.8% of respondents have invested in mutual funds, while 30.2% have not. This indicates that a significant majority of those surveyed have experience with mutual fund investments.

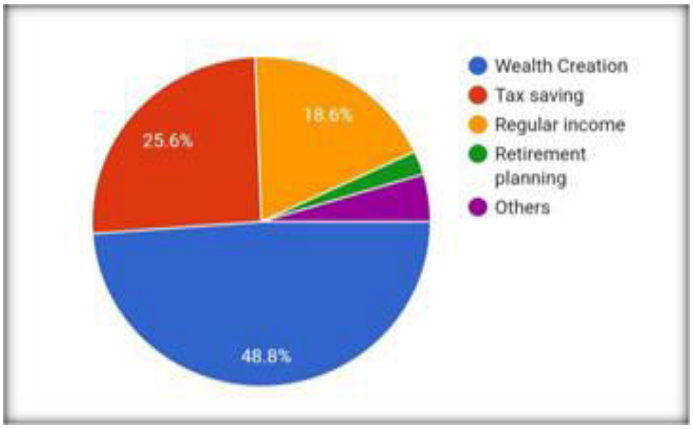


1.5 Response on the question of what type of mutual funds do you prefer?

With 43 responses visualized as a pie chart. The data shows the preference distribution across four types of mutual funds:

- **SIP:** 48.8% of respondents prefer SIP (Systematic Investment Plan).
- **Preference fund:** 25.6% of respondents prefer preference funds.
- **Equity fund:** 23.3% of respondents prefer equity funds.
- **Tax-saving Funds:** A smaller portion prefers tax-saving funds, but the exact percentage is not clearly labeled on the image.

This suggests that SIP is the most favored type of mutual fund among the respondents, while preference funds and equity funds have a roughly similar



Level of preference, and tax-saving funds are the least preferred in this sample.

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1.6 Response on the question of what is your primary objective for investing in mutual funds

The pie chart illustrates the primary objectives of 43 respondents for investing in mutual funds. The data reveals that the most significant objective is wealth creation, with 48.8% of respondents citing it as their primary goal. Tax saving is the second most prevalent objective, accounting for 25.6% of responses. Regular income is the third

Most common objective, with 18.6% of respondents selecting it. Retirement planning and other objectives constitute smaller portions, with 4.7% and 2.3% respectively. This distribution suggests that while a substantial portion of investors prioritize long-term wealth accumulation, tax benefits and steady income streams also play significant roles in their investment decisions.

CONCLUSION

The study shows that Thane District has a lot of untapped potential when it comes to mutual fund investments, especially within the bigger picture of emerging markets. As people in Thane become more financially aware, gain easier access to digital platforms, and start to shift their investment habits, many are moving away from traditional savings methods and starting to explore mutual funds.

That said, the transition isn't without its challenges. A lot of people still hesitate due to concerns about risk, limited knowledge of how mutual funds actually work, and fears about market ups and downs. These factors can hold back wider participation.

To really unlock Thane's investment potential, there's a need for ongoing investor education, clear and trustworthy regulations, and better financial advice. If those areas are strengthened, mutual funds could become a much more popular choice among everyday investors. Overall, Thane could serve as a great example of how mutual fund adoption can grow in emerging areas—with the right support, it's a space ready for significant growth.

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WOMEN'S CAREER PROGRESSION.

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ABSTRACT

This research paper explores the phenomenon of role conflict and its impact on women's career progression. Women often find themselves balancing multiple roles across professional and personal spheres, navigating through societal expectations, family obligations, and workplace responsibilities. Despite possessing immense potential and capability, many women are compelled to step back from their career ambitions due to these overlapping demands. The pressure to maintain an ideal work-life balance often leads to emotional and physical strain, contributing to role conflict and, in many cases, hindering career growth.

This study examines how such conflicts arise, their psychological and professional consequences, and the coping strategies women adopt. While many face these challenges daily, some women have overcome these barriers and achieved exceptional success—icons such as Kalpana Chawla, Indira Gandhi, and Mary Kom serve as inspiring examples. Through surveys, interviews, and case studies, this research aims to identify key factors contributing to role conflict and assess its influence on women's career trajectories. The paper also explores potential interventions and organizational policies that can support women in navigating these challenges more effectively. Ultimately, the study seeks to contribute to the discourse on gender equality and career development by highlighting the need for a more inclusive and supportive work environment.

Keywords: Role conflict, Work life balance, Gender Roles, Women Empowerment, Female workforce.

INTRODUCTION

In today's fast-paced world, the issue of work-life balance has become very important for females because it affects both personal and professional life. Studies show that when work and personal life are well balanced, people feel more at peace. But if there's an imbalance, it can negatively affect an employee's personal life, leading to job dissatisfaction and harming the organization's overall performance.

In the past, women were largely excluded from the workforce, often perceiving themselves as weaker compared to their male counterparts. Traditionally, their roles were confined to housework—cooking, cleaning, and caring for the family. .

women play a significant role in the economy. However, they still face many challenges in both their personal and work lives. Many working women struggle to maintain a healthy balance, which affects their social life. They often feel pressure not just at work but also at home. Because women are expected to take on many roles in society, it becomes even harder for them to balance work and life.

Despite these advances, many women continue to juggle dual roles as both professionals and homemakers. They are expected to manage their households, care for family members, and perform equally well in their careers. The primary factor contributing to this work-life imbalance is the lack of cooperation from both family members and colleagues.

One of the major challenges that working women face is role conflict, which has significantly slowed down their career progression. In many cases, even when women possess the necessary skills, qualifications, and potential to excel in their professions, the multiple responsibilities they are expected to handle—both at work and at home—often become barriers to their personal and professional growth. These responsibilities, such as managing household duties, caring for children or elderly family members, and fulfilling social expectations, create immense pressure that hinders their ability to focus on their careers fully.

As a result of these overlapping roles and responsibilities, many women delay important career-related decisions, such as pursuing higher education, accepting promotions, relocating for better opportunities, or even returning to work after a break. These delays not only impact their current professional standing but also affect their long-term career growth and reduce their potential to build or maintain competitive skill sets. Over time, this leads to a decline in their confidence and the overall contribution of women in the workforce.

Due to these ongoing challenges, women often find it difficult to compete equally with their male counterparts, who may not face the same level of personal or societal expectations. This inequality reinforces negative stereotypes, where women are unfairly judged as being less capable or less committed to their work compared to men.

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Ultimately, despite their abilities and dedication, women are often seen as falling short in performance simply because of the structural and social barriers that restrict their professional development.

LITERATURE REVIEW

"Ritwik Saraswat and Remya Lathabahvan" have studied the role of women in entrepreneurship and found that most believe women face challenges in decision-making. They suggest that the government should work towards reducing paperwork and streamlining procedures to better support women entrepreneurs."

"Tiwari" highlighted that employees, particularly women, often have to juggle dual roles—one at work and another at home. The study, conducted in private organizations with a sample of 150 female employees, revealed that 93.32% believed the evolving environment and its associated challenges were negatively impacting both their work and family lives. Furthermore, 56.67% felt that their organizational culture and managers did not provide adequate support to help them balance personal and professional responsibilities

Conversely, 83.32% reported receiving full support from their families in managing job-related duties and household obligations."

"Gunavathy" in a study conducted among married women employees in BPO companies, examined the causes and consequences of work-life imbalance, as well as potential interventions to promote balance. The findings revealed that over two-thirds of the respondents experienced work-life imbalance, primarily due to work encroaching on their personal lives. The study also concluded that such imbalance often leads to stress, burnout, health issues, and diminished work performance."

" Verma and Mulani " noted that Indian working women strive for independence and success but often struggle to balance career and family responsibilities. This imbalance leads to stress, sleep deprivation, frustration, and feelings of loneliness and helplessness. Over time, many women face emotional and psychological challenges but lack the time or support to express themselves or seek help."

OBJECTIVES

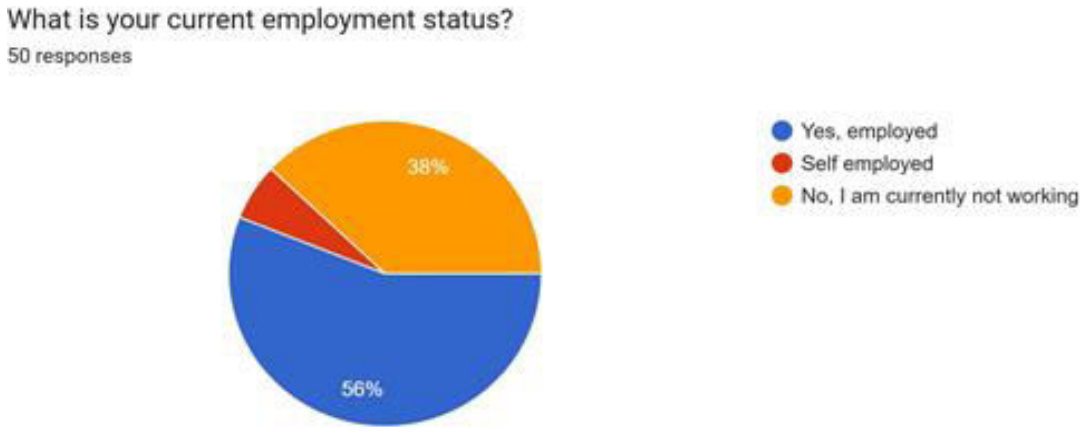
1. To study the challenges women encounter in balancing their work and personal lives.
2. To explore the factors contributing to unemployment among women.
3. To investigate the impact of personal responsibilities on women's professional lives.
4. To assess the effects of role conflict on women's personal well-being.
5. To identify the factors that lead to delays in women's career progression.

RESEARCH METHODOLOGY

Secondary data has been contributed to write this paper. The data is collected from various websites that focus on different aspects of the challenges women face in balancing work and personal life.

Primary data was collected through a public survey, utilizing a structured questionnaire. Responses were gathered from individuals across various age groups and professions.

DATA ANALYSIS & INTERPRETATION



Result: 56% of females are employed,6% of females are self employed where as 38% of females are not currently employed.

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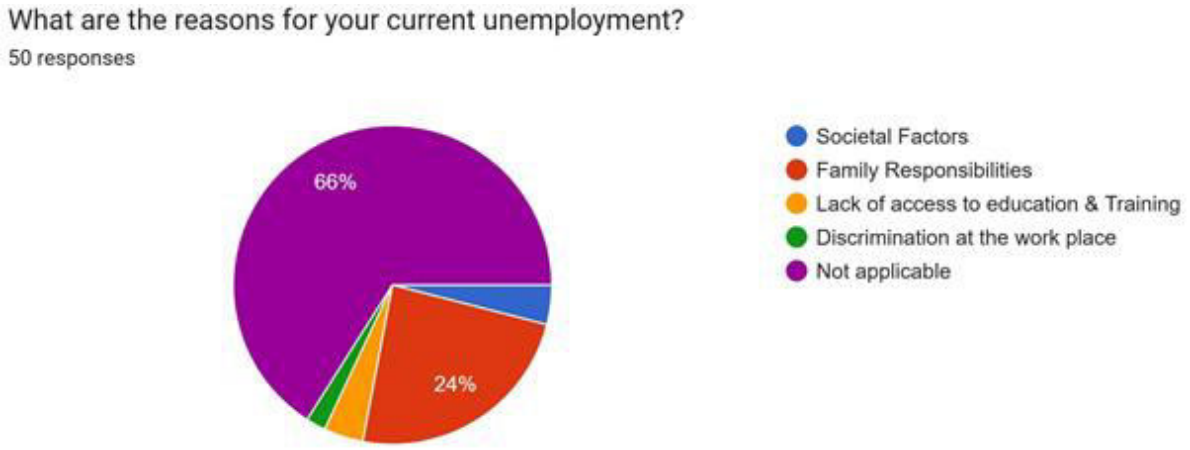
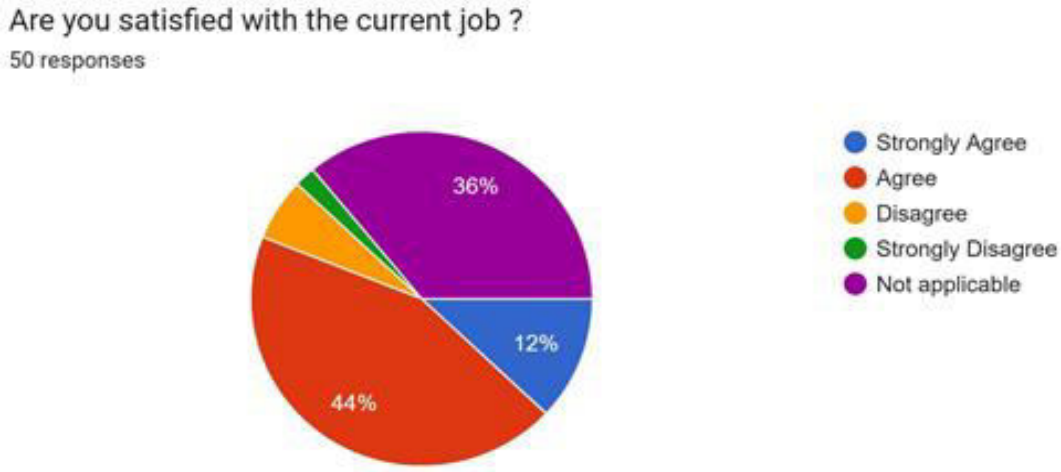


Result: 25% of the females said as family responsibility is the reason for their current unemployment, while 2.1 % of females responded as lack of access to education and training & Discrimination at workplace where as 2% of females says societal factors for their current unemployment.



Result : 12% of the females are strongly agree for satisfaction in their current job, 44% of the females are agree with this statement , 6% are disagree with the given statement , where as 2% of the females Strongly disagree with their current job satisfaction.

Result : Majority percentage of females (28%) says that they find it difficult in managing both personal & professional life where as (24%) says that they do not find any issue in managing both personal & professional life & (24%) says that somewhat issue they face it & 24 % are not at all employed.

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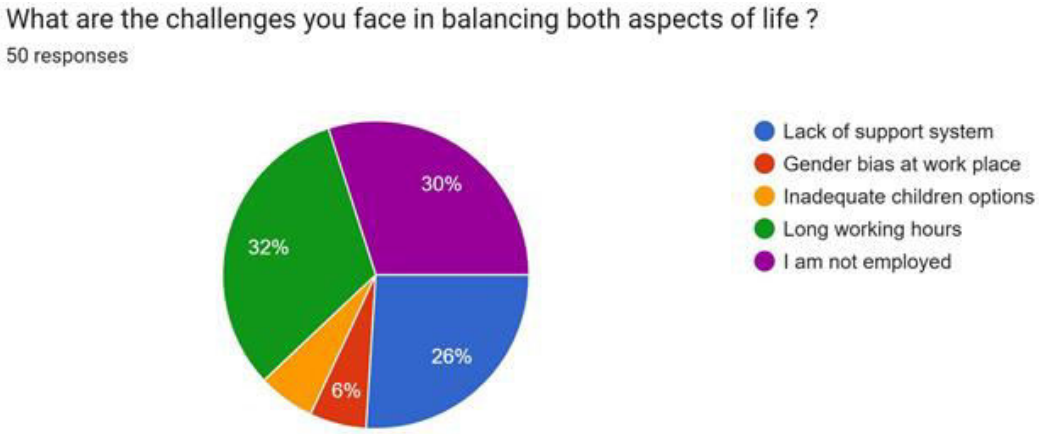
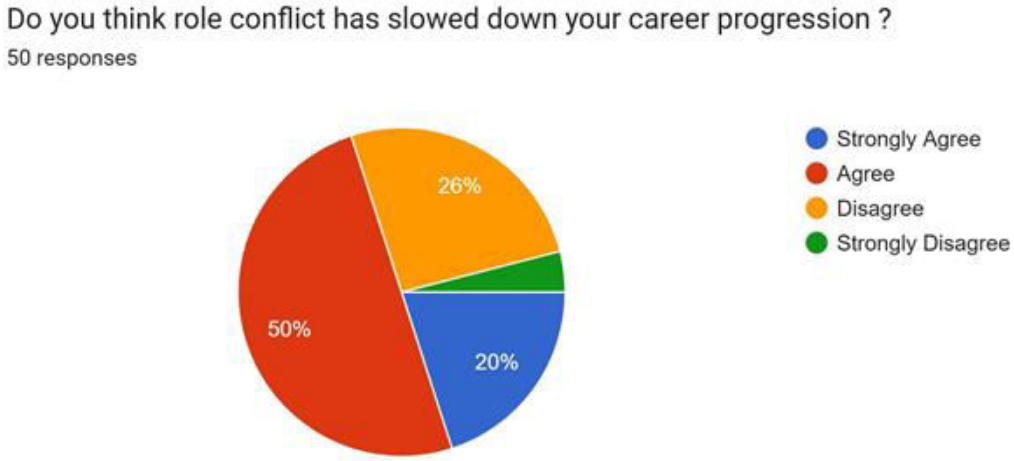
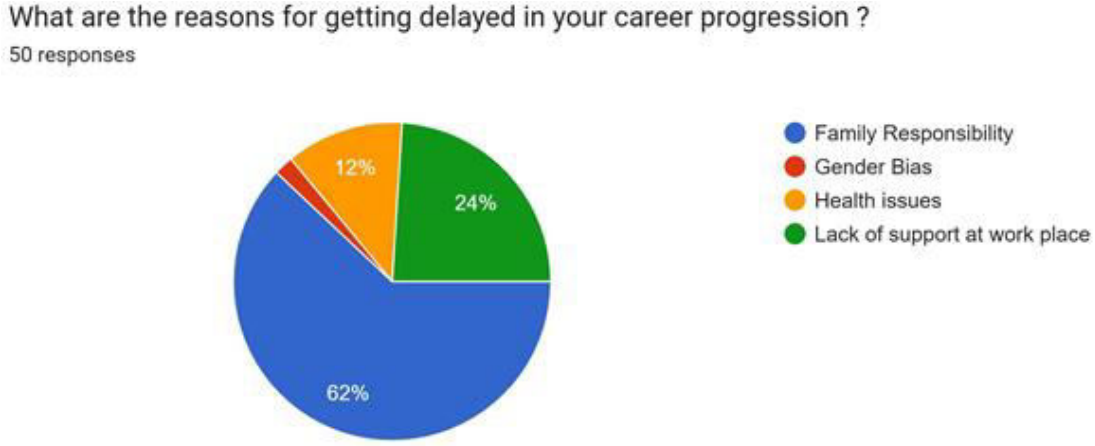


Result : Majority females (32%) says long working hours & Minimum females (6%) says gender bias at the work place & inadequate children option is the challenge they face in balancing both aspects of life where as 26% responded as lack of support system is the real challenge.



Result: 50% of the females agree that their role conflict has slowed down their career progression, 20% strongly agree with this statement, 26% Disagree with the given statement, where as 4% strongly disagree with the given statement.



Result : 62% of the females responded as family responsibility is the primary reason for getting delayed in their career progression, 24% says lack of support at work place,12% says health issues and 2% responded as gender bias for this statement.

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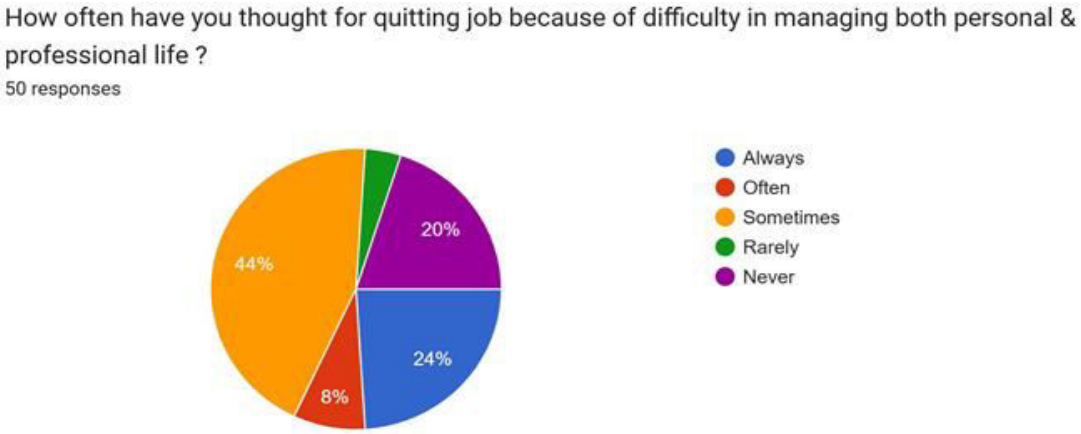

Result : 44% respondents sometimes they feel like to quit the job, 24% says they always have a thought of quitting, 8% often feels it, 4% feels have a rarely thought of quitting the job where as 20% never had a thought of quitting the job.

FINDINGS

The findings reveal that the highest level of education attained by most women is a Master's degree. A significant portion of the female respondents are married, with 56% of employed women falling into this category. The majority of these women are working in the education sector, which appears to be the most common industry for female employment.

However, family responsibilities have emerged as the leading reason for unemployment among women. Most of the employed women are positioned at the middle level in their organizations, and only 44% reported being satisfied with their current jobs. About 28% of the respondents admitted they struggle to manage both personal and professional responsibilities, while 32% identified long working hours as a major challenge in maintaining work-life balance.

Interestingly, 42% of the women stated that family support plays a crucial role in helping them manage both aspects of their lives. On the other hand, 56% still find it difficult to maintain a proper balance between work and personal commitments. Additionally, 50% of the women agreed that role conflict has delayed their career decisions, and 42% felt that their professional lives are somewhat impacted by their personal obligations.

Furthermore, 44% of the respondents mentioned that they occasionally consider quitting their jobs due to the challenges they face in managing work and home responsibilities. These insights reflect the ongoing struggle many women experience in balancing multiple roles, and highlight the urgent need for supportive measures to address work-life balance for working women.

SUGGESTIONS

In light of the findings, the following measures are recommended to address the work-life balance challenges faced by working women:

Although many women are highly educated, they often face limited professional opportunities aligned with their qualifications, particularly beyond the education sector. This challenge is intensified for married women managing both work and family responsibilities, underscoring the need for family-friendly policies like flexible hours, parental leave, and childcare support. With only 44% of mid-level female employees satisfied with their roles, organizations must invest in career development, leadership pathways, and engagement initiatives. Additionally, structured work-life balance and wellness programs are essential, as a significant portion of women continue to struggle with balancing personal and professional demands.

Long working hours remain a major concern for 32% of women, highlighting the need for reduced or flexible work options. Since 42% rely on family support to manage dual roles, awareness campaigns promoting shared responsibilities at home are crucial. Persistent challenges in balancing work and life for over half of female employees indicate the importance of gender-sensitive practices and ongoing organizational support. With role conflicts delaying career decisions for many, mentoring and coaching programs can offer valuable guidance. Lastly, to address the high attrition risk—evidenced by 44% considering quitting—retention strategies like counseling, peer support, and open dialogue with management are vital.

These recommendations aim to support the advancement, well-being, and retention of women in the workforce by creating a more balanced and inclusive professional environment.

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CONCLUSION

The findings of this study highlight the persistent challenges faced by working women, despite their high levels of education and active participation in the workforce. While the majority hold a Master's degree and are employed in the education sector, many women—particularly those who are married—struggle to balance professional responsibilities with family obligations. The data reveals that family responsibilities remain a key barrier to both employment and career progression, with a large number of women occupying mid-level roles and expressing dissatisfaction with their jobs.

Issues such as long working hours, lack of flexible work options, and insufficient organizational support further contribute to the difficulty in managing personal and professional life.

Moreover, the study underscores the critical role of family support in helping women maintain work-life balance, yet a majority still face significant difficulties in achieving it. Role conflict, delayed career decisions, and the emotional burden of juggling multiple responsibilities have led many women to consider quitting their jobs. These findings point to the urgent need for more inclusive, supportive workplace environments that recognize and respond to the unique challenges faced by women. Implementing flexible work policies, promoting shared family responsibilities, and offering career development support are essential steps toward empowering women and ensuring their long-term participation and growth in the workforce.

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FROM ROOF TO ROOT: SUPPLY CHAIN INNOVATIONS IN ROOFTOP ORGANIC FARMING FOR A SUSTAINABLE BHARAT - WITH SPECIAL REFERENCE TO KBMC AREA

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ABSTRACT

Achieving Viksit Bharat, India's goal for the future, must include sustainable urban growth. Rooftop organic farming is a new concept that is gaining traction in this context; it makes use of unused urban space to increase food security, improve sustainability, and encourage community involvement. Rooftop organic farming in the Kulgaon-Badlapur Municipal Corporation (KBMC) district of Maharashtra is the subject of this paper titled "From Roof to Root: Supply Chain Innovations in Rooftop Organic Farming for a Sustainable Bharat," which analyses the supply chain structure of this crop.

This research looked at how rooftop agriculture in the KBMC area was possible through technological advancements, stakeholder involvement, logistical frameworks, and local habits. Input sourcing (organic seeds, soil replacements, compost), urban agricultural methods (container growing, hydroponics), harvesting, storage, packing, and last-mile delivery are all heavily analyzed vital components of the supply chain. Innovations that enhance supply chain efficiency and transparency are being prioritized. These include hyperlocal distribution models, farm-to-table services that are based on mobile applications, and community cooperative structures.

Rooftop organic agriculture in the KBMC area strengthens urban food security, increases green space, and creates economic opportunities, particularly for women and self-help groups (SHGs), according to the research. Inadequate government support, infrastructure limitations, and low consumer awareness are a few of the issues mentioned in the study, which then suggests public-private partnerships, urban agricultural policy frameworks, and community-driven models as ways to expand the effort in a sustainable way.

According to this article, the national goal of a Sustainable Bharat can be achieved by the development of urban areas that are greener, smarter, and more self-sufficient, which can be achieved through rooftop organic gardening supported by innovative, localised supply chains. Other semi-urban areas in India can learn from the Kulgaon-Badlapur example.

Keywords: *Rooftop Organic Farming, Sustainable Urban Development, Supply Chain Innovations, Urban Agriculture, Viksit Bharat, Food Security, Container Gardening, Green Space Enhancement.*

1. INTRODUCTION

Although rapid urbanisation in India is a sign of improving the country's economy and infrastructure, it also presents complex challenges to realising Viksit Bharat, the goal of India's long-term vision of a developed and inclusive society. Concerns about food insecurity, environmental deterioration, and a lack of available urban space have emerged as key obstacles to city living in a sustainable way. Rooftop organic gardening is an innovative, community-based approach to environmental sustainability and economic development all at once.

The growing disparity between the daily need for food and the supply in highly populated metropolitan areas is being addressed by urban agriculture, particularly through rooftop organic gardening. By allowing for the cultivation of organic, fresh vegetables on underutilised rooftops, this method improves urban food sovereignty, decreases dependence on vast food supply networks, and lessens the impact on the environment associated with traditional agricultural logistics.

Rooftop farming offers an opportunity to turn urban areas into centres of environmentally friendly production, in line with the Viksit Bharat strategy's priorities of fair growth, technical innovation, and environmental preservation.

Rooftop organic farming is studied as an agricultural practice and a supply chain practice in the Kulgaon-Badlapur district of Maharashtra, which is the focus of the study. Vegetables such as cilantro, mint, ginger, turmeric, onion, garlic, tomatoes, and spinach were considered in the case study. By delving into crucial components, including resource sourcing (organic seeds, compost), vertical/container farming techniques, and hyperlocal distribution networks, the study offers a holistic view of how decentralised food production functions in an urban setting.

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New technology integrations like the IoT for remote monitoring, blockchain for traceability, and mobile apps for direct customer connection show how digital tools can make urban agriculture more transparent, efficient, and trustworthy for consumers.

The resilient, efficient, and inclusive supply chains are better developed when hyperlocal distribution models and CSA are put into place. Inadequate public awareness, infrastructure barriers, legislative instability, and lack of standardization all work against rooftop agriculture's potential for scaling. This study takes a look at these limitations and offers solutions for urban planners, politicians, and agricultural entrepreneurs looking to grow rooftop farming in a sustainable way.

To promote urban self-sufficiency, ecological equilibrium, and grassroots economic advancement—all of which align with the broad goals of Viksit Bharat—this research presents rooftop organic gardening as an all-encompassing answer.

2. REVIEW OF LITERATURE

a. Despommier, D. (2010) emphasised the imperative of vertical and rooftop agriculture in response to rapid urbanisation, advocating for efficient land use and reduced environmental impact. His research provides essential insights into the capacity of urban agriculture to transform cities into productive ecosystems.

b. Saha et al. (2014) investigated rooftop gardens in Indian cities, highlighting their role in enhancing urban food security and alleviating heat island effects. They suggested the integration of policy assistance and urban planning to improve scalability.

c. Grewal & Grewal (2012) assessed the feasibility of urban agriculture in U.S. cities, concluding that rooftop gardening may fulfil a significant portion of urban food needs while mitigating carbon emissions associated with food transportation.

d. Lal (2020) examined climate-smart agriculture and emphasised that the incorporation of rooftop farming with technologies such as IoT and data-driven tools enhances yield efficiency and sustainability.

e. Khosla, R. (2016) examined the role of green infrastructure, such as rooftop farming, in advancing India's smart city initiative and fostering sustainability, in accordance with urban regeneration programs like AMRUT and Viksit Bharat.

f. Bhatt & Kong (2021) found that blockchain and traceability technologies significantly enhance transparency and consumer confidence in urban agriculture, especially in direct-to-consumer models.

g. Bailkey and Nasr (2000) emphasised the significance of community involvement in rooftop agriculture, illustrating how Community Supported Agriculture (CSA) models can bolster urban resilience and socioeconomic inclusivity.

h. Roy, M. (2015) examined the challenges of urban agriculture in India, such as lack of legal recognition, insufficient zoning rules, and infrastructural shortcomings, urging for extensive reforms to promote its advancement.

i. Garnett (2011) examined the challenges of urban farming in India, such as inadequate legal recognition, feeble zoning restrictions, and infrastructural shortcomings, proposing for comprehensive reforms to promote its advancement.

j. Prasad & Kumar (2022) conducted a case study on urban farming initiatives in Maharashtra, demonstrating how mobile applications and IoT have improved consumer engagement and reduced food waste.

3. RESEARCH METHODOLOGY

a. Research Gap

In India, there is a dearth of research on rooftop organic farming; what little there is focusses on the technology and environmental advantages, rather than the full range of obstacles to implementation. The necessity for extensive implementation is underscored by the dearth of localised case studies, especially from Tier-II cities such as Badlapur.

b. Need for the study

Food insecurity, environmental degradation, and inefficient supply chains are increasing in urban areas, particularly in Kulgaon-Badlapur, Maharashtra. Rooftop organic farming offers a decentralized solution to address these issues. However, its practical viability, acceptance, and the issues related to operations have not been thoroughly investigated. Understanding economic concerns, consumer attitudes, trust in local produce, and

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awareness levels is crucial for assessing the feasibility of such projects. This research aims to understand urban awareness, local perceptions of rooftop farming, consumer demand, operational issues, and suggestions for sustainable urban farming projects. The study aims to enhance urban resilience and community involvement in localized food production models.

c. Scope of the study

This study evaluates the feasibility, challenges, and potential of rooftop organic farming as a sustainable solution for urban food security in the Kulgaon-Badlapur Municipal Corporation (KDMC) area of Maharashtra. It targets residents in apartments, housing societies, and bungalows with rooftop access, assessing awareness, attitudes, and perceptions. Key focus areas include evaluating hyperlocal production models, consumer perception, operational, economic, and social challenges, and recommending strategic actions for promoting and sustaining rooftop farming. The findings are specific to the KDMC region and may not be generalizable.

d. Objective of the study

This case study evaluates rooftop organic farming's feasibility, challenges, and potential as a sustainable, decentralized remedy for urban food security in the Kulgaon-Badlapur region of Maharashtra. Specifically, to find the operational viability of rooftop organic farming, the impact of hyperlocal distribution models, identify the crucial challenges, and recommend strategic actions for the same. The specific objectives are:

a. To find awareness and perception of rooftop organic farming among residents in the KBMC area.

b. To evaluate the perceived impact of localized rooftop farming systems on supply chain efficiency and sustainability.

c. To examine the influence of consumer perception, cost advantage, and trust on the intention to purchase organic vegetables grown through rooftop farming in local residential areas.

e. Hypotheses of the Study:

H_0: There is no significant relationship between the level of awareness about rooftop organic farming and the willingness to adopt or support such initiatives in residential societies.

H_1: There is a significant relationship between the level of awareness about rooftop organic farming and the willingness to adopt or support such initiatives in residential societies

H_0: Residents do not perceive rooftop organic farming as a viable method for reducing supply chain and logistics costs for daily-need vegetables

H_2: Residents perceive rooftop organic farming as a viable method for reducing supply chain and logistics costs for daily-need vegetables.

H_0: There is no positive correlation between perceived cost advantage, trust in produce quality, and the intention to purchase organic vegetables from rooftop gardens within their own society or bungalow.

H_3: There is a positive correlation between perceived cost advantage, trust in produce quality, and the intention to purchase organic vegetables from rooftop gardens within their own society or bungalow.

d. Research Design

This paper follows a mixed-methods research approach. This study is based on the pilot study, and it is followed by a well-structured questionnaire-based survey method. A total of 93 responses were collected from the cooperative housing society in the Kulgaon-Badlapur area. Inferential analysis is carried out through the Chi-square test, the ANOVA test, Spearman's Rank Correlation test, factor analysis, and Multiple Linear Regression test.

4. DATA ANALYSIS & INTERPRETATION

Objective 1: To assess the awareness and perception of rooftop organic farming among residents in the KDMC area.

H_0: There is no significant relationship between the level of awareness about rooftop organic farming and the willingness to adopt or support such initiatives in residential societies.

H_1: There is a significant relationship between the level of awareness about rooftop organic farming and the willingness to adopt or support such initiatives in residential societies.

The above hypothesis is tested through Spearman's Rank Correlation between awareness & feasibility and willingness & Likelihood to recommend. The tests are as below:

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Table 1: Spearman's Rank Correlation between awareness & feasibility:

Coefficient (rs):	-0.267355632
N:	93
T Statistics:	2.646757643
DF:	91
P-Value:	0.0095

Table 2: Spearman's Rank Correlation between willingness & Likelihood to recommend

Coefficient (rs):	0.241274
N:	93
T Statistics:	2.371669
DF:	91
P-Value:	0.0198

Source: Primary Data

Interpretation:
The relationship is negative (rs = -0.267) and statistically significant (p = 0.0095 < 0.05). This indicates that as awareness grows, certain residents may recognize feasible obstacles, potentially stemming from practical considerations (space, cost, maintenance), despite their awareness. A positive and statistically significant connection (rs = 0.241, p = 0.0198 < 0.05) suggests that individuals inclined to adopt rooftop farming are also predisposed to advocate it to others, reflecting a favourable disposition once willingness is confirmed.

In summary, the above two correlations are statistically significant at the 5% level, indicating a substantial association between awareness/perception characteristics and willingness/support behaviours among KBMC inhabitants.

The chi-square test is applied to test the Awareness level and Willingness to Participate as below:

Table 3: Chi-Square Test	**Yes**	**No**	**May be**	**Total**
Awareness	73	20	0	93
Willingness to Participate	24	60	9	93
Total	97	80	9	186

Chi-Square	**df**	**P-Value**
53.75	4	0.0001

Source: Primary Data

Interpretation:
The Chi-square test showed a significant correlation between the awareness levels and willingness to participate among respondents. However, despite increased awareness, actual willingness to participate significantly diminished, indicating that awareness alone does not fully translate into participation. The p-value was 0.0001, lower than the conventional significance threshold.

Objective 2: To evaluate the perceived impact of localized rooftop farming systems on supply chain efficiency and sustainability.

H_0: Residents do not perceive rooftop organic farming as a viable method for reducing supply chain and logistics costs for daily-need vegetables

H_2: Residents perceive rooftop organic farming as a viable method for reducing supply chain and logistics costs for daily-need vegetables

To compare perceived supply chain impact across residence types or areas, the ANOVA Test was applied:

Table 4: Anova: Single Factor

SUMMARY				
Groups	***Count***	***Sum***	***Average***	***Variance***
1	92	100	1.086957	0.16818
1	92	302	3.282609	1.589584

Source: Primary Data

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Table 5: ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	221.7609	1	221.7609	252.3216	0.0001	3.893061
Within Groups	159.9565	182	0.878882			
Total	381.7174	183				

Source: Primary Data

Interpretation

The F-value (252.322) is substantially bigger than the F-critical value (3.893). The P-value (0.0001) is far less than 0.05, indicating that the results are highly statistically significant. This suggests there is a statistically significant difference between the groups in terms of how they view rooftop farming's impact on supply chain efficiency and cost savings. Residents regard rooftop organic farming as a feasible and efficient approach to diminish supply chain and logistics costs for essential vegetables.

To group related items like Reduced Cost, challenges, opportunities into underlying factors representing supply chain perception, Factor analysis applied:

Table 6: KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.468
Bartlett's Test of Sphericity	Approx. Chi-Square	2.730
	df	3
	Sig.	0.435

Source: Primary Data

Table 7: Communalities		
	Initial	Extraction
Reduced Cost	1.000	0.643
Challenges	1.000	0.823
Opportunity	1.000	0.720
Extraction Method: Principal Component Analysis.		

Source: Primary Data

Table 8: Total Variance Explained						
Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
Cost & Opportunity Perception	1.147	38.225	38.225	1.147	38.225	38.225
Challenge Perception	1.039	34.631	72.856	1.039	34.631	72.856
3	0.814	27.144	100.000			
Extraction Method: Principal Component Analysis.						

Source: Primary Data

Table 9: Component Matrix[a]		
	Component	
	1	**2**
Reduced Cost	0.795	0.102
Challenges	0.326	0.847
Opportunity	0.639	-0.558
Extraction Method: Principal Component Analysis.		
a. 2 components extracted.		

Source: Primary Data

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Interpretation

Rooftop farming reduces costs and offers benefits like fresh food and communal benefits. However, residents perceive challenges independently, such as maintenance, space, and expertise, as separate cognitive clusters. Both components highlight the benefits of rooftop farming. The analysis reveals that residents' perceptions of rooftop organic farming's impact on supply chain and sustainability are based on its benefits (cost savings and opportunities) and challenges (obstacles and concerns). The extracted components explain 72.856% of the variance. So, it can be said that residents do perceive rooftop farming as a potential solution to improve supply chain efficiency, provided that challenges are addressed systematically.

Objective 3: To examine the influence of consumer perception, cost advantage, and trust on the intention to purchase organic vegetables grown through rooftop farming in local residential areas.

H_0: There is no positive correlation between perceived cost advantage, trust in produce quality, and the intention to purchase organic vegetables from rooftop gardens within their own society or bungalow.

H_3: There is a positive correlation between perceived cost advantage, trust in produce quality, and the intention to purchase organic vegetables from rooftop gardens within their own society or bungalow.

The Pearson or Spearman Correlation test is applied between trust, cost sensitivity, and intention to purchase:

Table 10: Correlations

		Trust	Cost	Purchase
Trust	Pearson Correlation	1	.492**	.[b]
	Sig. (2-tailed)		0.000	
	N	93	93	93
Cost	Pearson Correlation	.492**	1	.[b]
	Sig. (2-tailed)	0.000		
	N	93	93	93
Purchase	Pearson Correlation	.[b]	.[b]	.[b]
	Sig. (2-tailed)			
	N	93	93	93
**. Correlation is significant at the 0.01 level (2-tailed).				
b. Cannot be computed because at least one of the variables is constant.				

Source: Primary Data

Interpretation

The study revealed a significant positive correlation between trust in produce quality and perceived cost advantage of rooftop-farmed vegetables. Residents perceive these vegetables as cost-effective compared to market alternatives. However, the intention to purchase could not be analyzed statistically due to uniform responses. The study partially supports the alternative hypothesis (H_3) by showing a positive correlation between trust and cost advantage in rooftop-farmed produce, but the relationship cannot be fully established due to a lack of variation in purchase intention responses.

Multiple Linear Regression is applied between the dependent variable, i.e., Purchase Intention, and the Independent Variables like Trust in Local Produce, Price Sensitivity, and Willingness to Support.

Table 11: SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.6484316
R Square	0.42046354
Adjusted R Square	0.4009286
Standard Error	0.753461
Observations	93

Source: Primary Data

Table 12: ANOVA

	df	***SS***	***MS***	***F***	***Significance F***
Regression	3	36.65718662	12.21906	21.52367	1.43108E-10
Residual	89	50.52560908	0.567703		
Total	92	87.1827957			

Source: Primary Data

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Table 13	*Coefficients*	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	4.9228123	1.632760753	3.015024	0.00334799	1.678551459	8.1670731	1.678551459	8.167073135
Trust	0.81236335	0.103683612	7.835022	9.459E-12	0.606346225	1.0183805	0.606346225	1.018380483
Willing to Participate	-0.02039793	0.143114744	-0.14253	0.88698475	-0.30476388	0.263968	-0.30476388	0.263968019
Cost Sensitivity	-0.83232637	0.376950371	-2.20805	0.02981083	-1.58131873	-0.083334	-1.58131873	-0.08333401

Source: Primary Data

Interpretation

Confidence in locally sourced rooftop vegetables markedly enhances consumers' purchasing intentions. A one-unit augmentation in trust results in a 0.812-unit enhancement in buy intention, assuming all other factors remain constant. Cost sensitivity exhibits a substantial negative correlation with purchase intention. Consumers with a heightened sensitivity to price are less inclined to purchase rooftop-grown organic veggies. The willingness to participate is not a significant predictor. Consumer engagement in rooftop farming activities does not significantly influence their purchasing intentions. Given that both Trust and Cost Sensitivity are statistically significant ($p < 0.05$), and the model as a whole is significant ($p < 0.05$), we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_3) — indicating a positive correlation between perceived trust, perceived cost advantage (inversely for cost sensitivity), and the intention to purchase rooftop-farmed vegetables.

5. PILOT PROJECT ANALYSIS

Based on the above survey a pilot project was initiated. The detail of the pilot project is given below:

India's urbanization is causing environmental and social challenges, including shrinking green spaces, food insecurity, and long supply chains. Rooftop organic farming is a solution that combines ecological sustainability with community empowerment. A pilot initiative in the Manjarli area of Badlapur, west of the Kulgaon-Badlapur region in Maharashtra, used container and vertical farming techniques, organic inputs, and emerging technologies for the supply chain. The case study aims to build localized food production systems on underutilized urban rooftops, contributing to Viksit Bharat's vision.

A specific project was initiated in the Manjarli region of Badlapur West, inside the Kulgaon-Badlapur Municipal Area. The cooperative housing society had six buildings, with 80% currently inhabited. Twelve plastic grow bags were erected on the roof as part of a trial experiment. To prepare the soil, a mixture of 80% coco-pit and 20% soil used to decrease the weight of the grow bag and minimize water usage. Plastic trays were used for cultivating veggies, and plastic drums were used for the production of organic fertiliser.

Seeds were purchased from the local market and regional farmers, and residents were requested to segregate vegetable and fruit trash to ensure a constant supply of organic fertilisers. Cow dung and desiccated leaf waste were used in the production of organic fertiliser. Experts in agriculture were appointed for the agricultural process, and short-term vegetables were planted in the grow bags. The vegetables were ready for harvest within one to three months, and the harvested vegetables were allocated among the society members.

The project demonstrated the feasibility of hyperlocal farm-to-fork systems from a supply chain standpoint, effectively reducing post-harvest logistics, eliminating intermediaries, and eliminating waste and unsold inventory.

The minimal distribution costs, reduced input procurement charges, and community engagement produced a self-sustaining economic model beneficial to all people. The project showcased strong community engagement, from waste segregation for composting to collective farming activities led by local youth under expert guidance.

The initiative achieved a reduction in carbon footprint by minimising transportation emissions and fostering circular waste management via composting organic waste.

The research indicates the need for policy-level assistance, standardised safety and scalability frameworks, and extensive awareness efforts to replicate these ideas in other housing societies..

6. POLICY AND STRATEGIC FRAMEWORK

The Co-operative Housing Society in Badlapur has implemented a rooftop organic farming initiative, leading to policy recommendations to promote sustainability and replication. These include a comprehensive urban agriculture policy, financial incentives and subsidies, capacity development and technical assistance, waste-to-wealth programs, legal and regulatory assistance, public awareness campaigns, market connections, and incorporating rooftop gardens in affordable housing initiatives.

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The initiative also encourages waste segregation and waste segregation infrastructure in housing developments. Legal and regulatory assistance includes zoning restrictions and streamlined authorization for lightweight infrastructure. Public awareness campaigns highlight the health, environmental, and economic benefits of rooftop agriculture. Market connections are promoted through community-supported agriculture initiatives and local farmers' markets. Rooftop agriculture is also incorporated into affordable housing initiatives, offering micro-financing alternatives or eco-friendly loans to economically disadvantaged populations. A centralized database is created to monitor rooftop farming initiatives and provide ongoing policy feedback.

7. CONCLUSION

a. **Awareness alone does not ensure participation:** Rooftop organic farming is something that several locals are familiar with, but it doesn't necessarily mean they're eager to become involved. Still preventing active participation are practical obstacles such as expense, lack of room, and maintenance.

b. **Rooftop farming is perceived as a viable supply chain solution:** A growing number of locals are beginning to see rooftop organic farming as a real option for meeting their daily vegetable demands at a lower cost and with more supply chain efficiency. There is statistical evidence that supports the idea that it will improve food security in the area.

c. **Trust plays an important role in purchase intention:** Customers are interested in purchasing if they have faith in the legitimacy and high quality of rooftop-grown veggies. A higher degree of trust is significantly associated with a larger propensity to purchase.

d. **Cost sensitivity negatively affects purchase decisions:** Despite the benefits of local sourcing, affordability is a major obstacle, since consumers who are very price sensitive are less inclined to purchase organic vegetables grown on rooftops

8. SUGGESTIONS

a. **Augment practical assistance for adoption:** Awareness initiatives should be complemented with hands-on seminars, demonstrations, and financial incentives (e.g., setup subsidies) to alleviate people's apprehensions regarding feasibility and upkeep.

b. **Enhance community confidence via quality assurance:** Initiatives like as "Society Certified Organic" labels, routine quality assessments, and transparency regarding agricultural operations can cultivate and maintain trust in rooftop food quality, hence increasing purchase intention.

c. **Formulate economical models and incentives:** To mitigate cost sensitivity, communities could establish shared rooftop farming models or cooperative frameworks, facilitating economies of scale that reduce production and retail prices.

d. Encourage success narratives and grassroots advocacy: Showcasing early adopters and their favourable experiences via neighborhood events, newsletters, and social media will encourage further locals to support and buy from rooftop farms.

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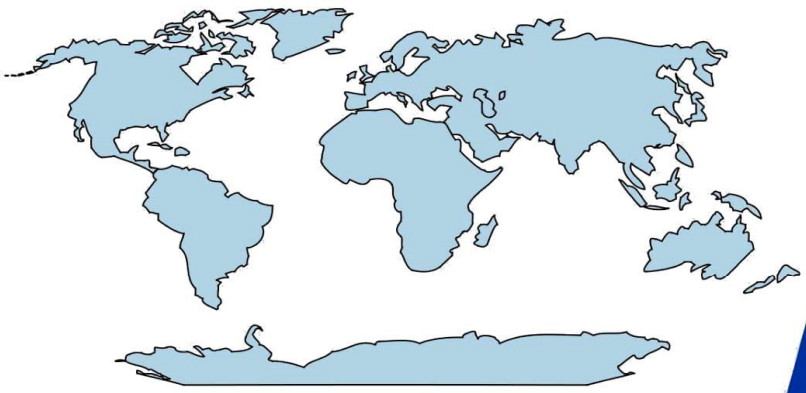

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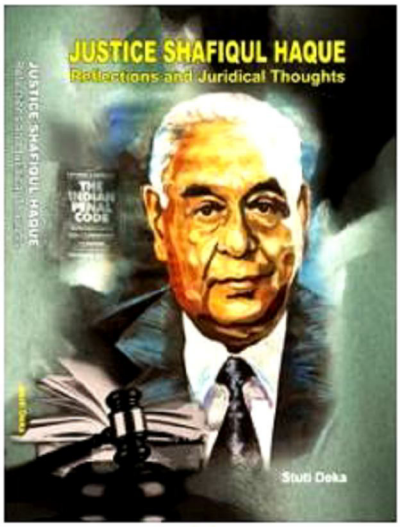

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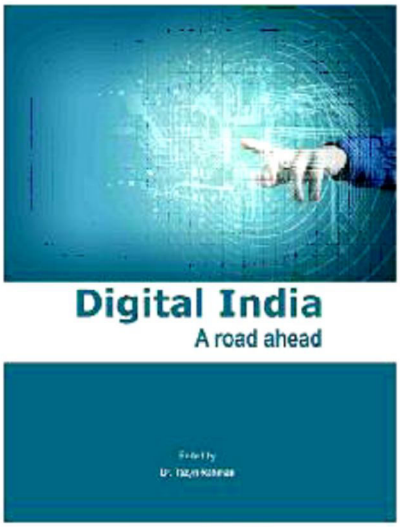

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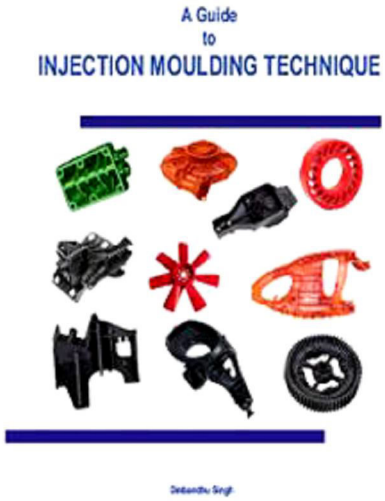

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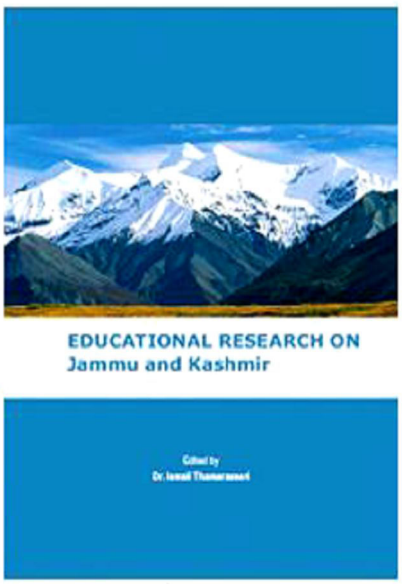

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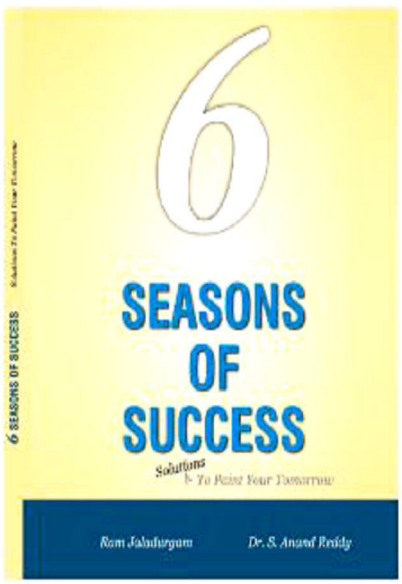

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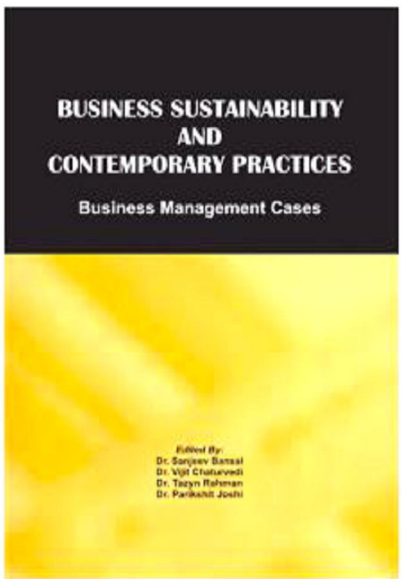

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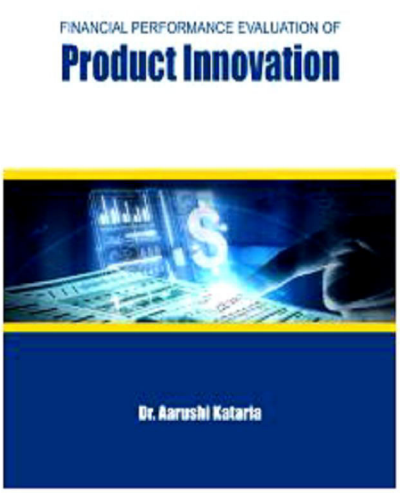

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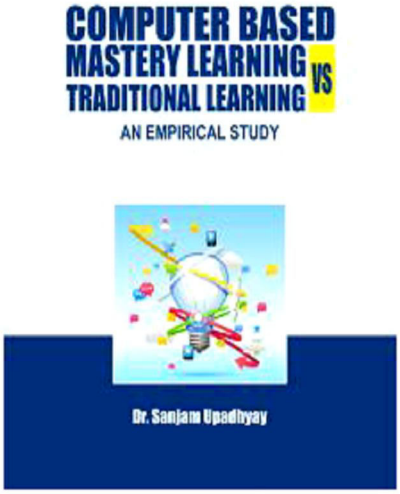

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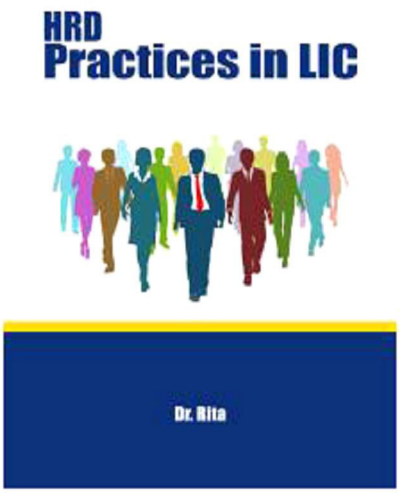

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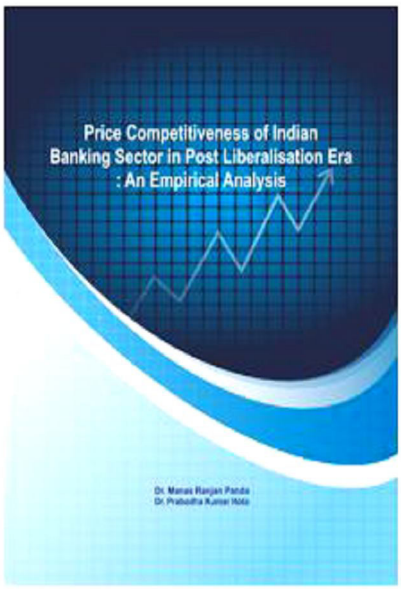

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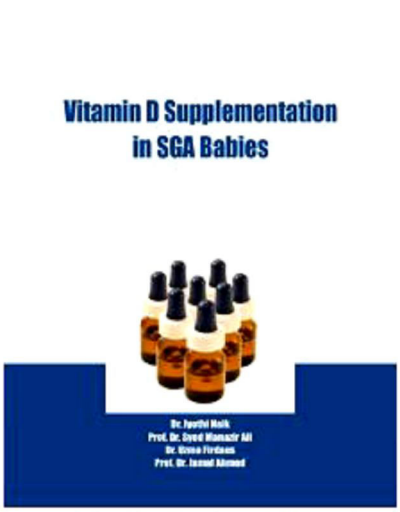

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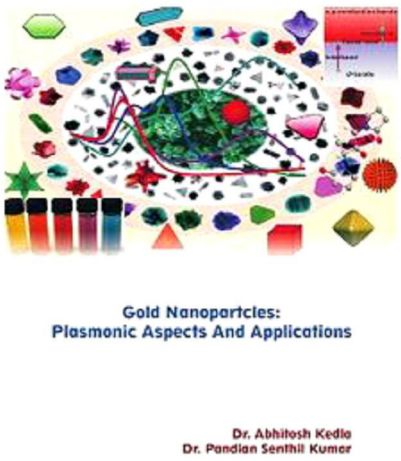

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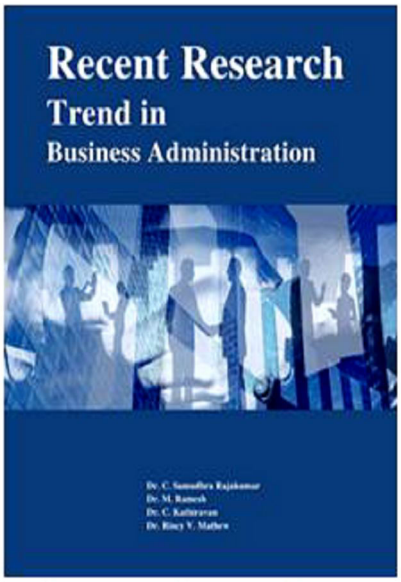

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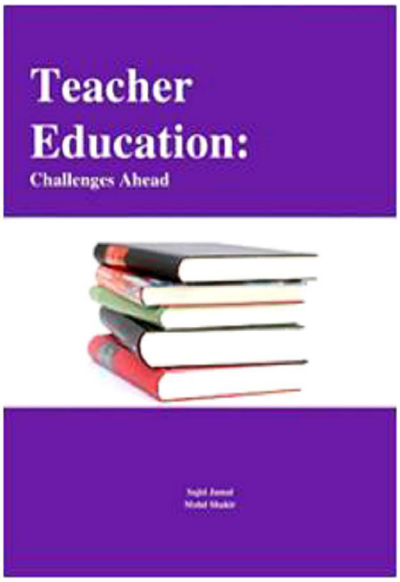

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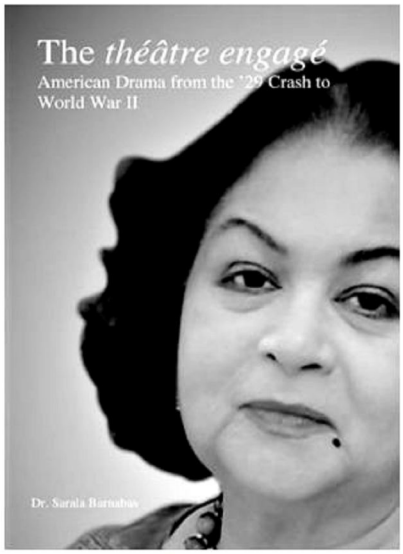

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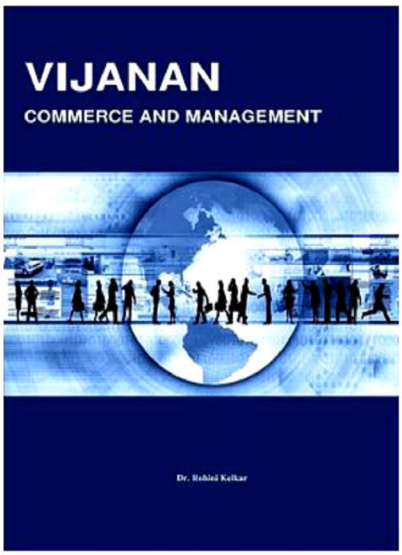

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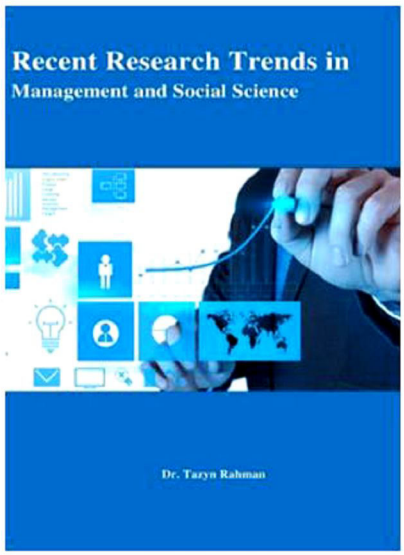

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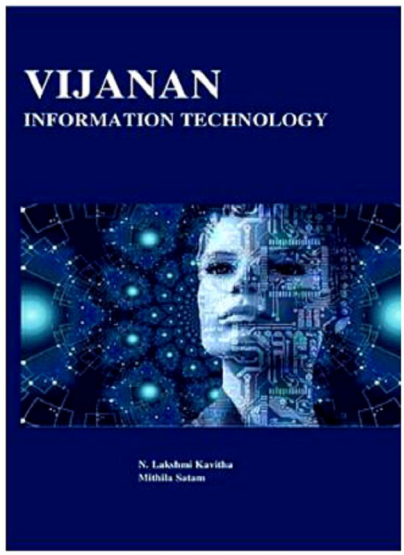

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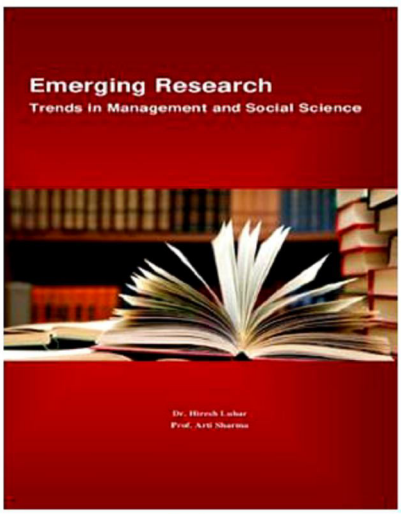

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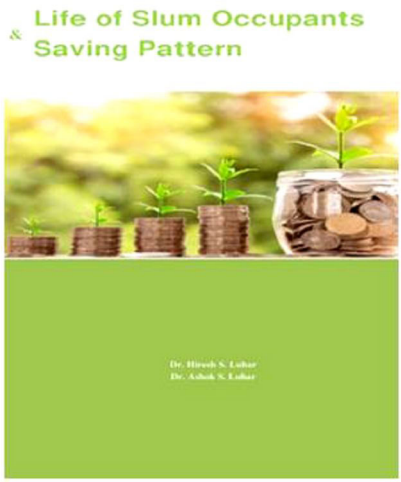

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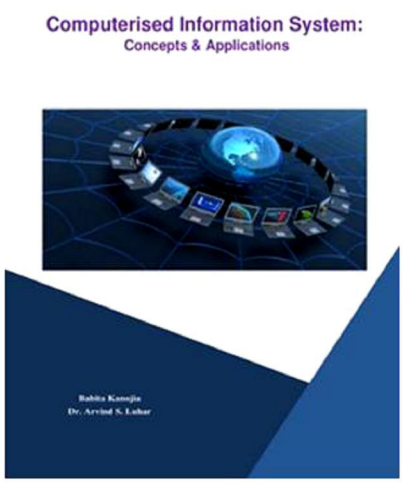

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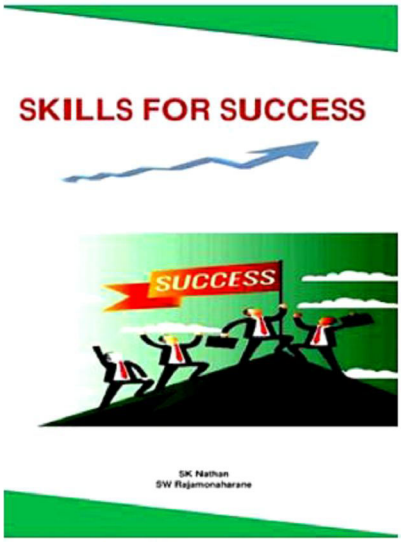

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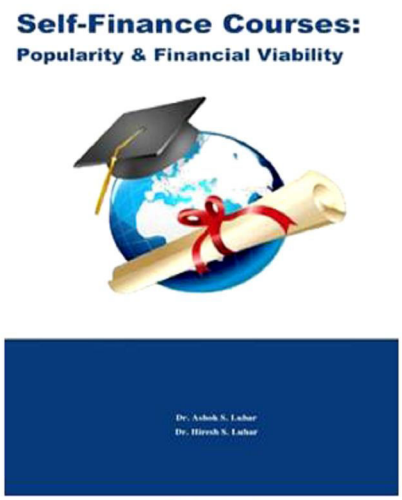

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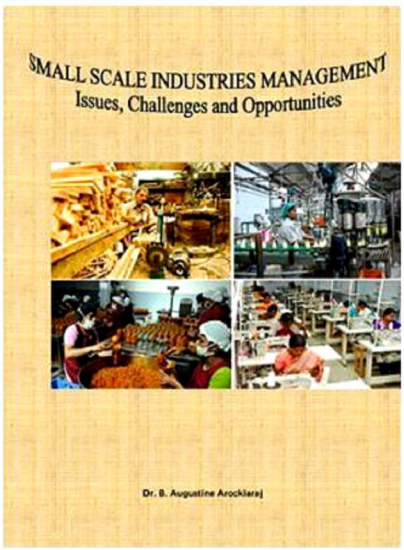

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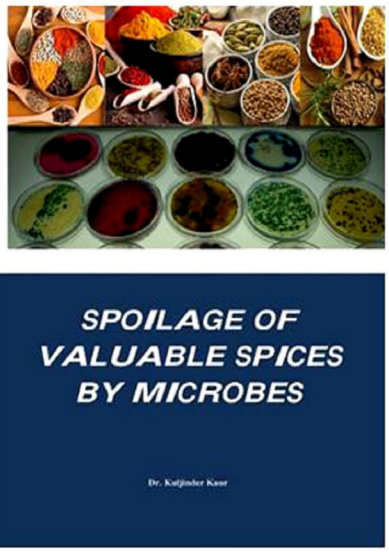

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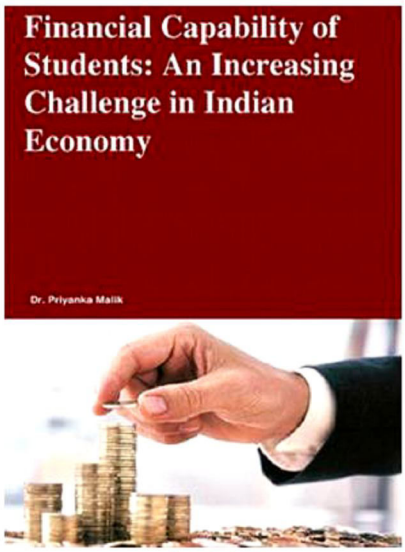

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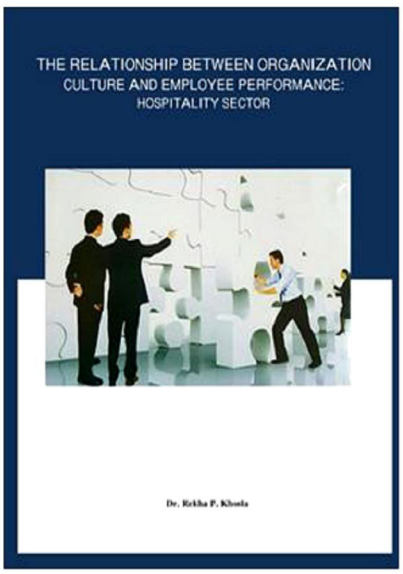

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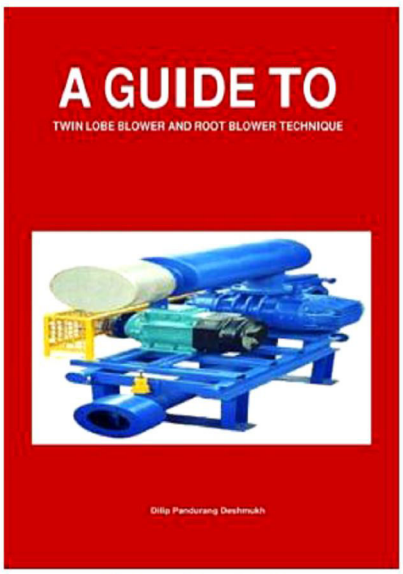

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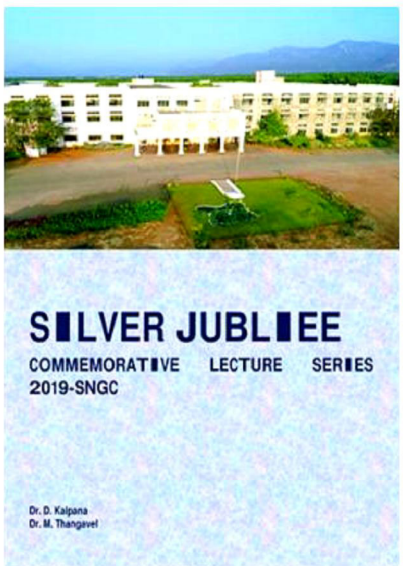

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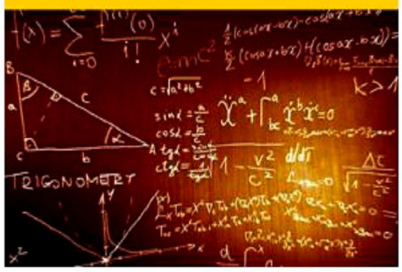

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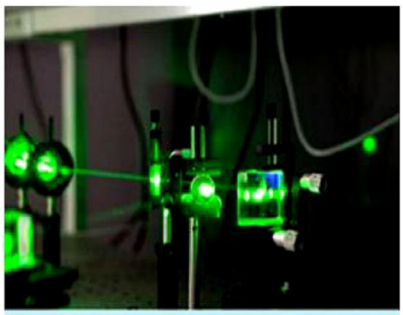

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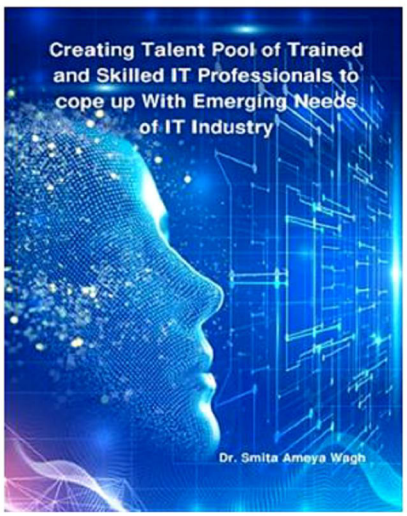

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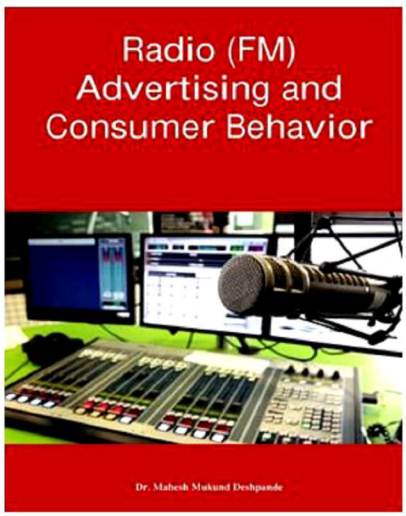

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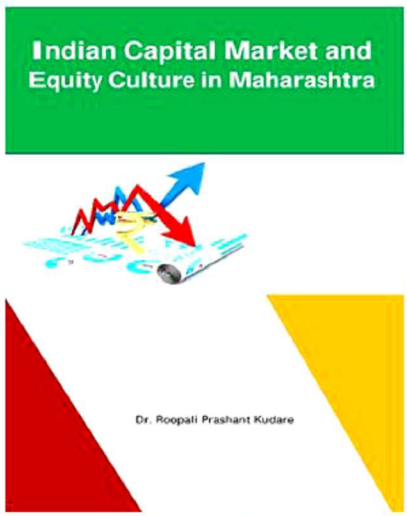

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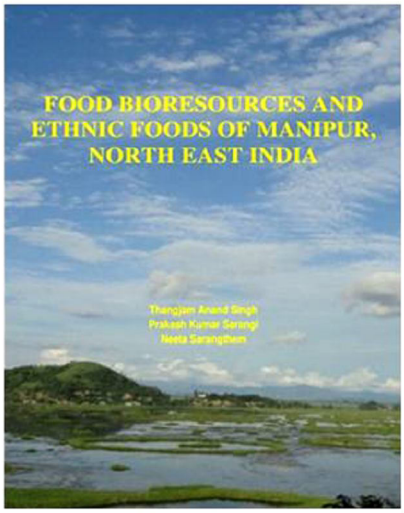

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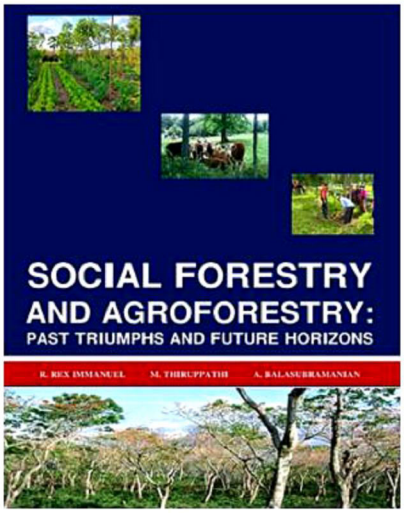

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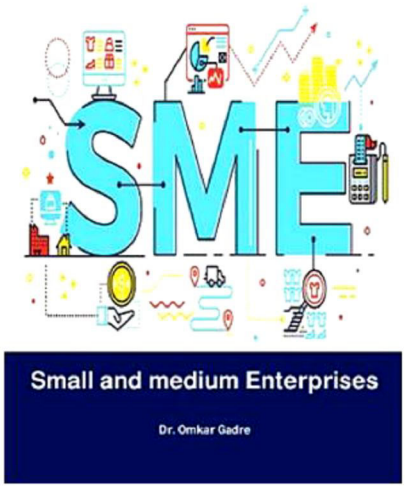

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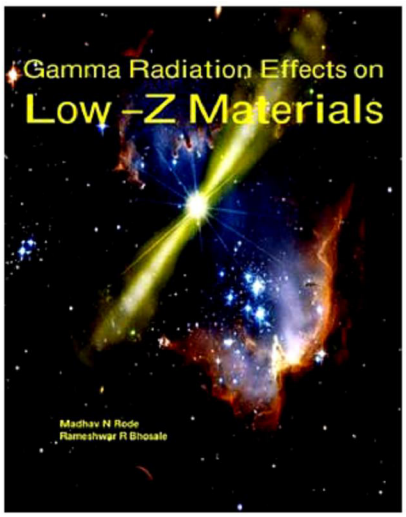

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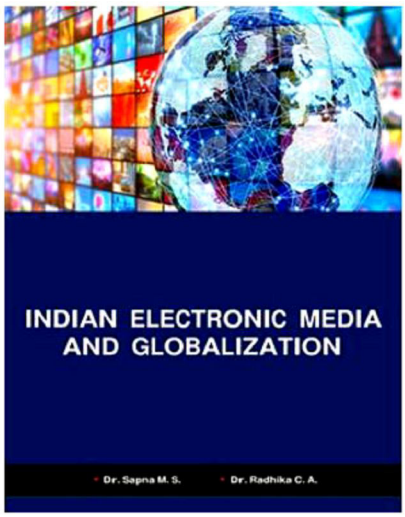

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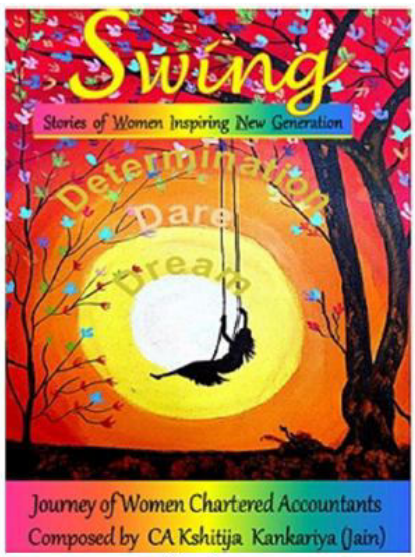

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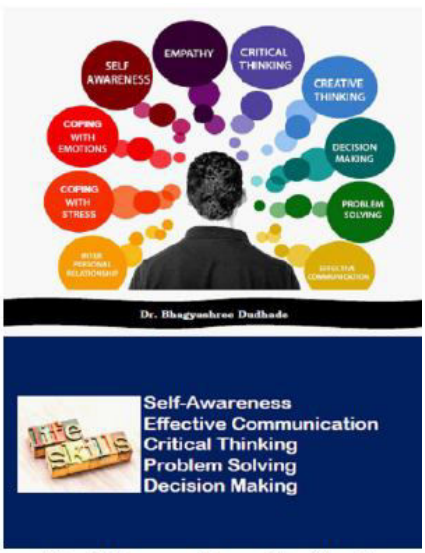

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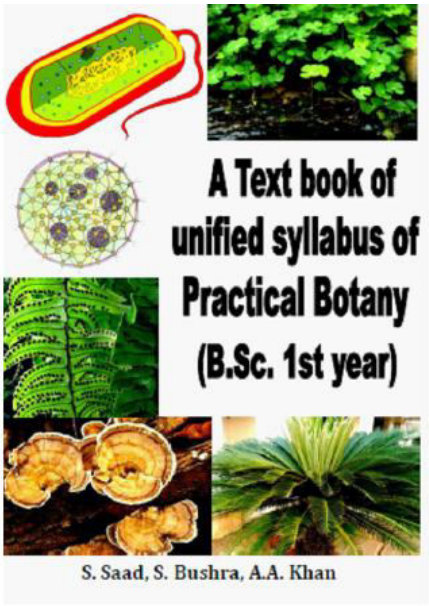

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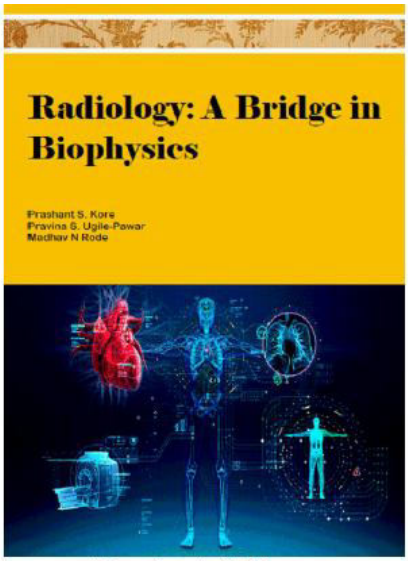

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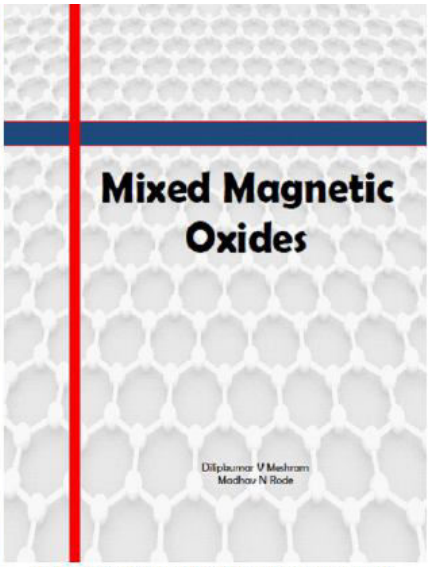

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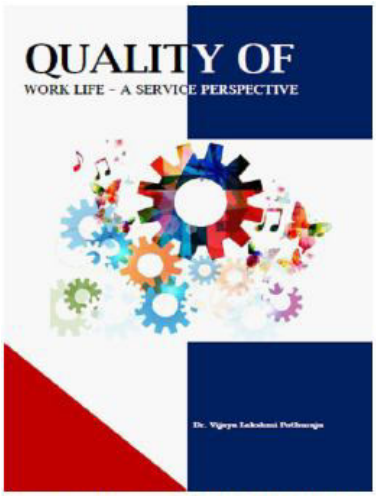

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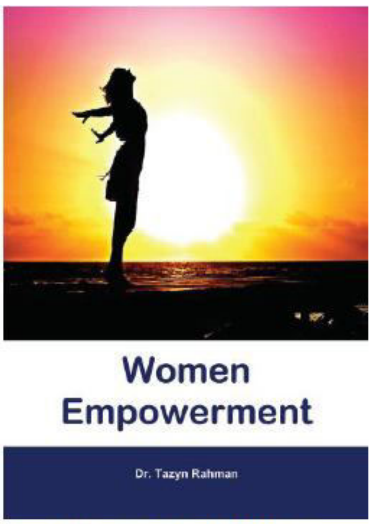

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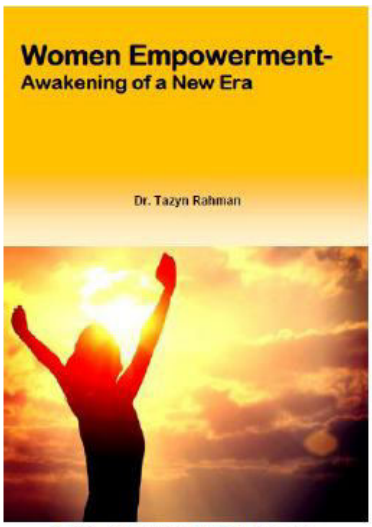

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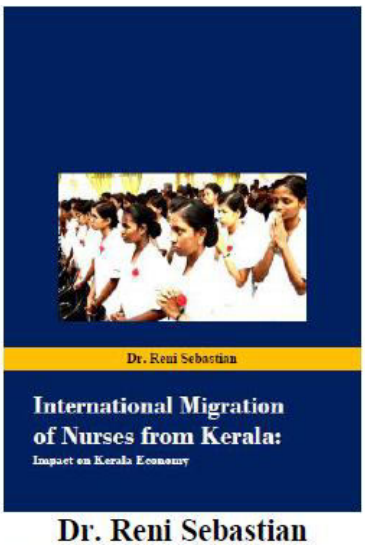

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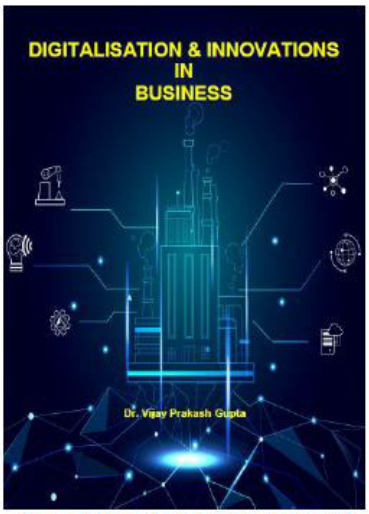

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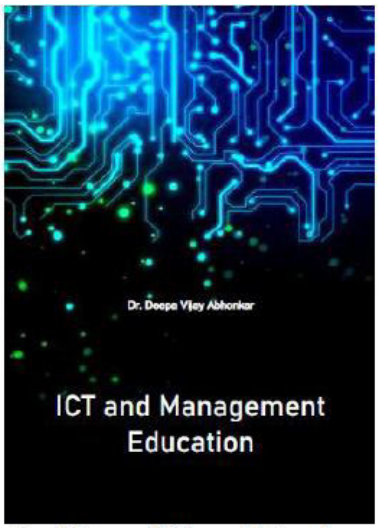

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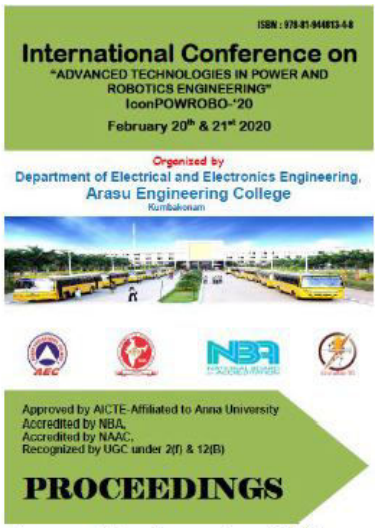

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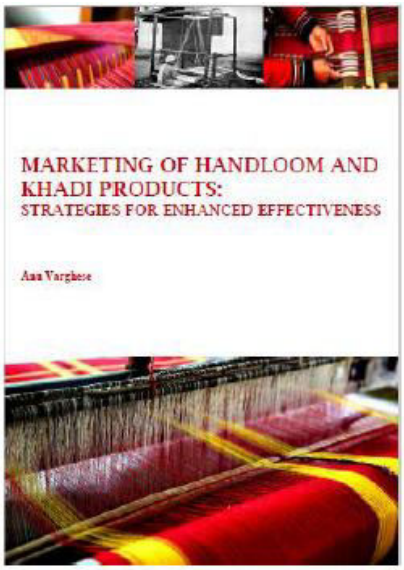

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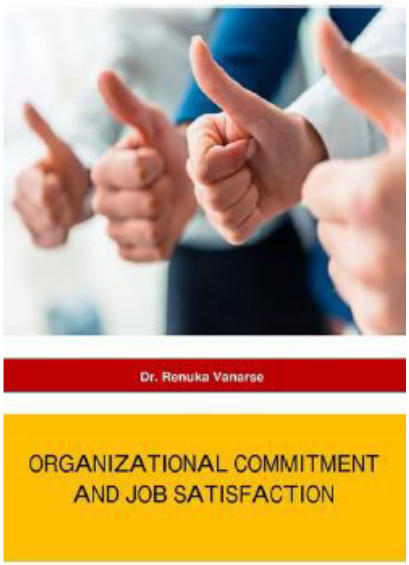

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