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Transformative Innovation through Sustainable Development

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Foreword

We proudly present the sixth edition of *Dhan-path – 2025*. This conference has served as a catalyst for groundbreaking action, fostering new collaborations and innovative pathways toward achieving transformative innovation for sustainable development. The pursuit of a sustainable future demands a shift toward a green economy—one that harmonizes economic growth, social equity, and environmental responsibility. Transformative innovation for sustainable development provides a comprehensive framework to navigate these complexities, guiding us toward meaningful progress at the heart of progress lies research, a fundamental pillar of academia. Research fuels knowledge creation, enabling innovation and practical applications that benefit commerce, industry, and society at large. It introduces new ideas, methodologies, and solutions across disciplines, reinforcing the foundation for sustainable economic growth.

I extend my deepest gratitude to all contributors—authors, editors, and readers—whose dedication and commitment to transformative innovation for sustainable development inspire us to redouble our efforts. The peer-reviewed articles in *Dhan-Path - 2025* mark a significant step toward realizing a more sustainable, equitable, and prosperous world for current and future generations.

Editor

Dhan-path2025

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Methods to Conserve Water with Special Reference to Tracking Water Usage Using Mathematical Models

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ABSTRACT

Water conservation is a critical global concern, requiring efficient management strategies to ensure sustainability. This study explores various water conservation techniques, emphasizing the role of mathematical models in tracking and optimizing water usage. By integrating commerce and mathematics, the research assesses the economic benefits of efficient water management while developing predictive models for consumption patterns. The findings aim to provide actionable insights for businesses, households, and policymakers to implement cost-effective and data-driven water conservation strategies. Through the analysis of secondary data, including case studies and government reports, the study demonstrates how mathematical techniques such as regression analysis, time series forecasting, and optimization methods can significantly reduce water wastage. Additionally, the research showcases how smart technologies and predictive analytics enhance monitoring capabilities and support informed decision-making. By linking economic outcomes with mathematical modelling, the study reinforces the importance of a multidisciplinary approach to sustainable water management. The ultimate goal is to encourage widespread adoption of advanced water conservation practices that contribute to both environmental sustainability and economic efficiency.

Keywords: Water Conservation, Mathematical Models, Water Usage Tracking, Optimization Techniques, Predictive Analytics.

INTRODUCTION

Water is one of the most essential resources for human survival, yet its scarcity has become a pressing global issue. Rapid urbanization, industrial expansion, and climate change have significantly increased water demand, making conservation a necessity rather than a choice. Traditional water management practices often fail to provide precise tracking and optimization, leading to unnecessary wastage and inefficient usage.

In response to this challenge, mathematical models offer a scientific approach to monitoring and managing water consumption. By utilizing predictive analytics, statistical techniques, and optimization methods, these models enable accurate tracking of water usage, helping businesses, households, and policymakers make informed decisions. Furthermore, from a commerce perspective, efficient water conservation leads to reduced operational costs, improved sustainability practices, and long-term economic benefits.

This study aims to explore effective water conservation methods while emphasizing the role of mathematical models in tracking water consumption. It also examines the economic impact of efficient water management, highlighting how businesses and households can leverage data-driven strategies to minimize waste and maximize resource efficiency.

STATEMENT OF THE PROBLEM

Water scarcity is a growing issue due to population growth, industrialization, and climate change. Traditional conservation methods often lack accuracy in tracking usage, leading to inefficiencies. This study explores how mathematical models can improve water usage monitoring and optimization while assessing the economic impact of efficient water management.

OBJECTIVES OF THE STUDY

- To analyse the economic impact of efficient water management
- To evaluate the role of mathematical models in tracking water usage
- To assess the effectiveness of mathematical models in optimizing water usage

SCOPE OF THE STUDY

The study focuses on mathematical modelling techniques for tracking water consumption and predicting usage patterns. It also examines the economic benefits of efficient water management for businesses and households. Case studies of industries and residential areas implementing data-driven conservation methods are included.

SIGNIFICANCE OF THE STUDY

This study emphasizes the role of mathematical models in optimizing water usage for sustainable conservation. Businesses can reduce costs, households can manage consumption efficiently, and policymakers can develop better strategies. By integrating mathematical and economic perspectives, the research promotes effective water management and resource sustainability.

RESEARCH METHODOLOGY

This study is based on secondary data, collected from research papers, government reports, case studies, and industry publications on water conservation and mathematical modelling. Statistical techniques and mathematical models are analysed to track water usage and optimize consumption. The study also reviews economic assessments of efficient water management, focusing on cost savings and sustainability. Data is interpreted through comparative analysis to identify best practices in water conservation using mathematical models.

REVIEW OF LITERATURE

Predictive analytics has gained prominence as an effective tool in water conservation strategies. Smith and Johnson (2020) examined the use of time series analysis and machine learning models in monitoring and managing water consumption. Their study demonstrated that these techniques enhance accuracy in detecting inefficiencies and forecasting usage patterns, ultimately contributing to reduced wastage and improved water resource planning.

Building upon this, Patel and Sharma (2021) analyzed the economic benefits of applying mathematical models in commercial and residential water management. Their research found that businesses utilizing these models achieved a 15–30% reduction in operational costs. Additionally, households equipped with smart water meters observed notable decreases in utility bills, indicating the practical value of data-driven water usage monitoring in both economic and environmental contexts.

Further support for the use of mathematical modelling in water governance comes from institutional studies. The World Water Council (2022) reported that governments are increasingly adopting data-driven models to enhance water pricing mechanisms, detect abnormal consumption patterns, and allocate resources more equitably. Their findings emphasize the policy-level significance of integrating mathematical tools in sustainable water management practices.

Together, these studies underscore the essential role of mathematical models in driving efficient, cost-effective, and sustainable water conservation efforts across various sectors.

RESULTS AND DISCUSSION

The study examines water conservation using mathematical models, focusing on three objectives: one commerce-related and two mathematical. The findings are based on secondary data analysis.

To Analyze the Economic Impact of Efficient Water Management

- Studies indicate that **businesses reducing water wastage through mathematical models save 15-30% on operational costs**.
- Households using smart meters lower utility bills, promoting sustainable consumption.
- Efficient water management **improves financial planning** and supports long-term economic growth.

To Evaluate the Role of Mathematical Models in Tracking Water Usage

- Predictive analytics and regression models help identify **consumption patterns**, leading to better resource allocation.
- Case studies show that **statistical methods detect leaks and inefficiencies**, reducing wastage.
- Time series analysis assists in **forecasting future demand**, improving conservation strategies.

To Assess the Effectiveness of Mathematical Models in Optimizing Water Usage

- Optimization techniques help industries and households **allocate water efficiently**, reducing unnecessary consumption.
- Case studies highlight that **regions implementing data-driven conservation policies experience better water distribution**.
- Mathematical simulations ensure **effective policy-making and regulatory planning** for sustainable water use.

CONCLUSION

The study highlights the significant role of mathematical models in tracking and optimizing water usage, based on secondary data from research papers, government reports, and case studies. The findings confirm that predictive analytics, regression models, and statistical techniques enhance water conservation by identifying consumption patterns and minimizing wastage. Businesses and households implementing data-driven approaches experience substantial cost savings, while policymakers benefit from accurate insights for regulatory planning.

Furthermore, integrating mathematical models with conservation strategies not only improves resource efficiency but also supports long-term sustainability and economic growth. By adopting data-driven water management techniques, industries, households, and governments can ensure responsible usage and contribute to global conservation efforts.

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EDUCATIONAL INSTITUTIONS AND CORPORATE SOCIAL RESPONSIBILITY: EMERGING TRENDS IN THE GLOBALIZED ERA

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ABSTRACT

Corporate Social Responsibility (CSR) has become a crucial and widely promoted aspect of the routine operations of organizations today. The 2013 amendment to the Companies Act mandated CSR compliance as part of tax clearance requirements, positioning it as a benchmark for evaluating a company's accountability toward its surrounding community, encompassing both living and non-living entities. Corporate entities governed by the Act have adhered to this directive, recognizing CSR as a key element for sustaining their competitive advantage in today's dynamic marketplace.

This paper highlights the significance of CSR initiatives in educational institutions, exploring their relevance as a transformative paradigm in the globalized era. Additionally, it provides a comprehensive view of this vital societal approach.

Keywords: Corporate Social Responsibility, Globalization, Social Impact, Educational Institutions, Accountability.

INTRODUCTION

The globalization of economies and the rapid integration of markets have reshaped various sectors, including education. With the introduction of the New Economic Policy (NEP) in India, the nation's landscape underwent a paradigm shift, fostering liberalization, privatization, and globalization (LPG). This policy reform not only revolutionized industries but also significantly influenced the academic ecosystem, compelling educational institutions to adopt innovative strategies that align with evolving societal needs.

As businesses redefined their role in community development through Corporate Social Responsibility (CSR), educational institutions also began embracing CSR as a meaningful approach to extend their impact beyond traditional academic pursuits. Historically rooted in India's cultural and ethical values, including teachings from works like the *Thirukkural*, the essence of CSR advocates for societal welfare and responsibility as essential components of growth.

In today's interconnected world, CSR-driven initiatives in education reflect emerging trends that promote sustainability, inclusivity, and ethical engagement. Educational institutions are increasingly adopting holistic practices such as skill development programs, community outreach initiatives, digital literacy campaigns, and research on sustainability. These efforts not only foster responsible citizenship but also equip students with the skills and values needed to tackle real-world challenges as socially conscious leaders.

The evolving relationship between CSR and educational institutions highlights a shared commitment to fostering social development, sustainability, and ethical progress. By embracing this synergy, academic institutions not only strengthen their relevance in a competitive globalized environment but also contribute meaningfully to national and international development narratives.

The Impact of Globalization on CSR

Globalization has ushered in a dual landscape for corporations worldwide—offering abundant opportunities for expansion and development while simultaneously posing unforeseen challenges. Adapting to these challenges often becomes a formidable task for many multinational corporations (MNCS), as they encounter obstacles at global, industrial, and operational levels.

In this evolving business environment, Corporate Social Responsibility (CSR) has emerged as a critical element for corporate sustainability and success. CSR initiatives are no longer just optional undertakings but are considered essential components of strategic decision-making. MNCS increasingly integrate moral, ethical, and social values into their operations to maintain compliance, brand integrity, and goodwill in global markets.

The significance of CSR in India is particularly notable, where companies are expected to align their activities with societal and environmental priorities. Globalization has amplified the outreach of CSR, driving collective efforts to address environmental degradation and social inequalities on an international scale.

Moreover, CSR plays a pivotal role in shaping brand reputation and positioning companies as responsible and ethical entities. Neglecting social responsibility can pose substantial risks to a corporation's image and operational viability. Conversely, embracing CSR allows organizations to foster trust, loyalty, and sustainability, securing a competitive advantage in the global marketplace.

In an era defined by interconnected economies, globalization continues to act as a catalyst for the widespread adoption of CSR, encouraging businesses to balance profitability with accountability toward society and the environment.

GLOBAL TRENDS IN CSR

Global trends in CSR in education focus on equitable access, digital transformation, sustainability, and skill development. Companies are investing in e-learning platforms, green campuses, and vocational training to bridge educational gaps and enhance employability**.** Teacher training, mental health programs, and community engagement are gaining priority, ensuring holistic development. Public-private partnerships are also strengthening educational infrastructure and policy reforms. With a growing emphasis on diversity, inclusion, and ethical education, CSR in education is evolving into a sustainable and transformative force for global progress. The major global trends in CSR are:

1. Equitable Access to Education
    - CSR initiatives focus on reducing the education gap for marginalized communities.
    - Scholarships, free educational resources, and digital learning programs enhance inclusivity.
2. Technology Integration & Digital Learning
    - Investment in e-learning platforms, AI-based education tools, and virtual classrooms.
    - Expanding internet access and digital infrastructure in remote areas.
3. Sustainability & Green Education
    - Schools and universities adopting eco-friendly campuses and sustainable practices.

- Integration of climate education and renewable energy projects into curricula.

4. Skill Development & Employability
    - Shift towards vocational training, entrepreneurship programs, and industry collaborations.
    - Focus on STEM education, AI, and coding to prepare students for future jobs.
5. Teacher Training & Capacity Building
    - CSR programs supporting continuous professional development for educators.
    - Training in modern pedagogy, digital teaching, and inclusive education.
6. Mental Health & Well-Being
    - Growing emphasis on student mental health programs and psychosocial support.
    - Implementation of stress management workshops and counselling services.
7. Community Engagement & Social Responsibility
    - Encouraging student involvement in community service and social impact projects.
    - Partnering with local communities to promote literacy and lifelong learning.
8. Public-Private Partnerships in Education
    - Increased collaboration between corporates, governments, and NGOs.
    - Joint initiatives for school infrastructure, research funding, and policy advocacy.
9. Diversity, Equity, and Inclusion (DEI) in Education
    - Promoting gender equality, disability-friendly learning spaces, and cultural inclusivity.
    - Focus on breaking social barriers through education for all.
10. Ethical & Value-Based Education
    - CSR initiatives incorporating ethics, leadership, and responsible citizenship.
    - Programs emphasizing integrity, environmental responsibility, and human rights.

GLOBAL ISSUES IN CSR

Critical Issues in CSR of Education

1. **Access to Quality Education:**

   Ensuring equitable access to education for underprivileged and marginalized communities remains a key challenge. CSR initiatives need to focus on bridging the urban-rural education divide and providing inclusive learning opportunities.

2. **Infrastructure Development:**

   Many educational institutions, especially in rural areas, suffer from inadequate infrastructure. Corporate investments in building and upgrading classrooms, libraries, and digital learning centres can significantly improve learning outcomes.

3. **Skill Development and Employability:**

   CSR in education should emphasize vocational training, digital literacy, and skill development to prepare students for evolving job markets. This requires collaboration between educational institutions and industry stakeholders.

4. **Teacher Training and Development:**

   The quality of education largely depends on the competence of teachers. Investment in continuous professional development and upskilling programs for educators is essential for enhancing teaching effectiveness.

5. **Sustainability and Digital Transformation:**

   As education systems increasingly adopt technology, CSR initiatives should support the digitalization of learning processes, ensuring that all students have access to digital tools and resources.

6. **Community Engagement and Awareness:**

   Building awareness about the importance of education in communities where dropout rates are high remains crucial. CSR can support campaigns to motivate parents and students to prioritize education.

7. **Ethical and Value-Based Education:**

   CSR efforts should also promote the integration of ethical and value-based education to foster responsible citizenship and social accountability among students.

Complex Issues in CSR of Education

1. **Fragmented Implementation of CSR Policies:**
   Many CSR programs in education lack coherence and alignment with national education priorities, leading to redundancy and inefficiency.
2. **Measuring Impact:**
   Assessing the long-term impact of CSR initiatives in education is complex due to the intangible nature of educational outcomes and delayed benefits.
3. **Balancing Short-Term and Long-Term Goals:**
   Companies often focus on visible, short-term projects for quick results rather than sustainable, long-term educational interventions that yield significant outcomes.
4. **Navigating Regulatory and Compliance Issues:**
   The legal and regulatory landscape for CSR in education can be challenging, with various guidelines affecting how corporates engage with educational institutions.
5. **Addressing Diverse Educational Needs:**
   Catering to the unique needs of different age groups, socio-economic backgrounds, and regions requires carefully customized CSR strategies.
6. **Resource Allocation and Scalability:**
   Many CSR initiatives start as pilot projects but face challenges when scaling up due to limited resources and stakeholder coordination.
7. **Stakeholder Collaboration:**
   Successful CSR efforts require seamless cooperation between corporates, educational institutions, government agencies, and communities, which can be challenging to coordinate.

A Kaleidoscopic View of India's CSR Expenditure on Education Institutions for FY 2024-25

In **FY 2024-25**, Corporate Social Responsibility (CSR) spending on education in India continues to play a transformative role in addressing key educational challenges, fostering skill development, and enhancing accessibility. With education consistently being one of the top sectors for CSR investment, corporates are channelling resources toward initiatives that promote digital literacy, infrastructure enhancement, teacher training, scholarships, and rural education. These investments not only contribute to educational excellence but also align with national development goals, ensuring a skilled and competitive workforce for the future.

Key Areas of CSR Investment in Education

1. Digital Literacy and Technological Integration

With the rapid shift towards **digital learning**, CSR funding is significantly directed towards:

- Smart classrooms and digital infrastructure in schools.
- E-learning platforms and free access to online educational resources.
- Coding, AI, and data science training for students to prepare them for emerging job markets.
- Providing digital devices (laptops, tablets, and internet connectivity) to bridge the digital divide in rural and underserved areas.

2. Skill Development and Vocational Training

Corporate funding is increasingly focused on:

- Industry-specific skill training programs to enhance employability among students.
- Vocational education in areas like IT, healthcare, and green energy to meet evolving industry demands.

- Internships and apprenticeships that allow students to gain real-world experience and improve job readiness.
- Entrepreneurial training to encourage self-employment and start-up culture among youth.

3. Infrastructure Development in Educational Institutions

CSR investments in infrastructure aim to improve learning conditions through:

- Building and renovating classrooms, libraries, and laboratories in government schools and rural institutions.
- Constructing sanitation facilities, clean drinking water systems, and sustainable energy solutions to create a safe learning environment.
- Enhancing access to education in remote areas by supporting residential schools, hostels, and transportation facilities.

4. Teacher Training and Capacity Building

Recognizing the crucial role of educators, CSR efforts include:

- Training programs for teachers to upgrade pedagogical skills, especially in STEM (Science, Technology, Engineering, Mathematics) and digital education.
- Leadership training for school administrators to enhance institutional management and governance.
- Partnerships with global institutions for knowledge exchange and curriculum innovation.

5. Rural and Inclusive Education Initiatives

To bridge the urban-rural educational divide, corporates are investing in:

- Model schools in rural areas with modern infrastructure and teaching methods.
- Programs for underprivileged children, including scholarships, mentorship, and midday meal schemes.
- Inclusive education initiatives supporting children with disabilities and marginalized communities.

6. Research and Innovation in Education

With a focus on long-term impact, CSR is also funding:

- EdTech innovations to develop personalized and adaptive learning systems.
- Research projects on education policy and learning methodologies to improve teaching outcomes.
- Pilot programs for experimental education models, such as gamified learning and competency-based education.

CSR Trends in Education for 2024-2025

- Increased Collaboration: More partnerships between corporates, NGOs, and government agencies to maximize impact.
- Outcome-Oriented Investments: A shift from short-term projects to sustainable, long-term educational improvements.
- Focus on Sustainable Development Goals (SDGs): Aligning CSR initiatives with SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth).
- Rise of EdTech Funding: Greater emphasis on AI-driven learning platforms, blockchain-based credentialing, and cloud education solutions.
- Local Community Engagement: Companies adopting a "Think Global, Act Local" strategy to tailor educational interventions to specific regional needs.

Fostering Educational Leadership in Modern Institutions

Educational institutions are undergoing a transformative shift in their organizational structures and leadership dynamics. The traditional hierarchical, supreme-led system is being gradually replaced by a paradigm of collaborative leadership, where peer-led and people-driven groups play a central role in achieving institutional goals. This evolving leadership model fosters inclusivity and innovation, positioning educational institutions at the forefront of meaningful change.

The transition from the early 20th-century *Great Man Theory* to more inclusive and competence-based leadership approaches is particularly significant in today's globalized world. Leadership is no longer confined to individuals holding designated positions of power but extends to those who demonstrate the necessary skills, acumen, and problem-solving abilities.

While top-tier leaders continue to play a visionary role in strategy development, decision-making, and forward planning, the active participation of individuals at all organizational levels has become indispensable. Visionaries at the top may illuminate pathways for progress, but it is the collective effort of teams across all layers that transforms these visions into actionable missions.

This lateral development approach not only empowers individuals but also encourages institutional growth and societal progress. By embracing competence-based leadership models, educational organizations can unlock untapped potential, fostering a culture of innovation, collaboration, and shared success. In doing so, they prepare themselves to meet the complex demands of an ever-changing educational landscape while contributing to broader societal advancements.

SUGGESTIONS

Education continues to be the backbone of national development, serving as a catalyst for transforming economies and societies. In the face of fierce competition and rapidly evolving global competencies, strengthening education through CSR (Corporate Social Responsibility) has never been more crucial. Governments and corporates alike must collaborate to create a learning ecosystem that nurtures skills, values, and holistic development.

The strategic recommendations tailored for the evolving educational landscape in 2024-25 are: A strategic and impactful CSR approach in education requires the adoption of a people-centric and inclusive framework that integrates ecological, economic, and educational paradigms for sustainable development. Education must be positioned as a powerful cultural bridge, promoting the exchange and preservation of values while fostering empathy and inclusivity. Equitable skill development programs are vital for bridging urban-rural learning divides and building a comprehensive talent pipeline. Strengthening the teaching talent pool through corporate investment in faculty training centres of excellence is essential to ensure high-quality education delivery. Furthermore, incorporating rural immersion experiences within educational curricula can help learners gain insights into grassroots realities and developmental challenges. Embracing the "Think Global, Act Local" ideology encourages the optimal use of local resources and talent while nurturing a global mindset. CSR initiatives must also prioritize nation-building through investments in digital literacy, skill development, and innovation, empowering citizens to contribute meaningfully to national progress. Together, these forward-looking strategies can foster a resilient, skilled, and inclusive society for a sustainable future.

CONCLUSION:

As India navigates through 2024-2025, the role of Corporate Social Responsibility (CSR) in the educational sector stands at a critical juncture. With rapid technological advancements and evolving societal needs, educational institutions are no longer confined to traditional roles. They must emerge as hubs of innovation, inclusivity, and social responsibility. CSR initiatives, when thoughtfully integrated, can help bridge gaps in accessibility, infrastructure, and skill development.

Going forward, the focus should be on fostering partnerships between educational institutions and corporations to promote inclusive and holistic learning experiences. Special emphasis on digital literacy, rural education, and sustainability will be essential for preparing a workforce capable of meeting future global challenges. By aligning CSR with the nation's educational and developmental goals, both corporations and educational entities can play a transformative role in shaping a prosperous and equitable society.

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Impact of the Paperless Strategy on Printing Presses: A Study in Karama, Dubai

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Abstract

In 2017, the government of Dubai has initiated an ambitious plan to become fully digital or paperless by the year 2021 in order to enhance the sustainability and efficiency. Although this revolution has many advantages for the public sector, it has caused some problems for other industries that used to work with papers and, therefore, printing presses. This paper aims at exploring the effects of the paperless initiative of Dubai on printing presses situated in Karama, Dubai and the difficulties that these firms encounter in the process of digitalization. Using a descriptive research design, the study used structured questionnaires to survey 16 printing press owners to understand issues such as financial constraints, awareness of the paperless law, and the overall impact on their business. The results show that most of the businesses in Karama are small-sized enterprises with financial constraints and low level of readiness to embrace the digital shift. A majority of the businesses have faced challenges in terms of low demand for their government-related printing services, high costs of raw materials and lack of innovation. Furthermore, although the majority of the printing presses are aware of the new paperless law, only a few of them have developed plans on how to manage the change. The study recommends that in order to guarantee the continuing viability of these firms, the government should offer assistance in the form of training, technological enhancement, and other plans that will actively promote the implementation of environmentally friendly policies. This research offers important findings that can be used by policy makers and industry leaders to help the printing industry as it goes through this important transformation.

Keywords: Dubai, paperless initiative, printing presses, digitalization, sustainability, government transition, small-scale businesses, challenges, technology, eco-friendly practices.

Introduction

In 2017, His Highness Sheikh Hamdan Bin Mohammed Al Maktoum launched an ambitious initiative to make Dubai's government operations completely paperless by 2021, with the goal of transforming both internal processes and customer-facing services (Dubai Government, 2017). This move aimed to reduce paper usage by one billion sheets annually, saving resources equivalent to feeding four million children and preventing the cutting down of around 130,000 trees each year (Dubai Government, 2017).

Dubai is the first government globally to turn completely paperless. Internal and external transactions as well as procedures in the Dubai government are now 100 percent digital and managed using a comprehensive digital government services platform (Victoria McEwan, 2023). To support the transition, Dubai invested in advanced technologies and created a legal framework for digital transactions (Dubai Government, 2017). The government also introduced the '100% Paperless' Stamp to recognize entities that successfully implemented the system (Dubai Government, 2017).

Problem Statement

This study is conducted various printing press in Karama, Dubai. The study is based on problem faced by printing press and the impact of new law go paperless in government sector. As the generation is going towards digitalization the impact in printing press undefined therefore the study is held to study the market and their problem.

Objectives of the Study

1. To find out the problem faced by various printing press.
2. To study the impact on printing press on go paperless.

Research Methodology

This study is descriptive in nature and focuses on the challenges faced by printing presses in Karama, Dubai, amidst the transition to a paperless environment. The population for the study comprises all printing presses operating in Karama. To gather insights, a sample size of 16 printing presses was selected using a simple random sampling technique to ensure unbiased representation.

The primary data for this research was collected directly from the entrepreneurs of these printing presses through structured questionnaires, enabling the collection of first-hand information regarding their experiences, challenges, and perspectives. Secondary data was sourced from various credible outlets, including newspapers and articles, to provide additional context and support for the analysis.

The study employs percentage calculations, tables, and charts to analyse and interpret the collected data effectively. This methodology facilitates a clear understanding of the current state of the printing industry and its ability to adapt to the paperless initiative. It is important to note that the scope of this research is limited to the printing presses in Karama, providing a localized perspective on the issue

Results and Discussions

The study reveals that most printing companies in Karama have been in operation for less than 10 years. This suggests that the industry is largely composed of newer businesses, which may lack the stability and experience required to adapt to major market shifts, such as the implementation of Dubai's paperless strategy. The longevity of these businesses is a potential concern, as their ability to sustain themselves amidst rapid digitalization appears uncertain.

Financially, 81% of the surveyed companies reported annual profits of less than AED 2 lakh. This low profitability highlights the challenges faced by the printing industry in generating sustainable revenues. The limited financial resources hinder companies' ability to invest in technology, diversify their offerings, or adopt alternative strategies to counter the declining demand for traditional printing services.

Awareness of the paperless law is relatively high, with 93.8% of companies familiar with the initiative. However, only 37.5% are fully informed about its details, with many possessing only surface-level knowledge. This knowledge gap could prevent businesses from making well-informed decisions or preparing effectively for the shift to digitalization. Furthermore, 62.5% of respondents reported being negatively affected by the new law, citing a significant reduction in government-related printing jobs as a primary concern.

The study also found that 68.8% of the companies employ fewer than seven people, indicating that the majority of printing presses in Karama are small-scale operations. Limited manpower and resources create additional challenges for these businesses, making it difficult to adapt to technological changes and stay competitive. Additionally, the dependency on government contracts poses another risk, as 62.5% of companies reported working with the government for less than a year. With the government transitioning to a paperless system, this dependency on short-term contracts could further destabilize the industry.

The challenges faced by the industry are further compounded by the high cost of raw materials, which was identified as a significant issue by 87.5% of respondents. Additionally, 75% of companies expressed concerns about raw material availability, though they rated it as “neutral.” These challenges add financial strain and disrupt operations, making it difficult for businesses to maintain consistent production levels.

Innovation and preparedness within the printing industry appear to be lacking, as 93.8% of businesses reported having no alternative strategies to counter the challenges posed by the paperless law. This lack of innovation underscores the need for industry-wide support and guidance to help businesses adapt. Awareness of digitalization trends was reported by 62% of companies, but the lack of actionable steps to embrace these changes suggests that many businesses are unprepared to pivot toward new opportunities.

The study also found mixed sentiments regarding the current market conditions. While 56.3% of respondents described the situation as “better,” no one rated it as “best.” This indicates some improvement in the market, but significant uncertainties remain. Additionally, satisfaction levels within the industry varied, with 37.5% expressing happiness with their choice of the printing industry, 31.3% being neutral, and 18.8% expressing dissatisfaction.

The findings highlight the significant challenges faced by the printing industry in Karama amidst Dubai's transition to digitalization and sustainability. The paperless strategy has fundamentally reduced the demand for traditional printing services, forcing companies to reevaluate their business models. High operational costs, particularly for raw materials

Conclusion

The study highlights the significant challenges faced by printing presses in Karama due to Dubai's transition to a paperless government, including reduced demand, high raw material costs, and limited preparedness for digitalization. While most businesses are aware of the new law, the lack of alternative strategies and innovation poses a serious threat to their survival. To ensure sustainability, collaborative efforts between the government and the industry are essential, focusing on training, technological upgrades, and eco-friendly practices.

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CIRCULAR ECONOMY IN INDIAN MSMES: A PATHWAY TO RESILIENCE AND BUSINESS GROWTH

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Abstract

The adoption of Circular Economy (CE) principles is increasingly recognized as a strategic approach to enhancing the sustainability and competitiveness of Micro, Small, and Medium Enterprises (MSMEs) in India. This study examines the extent of CE adoption among Indian MSMEs and its impact on business performance indicators such as cost efficiency, profitability, resource optimization, and market competitiveness. Through a comprehensive secondary data analysis, the study identifies key challenges hindering CE implementation, including financial limitations, lack of technical expertise, regulatory complexities, and inadequate supply chain integration. The findings highlight that while CE practices contribute to cost savings, increased profitability, and enhanced compliance with environmental regulations, the transition remains inconsistent across industries. To address these challenges, the study proposes targeted policy interventions, including financial incentives, skill development programs, regulatory reforms, and industry collaborations. Strengthening institutional support and aligning MSME operations with CE principles will be crucial for fostering sustainable economic growth, improving environmental outcomes, and enhancing India's global competitiveness in the circular economy landscape.

Keywords: Circular Economy, MSMEs, Sustainability, Resource Efficiency, Policy Interventions

1.1 INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a critical role in India's economic framework, contributing nearly 30% to the nation's GDP and accounting for 48% of total exports (Ministry of Micro, Small & Medium Enterprises, 2023). These enterprises provide employment to over 110 million people, spanning manufacturing, services, and trade sectors (World Bank, 2022). MSMEs are known for their agility, innovation, and contribution to inclusive growth, particularly in rural and semi-urban regions. However, they face persistent challenges, including limited financial access, outdated technology, supply chain inefficiencies, and stringent regulatory compliance (Kumar & Agarwal, 2021). These obstacles hinder their competitiveness and long-term sustainability, making it imperative to explore alternative business models that promote efficiency and resilience.

The Circular Economy (CE) has emerged as a viable solution to address these challenges. CE is a regenerative economic model that replaces the traditional linear “take-make-dispose” approach with sustainable resource management practices (Ellen MacArthur Foundation, 2019). CE principles—such as waste minimization, resource efficiency, product lifecycle extension, and recycling—can significantly benefit MSMEs by reducing production costs, enhancing regulatory compliance, and improving environmental impact (Bocken et al.As global sustainability trends influence markets, adopting circular strategies also strengthens MSMEs' competitiveness, as consumers increasingly favor eco-friendly products (Goyal & Kumar, 2021).

India’s policy landscape has begun incorporating CE principles through initiatives like Extended Producer Responsibility (EPR), Zero Effect Zero Defect (ZED) certification, and waste management regulations (Ministry of Environment, Forest and Climate Change, 2022). However, the transition to circular business models remains slow due to financial constraints, lack of technical expertise, and inadequate infrastructure (Geissdoerfer et al., 2017). This study explores the impact of CE adoption on the business performance of MSMEs in India using secondary data sources, highlighting both the opportunities and challenges of integrating CE principles into MSME operations. It also provides policy recommendations to accelerate CE adoption and strengthen the long-term resilience of Indian MSMEs in an evolving economic landscape.

1.2 Statement of the Problem

The Micro, Small, and Medium Enterprises (MSME) sector is a major contributor to India’s industrial output, employment generation, and export performance. However, MSMEs frequently struggle with inefficient resource utilization, high production costs, and unsustainable business practices due to their reliance on linear economic models (Sharma & Singh, 2022). These enterprises often lack access to advanced technology, financial resources, and structured waste management systems, which limits their ability to compete in a rapidly evolving market landscape (Jain et al., 2021).

As global economies shift towards sustainable production models, the Circular Economy (CE) has emerged as a strategic approach to enhancing resource efficiency, reducing environmental impact, and improving business resilience (Dey et al., 2022). While several large firms have successfully incorporated CE principles, MSMEs in India continue to lag behind due to regulatory uncertainty, a lack of skilled workforce, and insufficient policy incentives (Gupta & Bansal, 2021). The absence of a clear roadmap for CE adoption in small businesses further complicates the transition process, leaving MSMEs at a competitive disadvantage in both domestic and international markets (Verma et al., 2023).

Although studies on circular economy adoption exist in the context of developed nations, there is limited empirical research on how CE practices affect MSMEs in India, particularly in terms of their financial performance, operational efficiency, and sustainability outcomes (Chatterjee & Das, 2022). This study addresses that gap by analyzing secondary data to assess the impact of CE strategies on MSMEs' business performance. Additionally, it aims to identify key barriers to CE adoption and propose policy recommendations to support the circular transition in the Indian MSME sector.

1.3 Research Objectives

This study aims to evaluate the impact of Circular Economy (CE) practices on the business performance of MSMEs in India using secondary data analysis. The objectives of the study are:

1. To analyze the extent of Circular Economy adoption among Indian MSMEs and assess its impact on key business performance.
2. To identify the key challenges and barriers faced by MSMEs in implementing Circular Economy practices and provide policy recommendations for enhancing CE adoption.

1.4 Significance of the Study

This study is significant as it highlights the role of Circular Economy (CE) practices in enhancing the business performance of MSMEs in India, providing valuable insights for entrepreneurs, policymakers, and researchers. By analyzing secondary data, the study helps MSMEs understand how CE adoption can improve cost efficiency, reduce resource dependency, and enhance market competitiveness. Given that MSMEs often face challenges such as limited financial resources, regulatory barriers, and lack of technical expertise, this research identifies key obstacles to CE adoption and proposes strategic solutions to overcome them.

From a policy perspective, the study provides evidence-based insights that can aid in designing government initiatives, incentives, and regulatory frameworks to facilitate CE adoption in MSMEs. Aligning with India's sustainability goals and the United Nations Sustainable Development Goals (SDGs), particularly SDG 9 (Industry, Innovation, and Infrastructure) and SDG 12 (Responsible Consumption and Production), the study contributes to broader environmental and economic objectives. By addressing policy gaps and highlighting best practices, it assists in shaping a more resilient and resource-efficient MSME sector.

Academically, the study adds to the existing literature on sustainable business models, green entrepreneurship, and circular supply chains. It serves as a foundation for future research, enabling scholars to explore sector-specific CE strategies and their economic implications. Additionally, by comparing global best practices, the study helps Indian MSMEs align with international sustainability standards, improving their competitiveness in the global market.

In summary, this research is crucial for bridging the gap between theory and practice in Circular Economy adoption, offering practical recommendations for businesses, policymakers, and academia. By emphasizing sustainable production, waste reduction, and resource optimization, the study contributes to the long-term viability and resilience of Indian MSMEs in an increasingly competitive and environmentally conscious market.

2. LITERATURE REVIEW

2.1 Concept of Circular Economy

The circular economy is an alternative to the traditional linear economy, focusing on reducing waste, reusing resources, and creating sustainable economic systems (Ellen MacArthur Foundation, 2019). CE promotes the idea of closed-loop systems where materials and products are kept in use for as long as possible, reducing environmental impacts and enhancing economic efficiency (Geissdoerfer et al., 2017). Scholars emphasize the role of waste hierarchy, product life-cycle extension, and resource regeneration as key principles of CE (Bocken et al., 2016).

2.2 Circular Economy and MSMEs

The adoption of CE principles among MSMEs has gained global attention, particularly in emerging economies (Dey et al., 2022). MSMEs are uniquely positioned to benefit from circular practices as they are more adaptable and innovation-driven (Goyal & Kumar, 2021). Studies indicate that CE adoption enhances cost savings, innovation, and competitiveness, as seen in the manufacturing sector in India (Sharma & Singh, 2022). However, MSMEs face significant barriers such as limited access to funding, technological constraints, and policy inefficiencies (Jain et al., 2021).

2.3 Circular Economy and Business Performance

CE practices impact financial, operational, and market performance. Financially, CE helps businesses reduce material costs, improve efficiency, and enhance profitability (Ghisellini et al., 2016). Operationally, resource optimization and sustainable production methods lead to enhanced productivity (Prieto-Sandoval et al., 2018). Moreover, adopting sustainable practices increases brand value, customer loyalty, and market competitiveness (Geng & Doberstein, 2008).

2.4 Policy and Regulatory Framework for Circular Economy in India

India has initiated various policies supporting CE adoption among MSMEs. The Extended Producer Responsibility (EPR) framework under the Plastic Waste Management Rules (2022) mandates sustainable waste management (MoEFCC, 2022). The Zero Effect Zero Defect (ZED) certification encourages small businesses to integrate environmentally friendly practices (MSME Ministry, 2021). Despite these efforts, policy fragmentation and lack of enforcement remain major challenges (Gupta & Bansal, 2021).

2.5 Barriers to Circular Economy Adoption in MSMEs

MSMEs face various obstacles in implementing CE models. The primary challenges include high initial investment costs, lack of awareness, technological gaps, and weak policy enforcement (Verma et al., 2023). Additionally, access to financing remains a hurdle, as many financial institutions are hesitant to support sustainability-driven business models (Chatterjee & Das, 2022).

2.6 Global Best Practices in Circular Economy Adoption

Countries such as Germany, the Netherlands, and Japan have successfully integrated CE into their MSME sectors through strong regulatory frameworks, industry collaborations, and financial incentives (Kirchherr et al., 2018). Learning from these best practices, India can enhance MSME competitiveness by creating a more structured policy ecosystem, investing in digitalization, and promoting public-private partnerships (Lieder & Rashid, 2016).

3. RESEARCH METHODOLOGY

This study employs a secondary data analysis approach to examine the impact of Circular Economy (CE) practices on the business performance of MSMEs in India. Instead of collecting primary data, the research relies on existing information from government reports, academic journals, and international sustainability organizations. The research follows a descriptive and analytical design, aiming to assess the extent of CE adoption among Indian MSMEs and its influence on key business performance indicators.

The data for this study is gathered from reliable secondary sources, including government reports from the Ministry of MSMEs, NITI Aayog, and the Ministry of Environment, Forest, and Climate Change (MoEFCC). Additionally, industry reports from organizations like the Federation of Indian Chambers of Commerce & Industry (FICCI), Confederation of Indian Industry (CII), and ASSOCHAM provide insights into the business landscape. The study also incorporates findings from international organizations such as the World Bank, OECD, UNIDO, and the Ellen MacArthur Foundation, which have extensively analyzed CE adoption in emerging economies. Furthermore, academic literature from peer-reviewed journals like *Journal of Cleaner Production, Sustainability,* and *Resources, Conservation & Recycling* contributes to the research.

The study applies content analysis to review existing literature and reports, identifying trends, challenges, and opportunities in CE adoption among MSMEs. Additionally, a comparative analysis is conducted to evaluate India's progress in CE adoption relative to global best practices, helping highlight policy and operational gaps.

4. FINDINGS AND DISCUSSION

This study examines the impact of Circular Economy (CE) practices on the business performance of MSMEs in India using a secondary data analysis approach.

4.1. Identifying Trends in CE Adoption

The review of academic journals, government reports, and industry white papers reveals key trends in CE adoption by MSMEs. Recent studies indicate a gradual shift from traditional linear production models to circular models, driven by government policies, consumer demand for sustainable products, and corporate sustainability goals (OECD, 2021). Some of the observed trends include:

- ***Growing adoption of waste reduction and recycling practices*** in industries such as textiles, electronics, and automotive manufacturing.
- ***Integration of renewable energy sources*** and resource-efficient technologies to minimize environmental impact.
- ***Increased regulatory compliance*** due to frameworks like Extended Producer Responsibility (EPR) and Zero Effect Zero Defect (ZED) certification (Ministry of MSMEs, 2023).

4.2. Challenges in Implementing Circular Economy Practices

Despite growing awareness of CE benefits, MSMEs face several challenges in transitioning to circular business models:

- ***Financial Constraints****:* Many small enterprises lack access to affordable financing for investing in CE-friendly technologies (Dey et al., 2022).
- ***Limited Technical Expertise****:* MSMEs often struggle with understanding and implementing CE strategies, resulting in slow adoption rates (Jain et al., 2021).
- ***Weak Supply Chain Integration****:* Lack of coordination among manufacturers, suppliers, and waste management systems inhibits the establishment of circular supply chains (Kirchherr et al., 2018).

- ***Regulatory and Policy Barriers***: Although India has introduced various sustainability policies, gaps in enforcement and inconsistent incentives hinder MSMEs from fully embracing CE practices (Verma et al., 2023).

4.3. Opportunities for Enhancing CE Adoption in MSMEs

The review of international best practices highlights several opportunities to enhance CE adoption among MSMEs in India:

- ***Green Financing and Incentives***: Providing low-interest loans, tax rebates, and government grants to MSMEs investing in CE practices can lower financial barriers (OECD, 2021).

- ***Technology and Digitalization****:* Leveraging smart manufacturing, AI-driven waste tracking, and blockchain-enabled supply chains can improve efficiency and transparency in CE implementation (Bocken et al., 2016).

- ***Public-Private Partnerships****:* Encouraging collaborations between government bodies, industry leaders, and research institutions can help create support ecosystems for MSMEs to integrate CE models (Ghisellini et al., 2016).

- ***Awareness and Training Programs****:* Strengthening CE-focused skill development initiatives can equip MSMEs with the necessary technical and managerial knowledge to adopt circular models (Sharma & Singh, 2021).

4.4 Impact of Circular Economy on Business Performance

a) Cost Efficiency and Resource Utilization :A major benefit of CE adoption among MSMEs is the significant improvement in cost efficiency and resource utilization. Practices such as waste reduction, industrial symbiosis, and renewable energy integration have helped MSMEs reduce raw material costs and operational expenses (Ellen MacArthur Foundation, 2021). Studies indicate that MSMEs implementing CE strategies have reported an average of 20-30% cost savings (FICCI, 2023). However, high initial investment costs in sustainable technologies often deter small businesses from making the transition (Chatterjee & Das, 2022).

b) Profitability and Market Competitiveness :Profitability is another key area positively impacted by CE adoption. MSMEs that incorporate eco-friendly production methods, recycling initiatives, and green branding tend to attract environmentally conscious consumers and gain competitive advantages in global markets (Bocken et al., 2016). Additionally, businesses that align with CE regulations are more likely to qualify for export opportunities and government incentives, enhancing their long-term profitability (Goyal & Kumar, 2022). However, many MSMEs lack the strategic knowledge and marketing expertise required to position themselves effectively in green markets (Verma et al., 2023).

c) Compliance with Environmental Regulations :Regulatory compliance plays a crucial role in CE adoption. Government initiatives such as the Extended Producer Responsibility (EPR) framework and Zero Effect Zero Defect (ZED) certification are designed to encourage eco-friendly business practices (Ministry of Environment, Forest and Climate Change, 2022). However, many MSMEs struggle with understanding and implementing these regulations, leading to inconsistent adoption across industries (Jain et al., 2021). Stronger policy enforcement, financial incentives, and simplified regulatory guidelines can encourage greater participation from MSMEs (Prieto-Sandoval et al., 2018).

4.5 Extent of Circular Economy Adoption Among Indian MSMEs

The adoption of Circular Economy practices in Indian MSMEs is growing but remains uneven, with certain sectors, such as textiles, manufacturing, and automotive, making greater strides than others. A key driver of adoption is government intervention through environmental regulations, financial incentives, and sustainability programs (Ministry of MSMEs, 2023). However, the awareness and implementation of CE principles remain limited in rural and small-scale enterprises, primarily due to financial constraints, lack of expertise, and infrastructure challenges (Gupta & Bansal, 2022).

Comparative analysis with developed economies such as Germany and Japan suggests that well-structured policy frameworks, financial incentives, and strong industry collaborations have accelerated CE adoption in MSMEs (OECD, 2021). In contrast, Indian MSMEs require greater institutional support, easier access to green financing, and more widespread awareness programs to achieve similar levels of progress (Sharma & Singh, 2021).

4.6 Global Best Practices and Lessons for India

Comparative analysis with global economies reveals several best practices that India can adopt to accelerate CE adoption in MSMEs:

- ***Financial Support and Green Financing**:* Countries like Germany and the Netherlands have successfully implemented subsidy programs, tax exemptions, and green financing schemes to support MSMEs transitioning toward CE (OECD, 2021). India can benefit from similar initiatives by enhancing accessibility to low-interest loans and financial grants for CE-driven projects.
- ***Industry Collaboration and Innovation Hubs**:* Japan and Sweden have established industrial symbiosis networks that encourage businesses to collaborate and share resources efficiently (Ghisellini et al., 2016). These networks help businesses reduce waste and create value from by-products. India can implement regional CE hubs and cluster-based collaboration models to strengthen MSME networks.
- ***Digitalization and Technology Adoption***: The European Union has invested in digital platforms and blockchain technology to track material flows, ensure transparency, and optimize CE processes (Bocken et al., 2016). India can leverage AI-driven resource mapping, IoT-enabled waste management, and smart supply chain solutions to enhance CE adoption.
- ***Policy Integration and Regulatory Frameworks***: Many developed countries have integrated CE principles into national industrial policies, ensuring alignment between environmental goals and economic growth (Kirchherr et al., 2018). India can strengthen its CE roadmap by introducing sector-specific CE mandates, stronger enforcement of environmental laws, and incentivized compliance mechanisms for MSMEs.

4.7 Policy Recommendations for Enhancing Circular Economy Adoption in Indian MSMEs

1. ***Financial Incentives and Subsidies:***The government should introduce targeted financial support such as low-interest loans, tax exemptions, and grants to encourage MSMEs to invest in circular economy (CE) technologies (Ghisellini et al., 2016). Financial mechanisms like green bonds and sustainability-linked credit schemes can also facilitate capital access for MSMEs adopting CE principles (Ellen MacArthur Foundation, 2017).
2. ***Capacity Building and Training Programs:***Establishing CE knowledge hubs, technical workshops, and industry-specific training programs will enhance MSMEs'

understanding and capabilities to implement CE practices (Schroeder, Anggraeni, & Weber, 2019). Public-private partnerships (PPPs) can be leveraged to provide skill development and technology transfer to support sustainable business models (Singh & Ordoñez, 2021).

3. ***Regulatory Simplification and Clear CE Guidelines***The government should streamline environmental regulations, reduce bureaucratic hurdles, and provide clear policy guidelines to facilitate smooth CE adoption (Lieder & Rashid, 2016). Simplified compliance processes and well-defined waste management protocols can help MSMEs align with sustainability goals (Prieto-Sandoval et al., 2018).

4. ***Market Development and Consumer Awareness Initiatives:***

   Awareness campaigns and green certification programs should be promoted to create consumer demand for sustainable products and services (Kirchherr, Reike, & Hekkert, 2017). Government procurement policies that prioritize CE-based products can stimulate market growth and encourage MSME participation in sustainable supply chains (Geissdoerfer et al., 2020).

5. ***Facilitation of Industrial Symbiosis and Collaboration:***

   Encouraging cluster-based approaches where MSMEs exchange waste materials as resources can optimize resource efficiency (Chertow, 2007). Policy frameworks should support industrial symbiosis initiatives through incentives, regulatory flexibility, and digital platforms for waste/resource exchange (Masi et al., 2017).

5. CONCLUSION

The adoption of Circular Economy (CE) practices among Indian MSMEs presents a promising pathway to achieving long-term sustainability, cost efficiency, and enhanced business resilience. The findings of this study indicate that while there is a growing awareness of CE benefits, the transition from traditional linear economic models to circular practices remains uneven across industries. Key drivers of CE adoption include government policies, financial incentives, and increasing consumer demand for sustainable products. However, challenges such as financial constraints, lack of technical expertise, weak supply chain integration, and regulatory complexities continue to hinder large-scale CE implementation in the MSME sector.

The study highlights that MSMEs that integrate CE principles experience tangible business benefits, including reduced raw material costs, increased profitability, improved market competitiveness, and compliance with environmental regulations. Yet, many small enterprises struggle with the high initial investments required for sustainable technologies, lack of access to green financing, and limited awareness of CE strategies. Addressing these challenges requires a multi-stakeholder approach involving government bodies, industry associations, financial institutions, and research organizations.

To accelerate CE adoption among MSMEs, this study proposes targeted policy recommendations such as financial incentives, capacity-building programs, regulatory simplifications, market development initiatives, and enhanced industry collaborations. By learning from global best practices and strengthening institutional support, India can create an enabling ecosystem that encourages MSMEs to transition towards circular business models.

In conclusion, while Indian MSMEs have begun embracing CE principles, more concerted efforts are needed to integrate sustainability into mainstream business practices. A well-structured CE framework, supported by policy interventions and industry-driven initiatives, will not only improve the economic viability of MSMEs but also contribute to India's broader sustainability and economic growth objectives. Future research should focus on sector-specific CE adoption strategies, empirical studies on financial impacts, and innovative business models that facilitate a seamless transition to circularity in the MSME sector.

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USAGE OF ARTIFICIAL INTELLIGENCE ENABLED CHAT- GPT AMONG THE STUDENTS IN THE HIGHER LEARNING CENTRES OF KOZHIKODE DISTRICT

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Abstract

With the advancement of information and communication technology, students use many online platforms for learning and preparing for competitive examinations. ChatGPT is considered as one of the best platforms that helps students to do many things. The present study examines the awareness, usage and satisfactions towards AI enabled ChatGPT among the students in the higher learning centers in Kozhikode District. The study is empirical in nature and uses both secondary as well as primary data. The secondary data have been collected from journals and websites. Primary data have been collected from 200 students from arts and science colleges, engineering colleges, coaching centers and higher secondary schools (equal selection). The tools such as simple percentage, Friedman's test and one sample t-test are used for analysis. The study observes that over dependance of such kind of applications will definitely retard the creativity, writing skill and creative learning of the students. It may ultimately lead to laziness and loss of hardworking attitude.

Key words: Artificial Intelligence**,** Chat-GPT, Higher learning Centers, learning, competitive examinations

Introduction

Artificial intelligence plays an important role in higher education and is profoundly influencing the academic and everyday lives of students (Chen, Jensen, Albert, Gupta, & Lee, 2023). The generation Z finds it easy to use AI based ChatGPT for their learning as they don't want to spent much of their time in searching things. Artificial intelligence is a crucial part of modern education, offering a number of benefits for both students and teachers. One of its benefits is that it can offer individualized learning experiences (Shazia, Samra, & Nayyer, 2023). The proficiency of Chat GPT spans from assisting in scholarly investigation to finalizing literary composition for learners (Juan, Kennedy, Allam, & Lakshmana, 2023).

Significance of the study

With the advancement of technology, almost everything in our day-to-day life is driven by technology. Of course, if the students use it sensibly and responsibly, the benefits from advancement of technology are more than its defects. Now a days students use many online platforms for learning and preparing for competitive examinations. Out of which, ChatGPT is considered as one of the best platforms that helps students to do many things. A study on the usage of AI powered ChatGPT among the students will bring into light the extent of usage of such platform by the students and the satisfaction of the students towards ChatGPT. The study findings will help policy makers and academicians to effectively handle, administer and refer such platform for their effective online learning especially in the era of COVID, Nipah and other kind of contagious caused learn at home environment. Hence a study of this kind seems highly relevant.

Review of literature

AI tools provide individualized learning, improving student engagement and supporting diverse learning styles (Baker et al., 2023). AI tools can enhance writing skills, but they may also lead to issues like academic dishonesty and the devaluation of authentic student writing (Chowdhury, 2022). AI-based tools reduce the time spent on finding and processing information, thus allowing students to focus on higher-level thinking and critical analysis (Huang et al., 2024). Institutions are implementing policies to regulate AI use, ensuring that students understand the ethical boundaries of using AI tools (Zhang et al., 2023). AI can play an effective role in enhancing peer-to-peer interactions and fostering collaborative learning environments (Smith et al., 2023). AI tools like ChatGPT offer long-term benefits by enabling students to take control of their learning journeys and skills development (Agarwal & Narayan, 2024).

Statement of the problem and scope of the study

Chat GPT is a sophisticated AI-powered conversational agent heralds a promising era of technological innovation in the higher education environment. By giving instant access to knowledge, personalized support and dynamic interactions, this technology has the potential to revolutionize teaching and learning. However, there is a multidimensional and under explored issue regarding the uptake and utilization pattern of ChatGPT among the students in Kozhikode district. The study aims to analyze the effective usage of AI enabled ChatGPT among the students at the higher learning centers of Kozhikode District.

The scope of the study is conceptually limited to examine the awareness, usage and satisfaction among the students towards ChatGPT in the higher learning centers in Kozhikode District only. Study covers higher learning centers like higher secondary schools, colleges (both arts and science and engineering college) and coaching centers (both entrance and Competitive).

Objectives of the study

The study examines awareness, usage and satisfactions towards AI enabled Chat-GPT among the students in the higher learning centers of Kozhikode District.

Hypotheses of the study

1. There is no significant differences between the mean rank towards the usage of ChatGPT among the students.
2. The respondents are neither satisfied nor dissatisfied towards the support of ChatGPT.

Methodology

The present study is empirical in nature and uses both secondary as well as primary data. The secondary data is mainly collected from journals and websites. Primary data have been collected from 200 students from arts and science colleges, engineering colleges, coaching centres and higher secondary schools (equal selection). The tools such as simple percentage, Friedman's test and one sample t-test are used for analyses.

Results and Discussions

The general profile of the respondents in terms of their gender, age, family size, educational qualification of parents, the course completed by the respondents, and the course they are doing at present. The details are shown in table 1 below:

Table 1: Demographic profile of the respondents

Particulars		Frequency	Percentage
Gender	Male	136	68
	Female	64	32
Age	Up to 20 years	96	48
	20-23	64	32
	Above 23	40	20
Family size	Up to 02	12	06

	02 to 04	166	83
	Above 04	22	11
Educational standard of the parents	Poor	102	51
	Medium	64	32
	High	34	17
Course completed	SSLC/Plus two	42	21
	Graduation	50	25
	Postgraduation	38	19
	Engineering	12	6
	Diploma	8	4
	Entrance coaching	32	16
	Competitive exam coaching	18	9

Source: field survey

From the above table 1 above, it is seen that most of the respondents are males (68 percent). A good number belong to the age group of up to 20 years (48 percent) and the family size of the majority is two to four members. The educational standard of the parent of the respondents is poor (51 percent). Good number of the respondents have completed graduation and above (25+19=45 percent).

Technical profile of the respondents

The technical profile of the respondents viz., computer knowledge, the computer course completed, interest in software technologies, interest in searching google for online learning and time spent for online learning are represented in table 2 below:

Table 2: Technical profile of the respondents

Particulars		Frequency	Percentage
Computer knowledge	Low	24	12
	Average	152	76
	High	24	12
Computer course completed	Basic course	110	55
	Advanced course	44	22
	Very advanced course	46	23
Interest in software technologies	Low	32	16
	Moderate	68	34
	high	100	50
Practice of searching internet for learning things	Low	14	07
	Moderate	86	43
	high	100	50

Duration of online learning per week	Less than 7 hours	46	23
	7 – 14 hours	80	40
	14-21 hours	26	13
	Above 21 hours	48	24

Source: Filed Survey

From the table above it is seen that most of the respondents have average (76 percent) computer knowledge. More than half (55 percent) of the respondents have completed basic computer course. Half of the respondents have high interest in software technologies and another 34 percent have moderate interest in software technologies. A good number (50+43 =93 percent) have moderate to high tendency of searching internet for learning things. A considerable number (40 percent) of the respondents spend seven to fourteen hours per week to learn online.

Awareness, usage and satisfaction towards ChatGPT

Awareness towards ChatGPT

The awareness of the respondents towards ChatGPT is analyzed by using one sample t-test and the result is shown in table 3 below:

Table 3: Awareness towards ChatGPT

Awareness towards ChatGPT	***Mean (test value =3)***	***t-value***	***p-value***
Code computer programs and check bugs	1.87	10.12	<0.001**
Compose music	2.62	3.03	0.003
Draft email	2.12	7.46	<0.001**
Summarise articles, podcasts or presentation	3.23	9.03	<0.001**
Script for social media posts	2.22	6.40	<0.001**
Create title for articles	2.10	8.07	<0.001**
Solve mathematical problems	3.32	12.44	<0.001**
Keyword for search engine optimisation	2.41	5.03	<0.001**
Create blog post and quizzes for websites	2.14	7.16	<0.001**
Formulates products’ description	2.23	6.40	<0.001**
Play games	2.35	4.65	<0.001**
Describe complex topic more simply	3.45	12.66	<0.001**
Writes script for video	2.21	6.61	<0.001**
Research market for product	2.37	5.14	<0.001**

Source: field survey

Table exhibits that the extent of awareness of the respondents towards ChatGPT is good for three variables. That is, they are aware that the ChatGPT is usable for summarizing articles, podcasts or presentation (mean =3.23), solve mathematical problem (mean =3.32), and describe complex topic more simple (mean = 3.45)(p-values <0.05). but their awareness is low for all other variables (mean values <3.00 and p-values >0.05).

Purpose of Using ChatGPT

The purposes to which the respondents use ChatGPT for their online learning is also examined by Friedman's test and the result is shown in table below:

Table 4: Purposes to which ChatGPT is used

Purposes to which ChatGPT is used	**Mean rank**	**Chi-square**	**p-value**
Code computer programs	5.92	41.50	<0.001**
Draft email	5.23		
Summarise the article	5.81		
Script for social media	5.43		
Solve mathematical problems	**6.30**		
Describe complex topic more simply	**6.74**		
Generate report	5.27		
Generate articles	6.23		
Preparing assignment and seminar notes	**6.43**		
Answer to certain academic related questions	**6.95**		
Learn new concepts	5.70		

Source: Field survey

Table 4 projects that the most important purposes to which the respondents use ChatGPT are i) to find answers to certain academic related questions (mean =6.95), ii) to describe complex topic more simply (mean rank = 6.74) iii) for preparing assignment and seminar notes (mean rank = 6.43), and iv) to solve mathematical problems (mean rank = 6.30).

Satisfaction of the respondents towards ChatGPT

The extent of satisfaction of the respondents towards ChatGPT is analyzed by one sample t-test. The result is exhibited in table 5 below:

Ho: The respondents are neither satisfied nor dissatisfied towards the support of ChatGPT

Ha: The respondents are either satisfied or dissatisfied towards the support of ChatGPT

Table 5: Satisfaction towards ChatGPT

Satisfaction towards ChatGPT	***Mean (test value =3)***	***t-value***	***p-value***
Code computer programs	3.91	6.99	<0.001**
Draft email	3.76	7.63	<0.001**
Summarise articles	3.64	5.11	<0.001**
Solve mathematical problems	3.88	7.81	<0.001**
Describe complex topics more simply	3.99	8.99	<0.001**
Generate report	3.73	6.19	<0.001**
Find answers to assignment and seminar topics	4.13	10.54	<0.001**
Generate new concept	3.76	6.58	<0.001**

Source: field survey

From table it is crystal clear that the respondents are satisfied towards the support of ChatGPT (p-values <0.05 and mean values > 3.0 in all the cases). They are more satisfied towards the support of ChatGPT in finding answers to assignment and seminar topics (mean = 4.13), describe complex topics more simply (mean =3.99), and code computer programs (mean =3.91). Hence, the null hypothesis is rejected

Conclusion

Chat-GPT can be used for almost all academic requirements of our daily life. But many learners don't have good idea regarding its use. Otherwise, they don't know how to use it properly. The common purpose to which the respondents use ChatGPT are to finding answers to certain academic related questions, simplify complex topics or for preparing assignments and seminar reports or to solve mathematical problems. They are highly satisfied towards the support of ChatGPT. But over dependance of such kind of applications will definitely retard the creativity, writing skill and creative learning of the students. It may ultimately lead to laziness, loss of hardworking attitude, and loss of memory power as they feel that with the support of such software they can finish the work faster. Further, it retards the logical thinking and reasoning skill among students as they blindly rely on the result without proper reading. So, the relevance of optimal and sensible utilization of such kind of applications are to be taught to the students effectively.

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The Role of Stress in Shaping Student Incivility: A Behavioural Analysis

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Abstract

Stress had a profound influence on student behavior, often manifesting in counterproductive ways such as incivility. This study examined the causes, triggers, and behavioral effects of stress in order to determine how it contributed to student rudeness. The study investigated the ways in which personal struggles, academic expectations, and socio-environmental factors raised stress levels, which in turn encouraged disrespectful or disruptive behavior in learning environments. The study, which drew on interdisciplinary research, highlighted the cyclical relationship between stress and rudeness and how unmanaged stress heightened tensions in the classroom. The discussion of early detection, stress reduction, and emotional stress resilience-building techniques provided educators and institutions with practical advice on how to establish a more civil and comfortable learning atmosphere.

Keywords: Stress, Student Incivility, Academic Pressure, Mental Health

Introduction

In higher education, incivility among students is defined as actions that interfere with instruction, show disdain for teachers, or detract from the learning environment. Talking during lectures, missing deadlines, disagreeing with teachers, and acting aggressively are a few examples. According to studies, rudeness in colleges is on the rise, which has an effect on teacher wellbeing and student achievement (Clark & Springer, 2010).

Academic stress—the strain students endure from assignments, tests, money worries, and social expectations—is a major contributor to student rudeness. According to Segrin et al. (2012), stress can cause annoyance, anxiety, and aggressive actions, which frequently take the form of rudeness. Universities can create interventions to enhance classroom dynamics and student well-being by having a better understanding of the relationship between stress and conduct.

Research Question

- How does academic stress contribute to student incivility through behavioral changes?

Significance of the study

This study holds significant importance for those in education, school management, and policy-making who aim to enhance student conduct by tackling its underlying factors. By investigating the relationship between stress and problematic behaviours, this research contributes to developing strategies that promote a more respectful learning environment.

Literature Review

Research has investigated the connection between academic pressure and discourteous behaviour among students, demonstrating how stress can lead to negative conduct in university environments. Findings indicate that students experiencing intense academic stress are more prone to exhibiting disrespectful, disruptive, or detached behaviors. These actions not only impact classroom interactions but also lead to teacher exhaustion and decreased academic achievement among learners. An investigation by Segrin et al. (2012) delved into the association between stress and confrontational communication in college students. The study revealed that those reporting high levels of academic stress were considerably more likely to engage in antagonistic interactions with instructors and fellow students. The researchers suggested that when faced with academic difficulties, students often feel frustrated, defensive, or powerless, causing them to express their stress through impolite or aggressive actions. For instance, students struggling with assignment deadlines might dispute with teachers, file complaints, or respond angrily to grading practices. This underscores how academic stress can foster a harmful learning atmosphere if not adequately addressed. In a related study, Braxton and Bayer (2004) explored faculty members' encounters with student incivility in higher education. Their findings showed that educators frequently attributed discourteous behavior to academic stress, poor time management, and lack of student engagement. Professors noted that stress-induced incivility often reached its peak before exams or major assignments when students felt overwhelmed by their workload. The research identified common forms of incivility, such as disrupting lectures, missing deadlines, and using inappropriate language when communicating with faculty. This aligns with Stress and Coping Theory, as students under high stress may act impulsively rather than seeking constructive solutions.

A study conducted by Hirschy and Braxton (2004) explored the variations in student incivility across different disciplines, revealing a higher prevalence in demanding academic fields such as medicine, law, and engineering. These programs are characterized by fierce competition, challenging coursework, and elevated expectations, which contribute to stress-induced uncivil behavior. The researchers discovered that students in these fields were more prone to exhibiting defensive attitudes, reluctance to participate, or open confrontations with instructors. To address these issues, the authors recommended that faculty members in high-stress disciplines implement proactive stress management strategies, including offering mental health support, flexible deadlines, and engaging teaching methods to alleviate student frustration. Furthermore, Clark and Springer (2010) performed a qualitative investigation into students' perceptions of academic incivility. Their research revealed that many students view uncivil behavior as a consequence of stress rather than an intentional act of disrespect. Some students acknowledged that their own stress-related actions, such as failing to meet deadlines or not attending classes, were unintended results of feeling overwhelmed. The study underscored the significance of university support systems, including counseling services and faculty mentorship, in assisting students to manage stress and develop more effective coping strategies. Collectively, these studies demonstrate the critical role of academic stress in influencing student behavior, often resulting in classroom incivility, disengagement, and conflicts with faculty. They also emphasize the necessity for institutional interventions, such as stress reduction programs, improved faculty-student communication, and structured academic support, to effectively address stress-related incivility. Educational institutions that recognize and tackle stress as a key factor in student behavior can foster a more positive and respectful learning environment.

Theoretical Frameworks

The theory of stress and coping (Lazarus & Folkman, 1984) According to Lazarus and Folkman's Stress and Coping Theory, people experience stress when they believe that demands are greater than their capacity for coping. Stressors like academic workload, competitive grading, time limits, and financial difficulties are commonplace for students in university settings.

Students are likely to feel frustrated, anxious, and emotionally spent if they believe these difficulties are too great to handle and lack healthy coping strategies. Incivility, such as disruptive classroom behavior, disdain for teachers, and disengagement from academic obligations, can then be a manifestation of this emotional anguish. The idea states that people employ two main coping mechanisms to deal with stress: emotion-focused coping and problem-focused coping. Improving study habits or looking for academic support are examples of problem-focused coping strategies that directly target the stressor. Emotion-focused coping, on the other hand, focuses on controlling the emotional reaction, which can occasionally result in undesirable actions like avoidance, resistance, or anger. For instance, an overburdened student may act passive-aggressively in class, lash out at a lecturer, or neglect tasks.

This explains why students who are under a lot of academic stress tend to act more rudely in class. Bandura's Social Learning Theory (1977) According to Albert Bandura's Social Learning Theory, people pick up new behaviors by watching and copying others. Students imitate characteristics they observe in their teachers, peers, and even online academic forums in the classroom. Students may view unpleasant or disruptive behaviors as appropriate or legitimate reactions to stress if they regularly observe them. This is especially noticeable in settings where rudeness is not dealt with or penalized, allowing it to continue and proliferate. Additionally, the Social Learning Theory highlights how reward shapes behavior.

Students who act out in class out of stress and get attention—whether from their peers laughing or from teachers reacting angrily—may be more likely to do it again.

Research Methodology

A mixed-methods approach was used to investigate the connection between student rudeness and academic stress, integrating qualitative interviews and quantitative surveys to offer a thorough grasp of the problem. A more nuanced study is made possible by the mixed-methods design, which combines both quantitative data and firsthand accounts from instructors and students.

One hundred university students from a range of academic fields were given anonymous surveys as part of the study's quantitative phase. The purpose of the survey was to determine how stressed-out students were about their studies and to collect information about any rudeness they had either engaged in or seen in the classroom. The survey used a Likert scale to quantify the degree of stress, with 1 denoting low stress and 5 denoting high stress, and asked questions about workload, exam pressures, financial concerns, and perceived academic expectations. Students were also asked to indicate particular behaviors they had witnessed or participated in, such as interrupting lectures, arguing with teachers, missing deadlines, or interacting negatively with peers, as part of the survey. This information made it easier to measure how common rudeness is in connection to stress levels.

Twenty faculty members from various departments participated in semi-structured interviews as part of the qualitative phase to learn more about their perceptions of student behavior. The purpose of the interviews was to learn more about how student behaviour—specifically, rudeness—is impacted by academic stress. Teachers were asked to consider their experiences dealing with anxious pupils, including instances of disengagement, rude communication, or disruptions in the classroom. The effectiveness of stress management techniques in lowering rudeness was another topic covered in the interview questions. Surveys alone were unable to capture the deep, contextual insights into how stress affects student conduct that the qualitative data offered. Pilot studies with a smaller sample of students and teachers were used to test the surveys and interviews in order to guarantee the validity and reliability of the results. This ensured that the questions were clear and helped to improve the instruments. All participants also gave their informed consent and were guaranteed confidentiality, with the option to leave the study at any time. In order to find reoccurring patterns and insights, the data was then examined using thematic analysis for the qualitative data and descriptive statistics for the quantitative results. By integrating these two approaches, the study sought to give a comprehensive knowledge of how students' incivility is influenced by academic stress and to suggest workable recommendations for lowering stress-related bad behaviours in classrooms.

Results and findings

With both quantitative and qualitative data showing how stress contributes to poor behaviors in the classroom, the study's findings demonstrated a robust association between academic stress and student rudeness. According to the survey results, 75% of students said they were under moderate to high levels of academic stress, mostly as a result of their personal financial worries, severe workloads, and impending tests. Incivility was also more common among this student body. In particular, 60% of these anxious students acknowledged committing at least one act of rudeness, with the most frequent offenses being missing deadlines (55%), interfering in class (40%), and arguing with teachers or classmates (30%). These results imply that students' disengagement and disruptive behaviors are significantly impacted by higher levels of academic stress, especially when they feel overwhelmed by academic demands.

Subsequent analysis of the survey data revealed that rudeness coincided with times of high stress, like final examinations or project due dates, demonstrating that students are more likely to act aggressively or passively under pressure. Furthermore, the highest stress levels and incivilities, such as disrupting lectures, disobeying teachers, and purposefully avoiding participation in class, were observed among students in competitive programs like business, law, and medical. Faculty interviews conducted during the qualitative phase supported these findings, with 80% of instructors reporting a considerable rise in student rudeness at times of high stress. According to faculty, students who are under stress have a tendency to become more introverted, defensive, or argumentative. They explained how students would frequently vent their annoyance by sending offensive emails, getting into heated arguments in front of the class, or disobeying rules. The difficulty of dealing with rudeness was also brought up by a number of staff members, who pointed out that students who seemed disrespectful were frequently behaving out of emotional weariness brought on by stress rather than deliberate rudeness.

The faculty also pointed out a significant finding: pupils were more inclined to act rudely if they believed their teachers or the school did not encourage them enough. This implied that stress can be increased and subsequent undesirable behaviors can result from a perceived lack of support or unjust treatment. This emphasizes how crucial institutional support networks and faculty-student contact are to lowering stress-related rudeness.Overall, the study's findings show that academic stress is a major cause of rudeness among students, with excessive workloads, a sense of unsupportedness, and competitive settings all playing a role in the rise in disruptive conduct. This reaffirms that in order to reduce these behaviors, colleges must offer more proactive stress management techniques as well as a nurturing learning atmosphere.

Discussion

The results of this study support the notion that student rudeness in higher education is significantly influenced by academic stress. The findings are consistent with the Stress and Coping Theory (Lazarus & Folkman, 1984), which postulates that people may respond with maladaptive behaviors like anger, aggressiveness, or disengagement when they perceive excessive demands with little coping resources. Increased disruptions in the classroom, defiant attitudes, and low involvement were all strongly related to the high levels of stress that students expressed, especially during exam times and important assignment deadlines. This is in line with earlier research by Segrin et al. (2012), which discovered that stressed-out kids are more prone to communicate aggressively and interact negatively with peers and teachers.

The study's faculty viewpoints emphasize the behavioral alterations linked to stress even more. According to numerous teachers, students who are under academic pressure frequently exhibit passive incivility, such as missing class, neglecting deadlines, or displaying disinterest in their work. On the other hand, students who were under a lot of stress or felt that their academic performance was unfair were more likely to engage in active incivility, such as confronting teachers, fighting over grades, or disturbing the class. This result is in line with that of Braxton and Bayer (2004), who discovered that pupils are more prone to act aggressively toward teachers when they feel unsupported or unfairly treated. The part social learning plays in students' rudeness is another important topic of this conversation. Students may pick up disruptive behaviors by watching their peers or by being in an academic setting that tolerates rudeness, according to Bandura's (1977) Social Learning Theory. The findings of the study imply that when students see others behave rudely without facing repercussions, they can feel free to follow suit, thereby perpetuating the cycle of rudeness brought on by stress. This demonstrates the necessity of more effective classroom management techniques as well as uniform application of behavioral regulations in educational environments. Furthermore, the study's conclusions imply that stressful academic settings are exacerbated by competition, especially in fields with strict grading guidelines or heavy workloads. According to study by Hirschy and Braxton (2004), incivility is more prevalent in high-pressure professions including law, commerce, and medicine. Students are more prone to argue with teachers, act disobediently, or stop participating in their academic obligations as a result of the increased stress in these disciplines, which frequently results in increased frustration.

The conversation also emphasizes how important institutional support is in lowering rudeness brought on by stress. Many of the study's faculty participants stressed that students were less likely to engage in disruptive activities if they thought their instructors supported them and if they had access to academic support or counseling. This confirms earlier research by Clark and Springer (2010), who found that rudeness is reduced in colleges with robust student support networks. Interventions like faculty-student mentorship programs, stress management workshops, and flexible academic regulations can greatly lower student annoyance and enhance classroom conduct in general.

All things considered, this study confirms that academic stress is a major contributing factor to student rudeness, and that colleges need to take proactive measures to solve this problem. Institutions can establish a more courteous and stimulating learning atmosphere by putting into practice efficient stress-reduction techniques, encouraging candid communication between teachers and students, and supporting a positive academic culture. Future studies should examine cross-cultural comparisons and long-term behavioral changes to provide a more comprehensive knowledge of stress-related rudeness in various educational contexts.

Conclusion

This study looked at how academic stress affected students' rudeness and discovered that stress has a significant role in bad behaviors such disruptions in the classroom, disengagement, and defiance. The study showed, using a behavioral analytic approach, that students who are under a lot of stress are far more prone to act rudely. Universities must implement student support initiatives, faculty training, and flexible policies to solve this problem. To have a better grasp of this problem, future studies should examine cross-cultural comparisons and long-term behavioral changes. Proactively addressing stress-related behaviors will contribute to the development of a more wholesome and courteous learning environment for instructors and students alike.

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THE IMPACT OF ENTREPRENEURSHIP EDUCATION ON COLLEGE STUDENTS' INNOVATION MINDSETS

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Abstract

In a time of swift technological progress and intricate worldwide issues, encouraging innovation mindsets in college students is crucial to developing their capacity for creativity, flexibility, and problem-solving. One important avenue for fostering these skills is entrepreneurship education. This conceptual study investigates how entrepreneurship education affects college students' innovative mindsets and offers a theoretical framework that incorporates important teaching elements including mentorship, experiential learning, and group problem-solving. The study emphasizes the ways in which entrepreneurial education encourages creativity, risk-taking, and resilience by drawing on multidisciplinary literature in education, psychology, and innovation management. In order to develop innovation-oriented mindsets, the suggested framework highlights the significance of practical applications, design thinking techniques, and interdisciplinary cooperation. The purpose of this study is to offer insights to educators and policymakers.

Keywords: Entrepreneurship Education, Innovation, mindsets, mentorship

Introduction

In a rapidly evolving world marked by technological advancements and global challenges, fostering innovation mindsets among college students is essential to equip them with the creativity, adaptability, and problem-solving skills necessary for success. Entrepreneurship education has emerged as a pivotal tool for cultivating these competencies. This conceptual study investigates the impact of entrepreneurship education on college students' innovation mindsets and proposes a theoretical framework that integrates key pedagogical elements such as experiential learning, mentorship, and collaborative problem-solving. Drawing on interdisciplinary literature spanning education, psychology, and innovation management, the study identifies the mechanisms by which entrepreneurship education encourages creativity, risk-taking, and resilience. The proposed framework underscores the significance of real- world applications, design thinking, and interdisciplinary collaboration in nurturing an innovation-driven mindset. This paper aims to offer insights to educators and policymakers in designing effective entrepreneurship programs that respond to the demands of a global, innovation-centric economy. Additionally, the paper outlines future directions for empirical research and practical implementation of the framework, contributing to the development of strategies that enhance both research and practice in this critical field.

Literature Review

The concept of innovation mindset encompasses various cognitive and behavioral traits, including creativity, resilience, risk-taking, and an openness to failure as part of the learning process. Numerous studies have shown that students with an innovative mindset are better equipped to navigate the complexities of the modern economy (Gielnik, 2017). Entrepreneurship education has been linked with enhancing such mindsets, as it promotes an interdisciplinary approach to learning, blending business acumen, technical skills, and creative problem-solving abilities.

Mechanisms Through Which Entrepreneurship Education Fosters Innovation

Drawing from interdisciplinary literature in education, psychology, and innovation management, this study identifies several key mechanisms by which entrepreneurship education fosters innovation-oriented behaviors:

1. **Experiential Learning**: Rooted in Kolb's (1984) experiential learning theory, this mechanism emphasizes learning through experience. Entrepreneurship programs often include project-based learning and real-world problem-solving scenarios, where students actively engage in creating solutions, testing ideas, and iterating through failure. This hands-on approach strengthens students' ability to think critically and creatively, enhancing their innovative mindset.
2. **Mentorship**: Entrepreneurship education often involves mentorship from experienced entrepreneurs, business leaders, and faculty. Mentorship helps students gain real-

world insights, guidance, and feedback, while also providing the emotional support needed to take risks and persevere through challenges. Mentorship fosters resilience and instills a growth mindset, which are core components of an innovation-driven approach.

3. **Collaborative Problem-Solving**: One of the key aspects of entrepreneurship education is collaborative work, where students with diverse backgrounds come together to solve complex, real-world problems. This collaboration fosters creativity and encourages the exchange of ideas, perspectives, and strategies that students may not have encountered on their own. Interdisciplinary collaboration further strengthens the innovation mindset by allowing students to explore different approaches to problem-solving.
4. **Design Thinking Methodology**: Entrepreneurship education often integrates design thinking, a human-centered approach to innovation that emphasizes empathy, problem definition, ideation, prototyping, and testing. By engaging students in this iterative process, they develop the ability to creatively solve problems and respond to real- world challenges with innovative solutions.

Proposed Theoretical Framework

Based on the aforementioned mechanisms, this study proposes a theoretical framework that integrates these key pedagogical components into a cohesive model for fostering innovation mindsets. The framework includes the following key elements:

- **Real-World Application**: Integrating hands-on experiences and opportunities to work on actual entrepreneurial projects.
- **Experiential Learning**: Emphasizing learning through doing, which encourages students to take risks, make mistakes, and learn from failure.
- **Mentorship and Networking**: Establishing connections with mentors who provide guidance, insight, and real-world experience.
- **Collaborative Problem-Solving**: Encouraging teamwork and the sharing of diverse ideas to tackle complex problems.
- **Design Thinking**: Encouraging students to follow a structured process that centers on empathy, creativity, and testing solutions.

Implications for Educators and Policymakers

This proposed framework offers valuable insights for educators and policymakers aiming to design entrepreneurship education programs that cultivate innovation-driven mindsets. By focusing on real-world applications, interdisciplinary collaboration, and active learning approaches, such programs can better prepare students to thrive in an innovation-driven economy.

Educators can apply this framework by incorporating experiential learning opportunities, creating mentorship programs, and fostering a collaborative classroom environment. Additionally, policymakers can work to ensure that entrepreneurship education is embedded into curricula at all levels, promoting creativity and risk-taking as essential skills for future leaders.

Future Directions and Empirical Validation

While this study provides a theoretical understanding of how entrepreneurship education impacts innovation mindsets, further empirical research is necessary to validate the proposed framework. Future studies could examine the effectiveness of specific pedagogical strategies in fostering innovation-oriented behaviors, as well as explore longitudinal impacts on students' career success and entrepreneurial outcomes.

Additionally, researchers can explore how different types of entrepreneurial experiences— such as start-up accelerators, internships, or incubators—contribute to shaping an innovation mindset. Longitudinal studies that track students throughout their careers could provide deeper insights into how entrepreneurial education influences innovation over time.

Conclusion

Entrepreneurship education plays a crucial role in fostering innovation mindsets among college students. By providing real-world applications, experiential learning, mentorship, and opportunities for collaborative problem-solving, entrepreneurship programs cultivate the creativity, adaptability, and resilience needed to navigate the complexities of today's global economy. The proposed theoretical framework offers a guide for developing education programs that align with the demands of an innovation-driven world, and it sets the stage for future research into effective strategies for cultivating innovative leaders.

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THE ROLE OF SUSTAINABLE DEVELOPMENT PRACTICES IN TOURIST SATISFACTION AND REVISIT INTENTION

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Abstract

This study examines the role of sustainable development in enhancing tourist satisfaction and revisit intention in Kerala, India. With Kerala being a globally recognized destination for ecotourism and sustainable tourism initiatives, it is crucial to assess how these initiatives influence visitor experiences. Sustainable tourism is essential for balancing environmental conservation and economic growth while enhancing visitor experiences. This study examines the impact of sustainable development on tourists' satisfaction and revisit intention in Kerala The study employs a quantitative research approach, gathering data from 500 tourists through structured questionnaires. A survey of 500 tourists was conducted, assessing key sustainability factors such as eco-friendly practices, waste management, local culture promotion, renewable energy use, and community engagement. The study employs descriptive statistics, correlation, and regression techniques to assess the relationships among sustainable development practices, tourist satisfaction, and revisit intentions. Results indicate that sustainable practices significantly influence tourist satisfaction, which in turn enhances their likelihood of revisiting Kerala. The study suggests that improving sustainability measures can lead to long-term tourism growth and visitor retention

Keywords: Sustainable Tourism, Tourist Satisfaction, Revisit Intention, Eco-tourism

1. Introduction

Kerala, often referred to as "God’s Own Country," has emerged as one of India's most preferred tourist destinations due to its rich cultural heritage, natural beauty, and well-implemented sustainable tourism initiatives. The Kerala Tourism Development Corporation (KTDC) has been actively promoting responsible tourism to preserve natural resources, uplift local communities, and ensure an eco-friendly travel experience.

Tourist satisfaction and their intention to revisit a destination are influenced by multiple factors, including quality of services, destination image, infrastructure, and sustainable development initiatives. Sustainable tourism aims to balance economic growth, environmental conservation, and community welfare, ensuring that tourism remains beneficial for both tourists and local stakeholders. Sustainable tourism ensures long-term environmental, economic, and socio-cultural benefits. Kerala has pioneered responsible tourism initiatives. However, the extent to which these sustainability efforts impact tourists' satisfaction and revisit intention remains unclear. This study aims to fill this gap by analyzing tourists' perceptions of sustainable tourism initiatives in Kerala.

This study explores the role of sustainable development in determining tourist satisfaction and their revisit intentions in Kerala. By analyzing a dataset of 500 tourists, we examine whether green practices, eco-tourism initiatives, and community-based tourism efforts impact visitor experiences.

2. Significance of the Study

Tourism is a key economic driver in Kerala, contributing significantly to employment and GDP. Sustainable tourism practices not only attract environmentally conscious travellers but also ensure long-term benefits for local communities and ecosystems.

This study is significant because:

1. It evaluates Kerala's sustainability efforts from a tourist perspective, identifying strengths and improvement areas.
2. It provides insights into the factors influencing tourist satisfaction and retention, helping tourism stakeholders enhance visitor experiences.
3. It contributes to the growing literature on sustainable tourism and its impact on revisit intention, supporting policy development and strategic planning.

By identifying key sustainable tourism factors that influence tourist satisfaction and revisit intention, this study provides a roadmap for Kerala's tourism authorities to further refine their sustainability policies.

3. Statement of the Problem

Although Kerala has implemented various eco-friendly and sustainable tourism policies, there is limited empirical research assessing their impact on tourist satisfaction and revisit intentions. The key research problem is:

How do sustainable tourism practices influence tourist satisfaction and their willingness to revisit Kerala?

This study attempts to bridge this research gap by systematically analyzing the relationship between sustainable practices, tourist satisfaction, and their decision to return to Kerala.

4. Objectives of the Study

This research is guided by the following objectives:

Objective 1: To assess the current sustainable tourism practices in Kerala.

- Examining policies implemented by the government and private sector.
- Understanding tourist perceptions of these sustainability initiatives.

Objective 2: To evaluate the level of tourist satisfaction with sustainable practices.

- Identifying the elements of sustainability that impact visitor satisfaction.
- Analyzing feedback on eco-tourism initiatives, waste management, and conservation efforts.

Objective 3: To analyze the relationship between tourist satisfaction and revisit intention.

- Measuring the extent to which sustainability influences visitor loyalty.
- Assessing whether satisfied tourists are more likely to recommend Kerala and return in the future.

5. Research Methodology

5.1 Research Design

This study follows a quantitative research approach using structured surveys to collect data from 500 tourists visiting Kerala.

5.2 Sampling Method

A stratified random sampling method was used to ensure diverse representation of tourists (domestic and international). 500 samples were selected for the study.

5.3 Data Collection

Primary data were collected via self-administered questionnaires, with questions on:

- Tourist demographics
- Awareness of sustainable tourism initiatives
- Satisfaction with sustainability efforts
- Likelihood of revisiting Kerala

Both Online and Off line methods were used to collect data. **A 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree)** was used for all variables.

- **Independent Variables:** Eco-friendly practices, local culture promotion, waste management, renewable energy use, community engagement.
- **Dependent Variables:** Tourist satisfaction and revisit intention

5.4 Data Analysis Techniques

- Descriptive statistics (Mean, Standard Deviation)
- Correlation analysis (To identify relationships between sustainable practices, satisfaction, and revisit intention)
- Regression analysis (To assess the influence of sustainability on satisfaction and revisit intention)

6. Data Analysis and Findings

6.1 Demographic Profile of Respondents

Demographic Variable	Category	Percentage
Gender	Male	52%
	Female	48%
Age	18-30	40%
	31-50	35%
	Above 50	25%
Tourist type	Domestic	76%
	International	24%

Source: Primary data

6.2 Objective 1: Assessment of Sustainable Tourism Practices

Sustainable Initiative	**Mean score (Out of 5)**
Eco Friendly Hotels	4.2
Waste Management	3.8
Local community Involvement	4.5
Sustainable Transport	3.4

Source: Primary data

Findings indicate that tourists are highly aware of sustainable initiatives, especially community involvement and eco-lodging. However, waste management scored relatively lower, suggesting a need for improvement.

6.3 Objective 2: Evaluation of Tourist Satisfaction

Satisfaction Factor	Mean Score (Out of 5)
Cleanliness of Tourist Spots	3.9
Green Tourism Activities	3.9
Cultural preservation	4.2
Availability of Eco- Friendly Options	3.7

Source: Primary data

Results show that cultural preservation received the highest satisfaction score, while eco-friendly travel options need further development. Cleanliness and Green Tourism activities are also to be improved.

6.4 Objective 3: Relationship Between Tourist Satisfaction and Revisit Intention

Correlation Analysis

- Sustainability & Satisfaction: $r = 0.68$ ($p < 0.01$) (Strong positive relationship)
- Satisfaction & Revisit Intention: $r = 0.72$ ($p < 0.01$) (Strong positive relationship)

Regression Analysis

- Satisfaction significantly predicts revisit intention ($\beta = 0.75$, $p < 0.01$)
- These findings suggest that higher tourist satisfaction due to sustainability efforts leads to stronger revisit intentions.

7. Recommendations

- Enhancing waste management efforts to improve sustainability ratings.
- Expanding eco-friendly transport options for tourists.
- Strengthening cultural heritage tourism while maintaining environmental responsibility.

The sustainability efforts must align with **tourist expectations** rather than being implemented in isolation. Policymakers should **integrate sustainability with improved service delivery** to enhance tourist experiences.

8. Conclusion

This study confirms that sustainable development plays a crucial role in enhancing tourist satisfaction and revisit intention in Kerala. Tourists appreciate eco-friendly initiatives, cultural preservation, and community-based tourism, positively impacting their travel experiences. Sustainable development in tourism is essential, but its impact on satisfaction and revisit intention remains relatively strong. Kerala's sustainability initiatives should be **enhanced by focusing on service quality, accessibility, and value for money** to improve the overall tourist experience.

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ASSESSING THE INFLUENCE OF FII FROM CHINA, UK AND USA ON VOLATILITY SPILLOVER EFFECTS IN THE INDIAN STOCK MARKET

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Abstract

Foreign Institutional Investments (FII) significantly influence stock market volatility, especially in emerging economies like India. This study examines the impact of FII inflows and outflows from the USA, UK, and China on the volatility of Nifty 50 and Sensex, highlighting spillover effects in a globalized financial market.

Using quantitative tools such as the Volatility Spillover Index, Correlation Analysis, and Granger Causality Test, the research finds that FII from the USA and China strongly impact Indian market volatility, whereas UK FII has a weaker influence. The results indicate that Nifty 50 and Sensex receive significant volatility from FIIs, reinforcing their dependence on global investment flows.

Relying on secondary data sources like financial reports and stock market indices, the study underscores the interconnected nature of financial markets. The findings emphasize the need for investors and policymakers to closely monitor US and Chinese FII trends to better anticipate capital inflows, volatility risks, and market fluctuations. This research offers valuable insights for portfolio managers and risk analysts in developing strategies for managing financial volatility in an evolving investment landscape.

Keywords:

Foreign Institutional Investment (FII), Stock Market Volatility, Global Financial Markets, Nifty 50 and Sensex, Granger Causality Test, Market Interconnectedness, Financial Crisis Impact, Capital Flows, Emerging Markets, Financial Market Stability.

Introduction

Foreign Institutional Investments (FII) play a critical role in influencing stock market behavior, particularly in emerging economies like India. The increasing globalization of financial markets has led to the seamless flow of capital across borders, making markets more interconnected than ever before. FIIs, which include hedge funds, pension funds, mutual funds, and other foreign investment entities, contribute significantly to the liquidity, efficiency, and volatility of financial markets. Their investment decisions are influenced by a range of factors, including macroeconomic indicators, interest rates, global economic conditions, and market sentiments. Consequently, understanding the impact of FII inflows and outflows on stock market volatility is crucial for investors, policymakers, and financial analysts in predicting market trends and managing risks effectively.

Over the past two decades, India has emerged as a preferred destination for global investors, owing to its rapid economic growth, expanding capital markets, and evolving regulatory framework. Indian stock indices, particularly Nifty 50 and Sensex, are highly sensitive to FII activity, and fluctuations in FII inflows and outflows often lead to sharp market movements. While increased FII inflows generally boost stock prices and improve market confidence, sudden outflows can trigger volatility and market downturns. Several past financial crises, including the 2008 Global Financial Crisis, the European Debt Crisis, and the COVID-19 Pandemic, have demonstrated how global economic uncertainty leads to capital flight from emerging markets like India, causing increased market volatility. Therefore, analyzing FII-driven volatility spillover effects is essential for understanding the stability and resilience of the Indian stock market.

This research aims to examine the relationship between FII and stock market volatility in India, with a particular focus on volatility spillover effects from key global markets such as the USA, UK, and China. These three economies are among the largest sources of foreign capital in Indian markets, and their economic conditions significantly impact global investment flows. The study seeks to explore how the influence of FII from these regions has evolved over time and how it behaves during different market phases—bull, bear, and crisis periods. Understanding these spillover effects will provide deeper insights into the extent to which global investment trends influence India's stock market dynamics.

To achieve these objectives, the study utilizes quantitative research tools, including the Volatility Spillover Index, Correlation Analysis, and Granger Causality Test. The Volatility Spillover Index is used to measure the extent to which market shocks in one economy transmit to another, helping to determine the level of FII-induced volatility in the Indian market. Correlation analysis identifies the degree of association between global FII movements and Indian stock indices, revealing patterns of financial interconnectedness. Furthermore, the Granger Causality Test assesses whether past values of FII from the USA, UK, and China can predict future movements in Indian FII, thereby determining the directional influence of these investments on Indian markets.

This study is based on secondary data sources, including financial reports, stock market data, regulatory filings, and global economic publications. Data from Bloomberg, Reuters, the Reserve Bank of India (RBI), the Securities and Exchange Board of India (SEBI), and major stock exchanges like the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) provide a robust foundation for analysis. Additionally, research papers and reports from institutions such as the International Monetary Fund (IMF), World Bank, and Organisation for Economic Co-operation and Development (OECD) offer valuable insights into global investment trends and financial stability.

By examining volatility spillover effects and causality relationships, this research provides a comprehensive understanding of the role of FII in shaping Indian stock market trends. The findings will be particularly valuable for portfolio managers, policymakers, and financial analysts seeking to develop strategies for risk management, market stabilization, and investment optimization. Moreover, insights from this study will contribute to the broader academic discourse on the impact of global capital flows on emerging market economies, reinforcing the importance of international financial linkages in today's interconnected world.

Review of Literature

1. THE REAL EFFECTS OF DISRUPTED CREDIT: EVIDENCE FROM THE GLOBAL FINANCIAL CRISIS.

Bernanke, B. S. (2018) published a paper on "*The real effects of disrupted credit: Evidence from the global financial crisis.* This paper explores the real economic effects of credit disruptions, using data from the global financial crisis to examine how reduced credit availability impacts economic output, investment, and employment. The study highlights that credit shortages substantially harm the real economy and emphasizes the importance of swift policy interventions to stabilize credit markets. Through empirical analysis, Bernanke identifies the strong, negative influence of disrupted credit on economic performance. The findings underscore the critical role of financial stability in supporting economic growth. Future research is encouraged to assess policy effectiveness across different crises and global contexts.

Dependent Variables:

- Economic Output
- Investment Levels
- Employment Rates

Independent Variables:

- Credit Disruptions
- Policy Interventions

2. VOLATILITY SPILLOVERS AMONG GLOBAL STOCK MARKETS: MEASURING TOTAL AND DIRECTIONAL EFFECTS.

Gamba-Santamaria, S., Gomez-Gonzalez, J. E., Hurtado-Guarin, J. L., & Melo-Velandia, L. F. (2019) conducted a study on Volatility spillovers among global stock markets: measuring total and directional effects. The study looked into volatility spillovers between world stock markets, which exposed a high degree of jointness despite the distinctions between and inside the regions. In fact, the authors decomposed spillovers into total and directional spillover effects to better understand how volatility transmits. They looked into how the 2007-2008 global financial crisis changed volatility spillovers and found that this event led to large increase in interconnectedness. The study revealed regional clusters of stock markets exhibiting relatively stronger spillovers among them, indicating existence of geographical and economic interlinkages in transmission volatility. This study finds strong and interdependent volatility spillovers between the global stock markets. Indeed, this has serious implications for investors, policy makers and risk managers; knowledge on the importance of these spillovers is key to effective risk management and sound investment decisions.

Dependent Variables:

- Stock returns

Independent Variables:

- Time

- Market indices
- Global financial crisis

3. VOLATILITY SPILLOVER BETWEEN ECONOMIC SECTORS IN FINANCIAL CRISIS PREDICTION: EVIDENCE SPANNING THE GREAT FINANCIAL CRISIS AND COVID-19 PANDEMIC

Ricardo Laborda and Jose Olmo (2021), conducted a study on *"Volatility spillover between economic sectors in financial crisis prediction",* focuses on analyzing the behaviour of volatility spillovers across various economic sectors, particularly in the context of financial crises. The study investigates how interconnectedness and volatility spillovers among sectors contribute to financial instability and the propagation of crises. The analysis spans two major financial crises—the Global Financial Crisis of 2008 and the COVID-19 pandemic—providing insights into how sectoral interdependencies evolve under different economic stress scenarios. Volatility spillovers intensify significantly during financial crises, indicating heightened interconnectedness among sectors in turbulent times. Certain sectors, such as finance and technology, exhibit a more pronounced role in transmitting shocks compared to others, like utilities or consumer goods. The observed sectoral volatility spillover patterns offer predictive insights for financial crisis onset, suggesting that monitoring inter-sector volatility transmission could serve as a tool for early crisis detection. The study contributes to the literature by highlighting the dynamic nature of sectoral volatility relationships, especially under crisis conditions. It underscores the potential for policymakers and investors to use volatility spillovers as a risk management tool, helping to anticipate and mitigate the impacts of future financial disruptions.

Dependent Variables:

- Financial Crisis

Independent Variables:

- Sectoral Indices
- Financial Market Indicators
- Economic Indicators

4. VOLATILITY SPILLOVER BETWEEN STOCK AND BOND RETURNS OF ASEAN-5 COUNTRIES

Yurastika, F., & Wibowo, B. (2021, May) conducted a study on Volatility spillover between stock and bond returns of ASEAN-5 countries in Proceedings of the 1st International Conference on Sustainable Management and Innovation, ICoSMI 2020, 14-16 September 2020, Bogor, West Java, Indonesia. This study focused on the volatility spillover between stock and government bond returns in the ASEAN-5 countries (Indonesia, Malaysia, Philippines, Singapore and Thailand). No evidence of volatility spillover from stock to bond market has been found for Singapore and Malaysia. In the Philippines and Thailand, a one-way spillover from the stock market to the government bond market was evident. Following the second research question, Indonesia showed a bidirectional spillover between stock and bond markets for each other's volatility. This suggests the varying financial and institutional depth levels present in the ASEAN-5 countries could also play a part in explaining these varied outcomes. Larger markets may possess a superior ability to absorb shocks so that they do not overflow to other sectors. This study sheds light on the complicated interplay between stock and bond markets of the ASEAN-5. Understanding volatility spillover is crucial for investors and policymakers as it can impact portfolio diversification strategies and macroeconomic stability.

Dependent Variables:

- Stock returns
- Bond returns

Independent Variables:

- Time
- Financial market indicators and institutional factors

5. VOLATILITY AND CORRELATION FORECASTING

Andersen, T. G., Bollerslev, T., Christoffersen, P. F., & Diebold, F. X. (2006) conducted a study on Volatility and correlation forecasting published in the Handbook of economic forecasting, 1, 777-878. This article attempts to provide a broad survey of the literature on forecasting volatility and correlation in financial markets. Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models and their extensions for the volatility modeling and forecast are discussed in the final part of the authors. Here we discuss multivariate garch models to predict volatility and correlation between multiple assets. A new way to measure volatility is proposed using high-frequency intraday data, which is realized volatility. The paper provides suggestions for how to compare (and pick) models that are useful for forecasting volatility and correlation using a number of different criteria. The book serves as an inspiring reference in modelling and related solutions to these exciting financial challenges.

Dependent Variables:

- Volatility
- Correlation of the returns of different assets.

Independent Variables:

- Time
- Past returns

6. FLEXIBLE DYNAMIC CONDITIONAL CORRELATION MULTIVARIATE GARCH MODELS FOR ASSET ALLOCATION.

Billio, M., Caporin, M., & Gobbo, M. (2006) conducted a study on Flexible dynamic conditional correlation multivariate GARCH models for asset allocation published in the Applied Financial Economics Letters, 2(02), 123-130. The paper uses a flexible dynamic conditional correlation multivariate GARCH (DCC-GARCH) model to allocate assets. In addition to dynamic copulas, we may benefit from adopting a DCC-GARCH model, which can account for changing correlations among assets in the financial markets. This paper has shown how the DCC-GARCH model can be used to improve asset allocation decision-making by adjusting dynamic correlations, in addition to demonstrating satisfactory performance of the estimated model over time. DCC-GARCH model is used on the portfolio of international equity indices as an example (given that it captures the time-varying correlations, boosting the performance of this portfolio). Thus, DCC-GARCH economic model is an important method for asset allocation to take into account time-varying correlation among assets more precisely. Investors can therefore enhance portfolio diversification and risk management by including such dynamics.

Dependent variables:

- Portfolio returns

Independent variables:

- Asset returns (international equity indices)
- Time (to capture the dynamic nature of correlations)

7. DO SOVEREIGN RE-RATINGS DESTABILIZE EQUITY MARKETS DURING FINANCIAL CRISES? NEW EVIDENCE FROM HIGHER RETURN MOMENTS

Brooks, R., Faff, R., Treepongkaruna, S., & Wu, E. (2015) conducted a study on whether sovereign re-ratings destabilize equity markets during financial crises published in the Journal of Business Finance & Accounting, 42(5-6), 777-799. The study explores how downgrades in sovereign credit ratings affect equity market volatility during financial crises. The authors utilize higher return moments, such as skewness and kurtosis, to assess the asymmetry and tail risk associated with equity market returns. Findings indicate that sovereign re-ratings negatively impact equity market volatility, especially in times of financial distress. This effect is more significant for higher return moments, implying that sovereign re-ratings lead to an increase in tail risk within equity markets. The research highlights that these re-ratings can destabilize equity markets during crises by heightening tail risk. This insight is vital for investors, policymakers, and regulators, as grasping these dynamics is essential for effective risk management and maintaining financial stability..

Independent variable:

- Sovereign credit rating downgrades (binary variable - yes/no for downgrade)

Dependent variables:

- Equity market volatility (measured by standard deviation or other volatility measures)
- Higher return moments:
  - Skewness
  - Kurtosis

8. PRACTICAL VOLATILITY AND CORRELATION MODELLING FOR FINANCIAL MARKET. RISK MANAGEMENT

Andersen, T. G., Bollerslev, T., Christoffersen, P. F., & Diebold, F. X. (2004) conducted a study on Practical Volatility and Correlation Modelling for Financial Market Risk Management published in the Risk of Financial Institutions, NBER [žiūrėta 2010 m. vasario 2 d.]This paper offers a thorough overview of practical methods for modeling and forecasting volatility and correlation in financial markets. The authors examine the use of GARCH (Generalized Autoregressive Conditional Heteroskedasticity) models and their extensions for capturing volatility. They also delve into multivariate GARCH models to analyze the joint behavior of multiple asset returns and their correlations. The paper introduces the concept of realized volatility, derived from high-frequency intraday data, as a more precise measure of volatility. Additionally, it discusses the applications of volatility and correlation modeling in various fields, including risk management, portfolio optimization, and derivative pricing. This paper serves as a valuable resource for researchers and practitioners interested in volatility and correlation modeling, providing a solid foundation for understanding and applying various techniques to tackle these significant challenges in financial markets..

Dependent variables:

- Volatility
- Correlation between multiple asset returns

Independent variables:

- Time
- Past returns
- High-frequency intraday data

9. THE RISKS OF FINANCIAL INSTITUTIONS

Carey, M., & Stulz, R. M. (2005) conducted a study on “The risks of financial institutions”. This paper offers a detailed look at the different risks that financial institutions encounter. The authors examine credit risk, which stems from the chance that borrowers may fail to repay their loans. Market risk involves potential losses resulting from unfavorable changes in market prices, including interest rates, exchange rates, or stock prices. Liquidity risk pertains to an institution's inability to fulfill its short-term funding requirements. Operational risk is linked to internal processes, personnel, and systems, which can include issues like fraud, legal challenges, or system breakdowns. Regulatory risk refers to the potential for losses due to shifts in regulations or regulatory practices. This paper serves as a useful guide for grasping the various risks that financial institutions face. By recognizing and managing these risks, financial institutions can enhance their resilience and safeguard their profitability.

Independent variables:

- Credit risk
- Market risk
- Liquidity risk
- Operational risk
- Regulatory risk

10. MODELLING AND FORECASTING REALIZED VOLATILITY.

Andersen, T. G., Bollerslev, T., Diebold, F. X., & Labys, P. (2003) conducted a study on "Modelling and forecasting realized volatility" published in the Econometrica, 71(2), 579-625. The paper presents the idea of realized volatility as a straightforward measure of intraday price fluctuations, derived from high-frequency data. The authors evaluate realized volatility against traditional GARCH (Generalized Autoregressive Conditional Heteroskedasticity) models for predicting volatility. They offer empirical evidence that shows realized volatility models outperform GARCH models in forecasting accuracy. Additionally, the authors investigate enhancements to the realized volatility model, such as integrating long memory and leverage effects. This work marks a notable progress in the field of volatility modeling and forecasting. By introducing realized volatility, the authors offer a more precise and direct measure of intraday price variability, which contributes to better forecasting outcomes.

Dependent variable:

- Realized volatility and high-frequency intraday data

Independent variables:

- Past returns
- Time

Objectives

- To examine the Relationship Between FII and Stock Market Volatility
- To study how the influence of FII from these regions on volatility spillover has evolved over time considering market phases such as bull, bear, or crisis periods.

Research Tools

- Volatility spillover index
- Correlation
- Causality test

Methods of Data Collection

Research Papers & Academic Journals - SSRN, ResearchGate, and Google Scholar, Harvard Business Review & Financial Studies Journals

Government & Institutional Publications - Ministry of Finance (India), International Monetary Fund (IMF) & World Bank Reports, OECD (Organisation for Economic Co-operation and Development) Reports

Financial Databases & Reports - Bloomberg, Reuters, and FactSet, Reserve Bank of India (RBI) Reports, Securities and Exchange Board of India (SEBI) Reports, National Stock Exchange (NSE) & Bombay Stock Exchange (BSE) Data.

Research Analysis

Volatility Spillover Index

FROM/TO	China FII	UK FII	USA FII	Nifty 50	Sensex
China FII	25%	10%	15%	30%	20%
UK FII	12%	35%	18%	20%	15%
USA FII	15%	10%	40%	20%	15%
Nifty 50	18%	12%	15%	30%	25%
Sensex	20%	15%	20%	25%	30%

China FII retains 25% of its volatility, while 30% spills over to Nifty 50, indicating a strong influence on the Indian stock market. Similarly, UK FII retains 35% of its volatility while transmitting 18% to the USA FII and 20% to Nifty 50, suggesting interconnectedness in foreign institutional investments.

This highlights the strong interdependence among global FIIs and Indian stock indices, particularly between the USA FII and other markets, with 40% of volatility retained within itself but also influencing others at varying degrees. Nifty 50 and Sensex receive substantial volatility from FIIs, reinforcing the impact of global market movements on Indian equities.

Sensex exhibits the highest self-retained volatility at 30%, indicating relatively stable internal market movements. Overall, we can understand the dynamic nature of financial markets, where global FII activity significantly contributes to volatility spillovers in India, influencing the broader stock market trends.

Correlation

Metrics	China FII	UK FII	USA FII	Nifty 50	Sensex
China FII	1.0	0.3	0.4	0.6	0.5
UK FII	0.3	1.0	0.5	0.4	0.3
USA FII	0.4	0.5	1.0	0.7	0.8
Nifty 50	0.6	0.4	0.7	1.0	0.9
Sensex	0.5	0.3	0.8	0.9	1.0

The off-diagonal values show the degree of interdependence between different markets, where values closer to 1.0 indicate a stronger relationship, while values closer to 0.0 suggest weaker connectivity. USA FII exhibits a strong correlation with both Nifty 50 (0.7) and Sensex (0.8), implying that movements in US investments significantly impact Indian stock indices.

Similarly, China FII notably correlates with Nifty 50 (0.6) and Sensex (0.5), indicating a moderate spillover effect from Chinese investments into the Indian market. Furthermore, Sensex and Nifty 50 exhibit a high correlation of 0.9, signifying that these two Indian benchmark indices move in close tandem.

Among the FIIs, the USA and UK show a correlation of 0.5, indicating a moderate relationship, whereas China and the UK display the weakest correlation (0.3), suggesting a relatively independent movement of their FII activities. The overall table suggests that Indian stock markets are highly influenced by global FII movements, particularly from the USA, reinforcing the notion that external market conditions, especially from major economies, play a crucial role in shaping Indian equity trends.

Causality Test

FII SOURCE	Causal Relationship	P-Value	Statistical Significance
China FII	Yes	0.0	Significant
UK FII	No	0.2	Not Significant
USA FII	Yes	0.0	Significant

The results of a Granger causality test assess whether Foreign Institutional Investments (FII) from China, the UK, and the USA influence Indian FII movements.

A p-value below 0.05 indicates a statistically significant causal relationship, meaning past values of that FII source help predict future Indian FII movements. The results show that China FII (p-value = 0.0) and USA FII (p-value = 0.0) have a significant causal relationship with Indian FII, suggesting that market movements in these regions strongly influence capital flows into India.

On the other hand, UK FII does not exhibit a significant causal relationship (p-value = 0.2), implying that investments from the UK do not meaningfully contribute to predicting Indian FII trends. This could be due to different market dynamics, investment strategies, or lower capital flow volumes compared to China and the USA. Overall, the findings highlight the dominant role of China and USA FIIs in shaping India's financial markets, reinforcing the strong interconnection between these economies and India's capital market movements.

Conclusion

The research findings reveal a strong relationship between Foreign Institutional Investments (FII) and Indian stock market volatility, with significant spillover effects from global financial markets. The Volatility Spillover Index highlights that China and USA FIIs contribute substantially to volatility transmission in Indian equities, particularly in Nifty 50 and Sensex. The USA FII exhibits the highest self-contained volatility (40%), yet it strongly influences other markets, indicating that fluctuations in US investments play a crucial role in shaping market movements. Similarly, China FII transmits 30% of its volatility to Nifty 50, further emphasizing its impact on Indian stock market trends.

The correlation analysis reinforces this dependency, showing that USA FII has the highest correlation with Nifty 50 (0.7) and Sensex (0.8), followed by China FII (0.6, 0.5). This suggests that Indian equities are highly sensitive to changes in investment patterns from these two economies. The Granger causality test confirms that China and USA FIIs significantly influence Indian FII movements (p-value = 0.0), while UK FII does not (p-value = 0.2). This indicates that market trends in China and the USA serve as key predictors of capital flows into India, while UK-based investments have a relatively weaker linkage. These findings underscore the interconnected nature of financial markets, suggesting that policymakers and investors should closely monitor US and Chinese market trends to anticipate capital inflows and volatility in the Indian stock market.

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PRODUCTIVE EFFICIENCY OF PRIVATE SECTOR AND PUBLIC SECTOR BANKS IN INDIA

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Abstract

This research evaluates the efficiency of Indian banks, focusing on the utilization of resources such as loans, deposits, employees, and branch networks. The banking sector, integral to economic development, requires efficient resource management to optimize performance, minimize costs, and meet customer demands. Using Data Envelopment Analysis (DEA), a non-parametric technique, the study compares the efficiency of 12 public-sector banks and 20 private-sector banks over a five-year period. DEA's ability to assess multiple inputs and outputs simultaneously makes it ideal for evaluating banking operations, identifying best-practice performers, and revealing areas for improvement. By generating efficiency scores, this research provides a detailed understanding of how banks can enhance their operational effectiveness, improve resource allocation, and increase profitability. The findings aim to offer insights for banking professionals, policymakers, and regulators to foster long-term growth and sustainability within India's banking sector. While the study does not directly compare public and private sector banks, it provides valuable insights into overall banking performance. In an environment increasingly influenced by technological advances and regulatory changes, this research will contribute to improving the efficiency and competitiveness of Indian banks, ensuring their role in fostering economic stability and growth.

Key words: Data Envelopment Analysis (DEA), Banking Efficiency, Public Sector Banks, Private Sector Banks, Resource Utilization

1.Introduction

The banking sector plays a crucial role in the economic development of any country, and India is no exception. With a diverse range of banking institutions, including public and private sector banks, the efficiency of these banks is essential for maintaining financial stability, fostering economic growth, and improving customer services. Banks are integral in channeling savings into productive investments, and their efficiency in managing resources such as loans, deposits, employees, and branch networks significantly impacts their financial performance and sustainability. Efficiency, in the context of banking, refers to the ability of banks to maximize output (e.g., loans and deposits) while minimizing input (e.g., labor, capital, and physical infrastructure). The effective management of resources is essential for maintaining competitive advantage, optimizing operational costs, and improving profitability. Given the complexities of banking operations, understanding and evaluating this efficiency is critical for ensuring that banks can meet the evolving demands of their customers and the broader economy.

This research aims to evaluate the product efficiency of Indian banks by analyzing key performance indicators (KPIs), such as loan growth, deposit accumulation, employee productivity, and branch network expansion. The study includes data from 12 public-sector banks and 20 private-sector banks over a five-year period, providing a comprehensive view of how efficiently these institutions utilize their resources. To assess this efficiency, the study uses the Data Envelopment Analysis (DEA) method, a robust non-parametric technique widely used in performance evaluation. DEA is particularly suited for this type of analysis as it allows for the assessment of the relative efficiency of decision-making units (in this case, banks) without making assumptions about the functional form of the production process. DEA compares the performance of each bank relative to others in the sample, identifying best-practice performers and highlighting areas where less efficient banks can improve.

Through DEA, the study will generate efficiency scores for each bank, enabling an in-depth evaluation of their resource utilization and operational effectiveness. The method's ability to handle multiple inputs and outputs simultaneously is key in understanding how various factors, such as branch size, number of employees, loan disbursement, and deposit growth, interact and contribute to a bank's overall efficiency. DEA also helps identify the "efficient frontier" a benchmark that other banks can aspire to, highlighting the most efficient institutions in the sector. The goal of this research is to provide insights into the product efficiency of Indian banks, uncovering patterns in resource utilization that may offer valuable guidance for improving their performance. While the study does not directly compare public and private sector banks, it aims to provide an understanding of how well these banks, in general, manage their resources. The findings will have implications for banking professionals, policymakers, and regulators looking to enhance the operational efficiency of Indian banks and improve the overall effectiveness of the banking sector.

2. Literature Review

(Gupta, Doshit, & Chinubhai, 2008) analyzed the performance of the Indian banking sector using Data Envelopment Analysis (DEA). The study revealed that the State Bank of India (SBI) and its group had the highest efficiency, followed by private banks, and then other nationalized banks.

(Haralayya & Aithal, 2021) examined the productive efficiency of financial institutions. The study emphasized the importance of considering both working and financing inefficiencies as components of productive inefficiency.

(Arora & Verma, 2007) studied the relative efficiency of public sector banks in India using the Average Compounding Growth Rate (ACGR) method. The study found that the performance of public sector banks significantly improved after the liberalization process.

(Bhattacharyya, Lovell, & Sahay, 1997) examined the productive efficiency of Indian commercial banks during the early stages of liberalization. The study found that publicly-owned Indian banks were the most efficient, followed by foreign-owned banks and privately-owned Indian banks.

(George, 2016) compared the productive efficiency and service quality of foreign and private banks in India. The study concluded that while efficiency and service quality were crucial, they did not necessarily result in superior profitability.

(Sathye, 2003) measured the productive efficiency of banks in India using Data Envelopment Analysis (DEA). The study found that foreign banks were the most efficient, followed by private banks and public sector banks.

(Mohan, Khan , & Janjua, 2005) examined the impact of reforms on the productivity and efficiency of Indian banks. The study revealed that reforms led to significant improvements in both efficiency and productivity.

(Sahoo, 2007) evaluated the productive performance of Indian banks using Data Envelopment Analysis (DEA). The study found that average annual trends in technical efficiency for all ownership groups indicated positive outcomes from the reform process.

(ketkar, Noulas, & Agarwal, 2003) analyzed the relative efficiency of Indian state-controlled, nationalized, private, and foreign banks. The study found that foreign banks were the most efficient, followed by private banks and public sector banks.

(Kumar & Gulati, 2009) appraised the efficiency, effectiveness, and performance of Indian public sector banks using Data Envelopment Analysis (DEA). The study found that high efficiency did not always correlate with high effectiveness.

(Sharma, Sharma, & Barua, 2013) reviewed literature on the efficiency and productivity of the banking sector. The study highlighted the importance of using both parametric and non-parametric frontier techniques.

(Dash & Charles, 2009) investigated the technical efficiency of Indian banks using Data Envelopment Analysis (DEA). The study found that partially privatized banks had higher efficiency scores than fully public banks.

(Mohan & Ray, 2004) compared the productivity growth and efficiency of public, private, and foreign banks in India. The study found that public sector banks were not necessarily less efficient than private sector banks.

(Das & Kumbhakar, 2012)examined the productivity and efficiency dynamics of Indian banks using an input distance function approach. The study revealed that banks improved their efficiency during the post-deregulation period.

(Fujii, Managi, & Matousek, 2014) explored the technical efficiency and productivity growth of Indian banks. The study incorporated undesirable outputs in their analysis, which affected the overall performance evaluation.

3.Methodology

DEA (Data Envelopment Analysis) originates from the work of Edward Rhodes who was pursuing a doctorate at Mellon University's School of Urban and Public Affairs (now the H.J.Heinz III School of Public Policy and Management). Charnes, Cooper and Rhodes (1978) proposed the DEA model as a non-parametric technique for measuring the relative efficiency of a set of decision-making units (DMUs) in a public sector, or a set of firms in an industry.

DEA is a specific methodology for analysis of the relative efficiency for multiple inputs and outputs by evaluation of all decision-making units (DMUs) and measurement of their performance in respect to the best practice banks, which determine the efficient frontier. The most important advantage of DEA is that it does not require in advance assumptions about the production function's analytical form. At the same time like the rest of the models, DEA also has some disadvantages. First, it is sensitive to extreme observations, and second, it does not decompose the banks deviation from the efficient production frontier into inefficiency and random error components.

The productive efficiency approach was used to calculate the efficiency of Indian banks, which measures the ability of banks to produce maximum output from a given set of inputs. The branches and employees were used as inputs.

The data for this study was collected from the balance sheets of 32 Indian banks, comprising 12 public sector banks and 20 private sector banks, for the period 2020-2024. The data variables used in this study included:

- Inputs: Branches, Employees

- Outputs: Deposits, Loans

The sample size for this study consisted of 32 Indian banks, selected using the purposive sampling technique. The reliability of the data was checked using descriptive statistics and data visualization techniques. The validity of the DEA model was checked using sensitivity analysis and robustness checks.

4. Data Analysis and Interpretation

Step 1: Prepare Input and Output Matrices

Prepare the input matrix (input matrix) with dimensions (num dmus, num inputs), where num dmus is the number of Decision-Making Units (DMUs) and num_inputs is the number of inputs.

Prepare the output matrix (output_matrix) with dimensions (num dmus, num outputs), where num outputs is the number of outputs.

Step 2: Define Variables and Objective

Define the variables u and v using CVXPY, where u represents the weights for outputs and v represents the weights for inputs.

-Define the objective function to maximize the weighted outputs of the current DMU.

Step 3: Define Constraints

Define the constraints for the DEA problem, including:

Normalizing inputs: Weighted sum of inputs for the current DMU should be 1.

Efficiency of all DMUs <= 1.

Step 4: Solve the Problem

Create a CVXPY problem object with the defined objective and constraints.

Solve the problem using the SCS solver (or optionally ECOS).

Step 5: Calculate Efficiency Score

Calculate the efficiency score for the current DMU using the formula: efficiency score = problem value.

Store the efficiency score in the efficiency scores list.

DMU	Efficiency score				
	2020	2021	2022	2023	2024
BANK OF BARODA	0.842537	0.835238	0.876858	0. 898098	0.900493
BANK OF INDIA	0.846808	0.813217	0.802866	0.686121	0.693268
BANK OF MAHARASHTRA	0.869749	0.884477	0.918402	0.972706	0.947732
CANARA BANK	0.804777	0.764692	0.771647	0.739852	0.75041
CENTRAL BANK OF INDIA	0.685585	0.680969	0.722819	0.622562	0.575535
INDIAN OVERSEAS BANK	0.66096	0.680032	0.712725	0.630748	0.629089
PUNJAB AND SIND BANK	0.729356	0.726145	0.730018	0.669367	0.64595
STATE BANK OF INDIA	1	1	1	1	1
UCO BANK	0.630774	0.624251	0.63203	0.612669	0.579488
UNION BANK OF INDIA	0.904936	0.788287	0.815066	0.788318	0. 760816
PUNJAB NATIONAL BANK	0.776542	0.725189	0.711669	0.656022	0. 632367
INDIAN BANK	1	0.871567	0.896933	0.812223	0. 807672
AXIS BANK	0.871577	0.824352	0. 823149	0.923677	0.753067
BANDHAN BANK	0.355275	0.352238	0. 366193	0. 362776	0. 292017
CSB BANK	0.364361	0.33122	0. 296697	0.222543	0. 194101
CITY UNION BANK	0.585951	0.590863	0. 655890	0.52733	0.397213
DCB BANK	0.442837	0. 423869	0. 368519	0.401052	0. 409983
DHANLAXMI BANK	0.463046	0.471942	0.45074	0.402861	0.400504
FEDERAL BANK	1	1	1	0.955685	0. 863319
HDFC BANK	1	1	1	1	1
ICIC BANK	0.751835	0.806902	0. 863099	0. 859673	0. 828193
INDUSLND BANK	0.759852	0.728428	0. 683590	0.675315	0. 556589
IDFC FIRST BANK	1	0.835174	0.851883	0.916834	0. 780156

JAMMU AND KASHMIR BANK	0. 669627	0.633997	0.63236	0.597363	0. 593980
KARNATAKA BANK	0.687805	0.609636	0.594131	0.538385	0.520204
IDBI BANK	0.948103	0.889652	0.878941	0.763147	0.690051
RBL BANK	0.927409	0.785868	0.75448	0. 696254	0.712798
SOUTH INDIAN BANK	0.763899	0.686755	0.595269	0.533115	0.497723
TAMILNAD MERCANTILE BANK	0.646295	0.681627	0.658706	0. 610230	0. 541486
YES BANK	0.870974	0.792283	0.765817	0.833257	0.812585
KOTAK MAHINDRA BANK	0.77529	0.733527	0.78269	0. 878061	0.926095
KARURVYSYA BANK	0.59857	0.62081	0.713862	0.599485	0.595065

Based on the efficiency scores for Indian banks from 2020 to 2024, here are the findings from the research on the productive efficiency of these banks:

Top Performers:

State Bank of India, Indian Bank, Federal Bank, HDFC Bank, and IDFC First Bank emerged as the top performers, consistently showcasing exceptional efficiency scores ranging from 0.9 to 1 throughout the 2020-2024 period. These banks demonstrated outstanding operational excellence, successfully optimizing their resources to achieve maximum output. Their impressive performance sets a benchmark for the industry, highlighting the importance of strategic planning, effective management, and innovative practices in driving banking excellence.

Bottom performers:

Bandhan Bank, CSB Bank, and City Union Bank lagged behind as the bottom performers, with efficiency scores ranging from 0.2 to 0.4 throughout the 2020-2024 period. These banks struggled to optimize their resources, resulting in subpar performance and a significant gap with their industry peers. To regain competitiveness, these banks must reassess their operational strategies, address inefficiencies, and invest in innovative technologies to drive growth and improvement.

5.Conclusion

This study examines the productive efficiency of Indian banks from 2020 to 2024 using Data Envelopment Analysis (DEA), a widely used non-parametric method for performance evaluation. By analyzing key inputs such as branches and employees and outputs like deposits and loans, the research provides a comprehensive understanding of how well banks utilize their resources. The findings reveal considerable differences in efficiency levels among banks, highlighting both high-performing institutions and those struggling with inefficiencies.

Top-performing banks, including State Bank of India, Indian Bank, Federal Bank, HDFC Bank, and IDFC First Bank, consistently maintained high efficiency scores, showcasing strong operational management, strategic planning, and effective use of technological advancements. These banks successfully optimized their resources to maximize output, setting benchmarks for the industry. On the other hand, lower-performing banks such as Bandhan Bank, CSB Bank, and City Union Bank exhibited low efficiency scores, indicating challenges in resource utilization and the need for structural improvements.

The study underscores the importance of banking efficiency in ensuring profitability, competitiveness, and long-term financial stability. Banks that lag in efficiency must focus on better operational strategies, workforce management, and investments in digital transformation to improve performance. These insights are valuable for banking professionals, policymakers, and regulators in designing strategies that enhance efficiency and drive sustainable growth in India’s banking sector.

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Financial Literacy and Risk Tolerance's Impact on Financial Decisions Due to Behavioural Biases

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Abstract

This study explores the complex factors influencing personal financial decision-making, focusing on financial literacy, risk tolerance, and behavioural biases. It examines how these elements shape decisions and highlights the importance of understanding psychological biases, such as overconfidence and loss aversion, which often lead individuals to make suboptimal financial choices. The study also emphasizes the role of financial literacy in improving decision-making, as individuals with a stronger grasp of financial concepts are better equipped to manage risks and plan for the future. Through a survey conducted in the districts of Ernakulam and Thrissur, the research investigates how demographic factors, including age, income, and employment status, impact financial decisions. Findings reveal that while financial literacy and risk tolerance significantly influence decision-making, biases like loss aversion and media exposure also play crucial roles. The results underscore the need for tailored financial literacy programs that address the psychological and educational aspects of financial decision-making. Overall, the study contributes to a better understanding of how these factors interact, providing valuable insights for individuals and policymakers aiming to foster sound financial behaviours.

Keywords

Financial literacy, risk tolerance, behavioural biases, financial decision-making, loss aversion, overconfidence, media influence, demographic factors, Ernakulam, Thrissur.

Introduction

When it comes to managing personal finances, decisions about saving, investing, and spending aren't always based purely on logic. Instead, they're shaped by a combination of factors like our individual tolerance for risk, how much we understand financial concepts, and the psychological biases that influence how we think about money. These factors play a significant role not only for individuals trying to reach their financial goals but also for policymakers seeking to ensure broader economic stability (Lusardi & Mitchell, 2014).

Behavioural biases are one of the main reasons why people often make decisions that go against their own best interests. These biases, rooted in psychology rather than economics, can lead us to make less-than-optimal choices. For instance, overconfidence might cause someone to overestimate their ability to predict market movements, while loss aversion could make a person reluctant to sell losing investments even when it would be wiser to do so (Kahneman & Tversky, 1979). These biases are natural but can cloud our judgment, leading us to hold on to poor investments or make rash financial decisions without fully considering the risks.

Financial literacy also plays a crucial role in how we make financial decisions. The more we understand concepts like budgeting, investing, and risk, the better equipped we are to spot our own biases and make smarter choices. Financially literate individuals are able to make more informed decisions, evaluate risks effectively, and plan for the future with greater confidence (Lusardi & Mitchell, 2011). Similarly, understanding one's risk tolerance—the willingness to accept risk in pursuit of higher returns—helps individuals create investment strategies that align with their comfort levels and financial goals (Grable & Joo, 2004). With the right knowledge, we can navigate the psychological challenges of financial decision-making and work toward a secure financial future.

Statement of the Problem

The study investigates how risk tolerance, financial literacy, and behavioural biases influence on financial decisions. Behavioural biases can cause decisions to diverge from reason, such as overconfidence and loss aversion. Understanding financial concepts and practicing financial literacy can help reduce these prejudices. For the purpose of creating individualized financial plans, risk tolerance—which is influenced by variables such as age, income, and personal attitudes—is essential. Studies that examine these processes in a variety of demographic and cultural situations are few, and existing research frequently concentrates on individual components.

Therefore, this study will assist in determining how behavioural economics ideas, risk tolerance and financial literacy affect the process of financial decision-making in the districts of Ernakulam and Thrissur.

Objectives of the Study

1. To determine the degree to which variations in financial literacy skills.
2. To describe observed differences in people's actions during the financial decision-making process.
3. To look at how much a person's risk tolerance affects the way they behave while making judgments about investments.
4. To investigate how behavioral biases like anchoring, loss aversion, and overconfidence affect people's financial decisions.

Hypothesis of the Study

H1: Variations in financial literacy significantly influence individuals' behavioural biases (over confidence, loss aversion, herd mentality, mental accounting, confirmation and presentation biases) during decision-making processes.

H2: Variations in financial literacy significantly influence individual's financial decisions.

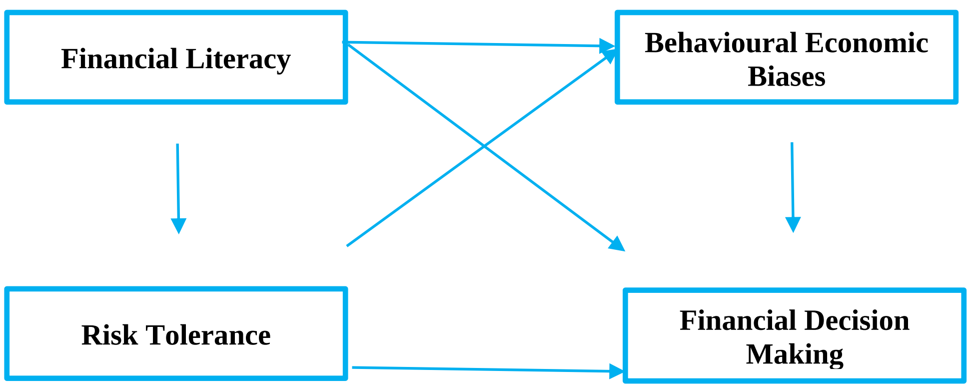
H3: Variations in risk tolerance have a major impact on how people apply behavioural biases (over confidence, loss aversion, herd mentality, mental accounting, confirmation and presentation biases) to their financial decision- making.

H4: Variations in risk tolerance have a major influence to their financial decision-making.

H5: Financial literacy has a significant and positive relationship with risk tolerance.

H6: Behavioural biases have a significant influence on an individuals' financial decision making

Hypothetical Model of the Study



Research Methodology

For this study, we use a descriptive and analytical approach to better understand patterns in financial behaviour. Our focus is on how behavioural biases, financial literacy, and risk tolerance come together to influence financial decision-making. By exploring these connections, we aim to uncover the factors that guide how people handle their personal finances.

To gather primary data, we created a structured questionnaire and distributed it through Google Forms. This method allows for standardized data collection, ensuring that we capture responses in a consistent way. The questionnaire includes a variety of question types, like multiple-choice, linear scales, and close-ended questions, to make it easy for participants to respond and for us to analyse. Once the data is collected, we will use statistical tools like SPSS to perform regression and correlation analysis, which will help us explore the relationships between the different factors at play in financial decision-making.

In addition to the primary data, we also draw on secondary data from credible scholarly articles, reports, and other published sources. This secondary information helps provide a broader context for the study and supports our analysis of the research objectives. By combining both primary and secondary data, we aim to get a fuller picture of what drives financial behaviours.

The study focuses on individuals aged 18 and older in the districts of Thrissur and Ernakulam. We chose a sample of 105 respondents through convenience sampling, allowing us to easily reach participants who are accessible and willing to contribute. With this sample, we will dive into the data, using regression and correlation analyses to understand how financial literacy, risk tolerance, and behavioural biases shape financial decisions.

Hypothesis Testing

Table 1.1-1.5 Analysis the influence of financial literacy in the behavioural biases.
H0: There is no significant influence of financial literacy in the behaviour biases.
H1: Behaviour biases are significantly influenced by the financial literacy.

Table 1.1 Analysis the influence of financial literacy in the overconfidence biases of behavioural biases.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.248[a]	.062	.052	1.675

a. Predictors: (Constant), FL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.958	1	18.958	6.759	.011[b]
	Residual	288.889	103	2.805		
	Total	307.848	104			

a. Dependent Variable: BP1

b. Predictors: (Constant), FL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	6.024	.763		7.896	<.001	4.511	7.537
	FL	.170	.065	.248	2.600	.011	.040	.299

a. Dependent Variable: BP1

Table 1.2 Analysis the influence of financial literacy in the herd mentality biases of behavioural biases.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.188[a]	.035	.026	.68198

a. Predictors: (Constant), FL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.761	1	1.761	3.787	.054[b]
	Residual	47.904	103	.465		
	Total	49.666	104			

a. Dependent Variable: BP2

b. Predictors: (Constant), FL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.183	.322		6.778	<.001	1.545	2.822
	FL	.211	.109	.188	1.946	.054	-.004	.427

a. Dependent Variable: BP2

Table 1.3 Analysis the influence of financial literacy in the loss aversion biases of behavioural.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.266[a]	.071	.062	.55912

a. Predictors: (Constant), FL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.450	1	2.450	7.838	.006[b]
	Residual	32.199	103	.313		
	Total	34.650	104			

a. Dependent Variable: BP3

b. Predictors: (Constant), FL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.089	.264		7.911	<.001	1.565	2.613
	FL	.249	.089	.266	2.800	.006	.073	.426

a. Dependent Variable: BP3

Table 1.4 Analysis the influence of financial literacy in the mental accounting biases of behavioural.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.224[a]	.050	.041	.60144

a. Predictors: (Constant), FL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.970	1	1.970	5.445	.022[b]
	Residual	37.258	103	.362		
	Total	39.228	104			

a. Dependent Variable: BP4

b. Predictors: (Constant), FL

Table 1.5 Analysis the influence of financial literacy in the anchoring and confirmation biases.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.088[a]	.008	-.002	.44114

a. Predictors: (Constant), FL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.155	1	.155	.798	.374[b]
	Residual	20.045	103	.195		
	Total	20.200	104			

a. Dependent Variable: BP5

b. Predictors: (Constant), FL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.097	.284		7.383	<.001	1.534	2.661
	FL	.223	.096	.224	2.333	.022	.034	.413

a. Dependent Variable: BP4

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.718	.208		13.043	<.001	2.305	3.131
	FL	.063	.070	.088	.893	.374	-.077	.202

a. Dependent Variable: BP5

Interpretation:

The tables 1.1–1.5 clearly demonstrate the impact of the financial literacy on people's behavioural biases, including mental accounting, loss aversion, overconfidence, herd mentality, anchoring, and confirmation. And the findings demonstrate that all biases—aside anchoring and confirmation biases will make any significant impact by the financial literacy of the individuals so, accepting alternative hypothesis that financial literacy play a vital role on the behaviour biases of the individuals

Table 2.1-2.5 Analysis the influence of risk tolerance in the behavioural biases.

H0: There is no significant influence of the risk tolerance over the behavioural biases of an individuals.

H1: The behavioural biases of an individuals are significantly influenced by the risk tolerance.

Table 2.1 Analysis the influence of risk tolerance in the over confidence biases of behaviour.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound
1	(Constant)	6.435	.767		8.385	<.001	4.913	7.957
	RT	.171	.084	.197	2.037	.044	.005	.338

a. Dependent Variable: BP1

Table 2.2 Analysis the influence of risk tolerance in the herd mentality biases of behavioural economics.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.154[a]	.024	.014	1.659

a. Predictors: (Constant), RT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.532	1	41.532	14.882	<.001[b]
	Residual	287.458	103	2.791		
	Total	328.990	104			

a. Dependent Variable: BP2

b. Predictors: (Constant), RT

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound
1	(Constant)	4.160	.756		5.500	<.001	2.660	5.660
	RT	.319	.083	.355	3.858	<.001	.155	.483

a. Dependent Variable: BP2

Table 2.3 Analysis the influence of risk tolerance in the loss aversion principle of behavioural economics.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.213[a]	.045	.036	.56672

a. Predictors: (Constant), RT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.569	1	1.569	4.886	.029[b]
	Residual	33.080	103	.321		
	Total	34.650	104			

a. Dependent Variable: BP3

b. Predictors: (Constant), RT

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound
1	(Constant)	2.183	.290		7.520	<.001	1.607	2.759
	RT	.214	.097	.213	2.210	.029	.022	.405

a. Dependent Variable: BP3

Table 2.4 Analysis the influence of risk tolerance in the mental accounting principle of behavioural economics.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.313[a]	.098	.089	1.788

a. Predictors: (Constant), RT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.850	1	35.850	11.217	.001[b]
	Residual	329.198	103	3.196		
	Total	365.048	104			

a. Dependent Variable: BP4

b. Predictors: (Constant), RT

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound
1	(Constant)	4.450	.851		5.232	<.001	2.763	6.137
	RT	.310	.093	.313	3.349	.001	.127	.494

a. Dependent Variable: BP4

Table 2.5 Analysis the influence of risk tolerance in the anchoring and confirmation principle of behavioural economics.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.346[a]	.120	.111	.41397

a. Predictors: (Constant), RT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.406	1	2.406	14.037	<.001[b]
	Residual	17.652	103	.171		
	Total	20.057	104			

a. Dependent Variable: BP5

b. Predictors: (Constant), RT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.263	.212		10.673	<.001	1.843	2.684
	RT	.264	.071	.346	3.747	<.001	.124	.404

a. Dependent Variable: BP5

Interpretation

The tables 2.1–2.5 clearly demonstrate the impact of the risk tolerance on people's behavioural biases, including mental accounting, loss aversion, overconfidence, herd mentality, anchoring, and confirmation. And the findings demonstrate that biases are significantly influenced by the risk tolerance capacity of the individuals so, accepting null hypothesis that the behaviour of an individuals are highly influenced by the risk tolerance capacity.

Tables 3.1 - 3.5 Analysis the influence of behavioural basis in the financial decision making.

H0: Financial decisions of the individuals are not influenced by their behaviour variations.

H1: Financial decision of the individuals is significantly influenced at the time decision making.

Table 3.1 Analysis the influence of overconfidence biases in the financial decision making.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.402[a]	.161	.153	2.233

a. Predictors: (Constant), BP1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	98.865	1	98.865	19.821	<.001[b]
	Residual	513.764	103	4.988		
	Total	612.629	104			

a. Dependent Variable: FD

b. Predictors: (Constant), BP1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.602	1.037		3.475	<.001	1.546	5.658
	BP1	.567	.127	.402	4.452	<.001	.314	.819

a. Dependent Variable: FD

Table 3.2 analysis the influence of herd mentality biases in financial decision making of the respondents.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.443[a]	.196	.188	2.186

a. Predictors: (Constant), BP2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	120.233	1	120.233	25.151	<.001[b]
	Residual	492.396	103	4.781		
	Total	612.629	104			

a. Dependent Variable: FD

b. Predictors: (Constant), BP2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.877	.871		4.449	<.001	2.148	5.605
	BP2	.605	.121	.443	5.015	<.001	.365	.844

a. Dependent Variable: FD

Table 3.3 analysis the influence of loss aversion biases in financial decision making of the respondents.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.287[a]	.082	.073	2.336

a. Predictors: (Constant), BP3

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.429	1	50.429	9.239	.003[b]
	Residual	562.200	103	5.458		
	Total	612.629	104			

a. Dependent Variable: FD

b. Predictors: (Constant), BP3

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound
1	(Constant)	5.592	.861		6.498	<.001	3.885	7.299
	BP3	.355	.117	.287	3.040	.003	.124	.587

a. Dependent Variable: FD

Table 3.4 analysis the influence of mental accounting biases in financial decision making of the respondents.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.265[a]	.070	.061	2.352

a. Predictors: (Constant), BP4

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.868	1	42.868	7.750	.006[b]
	Residual	569.761	103	5.532		
	Total	612.629	104			

a. Dependent Variable: FD

b. Predictors: (Constant), BP4

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound
1	(Constant)	5.371	1.012		5.307	<.001	3.364	7.378
	BP4	.359	.129	.265	2.784	.006	.103	.615

a. Dependent Variable: FD

Table 3.5 analysis the influence of anchoring and confirmation biases in financial decision making of the respondents.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.252[a]	.063	.054	.70407

a. Predictors: (Constant), BP5

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.456	1	3.456	6.972	.010[b]
	Residual	51.058	103	.496		
	Total	54.514	104			

a. Dependent Variable: FD

b. Predictors: (Constant), BP5

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.512	.528		2.861	.005	.464	2.560
	BP5	.458	.174	.252	2.640	.010	.114	.802

a. Dependent Variable: FD

Interpretation

The tables 3.1–3.5 clearly demonstrate the impact of behavioural biases on people's financial decision-making, including mental accounting, loss aversion, overconfidence, herd mentality, anchoring, and confirmation. And the findings demonstrate that all biases are significantly influence on people's financial decisions making.so, accepting the alternative hypothesis that financial decisions of the individuals are significant influence by their behavioural biases effectively.

Table 4.1 analysis the influence of financial literacy in financial decision making of the respondents.

H0: There is no significant influence of the financial literacy over the financial decision making.

H1: There is a significant influence of the financial literacy over the financial decision making of the individuals.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.274[a]	.075	.066	.70909

a. Predictors: (Constant), FL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.206	1	4.206	8.365	.005[b]
	Residual	51.790	103	.503		
	Total	55.996	104			

a. Dependent Variable: FD

b. Predictors: (Constant), FL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.935	.335		5.776	<.001	1.270	2.599
	FL	.327	.113	.274	2.892	.005	.103	.551

a. Dependent Variable: FD

Interpretation

Table 4.1 Shows the regression analysis on the influence of financial literacy in financial decisions. Here, calculated value .005 is less than the table value 0.05. So, we accept alternative hypothesis that there is a significant influence **of** financial literacy over financial decisions among individuals.

Table 4.2 analysis the influence of risk tolerance in financial decision making of the respondents.

H0: There is no significant influence of the risk tolerance over the financial decision making.

H1: There is a significant influence of the risk tolerance over the financial decision making of the individuals.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.501[a]	.251	.244	.62965

a. Predictors: (Constant), RT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.679	1	13.679	34.502	<.001[b]
	Residual	40.836	103	.396		
	Total	54.514	104			

a. Dependent Variable: FD

b. Predictors: (Constant), RT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.036	.322		3.212	.002	.396	1.675
	RT	.630	.107	.501	5.874	<.001	.418	.843

a. Dependent Variable: FD

Interpretation:

Table 4.2 Shows the regression analysis on the influence of risk tolerance in financial decisions. Here, calculated value .001 is less than the table value 0.05. So, we accept alternative hypothesis that there is a significant influence of financial literacy over financial decisions among individuals.

Table 4.3 analysis the relationship between financial literacy and risk tolerance of the respondents.

H0: Financial literacy and risk tolerance are not correlated with each other.

H1: Financial literacy and risk tolerance are positively correlated with each **other.**

Correlations

		RT	FL
RT	Pearson Correlation	1	.126
	Sig. (2-tailed)		.201
	N	105	105
FL	Pearson Correlation	.126	1
	Sig. (2-tailed)	.201	
	N	105	105

Interpretation:

Table 4.3 Shows the correlation analysis the relationship between risk tolerance and financial literacy. Here, calculated value .126 is between the 0-1. So, we accept null hypothesis that risk tolerance and financial literacy in financial decisions among individuals are have a minor correlation**.**

Results and Discussions

The analysis of the survey results provides insightful perspectives on the factors influencing financial decision-making, with a specific focus on financial literacy, risk tolerance, and behavioural biases. One of the key findings from the demographic data reveals that a larger proportion of respondents are female, and a notable number of males are also actively involved in financial decision-making. This highlights the increasing participation of both genders in financial matters and underscores the need for inclusive financial literacy programs that cater to both male and female decision-makers.

Age-wise, the respondents from the age group of 35–42 make up the largest share, followed closely by the 18–26 and 27–34 age groups. This wide distribution suggests that financial decision-making spans various life stages, with respondents from mid-career phases (35–42 years) contributing significantly to the financial landscape. The presence of younger individuals (18–26) also indicates an early engagement with financial decisions, which is crucial for developing good financial habits from an early age. As these trends are seen across various age groups, policymakers and financial educators should focus on addressing the unique financial challenges and opportunities presented at different life stages.

Further demographic analysis shows a diverse professional landscape, with a majority of respondents employed in formal sectors, followed by those in business and farming. This employment distribution suggests that individuals in formal employment may tend to make more cautious and planned financial decisions, while those in business or farming might have different risk profiles due to the nature of their work. A significant proportion of respondents believe that their past experiences heavily influence their current financial decisions, emphasizing the role of financial education and prior financial exposure in shaping long-term financial behaviour. This finding aligns with the importance of fostering continuous financial learning to improve decision-making across different professions.

Regarding income, a large proportion of respondents earn between 50,000 to 100,000, indicating a middle-income demographic. This distribution reflects the broader population's income levels and suggests that financial literacy programs and decision-making strategies should be tailored to the middle-income group, who are more likely to deal with financial challenges like savings, investments, and debt management. Additionally, the survey found that a majority of respondents seek professional advice occasionally, reinforcing the importance of trusted financial guidance in decision-making processes. However, the relatively small proportion of individuals who never consult experts suggests a gap that could be filled by increasing access to affordable financial consulting services.

The survey also reveals insightful findings about the respondents' risk tolerance and behavioural biases. A significant portion favours taking natural risks, while others prefer calculated risks or follow set guidelines. This reflects a well-rounded approach to risk-taking, suggesting that respondents recognize the need for flexibility in managing financial risk. However, the substantial percentage of respondents who express uncertainty in their risk preferences indicates a potential area for further study to better understand how individuals perceive and manage financial risks. Additionally, loss aversion, a key behavioural bias, is shown to strongly influence decision-making, with many respondents holding onto their investments rather than cutting losses. This aligns with the concept that people are generally more motivated to avoid losses than to seek gains.

The role of media in influencing financial decisions is also notable, as many respondents agree that media impacts their choices. This underscores the importance of media literacy in financial education, as the media can have both positive and negative effects on financial decision-making. Furthermore, the data reflects diverse opinions about cognitive biases, with many respondents remaining neutral about their influence on decisions. The presence of biases like overconfidence and mental accounting shows that, while financial decisions are often based on rational thought, they are significantly shaped by psychological factors.

The regression and correlation analyses further confirm the significant influence of financial literacy and risk tolerance on financial decision-making. The results from Table 4.1 demonstrate that financial literacy has a statistically significant impact on individuals' financial decisions. Similarly, Table 4.2 confirms that risk tolerance also plays a significant role in shaping financial decisions. However, the correlation analysis between risk tolerance and financial literacy (Table 4.3) reveals only a minor correlation, suggesting that while both factors are important, their direct relationship may not be as strong as previously expected.

Conclusion

his study provides valuable insights into the complex interplay of financial literacy, risk tolerance, and behavioural biases in shaping financial decisions. It underscores the need for targeted educational interventions that address the various factors influencing decision-making, especially in a middle-income population. The findings emphasize that both financial literacy and risk tolerance significantly affect how individuals approach financial decisions, while behavioural biases like loss aversion also play a crucial role. As financial markets continue to evolve, understanding these factors will be essential for both individuals and policymakers in fostering sound financial decision-making practices.

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SENTIMENT ANALYSIS USING VADER ALGORITHM FOR NIFTY 50 STOCK SELECTION

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Abstract

This study explores the role of sentiment analysis in financial markets, focusing on the Nifty 50 index. Sentiment analysis captures public sentiment from textual data, such as financial news and social media posts, which significantly influence stock prices and market trends. Traditional stock selection methods rely primarily on fundamental and technical analysis, often neglecting the impact of public mood and sentiment. By leveraging the VADER (Valence Aware Dictionary and Sentiment Reasoner) algorithm, this research assesses how sentiment scores correlate with stock movements and how sentiment-driven strategies enhance predictive accuracy. The findings provide a framework for integrating sentiment analysis into stock selection methodologies, offering a competitive advantage in volatile markets.

Keywords: Sentiment Analysis, VADER Algorithm, Nifty 50, Financial Markets, Stock Prediction

1. Introduction

1.1 Background

Sentiment analysis has become an essential tool in financial markets due to the increasing influence of digital platforms like financial news portals and social media on public opinion. The Nifty 50 index, representing India’s top 50 companies, is a robust benchmark for examining market sentiment’s impact on stock performance. Traditional methods like fundamental and technical analysis primarily focus on historical data, neglecting the sentiment-driven factors that influence short-term price movements.

1.2 Problem Statement

Investor sentiment plays a pivotal role in driving stock price dynamics, particularly in volatile markets. Traditional stock analysis fails to incorporate sentiment data effectively, creating a gap in predicting price movements accurately. By utilizing the VADER algorithm, a rule-based model optimized for analysing informal text data, this study bridges the gap, offering insights into the impact of sentiment on Nifty 50 stocks.

1.3 Research Questions

1. How effectively does the VADER algorithm capture and classify sentiment from financial news and broker tips related to Nifty 50 stocks?
2. How can sentiment analysis be used to identify optimal stock selections for investment decisions?

1.4 Objectives

1. Evaluate the VADER algorithm's effectiveness in analysing sentiment from financial news and social media.

2. To select the appropriate stock based on the sentimental score.

2. Literature Review

Chethan and Sangeetha (2020) explored the role of Twitter in shaping market sentiment, specifically its impact on the USD/INR exchange rate and the BSE Sensex. Using sentiment analysis in R, they categorized tweets into emotional responses such as trust, anticipation, joy, fear, and anger. Their findings suggested that positive sentiments, like trust and joy, correlated with upward market trends, while negative emotions such as fear and anger indicated downward movements.

Paramanik and Singhal (2020) investigated the influence of market sentiment on stock market volatility in India. Using sentiment analysis of news articles, they constructed sentiment indices and applied them to an asymmetric GARCH model. Their study showed that negative sentiment had a more pronounced effect on market volatility than positive sentiment, with implications for financial policy and regulation.

Nti, Adekoya, and Weyori (2020) examined how public sentiment from various sources like web news, Twitter, and forums could predict stock price movements on the Ghana Stock Exchange. By using Artificial Neural Networks (ANN), they demonstrated that combining sentiment from multiple platforms improved the accuracy of stock price predictions, with negative sentiment having a stronger impact on market behavior.

Paul, Varghese, K. P., and Suraj (2023) analyzed the effectiveness of the VADER sentiment analysis algorithm in developing investment strategies for the Indian stock market. By analyzing Sensex stocks, they showed that stocks with high positive sentiment, such as Asian Paints and Hindustan Unilever, were optimal for short-term investment.

Cristescu, Nerisanu, Mara, and Oprea (2022) explored the use of sentiment analysis in stock market prediction by incorporating financial news data. They showed that incorporating sentiment scores as exogenous factors enhanced the performance of regression models used to predict stock price movements, supporting previous findings that sentiment could improve predictive accuracy.

Sharaf, Hemdan, El-Sayed, and El-Bahnasawy (2023) presented a hybrid stock trend prediction system that combined machine learning and sentiment analysis techniques. Their research addressed the impact of COVID-19 on stock markets by using sentiment analysis of news articles and historical stock data to predict future trends for stocks like Tesla, Amazon, and Google. The system integrated machine learning classifiers like Random Forest and deep learning methods such as Stacked-LSTM, achieving high prediction accuracy during the pandemic period.

Nemes and Kiss (2021) focused on predicting stock value changes through sentiment analysis of economic news headlines. Their research demonstrated the significant effect of news headlines on stock prices, utilizing various sentiment analysis tools, including BERT, VADER, and Recurrent Neural Networks (RNN). They found that sentiment polarity was crucial for forecasting market shifts, with BERT and RNN models providing superior accuracy compared to other tools.

Hasselgren, Chrysoulas, Pitropakis, and Buchanan (2022) explored the use of social media sentiment data for guiding investment decisions. They emphasized that, over the past decade, research had shown promising results in predicting market performance based on social media metrics like tweets. Their study integrated social media sentiment analysis with market data and quantified user engagement metrics like likes and retweets to refine sentiment scoring.

Dash and Mishra (2022) provided a comprehensive survey on the use of sentiment analysis methods for predicting trends in the Indian stock market. They highlighted how machine learning techniques had improved sentiment analysis accuracy, surpassing traditional lexicon-based methods. The survey covered research from 2015 to 2021 and identified challenges related to implementing machine learning models, including the infrastructure needed for processing large datasets.

Fathali, Kodia, and Ben Said (2022) investigated the application of machine learning techniques for predicting the NIFTY 50 index in India. They focused on the impact of feature selection and hyperparameter optimization, demonstrating that LSTM models provided superior prediction accuracy compared to other methods like RNN and CNN. Their research underscored the importance of selecting appropriate features like high, low, open, and close prices for accurate stock market predictions.

2.1 Research Gaps

1. Limited application of VADER to Indian stock markets, such as the Nifty 50.
2. Challenges in real-time data analysis for actionable insights.

3. Theoretical Framework

This research is grounded in concepts from behavioural finance and computational sentiment analysis, focusing on how investor sentiment influences stock prices and market dynamics.

3.1 Behavioural Finance and Market Sentiment

Traditional stock selection relies on fundamental and technical analysis, often overlooking the psychological and emotional factors that influence investor decisions.

Behavioural finance highlights the role of:

- **Investor Sentiment**: Public mood, reflected in news and social media, can significantly impact short-term stock price movements.
- **Market Trends**: Positive sentiment often correlates with upward price movements, while negative sentiment can signal downturns.

3.2 Sentiment Analysis in Finance

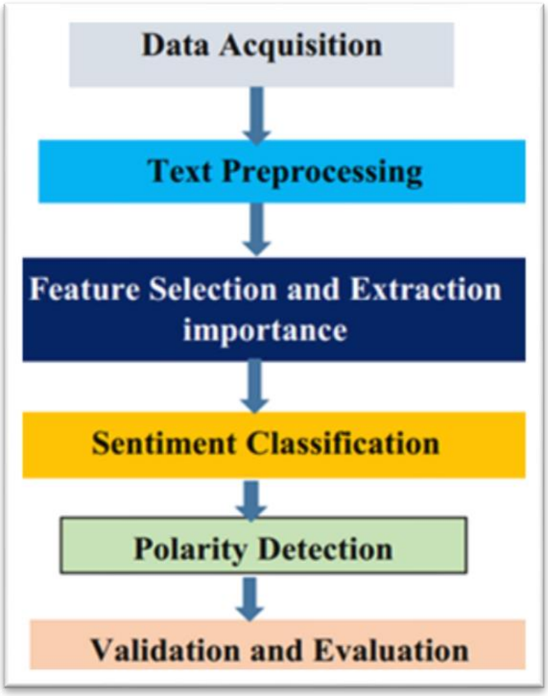
Sentiment analysis captures subjective information from textual data, offering insights into market trends. Its relevance lies in:

- **Predicting Short-Term Trends**: Sentiment scores can serve as indicators of market movements.
- **Enhancing Stock Selection**: Integrating sentiment with traditional analysis provides a more comprehensive view of market dynamics.

3.3 VADER Algorithm for Sentiment Analysis

The VADER algorithm, a rule-based sentiment analysis tool, is particularly suitable for analysing financial news and social media.

- **Key Features**:
    - Predefined lexicon optimized for short texts.
    - Compound sentiment scores that represent overall mood.
- **Customization**: By adding financial terms (e.g., *rally*, *crash*), VADER adapts to the specific context of financial markets.



This theoretical framework connects the behavioural aspects of financial markets with the technical capabilities of sentiment analysis, establishing the foundation for integrating VADER into stock selection methodologies.

4. Methodology

4.1 Data Collection

- **Source**: Financial news data from *Business Standard* and social media posts.
- **Tools**: Selenium for web automation and BeautifulSoup for HTML parsing.
- **Process**: Articles related to Nifty 50 stocks were extracted, including titles, summaries, and publication dates.

```
import requests
from bs4 import BeautifulSoup
from selenium import webdriver
from selenium.webdriver.chrome.service import Service
from selenium.webdriver.chrome.options import Options
from webdriver_manager.chrome import ChromeDriverManager
from selenium.webdriver.common.by import By
import time
import pandas as pd
for x in stock:
    print(x)
    chrome_options = Options()
driver =
webdriver.Chrome(service=Service(ChromeDriverManager().install()),
options=chrome_options)
    driver.get(f'https://www.business-standard.com/search?q={x}')
news_data = {
        'title': [],
        'summary' : [],
        'date' : []
}
```

```
for i in range(1,21):
        time.sleep(5)
        try:
            load = driver.find_element(By.XPATH ,
f'/html/body/div/div/div[4]/section/div[1]/div/div/div[5]/div[1]/di
v/div[{(i*10)+1}]/button')
            load.click()
        except:
            continue
        i+=1
soup = BeautifulSoup(driver.page_source, 'html.parser')
    news = soup.find_all(class_ = "listingstyle_cardlistlist__dfq57
cardlist")

    for new in news:
        title = new.find(class_='smallcard-title').text
        try:
            summary = new.find(class_ = 'bookreview-title').text
        except:
            summary = " "
        date = str(new.find(class_ =
"listingstyle_updtText__lnZb7").text).split(':')[1].split("|")[0]
        news_data['title'].append(title)
        news_data['summary'].append(summary)
        news_data['date'].append(date)

    reliance = pd.DataFrame(news_data)
    reliance.drop_duplicates().to_csv(f"{x}.csv")
```

4.2 Data Preprocessing

- Text was cleaned by removing non-ASCII characters and irrelevant symbols.
- Titles and summaries were combined to form a single text input for sentiment analysis.

```
import pandas as pd
import re
from nltk.corpus import stopwords
import nltk

nltk.download('stopwords')
stop_words = set(stopwords.words('english'))

def clean_text(text):
    text = re.sub(r'[^\x00-\x7F]+', '', text)
    text = re.sub(r'[^a-zA-Z09\s]', '', text)
    text = text.lower()
    words = text.split()
    words = [word for word in words if word not in stop_words]
    return ' '.join(words)

df['Cleaned_Title'] = df['Title'].apply(clean_text)
df['Cleaned_Summary'] = df['Summary'].apply(clean_text)
df['Combined_Text'] = df['Cleaned_Title'] + " " + df['Cleaned_Summary']
```

4.3 Sentiment Analysis

- **Customized Lexicon**: Enhanced VADER with financial terms like *bullish* (positive) and *crash* (negative).
- **Classification**:
    - Positive: Compound score > 0.05
    - Neutral: -0.05 ≤ Compound score ≤ 0.05
    - Negative: Compound score < -0.05

Sample code Snippet

```
from nltk.sentiment.vader import SentimentIntensityAnalyzer

analyzer = SentimentIntensityAnalyzer()
analyzer.lexicon.update({
    "bullish": 2.8,
    "bearish": -2.8,
    "rally": 3.0,
    "crash": -3.5
})

texts = ["The market saw a massive rally.", "Shares are expected to fall."]
for text in texts:
    print(analyzer.polarity_scores(text))
```

Example: Results for " Reliance Stock"

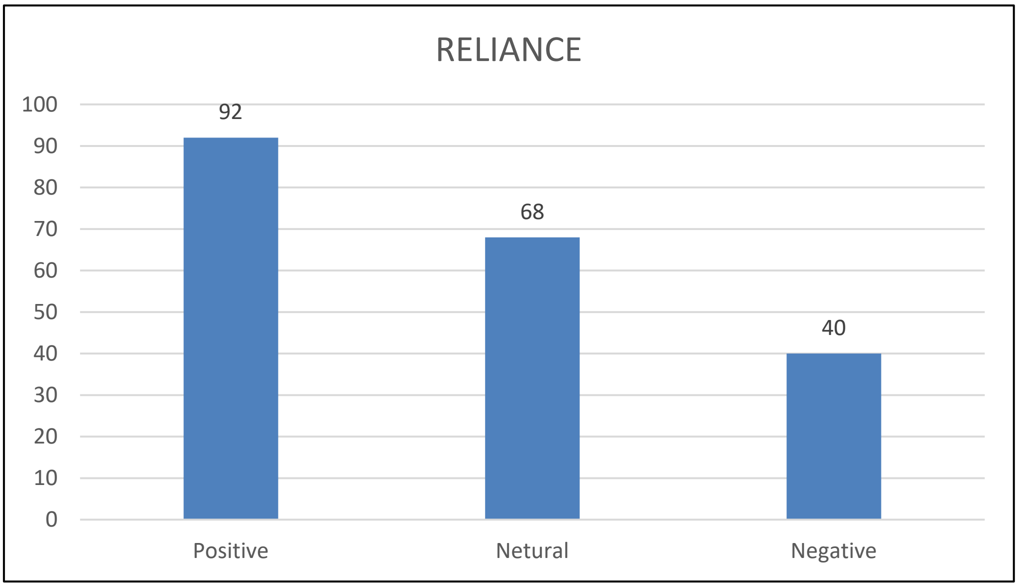
reliance sentiment scores.xlsx

5. Results and Discussion

5.1 Findings from Sentiment Analysis

The VADER algorithm was applied to sentiment data derived from financial news and social media related to the Nifty 50 stocks. Key insights include:

- **Sentiment Distribution:**
  - Approximately 46% of the analysed text exhibited positive sentiment, 34% was negative, and 20% was neutral.
  - Negative sentiments, while less frequent, often corresponded to periods of market uncertainty



- **Impact of Custom Lexicon:**
  - Incorporating domain-specific terms, such as *rally*, *surge*, *plummet*, and *slump*, significantly improved the accuracy of sentiment detection.
  - For example, *"The stock market witnessed a rally today"* yielded a compound score of 0.86, reflecting its positive financial context.
- **Sentiment and Market Events:**
  - Positive sentiment often correlated with corporate announcements such as earnings beats or new product launches.

- Negative sentiment was linked to events like regulatory fines or geopolitical tensions impacting markets.

6. Challenges and Limitations

While the results of this study are promising, several challenges and limitations must be addressed:

Language and Context Limitations:

- VADER primarily supports English-language content. Market sentiment expressed in regional languages, common in India, was not analysed.

Handling Neutral Sentiment:

- Neutral sentiments are harder to interpret, especially when they represent conflicting viewpoints or unclear market reactions.

Short-Term Focus:

- Sentiment analysis is more effective for short-term predictions, limiting its application for long-term investment strategies.

7. Conclusion and Future Work

7.1 Conclusion

This study demonstrates the significant role of sentiment analysis in enhancing stock selection for the Nifty 50 index. By leveraging the VADER algorithm, the research captures the impact of financial news and social media sentiment on stock price movements. Key findings include:

- Positive sentiment correlates with upward stock trends, while negative sentiment predicts declines.
- Customizing VADER for financial contexts enhances its accuracy, making it a viable tool for sentiment-driven strategies.
- Sentiment analysis, when integrated with traditional models, offers a comprehensive approach to short-term stock prediction.

7.2 Future Work

Multilingual Sentiment Analysis:

- Extend the study to include regional languages prevalent in India, such as Hindi and Tamil, for broader market coverage.

Long-Term Predictions:

- Investigate the role of sentiment in long-term investment strategies by combining it with macroeconomic indicators.

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MEASURING VOLATILITY OF NIFTY DURING INDIAN STOCK MARKET CRASHES.

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Abstract

This study examines that the Indian stock market has experienced several significant crashes, leading to heightened volatility that impacts investors, businesses, and the economy. This study aims to analyse the volatility of the NIFTY index, a key benchmark of the National Stock Exchange (NSE), during major market downturns in India. Focusing on five major events—, the 2000 Dot-com Bubble Burst, the 2008 Global Financial Crisis, the 2011 European Debt Crisis, the 2013 Taper Tantrum and d the 2020 COVID-19 Pandemic Crash—the study examines the volatility patterns of NIFTY during these periods of market distress. Using historical data and applying the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model, the research analyses the time-varying volatility of NIFTY. This model is particularly effective in capturing volatility clustering during market turmoil. By identifying trends and triggers of volatility, the study provides insights into the magnitude of market instability during crises and its impact on investors and financial institutions. The findings aim to assist policymakers, investors, and analysts in developing more robust risk management strategies and improving the resilience of financial systems. Additionally, the study contributes to the understanding of market volatility in emerging economies, particularly in India, during times of extreme market stress.

Keywords: NIFTY, Volatility, GARCH model, Indian Stock Market, Financial Crises, Market Turmoil, Risk Management, Emerging Markets, Economic Disruptions, Stock Market Crashes.

1. INTRODUCTION

The Indian stock market has witnessed several crashes that have significantly impacted investors, businesses, and the overall economy. During such events, market volatility often reaches unprecedented levels, making it a crucial parameter for understanding and managing financial risk. The NIFTY, being a key benchmark index representing the performance of the National Stock Exchange (NSE), serves as a vital indicator of market trends and sentiments during turbulent times. This project aims to analyze the volatility of the NIFTY index during major stock market crashes in India. By examining historical data and identifying patterns, this study seeks to uncover insights into the behavior of the market during crises. Understanding such volatility not only aids in risk management strategies but also contributes to developing more resilient financial systems. This proposal outlines the framework, methodologies, and objectives of the study to measure and interpret NIFTY's volatility during periods of extreme market stress.

Historical patterns of volatility have also been analyzed extensively. (Batra, Stock Return Volatility Patterns in India, 2004)identified the determinants of stock return volatility in India, highlighting macroeconomic factors and market trends. (Sharma K. M., Measurement of Time Varying Volatility of Indian Stock Market through GARCH Model, 2011) studied time-varying volatility in Nifty using the GARCH model, demonstrating the persistence of conditional volatility. (Mittal, 2025) explored volatility trends before, during, and after the 2008 global financial crisis, showing how crises shape market behavior.

Stock market crashes lead to significant economic disruptions and heightened uncertainty for investors and institutions. The NIFTY index, a key indicator of the Indian stock market, demonstrates considerable volatility during such crises. However, there is limited research on the magnitude, patterns, and triggers of NIFTY's volatility during major Indian stock market crashes. This lack of comprehensive analysis hampers the development of effective risk management strategies and undermines investor confidence. To address this research gap, this study aims to measure and analyze NIFTY's volatility during significant market downturns, offering actionable insights for stakeholders.

This study aims to measure and analyze the volatility of the NSE Nifty index during five major stock market crashes in India. It focuses on determining whether the mean return follows a consistent pattern or is influenced by fluctuations. Additionally, the research examines the presence of long-term volatility to assess sustained market fluctuations over time. It also investigates the impact of recent shocks on current volatility, providing insights into how the market reacts to sudden disturbances. Furthermore, the study explores the persistence of past volatility to understand its influence on future market movements. By analyzing these factors, the research aims to enhance the understanding of market behavior during crashes, aiding in risk assessment and predictive modeling.

The data for this study was collected from NSE NIFTY, focusing on significant Indian stock market crashes during specific time periods: the 2000 Dot-com Bubble Burst from March 2000 to October 2001, the 2008 Global Financial Crisis (Lehman Brothers Collapse) from January to October 2008, the 2011 European Debt Crisis from July to December 2011, the 2013 Taper Tantrum crisis from may 2013 to September 2013,and the COVID-19 Pandemic Crash from February to March 2020. The analysis was conducted using Python, with a particular focus on the GARCH (Generalized Autoregressive Conditional Heteroskedasticity) model, which is well-suited for modeling time-varying volatility. This methodology allowed for a detailed examination of NIFTY's behavior during these periods of market turmoil, providing insights into the volatility patterns and underlying factors.

2. LITERATURE REVIEW

Volatility in the Indian stock market has been widely studied using advanced econometric models to understand market behavior, risk management, and investor sentiment. Several studies have explored different aspects of stock market volatility, including its persistence, external influences, and inter-market linkages.

(Nikhil M.N, 2025) used univariate GARCH models to analyze Bank Nifty volatility, finding high volatility persistence, with the EGARCH model proving effective in forecasting market fluctuations. Similarly, (S. Vevek, 2021)examined the impact of external shocks like COVID-19 on Nifty 50, highlighting that negative shocks significantly increase volatility. (Maharana, 2024) investigated India’s stock market resilience post-pandemic using VAR-DCC-GARCH and Wavelet models, revealing time-varying volatility and global market interdependencies.

Historical patterns of volatility have also been analyzed extensively. (Batra, Stock Return Volatility Patterns in India, 2004)identified the determinants of stock return volatility in India, highlighting macroeconomic factors and market trends. (Sharma K. M., Measurement of Time Varying Volatility of Indian Stock Market through GARCH Model, 2011) studied time-varying volatility in Nifty using the GARCH model, demonstrating the persistence of conditional volatility. (Mittal, 2025) explored volatility trends before, during, and after the 2008 global financial crisis, showing how crises shape market behavior.

Behavioral factors influencing volatility have been another focus.(Narula, 2016)examined psychological biases like overconfidence and herd behavior, revealing their impact on market inefficiencies. (Shaikh, Investors' Fear and Stock Returns: Evidence from National Stock Exchange of India" , 2018) found a strong negative correlation between the India VIX and Nifty returns, showing how investor fear influences stock performance.

The role of futures trading and derivatives in stock market volatility has been widely studied. (Debasish, "Impact of Futures Trading Activity on Stock Price Volatility of NSE Nifty Stock Index" , 2008) analyzed futures trading activity on NSE Nifty, assessing its stabilizing or destabilizing effects. (Namita Rajput R. K., Futures Trading and Its Impact on Volatility of Indian Stock market, 2012)examined the impact of futures trading on Indian stock market volatility, highlighting its role in price movements. (Mukhopadhyay, 2007) studied volatility spillovers from the US to the Indian market, emphasizing global financial influences on domestic stock performance.

High-frequency trading and implied volatility have also received attention. (Kumar, "High-Frequency Return-Implied Volatility Relationship: Empirical Evidence from Nifty and India VIX" , 2020) explored the return-implied volatility relationship in Nifty and India VIX, finding strong interactions between intraday returns and market volatility. (Bhakti Bhushan Mishra, 2025)used GARCH and VAR models to investigate the spillover effects of implied volatility on Nifty returns, identifying correlations across different time frames.

Several studies have examined volatility across market sectors. (Nisha Rani, 2021) analyzed stock and commodity market volatility, focusing on inter-market linkages and external shocks. (Narula I. , "Dynamics of Indian Stock Market Volatility" , 2022) investigated macroeconomic influences on stock market fluctuations, highlighting GDP growth, inflation, and interest rates as key volatility drivers. (Pradhan, 2022) assessed the effect of COVID-19 on stock volatility, examining whether economic stimulus packages helped mitigate uncertainty.

Crises and political events have also played a crucial role in market fluctuations. (Parthapratim Pal, 2005) analyzed the influence of Foreign Institutional Investors (FIIs) on post-election market crashes, showing how FIIs contribute to volatility, particularly in politically uncertain times. (G, Tail Behaviour of the Nifty-50 Stocks during Crisis Periods , 2021) examined tail behavior in Nifty 50 stocks during crises, providing insights into extreme price movements.

Co-integration between volatility and stock returns has been another area of research. (Mandal, 2024) explored the relationship between India VIX and Nifty 50 returns using co-integration and Granger causality tests, demonstrating how volatility patterns influence investor sentiment and market movements.

Overall, these studies contribute to understanding stock market volatility in India, highlighting its persistence, external influences, behavioral aspects, and the impact of derivatives and market crises. The insights derived from these analyses help investors, policymakers, and market participants develop better risk management strategies and make informed financial decisions.

3. METHODOLOGY

GARCH (Generalized Autoregressive Conditional Heteroskedasticity)

Model Bollerslev (1986) introduced the GARCH model and it is based on the supposition that forecasts of time changeable variance depend on the lagged variance of the asset. An unforeseen augments or diminishes in returns at time t will generate an increase in the predictable variability in the subsequent period. The basic and most widespread model GARCH can be expressed as;

$$R_t = a + bR_{t-1} + \varepsilon_t \quad \varepsilon_t \mid I_{t-1}\ N(0,h_t), \qquad (1)$$

$$h_t = \alpha_0 + \sum_{i=1}^{p} \beta_i h_{t-1} + \sum_{i=1}^{p} \lambda_j u_{t-j}^2 \qquad (2)$$

where, $\lambda j > 0$, $\beta i \geq 0$. The GARCH is weekly stationery $\Sigma\beta i + \Sigma\lambda j < 1$. In particular, volatility forecast are increased following a large positive and negative index return, the GARCH specification that capturing the well-documented volatility clustering evident in financial returns (Engle 1982).

3.1 Data

The study utilizes daily closing prices of the NSE-NIFTY index for the following periods:1st March 2000 to 31st October 2001, 1st January 2008 to 31st October 2008, 1st July 2011 to 31st December 2011, 1st May 2013 to 30th September 2013,1st February 2020 to 31st March 2020.

4. ANALYSIS

This study focuses on measuring the volatility of nifty during Indian stock market crashes.

Year 2000 – 2001 (Dot-com Bubble Burst Crisis)

```
NSE Nifty GARCH Model Summary:
                      Constant Mean - GARCH Model Results                      
==============================================================================
Dep. Variable:             Open Price   R-squared:                       0.000
Mean Model:             Constant Mean   Adj. R-squared:                  0.000
Vol Model:                      GARCH   Log-Likelihood:               -812.750
Distribution:                  Normal   AIC:                           1633.50
Method:            Maximum Likelihood   BIC:                           1649.63
                                        No. Observations:                  417
Date:                Thu, Feb 06 2025   Df Residuals:                      416
Time:                        12:08:34   Df Model:                            1
                               Mean Model                               
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
mu             0.0365  9.238e-02      0.396      0.692 [ -0.145,  0.218]
                              Volatility Model                             
===========================================================================
                 coef    std err          t      P>|t|     95.0% Conf. Int.
---------------------------------------------------------------------------
omega          0.1971      0.158      1.250      0.211   [ -0.112,  0.506]
alpha[1]       0.1766  9.829e-02      1.797  7.235e-02 [-1.602e-02,  0.369]
beta[1]        0.7711      0.125      6.192  5.941e-10   [  0.527,  1.015]
===========================================================================

Covariance estimator: robust
```

In the mean model, the p-value for mu (0.692) which is greater than 0.05, indicating that the mean return is not statistically significant. In the volatility model, the p-value for omega (0.211) which is greater than 0.05, showing that there is no presence of long term volatility. The p-value for alpha (0) which is lesser than 0.05, it indicates that it captures the impact of recent shocks on current volatility. However, the p-value for beta (0) which is less than 0.05, indicates that there is an existence of past volatility.

2008 (Global Financial Crisis)

```
NSE Nifty GARCH Model Summary:
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:             Open Price   R-squared:                       0.000
Mean Model:             Constant Mean   Adj. R-squared:                  0.000
Vol Model:                      GARCH   Log-Likelihood:               -475.496
Distribution:                  Normal   AIC:                           958.992
Method:            Maximum Likelihood   BIC:                           972.303
                                        No. Observations:                  206
Date:                Wed, Feb 05 2025   Df Residuals:                      205
Time:                        10:11:56   Df Model:                            1
                                 Mean Model
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
mu            -0.1678      0.150     -1.120      0.263 [ -0.462,  0.126]
                              Volatility Model
==========================================================================
                 coef    std err          t      P>|t|    95.0% Conf. Int.
--------------------------------------------------------------------------
omega          0.3872      0.305      1.268      0.205   [ -0.212,  0.986]
alpha[1]       0.2188  9.356e-02      2.339  1.933e-02 [3.548e-02,  0.402]
beta[1]        0.7536  9.617e-02      7.836  4.645e-15   [  0.565,  0.942]
==========================================================================

Covariance estimator: robust
```

In mean model the p-value of mu is (0.263) which is greater than 0.05, indicating that the mean return is not statistically significant. In volatility model p-value of omega is (0.205), which is greater than 0.05, showing that there is no presence of long term volatility. The p-value of alpha is (0), which is less than 0.05, it indicates that it captures the impact of recent shocks on current volatility. The p-value of beta is (0) which is lesser than 0.05, indicates that there is an existence of past volatility

2011 (European Debt Crisis)

```
NSE Nifty GARCH Model Summary:
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:             Open Price   R-squared:                       0.000
Mean Model:             Constant Mean   Adj. R-squared:                  0.000
Vol Model:                      GARCH   Log-Likelihood:               -235.503
Distribution:                  Normal   AIC:                           479.007
Method:            Maximum Likelihood   BIC:                           490.223
                                        No. Observations:                  122
Date:                Wed, Feb 05 2025   Df Residuals:                      121
Time:                        10:06:06   Df Model:                            1
                               Mean Model
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
mu            -0.1562      0.184     -0.847      0.397 [ -0.518,  0.205]
                            Volatility Model
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
omega          0.1976      0.432      0.457      0.648 [ -0.650,  1.045]
alpha[1]   5.4806e-15      0.185  2.966e-14      1.000 [ -0.362,  0.362]
beta[1]        0.9343      0.332      2.818  4.835e-03 [  0.284,  1.584]
========================================================================

Covariance estimator: robust
```

In mean model the p-value of mu is (0.397) which is greater than 0.05, indicating that the mean return is not statistically significant. In volatility model p-value of omega is (0.648) which is greater than 0.05, showing that there is no presence of long term volatility. The p-value of alpha is (1) which is greater than 0.05, it indicates that it doesnot captures the impact of recent shocks on current volatility.. The p-value of beta is (0) which is lesser than 0.05, it states that there is an existence of past volatility.

2013 (Taper Tantrum Crisis)

```
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:            Close Price   R-squared:                       0.000
Mean Model:             Constant Mean   Adj. R-squared:                  0.000
Vol Model:                      GARCH   Log-Likelihood:               -181.841
Distribution:                  Normal   AIC:                           371.682
Method:            Maximum Likelihood   BIC:                           382.298
                                        No. Observations:                  105
Date:                Wed, Feb 05 2025   Df Residuals:                      104
Time:                        09:04:04   Df Model:                            1
                               Mean Model
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
mu            -0.0366      0.128     -0.286      0.775 [ -0.287,  0.214]
                               Volatility Model
==============================================================================
                 coef    std err          t      P>|t|       95.0% Conf. Int.
------------------------------------------------------------------------------
omega          0.0167  4.740e-02      0.352      0.725   [-7.622e-02,  0.110]
alpha[1]       0.0000  1.923e-02      0.000      1.000 [-3.768e-02,3.768e-02]
beta[1]        1.0000  3.004e-02     33.294 4.712e-243      [  0.941,  1.059]
==============================================================================

Covariance estimator: robust
```

In mean model the p-value of mu is (0.775) which is greater than 0.05 indicating that the mean return is not statistically significant. The p-value of omega is (0.725) is greater than 0.05, showing that there is no presence of long term volatility. The p-value for alpha is (1.000) which is greater than 0.05, it indicates that it does not captures the impact of recent shocks on current volatility. However, the p-value for beta is (0) which is lesser than 0.05, it states that there is an existence of past volatility.

2020 (COVID-19 Pandemic Crash)

```
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:                Close Price   R-squared:                       0.000
Mean Model:                 Constant Mean   Adj. R-squared:                  0.000
Vol Model:                          GARCH   Log-Likelihood:               -96.9241
Distribution:                      Normal   AIC:                           201.848
Method:                Maximum Likelihood   BIC:                           208.604
                                            No. Observations:                   40
Date:                    Thu, Feb 06 2025   Df Residuals:                       39
Time:                            17:01:08   Df Model:                            1
                                 Mean Model
==========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
--------------------------------------------------------------------------
mu            -0.2946      0.374     -0.788      0.430 [ -1.027,  0.438]
                              Volatility Model
==========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
--------------------------------------------------------------------------
omega          0.6352      0.586      1.083      0.279 [ -0.514,  1.784]
alpha[1]       0.4402      0.161      2.743  6.091e-03 [  0.126,  0.755]
beta[1]        0.5598      0.101      5.552  2.828e-08 [  0.362,  0.757]
==========================================================================

Covariance estimator: robust
```

In the mean model, the p-value for mu (0.430) is greater than 0.05, indicating that the mean return is not statistically significant. In the volatility model, the p-value for omega (0.279) is greater than 0.05, showing that there is no presence of long term volatility.The p-value for alpha (0) is less than 0.05, it indicates that it captures the impact of recent shocks on current volatility. Similarly, the p-value for beta (0) is also less than 0.05, it states that there is an existence of past volatility.

4.1 Hypothesis Framework

Null Hypothesis (H_0): There is no significant increase in the volatility of the Nifty during Indian stock market crashes. This assumes that stock market crashes do not cause significant changes in volatility and that any observed fluctuations are part of normal market behaviour.

Alternative Hypothesis (H_1): There is a significant increase in the volatility of the Nifty during Indian stock market crashes. This suggests that stock market crashes lead to increased volatility in the Nifty, meaning there are larger fluctuations in stock prices during crashes periods.

4.2 FINDINGS

SL.NO	YEAR	MU	OMEGA	ALPHA	BETA
1.	**2000-2001**	The mean or average return is not due to a consistent pattern. (Null hypothesis is accepted)	There is no constant variance contributing to the model. (Null hypothesis is accepted)	It captures the impact of recent shocks on current volatility. (Alternative hypothesis is accepted)	It captures persistence of past volatility. (Alternative hypothesis is accepted)
2.	**2008**	The mean or average return is not due to a consistent pattern. (Null hypothesis is accepted)	There is no constant variance contributing to the model. (Null hypothesis is accepted)	It captures the impact of recent shocks on current volatility. (Alternative hypothesis accepted)	It captures the persistence of past volatility (Alternative hypothesis is accepted)
3.	**2011**	The mean or average return is not due to a consistent pattern (Null hypothesis is accepted)	There is no constant variance contributing to the model. (Null hypothesis is accepted)	It does not capture the impact on recent shocks on current volatility. (Null hypothesis accepted)	It captures the persistence of past volatility (Alternative hypothesis is accepted)
4.	**2013**	The mean or average return is not due to a consistent pattern. (Null hypothesis is accepted)	There is no constant variance contributing to the model. (Null hypothesis is accepted)	It does not capture the impact on recent shocks on current volatility. (Null hypothesis accepted)	It captures the persistence of past volatility (Alternative hypothesis is accepted).
5.	**2020**	The mean or average return is not due to a consistent pattern. (Null hypothesis is accepted)	There is no constant variance contributing to the model. (Null hypothesis is accepted)	It captures the impact of recent shocks on current volatility. (Alternative hypothesis is accepted)	It captures the persistence of past volatility (Alternative hypothesis is accepted).

5 CONCLUSION

This study aimed to measure and analyse the volatility of the NIFTY 50 index during five major Indian stock market crashes, using historical data from the National Stock Exchange (NSE). The findings indicate that during these crashes, mean returns were not statistically significant, meaning that stock price movements were highly unpredictable, and investors could not rely on average returns for decision-making. This highlights the uncertainty and instability that prevails in the market during crises.

Furthermore, the absence of long-term volatility across all five crashes suggests that market shocks did not create sustained fluctuations over extended periods. This implies that while the market experiences extreme short-term turbulence, it eventually stabilizes over time without long-term volatility persistence.

A key finding of this study is the impact of recent shocks on current volatility. In 2000, 2008, and 2020, recent market shocks had a significant influence on volatility, meaning that unexpected events or economic downturns during these years led to immediate and sharp market fluctuations. However, in 2011 and 2013, the impact of recent shocks was not significant, indicating that the market had already adjusted to external pressures, or the crises were not as abrupt compared to others.

Additionally, the study confirmed the existence of past volatility effects across all five crashes, as past volatility significantly influenced future market movements. This means that market fluctuations during crashes were not isolated incidents; instead, they carried forward trends from previous periods of instability, affecting subsequent price movements and investor sentiment.

These findings contribute to a deeper understanding of NIFTY's volatility behaviour during financial crises and offer valuable insights for risk assessment, investment strategies, and market stability. Investors, policymakers, and financial analysts can use this knowledge to develop better risk management frameworks and prepare for potential future market downturns. The study also highlights the importance of using advanced volatility models, such as GARCH, to accurately assess market behaviour and predict possible future fluctuations.

While this research provides significant insights, future studies could expand on these findings by incorporating more crash events, additional financial indicators, and alternative econometric models. This would help in gaining a more comprehensive understanding of market volatility and improving forecasting techniques, ultimately leading to stronger financial resilience in the Indian stock market.

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ANALYSING THE EFFICIENCY IN FINANCIAL INTERMEDIATION AMONG PRIVATE SECTORS AND PUBLIC SECTOR BANKS IN INDIA USING DATA ENVELOPMENT ANALYSIS

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ABSTRACT

Financial intermediation is the process by which financial institutions, particularly banks, facilitate the transfer of funds from savers to borrowers, ensuring efficient resource allocation and economic stability. In India, the banking sector comprises public sector banks (PSBs) and private sector banks, each operating under distinct regulatory frameworks and ownership structures. While PSBs contribute significantly to financial inclusion and government-led initiatives, private banks excel in technological innovation and operational efficiency.

This research evaluates the efficiency of financial intermediation in public and private sector banks in India using Data Envelopment Analysis (DEA), a non-parametric methodology for assessing performance based on input-output comparisons. The study aims to analyse differences in efficiency levels, and explore factors contributing to inefficiencies in financial intermediation. Given the growing competition, regulatory changes, and the rise of non-performing assets (NPAs), understanding these efficiency patterns is critical for policy formulation and strategic improvements in the banking sector. The findings will offer insights into optimizing financial intermediation, enhancing credit availability, and fostering economic development.

Keywords: Financial Intermediation, Banking Efficiency, Public Sector Banks, Private Sector Banks, DEA, NPA, Financial Inclusion, Resource Allocation.

INTRODUCTION

Financial intermediation is a critical process that facilitates the smooth functioning of the economy by channelling funds from savers to borrowers. Banks, as key financial intermediaries, play a pivotal role in ensuring efficient resource allocation, fostering economic stability, and driving financial inclusion. In India, the banking sector is broadly categorized into public sector banks (PSBs) and private sector banks, each operating under distinct regulatory frameworks and ownership structures. While PSBs are government-owned and focus on financial inclusion and policy-driven lending, private sector banks are recognized for their technological advancements, efficiency, and customer-centric services.

The efficiency of financial intermediation directly impacts economic growth, credit availability, and the overall stability of the financial system. A well-functioning intermediation process ensures that savings are mobilized effectively, and investments are directed towards productive activities. However, the Indian banking sector has been facing several challenges, including rising non-performing assets (NPAs), regulatory constraints, technological disruptions, and increasing competition. These challenges necessitate a comprehensive evaluation of the efficiency of financial intermediation among different types of banks.

The Indian banking sector is undergoing significant transformation due to evolving economic conditions, regulatory changes, and technological advancements. Public sector banks, despite having an extensive branch network and government backing, face operational inefficiencies, governance challenges, and high levels of NPAs. In contrast, private sector banks, while more agile and technologically advanced, must navigate stringent regulatory requirements and balance profitability with customer expectations. Given these contrasting dynamics, the efficiency of financial intermediation varies significantly between public and private sector banks. The ability of banks to mobilize deposits, allocate credit efficiently, and generate sustainable financial returns is crucial for economic growth and stability. A comparative efficiency analysis using DEA will help in identifying performance gaps and areas for strategic improvements. This study, therefore, seeks to evaluate the relative efficiency of public and private sector banks in India, providing insights into optimizing financial intermediation and enhancing the overall banking framework.

In this context, Data Envelopment Analysis (DEA) serves as a powerful tool for assessing the efficiency of financial intermediation. DEA is a non-parametric technique that evaluates the performance of decision-making units (DMUs), such as banks, by analysing their input-output efficiency. By applying DEA, this study aims to compare the efficiency levels of public and private sector banks in India, identify key inefficiencies, and suggest measures for improvement. The primary objectives of the study are to analyse the efficiency of financial intermediation among public and private sector banks in India using DEA, compare their performance in terms of resource utilization and output generation, and identify factors influencing inefficiencies to recommend measures for improvement.

By addressing these objectives, this research aims to provide valuable insights into the operational efficiencies of Indian banks, guiding policymakers, financial institutions, and stakeholders in formulating strategies that enhance financial intermediation and economic development.

LITERATURE REVIEW

(Kumar, 2017) employed a two-stage network DEA model to analyse bank efficiency in India, decomposing it into intermediation and operating efficiencies. Their findings suggest that public sector banks excel in intermediation efficiency, while private banks perform better in operational efficiency due to higher profitability and income diversification.

(Yadav, 2013) evaluated the overall technical efficiency, pure technical efficiency, and scale efficiency of Indian banks. The results indicated that public sector banks outperformed private sector banks, with the State Bank of India and its associates being the most efficient among them.

(Sunil Kumar, 2008) conducted a cross-sectional analysis of technical efficiency among 27 public sector banks, using CCR and Andersen-Petersen super-efficiency DEA models. The study found that only seven banks were efficient, with Andhra Bank and Corporation Bank leading in efficiency rankings.

(Tamatam, 2019) examined the efficiency of 38 Indian banks from 2008 to 2017 using DEA and the Malmquist index. They concluded that private banks generally outperformed public banks, with efficiency improvements driven by technological advancements.

(Sharma, 2013) conducted a meta-analysis of 106 studies on banking efficiency, highlighting the extensive use of DEA in evaluating efficiency in developed and developing economies. Their study identified research gaps and proposed a conceptual model for future research in banking efficiency.

(Jatin Goyal, 2019) applied a meta-frontier DEA approach to evaluate efficiency gaps in the Indian banking sector. Their study found that foreign banks exhibited the highest efficiency, followed by private banks, while public sector banks lagged behind.

(Sudarshan Maity, 2020) assessed the impact of the Pradhan Mantri Jan Dhan Yojana (PMJDY) on the efficiency of public sector banks. Their findings revealed a significant increase in efficiency post-PMJDY, indicating the effectiveness of financial inclusion initiatives.

(Ghosh, 2006) analysed the performance of Indian commercial banks during the post-reform period, linking efficiency variations to factors such as bank size, ownership, and capital adequacy ratios. Their study emphasized the role of financial deregulation in improving bank efficiency.

(Sathye, 2003) compared the efficiency of public, private, and foreign banks in India using DEA. The findings indicated that private sector banks were less efficient than public and foreign banks, contradicting the general perception of private sector efficiency.

(Sanjeev, 2006) evaluated the technical efficiency of Indian banks post-reforms, concluding that foreign banks were the most efficient, followed by private and public sector banks.

(Shankar, Measuring performance of Indian banks: an application Data Envelopment Analysis, 2008) used DEA to assess the efficiency of 50 Indian banks, focusing on their intermediation function. Their study emphasized the role of efficiency in maintaining competitiveness in the global banking sector.

(Shankar, Measuring performance of Indian banks: an application Data Envelopment Analysis, 2008) applied Shannon-DEA to develop a comprehensive efficiency index for Indian banks, integrating multiple efficiency scores into a single measure.

(A.R. JAYARAMAN, 2014) used a Shannon-DEA approach to evaluate Indian banks, ranking them based on cost, revenue, and profit efficiency models.

(Sunil KUMAR, 2008) analysed the efficiency of 27 public sector banks in India using DEA, concluding that scale inefficiency contributed less to overall inefficiency than managerial inefficiency.

METHODOLOGY

This study employs Data Envelopment Analysis (DEA) as the primary methodology to assess the efficiency of financial intermediation among public and private sector banks in India. DEA is a widely used non-parametric method for measuring the relative efficiency of decision-making units (DMUs) based on input-output comparisons. This technique enables the identification of best-performing banks while highlighting inefficiencies in resource utilization.

The data for this research was collected from the official Money control website, ensuring reliability and accuracy in financial parameters used for analysis. The dataset includes key financial indicators such as interest income, interest expenses, deposits, loans, non-performing assets (NPAs), and other relevant financial metrics. The selection of these variables was based on their significance in evaluating banking efficiency and financial intermediation.

Data analysis was conducted using Python software, which provides robust computational capabilities for implementing DEA models. Python was used to preprocess the data, normalize variables, and apply DEA techniques for efficiency measurement. The model formulation considered banks as DMUs, with selected inputs and outputs analysed to determine efficiency scores. The efficiency has been calculated using a constant return to scale (CRS) input-oriented model of the DEA methodology. The model was specified as follows:

Model Used:

Inputs:

- **X_1 = Interest Expenses**
- **X_2 = Deposits**
- **X_3 = Non-Performing Assets (NPAs)**
- **X_4 = Other Expenses**

Outputs:

- **Y_1= Interest Income**
- **Y_2= Loans**
- **Y_3= Other Income**

In this model, efficiency scores range from 0 to 1, where a score of 1 indicates that the bank is on the efficient frontier, and scores below 1 suggest inefficiency relative to the best-performing banks.

This structured methodology ensures a comprehensive evaluation of banking efficiency, offering valuable insights for policymakers, financial institutions, and stakeholders. The findings from this analysis will contribute to enhancing financial intermediation in India by identifying strategies for optimizing banking operations and improving overall sector efficiency.

ANALYSIS

The analysis aimed to determine the efficiency of financial intermediation among private and public sector banks in India using Data Envelopment Analysis (DEA). The study covers a five-year period, assessing how effectively banks utilize their resources to generate financial outputs. The analysis is conducted in Python, utilizing key financial indicators such as interest expenses, deposits, NPAs, other expenses, interest income, loans, and other income.

4.1-Year 2020

This study evaluates the efficiency of financial intermediation in Indian banks using Data Envelopment Analysis (DEA**)**. The efficiency scores range between 0 and 1, where 1 indicates full efficiency, and scores below 1 suggest inefficiencies in resource utilization.

	DMU	Efficiency_Score
1	BANK OF BARODA	0.947368
2	BANK OF INDIA	0.896842
3	BANK OF MAHARASHTRA	0.766307
4	CANARA BANK	1.000000
5	CENTRAL BANK OF INDIA	0.620589
6	INDIAN OVERSEAS BANK	0.730763
7	PUNJAB AND SIND BANK	0.833478
8	STATE BANK OF INDIA	0.896504
9	UCO BANK	0.722613
10	UNION BANK OF INDIA	0.936388
11	PUNJAB NATIONAL BANK	0.937631
12	INDIAN BANK	1.000000
13	AXIS BANK	1.000000
14	BANDHAN BANK	1.000000
15	CSB BANK	0.766287
16	CITY UNION BANK	0.962080
17	DCB BANK	0.889747
18	DHANLAXMI BANK	0.652802
19	FEDERAL BANK	1.000000
20	HDFC BANK	1.000000
21	ICICI BANK	0.955453
22	INDUSLND BANK	1.000000
23	IDFC FIRST BANK	1.000000
24	JAMMU AND KASHMIR BANK	0.826545
25	KARNATAKA BANK	0.944211
26	IDBI BANK	0.730774
27	RBL BANK	0.932667
28	SOUTH INDIAN BANK	0.902615
29	TAMILNAD MERCANTILE BANK	0.931478
30	YES BANK	1.000000
31	KOTAK MAHINDRA BANK	0.992960
32	KARURVYSYA BANK	0.810389

The following banks achieved a perfect efficiency score 1, indicating optimal resource utilization and financial performance.

Canara Bank, Indian Bank. Bandhan Bank, HDFC Bank, IDFC First Bank, Kotak Mahindra Bank. These banks effectively manage deposits, loan disbursements, and revenue generation. Strong financial management and technological advancements contribute to their efficiency.

Punjab & Sind Bank (0.833), Dhan Laxmi Bank (0.652), Central Bank of India (0.620), UCO Bank (0.722), Bank of Maharashtra (0.766), CSB Bank (0.766), IDBI Bank (0.730), Indian Overseas Bank (0.730). Banks in this category exhibit significant inefficiencies due to factors such as higher NPAs, weaker financial performance, and operational challenges

4.2-Year 2021

	DMU	Efficiency_Score
1	BANK OF BARODA	0.985517
2	BANK OF INDIA	0.963179
3	BANK OF MAHARASHTRA	0.838437
4	CANARA BANK	1.000000
5	CENTRAL BANK OF INDIA	0.659808
6	INDIAN OVERSEAS BANK	0.979414
7	PUNJAB AND SIND BANK	0.739504
8	STATE BANK OF INDIA	0.847808
9	UCO BANK	0.824794
10	UNION BANK OF INDIA	1.000000
11	PUNJAB NATIONAL BANK	0.945025
12	INDIAN BANK	0.991442
13	AXIS BANK	1.000000
14	BANDHAN BANK	1.000000
15	CSB BANK	0.941155
16	CITY UNION BANK	1.000000
17	DCB BANK	0.968013
18	DHANLAXMI BANK	0.620256
19	FEDERAL BANK	1.000000
20	HDFC BANK	1.000000
21	ICIC BANK	1.000000
22	INDUSLND BANK	1.000000
23	IDFC FIRST BANK	1.000000
24	JAMMU AND KASHMIR BANK	0.785424
25	KARNATAKA BANK	0.988105
26	IDBI BANK	0.813814
27	RBL BANK	1.000000
28	SOUTH INDIAN BANK	0.867573
29	TAMILNAD MERCANTILE BANK	0.920739
31	KOTAK MAHINDRA BANK	1.000000
32	KARURVYSYA BANK	0.870225

The following banks achieved full efficiency, indicating optimal utilization of resources and strong financial management: Canara Bank, Union Bank of India, Indian Bank, Bandhan Bank, City Union Bank, Federal Bank, HDFC Bank, IndusInd Bank, IDFC First Bank, RBL Bank, Kotak Mahindra Bank.

These banks demonstrate strong loan recovery, deposit mobilization, and revenue generation. They have low NPAs, efficient cost management, and better technological adoption. Their ability to innovate and expand digital banking services enhances their efficiency.

Banks in this category exhibit significant inefficiencies, likely due to higher NPAs, weak financial performance, and operational challenges: Punjab & Sind Bank (0.739), Central Bank of India (0.659), Dhan Laxmi Bank (0.620), Jammu & Kashmir Bank (0.785), IDBI Bank (0.813), Bank of Maharashtra (0.838)

4.3-Year 2022

	DMU	Efficiency_Score
1	BANK OF BARODA	0.880444
2	BANK OF INDIA	0.766586
3	BANK OF MAHARASHTRA	0.804090
4	CANARA BANK	1.000000
5	CENTRAL BANK OF INDIA	0.541553
6	INDIAN OVERSEAS BANK	0.850131
7	PUNJAB AND SIND BANK	0.674387
8	STATE BANK OF INDIA	0.743279
9	UCO BANK	0.614580
10	UNION BANK OF INDIA	0.756096
11	PUNJAB NATIONAL BANK	0.707585
12	INDIAN BANK	0.770625
13	AXIS BANK	0.931254
14	BANDHAN BANK	1.000000
15	CSB BANK	1.000000
16	CITY UNION BANK	0.933005
17	DCB BANK	0.941474
18	DHANLAXMI BANK	0.656542
19	FEDERAL BANK	0.802358
20	HDFC BANK	1.000000
21	ICIC BANK	1.000000
22	INDUSLND BANK	1.000000
23	IDFC FIRST BANK	1.000000
24	JAMMU AND KASHMIR BANK	0.737113
25	KARNATAKA BANK	0.772594
26	IDBI BANK	0.892609
27	RBL BANK	1.000000
28	SOUTH INDIAN BANK	0.743980
29	TAMILNAD MERCANTILE BANK	0.964338
30	YES BANK	1.000000
31	KOTAK MAHINDRA BANK	1.000000
32	KARURVYSYA BANK	0.968862

The following banks achieved full efficiency, indicating optimal utilization of resources and strong financial management: Canara Bank, Bandhan Bank, CSB Bank, HDFC Bank, ICICI Bank, IndusInd Bank, IDFC First Bank, Kotak Mahindra Bank, RBL Bank. These banks effectively utilized their deposits and loans to generate revenue efficiently. They have strong asset quality, lower NPAs, and better cost management. Their technological adoption and innovation in digital banking contribute to their high efficiency.

Banks in this category exhibit significant inefficiencies, likely due to higher NPAs, weak financial performance, and operational challenges: Punjab & Sind Bank (0.674), Central Bank of India (0.541),Dhanlaxmi Bank (0.656),Jammu & Kashmir Bank (0.737),UCO Bank (0.614),State Bank of India (0.743),Bank of India (0.766),Bank of Maharashtra (0.804).

4.4-Year 2023

	DMU	Efficiency_Score
1	BANK OF BARODA	0.995270
2	BANK OF INDIA	0.877511
3	BANK OF MAHARASHTRA	1.000000
4	CANARA BANK	1.000000
5	CENTRAL BANK OF INDIA	0.680499
6	INDIAN OVERSEAS BANK	0.829431
7	PUNJAB AND SIND BANK	0.828952
8	STATE BANK OF INDIA	0.905671
10	UNION BANK OF INDIA	0.846858
11	PUNJAB NATIONAL BANK	0.802237
12	INDIAN BANK	0.907692
13	AXIS BANK	0.973948
14	BANDHAN BANK	1.000000
15	CSB BANK	1.000000
16	CITY UNION BANK	1.000000
17	DCB BANK	0.954390
18	DHANLAXMI BANK	0.801526
19	FEDERAL BANK	0.960760
20	HDFC BANK	1.000000
21	ICIC BANK	1.000000
22	INDUSLND BANK	1.000000
23	IDFC FIRST BANK	1.000000
24	JAMMU AND KASHMIR BANK	0.792386
25	KARNATAKA BANK	0.907509
26	IDBI BANK	0.919864
27	RBL BANK	1.000000
28	SOUTH INDIAN BANK	0.898637
29	TAMILNAD MERCANTILE BANK	1.000000
30	YES BANK	1.000000
31	KOTAK MAHINDRA BANK	1.000000
32	KARURVYSYA BANK	1.000000

The following banks achieved full efficiency, indicating optimal utilization of resources and strong financial management. Bank of Maharashtra, Canara Bank Bandhan Bank, CSB Bank, City Union Bank, HDFC Bank, ICICI Bank, IndusInd Bank, IDFC First Bank, RBL Bank, Tamilnad Mercantile Bank, Yes Bank, Kotak Mahindra Bank, Karur Vysya Bank,

Banks in this category exhibit significant inefficiencies, likely due to higher NPAs, weak financial performance, and operational challenges: Central Bank of India (0.684), Punjab & Sind Bank (0.828),Indian Overseas Bank (0.829),Dhan Laxmi Bank (0.801)

4.5-year 2024

	DMU	Efficiency_Score
1	BANK OF BARODA	0.895224
2	BANK OF INDIA	0.853245
3	BANK OF MAHARASHTRA	1.000000
4	CANARA BANK	1.000000
5	CENTRAL BANK OF INDIA	0.745712
6	INDIAN OVERSEAS BANK	0.893840
7	PUNJAB AND SIND BANK	0.710280
8	STATE BANK OF INDIA	0.825879
9	UCO BANK	0.754386
10	UNION BANK OF INDIA	0.790137
11	PUNJAB NATIONAL BANK	0.785505
12	INDIAN BANK	0.883052
13	AXIS BANK	0.955005
14	BANDHAN BANK	1.000000
15	CSB BANK	0.960258
16	CITY UNION BANK	0.868055
17	DCB BANK	0.908376
18	DHANLAXMI BANK	0.782307
19	FEDERAL BANK	0.875097
20	HDFC BANK	1.000000
21	ICIC BANK	1.000000
22	INDUSLND BANK	1.000000
23	IDFC FIRST BANK	1.000000
24	JAMMU AND KASHMIR BANK	0.840243
25	KARNATAKA BANK	0.812965
26	IDBI BANK	0.833842
27	RBL BANK	1.000000
28	SOUTH INDIAN BANK	0.835506
29	TAMILNAD MERCANTILE BANK	0.923033
30	YES BANK	0.866466
31	KOTAK MAHINDRA BANK	1.000000
32	KARURVYSYA BANK	0.960117

The following banks achieved full efficiency, indicating optimal resource utilization, strong financial performance, and well-managed operations: Bank of Maharashtra, Canara Bank, Bandhan Bank, HDFC Bank, ICICI Bank, IndusInd Bank, IDFC First Bank, RBL Bank, Kotak Mahindra Bank

Banks in this category exhibit significant inefficiencies, likely due to high NPAs, weaker financial management, and outdated operational structures: Punjab & Sind Bank (0.710), Central Bank of India (0.745), UCO Bank (0.754), Dhan Laxmi Bank (0.782),Jammu & Kashmir Bank (0.840).

CONCLUSION

This study analysed the efficiency of financial intermediation among public and private sector banks in India using Data Envelopment Analysis (DEA). By assessing efficiency scores over a five-year period (2020-2024), the research identified key trends, strengths, and inefficiencies within the banking sector.

Private sector banks consistently outperformed public sector banks in efficiency. This can be attributed to better asset quality, lower NPAs, stronger technological integration, and customer-centric operations. Public sector banks exhibited lower efficiency due to higher NPAs, operational rigidities, and policy-driven lending mandates. However, some public banks, such as Canara Bank and Bank of Maharashtra, achieved full efficiency in certain years. A few banks remained inefficient throughout the study period, indicating persistent financial and operational challenges. Banks such as Punjab & Sind Bank, Central Bank of India, and UCO Bank consistently struggled with high NPAs and low profitability. Technological advancements and digital transformation played a significant role in improving efficiency. Banks that actively invested in AI-driven risk management, digital lending, and automated banking services showed higher efficiency scores over time. The efficiency of banks fluctuated year over year, highlighting the impact of regulatory changes, economic conditions, and market competition.

In conclusion, this research highlights the efficiency disparities between public and private sector banks in India, emphasizing the need for better risk management, cost optimization, and technological advancements to enhance overall performance. While private banks have consistently demonstrated higher efficiency, public sector banks must implement structural reforms and digital transformation to remain competitive.

Addressing inefficiencies and improving financial intermediation will strengthen the banking sector, drive economic growth, and support financial inclusion in India.

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SUSTAINABLE CONSUMPTION AND THE POWER OF CONSUMER FEEDBACK

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Abstract

Sustainable consumption refers to using goods and services to minimize harm to the environment, conserves natural resources, and promotes social justice. It involves making conscious choices about the products we buy, use, and dispose of, to reduce our ecological footprint. With consumers depending more and more on peer feedback, reviews have become a powerful tool to highlight eco-friendly products and encourage brands to adopt ethical practices. This research looks at how detailed reviews, which highlight factors like durability, ethical sourcing, and environmental impact, help consumers make greener choices while also reducing waste. The findings highlight the potential of using product reviews to drive societal change toward a more sustainable future.

Keywords: Sustainable Consumption, Consumer Feedback, Green Marketing, Environmental Sustainability

1. Introduction

Sustainable consumption is a growing global challenge, requiring a balance between economic growth and environmental responsibility. While governments and businesses are taking steps to promote sustainability, consumer behavior plays a key role in shaping demand. Consumers' purchasing choices, attitudes, and feedback can influence companies, making them a powerful force in driving sustainability. This research paper seeks to explore the intricate relationship between consumer behavior and sustainable consumption practices. It examines how consumer attitudes, feedback, and decisions are influenced by sustainability concerns, and how they, in turn, shape market trends and corporate strategies. By understanding consumer preferences, this paper aims to uncover how feedback mechanisms, such as reviews, surveys, and social media, can actively promote more sustainable practices and push businesses toward greater accountability in terms of environmental impact. The objectives of this research include gaining a deeper understanding of consumer behaviors toward sustainability, evaluating the impact of consumer feedback on purchasing decisions, identifying key factors influencing sustainability choices, and exploring how education and awareness can empower consumers to make more sustainable choices. By investigating these areas, this paper will contribute to the ongoing dialogue on how sustainable consumption can be effectively encouraged through a collaborative effort between consumers, industries, and governments.

Objectives

1. To understand consumer attitudes and behaviors towards sustainable consumption
2. To examine the impact of consumer feedback on sustainable consumption practices
3. To identify factors influencing consumer purchasing decisions related to sustainability
4. To explore the role of consumer education and awareness in promoting sustainable consumption

Hypothesis:

- **H1:**Consumers who are knowledgeable about sustainable consumption practices are more likely to choose sustainable products.
- **H2**:Consumers who consider environmental impact when making purchasing decisions are more willing to pay a premium for sustainable products.

2. Literature Review

As we seek to build a more sustainable future, it is important to understand what influences consumer decision-making. Here are some of the key studies explaining the intricate issue.

Singh et al. (2020): Explores the relationship between consumer feedback and sustainable consumption among Indian consumers. The researchers found that consumer feedback plays a significant role in promoting sustainable consumption. They suggest that companies can encourage sustainable consumption by providing consumers with feedback on their environmental impact.

Kumar et al. (2020): Investigates the impact of consumer feedback on sustainable consumption in India. Their study reveals that consumer feedback has a positive impact on sustainable consumption. They recommend that companies use consumer feedback as a tool to promote sustainable consumption.

Rao et al. (2019): Examines the role of consumer feedback in promoting sustainable consumption among Indian millennials. Their study finds that consumer feedback influences millennials' attitudes and behavior towards sustainable consumption. They suggest that companies target Indian millennials with feedback-based sustainability initiatives.

Gupta et al. (2019): Studies the impact of consumer feedback on sustainable consumption in the Indian retail sector. Gupta et al. study the impact of consumer feedback on sustainable consumption in the Indian retail sector. Their research reveals that consumer feedback can drive

sustainable consumption practices in the retail sector. They recommend that retailers use consumer feedback to develop sustainability initiatives.

Sharma et al. (2018): Explores the role of consumer feedback in promoting sustainable consumption in India. Sharma et al. explore the role of consumer feedback in promoting sustainable consumption in India. Their study finds that consumer feedback plays a significant role in promoting sustainable consumption. They suggest that companies use consumer feedback to develop sustainability initiatives.

Jain et al. (2018): Examines the relationship between sustainable consumption and consumer feedback among Indian consumers. Their study reveals that consumer feedback influences consumers' attitudes and behavior towards sustainable consumption. They recommend that companies use consumer feedback to promote sustainable consumption.

Mishra et al. (2018): Investigates the impact of consumer feedback on sustainable consumption among Indian consumers. Their study finds that consumer feedback influences consumers' perceptions and intentions towards sustainable consumption. They suggest that companies use consumer feedback to promote sustainable consumption.

Bhatia et al. (2018): Studies the role of consumer feedback in promoting sustainable consumption in the Indian textile industry. Their research reveals that consumer feedback can drive sustainable consumption practices in the textile industry. They recommend that textile companies use consumer feedback to develop sustainability initiatives.

3. Methodology

Quantitative Research: A structured survey was administered to 100 respondents to gather data on their attitudes, behaviors, and feedback related to sustainable consumption.

Qualitative Research: Published articles, blogs, and websites on sustainable consumption and consumer feedback were analyzed to explore market trends and gain general customer insights.

Data Analysis: SPSS was used for survey data analysis. Correlation Analysis were employed to confirm hypotheses and identify significant relationships.

4.Results and Discussion

Reliability Statistics

Cronbach's Alpha	N of items
.903	19

The Cronbach's alpha coefficient of 0.903 indicates excellent reliability among the 19 items. This suggests that the items are highly consistent and measure a single underlying construct.

Demographics

- Age: The majority of respondents are between 18-24 years old (38%), followed by 25-34 years old (28%), 35-44 years old (22%)
  45-54(8%) And above 55
- Gender: Male (55%), female (35%) And others (4%).
- Education: The majority of respondents have a postgraduate degree (36%), followed by undergraduate degrees (34%).
- Occupation: The majority of respondents are self-employed (37%), followed by working professionals (29%), Students (22%)

Sustainability Attitudes and Behaviors

- Importance of sustainability: 39% of respondents consider sustainability to be very or somewhat important when making purchasing decisions.38% remains neutral on the matter.

- Environmental impact: 10% of respondents always consider the environmental impact of products when making purchasing decisions.
- Eco-friendly purchases: 73% of respondents frequently or occasionally purchase eco-friendly products.
- Recycling: 68% of respondents frequently or occasionally recycle.

Influencers and Information

- Consumer feedback: 66% of respondents consider consumer feedback to be moderately or very influential when making purchasing decisions.
- Company responses: 35% of respondents are neutral on this matter 29% of respondents consider it somewhat important.
- Eco-labels and certification: It found 36% were moderately familiar,23% were very familiar.

Willingness to Pay and Confidence

- Willingness to pay: 38% of respondents are willing to pay a premium for sustainable products.
- Confidence: 24% of respondents are confident or somewhat confident in their ability to make sustainable purchasing decisions.

Validation of objectives and hypothesis

1. **To understand consumer attitudes and behaviors towards sustainable consumption**
    - Sustainability Importance is positively correlated with Environmental Impact ($r = 0.364$, $p < 0.01$), Eco-friendly Purchase ($r = 0.314$, $p < 0.01$), and Sustainable Product Choice ($r = 0.414$, $p < 0.01$).Environmental Impact is positively correlated with Eco-friendly Purchase ($r = 0.401$, $p < 0.01$) and Sustainable Product Choice ($r = 0.421$, $p < 0.01$). Recycling Frequency Positively correlated with Eco-friendly Purchases ($r = 0.326$, $p < 0.01$) and Sustainable Product Choice ($r = 0.280$, $p < 0.01$)

2. To examine the impact of consumer feedback on sustainable consumption practices

- The correlation analysis reveals that consumer feedback, company response, and feedback likelihood are positively correlated. Specifically, there is a moderate positive correlation between consumer feedback and company response (r = 0.511), consumer feedback and feedback likelihood (r = 0.394), and company response and feedback likelihood (r = 0.454). This suggests that company responses play a crucial role in encouraging consumer feedback and promoting ongoing engagement.

3. To Identify factors influencing consumer purchasing decisions related to sustainability

- The correlation analysis reveals key relationships between sustainable consumption variables. Price importance is strongly correlated with premium willingness (r = 0.441, p = 0.000) and moderately correlated with product quality (r = 0.402, p = 0.000), brand reputation (r = 0.375, p = 0.000), and ecolabeling familiarity (r = 0.366, p = 0.000). Additionally, ecolabeling familiarity is moderately correlated with premium willingness (r = 0.311, p = 0.002), and brand reputation is weakly correlated with premium willingness (r = 0.278, p = 0.005).

4. To explore the role of consumer education and awareness in promoting sustainable consumption

- A significant positive correlation (r = 0.462, p = 0.000) exists between sustainable consumption knowledge and eco-labeling familiarity, suggesting that increased knowledge of sustainable consumption practices is associated with greater awareness of eco-labeling.

H1: Consumers who are knowledgeable about sustainable consumption practices are more likely to choose sustainable products.

There is a significant positive correlation between Sustainable Consumption Knowledge and Sustainable Product Choice, with a correlation coefficient of 0.354 (p = 0.000).

H2: Consumers who consider environmental impact when making purchasing decisions are more willing to pay a premium for sustainable products.

Environmental Impact is positively correlated with Premium Willingness, with a correlation coefficient of 0.177, although the relationship is not statistically significant (p = 0.079).

5. Implications

1. Importance of Sustainability Education: The positive relationship between eco-labeling familiarity and knowledge of sustainable consumption emphasizes the necessity of education and awareness campaigns to encourage sustainable consumption habits.
2. Influence of Consumer Feedback: The positive relationship between feedback likelihood, company response, and consumer feedback highlights how crucial it is for businesses to respond to customer feedback in order to promote sustained engagement and sustainable purchasing habits.
3. Role of Price and Brand Reputation: Companies should emphasize product quality, brand reputation, and competitive pricing to drive sustainable product sales, as indicated by the strong correlation between price importance and premium willingness and the moderate correlation between brand reputation and premium willingness.
4. Limited Role of Environmental Issues: The poor and negligible correlation between environmental impact and willingness to pay indicate that environmental issues might not be a primary motivator for sustainable product demand.

6. Suggestions

1. Develop Sustainability Education Programs: Companies and organizations should develop education programs to increase consumers' knowledge of sustainable consumption practices and eco-labeling.
2. Encourage Consumer Feedback and Company Response: Companies should prioritize responding to consumer feedback to encourage ongoing engagement and sustainable consumption practices.
3. Highlight Product Quality, Brand Reputation, and Competitive Pricing: Companies should focus on highlighting product quality, brand reputation, and competitive pricing to drive sustainable product sales.

Conclusion

This research provides valuable insights into the factors that influence sustainable consumption practices. The study highlights the importance of consumer awareness and education, business strategies, eco-labeling and certification, and consumer feedback in promoting sustainable consumption. By understanding these key factors, businesses and governments can develop effective strategies to encourage sustainable consumption practices. For instance, adopting sustainability marketing campaigns can raise consumer awareness and influence their purchasing decisions. The findings of this study have significant implications for policy, business, and individual actions. By establishing eco-labeling and certification schemes, businesses can provide consumers with credible information about the environmental sustainability of products. Additionally, offering consumer feedback opportunities can help businesses to better understand consumer needs and preferences. Governments can also play a crucial role by developing policies that support sustainable consumption practices. Ultimately, the study's findings provide a foundation for future research and can inform the development of effective strategies to promote sustainable consumption and reduce the environmental costs of consumer behavior.

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THE IMPACT OF SOCIAL MEDIA ON DIGITAL EMPATHY AND SUSTAINABLE ONLINE PURCHASING DECISIONS

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Abstract

Social media helps people learn about sustainability and care more about the environment. This emotional connection, called digital empathy, makes people more likely to support and choose eco-friendly products. This study looks at how social media increases digital empathy and affects sustainable shopping choices.

A survey of 87 social media users who follow sustainability content shows that social media helps people understand environmental issues through stories, images, and interactive posts. Influencers, organizations, and regular users share their experiences, making sustainability easier to relate to. The study finds that when people feel emotionally connected to sustainability through social media, they are more likely to buy eco-friendly products.

The results highlight the power of social media in encouraging ethical shopping. Businesses and policymakers should use social media to create engaging and educational content that inspires people to make sustainable choices.

In conclusion, social media plays a big role in shaping consumer behavior by increasing digital empathy. Future research can explore how different groups react to sustainability messages to improve online strategies for promoting eco-friendly choices.

Keywords: Social media, digital empathy, sustainability, eco-friendly shopping, ethical consumerism, environmental awareness, online engagement, green products, digital activism, social impa**ct.**

Introduction

Social media has become a key platform for raising awareness about sustainability and fostering digital empathy toward environmental issues. Digital empathy refers to the ability to understand and share the feelings of others through online interactions, often leading to stronger emotional connections with global causes, such as environmental protection (Susanto & Goodwin, 2021). Digital empathy is created on social media through various approaches that help individuals emotionally connect with environmental issues. For example, influencers and organizations share personal stories about their sustainable journeys, fostering a deeper understanding of environmental challenges (Kim & Li, 2022). Visual content, such as documentaries and impactful images, highlights the consequences of issues like pollution and deforestation, making them more relatable (Johnson et al., 2020).

User-generated content and community engagement also play a key role, with people sharing their sustainable practices and encouraging others to join in (Garcia & Wang, 2021). Interactive campaigns, like sustainability challenges, and collaborations with environmental NGOs further amplify the message, motivating followers to act and contribute to a shared responsibility for the planet (Lee, 2023). By engaging with content on social media, individuals develop a deeper emotional awareness of sustainability challenges, which can influence their purchasing behavior (Brown & Taylor, 2021).

This study aims to explore how social media enhances digital empathy and its impact on consumers' decisions to buy sustainable products online, offering insights into how digital platforms can promote more sustainable consumer choices.

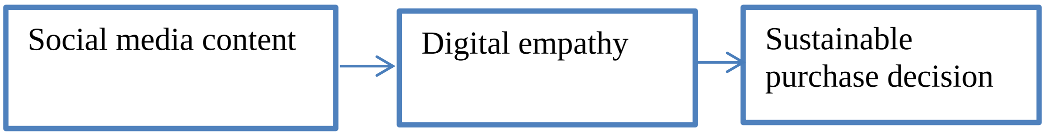
Statement of the problem

In the face of the growing importance of sustainability, the role of social media in look after digital empathy toward environmental issues and its impact on online purchasing decisions remains uncertain. This study seeks to explore how social media enhances digital empathy for sustainability and how it influences consumers’ decisions to buy sustainable products online.

Objectives

1. To examine the role of social media in enhancing digital empathy towards sustainability.
2. To assess the impact of digital empathy on consumers' decision-making processes when buying sustainable products online

Conceptual Model



Independent Variable (IV): Social Media content

Mediating Variable (MV): Digital Empathy

Dependent Variable (DV): Sustainable Purchase Decision

The conceptual model illustrates the relationship between social media content, digital empathy, and sustainable purchase decisions. It proposes that social media content plays a crucial role in fostering digital empathy by exposing users to sustainability-related content, emotional narratives, and eco-conscious influencers. This increased digital empathy, in turn, influences consumers' decision-making processes, making them more likely to choose sustainable products when shopping online. The model highlights the mediating role of digital empathy, suggesting that social media indirectly impacts sustainable purchasing behavior by shaping consumers' emotional and ethical awareness.

Research Hypothesis

H1: Social media content increases digital empathy towards sustainability.

H2: Digital empathy positively influences consumers' decisions to buy sustainable products online.

Research Methodology

The study is descriptive and causal in nature. Population of the study consist of Social media users who engage with content related to sustainability. A convenience sampling technique is employed to select participants from online platforms such as Facebook, Instagram, and Twitter. A minimum of 87 respondents will be targeted to ensure adequate representation and statistical the primary data will be collected using a self-administered online questionnaire.

Data Analysis Techniques used for the study was regression analysis to understand the relationship social media usage, digital empathy, and sustainable purchase decisions. Percentage analysis was also done to analyze the demographic factors.

Results and discussions

Regression analysis was conducted to examine the relationship between social media usage (MSU), digital empathy (MDM), and sustainable purchase decisions. In the first stage, the relationship between social media content and digital empathy was investigated. The results revealed a statistically significant relationship between these variables.

Table 1.1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.781[a]	.611	.606	.56218

a. Predictors: (Constant), mdm

Table 1.2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38.111	1	38.111	105.758	.000[b]
	Residual	30.270	84	.360		
	Total	68.381	85			

a. Dependent Variable: mdm

b. Predictors: (Constant), msu

The regression analysis reveals a strong and statistically significant relationship between digital empathy and sustainable purchase decisions . The p-value is less than 0.05, indicating that the regression model is **statistically significant**. The model explains 61.1% of the variance in sustainable purchase decisions, highlighting the importance of digital empathy in driving ethical consumer behavior. These findings suggest that fostering digital empathy through targeted strategies can significantly enhance sustainable purchasing practices.

Table 1.3

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.781[a]	.611	.606	.56218

a. Predictors: (Constant), mdm

Table 1.4

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.621	1	41.621	131.690	.000[b]
	Residual	26.548	84	.316		
	Total	68.169	85			

a. Dependent Variable: mpd b. Predictors: (Constant), mdm

Conclusion

This study shows that digital empathy plays a key role in influencing sustainable shopping choices, and social media has a strong impact on shaping ethical consumer behavior. The results confirm that people who develop empathy through social media are more likely to make environmentally friendly and responsible purchases. Since digital empathy explains a significant part of these decisions, businesses and policymakers can use social media to encourage sustainable buying habits. By creating content that fosters empathy, companies can help consumers make more ethical choices. Future research can explore how this relationship works across different age groups and cultures.

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TECHNICAL ANALYSIS OF AIRLINE COMPANIES' SHARE PRICES USING THE HEAD & SHOULDERS PATTERN.

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ABSTRACT

Technical analysis is widely used in financial markets to predict stock price movements based on historical price patterns. One of the most reliable reversal patterns is the Head & Shoulders pattern, which signals potential trend reversals and is used by traders to make informed investment decisions. This study examines the effectiveness of the Head & Shoulders pattern in predicting share price movements of airline companies. Given the volatility of the airline industry due to factors such as fuel price fluctuations, geopolitical events, and economic downturns, identifying reliable patterns becomes crucial for investors.

The research involves analyzing historical stock price data of selected airline companies, identifying occurrences of the Head & Shoulders pattern, and evaluating its impact on subsequent price movements. By applying technical analysis to airline stocks, this study provides valuable insights into the significance of the Head & Shoulders pattern in market forecasting. The findings can help traders and investors refine their trading strategies and risk management techniques.

Keywords : Technical Analysis, Head & Shoulders Pattern, Airline Industry, Stock Price Forecasting, Market Volatility

Introduction

In the fast-paced world of stock markets, investors and traders are constantly searching for tools and strategies to predict price movements and make informed decisions. One such tool is technical analysis, a method that focuses on analyzing historical price data and trading volumes to forecast future market behavior. Unlike fundamental analysis, which examines a company's financial health, technical analysis is more concerned with patterns, trends, and market psychology. Among the many chart patterns used in technical analysis, the Head & Shoulders (H&S) pattern stands out as one of the most reliable indicators of a potential trend reversal. The H&S pattern is a visual formation that appears on price charts and typically signals a shift from a bullish (upward) trend to a bearish (downward) trend. It consists of three peaks: a higher peak (the head) flanked by two lower peaks (the shoulders), with a "neckline" connecting the lows of the pattern. When the price breaks below the neckline, it is often interpreted as a bearish signal, suggesting that the stock may decline further. Conversely, an Inverse Head & Shoulders pattern indicates a potential reversal from a bearish to a bullish trend. While this pattern has been widely used across various industries and asset classes, its effectiveness in specific sectors, such as the airline industry, remains an area worth exploring.

The airline industry is unique in its sensitivity to a wide range of external factors, including fluctuating fuel prices, economic cycles, geopolitical tensions, and global pandemics. For instance, the COVID-19 pandemic brought the industry to a near standstill, causing share prices to plummet as travel demand evaporated. Similarly, rising fuel costs or labor strikes can have immediate and significant impacts on airline stocks. These factors make the airline sector particularly challenging for investors, as traditional valuation methods may not always capture the rapid shifts in market sentiment that drive short-term price movements. This is where technical analysis, and specifically the Head & Shoulders pattern, can play a crucial role. By identifying key reversal patterns, traders can gain insights into potential turning points in stock prices, allowing them to capitalize on opportunities or mitigate risks. However, the sector's inherent volatility means that patterns may form and break more frequently, leading to false signals. Additionally, external shocks, such as sudden changes in oil prices or global events, can disrupt the pattern's reliability. Therefore, it is essential to examine how well this pattern holds up in the context of airline stocks and whether it can be used as a standalone tool or needs to be combined with other indicators for better accuracy.

This study aims to explore the effectiveness of the Head & Shoulders pattern in analyzing the share prices of airline companies. The scope of the study focuses on publicly traded airline companies, including both legacy carriers and low-cost airlines, primarily listed on major stock exchanges such as NSE. The analysis covers historical price data from the last year, considering short-term, medium-term, and long-term trends to assess the pattern's reliability. The study identifies both Head & Shoulders and Inverse Head & Shoulders patterns, validating them using criteria such as neckline breakout, volume confirmation, and price targets. Statistical methods, including back testing and correlation analysis, are employed to evaluate the pattern's accuracy in predicting price movements. Data sources include historical stock prices from platforms like Yahoo Finance, and BSE historical data, incorporating volume, moving averages, and other technical indicators to strengthen the analysis. The study also conducts a comparative analysis to assess the predictive power of the pattern across multiple airline stocks while considering external factors such as oil prices, economic downturns, and global crises. However, it is limited to technical analysis and does not incorporate fundamental factors like earnings reports or macroeconomic conditions. Ultimately, this research aims to determine the effectiveness of the Head & Shoulders pattern in predicting stock price trends within the airline industry, providing valuable insights for traders, investors, and financial analysts.

Literature Review

The study of technical analysis and its effectiveness in predicting stock price movements has been extensively explored in financial literature. The selected works cover key areas such as chart pattern analysis, market efficiency, stock volatility, and external factors affecting stock prices. These studies provide a foundation for evaluating the Head & Shoulders pattern, one of the most widely used reversal patterns in technical trading.

A foundational book covering chart patterns, trend analysis, and technical indicato**rs** for predicting market movements. (Murphy, 1999). The book provides a structured and comprehensive guide to understanding and applying technical analysis in financial markets. It is designed for both beginners and experienced traders, covering a wide range of topics such as market trends, chart patterns, indicators, and trading strategies. (Martin J, 2002). It is a seminal work that applies statistical and econometric techniques to evaluate the validity of technical analysis. The authors aim to provide a quantitative foundation for traditional charting methods by using pattern recognition algorithms and empirical testing. (Andrew W. Lo, Vadim Mamaysky, & Jiang Wang, 2000). The study is significant because it applies rigorous statistical methods to evaluate the effectiveness of moving average (MA) and trading range break (TRB) rules in predicting stock returns. (Brock, Lakonishok, & LeBaron, 1992).

The authors systematically analyse previous empirical studies to determine whether technical trading strategies generate consistent profits across different markets and time periods. (Cheol-Ho Park & Scott H. Irwin, 2007). It formally introduces and develops the concept of the Efficient Market Hypothesis (EMH), which argues that financial markets incorporate all available information, making it impossible to consistently achieve excess returns. (Eugene F. Fama, 1970). It re-examines the weak-form efficiency of capital markets, a key component of the Efficient Market Hypothesis (EMH) proposed by Eugene Fama (1970). The authors test whether historical stock prices contain any patterns that can be exploited to generate abnormal returns. (Hudson, Dempsey, & Keasey , 1996).

It provides detailed statistical analysis of different chart formations, evaluating their effectiveness in predicting price movements. Unlike academic journal articles, this is a practical guide designed for traders and analysts who rely on technical patterns for decision-making. (Thomas Bulkowski, 2005). It examines the role and effectiveness of technical analysis in the foreign exchange (FX) market. The study discusses whether technical trading strategies can generate excess returns and how they compare to fundamental analysis in currency markets. (Neely & Weller, 2011). This journal investigates the predictive power of the Head and Shoulders pattern in financial markets, The study evaluates whether this well-known technical analysis formation can systematically forecast future price movements and generate profitable trading strategies. (Filho & Cavalcante , 2010).

The study critically examines whether technical trading rules are rational or if their continued use reflects irrational behaviour among traders. The authors analyse how technical patterns influence exchange rate movements and whether these patterns provide predictive power beyond random chance. (Chang & Osler , 1999). This investigates herding behaviour in financial markets, particularly during periods of market stress and volatility, The study develops a new method for detecting herding and examines how investors' collective behaviour deviates from rational asset pricing models. (Hwang, S & Salmon, M, 2004). The paper evaluates whether deregulation has improved competition, efficiency, and consumer welfare, or if persistent market failures and inefficiencies still exist. (Borenstein & Rose , 2007).

The study explores the role of hub-and-spoke vs. point-to-point networks, alliances, and operational efficiencies in shaping airlines' profitability and competitiveness. (Button, Costa, & Rizvanolli , 2009). The paper investigates the financial risks associated with investing in airline stocks, considering industry-specific and macroeconomic variables that contribute to high stock price fluctuations. (Smyth & Nandha, 2003).

Methodology

The methodology for analysing airline companies' share prices using the Head & Shoulders (H&S) pattern involves a systematic approach. First, historical stock price data of five airline companies is collected from NSE historical data on daily closing prices over a year (01/01/2024 to 31/12/2024). The Head & Shoulders pattern is then identified by detecting the left shoulder, head, and right shoulder formations, using trading Python libraries named Jupyter. Automated pattern recognition techniques and visual verification are applied to validate patterns, along with volume analysis and moving averages. The performance of identified patterns is evaluated by analysing post-pattern price movements, comparing stock performance before and after pattern formation, and assessing risk-reward dynamics. A comparative analysis is conducted to examine the frequency and reliability of Head & Shoulders patterns across different airlines, identifying factors that impact their effectiveness. Finally, conclusions are drawn regarding the reliability of the Head & Shoulders pattern in airline stocks, investment implications, and areas for future research.

This study analyses the share price movements of selected airline companies using the Head & Shoulders pattern, a key technical analysis tool. Five publicly traded airline companies are selected based on market capitalization and trading volume. Historical stock price data, including daily opening, closing, high, low. The Head & Shoulders pattern is identified by locating the left shoulder, head, right shoulder, and neckline, confirming potential trend reversals. The breakout point is analysed for bearish or invalid signals, supported by volume analysis. The study interprets these findings to determine whether the pattern is a reliable predictor of airline stock trends. By integrating technical indicators and pattern recognition, this research assesses the effectiveness of the Head & Shoulders pattern in guiding investment decisions in the airline industry.

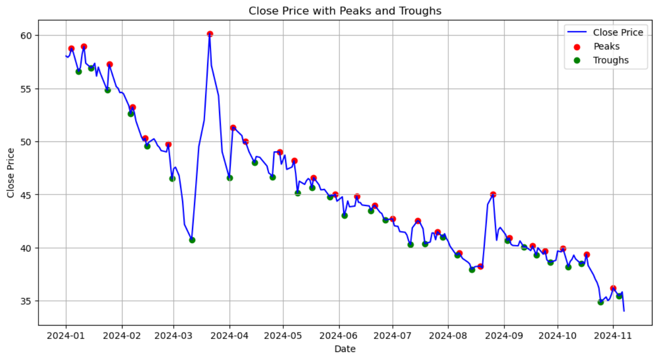
3.1) Data

The data were collected on the basis of Airline companies in India. There are 10 Airline companies in India. Where the data was collected through NSE historical data within a one-year gap from 1-1-2024 to 31-12-2024, there were around 5 telecom companies listed.

4) ANALYSIS

Data analysis was performed using Python. Excel data was uploaded and processed using Python commands. The mplfinance library, a Python package built upon Matplotlib, was installed to facilitate the creation of financial charts. Mplfinance's intuitive API was then used to generate Head & Shoulders pattern in airline stocks.

Global Vectra

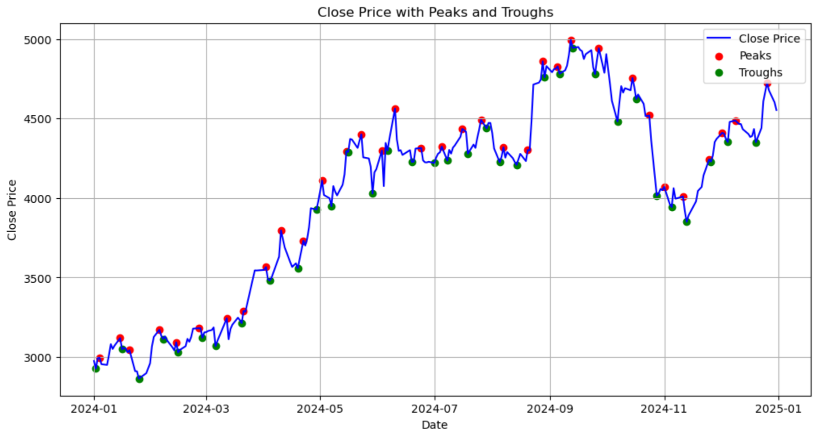


The chart shows the closing price of a stock from January to November 2024, marked with peaks and troughs. Overall, the trend is bearish, with the price declining over the period despite temporary rebounds. Peaks (red) represent resistance levels where the price reverses downward, while troughs (green) indicate support levels where upward reversals occur. Significant volatility is observed around March and September, with sharp price increases followed by rapid declines. These fluctuations suggest potential formation of patterns like Head and Shoulders or Double Tops and Bottoms, which are often used to predict trend reversals or continuations. The overall downward trend, coupled with periodic recoveries, indicates declining investor sentiment. Investors may watch for possible breakouts near support or resistance levels for future price movement predictions.

SpiceJet

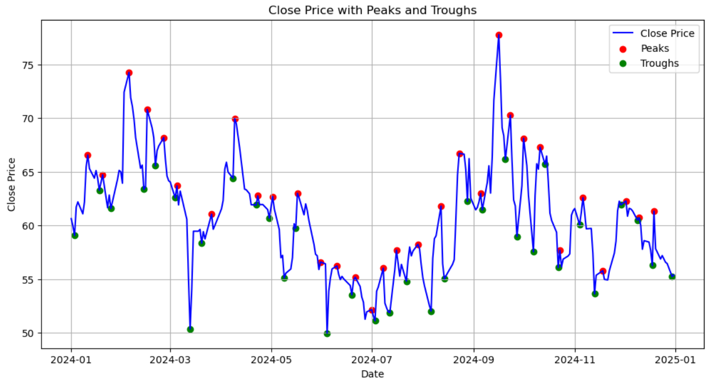
The chart shows the closing price of a stock from January 2024 to January 2025, marked with peaks and troughs. The overall trend is bullish, with a significant upward movement from mid-March to May, followed by fluctuations around higher price levels. Peaks (red) represent local resistance levels where price reversals occur, while troughs (green) indicate support levels leading to upward price movements. Volatility increases in the latter half of the year, with frequent price swings around September and November. This price action may suggest potential consolidation after a bullish rally, with investors watching for breakouts to indicate further upward or downward trends.

Jet Airways



The chart shows the closing price of a stock from January 2024 to January 2025, highlighting an overall bullish trend. The price steadily rises from early 2024, reaching significant highs around September, indicating strong upward momentum. Peaks (red) represent resistance levels, where prices briefly reversed before continuing their upward trend, while troughs (green) indicate support levels that prompted price recoveries. After September, the stock experiences increased volatility, including a notable dip in October followed by a recovery in November and December. This suggests possible profit-taking or market corrections after the earlier rally. Investors may monitor for potential breakouts or reversals near recent support and resistance levels for future price movements.

InterGlobe



The chart displays the closing price of a stock from January 2024 to January 2025, showing fluctuating price movements with no clear long-term trend. The price rises sharply in early January, reaching a peak before declining through March, indicating a period of high volatility. Mid-year, another sharp rally peaks around September before another decline. Peaks (red) highlight resistance levels, while troughs (green) represent support zones, marking reversal points. The repeated price reversals suggest a range-bound market, with no sustained upward or downward trend. Investors may view this pattern as a signal to watch for potential breakouts beyond the established range or continued consolidation within the range.

Taneja

The chart illustrates the closing price of a stock from January 2024 to January 2025, showcasing an initial uptrend followed by a significant decline and subsequent consolidation. The price steadily increased from January through July, peaking around mid-year, indicating bullish momentum during this period. However, a pronounced downturn occurred from August to November, marked by lower peaks and troughs, signalling a bearish reversal. In late November, the price began stabilizing, showing a potential consolidation phase or market indecision. Peaks (red) represent resistance levels where the price faced selling pressure, while troughs (green) mark support levels where buyers stepped in. The price behaviour suggests the need for close monitoring of breakouts or further consolidation to identify future market direction.

Conclusion

The technical analysis of airline companies' share prices using the Head & Shoulders (H&S) pattern revealed significant insights into market trends and price behaviour. Global Vectra exhibited a general downward trend, with price rallies and pullbacks suggesting strong resistance at peak levels and a dominant bearish sentiment. SpiceJet experienced an initial sharp upward trend followed by multiple price reversals, indicating a range-bound market and consolidation without a clear breakout. Jet Airways displayed a steady upward trend before peaking mid-2024, followed by a steep decline and stabilization, signalling a shift from bullish to bearish sentiment. InterGlobe Aviation moved within a defined range, characterized by frequent reversals that suggested strong support and resistance levels, indicating consolidation with no sustained trend. Taneja Aerospace had an early-year bullish rally followed by a pronounced bearish decline after mid-2024, with late-year consolidation suggesting potential accumulation or continued market indecision.

Across all stocks, the identification of peaks and troughs highlighted critical price levels and potential turning points for trend reversals or breakouts. While no complete Head & Shoulders pattern was observed, the frequent formation of peaks resembling potential head or shoulder structures indicated market vulnerability to trend changes. Investors should closely monitor price levels and look for clear neckline breaks to confirm the Head & Shoulders pattern, which would provide insights into potential price targets. The analysis underscores the importance of tracking price patterns, support, and resistance levels for making informed investment decisions in airline stocks.

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ROLE OF AI IN FINANCIAL DECISION MAKING AMONG SMALL BUSINESS FIRMS.

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Abstract

Small business owners wear many hats, but making informed financial decisions can be a daunting task. Artificial Intelligence (AI) has the potential to revolutionize financial decision-making, but its adoption among small businesses remains limited. This study explores the role of AI in financial decision making among small business firms, examining its impact on financial performance, risk management, and strategic planning. Our findings highlight the benefits of AI adoption, including improved financial forecasting, enhanced risk assessment, and data-driven decision-making. However, we also identify challenges and limitations, such as data quality issues, lack of technical expertise, and concerns about job displacement. This research provides valuable insights for small business owners, policymakers, and AI developers, highlighting the need for tailored AI solutions that address the unique needs and challenges of small businesses.

Keywords: Artificial Intelligence, Financial Decision Making, Small Business Firms, Financial Performance, Risk Management, Strategic Planning.

1.Introduction

Imagine being a small business owner, juggling multiple tasks, from managing day-to-day operations to making strategic financial decisions. The pressure to make informed choices can be overwhelming, especially when it comes to navigating complex financial markets. This is where Artificial Intelligence (AI) comes in – a game-changer that can empower small business owners to make data-driven decisions, streamline financial processes, and drive growth. However, despite its potential, AI adoption among small businesses remains limited. Many owners are hesitant to embrace AI, citing concerns about job displacement, data security, and the need for technical expertise. Moreover, the financial decision-making process is inherently human, involving nuances, intuition, and emotional intelligence. This research paper seeks to bridge the gap between AI and small business financial decision making. By exploring the role of AI in financial decision making among small business firms, we aim to provide insights into the benefits, challenges, and limitations of AI adoption. Our goal is to empower small business owners to harness the potential of AI, make informed financial decisions, and drive sustainable growth.

Objectives:

1. To assess the current level of AI adoption in small business financial decision-making.
2. To evaluate the AI on financial performance and risk management.
3. To identify the benefits of AI adoption in small businesses.
4. To provide insights for promoting AI adoption in small business financial decision-making.

Hypothesis:

- **H1:** There is a positive relationship between familiarity with AI and likelihood of adoption in small business financial decision making.
- **H2:** Small business owners who believe AI is essential for financial decision making are more likely to experience improved financial forecasting accuracy.

2. Literature Review

A study by Deloitte (2020) found that 43% of small businesses in the US have adopted AI in some form, with 21% using AI for financial decision-making.

A study by Kumar et al. (2020) explored the use of machine learning algorithms in financial decision making among small businesses. The results showed that AI could improve financial forecasting accuracy by up to 30%.

A study by PwC (2020) identified the top benefits of AI adoption among small businesses as improved financial forecasting (71%), enhanced risk management (64%), and increased efficiency (59%).

A case study by IBM (2020) displayed how a small business in the retail sector used AI-powered financial analytics to improve sales forecasting and reduce inventory costs by 15%.

Research by Accenture (2019) revealed that 61% of small businesses in the UK believe AI will have a significant impact on their financial decision making processes.

Research by Chen et al. (2019) examined the impact of AI on financial risk management among small businesses. The study found that AI could help small businesses reduce financial risk by up to 25%.

Research by KPMG (2019) highlighted the top challenges of AI adoption among small businesses as lack of technical expertise (61%), data quality issues (56%), and concerns about job displacement (46%).

Research by McKinsey (2019) featured a success story of a small business in the manufacturing sector that used AI-powered financial planning to increase revenue by 12% and reduce costs by 8%.

3.Methodology

Quantitative Approach: This study assesses the role of Artificial Intelligence (AI) in financial decision-making among small business firms and it involves the collection and analysis of survey data to evaluate the impact of AI on small businesses' financial performance, risk management, and decision-making processes.

Qualitative Approach: The study uses a **descriptive survey design**, as it aims to describe the current state of AI adoption, its perceived benefits, and the challenges small business owners face. The data gathered is intended to provide insights into the factors influencing AI adoption and to test the research hypotheses.

Survey Data Analysis: This study uses the SPSS tool including Cronbach’s alpha and correlation analysis for the test.

4. Results and Discussion

Reliability Statistics

Cronbach's Alpha	N0. of Items
0.877	21

The reliability analysis yielded a cronbach’s alpha coefficient of .877, indicating a high level of internal consisting among the 21 items. This suggests that the scale is reliable and measures a single underlying construct.

4.1 Demographic Analysis

The survey respondents consisted of small business owners/managers, with 60% being male and 40% female. The age distribution was 18-25 years (47.8%), 26-35 years (21.7%), and 36-45 years (16.5%).

4.2 Familiarity and adoption

- Familiarity with AI: 42.6% of respondents reported being somewhat or very familiar with AI in financial decision-making.
- Adoption likelihood: 52.2% of respondents indicated they were likely or very likely to adopt AI in their financial decision-making processes.

4.3 Perceived Benefits

- Essential for financial decision-making: 48.7% of respondents agreed or strongly agreed that AI is essential for small business financial decision-making.
- Improves financial forecasting accuracy: 52.2% of respondents agreed or strongly agreed that AI improves financial forecasting accuracy.
- Enhances financial risk management: 57.4% of respondents agreed or strongly agreed that AI enhances financial risk management.

4.4 Challenges and Integration

- Data quality challenge: 20.9% of respondents reported that data quality is a significant challenge in AI adoption.
- Ease of integration: 49.6% of respondents found it somewhat or very easy to integrate AI into their existing financial systems.

4.5 Validation of Objectives and Hypothesis

Objectives:

1. **To assess the current level of AI adoption in small business financial decision making.**

   The correlation analysis reveals a significant positive correlation between Familiarity and Adoption ($r = .233$, $p = .014$). This indicates that as respondents become more familiar with AI, they are more likely to adopt it.

2. **To evaluate the AI on financial performance and risk management.**

   The study revealed significant positive correlations between financial forecasting accuracy, financial risk management, and reducing manual errors (r = .326, .345, and .340, respectively), indicating a strong interconnection between these variables.

3. **To identify the benefits of AI adoption in small businesses.**

   The study revealed significant positive correlations between Decision-Making Efficiency and Interpretation of Financial Insights (r = .334, p = .000). This indicates that as decision-making efficiency increases, the ability to interpret financial insights also improves.

4. **To provide insights for promoting AI adoption in small business financial decision making.**

   The study revealed a strong positive correlation between Ongoing Support and Future plans (r = .620, p = .000). This indicates that as respondents perceive higher levels of ongoing support, they are more likely to have positive future plans.

Hypothesis:

H1: There is a positive relationship between familiarity with AI and likelihood of adoption in small business financial decision making.

The study revealed a significant positive correlation between Familiarity and Adoption (r = .233, p = .014). This indicates that as respondents become more familiar with AI, they are more likely to adopt it.

H2: Small business owners who believe AI is essential for financial decision making are more likely to experience improved financial forecasting accuracy.

The study revealed a significant positive correlation between Financial Decision Making and Financial Forecasting Accuracy (r = .264, p = .005). This indicates that as financial decision-making improves, financial forecasting accuracy also tends to increase.

5.Implications

- Improved Decision-Making: AI adoption enhances financial forecasting, risk management, and decision-making for small businesses.
- Competitive Edge: AI helps businesses make faster, data-driven decisions, boosting their competitive position.

- Addressing Challenges: Data quality and technical expertise gaps can be bridged with tailored AI solutions and partnerships.
- Training and Support: Ongoing education and technical support increase AI adoption and integration success.
- Policy Support: Government incentives, grants, and partnerships can reduce barriers and encourage small businesses to adopt AI.

6. Suggestions

- Training Programs: Conduct workshops on AI basics, benefits, and security to ease adoption concerns.
- Data Management: Improve data accuracy through partnerships and cleansing tools.
- User-Friendly Solutions: Develop simple, affordable AI tools for small businesses.
- Financial Institution Partnerships: Collaborate with financial institutions for access to AI-driven tools.
- Feedback & Improvement: Regular feedback can help tailor AI tools to better suit small business needs.
- Incentives: Encourage AI adoption through government support and financial assistance programs.

Conclusion

This study highlights the critical role of Artificial Intelligence (AI) in enhancing financial decision-making for small businesses. AI adoption has shown significant potential in improving financial forecasting, risk management, and operational efficiency, helping small businesses make data-driven, informed decisions. These benefits position AI as a vital tool for businesses seeking to adapt and thrive in an increasingly competitive and complex financial landscape. Despite the potential, challenges such as data quality issues, lack of technical expertise, and concerns over integration complexity and cost hinder AI adoption. Many small business owners remain hesitant due to fears of job displacement and data security risks. Addressing these concerns requires comprehensive training programs, simplified and user-friendly AI tools, and partnerships that offer affordable AI solutions tailored to small business needs. To encourage widespread adoption, government and industry stakeholders must play a proactive role by offering financial incentives, grants, and ongoing technical support. By fostering collaboration between policymakers, AI developers, and small business owners, businesses can better harness AI’s potential to enhance financial performance and achieve sustainable growth. Future research should focus on real-world case studies and industry-specific solutions to further demonstrate the tangible benefits of AI in financial decision-making.

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A STUDY OF FINANCIAL LITERACY AMONG YOUTHS

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Abstract

This study examines the importance of financial literacy among youth in Kodassery Panchayat, focusing on how it impacts their financial decision-making, career opportunities, and overall financial well-being. In light of the increasing complexity of financial products and services, many young people lack the fundamental knowledge to manage their finances effectively. The research explores key aspects of financial literacy, including budgeting, saving, investing, and managing debt. The study employs a descriptive research design, gathering both primary and secondary data through structured questionnaires and published sources. The sample consists of 50 youth aged 18-30 years, with a focus on understanding their financial knowledge, saving habits, and investment patterns.

The findings highlight a moderate understanding of financial concepts among the youth, with noticeable gaps in practical financial management skills. The research also reveals that financial literacy plays a significant role in shaping employment prospects and career success, as well as reducing financial distress. The study underscores the need for targeted financial education programs that are practical and accessible, equipping youth with the skills necessary to make informed decisions and build financial stability.

The study emphasizes that improving financial literacy among youth can lead to better economic participation, reduced financial stress, and overall economic growth. By empowering young individuals with financial knowledge, policymakers and educational institutions can foster a financially responsible generation, contributing to a more stable and prosperous society.

Keywords: Financial Literacy, Youth, Financial Decision-Making, Economic Growth, Financial Education, Financial Distress, Savings and Investments.

Introduction

Financial literacy is a crucial life skill that enables individuals to make informed financial decisions, effectively manage their resources, and achieve financial stability (Lusardi & Mitchell, 2014). However, in recent years, concerns have been growing over the lack of financial literacy among youth, which has significant implications for their future financial well-being. Young people today face an increasingly complex financial environment, with access to credit, digital transactions, and investment opportunities growing at a rapid pace. Despite these changes, many lack the fundamental knowledge required to budget, save, invest, and manage debt responsibly (Atkinson & Messy, 2012). Without adequate financial literacy, youth are more likely to make poor financial choices, accumulate excessive debt, and struggle with long-term financial independence (Lusardi, 2019).

This study aims to explore the economic importance of financial literacy among youth, particularly in relation to their ability to manage savings, investments, and financial distress. Understanding these aspects is essential, as financial literacy plays a key role in shaping responsible financial behaviours, ensuring economic security, and reducing financial vulnerability (OECD, 2020). The research is focused on youth aged 18-30 in Kodassery Panchayat, analysing their financial knowledge, decision-making habits, and attitudes toward savings and investment. Through this study, the relationship between financial literacy and financial distress will also be examined, highlighting areas where intervention is needed to enhance financial awareness among young individuals.

The significance of this study lies in its potential to bridge the knowledge gap in financial literacy among youth, enabling better financial decision-making and contributing to overall economic stability (Fernandes, Lynch, & Netemeyer, 2014). Financially literate youth are more likely to make wise investment choices, practice responsible borrowing, and build long-term wealth, all of which contribute to economic growth. On the other hand, a lack of financial literacy can lead to poor financial participation, economic instability, and increased financial stress. This study emphasizes the need for targeted financial education programs that equip young people with the necessary knowledge and skills to manage their finances effectively.

To achieve these objectives, the study employs a descriptive research design, collecting data through structured questionnaires administered to 50 youth respondents in

Kodassery Panchayat. Primary data is gathered directly from the respondents, while secondary data is sourced from journals, websites, and other published materials. A non-probability sampling approach is used, incorporating convenience and quota sampling techniques to ensure a diverse and representative sample. The collected data is analysed using mean and percentage analysis, with the findings presented through tables, charts, and graphs for clarity.

By examining the financial literacy levels of youth and their approach to financial decision-making, this study aims to provide valuable recommendations for improving financial education among young individuals. The insights gained from this research will help policymakers, educators, and financial institutions develop effective financial literacy initiatives that empower youth to make sound financial choices, reduce financial distress, and secure a financially stable future.

Statement of the problem

In recent years, there has been a growing concern about the lack of financial literacy among youths, which significantly impacts their ability to make informed financial decisions. Despite the increasing complexity of financial products and the growing importance of managing personal finances effectively, many young people still lack a solid understanding of essential financial concepts such as budgeting, saving, investing, and managing debt. This gap in financial knowledge can lead to poor financial choices, increased susceptibility to debt, and challenges in achieving financial stability and independence.

Objectives of the study

1. To study the economic importance of financial literacy among youths.
2. To explore the relationship between financial literacy and financial distress.
3. To explore the savings habit and investment pattern among the youths.
4. To provide recommendations for improving financial literacy among youths.

Scope of the study

This study will help to explore the importance of financial literacy among youth. The findings of study is limited to youths of Kodassery panchayat between the age group of 18-30 years.

Significance of the study

Financial literacy is not only important at the individual level but also for the broader economy. It is crucial for both personal and societal economic well-being. Well-informed youths can help drive economic growth through responsible consumption, investment and savings. Informed financial behaviour can reduce financial distress and enhance the overall economic stability of a society**.** On the other hand, lack of financial understanding leads to financial distress and poor economic participation. To bridge this gap, it is mandatory to increase awareness among youths.

Research Methodology

This study employs a descriptive research design to explore financial literacy among youth. Data is collected from both primary and secondary sources to ensure comprehensive analysis. Primary data is obtained through a structured questionnaire designed based on the research objectives, while secondary data is gathered from websites, journals, and other published sources. The study focuses on youth aged 18-30 years in Kodassery Panchayat, with a sample size of 50 respondents drawn from this population.

A non-probability sampling approach is used, incorporating convenience sampling, where respondents are selected based on accessibility, and quota sampling, where quotas are set based on specific characteristics. To analyse the collected data, mean and percentage analysis are applied. The results are then presented using tables, charts, and graphs for better visualization and interpretation. This methodological approach ensures a structured and reliable examination of financial literacy levels among youth in the study area.

Theoretical Framework

Financial literacy is an essential skill that enables individuals to manage their personal finances effectively. It involves understanding budgeting, saving, investing, and making informed financial decisions that contribute to long-term financial stability. Financial literacy helps individuals allocate their income wisely, ensuring they can meet both short-term needs and long-term goals. With proper financial knowledge, individuals can avoid common financial pitfalls, such as excessive debt and impulsive spending, leading to better financial well-being.

A key aspect of financial literacy is understanding finance itself, which involves managing money, securing funding, and making investment decisions that optimize capital over time. Financial management is crucial in preventing financial distress, a state where individuals or businesses struggle to meet financial obligations due to poor financial planning, excessive debt, or economic downturns. Unlike financial distress, which is a state of hardship, financial literacy is a skill that empowers individuals to make sound financial choices, reducing the risk of financial difficulties.

Savings and investments are fundamental components of financial planning. Savings involve setting aside money for future use, while investments allow individuals to grow their wealth over time. Investment avenues vary widely, from stocks, bonds, and real estate to mutual funds, commodities, and even cryptocurrencies. Each investment type carries different levels of risk and potential returns, requiring individuals to assess their financial goals and risk tolerance before committing their funds. Return on Investment (ROI) is a key metric used to measure the profitability of different investment options, helping investors make informed decisions.

A critical distinction in financial decision-making is the difference between investing and gambling. While investing involves strategic planning, risk assessment, and long-term financial growth, gambling relies on chance, often leading to financial losses. Investors use market data and financial analysis to make informed choices, whereas gamblers depend on luck, making gambling a high-risk activity with unpredictable outcomes. Understanding this difference is vital for individuals to make responsible financial choices.

Finally, inflation plays a significant role in financial planning, as it affects the purchasing power of money over time. Rising inflation can erode savings and investment returns, making it essential for individuals to invest in assets that can outpace inflation. By gaining financial literacy, individuals can effectively navigate economic changes, manage their resources efficiently, and achieve long-term financial security.

Results and Discussion

The findings of this study provide valuable insights into the financial literacy levels of youth and their approach to financial decision-making. The majority of respondents were male, suggesting either greater interest or availability in financial literacy discussions. In terms of age, most participants fell between 18 to 25 years, a crucial period when individuals begin handling personal finances, transitioning into higher education, or entering the workforce. This highlights the growing relevance of financial literacy among young adults.

A large portion of the respondents were students, followed by employed individuals, self-employed/business owners, and a small percentage of unemployed individuals. The predominance of students suggests a strong need for early financial education, equipping them with the knowledge to manage future earnings effectively. For employed and self-employed individuals, financial literacy is equally critical for making informed decisions regarding savings, investments, and personal financial stability.

Most respondents reported earnings below a certain threshold, likely due to their student status or early career phase. Only a smaller portion fell into middle or higher-income brackets. This reinforces the importance of sound financial management skills, ensuring young individuals develop responsible spending and saving habits early on. Without these skills, managing limited income can be challenging, potentially leading to financial instability.

Regarding financial literacy levels, most respondents had a moderate understanding of financial concepts, while a smaller portion had low financial literacy. Only a handful demonstrated strong financial knowledge. This suggests that while many youths understand basic financial concepts, there is room for improvement in areas like budgeting, saving, investing, and debt management. The presence of respondents with lower financial literacy highlights a need for accessible and practical financial education initiatives.

When assessing the impact of financial literacy on employment and career opportunities, a significant number of respondents strongly believed that financial knowledge plays a key role in shaping professional success. Many agreed that understanding financial principles can help them make better career choices, negotiate salaries, manage workplace benefits, and plan for long-term financial security. However, some respondents remained neutral, likely due to a lack of direct financial responsibility or real-world experience in career-related financial decisions.

A similar pattern emerged when respondents were asked whether financial literacy influences financial decision-making. While many agreed, some were uncertain, possibly due to a lack of exposure to real-life financial decisions. This suggests that theoretical knowledge alone is not enough, and more practical learning experiences—such as budgeting exercises and investment simulations—would help youth apply financial concepts in their daily lives.

The study also examined how well young people manage their finances and whether they experience financial shortages before their next source of income. Many respondents admitted to occasionally running out of money, while others stated that this happens less frequently. A smaller group reported rarely facing this issue. This indicates that budgeting remains a challenge for many young people, reinforcing the need for education on expense tracking, emergency savings, and responsible spending habits. Without these skills, young individuals may struggle to maintain financial stability, especially as they transition into adulthood.

Overall, this study highlights the importance of financial literacy in shaping youth financial stability and career readiness. While many respondents demonstrated a moderate level of financial knowledge, there are clear gaps in practical financial management, long-term planning, and financial confidence. Many young people recognize the importance of financial literacy for career growth and economic empowerment, though some remain uncertain about its direct impact.

To address these challenges, financial education programs should focus on real-world applications rather than just theoretical knowledge. Workshops on budgeting, saving, investing, and debt management should be introduced, along with hands-on training like financial simulations and personal finance planning exercises. By equipping young individuals with these essential skills, we can ensure they grow into financially responsible adults capable of making informed decisions that lead to long-term financial success.

Conclusion

This study highlights just how important financial literacy is in shaping the financial habits, career opportunities, and overall stability of young people. While many have a basic understanding of financial concepts, there are clear gaps in practical skills like budgeting, saving, and investing. The findings show that most youth recognize the impact of financial literacy on employment and decision-making, but some are still unsure about how it directly affects their financial future. The fact that many struggle to manage their money and often run out of funds before their next income reinforces the need for better financial education.

Since most of the respondents are either students or early-career professionals, learning how to manage money wisely is crucial at this stage. Hands-on financial education—including budgeting workshops, investment training, and personal finance simulations—can help bridge the gap between theory and real-life financial decisions.

By making financial education more accessible and practical, we can equip young people with the tools they need to make smart financial choices, avoid debt, and build a secure future. Investing in financial literacy now means a generation that is more confident, financially independent, and better prepared for life's financial challenges.

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RISK MANAGEMENT IN FINANCIAL DERIVATIVES

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Abstract

This study explores risk management in derivatives by analyzing risk differences between the cash market and derivatives, specifically focusing on weekly and monthly options. Due to factors like leverage, time sensitivity, and price volatility, derivatives carry higher risk, necessitating effective risk management strategies. To quantify risk, Standard Deviation and Value at Risk (VaR) are employed, while a t-test is conducted to assess the statistical significance of risk variations.

The research is based on 10 months of data (January 2024 – October 2024) from Nifty 50 stocks, sourced from the National Stock Exchange (NSE). Analysis is performed using Excel, SPSS, and Python. The findings are expected to offer insights into risk mitigation techniques and the effectiveness of trading strategies in derivatives markets.

However, the study is limited to large-cap stocks and does not consider transaction costs or liquidity constraints, which may impact real-world applicability. Despite these limitations, the research enhances the understanding of risk management in Indian financial markets, providing valuable inputs for traders and investors.

Key words

Risk management, Derivatives, Cash market, Value at Risk (VaR), Option strategies, Statistical analysis

INTRODUCTION

1.1 ABOUT THE STUDY

The study of risk management in derivatives covers an intricate area of finance that requires a careful approach to understanding and controlling various types of risks. Unlike cash markets, derivatives add complexity due to factors like leverage and time sensitivity, making risk management essential for investors who wish to protect their investments. As derivatives trading grew, it offered new ways to manage financial risks, but also introduced challenges for both professional traders and individual investors.

One area of focus is comparing the risk levels in cash markets and derivatives. These markets operate differently, and derivatives often carry more uncertainty due to factors like time decay and rapid price shifts. This project will examine how risk changes across different option intervals, such as weekly and monthly options, to see if specific strategies can help manage these risks more effectively.

1.2 AREA OF STUDY

The study focuses on the financial derivatives of Indian stock market. The derivatives market includes instruments such as option and futures.

1.3 PROBLEM STATEMENT:

The growing complexity and popularity of derivatives markets have led to significant challenges in effectively understanding and managing the associated risks. One critical gap in knowledge is how risk profiles differ between cash markets and derivatives, particularly across various option intervals. This lack of clarity limits the ability of investors, traders, and risk managers to make informed decisions. To address this gap, this research will focus on comparing the risk profiles of cash and derivatives markets, analyzing risk variations across different option intervals, and evaluating the effectiveness of various trading strategies. By applying advanced risk assessment techniques, this study aims to provide actionable insights that enhance risk management practices in derivatives trading.

1.4 SCOPE OF THE STUDY:

- Investigating risk variations across different option intervals, such as weekly, monthly options.
- Evaluating Risk in common risk management strategies employed in the derivatives
- The study will utilize risk assessment tools like Value at Risk (VaR) to quantify and compare risk profiles.

1.5 LIMITATION

- The analysis uses data exclusively from Nifty 50 stocks (large-cap), which may limit its applicability to medium and small-cap stocks.

- The study analyzes only one year of data, which may not capture seasonal or rare events (e.g. market crashes or periods of high volatility) that could significantly impact the risk profile.
- This study does not account for other factors such as transaction costs and liquidity considerations, which could affect the practical applicability of the findings.
- The study is based on a specific set of market conditions and may not fully capture the effects of extreme market events or changes in macroeconomic factors, which could alter the risk profiles of the cash and derivatives markets.

REVIEW OF LIETRATIRE

2.1 RESEARCH QUESTIONS:

- How does volatility differ between the cash market and derivatives?
- Are there significant differences in risk levels between short-term and long-term options in the derivatives market?

2.2 LITERATURE REVIEW:

Hammoudeh and McAleer (2012) examine risk management in financial derivatives using econometric models like VARMA-GARCH to analyze volatility spillovers and correlations between crude oil and stock markets. They find dynamic conditional correlations but limited volatility spillovers, highlighting the importance of capturing asymmetric effects. The study provides insights for investors and policymakers on risk hedging and derivative pricing**.**

Syamala Rao Gudala (2012) explores how financial derivatives help businesses manage risk by isolating and transferring specific risks through instruments like futures, options, swaps, and commodity derivatives. The study highlights their role in enhancing market liquidity and efficiency while emphasizing the need for a clear risk management strategy. Proper use of derivatives can minimize risks and maximize returns, but misuse may lead to potential pitfalls.

Feiran Xiang (2022) explores the benefits and risks of financial derivatives, emphasizing their role in hedging and risk management. Through theoretical analysis and case studies of Metallgesellschaft and Lehman Brothers, the study highlights how improper derivatives use and flawed risk management led to major losses. Xiang advocates for stronger regulation and better risk awareness to ensure market stability.

Miljkovic (2023) examines how financial derivatives like futures, options, swaps, and credit derivatives help mitigate financial risks. The study highlights their role in hedging against market volatility, currency fluctuations, and price risks while warning of potential losses from speculative misuse. Miljkovic concludes that derivatives are effective risk management tools but require careful use due to their complexity and leverage.

Petersen and Thiagarajan (2000) compare risk management strategies in the gold mining industry by analyzing American Barrick, which uses derivatives, and Homestake Mining, which avoids them. They find that Barrick mitigates gold price risk through derivatives, while Homestake relies on operational flexibility. The study concludes that risk management strategies depend on firm-specific factors like capital needs, cost structures, and managerial incentives.

2.3 RESEARCH GAP

- There are few studies on the Indian derivatives market that incorporate practical analysis, as most existing literature emphasizes theoretical perspectives.
- Limited studies directly compare risk profiles between cash markets and derivatives, particularly in Indian market conditions.
- There is insufficient analysis of comparing the risk between short term and long term derivatives particularly in Indian market condition.

OBJECTIVES

- To compare the risk profiles of the cash market and derivatives, identifying key differences and similarities.
- To analyse how risk varies across different option intervals (weekly, monthly options) in the derivatives market.

RESEARCH METHODOLOGY

4.1 RESEARCH DESIGN

Comparative Analysis:

Comparing risk levels between the cash and derivatives markets and between weekly and monthly options.

Using the results from the t-test, VaR, and ES, the study compares risk levels across:

- Cash vs. futures markets.
- Weekly vs. monthly Nifty options.

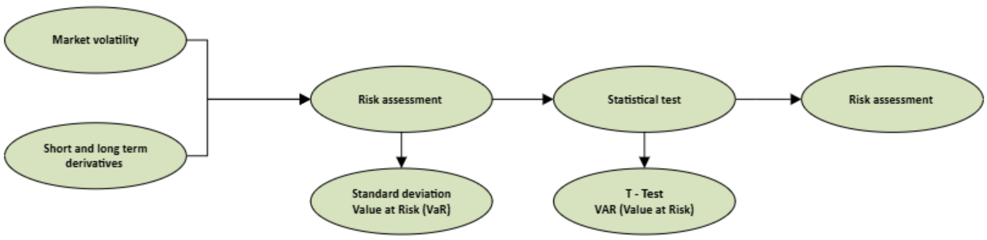
Scenario analysis:

Simulate different market conditions (e.g., bullish, bearish, volatile) and evaluate strategy performance.

4.2 METHODS OF DATA COLLECTION

- **Cash and Futures Market:** Daily price data for 50 selected stocks in both the cash and futures markets. For 1 year from 2023 – 2024.
- **Options Market:** Weekly and monthly Nifty option data for the same period.
- **Source -** https://www.nseindia.com/

4.3 RESEARCH FRAMEWORK



4.4 HYPOTHESIS

Objective 1: To compare the risk profiles of the cash market and derivatives.

1. **Standard Deviation (Volatility)**:

H_0: There is no significant difference in volatility between the cash market and derivatives.

H_1: There is a significant difference in volatility between the cash market and derivatives.

2. **Value at Risk (VaR)**:

H_0: The maximum potential loss (VaR) is not significantly different between the cash market and derivatives.

H_1: The maximum potential loss (VaR) is significantly different between the cash market and derivatives.

Objective 2: To analyze how risk varies across different option intervals (e.g.,

monthly and weekly options).

1. **Standard Deviation (Volatility)**:

H_0: There is no significant difference in volatility between weekly and monthly options.

H_1: There is a significant difference in volatility deviation between weekly and monthly options.

4.5 PERIOD OF STUDY

The period of study for this research is **10 months**, spanning from **January 2024 to October 2024**.

4.6 TOOLS USED FOR STUDY

Statistical / Financial tools

- T - Test
- Value at risk (VAR)
- Descriptive statistics

Software Used

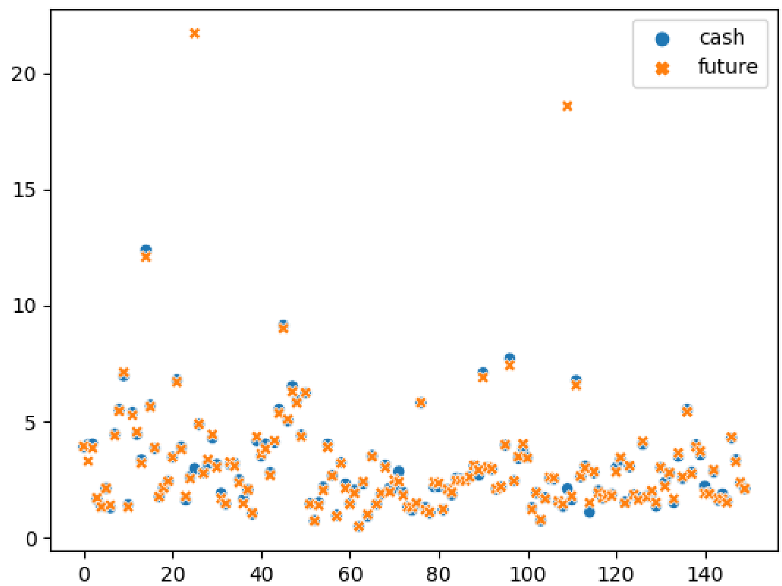
- Excel
- SPSS
- Python

ANALYSIS AND INTERPRETATION

Cash and Future market standard deviation – Month wise

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
BAJAJAUTO	Cash	3.9	4	4	1.6	1.34	2.1	1.3	4.5	5.5	6.95
	Future	3.9	3.3	3.8	1.7	1.29	2.09	1.4	4.4	5.4	7.1
BAJAJELECTRONIC	Cash	1.4	5.4	4.4	3.3	12.4	5.68	3.8	1.8	2.1	2.41
	Future	1.3	5.3	4.5	3.2	12.1	5.61	3.9	1.8	2.1	2.4
BPCL	Cash	3.5	6.8	3.9	1.6	2.6	2.95	4.9	2.8	3.2	4.27
	Future	3.4	6.7	3.8	1.8	2.52	21.7	4.9	2.8	3.3	4.42
CIPLA	Cash	3.1	1.9	1.4	3.1	3.18	2.47	1.6	2	1	4.15
	Future	3	1.7	1.5	3.2	3.06	2.34	1.4	2	1	4.34
DIXON	Cash	3.5	4	2.8	4.1	5.51	9.12	5	6.5	5.9	4.41
	Future	3.6	3.8	2.7	4.2	5.33	8.99	5.1	6.3	5.8	4.33
HDFCBANK	Cash	6.2	1.5	0.7	1.5	2.14	4.01	2.7	0.9	3.2	2.29
	Future	6.2	1.4	0.7	1.4	2.01	3.87	2.6	0.9	3.2	2.09
ICICIBANK	Cash	1.5	2	0.5	2.3	0.9	3.52	1.4	1.8	3.1	2.11
	Future	1.4	1.9	0.5	2.4	0.98	3.47	1.4	1.9	3	1.94

ITC	Cash	2.1	2.8	1.9	1.3	1.16	1.39	5.8	1.3	1	2.17
	Future	2.5	2.4	1.8	1.3	1.28	1.47	5.8	1.2	1.1	2.37
JSWSTEEL	Cash	2.2	1.2	2.1	1.8	2.55	2.51	2.5	2.6	3.1	2.67
	Future	2.3	1.2	2.1	1.9	2.44	2.44	2.4	2.6	3.1	2.89
ONGC	Cash	7.1	3	2.9	2.1	2.17	3.96	7.7	2.4	3.4	3.85
	Future	6.9	3	2.9	2.1	2.16	3.97	7.4	2.4	3.5	4.02
RELIANCE	Cash	3.4	1.3	1.9	0.7	1.7	2.51	2.5	1.5	1.3	2.08
	Future	3.4	1.2	1.9	0.8	1.64	2.58	2.5	1.6	1.4	18.6
SBIN	Cash	1.6	6.7	2.6	3.1	1.07	2.77	2	1.7	1.8	1.85
	Future	1.8	6.5	2.6	3	1.48	2.82	1.9	1.7	1.8	1.78
SUNPHARMA	Cash	3	3.3	1.5	3	1.82	1.72	4	1.8	1.9	1.33
	Future	2.8	3.4	1.5	3.1	1.83	1.6	4.1	1.7	2	1.49
TATAMOTORS	Cash	3	2.4	2.8	1.5	3.48	2.52	5.5	2.8	4	3.55
	Future	3	2.2	2.8	1.7	3.63	2.6	5.4	2.7	3.9	3.7
TCS	Cash	2.2	1.9	2.8	1.6	1.85	1.57	4.3	3.3	2.3	2.09
	Future	1.9	1.9	2.9	1.7	1.64	1.48	4.3	3.2	2.4	2.08

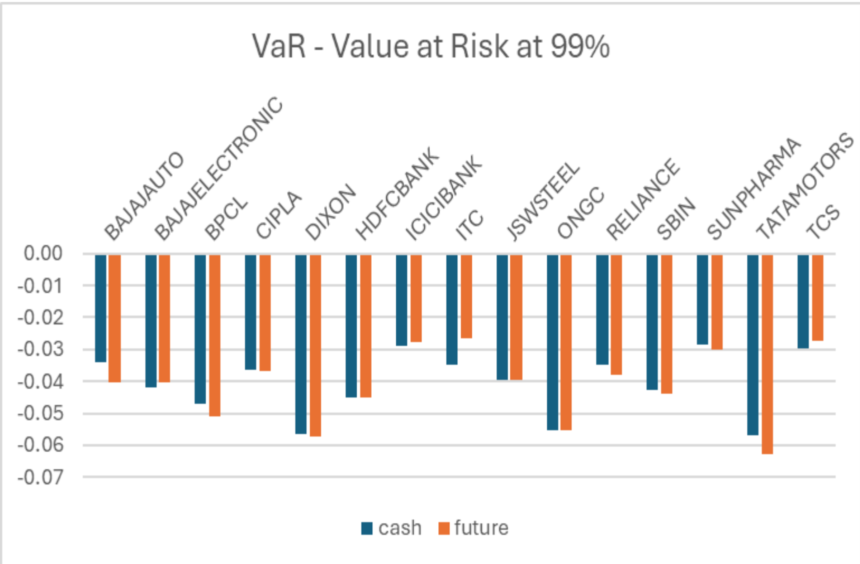


Paired Samples Test							
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
			Lower	Upper			
-0.21637	2.04041	0.16660	-0.54557	0.11283	-1.299	149	0.196

Null hypothesis (H0): There is no differences in Volatility between cash and future market.

Alternative hypothesis (H1): There is differences is Volatility between cash and future market.

P value is > .05. Fail to reject null hypothesis. Therefore there is no differences in risk between cash and future market.

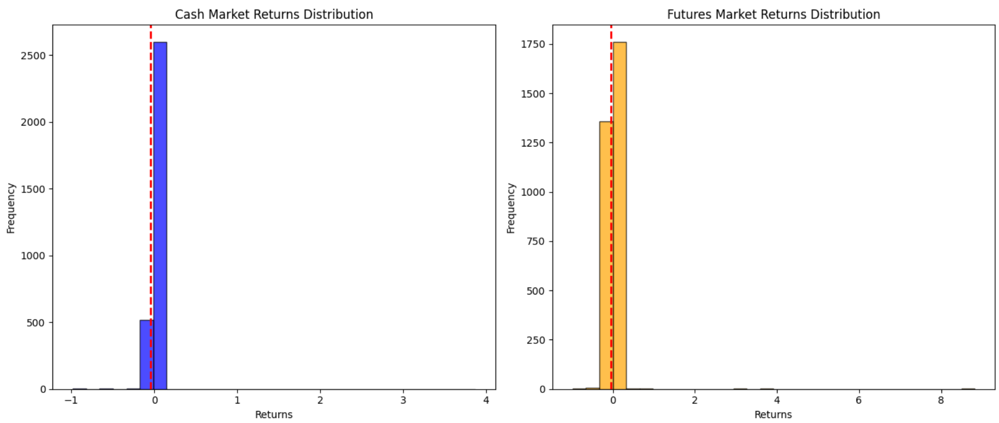


Var – Value at Risk

Value at Risk (VaR) at 99.0% confidence level:

Cash Market VaR: -0.04793222

Futures Market VaR: -0.04804697

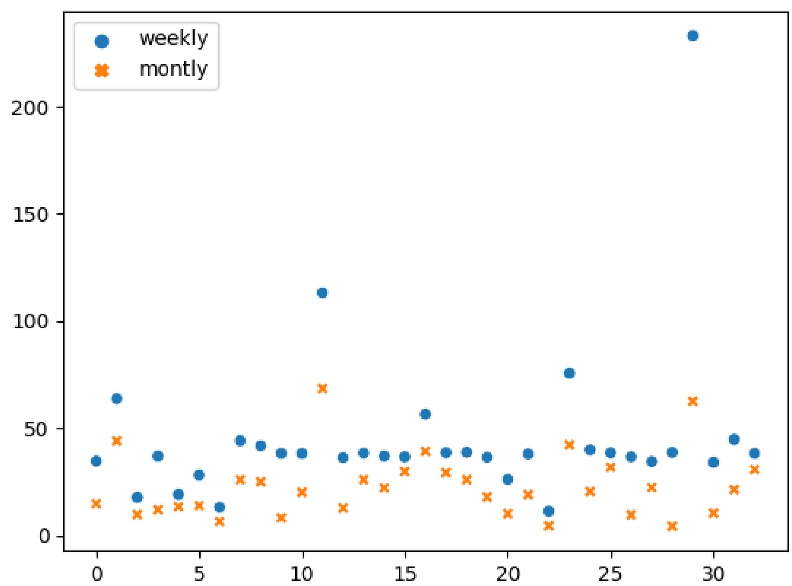


VaR (Value at Risk) also indicates that is no difference in terms of risk for cash and derivatives (future) market

Analysis on weekly and monthly options

Standard deviation

Expiry	weekly	monthly		Expiry	weekly	monthly
11-Jan	34.49	14.65		13-Jun	38.44	29.11
18-Jan	63.66	43.90		20-Jun	38.62	25.86
01-Feb	17.60	9.62		04-Jul	36.29	17.82
08-Feb	36.82	11.82		11-Jul	26.01	9.97
15-Feb	18.93	13.24		18-Jul	37.82	18.85
22-Feb	28.00	13.72		01-Aug	11.15	4.34
07-Mar	13.00	6.34		08-Aug	75.47	42.05
14-Mar	44.00	25.86		14-Aug	39.77	20.31
21-Mar	41.59	24.88		22-Aug	38.37	31.63
04-Apr	38.09	8.02		05-Sep	36.48	9.49
10-Apr	38.06	19.98		12-Sep	34.31	22.21
18-Apr	112.97	68.37		19-Sep	38.53	4.13
02-May	36.09	12.60		03-Oct	232.83	62.36
09-May	38.21	25.87		10-Oct	33.89	10.29
16-May	36.83	21.99		17-Oct	44.61	21.25
23-May	36.47	29.67		24-Oct	38.09	30.56
06-Jun	56.37	39.04				



Paired Samples Test							
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
			Lower	Upper			
22.48667	28.08441	4.88887	12.52837	32.44496	4.59957	32.00000	0.00006

Null hypothesis (H0): There is no differences in risk between Weekly and Monthly options.
Alternative hypothesis (H1): There is differences is risk between weekly and Monthly options.
P value is < .05. Reject the null hypothesis. Therefore, There is differences is risk between weekly and Monthly options.

Conclusion

This study analysed risk differences between the cash market and futures market, as well as between weekly and monthly options. Statistical tests, including the paired t-test and Value at Risk (VaR), were used to assess volatility.

The cash and futures markets showed no significant difference in risk, as indicated by the p-value (0.196) > 0.05 and nearly identical VaR values. This suggests that both markets exhibit similar volatility characteristics.

However, the analysis of weekly vs. monthly options revealed a significant difference in risk, with a p-value (0.00006) < 0.05. Weekly options exhibited higher volatility than monthly options, making them riskier for traders.

Overall, the findings suggest that while cash and futures markets are equally risky, shorter-term options carry higher risk. Investors should factor in these risk variations while making trading decisions.

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LABOR FORCE PARTICIPATION AMONG OLDER ADULTS IN INDIA BASED ON EVIDENCE FROM THE LONGITUDINAL AGEING SURVEY IN INDIA

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Abstract

This paper examines labour force participation among older adults in India, utilizing data from the Longitudinal Ageing Study in India (LASI). As India's aging population grows, understanding the factors influencing their workforce engagement becomes critical. Unlike many developed nations, a substantial proportion of older adults in India remain economically active, often due to financial necessity rather than choice. The study identifies key determinants, including socioeconomic factors such as gender, education, economic status, and living arrangements; health conditions influencing workforce engagement; and the role of social security provisions, including pensions and insurance. Findings highlight that older adults with lower financial security, limited education, and better health status are more likely to work. Rural-urban disparities and gender differences also play a crucial role. The paper underscores the need for policy interventions focusing on social security expansion, accessible healthcare, and employment opportunities in less physically demanding sectors to promote active and healthy aging. Addressing these challenges can ensure economic stability and well-being for India's growing elderly population.

Keywords: ***Labour force participation, Older adults, Longitudinal Ageing Study in India, Employment, Work Participation, Workforce Engagement***

Introduction

The aging population is a pressing issue facing many countries, with India experiencing significant demographic shifts as life expectancy increases and the proportion of older adults rises. As individuals age, their participation in the labour force becomes an essential aspect of both their economic well-being and the overall economy. In India, a substantial number of older adults, particularly those over the age of 60, remain engaged in the workforce, often influenced by various factors such as economic necessity, health status, and social support systems.

Research indicates that nearly three-fourths of older adults in India are economically dependent in various ways, driven by factors like widowhood, the transition from salary to pension income, and inadequate savings (Kumar & Kumar, 2019; Rajan, 2010). This economic vulnerability compels many to continue working beyond retirement age to sustain themselves. Furthermore, health conditions play a crucial role in determining the ability and necessity to work, as older individuals face a myriad of health challenges, including non-communicable diseases, which can complicate their employment status (Kanitkar et al., 2018; Chattopadhyay, 2004).

This paper explores the multifaceted relationship between labour force participation, health, and socioeconomic conditions among older adults in India. It aims to shed light on the complexities of this demographic group's work status amidst ongoing changes in Indian society. By examining factors such as gender dynamics, education levels, and the rural-urban divide, this analysis seeks to inform policymakers about the needs of older adults and the implications for social security and economic policies aimed at fostering active and healthy aging in the country.

Review of literature

Gender: Between 1971 and 2001, older women's rates of workforce involvement rose, whereas older men's rates fell (Dhillon & Ladusingh, 2013). The feminization of aging may be one explanation for this, as a higher percentage of widows increases labour force participation because of their economic vulnerability (Quinlan & Mayhew, 1998). Additionally, in rural India, almost one-fifth of older women work on farms, while only one-tenth of their urban counterparts are involved in any kind of economic activity (Selvaraj et al., 2014). This is due to a lack of skills and a lack of alternative income-generating activities (Clark & Anker, 1993; Adhikari et al., 2011; India, 2011). This could be the reason why women in rural areas are more likely than those in urban areas to be employed (Chaudhary & Verick, 2014).

Education: It is anticipated that greater education will improve one's capacity, willingness, and employment prospects as one matures (Peracchi & Welch, 1994; Bass, 2009; Haider & Loughran, 2011). Because more educated workers start their careers relatively later than their less educated counterparts, they may need to work until relatively older ages to maintain income security and savings, indicating a positive relationship between education and employment at later ages (Börsch-Supan & Ferrari, 2020). Additionally, task complexity and work autonomy result in increased employment rates with education in industrialized nations like Sweden, Denmark, and Germany (Larsen & Pedersen, 2017). However, in India, older persons with higher education tend to leave the labour force since there aren't enough good work possibilities, defying the positive correlation between greater education and employment at later ages (Das & Desai, 2003).

Health Status and Employment: Empirical studies emphasize the strong correlation between health and the ability of older adults to remain in the workforce. Research by Angel et al. (2003) indicated that health deterioration associated with aging often leads to economic challenges, impacting labour force participation. In India, Chattopadhyay et al. (2022) echo this sentiment by highlighting that older adults in good health are significantly more likely to be employed, suggesting that better healthcare systems could improve labour market outcomes for this demographic.

Economic Security and Pension Coverage: The economic imperative to work among older adults has been extensively studied, with a common theme being insufficient social security. Adhikari et al. (2011) found that labour force participation is higher among individuals without pension coverage, as they are forced to rely on continued employment for financial security. Chattopadhyay et al. (2022) further elabourate on this, pointing out that the absence of comprehensive pension schemes in India forces many older adults into the workforce, often in precarious and informal jobs.

Labour Force Participation Trends: The labour force participation of older adults has been a subject of significant research. Ahn and McGowan (2016) observe that, globally, there has been an increase in the number of older adults engaging in the workforce. Specifically, in the context of India, Chattopadhyay et al. (2022) find that approximately 36% of adults aged 60 and above are active in the labour market, predominantly in agriculture and related sectors. This trend suggests a growing reliance on older individuals for workforce stability, especially in developing economies.

Data Analysis and results

The overall statistic shows that 61.9% of adults aged 45 and above are currently employed. This figure reflects a significant reliance on work to secure financial stability among older adults. Among those aged 60 and above, the percentage is 36, indicating that a significant portion of the elderly population (60+) is also active in the labour market, challenging the assumption that retirement is the norm beyond a certain age. It suggests economic necessity or a desire for continued engagement in the workforce. The trend suggests a desire among older adults to remain economically active. However, the decrease in employment among those aged 60 and above highlights potential barriers to continuing work, such as health issues, discrimination against older workers, or family obligations. The decline in proportion for 60+ compared to 45+ could be attributed to health issues, voluntary retirement, or the pursuit of other life activities.

91.5% of males aged 45-59 are currently working, compared to 44.2% of females. Among those aged 60 and older, 50.9% of males are working, while only 22% of females are. The disparity in employment between genders indicates systemic barriers that older women face, which may include social norms, caregiving responsibilities, and limited access to skills training. The significant drop in employment for older women suggests that these barriers may worsen with age, thus obstructing financial independence.

Among older adults, 62.6% are working in the 45-59 age group, and 43.4% in the 60+ group. Employment rates for this group are 55.3% (45-59) and 22.4% (60+), indicating that married individuals tend to be more engaged in the workforce than their widowed counterparts. Marital status appears to influence work engagement. Married individuals might benefit from dual-income households, while widowed individuals may encounter economic hardships that prevent them from continuing to work, especially in the absence of pension support or financial stability.

In the poorest economic group, 64.6% of individuals aged 45-59 are currently working, but this drops significantly to 35.5% for those aged 60 and above. In contrast, employment is less prevalent in the richest group, with 60.9% of those aged 45-59 working, declining further to 31.3% beyond the age of 60. The lower employment rates among the richest older adults could indicate a reliance on pensions or personal savings, while those from poorer quintiles must remain in the workforce to survive. It underscores that financial security in retirement is often tied to income levels prior to retirement.

Among those who work, two-thirds are employed in agriculture and allied services;

only 5% have full-time employment, and a mere 6% receive a work-related pension. The high concentration of older adults in agricultural jobs highlights the reliance on informal or self-employed work. The low percentage of full-time positions and pension coverage indicates limited social security infrastructure for older workers, reinforcing economic vulnerabilities.

Education level significantly influences employment among older adults. Among those with no formal schooling, 60.9% remain engaged in work. In contrast, while 62.8% of individuals with 10 or more years of education are employed, their participation in the workforce declines sharply with age, dropping to 35.2% for those aged 60 and above as they transition into retirement. Education appears to correlate with employment opportunities and potentially with the type of work available. Those with little to no formal education may occupy less secure, informal positions, while educated individuals may transition to retirement more easily. Also, educational attainment affects the type of jobs accessible, with lower educational levels leading to higher competition for less desirable positions. The lower educational attainment and lack of family support are linked to continued labour force participation, possibly driven by financial necessity. Conversely, individuals with better health and social networks may have the means to retire comfortably.

In urban areas, older adults across wealth categories exhibit similar labour force participation rates, while vulnerable older females (rural, living alone, divorced/separated) work more than their male counterparts. This challenges the stereotype that only economically disadvantaged older adults work, revealing a more complex interaction of gender, socioeconomic status, and rural-urban dynamics. The higher participation rate among vulnerable females likely reflects limited economic opportunities and greater familial responsibilities.

Scheduled Tribes has high participation in the workforce (74.9% working at ages 45-59) compared to other categories. Caste continues to be robust indicators of work status and economic opportunity. Scheduled Tribes may face economic necessities that push them towards work.

Employability decreases significantly as age increases, particularly after 60, which correlates with an increase in health-related issues such as chronic diseases, mobility limitations, and other age-related health declines. The findings highlight the potential health challenges faced by older adults. Many may choose to retire due to health concerns, suggesting a need for healthcare services that cater to chronic conditions commonly found in older populations. Promoting preventive health measures could enable longer workforce participation.

Pension systems and social security are critical components for the economic stability of older adults, particularly in a rapidly aging society like India. A significant portion of older adults in India are economically dependent due to inadequate pension coverage. More than one-third (36%) of older adults currently work, indicating a considerable number who may not have sufficient pension income to support themselves. This lack of coverage leads many to continue working beyond the traditional retirement age.

Older adults in India often transition from salary-based income to pensions, which may not adequately support their living expenses. The findings reveal that working older adults earn much less than the average monthly pension received by the officially retired population, suggesting that many older individuals are compelled to work to meet their financial needs. The interplay between health and economic status is paramount. Older adults face many non-communicable diseases, prompting concerns about escalating healthcare costs that may not be affordable on limited pensions. Many older adults engage in work to manage these rising health expenditures, further highlighting the need for enhanced social security.

Suggestions

Expanding pension schemes and social security benefits tailored for older adults is essential in reducing economic dependency and ensuring a stable income post-retirement. Strengthening these financial safety nets can provide older individuals with greater economic security, allowing them to make informed choices about their participation in the workforce. Additionally, improving healthcare access through targeted programs can promote healthy aging and better management of chronic diseases, enabling older adults to maintain their physical and mental well-being. With adequate healthcare support, they can continue to contribute effectively in professional and social spheres.

Investing in lifelong learning and vocational training is equally crucial, particularly in rural areas where employment opportunities may be limited. Educational programs that equip older adults with new skills aligned with evolving job markets can enhance their employability and reduce the risk of social and economic marginalization. Furthermore, targeted interventions should be developed for at-risk populations, including widows, divorced individuals, and those living alone, to ensure they have access to both economic and social resources. These efforts can help create a more inclusive society where older adults are not left vulnerable due to life circumstances.

In addition to economic and educational support, fostering an age-friendly work environment is vital to encouraging the continued workforce participation of older adults. Implementing flexible work arrangements, promoting policies that accommodate their needs, and creating a supportive organizational culture can enable older individuals to balance their professional and personal commitments effectively. At the same time, further research is necessary to explore the motivations and challenges those older adults face in the labour market. Understanding these factors can lead to the development of more effective policies and programs that address their specific needs. By implementing these strategies, societies can create a more supportive environment that values the contributions of older adults while ensuring their well-being and economic security.

Conclusion

The labour force participation of older adults in India is a complex phenomenon shaped by various interrelated factors, including economic necessity, health status, and social conditions. This analysis highlights that a substantial proportion of older adults continue to work, often driven by financial vulnerabilities and the necessity to achieve basic sustenance. Despite common perceptions that only economically disadvantaged individuals engage in the workforce beyond the age of 60, the data reveal that many older adults across different wealth categories remain active participants in the labour market, particularly in rural areas.

The findings underscore the critical role of health in influencing work status among older adults. Individuals experiencing better health are more likely to continue working, thus complicating the narrative that equates labour force participation with economic hardship alone. Policies aimed at promoting healthy aging and addressing the healthcare needs of older adults are essential for enabling them to continue working if they choose. Furthermore, there is a pressing need for comprehensive social security frameworks that ensure the economic stability of this demographic, allowing for improved quality of life in later years.

In conclusion, supporting active aging through targeted investments in health care, social security, and employment opportunities can enhance the well-being of older adults in India. This approach not only benefits the older population but also contributes to the broader economy by harnessing the potential of an experienced workforce. Continued research is necessary to further explore the motivations of older adults when it comes to work, as well as the development of effective policies that promote both economic participation and health in the aging population.

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SOWING SUCCESS: WOMEN ENTREPRENEURS AND THE MILLET REVOLUTION

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Abstract

The global shift towards sustainable and nutritious food options has sparked a millet revolution, opening new avenues for women entrepreneurs in agriculture and food processing. This study explores the role of women-led millet enterprises, analyzing the opportunities they harness and the challenges they encounter in their journey toward success. It examines key factors such as access to finance, market dynamics, technological advancements, and policy support, which influence the growth and sustainability of their businesses.

Women entrepreneurs in the millet sector are not only promoting the revival of traditional grains but also driving innovation through value-added products, organic farming, and eco- friendly business models. Their contributions extend beyond economic gains, impacting rural development, food security, and women's empowerment. However, barriers such as limited market access, financial constraints, lack of business training, and socio-cultural biases often hinder their progress.

This study underscores the need for a holistic support system, including government incentives, financial aid, skill development programs, and cooperative networks, to strengthen women's participation in the millet economy. By overcoming these challenges, women entrepreneurs can play a transformative role in reshaping the agricultural landscape, fostering sustainable agribusiness, and ensuring the long-term success of the millet revolution.

Keywords: Financial constraints, Empowerment, Market access, Policy support, Value added products, Skill development.

INTRODUCTION

In recent years, the importance of sustainable agricultural practices and food security has gained significant attention globally, particularly in India. As traditional grains like rice and wheat dominate the market, millets-often referred to as “Nutri-cereals”—are emerging as an alternative that offers both health benefits and environmental resilience. Millets are not only highly nutritious but also drought-resistant, making them suitable for cultivation in a variety of climatic conditions. Despite these benefits, millets have remained a neglected crop for decades. However, with renewed focus on security and health, millet witnessing a revival, and growing number of entrepreneurs are capitalizing on this trend. In Kerala, a state known for its agricultural diversity, there is an increasing interest among entrepreneurs to build businesses around millet products. Women in particular are playing a central role in this movement, using their knowledge of traditional practices and culinary skills to establish millet-based enterprises. These women entrepreneurs contribute significantly to the local economy, promote sustainable agriculture, and play a role in the renewal of indigenous grains. Yet they face a unique set of challenges ranging from market access and capital constraints to societal attitudes and policy limitations.

Over thousands of years, people have been cultivating millets, a family of small-seeded grasses, in many parts of the world, but especially in Africa and Asia. Thanks to its nutritional value, hardiness in extreme weather and capacity to thrive in drought-prone areas, millets have become more popular to produce and eat in recent years. Smallholder farmers, particularly women, now have more chances to pursue agricultural entrepreneurship because of the increased popularity of millets. Women are heavily involved in home administration, food production, and money generation in many rural areas, especially in developing nations. The emergence of millet-based business has provided women with more opportunities to utilize their expertise in agriculture and support rural economies. The potential of millet-based entrepreneurship for women notwithstanding, there are significant obstacles that they must overcome, including as limitations based on gender and society and limited access to markets, capital and technology. This study explores the experiences of female company owners who own companies centered around millet. With a focus on the socioeconomic, cultural, and financial factors that affect their performance and work-life balances, it attempts to examine the opportunities and problems individuals face while pursuing their entrepreneurial goals.

1.1 STATEMENT OF PROBLEM

Millets are gaining recognition for their nutritional benefits and environmental sustainability. However, women entrepreneurs in Kerala face significant challenges in starting and running millet-based businesses. These challenges include limited access to funding, poor infrastructure for processing and marketing, and lack of support from institutions. Additionally, low consumer awareness about millet-based product makes it difficult for these business to thrive.

Despite their important role in promoting sustainable agriculture and supporting rural livelihoods, the struggles of women millet-based entrepreneurs have not been well studied. Most existing research focuses on millet farming and consumption, leaving a gap in understanding the specific issues faced by women entrepreneurs in this field.

Addressing these challenges is essential to empower women, support sustainable agriculture, and strengthen food security. This study aims to explore the challenges faced by women millet-based entrepreneurs in Kerala and identity opportunities to support and grow their businesses.

1.2 SIGNIFICANCE OF THE STUDY

This study is important because it focuses on the challenges faced by women millet-based entrepreneurs in Kerala, a critical yet underexplored area. Women play a key role in promoting millets, which are vital for sustainable agriculture, better nutrition, and local economic development. The finding will help to identify the barriers these entrepreneurs face, such as limited financial support, poor market access, and institutional challenges. It will also highlight opportunities to empower them and support their businesses.

By addressing these issues, the study aims to provide practical insights for policymakers and stakeholders to create effective interventions. It also emphasizes the broader impact of millet-based enterprises on food security, climate resilience, and gender equality. This research will contribute to the growth of the millet sector while promoting inclusive and sustainable development in Kerala.

1.3 REVIEW OF LITERATURE

1. **Ministry of Women and child Development (2023): Entrepreneurial support for Women in Agriculture,** This government report explores various schemes designed to promote women-led agribusinesses, including millet-based entrepreneurship. It highlights initiative like PM formalization of Micro Food Processing Enterprises (PMFME), which offer financial support, skill training and marketing assistance. For women in Kerala, programs like Kudumbashree play a pivotal role by providing microfinancing, cooperative models, and business training tailored to rural women. The report also emphasizes the need for awareness campaigns to help women entrepreneurs fully utlize these resources.
2. **Thomas, M., & George, A (2022): Consumer perception of millet products in Kerala,** This study examines the growing popularity of millet products in Kerala., driven by rising health consciousness and lifestyle changes. The findings reveal that urban consumers are more inclined towards millet-based products due to their health benefits, whereas rural consumers show resistance due to higher costs and unfamiliarity with millet-based diets. This dichotomy poses a challenge for entrepreneurs targeting diverse markets. Thes study also identifies the role of branding, packaging and consumer education in boosting market acceptance. For women entrepreneurs, this highlights the need to adopt innovative marketing strategies and educate consumers about the nutritional benefits of millet products.
3. **Gupta, A ., & Patel, k. (2021) Millets for sustainable development : A review,** this study focuses on the role of millets in achieving sustainable development goals, emphasizing their importance in addressing issues like food security, malnutrition, and climate change. Millets are resilient to drought and pests, making them ideal for regions like Kerala, where erratic monsoon impact agriculture. The author highlights opportunities for entrepreneurs to capitalize on the growing demand for healthy, organic food products. However, they identify significant challenges, including inadequate consumer awareness, limited market infrastructure and underdeveloped processing technologies. For women entrepreneurs in Kerala, understanding these challenges is crucial for positioning their millet-based ventures in competitive markets.
4. **Reddy, B. V. S et al. (2020) Value addition in millet: scope and challenges,** the study emphasize the critical role of value addition in enhancing the profitability of

millet- based products. Value-added products such as millet-based snacks, flours and ready-to- eat meals have growing market among health-conscious consumers. However, the study also highlights key barriers including the lack of advanced processing technologies, high production cost and difficulty in maintaining product consistency. For women entrepreneurs in Kerala, the findings underscore the importance of investing in innovative technologies and leveraging local resources for product development.

5. **Singh, R., & Sharma, P (2019) Women Agripreneurs: challenges and success factors,** this article provides a gender-specific analysis of agricultural entrepreneurship,highlighting the systematic barriers women faces. Issues such as lack of access of capital, limited decision making power and societal expectation are common hurdles. For Kerala's women millet entrepreneurs, these challenges are amplified due to traditional family roles and social norms. However, the study also identifies success factors such as access to training programs, mentorship and networking platforms. This is highly relevant for research, as it provides insights into how targeted intervention can empower women to overcome these barriers and thrive in the millet-based entrepreneurship space

1.4 RESEARCH GAP

Despite the growing awareness of millets as a sustainable and nutritious crop and the expanding role that women entrepreneurship plays in rural development, there is a lack of data covering the entrepreneurs of women who are based on millets. Few research have looked into the difficulties women who own millet-based businesses encounter as they move from ancient milling method to modern based enterprises. The prospects for innovation, commercial expansion, and social impact that are open to women entrepreneurs based on millet have not received much attention in study. It is important to figure out how gender, caste and class connect to influence the lives of women millet entrepreneurs.

1.5 OBJECTIVES OF THE STUDY

1. To review and understand the significance of millet-based products.
2. To analyze the social and financial empowerment experienced by women millet entrepreneurs.
3. To explore the challenges faced by women millet entrepreneurs.

1.6 RESEARCH QUESTIONS

1. What is the significance of millet-based products in the current market?
2. How do millet-based women entrepreneurs experience social and financial empowerment through their business ventures?
3. What are the challenges faced by women millet entrepreneurs?

1.7 RESEARCH METHODOLOGY

This study used a quantitative research approach, focusing on a small group of millet entrepreneurs as only a hand full are currently operating in and around in Ernakulam District. The total of 30 were sampled, with data collected through questionnaire and sample survey.

1.7.1 Data collection

Primary and Secondary data are used for data collection. Data was collected through questionnaire and sample survey. After the required data collection it was processed and analyzed using Statistical Package for the Social Science (SPSS).

1.7.2 Primary data

It is the first-hand data collected research while conducting the study. Primary data are collected through online survey method by the way of distributing questionnaire.

1.7.3 Secondary data

The data which is been already collected for some research purposes. It may be from published or unpublished sources. Collecting information through journals, magazines, articles, newspapers, internet etc.

1.8 AREA OF THE STUDY

The study focuses on a sample of 30 entrepreneurs and 100 consumers from the Ernakulam district, focusing on the opportunities and challenges faced by women entrepreneurs.

1.9 POPULATION

The respondents were Women entrepreneurs who are engaged in millet-based business, and Consumers who purchase and use millet products.

1.10SAMPLE SIZE

Entrepreneurs: Data was collected from 30 women entrepreneurs who are involved in various stages of millet production, processing and marketing.

Consumers: To understand the market demand and consumers preferences, the study includes data from 100 consumers of millet-based products.

1.11 TOOLS USED FOR STUDY

The scale used for preparing the questionnaire is Nominal Scale and Likert Scale. Five point scale is used for collecting the responses.

To test the hypothesis of relationship between Social and financial status , Pearson's Coefficient is used.

Chi-square test was applied to analyze the association between consumer responses and their perceived satisfaction.

1.12 RESEARCH HYPOTHESES

1. Social and Financial Empowerment of Women Millet Entrepreneurs

HO: There is no significant relationship between millet entrepreneurship and financial status of women entrepreneurs.

H1: There is significant relationship between millet entrepreneurship and the financial status of women entrepreneurs.

1.14 LIMITATION OF THE STUDY

- Time constraint is the major issue in this study.

DATA ANALYSIS AND INTERPRETATION

This section presents that the analysis and interpretation f data collected for the study titled "From Mills to Millet: A study on Millet-based Women Entrepreneurs-The challenges and opportunities". The analysis aims to explore the key objective of the research, which include understanding the opportunities available to millet-based women entrepreneurs, the challenges faced and the social and financial empowerment they experience. Various statistical tools and techniques are used to extract valuable insights from data, helping to address the research questions and achieve the study's objective. The interpretation of these result's is crucial in getting conclusions and providing recommendation for enhancing entrepreneurial environment for women in millet industry

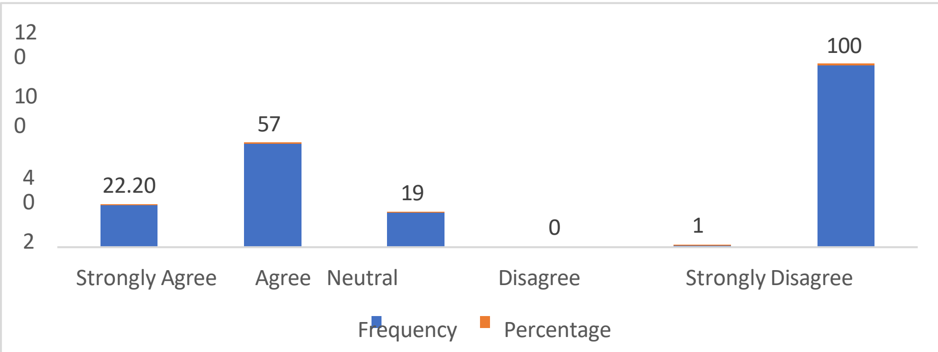
Objective 1: To Review And Understand The Significance Of Millet-Based Products

Table 4.1 Millets are an important source of nutrition and offer significant health benefits compared to conventional staple grains

Millets are recognized for their rich nutritional content and health benefits, offering an excellent alternative to conventional staple grains like rice and wheat. This question aims to explore the awareness and perception of millet nutritional value among the consumers when compared to more commonly consumed grains.

Response	Frequency	Percentage
Strongly Agree	23	23%
Agree	57	57%
Neutral	19	19%
Disagree	0	0%
Strongly Disagree	1	1%
Total	100	100%

Figure 4.1 Millets are an important source of nutrition and offer significant health benefits compared to conventional staple grains



Interpretation

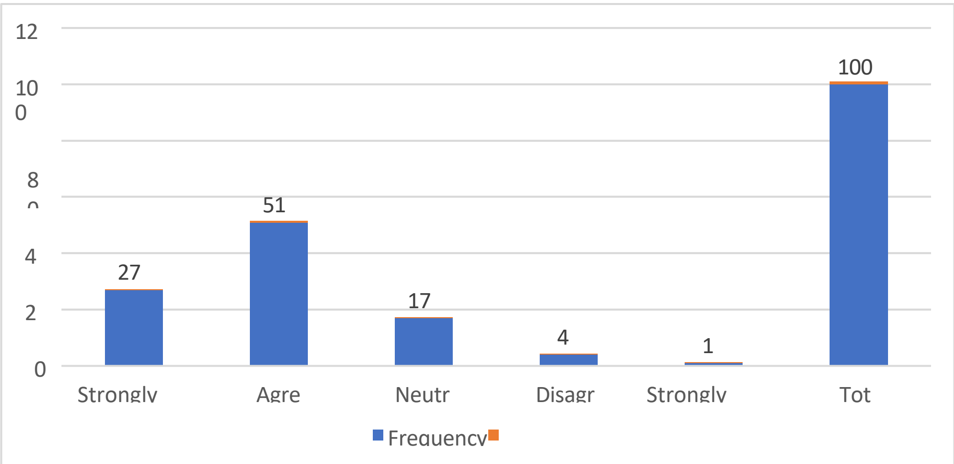
The data in Table 4.1 shows respondents' opinions about the nutritional value and health benefits of millets compared to conventional staple grains. Most respondents (57%) agreed that millets are a valuable source of nutrition and offer significant health benefits, and 23% strongly agreed. About 19% were neutral, indicating they might not have a strong opinion or enough knowledge about the topic. Only 1% strongly disagreed, and none disagreed. This suggests that most people recognize the health benefits of millets, with very little disagreement.

Table 4.2 Millets play a crucial role in enhancing food security due to their adaptability to various environment conditions.

Millets play a vital role in improving food security, especially in regions prone to climate variability and harsh environmental conditions. This question aim to explore how millet adaptability contributes to food security and its potential to sustain communities facing agricultural challenges.

Response	Frequency	Percentage
Strongly Agree	27	27%
Agree	51	51%
Neutral	17	17%
Disagree	4	4%
Strongly Disagree	1	1%
Total	100	100%

Figure 4.2 Millets play a crucial role in enhancing food security due to their adaptability to various environment conditions.



Interpretation

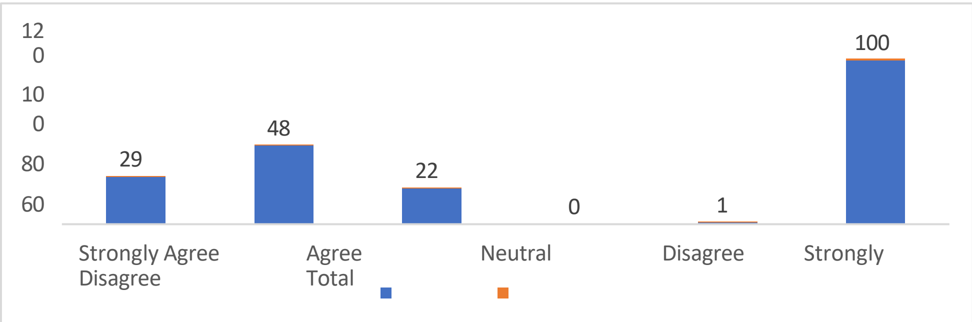
The data in Table 4.2 shows respondents' opinions on how millets help food security because they adapt well to different environments, such as drought or poor soil. Most respondents (51%) agreed, and 27% strongly agreed, showing that many believe millets are important for food security. About 17% were neutral, which might mean they are unsure or lack knowledge about millets. A small number disagreed (4%), and only 1% strongly disagreed, possibly because they may not see millets as a common food choice or are unaware of their benefits. Overall, the results suggest that most people recognize millets as a reliable crop that supports food security due to their ability to grow in tough conditions.

Table 4.3 Millets are crucial components of balanced diet due to their high nutritional value

Millets are considered as a vital part of balanced diet because of their rich nutritional profile. They are packed with essential nutrients. This question seeks to assess the extent to which consumers recognize the role of millets in contributing to a healthy, balanced diet and its awareness of nutritional benefit compared to others.

Response	Frequency	Percentage
Strongly Agree	29	29%
Agree	48	48%
Neutral	22	22%
Disagree	0	0%
Strongly Disagree	1	1%
Total	100	100%

Figure 4.3 Millet are crucial components of balanced diet due to their high nutritional value



Interpretation

Table 4.3 indicates that 77% of respondents (29% strongly agree,48% agree) consider millet as a crucial component of a balanced diet due to their high nutritional value. Meanwhile, 22% of respondents expressed a neutral stance, suggesting a need for greater awareness of millet's nutritional benefits. Only 1% strongly disagree and 0% disagreed.

Objective: 2 To Analyze The Social And Financial Empowerment Experienced By Women Millet Entrepreneurs.

This objective aims to explore how engaging in millet-based entrepreneurship has contributed to the social and financial empowerment of women. It examines how these women has obtain greater economic independence, improved their financial stability and enhance their role in both family and society. It also looks how these entrepreneurship has influenced their self- confidence. Decision making ability and overall quality of their life.

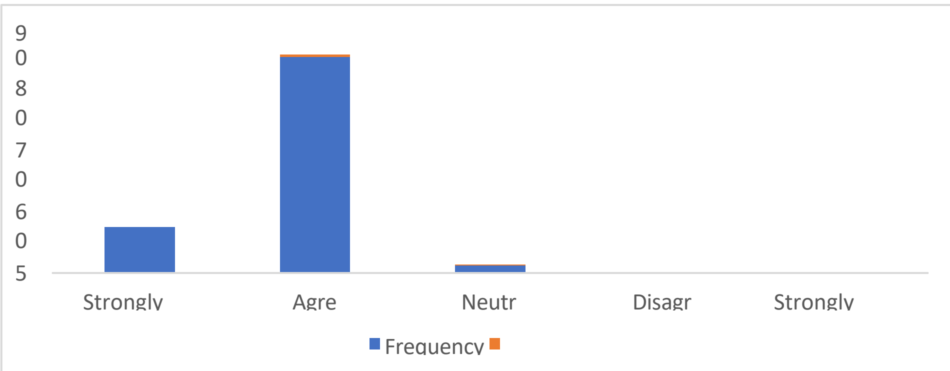
Table 4.4 Owning a millet-based business has improved social and financial recognition in the community.

For many women entrepreneurs, owning a millet-based business has not only brought financial benefits but also enhanced their social standing and recognition within their communities. By contributing to local economies and offering sustainable, health-conscious products, these women often gain greater respect and visibility in their social circles. This question aims to assess how entrepreneurship has affected their reputation, social influence, and the respect they receive from family, peers, and the broader community.

Response	Frequency	Percentage
Strongly Agree	6	20%
Agree	24	80
Neutral	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	30	100%

Source: Field Study

Figure 4.4 Owning a millet-based business has improved social and financial recognition in the community.



Interpretation

Table 4.4 presents the responses of millet entrepreneurs regarding the impact of owning a millet-based business on their social and financial recognition. A total of 100% of respondents either agree (80%) or strongly agree (20%) that their business has improved their recognition. This indicates a strong perception among the entrepreneurs that their businesses are contributing to a better social and financial standing in the community. The absence of neutral or negative responses suggests that the benefits of owning a millet-based business are widely recognized and experienced by all respondent.

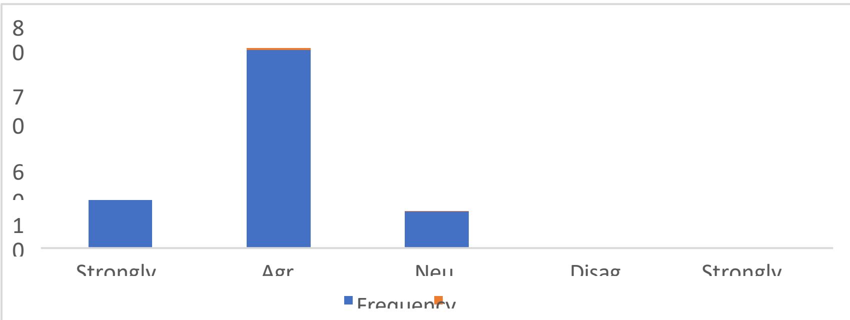
Table 4.5 Empowerment of women entrepreneur to make decisions on business and personal life.

Entrepreneurship often empowers women to take greater control of both their business and personal lives. Running a millet-based business can enhance their ability to make independent decisions regarding their operations, finances, and growth strategies, while also impacting personal choices related to family, time management, and social roles. This question seeks to explore how entrepreneurship has influenced women's autonomy in decision-making, both professionally and personally, and the extent of their empowerment in these areas.

Response	Frequency	Percentage
Strongly Agree	6	17%
Agree	20	70%
Neutral	4	10%
Disagree	0	0%
Strongly Disagree	0	0%
Total	30	100%

Source: Field Study

Figure 4.5 Empowerment of women entrepreneur to make decisions on business and personal life.



Interpretation

Table 4.5 shows that a large majority of women entrepreneurs feel empowered to make decisions in both their business and personal lives. Specifically, 70% agree and 17% strongly agree, indicating strong feelings of empowerment. This suggests that most women entrepreneurs feel confident in their ability to make important decisions. However, 10% are neutral, suggesting that some may still experience limitations or challenges in decision-making, perhaps due to external or personal factors. The absence of any disagreement indicates that none of the respondents feel disempowered in their decision-making abilities. Overall, this reflects a generally positive view of empowerment among the women entrepreneurs surveyed.

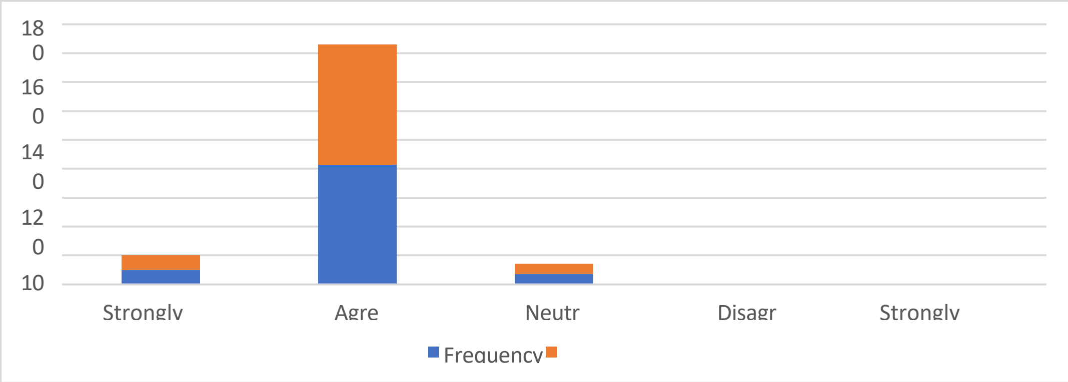
Table 4.6 Running millet-based has allowed to create employment opportunities for others in the community.

Entrepreneurship often empowers women to take greater control of both their business and personal lives. Running a millet-based business can enhance their ability to make independent decisions regarding their operations, finances, and growth strategies, while also impacting personal choices related to family, time management, and social roles. This question seeks to explore how entrepreneurship has influenced women's autonomy in decision-making, both professionally and personally, and the extent of their empowerment in these areas.

Response	Frequency	Percentage
Strongly Agree	4	13.3%
Agree	25	83.3%
Neutral	1	3.4%
Disagree	0	0%
Strongly Disagree	0	0%
Total	30	100%

Source: Field Study

Figure 4.6 Running millet-based has allowed to create employment opportunities for others in the community.



Interpretation

Table 4.6 shows that a significant majority of millet entrepreneurs (83.3%) agree that running a millet-based business has allowed them to create employment opportunities for others in the community, with 13.3% strongly agreeing. This reflects a positive impact on local employment, indicating that millet businesses contribute to community development. Only 3.4% of respondents are neutral, suggesting they may not have seen as much direct impact on employment creation, possibly due to the scale of their business or other limitations. No respondents disagreed or strongly disagreed, reinforcing the general consensus that millet businesses help generate local employment.

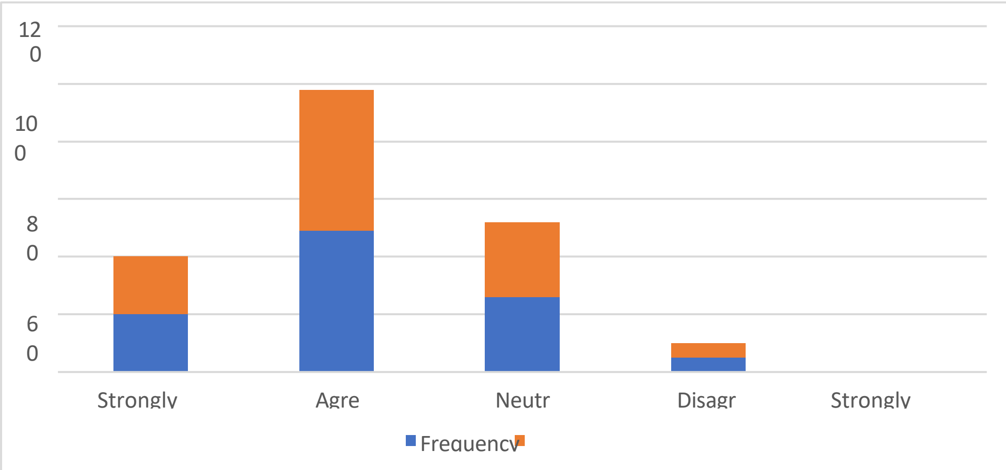
Table 4.7 Income generated from millet-based business has enabled to improve family's living standard.

Entrepreneurship often empowers women to take greater control of both their business and personal lives. Running a millet-based business can enhance their ability to make independent decisions regarding their operations, finances, and growth strategies, while also impacting personal choices related to family, time management, and social roles. This question seeks to explore how entrepreneurship has influenced women's autonomy in decision-making, both professionally and personally, and the extent of their empowerment in these areas.

Response	Frequency	Percentage
Strongly Agree	2	7%
Agree	24	80%
Neutral	4	13%
Disagree	0	0%
Strongly Disagree	0	0%
Total	30	100%

Source: Field Study

Figure 4.7 Income generated from millet-based business has enabled to improve family's living standard.



Interpretation

Table 4.7 shows that a large majority of millet entrepreneurs (80%) agree that the income generated from their millet-based business has improved their family's living standards, with 7% strongly agreeing. This suggests that the businesses have a positive financial impact on their families, contributing to a better quality of life. A small percentage (13%) are neutral, indicating that while they might not yet see significant improvements, they may still experience some positive effects. No respondents disagreed or strongly disagreed, suggesting that millet entrepreneurship is generally seen as a source of financial upliftment for the families involved.

Table 4.8 Hypothesis testing

Research Hypothesis

Ho: There is no significant relationship between social and financial empowerment and the challenges faced by women.

H_1: There is significant relationship between social and financial empowerment and the challenges faced by women.

		Social and Financial Empowerment	Challenges Faced by Women Entrepreneurs
Social and Financial Empowerment	Pearson Correlation	1	.043
	Sig. (2-tailed)		.817
	N	31	31
Challenges Faced by Women Entrepreneurs	Pearson Correlation	.043	1
	Sig. (2-tailed)	.817	
	N	30	30

Interpretation

The table 4.8 presents the result of a Pearson correlation analysis between social and financial empowerment and challenges faced by women.

The correlation coefficient (r = 0.043) indicates a very weak positive relationship. This means that as the challenges faced by women increase, there is almost no significant increase or decrease in their social and financial empowerment levels.

The p-value (Sig. 2-tailed) is 0.817, which is much greater than the standard significance level of 0.05, the null hypothesis is accepted. This means there is no significant relationship between the social and financial empowerment and the challenges faced by women.

Objective: 3 To Exlpore The Challenges Faced By Women Millet Entreprenurs.

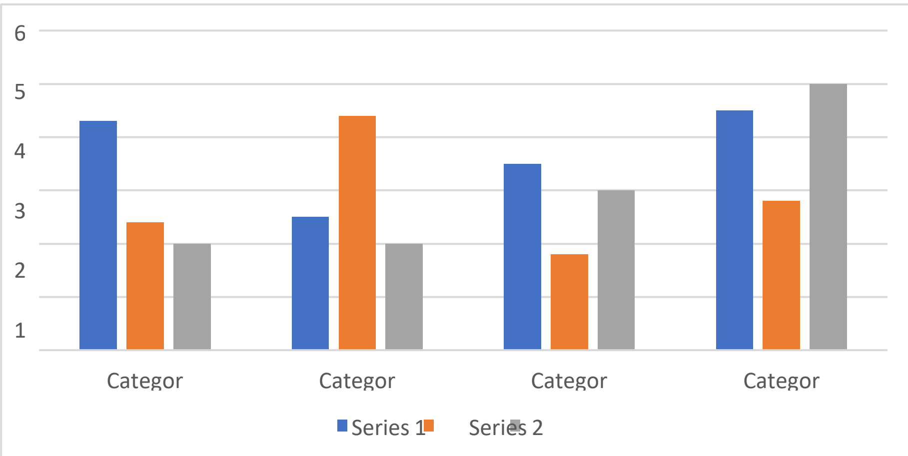
The objective of this study is to explore the unique challenges faced by women entrepreneurs, with a specific focus on those engaged in millet-based enterprises. Through this analysis, the study aims to provide a deeper understanding of their experience and identifying solutions to address these challenges effectively.

Table 4.9 Overview of Challenges faced by Women Millet Entrepreneurs

	Statements	**SA**	**A**	**N**	**D**	**S D**
1. **Lack of affordability**	The affordability of millet products affecting your purchasing decisions	3	18	9	0	0
		10 %	60%	30%	0%	0%
2.**Inferior image**	Millet-based products are often seen as having a less favourable image compared to other food products.	3 10 %	22 73%	5 16%	0 0%	0 0%
3.**Sensory attributes**	The sensory attributes (Taste, Texture, Aroma, Appearance) of millet-based product influence your decision to purchase them.	2 6%	21 70%	7 24%	0 0	0 0
4.	Management of both millet business and family responsibilities often cause stress and fatigue.	0 0%	26 87%	4 13%	0 0%	0 0

Source: Field Study

Figure 4.9 Overview of challenges faced by women millet entrepreneurs



Interpretation

Table 4.9 highlights the various challenges faced by women millet entrepreneurs, starting with the most significant issue. The highest concern is the **management of both business and family responsibilities**, with 87% of respondents agreeing that this causes stress and fatigue. This suggests that balancing business demands with family life is a substantial burden for many women entrepreneurs. Next, **inferior image** is a challenge, as 73% of respondents agree that millet-based products are often seen as having a less favorable image compared to other food products. This indicates that perception and branding issues are hindering the growth of millet-based businesses. **Affordability** is another significant challenge, with 60% agreeing that the cost of millet products impacts consumer purchasing decisions. This shows that pricing remains a key barrier to reaching a wider market. Finally, **sensory attributes** like taste, texture, aroma, and appearance influence 70% of respondents, although 24% remain neutral. This suggests that while sensory factors are important for many consumers, their impact may vary depending on individual preferences. Overall, these challenges highlight the need for improved market perception, pricing strategies, and product development to support women millet entrepreneurs.

GREEN TRANSFORMATIONAL LEADERSHIP: A PATHWAY TO SUSTAINABLE EMPLOYEE EXCELLENCE

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Abstract

Green transformational leadership (GTL) represents a contemporary leadership approach that integrates environmental sustainability into the core of transformational leadership principles, aiming to inspire and motivate employees toward achieving sustainable excellence. This leadership style emphasizes creating a compelling vision for sustainability, fostering innovation, and empowering employees to contribute to eco-friendly organizational goals. By role-modelling green behaviours and encouraging an organizational culture centred on environmental consciousness, GTL enhances employee engagement, performance, and well-being. As a pathway to sustainable employee excellence, GTL not only aligns individual and organizational goals with broader environmental imperatives but also drives innovation and long-term success. This study explores the role of GTL in shaping employee behaviours, fostering a culture of sustainability, and achieving exceptional organizational outcomes, particularly in industries like IT, where green innovation and employee engagement are critical for competitive advantage.

UNDERSTANDING OF MOOC AMONG PG STUDENTS – AN EXAMINATION OF PERCEPTION, BENEFITS AND CHALLENGES

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ABSTRACT

Massive Open Online Courses (MOOCs) have fundamentally reshaped the educational landscape by providing widespread access to learning opportunities for individuals around the world. These courses, which are open to anyone with an internet connection, offer flexible and inclusive education that transcends traditional barriers such as geographical location, tuition costs, and institutional requirements. Originally introduced in 2008, MOOCs were designed to encourage networked learning and peer interaction. Over time, they have evolved, incorporating various teaching methods, including video lectures, interactive assessments, and real-time discussions, to enhance the learning experience.

MOOCs have had a profound impact on global education, improving accessibility for marginalized populations and offering learners the flexibility to study at their own pace. These courses provide access to high-quality educational resources and instructors, allowing individuals to develop valuable skills in rapidly advancing fields such as artificial intelligence, data science, and cybersecurity.
Furthermore, MOOCs foster collaboration and knowledge sharing among learners from diverse backgrounds, contributing to a more interconnected global community.

However, MOOCs are not without their challenges. High dropout rates remain a significant concern, with many participants failing to complete their courses due to low levels of engagement and motivation. The lack of personalized support and feedback in some MOOCs exacerbates this issue, leaving learners with limited opportunities for assistance and guidance. Despite these challenges, MOOCs continue to evolve and have the potential to further transform education by offering

a wide range of subjects, certifications, and learning pathways, while encouraging innovation in teaching and student engagement.

Keywords: Flexibility, Online learning, Artificial Intelligence, Collaboration, Cybersecurity, Data Science, Dropout rates.

INTRODUCTION

The advent of digital technology has profoundly reshaped the educational environment, improving accessibility, flexibility and inclusivity. A significant development in this domain is the Massive Open Online Course (MOOC). A MOOC is characterized as an online courses that permits unlimited participation and offers open access to anyone with internet access. The impact of MOOCs on education has been substantial. They have improved accessibility particularly for marginalised populations worldwide.

STATEMENT OF THE PROBLEM

The extensive integration of Massive Open Online Courses (MOOCs) has transformed the educational environment, providing adaptable learning options for students globally. Nevertheless, in spite of their increasing acceptance, MOOCs encounter considerable obstacles in fostering academic advancement, skill development and knowledge enhancement among Postgraduate students.

SIGNIFICANCE OF THE STUDY

The importance of this research is rooted in its ability to greatly enhance the comparison of the adoption of Massive Open Online Course (MOOC) by postgraduate students. The results of this investigation will yield critical insights into the awareness, usage and perception of MOOCs within this student population, thereby guiding educators, policymakers and stakeholders in optimising the design and delivery of MOOCs.

REVIEW OF LITERATURE

Huay You (2019), This paper represents a form of open online education that enhances learning opportunities, particularly within higher education by leveraging information technologies. This study examines personal characteristics including; learning strategies and cognitive appraisal to identify factors that may affect students acceptance of MOOCs in their educational journey. Additionally, perceived usefulness (PU) and perceived ease of use (PEOU) are identified as key factors influencing the adoption of MOOCs. The research was conducted at a university in Selangor, Malaysia, involving pre-university students during the 20118/2019 academic year.

Dominic Petronzi, Munib Hadi (2016), this research investigates the key motivations expressed by individuals enrolled in two specific MOOCs: fundamentals of Clinical Trials and Introduction to Data Science, with a total of 970 participants. A consistent pattern of primary motivations was observed across both MOOCs, with participants highlighting the potential advantages of their current positions or future careers, as well as expressing a general interest in the subject matter or a straightforward desire to learn.

Helene Fournier, Rita Kop (2015), this document discuss ongoing initiatives related to various frameworks designed to steer research, development and evaluation efforts concerning Massive Open Online Courses (MOOCs). It will highlight initiatives and activities particularly the current endeavors of the National Research Council (NRC) within the realm of learning and Performance Support Systems and MOOCs, while also addressing significant challenges and issues that require attention in the near future.

RESEARCH GAP

Although there is an increasing amount of research focused on MOOCs, there lack studies that specifically investigate the awareness, benefits, perception and challenges of the post graduate students in colleges concerning MOOCs remains negligible. Addressing these areas, could yield significant insights into strategies enhancing MOOC adoption and improving educational outcomes for postgraduate students. Therefore, this study aims to investigate these dimensions and offer a thorough understanding of postgraduate students engagement with MOOCs.

OBJECTIVES OF THE STUDY

1. To assess the level of awareness regarding MOOCs among postgraduate students in colleges.

2. To evaluate the perception of MOOCs among post graduate students.

RESEARCH QUESTIONS

1. What is postgraduate students awareness and utilizing of MOOC?
2. What factors affect MOOC completion among post graduate students?

RESEARCH METHODOLGY

This study is conducted with the help of both primary and secondary data. Questionnaire method is used for collecting data. It is used for getting the opinion about the respondents perception, benefits and challenges about MOOC courses among the post graduate students. It is conducted in colleges functioning under Cochin corporation.

DATA COLLECTION

Primary and secondary data were used for data collection. Primary data is collected through questionnaire and secondary data is collected from various published sources.

PRIMARY DATA

The primary data were collected through questionnaire from respondents with the help of Google form, the sample size taken for the study is 100.

SECONDARY DATA

Secondary data is collected from various published sources like articles, journals, websites etc.

AREA OF THE STUDY

The area of respondents is confined to post graduate students from 10 colleges functioning under Cochin corporation.

POPULATION OF THE STUDY

The respondents were the post graduate students of 10 colleges functioning under Cochin corporation. The population was 200 by simple random sampling, estimated size was 132. It is calculated on the basis of 132 and by using convenient sampling the estimated sample is taken as 100. It is taken from 10 students from each college.

SAMPLE SIZE

Sample size was taken from 10 colleges functioning under Cochin corporation. 10 students from each college is taken all in total of 100. The estimated sample size using random sampling was 132, sample size is calculated on the basis of population 100.

Confidence level : 95%

Margin of error: 5

Confidence interval: 50

Population : 132

Sample size needed : 100

TOOLS USED FOR THE STUDY

In this study the different tools used were nominal scale, percentage method and Likert scale method. The five point Likert scale contains five response options to the respondents. Example of a five point rating scale for measuring the response is; Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree. Range of the same consist of Strongly Agree (5), Agree (4), Neutral (3), Disagree (2) and Strongly Disagree (1). The most frequent way to represent statistics is by percentage. Percentage is calculated by taking the frequency in the category divided by the total number of participants multiplied by 100.

RESEARCH HYPOTHESES

H_0 : MOOC courses has not significantly influenced in academic growth.
H_1 : MOOC courses has significantly influenced in academic growth.

H_0 : There is no significant effect of MOOC courses on skills and knowledge enhancement.

H_1 : There is significant effect of MOOC on skills and knowledge enhancement.

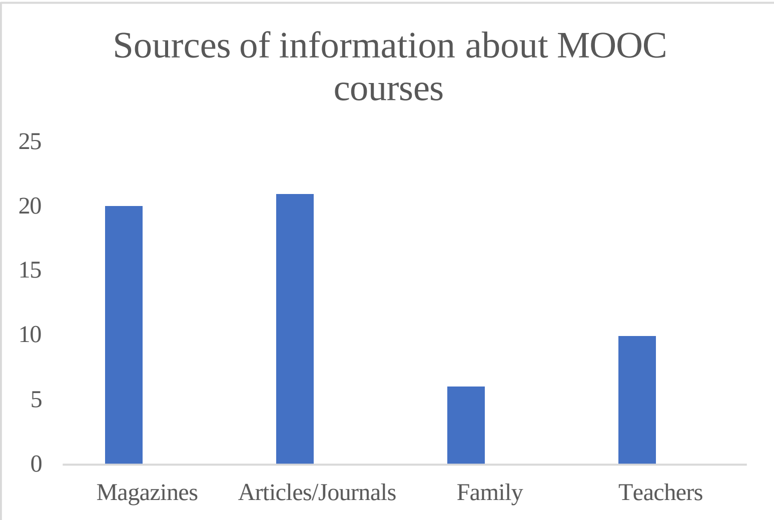
LIMITATIONS OF THE STUDY

- Time constraint
- Confined only to post graduate students.

DATA ANALYSIS AND INTERPRETATION

Sources from where you got the information about MOOC

	Frequency	Percentage
Magazines	20	21
Articles/Journals	21	23
Family	6	6
Friends	10	10
Teachers	34	37
Total	91	100

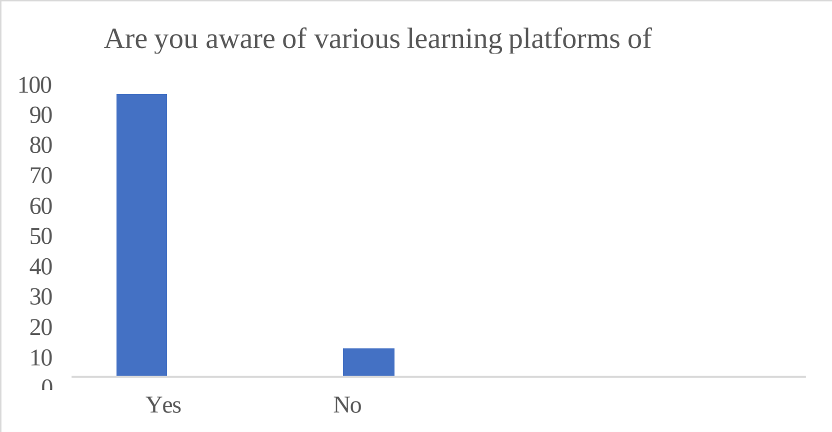


Interpretation

From the above table, the most significant information about MOOCs comes from teachers 37% suggest that educators plays a crucial role in disseminating knowledge about MOOCs, articles and journals represent a substantial source, contributing to 23% of the responses, it indicates that academic literature is a vital resource for understanding MOOCs, magazines at 21% shows a noteworthy level of influence, which may reflect broader public engagement with MOOCs through public media, in contrast information from friends and family is relatively low, at 10% and 6% respectively.

Are you aware of various learning platforms of MOOC

Response option	Frequency	Percentage
Yes	91	91
No	9	9
Total	100	100

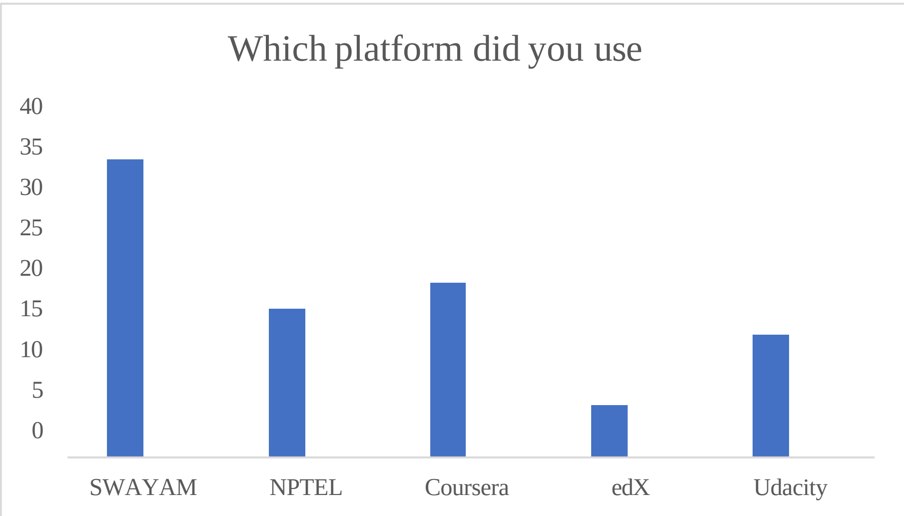


Interpretation

The results indicate that the vast majority of the respondents 91% are aware of various learning platforms of MOOCs , highlighting widespread knowledge of these educational resources. Only 9% of the respondents are unaware of such platforms, suggesting that MOOCs have achieved a significant level of visibility and recognition among learners. This reflects growing prominence of online learning platforms in the educational landscape.

Which Platform Did You Use

Response option	Frequency	Percentage
SWAYAM	34	37.3
NPTEL	17	18.6
Coursera	20	21.9
edX	6	6
Udacity	14	15.3
Total	91	100

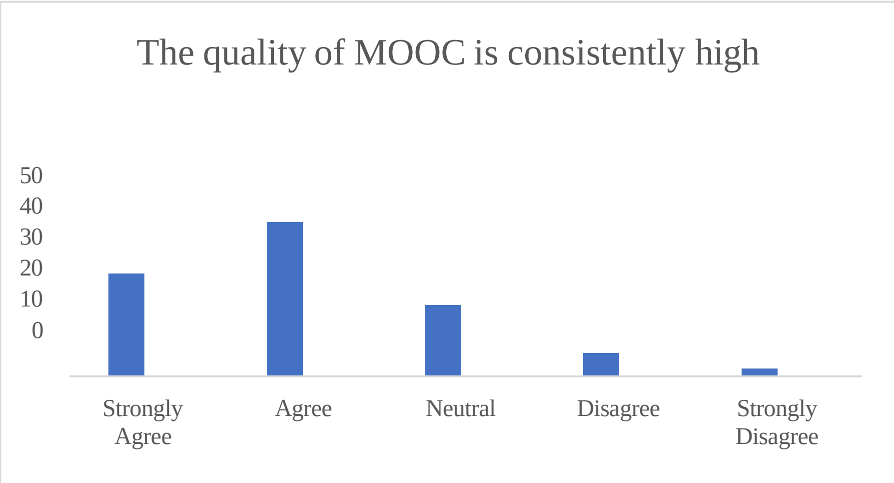


Interpretation

From the table above, SWAYAM is the most frequently used platform with 37.3% of the respondents indicating they use it, this suggest that SWAYAM is dominant platform, likely because it offers a broad range of free courses and is accessible to many users. Coursera (21.9%) and NPTEL (18.6%) are also popular but slightly fewer users than SWAYAM, Coursera's international appeal and diverse course offerings likely to contribute to its popularity. Udacity with 15.3% of the respondents using it, occupies the middle position in popularity. edX has the lowest percentage of 6%.

The quality of MOOC is consistently high

Response option	Frequency	Percentage
Strongly Agree	26	28.5
Agree	39	42.8
Neutral	18	19.7
Disagree	6	6.5
Strongly Disagree	2	2.1
Total	91	100

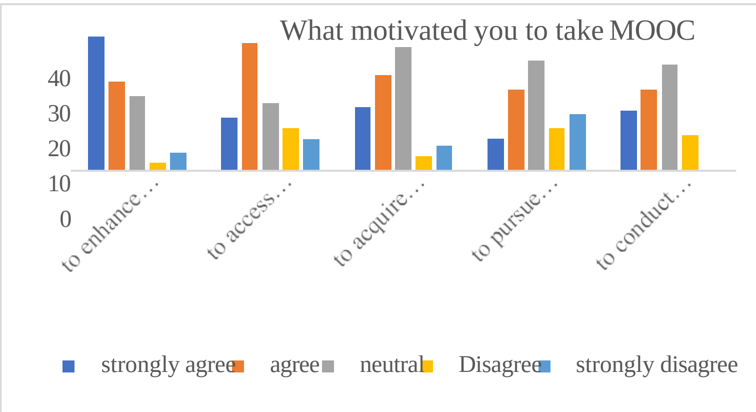


Interpretation

From the above data table indicates that majority of the respondents (71.3%) have a positive perception of the quality of MOOCs, with 28.5% strongly agreeing and 42.8% agreeing that the quality of MOOC is consistently high. Only a small percentage *.6% disagree or strongly disagree, suggesting that while there are a few who have reservations, the overall view is generally favourable. Additionally, 19.7% of the respondents are neutral, indicating some level of indifference or uncertainty about the consistency of MOOC quality. This suggests that MOOCs are widely viewed as having high quality, though there is still a portion of individuals who remain uncertain or have concerns.

What motivated you to take MOOC?

Response options	**Strongly Agree (5)**	**%**	**Agree**	**%**	**Neutral**	**%**	**Disagree**	**%**	**Strongly Disagree**	**%**	**Total**	**%**
To Enhance my profession al career and growth	38	42	25	27.4	21	23	2	2	5	5.4	91	100
To access quality education from anywhere, at anytime	15	16.4	36	39.5	19	20.8	12	13.1	9	9.8	91	100
To acquire new skills and stay updated in my field	18	20	27	29.6	35	38.4	4	4.3	7	7.6	91	100
To pursue my passion and interest in a specific subject	9	9.8	23	25.2	31	34.0	12	13	16	17.5	91	100
To conduct research, collect	17	18.6	23	25.2	30	33	10	11	11	12	91	100
Data and analyse results												

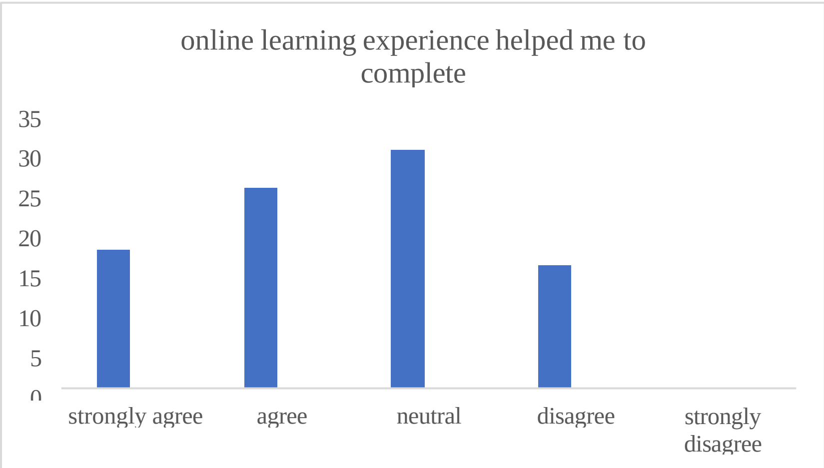


Interpretation

The table above reveals the results that the main motivation for taking MOOCs was to enhance professional career growth, with 42% strongly agreeing and 27.4% agreeing. Additionally, 20% of the respondents were driven by the desire to acquire new skills and stay updated to their field, accessing quality education from anywhere and at anytime was a motivating factor for 16.4% who strongly agreed and 39.5% who agreed. Pursuing personal passions or interest in specific subjects was less of a motivation, with only 9.8% strongly agreeing and 25.2% agreeing. A desire to conduct research and analyse data was also a motivating factor for 18.6% of the respondents, with 25.2% agreeing. Overall, professional development and skill acquisition were the strongest motivations for enrolling in MOOCs.

Online learning experience helped me to complete MOOC courses

Response option	Frequency	Percentage
Strongly agree	18	19.7
Agree	26	28.5
Neutral	31	34
Disagree	16	17.5
Strongly disagree	0	0
Total	91	100

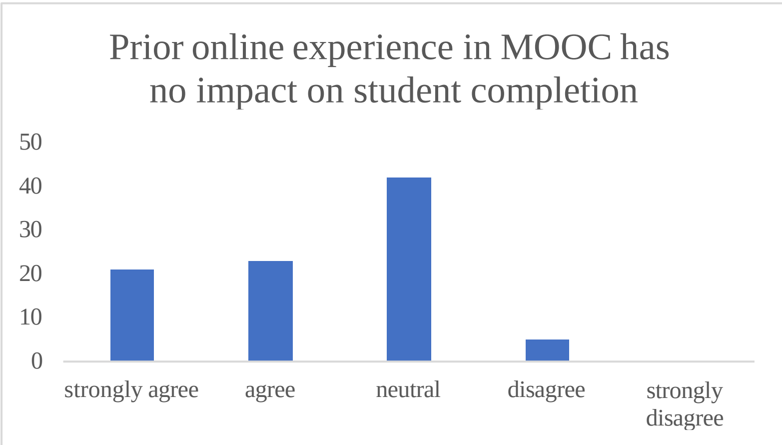


Interpretation

From the table, majority of the respondents (47.7%) felt that the online learning experience helped them to complete their MOOC courses, with 19.7% strongly agreeing and 28.5% agreeing. However, a significant portion 34% remained neutral, indicating that the online format had little impact on their course completion. On the other hand, 17.5% disagreed, suggesting that for some, the online learning experience did not contribute in completing the courses. Notably, no one strongly disagreed suggesting that while online learning posed challenges for some, did not entirely prevent course completion.

Prior online experience with MOOC has no impact on student completion

Response option	Frequency	Percentage
Strongly Agree	21	23
Agree	23	25.2
Neutral	42	46.1
Disagree	5	5.4
Strongly disagree	0	0
Total	91	100

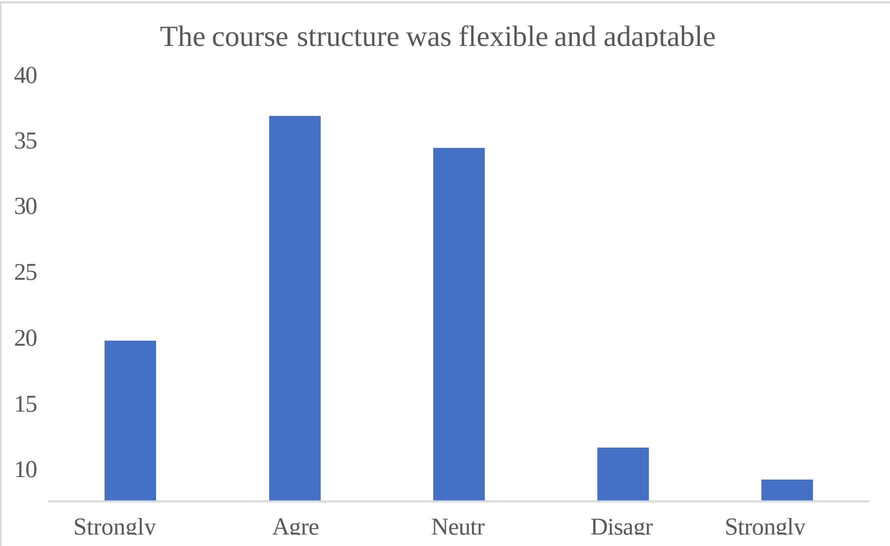


Interpretation

From the table it suggests that a significant portion of the respondents, 23% and 25.2% believe that prior online experience with MOOCs has no impact on their ability to complete the courses. However, a larger proportion, 46.1% remained neutral, indicating uncertainty or indifference regarding the influence of prior online experience on course completion. Only 5.4% disagreed, suggesting that a small minority felt prior experience did have an effect. Notably, no one strongly disagreed, implying that the role of prior experience was not seen as a major hindrance in completing the courses for most of the participants.

The course structure was flexible and adaptable to my research

Response option	Frequency	Percentage
Strongly Agree	15	16.4
Agree	36	39.5
Neutral	33	36.2
Disagree	5	5.4
Strongly disagree	2	2.1
Total	91	100

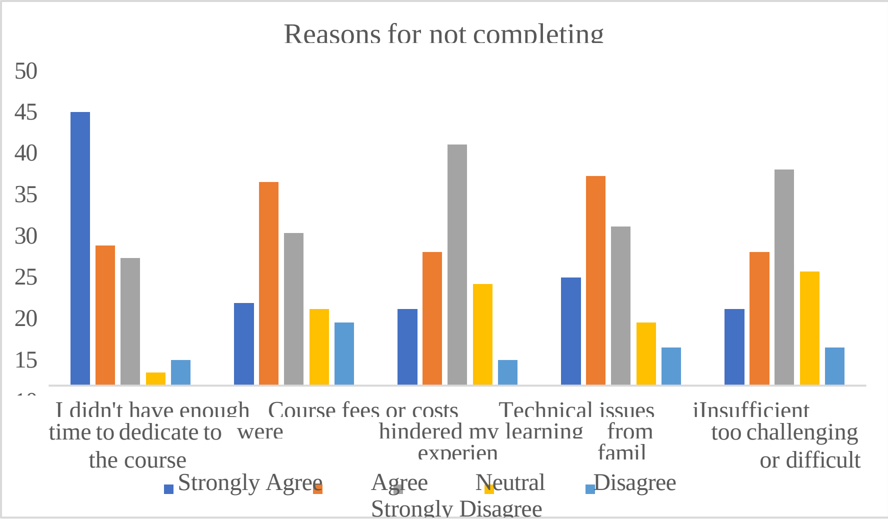


Interpretation

From the above table, majority of the respondents, 16.4% , 39.5% found that the course structure to be flexible and adaptable to their research needs. However, 36.2% **werRee** neutral, indicating that the flexibility of the course structure was neither particularly beneficial nor limiting for them. A small percentage 2.1% and 5.4% of them felt that the course structure was not flexible enough to support their research. This suggests that while the course design was generally perceived as adaptable by most participants, there were still a few who found it lacking in flexibility.

Reasons for not completing MOOC

Responsе options	Strong ly Agree (5)	%	Agree (4)	%	Neutral (3)	%	Disagree (2)	%	Strongly Disagree (1)	%	Total	%
I didn't have enough time to dedicate to the course	43	47.2	22	24	20	22	2	2.1	4	4.3	91	100
Course Fees or cost were expensive	13	14.2	32	35.1	24	26.3	12	13	10	10.9	91	100
Technical issues hindered my learning experience	12	13	21	23.0	38	42	16	17.5	4	4.3	91	100
Insufficient support from teachers and family	17	19	33	36.2	25	27.4	10	11	6	6.5	91	100
Course material was too challengingor difficult	12	13.1	21	23.0	34	37.3	18	20	6	6.5	91	100

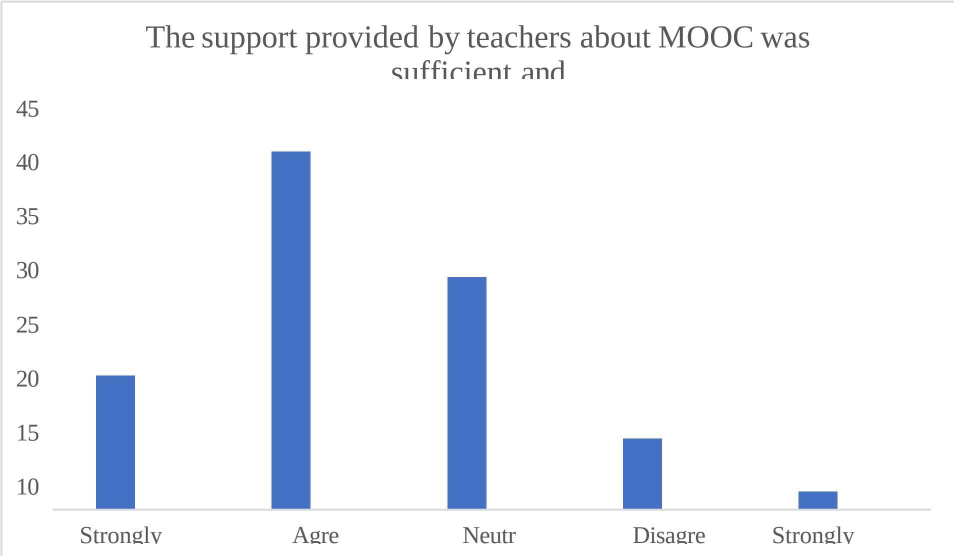


Interpretation

From the table above, the results indicate that the primary reason for not completing MOOCs(Massive Open Online Course) was lack of time, with 47.2% strongly agreeing and 24% agreeing that they couldn't dedicate enough time of the course. Financial barriers were also a significant factor, with 14.2% strongly agreeing and 35.1% agreeing that the course fees were too expensive, technical issues, such as problems with platform or access, were an obstacle for 13% strongly agreeing and 23% agreeing. A lack of support from teachers and family affected 19% strongly agreeing and 36.2% agreed, suggesting that external encouragement and guidance were insufficient for some learners. Finally, 13.1% of the respondents found that the course materials were too challenging, with 23% agreeing, highlighting the difficulty some faced in keeping up with the content. Overall, time constraints and financial barriers emerged as the most prominent challenges faced by learners in completing MOOCs.

The support provided by the teachers about MOOC was sufficient and helpful

Response option	Frequency	Percentage
Strongly Agree	15	16.4
Agree	40	43.9
Neutral	26	28.5
Disagree	8	8.7
Strongly Disagree	2	2.1
Total	91	100

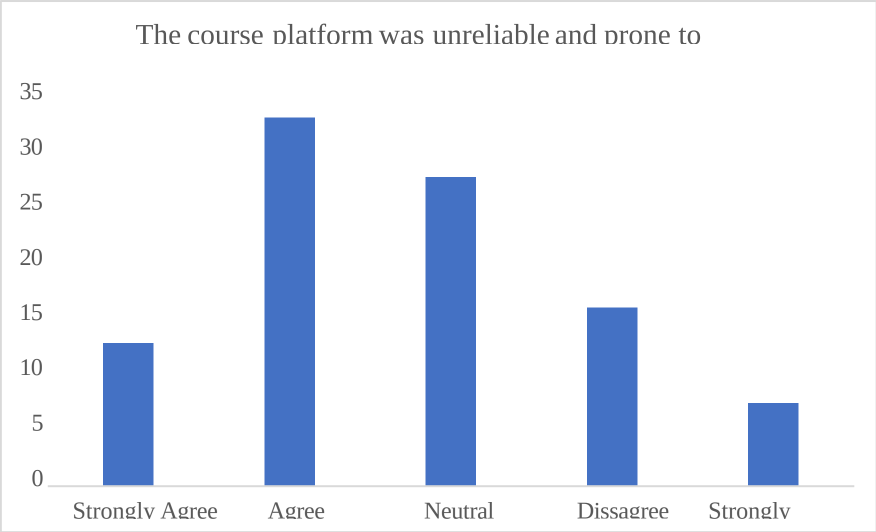


Interpretation

The above table reveals the results indicating that most of the learners felt the support provided by teachers in MOOCs was sufficient and helpful. Specifically, 16.4% strongly agreed and 43.9% agreed with this statement, suggesting a positive perception of teacher support. However, 28.5% remained neutral, indicating some uncertainty or mixed experiences. A smaller percentage 8.7% disagreed, and only 2.1% strongly disagreed, showing that relatively few felt that the support was inadequate. Overall, the majority of the respondents found that the support provided by the teachers in MOOC is beneficial, although there is still a notable portion of learners who were either or dissatisfied.

The course platform was unreliable and prone to technical problems

Response option	Frequency	Percentage
Strongly Agree	12	13.1
Agree	31	34
Neutral	26	28.5
Disagree	15	16.4
Strongly Disagree	7	7.6
Total	91	100



Interpretation

From the table above the results suggest that while most learners did not experience significant issues with the course platform, a notable number did encounter technical problems, specifically, 13.1% strongly agreed and 34% agreed that the platform was unreliable and prone to technical issues. However, a substantial 28.5% remained neutral, indicating mixed or uncertain experiences. On the other hand, 16.4% disagreed, and 7.6% strongly disagreed, suggesting that a portion of respondents did not face reliability issues. Overall, while technical difficulties affected a considerable group, they were not experienced by all, and many learners did not find the platform to be particularly problematic.

HYPOTHESES TESTING

H_O: MOOC courses has not significantly influenced in academic growth. H_1: MOOC courses has significantly influenced in academic growth.

Hypothesis testing

		Student Perspective	Learning Outcomes
Student Perspective	Pearson Correlation	1	.801
	Sig. (2-tailed)		.000
	N	100	100
Learning Outcome	Pearson Correlation	.801	1
	Sig. (2-tailed)	.000	
	N	100	100

Interpretation

The Pearson correlation between "student perspective" and "learning outcome" is .801, which indicate a strong positive relationship between the two variables. The p-value is 0.000, which is statistically significant (less than the typical significance level of .05). This suggests that the relationship between student perspective and learning outcome is not due to chance.

The p-value is less than 0.05, we reject null hypothesis (H_O), which states that MOOC courses have not significantly influenced academic growth. Instead we accept the alternative hypothesis (H_1), which asserts that MOOC courses have significantly influenced academic growth, as the data shows a significant positive correlation between student perspective and learning outcomes.

Research Hypothesis

H_O: There is no significant effect of MOOC courses on skills and knowledge enhancement. H_1: There is significant effect of MOOC courses on skills and knowledge enhancement.

Hypothesis testing

		Learning Design	Student Perspective
Learning Design	Pearson Correlation	1	.750
	Sig. (2-tailed)		.000
	N	100	100
Student Perspective	Pearson Correlation	.750	1
	Sig. (2-tailed)	.000	
	N	100	100

Interpretation

The Pearson correlation coefficient between learning design and Student perspective is 0.750, with a significance value of 0.000 ($p < 0.05$). this indicates a strong positive correlation between the two variable, meaning that as the learning design improves or is perceived more positively, students perspectives also improves correspondingly. The p-value being less than 0.05 further supports the existence of a statistically significant relationship between the two variables.

Given the significant correlation, the null hypothesis (H_O), which states that there is no significant effect of MOOC courses on skills and knowledge enhancement, is rejected. Instead the alternative hypothesis (H_1) is accepted. Therefore, it can be concluded that the learning design of MOOC courses has a significant effect on students perceptions, which is likely corresponds to an enhancement of their skills and knowledge.

FINDINGS

1. Teachers are the main source of information about MOOCs (37%), followed by academic articles (23%), magazines (21%), and friends/family (10% and 6%).
2. 91% of respondents are aware of MOOCs, showing widespread recognition, with only 9% unaware.
3. SWAYAM is the most popular platform (37.3%), followed by Coursera (21.9%), NPTEL (18.6%), Udacity (15.3%), and edX (6%).
4. 71.3% of respondents have a positive view of MOOC quality, with 28.5% strongly agreeing and 42.8% agreeing.
5. Career growth (42%) and skill acquisition (20%) are the top motivations for taking MOOCs, followed by flexibility (16.4%) and personal interest (9.8%).
6. 47.7% felt online learning helped with MOOC completion, while 34% were neutral and 17.5% disagreed.
7. 46.1% felt prior online experience with MOOCs had no impact on completion, while 5.4% disagreed.
8. 16.4% and 39.5% found the course structure flexible and adaptable, while 36.2% were neutral.
9. 47.2% strongly agree and 24% agree that time constraints were the main reason for not completing MOOCs; other barriers include high fees, technical issues, lack of support, and challenging materials.
10. 16.4% strongly agree and 43.9% agree that teacher support in MOOCs was helpful, though some were neutral or dissatisfied.
11. 13.1% strongly agree and 34% agree that the course platform was unreliable, while 16.4% disagreed.

SUGGESTIONS

1. Increase Teacher Training: Enhance teacher resources to guide students on MOOCs.
2. Boost Media Coverage: Increase magazine and article exposure to raise awareness.
3. Improve Platform Reach: Other platforms should enhance user experience and visibility.
4. Maintain Quality: Continuously monitor and improve MOOC quality.
5. Career-Focused Courses: Offer certifications and career support linked to job markets.
6. Provide Learning Support: Strengthen technical and mentor support for online learners.
7. Simplify for Beginners: Make platforms more accessible for newcomers with guided introductions.
8. Flexible Course Structure: Ensure adaptability for research-focused learners.
9. Address Barriers: Offer flexible schedules, financial aid, and affordable pricing.
10. Enhance Teacher Support: Improve communication and personalized guidance for students.
11. Upgrade Platforms: Ensure consistent reliability by improving technical infrastructure.

CONCLUSION

The findings suggest that MOOCs are widely recognized and valued for their quality, with a clear focus on career growth and skill acquisition as primary motivations for learners. Platforms like SWAYAM and Coursera are most popular, and while the overall perception of MOOCs is positive, challenges such as time constraints, financial barriers, and technical issues persist. Teacher support and course flexibility play key roles in successful completion, although some students report dissatisfaction. Overall, MOOCs are seen as a valuable educational tool, but there is room for improvement in terms of support systems, platform reliability, and course adaptability.

SCOPE FOR FURTHER STUDY

Further studies could focus on the impact of teacher involvement and training on MOOC completion rates, as well as the long-term career outcomes for learners. Comparing different platforms, like SWAYAM and Coursera, could reveal which features are most effective. Research on addressing barriers such as time and financial constraints, along with exploring personalized learning paths, could improve learner engagement. Additionally, examining platform reliability and technical support, especially in regions with limited access, would help enhance the overall MOOC experience.

MEASURING VOLATILITY OF SENSEX DURING INDIAN STOCK MARKET CRASHES

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ABSTRACT

The Indian stock market is a critical indicator of economic activity, yet it remains highly susceptible to volatility, particularly during financial crises. This study examines the volatility of the Bombay Stock Exchange's Sensex during five major stock market crashes in India (1992, 2000, 2008, 2011, and 2020) using the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model in Python's Jupyter Notebook. The analysis evaluates key volatility components, including mean returns, long-term volatility, the impact of recent shocks, and the persistence of past volatility. Findings reveal that while past volatility exists across all crashes, long-term volatility is present only in the 2000 crash. Recent shocks influence volatility in the 2000, 2008, and 2020 crashes but are absent in the 1992 and 2011 crashes. The study highlights the dynamic nature of stock market behaviour, demonstrating that different crises exhibit unique volatility patterns influenced by various economic and financial factors. Understanding these patterns can help investors, policymakers, and financial institutions develop risk management strategies to mitigate future financial disruptions. The findings contribute to the literature on financial market stability and provide insights into the evolving behaviour of Indian stock market volatility during crises.

Keywords: Stock Market Volatility, Sensex, GARCH Model, Financial Crises, Indian Stock Market.

1. INTRODUCTION

The Indian stock market has historically been a dynamic and critical component of the country's economy, reflecting the economic activities and sentiments of both domestic and international investors. However, like any financial market, it is subject to periods of extreme volatility, especially during financial crises. Volatility in the stock market is characterized by significant fluctuations in trading prices over a specific period and serves as a key indicator of market risk. Understanding the causes and patterns of volatility during market crashes is vital for investors, policymakers, and financial institutions as it helps in formulating strategies to mitigate risks and stabilize the market.

Volatility becomes particularly pronounced during stock market crashes, which are marked by rapid declines in stock prices, leading to substantial financial losses and erosion of investor confidence. These events not only impact individual investors but also have far-reaching effects on the broader economy. The Indian stock market has witnessed several major crashes, notably in the years 1992, 2000, 2008, 2011, and 2020. Each of these crashes was caused by different factors, ranging from domestic financial scandals to global economic crises, underscoring the complexity and complex nature of market volatility.

(Basavaraj, 2021) analysed financial crises in India, including the Harshad Mehta scam of 1992, the global financial crisis of 2008, and the currency crisis of 2013, emphasizing the role of regulatory oversight in maintaining market stability. The study highlights how transparency and risk management are crucial in mitigating economic disruptions and preventing systemic failures. (Narayana Mahararana, 2024) examined stock market volatility from 2016 to 2024, focusing on the impact of COVID-19 on global financial dynamics. The findings reveal that India’s financial influence on emerging markets grew, while the U.S. market’s dominance declined, signal a shift in global investment patterns.

The problem to be investigated is whether major stock market crashes in India have led to significant and persistent volatility in the Bombay Stock Exchange’s Sensitive Index (Sensex). Specifically, the research seeks to determine the patterns and intensity of volatility during these crashes and assess whether past market shocks have a lasting influence on present volatility. By analysing the crashes of 1992, 2000, 2008, 2011, and 2020, the study aims to identify trends in market fluctuations and provide insights into the long-term impact of economic and financial crises on Sensex behaviour.

The objective of study aims to measure and analyse the volatility of the Bombay Stock Exchange's Sensitive Index (Sensex) during the five major stock market crashes in India. The research aims to identify whether the mean return from the Sensex follows a consistent pattern, explore the presence of long-term volatility, and assess the impact of recent economic or market shocks on current volatility. Additionally, the study seeks to investigate whether past volatility events continue to influence the present volatility of the Sensex, offering a comprehensive understanding of how these factors contribute to market behaviour and performance over time.

The study is structured into six sections. Section 1 Introduction provides a brief overview of the topic, followed by the statement of the problem and research objectives. Section 2 Literature Review critically examines existing studies to establish a theoretical foundation. Section 3 Methodology explains the research design and data collection process. Section 4 Analysis presents the research findings and interpretation of the results. Section 5 Conclusion summarizes key insights and implications. Lastly, a thorough list of all the sources used in the study is provided in Section 6 References.

2. Literature Review

The volatility of the SENSEX during Indian stock market crashes has been extensively studied, highlighting the dynamics of market fluctuations, stock market volatility, attributing it to factors such as information asymmetry, leverage, foreign institutional investor (FII) activity, and market sentiment.

(Pal, 2005) examined the post-election crash, revealing how volatility spikes can be linked to political events and FIIs' activities. This study underscores the significant influence of external investors on market stability. (Chittedi, 2008) explored the broader impact of FIIs on the volatility of the Indian stock market, emphasizing the sensitivity of the SENSEX to global investment trends. The findings suggest that FIIs' investment patterns can exacerbate market fluctuations, particularly during economic uncertainties.

(Loomba, 2012) explored the impact of FIIs on the volatility of the Indian stock market, reaffirming the significant role of international investors in driving market dynamics. His research highlights the dual-edged nature of FII involvement, where increased investment can lead to both market growth and heightened volatility. (Maroor, 2014) investigates the impact of FII activity on market volatility, providing evidence that foreign investment flows are a significant determinant of market behaviour. Increased FII activity tends to amplify volatility, particularly during periods of market stress.

(Kaur, 2002) presented a foundational analysis of stock market volatility in India, offering a historical perspective on the SENSEX's behaviour. Her work laid the groundwork for understanding long-term volatility trends and their implications for investors and policymakers. (Som Sankar Sen, 2012) examine the characteristics of conditional volatility in the BSE SENSEX, focusing on the impact of information asymmetry and leverage. Their study reveals that asymmetrical information flow significantly contributes to market volatility, with leveraged positions exacerbating these effects.

(Amit Kumar Singh, 2021) explore the spillover of returns and volatility between the BSE SENSEX and the BSE SME exchange. Their research indicates significant bidirectional volatility spillovers, suggesting that developments in the SME segment have notable implications for the broader market. (Nisarg A Joshi, 2021) analyse the causality and cointegration among stock market indices, including the SENSEX, and developed markets. Their findings suggest a long-term equilibrium relationship, with volatility in global markets influencing the Indian stock market and vice versa.

(Punithavathy Pandian, 2009) focused on the volatility patterns within Indian stock exchanges, emphasizing the role of market microstructure and liquidity. Their work sheds light on the internal factors that influence price movements, providing insights into the unique characteristics of the Indian market. (Sarika Mahajan, 2009) investigated the relationship between stock returns, trading volume, and volatility dynamics. Their empirical findings highlight the complex interplay between market activity and price fluctuations, providing a nuanced view of the factors driving market volatility.

(Hojatallah Goudarzi, 2010) focus on modeling and estimating volatility in the Indian stock market. Their research underscores the importance of adopting robust econometric models to capture the nuances of market fluctuations, providing insights into effective risk management strategies. (Mukherjee, 2011) compares volatility patterns across India and other developed and emerging markets. Her findings suggest that while Indian markets exhibit high volatility, the patterns are not drastically different from those in other emerging markets, indicating a globalized influence on market behaviour.

(Arndam Mandal, 2012) examined the impact of the Great Recession on the Indian stock market, analysing the correlation between global economic downturns and domestic market volatility. Their study illustrates how international financial crises can ripple through emerging markets, affecting investor confidence and market stability. (Ruta Khaparde, 2014) analysed the influence of macroeconomic performance on stock market volatility from an Indian perspective. Their study underscores the importance of economic indicators, such as GDP growth and inflation, in shaping investor expectations and market reactions.

(Aparna Bhatia, 2014) compared the volatility of Indian and Chinese stock markets, offering a cross-country analysis that highlights the similarities and differences in market behaviour. Their comparative approach provides valuable insights into how emerging markets respond to global economic shocks. (P Srinivasa Suresh, 2016) examine the dynamics between market sentiment and return volatility, highlighting the cyclical nature of investor sentiment and its influence on market returns. Their research suggests that sentiment-driven volatility can lead to mispricing and increased market risk.

(Akanksha Dubey, 2020) provide an empirical analysis of stock market crashes in India since liberalization, investigating whether these crashes were a result of the pandemic or market bubbles. Their research highlights the complex interplay of global and domestic factors influencing market volatility. (Rajendra N Paramanik, 2020) employ sentiment analysis to investigate the relationship between market sentiment and stock market volatility. Their study finds that negative sentiments often lead to increased volatility, reflecting the psychological impact of investor behaviour on market stability.

(Mishra, 2010) applied a GARCH model to assess capital market volatility in India, demonstrating that past volatility significantly influences future market fluctuations. (Maniklal Adhikary, 2016) extended this research by employing asymmetric GARCH models, revealing that negative shocks (bad news) tend to have a stronger impact on volatility than positive shocks (good news). These findings align with behavioural finance theories, suggesting that investor sentiment plays a crucial role in market fluctuations.

3. METHODOLOGY

GARCH (Generalized Autoregressive Conditional Heteroskedasticity) Model Bollerslev (1986) introduced the GARCH model and it is based on the supposition that forecasts of time changeable variance depend on the lagged variance of the asset. An unforeseen augment or diminishes in returns at time t will generate an increase in the predictable variability in the subsequent period. The basic and most widespread model GARCH can be expressed as;

$$R_t = a + bR_{t-1} + \varepsilon_t \quad \varepsilon_t \,|\, I_{t-1}\ N(0, h_t), \quad (1)$$

$$h_t = \alpha_0 + \sum_{i=1}^{p} \beta_i h_{t-1} + \sum_{i=1}^{p} \lambda_j u_{t-j}^2 \qquad (2)$$

where, $\lambda_j > 0$, $\beta_i \geq 0$. The GARCH is weekly stationery $\Sigma\beta_i + \Sigma\lambda_j < 1$. In particular, volatility forecast is increased following a large positive and negative index return, the GARCH specification that capturing the well-documented volatility clustering evident in financial returns (Engle 1982).

3.1 Data

The study utilizes daily closing prices of the BSE-SENSEX index for the following periods: 2nd April 1992 to 29th May 1992, 1st May 2000 to 31st October 2001, 1st January 2008 to 31st October 2008, 1st July 2011 to 30th December 2011, and 1st February 2020 to 31st March 2020. The data for the study were collected from the website of Bombay Stock Exchange (www.bseindia.com).

4. ANALYSIS

This study focuses on measuring the volatility Sensex during Indian stock market crashes.

Year 1992

```
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:              Open Price   R-squared:                       0.000
Mean Model:              Constant Mean   Adj. R-squared:                  0.000
Vol Model:                       GARCH   Log-Likelihood:               -70.5356
Distribution:                   Normal   AIC:                           149.071
Method:             Maximum Likelihood   BIC:                           153.947
                                         No. Observations:                   25
Date:                 Mon, Jan 13 2025   Df Residuals:                       24
Time:                         14:48:36   Df Model:                            1
                                 Mean Model
===========================================================================
                 coef    std err          t      P>|t|     95.0% Conf. Int.
---------------------------------------------------------------------------
mu            -1.4741      0.713     -2.067  3.878e-02 [ -2.872,-7.601e-02]
                              Volatility Model
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
omega          0.6297      4.427      0.142      0.887 [ -8.048,  9.307]
alpha[1]   6.7101e-11      0.114  5.891e-10      1.000 [ -0.223,  0.223]
beta[1]        0.9461      0.373      2.537  1.118e-02 [  0.215,  1.677]
========================================================================

Covariance estimator: robust
```

In mean model the probability value of mu is 0 which is lesser than 0.05 which means mean return from the data of the year is significant and it further states that this return is due to a constant pattern. In this case the null hypothesis is rejected. In volatility model the probability value of omega is 0.887 which is greater than 0.05 and this indicates there is no presence of long-term volatility. The probability value of alpha is 1.000 which is greater than 0.05 which states that it does not captures the impact of recent shocks on current volatility. The probability value of beta is 0 which is less than 0.05 and it indicates that there is an existence of past volatility.

Year 2000

In mean model the probability value of mu is 0.814 which is greater than 0.05 which means mean return from the data of the year is not significant. In this case the null hypothesis is accepted. In volatility model the probability value of omega is 0 which is less than 0.05 and this indicates there is a presence of long-term volatility. The probability value of alpha is 0 which is less than 0.05 which states that it captures the impact of recent shocks on current volatility. The probability value of beta is 0 which is less than 0.05 and it indicates that there is an existence of past volatility.

```
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:             Open Price   R-squared:                       0.000
Mean Model:             Constant Mean   Adj. R-squared:                  0.000
Vol Model:                      GARCH   Log-Likelihood:               -931.809
Distribution:                  Normal   AIC:                           1871.62
Method:            Maximum Likelihood   BIC:                           1887.75
                                        No. Observations:                  417
Date:                Mon, Jan 13 2025   Df Residuals:                      416
Time:                        14:43:10   Df Model:                            1
                                 Mean Model
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
mu            -0.0228  9.647e-02     -0.236      0.814 [ -0.212,  0.166]
                              Volatility Model
============================================================================
                 coef    std err          t      P>|t|      95.0% Conf. Int.
----------------------------------------------------------------------------
omega          0.2502      0.138      1.812  6.995e-02 [-2.040e-02,  0.521]
alpha[1]       0.1611  4.272e-02      3.771  1.626e-04  [7.737e-02,  0.245]
beta[1]        0.8004  3.959e-02     20.220  6.494e-91    [  0.723,  0.878]
============================================================================

Covariance estimator: robust
```

Year 2008

```
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:             Open Price   R-squared:                       0.000
Mean Model:             Constant Mean   Adj. R-squared:                  0.000
Vol Model:                      GARCH   Log-Likelihood:               -501.529
Distribution:                  Normal   AIC:                           1011.06
Method:            Maximum Likelihood   BIC:                           1024.37
                                        No. Observations:                  206
Date:                Mon, Jan 13 2025   Df Residuals:                      205
Time:                        14:47:05   Df Model:                            1
                                 Mean Model
==========================================================================
                 coef    std err          t      P>|t|   95.0% Conf. Int.
--------------------------------------------------------------------------
mu            -0.1260      0.172     -0.733      0.464 [ -0.463,  0.211]
                               Volatility Model
============================================================================
                 coef    std err          t      P>|t|     95.0% Conf. Int.
----------------------------------------------------------------------------
omega          0.7964      0.574      1.388      0.165   [ -0.329,  1.921]
alpha[1]       0.1962  9.691e-02      2.024  4.293e-02 [6.241e-03,  0.386]
beta[1]        0.7264      0.126      5.752  8.808e-09   [  0.479,  0.974]
============================================================================

Covariance estimator: robust
```

In mean model the probability value of mu is 0.464 which is greater than 0.05 which means mean return from the data of the year is not significant. In this case the null hypothesis is accepted. In volatility model the probability value of omega is 0.165 which is greater than 0.05 and this indicates there is no presence of long-term volatility. The probability value of alpha is 0 which is less than 0.05 which states that it captures the impact of recent shocks on current volatility. The probability value of beta is 0 which is less than 0.05 and it indicates that there is an existence of past volatility.

Year 2011

```
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:             Open Price   R-squared:                       0.000
Mean Model:             Constant Mean   Adj. R-squared:                  0.000
Vol Model:                      GARCH   Log-Likelihood:               -92.2750
Distribution:                  Normal   AIC:                           192.550
Method:            Maximum Likelihood   BIC:                           199.305
                                        No. Observations:                   40
Date:                Mon, Jan 13 2025   Df Residuals:                       39
Time:                        14:55:57   Df Model:                            1
                                 Mean Model
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
mu            -0.2010      0.256     -0.787      0.431 [ -0.702,  0.300]
                              Volatility Model
========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
------------------------------------------------------------------------
omega          0.2322      0.210      1.105      0.269 [ -0.180,  0.644]
alpha[1]       0.3653      0.118      3.105  1.903e-03 [  0.135,  0.596]
beta[1]        0.6347      0.102      6.234  4.559e-10 [  0.435,  0.834]
========================================================================

Covariance estimator: robust
```

In mean model the probability value of mu is 0.272 which is greater than 0.05 which means mean return from the data of the year is not significant. In this case the null hypothesis is accepted. In volatility model the probability value of omega is 0.204 which is greater than 0.05 and this indicates there is no presence of long-term volatility. The probability value of alpha is 1.000 which is greater than 0.05 which states that it does not captures the impact of recent shocks on current volatility. The probability value of beta is 0 which is less than 0.05 and it indicates that there is an existence of past volatility.

Year 2020

In mean model the probability value of mu is 0.431 which is greater than 0.05 which means mean return from the data of the year is not significant. In this case the null hypothesis is accepted. In volatility model the probability value of omega is 0.269 which is greater than 0.05 and this indicates there is no presence of long-term volatility. The probability value of alpha is 0 which is less than 0.05 which states that it captures the impact of recent shocks on current volatility. The probability value of beta is 0 which is less than 0.05 and it indicates that there is an existence of past volatility.

```
                     Constant Mean - GARCH Model Results
==============================================================================
Dep. Variable:              Open Price   R-squared:                       0.000
Mean Model:              Constant Mean   Adj. R-squared:                  0.000
Vol Model:                       GARCH   Log-Likelihood:               -227.706
Distribution:                   Normal   AIC:                           463.412
Method:             Maximum Likelihood   BIC:                           474.628
                                         No. Observations:                  122
Date:                 Mon, Jan 13 2025   Df Residuals:                      121
Time:                         14:52:35   Df Model:                            1
                               Mean Model
==========================================================================
                 coef    std err          t      P>|t|  95.0% Conf. Int.
--------------------------------------------------------------------------
mu            -0.1542      0.141     -1.098      0.272 [ -0.430,  0.121]
                              Volatility Model
=============================================================================
                 coef    std err          t      P>|t|       95.0% Conf. Int.
-----------------------------------------------------------------------------
omega          0.1529      0.120      1.271      0.204  [-8.286e-02,  0.389]
alpha[1]       0.0000  4.412e-02      0.000      1.000 [-8.647e-02,8.647e-02]
beta[1]        0.9430  8.403e-02     11.222  3.175e-29      [  0.778,  1.108]
=============================================================================

Covariance estimator: robust
```

4.1 Hypothesis Framework

Null Hypothesis (H_0): There is no significant increase in the volatility of the Sensex during Indian stock market crashes. This assumes that stock market crashes do not cause significant changes in volatility and that any observed fluctuations are part of normal market behaviour.

Alternative Hypothesis (H_1): There is a significant increase in the volatility of the Sensex during Indian stock market crashes. This suggests that stock market crashes lead to increased volatility in the Sensex, meaning there are larger fluctuations in stock prices during crashes periods.

4.2 Findings

SL.NO	YEAR	MU	OMEGA	ALPHA	BETA
1	1992	The mean return is due to a consistent pattern. (Alternate Hypothesis is accepted)	There is no constant variance contributing to the model. (Null Hypothesis is accepted)	It does not capture the impact of recent shocks on current volatility. (Null Hypothesis is accepted)	It captures persistence of past volatility. (Alternate Hypothesis is accepted)
2	2000	The mean or average return is not due to a consistent pattern. (Null Hypothesis Accepted)	There is constant variance to the model. (Alternate Hypothesis is accepted)	It captures the impact of recent shocks on current volatility. (Alternate Hypothesis is accepted)	It captures persistence of past volatility. (Alternate Hypothesis is accepted)
3	2008	The mean or average return is not due to a consistent pattern. (Null Hypothesis Accepted)	There is no constant variance contributing to the model. (Null Hypothesis is accepted)	It captures the impact of recent shocks on current volatility. (Alternate Hypothesis is accepted)	It captures persistence of past volatility. (Alternate Hypothesis is accepted)
4	2011	The mean or average return is not due to a consistent pattern. (Null Hypothesis Accepted)	There is no constant variance contributing to the model. (Null Hypothesis is accepted)	It does not capture the impact of recent shocks on current volatility. (Null Hypothesis is accepted)	It captures persistence of past volatility. (Alternate Hypothesis is accepted)

5	2020	The mean or average return is not due to a consistent pattern. (Null Hypothesis Accepted)	There is no constant variance contributing to the model. (Null Hypothesis is accepted)	It captures the impact of recent shocks on current volatility. (Alternative Hypothesis is accepted)	It captures persistence of past volatility. (Alternate Hypothesis is accepted)

5. CONCLUSION

The study analysed the volatility of the Bombay Stock Exchange's Sensex during five major stock market crashes in India using the GARCH model, offers valuable insights into the behaviour of the market during financial crises. The findings reveal that mean returns were statistically significant only during the 1992 crash, suggesting a relatively stable return pattern during that period. In contrast, the returns during other crashes were highly unpredictable, indicating that market conditions or external factors may have contributed to a more consistent pattern in 1992, while the subsequent crashes experienced heightened uncertainty and instability.

One of the key observations from the study is the presence of long-term volatility during the 2000 crash, while other crashes showed short-lived instability. This suggests that some crashes, like the 2000 crisis, result in prolonged disruptions in market dynamics, while others, such as the 2008 and 2020 crashes, experience quick recoveries. The findings also highlight the immediate impact of recent shocks in the 2000, 2008, and 2020 crashes, with investor reactions being swift. However, in the 1992 and 2011 crashes, such immediate reactions were less evident, suggesting that the nature and context of each crisis can significantly influence how market participants respond.

Despite the variations across the five crashes, past volatility consistently influenced market behaviour, underscoring the role of historical market trends in shaping future volatility. This finding reinforces the idea that past fluctuations create a framework within which markets react to new shocks. The persistence of volatility across multiple crises highlights the need for investors, regulators, and policymakers to factor in historical patterns when designing strategies to manage risks and stabilize the market.

The study's findings emphasize the complexity of stock market crashes and the necessity for robust risk management strategies to shield investors from extreme market fluctuations. Strengthening market stabilization policies and fostering investor awareness and education are critical to minimizing the adverse effects of financial downturns and ensuring more stable recoveries. By understanding the distinct volatility patterns of various market crashes, policymakers, financial institutions, and investors can develop more effective strategies to mitigate risks, enhance market stability, and build resilience against future economic shocks.

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ECOSYSTEM RESTORATION, REGENERATION, AND REWILDING: A CASE OF KERALA'S SUSTAINABLE CONSERVATION PRACTICES

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Abstract

Kerala established its worldwide reputation as "God's Own Country" by securing its position as a biodiversity hotspot through the diverse range of ecosystems that extend from tropical forests and wetlands to coastal mangroves and grasslands. The state faces major environmental issues from urbanization and deforestation and climate change while requiring new methods for ecosystem restoration together with regeneration and rewilding efforts. This study examines the approaches used in Kerala for rehabilitating damaged ecosystems while recovering natural habitations and adding native wildlife species to boost biodiversity. The main environmental initiatives in Kerala focus on three projects: mangrove afforestation schemes combined with river regeneration programs and forest restoration activities targeted at Western Ghats devastation. Traditional ecological knowledge together with community partnerships makes essential contributions to these conservation initiatives. Kerala established a model that merges both ecological protection with sustainable advancement while it confronted difficulties due to land-use disputes along with environmental risks from climate change. Through its detailed study of Kerala's conservation efforts this research emphasizes the necessity for complete methods involving community participation in managing ecosystems. The results deliver practical solutions which world politics may utilize to handle escalating environmental decline and biodiversity depletion.

Keywords: ecosystem restoration, regeneration, rewilding, biodiversity conservation, sustainable development

1. Introduction

The southwestern Indian territory of Kerala exists as a prominent destination because of its abundant natural glories along with numerous diverse ecosystems. The state presents a rich diversity of geographic terrains because it includes tropical rainforests along with extensive backwaters together with mangroves and wetlands and endemic natural habitats. These ecosystems serve a crucial purpose for Kerala's biodiversity while contributing to ecological equilibrium and local economic sustainability. The rainforests house an extensive range of plant and animal species and the backwaters sustain fishing activities together with coastal tourism for local communities. Mangroves together with wetlands perform vital coastal functions which include area stabilization and water purification and storm protection (Nair, 2017).

The rich natural resources that exist naturally in Kerala encounter major environmental threats. The leading environmental hazards in Kerala correspond to deforestation alongside habitat fragmentation alongside industrial pollution and climate change effects. Human development activities that include agricultural growth and infrastructure developments together with urbanization expansion have caused major deforestation and habitat destruction of natural areas (Bose, 2013). Ecological consequences worsen because of fragmentation that divides species populations from each other thus diminishing biodiversity and weakening ecosystems (Thomas et al., 2020). The water bodies of the region experienced contamination because of industrial pollution through chemical waste and discharge which negatively affected the local species (Sankar & Sundararajan, 2016). The state of Kerala remains exposed to climate change impacts through escalating temperatures along with changes in rainfall totals and increased occurrences of severe weather events which degrade its ecosystems.

a. **Ecosystem Restoration**: This entails direct work to restore degraded environments until they reach their natural form before human interference. Post-disturbance reconstruction initiatives concentrate their activities on vegetation revival projects along with fauna resettlement and forest recovery alongside water and soil rehabilitation. The restoration of ecosystems succeeds at bringing back essential services such as flood control together with carbon storage capabilities and biodiversity sustainability (Aronson et al., 2016). Day and night restoration depends heavily on ecological process reintegration including disrupted nutrient cycles and halted pollination systems due to human activities (Hobbs & Harris, 2001).
b. **Ecosystem Regeneration:** The main difference between regeneration and restoration occurs when regeneration focuses on enabling natural recovery mechanisms to become stronger. Nature healing activities form the basis of ecosystem regeneration because it allows ecosystems to mend themselves without

human-made interventions so the environment can discover its own return to balance. Protection of natural succession alongside promoting native plant species expansion is among the possible practices. Effective ecosystem recovery through minimal human intervention serves the goals of regeneration because it permits natural balance to restore itself with time (Menz et al. 2013).

c. **Rewilding**: Introduces native species which previously existed within an ecosystem by bringing back species that disappeared or decreased in population. Ecological processes and structures depend on these species because they are key ecological players such as large herbivores and predators especially. The rewilding project in Kerala would bring crucial species back to their natural habitat such as reintroducing Nilgiri Tahr along with the lion-tailed macaque for advancing biodiversity maintenance. Ecosystems directed by rewilding need minimal human contact which lets them develop naturally throughout time.

The unified strategy works towards recovering natural ecosystem functions and promotes biodiversity and resistance against the ongoing environmental challenges. These ecosystems should maintain self-generating abilities to provide vital ecological services for local residents and safeguard rare species together with environmental wellness.

2. Objectives

- **To analyse the key environmental challenges** affecting Kerala's ecosystems, including deforestation, habitat fragmentation, pollution, and climate change.

- **To examine Kerala's conservation strategies**, including mangrove afforestation, river rejuvenation, and forest restoration.

- **To assess the role of traditional ecological knowledge** and community participation in ecosystem restoration and biodiversity conservation.

- **To evaluate the effectiveness of rewilding initiatives** in Kerala, particularly in restoring native species and rebuilding ecological balance.

- **To identify challenges and gaps** in Kerala's ecosystem restoration activities and suggest policy recommendations for enhancing sustainability.

3. Kerala's Ecosystem: Challenges and Conservation Approaches

The southwestern coastal part of India named Kerala displays multiple distinctive ecosystems throughout its territory. The four major categories of ecosystem in Kerala consist of tropical rainforests along with shola forests wetlands grasslands and coastal mangroves which create extensive biodiversity in the state. The UNESCO World Heritage Site Western Ghats serves as one of the world's greatest biodiversity hotspots near Kerala's eastern border. The mountain range houses numerous locally found species which makes it essential for environmental conservation research (Gadgil & Guha, 1995). The Western Ghats along with other areas of Kerala house tropical rainforests manifesting as dense evergreen forests which serve as necessary habitats for several endangered species such as the lion-tailed macaque and Nilgiri tahr (Menon, 1997).

Kerala boasts extensive backwaters along with its rainforests while holding Vembanad Lake among its most renowned freshwater lakes in all of India. The wetlands protect many migratory species and fish populations and water-dwelling life while sustaining the ecological balance of the state (Kumar et al, 2012). Kerala's coastal regions protect both coastal zones from storm and sea level rise erosion and provide animal habitats for fish and crustaceans in their large mangrove forest areas. Local populations who practice fishing and agriculture depend on coastal mangroves for their subsistence while these ecosystems also deliver essential carbon sequestration services to the environment.

Natural habitats in Kerala experience major environmental threats due to actions performed by humans among other causes. The combination of urban development with newly built infrastructure along with forestry clearance has resulted in decreased forest and swamp area coverage which increases environmental barriers for species survival and population growth. The combined result of numerous unsustainable natural resource extraction methods particularly illegal logging and destructive agricultural methods leads both to diminished biodiversity and ecosystem deterioration. The release of chemicals from industrial operations together with water body pollution through waste disposal threatens aquatic ecosystems which consequently impacts both oceanic and freshwater species' health.

The problems have become more complicated due to environmental changes caused by climate change. The combination of growing temperatures and irregular rainfall and more frequent cyclones and floods has turned Kerala into a more susceptible region for environmental pressures. The biological stability of Kerala's ecosystems faces danger due to modifications of species living areas as well as disrupted migration pathways together with heightened occurrences of environmental catastrophes.

The developing pressures on Kerala's ecosystems have prompted the state to implement new innovative strategies to regenerate and restore its ecosystems. Kerala conducted major forest development initiatives for two purposes: tackling deforestation and healing damaged environmental areas. The strategy to enhance biodiversity and ecosystem stability in Kerala includes executing native species repopulation programs across natural areas through rewilding projects. Research-based strategies display active capacity to rebalance nature while maintaining the sustainable state of Kerala's specific natural ecosystems.

Kerala has made ecosystem restoration an essential element of its environmental strategies to manage the deterioration of its vital ecological systems consisting of mangroves along with rivers and forests. Restoration programs concentrate on recovering natural habitats which people have modified while they simultaneously enhance biodiversity and yield ecosystem services for local populations.

a. Mangrove Afforestation

The coastal areas of Kerala have endured substantial mangrove depletion because of urbanization and agricultural enlargement combined with shrimp farming (Alongi, 2002). Mangrove forests have suffered heavily because they serve as essential ecosystem protectors and biodiversity providers and carbon sinks. Under the "Mangrove Reforestation Program" the state conducts tree plantations in depleted coastal areas of Kannur, Kasaragod and Alappuzha districts (Basha, 1992). The restorative efforts have boosted coastal defenses thus helping protect coastal settlements against sea erosion and cyclonic storms. The projects boost local economic activities because mangrove forests function as critical marine species breeding sites that enhance fishery resources.

b. River Rejuvenation Programs

Various environmental degradations including pollution sand mining and encroachments have impacted the Bharathapuzha, Periyar and Pamba rivers of Kerala.

Water quality deterioration and biodiversity loss have occurred because of these factors while negatively affecting both human health and ecological environments. Kerala implements multiple river restoration initiatives because of pollution issues and they use techniques including riverbed cleaning operations and the reinstatement of waterway plant life and industrial emission regulations.

c. Forest Restoration and Rewilding Initiatives

The state of Kerala executes multiple restoration efforts to protect its natural forest and wildlife habitats particularly within protected locations including Silent Valley National Park. The rewilding process in Kerala includes native species recovery by reintroducing endangered species such as Nilgiri Tahr (Nilgiritragus hylocrius) alongside lion-tailed macaque (Macaca silenus). These species experienced major habitat decline. The restoration of both native vegetation and wildlife populations at Silent Valley demonstrates remarkable achievements (Nair, 1991). Radiological research in wildlife conservation focuses on the double mission of safeguarding species populations and restoring complete natural habitats along with all their linked ecological systems.

4. Regeneration Initiatives

The restoration of ecosystems in Kerala demands urgent regeneration programs for attaining sustainable agricultural practices. The initiatives dedicate their work to making environments heal naturally by establishing favourable ecological conditions. The state implements strategies that unite both ancient wisdom with contemporary preservation strategies to accomplish a healthy environment and social well-being.

a. Agroforestry Practices

Kerala employs agroforestry as one of its main approaches to regenerate vegetation by uniting trees and farming elements. Agroforestry cultivation lets farmers achieve sustainable land management through recovering soil fertility and protecting biodiversity. Kerala implements Integrated Farming System (IFS) for agroforestry by combining tree planting with crops and it enhances soil quality while improving water storage capabilities (Kumar et al., 2015).

b. Traditional Farming Methods

Kerala focuses on the vital task of reviving indigenous farming practices by making

Pokkali rice cultivation part of its regeneration strategy. The practice of Pokkali farming in Kuttanad's saline areas creates a balanced coexistence of fish farming and rice cultivation where rice fields become fisheries. The method demonstrates exceptional importance for biodiversity conservation because it maintains various aquatic species while improving soil quality through organic farming practices.

c. Marine Rewilding

The marine rewilding efforts in Kerala concentrate on repairing coral reefs together with seagrass beds that support coastal biodiversity while sustaining local resident income. The underwater habitat called “rainforests of the sea” refers to coral reefs because these marine ecosystems create essential habitat space for multiple ocean species while seagrass beds provide fundamental ecological services through seabed stabilization and fish nursery functions. Human activities including fishing and pollution affect coastal development have resulted in the severe degradation of such ecosystems. The government of Kerala has implemented two restoration programs by transplanting coral structures and building artificial reef foundations to revive damaged marine ecosystems which aims to rebuild biological diversity while strengthening ocean ecosystems in order to face climate changes better.

The state of Kerala works actively to solve environmental degradation-related ecological and social-economic problems in the long-term. The state's work in ecosystem restoration serves as evidence for regions worldwide which face similar environmental problems about how ecologic restoration integrates with sustainable community practices.

5. Policy Measures and Community Involvement

The ecosystem restoration activities in Kerala thrive because of strong policy structures combined with active community participation. The structure concentrates on protecting natural environments while simultaneously making sure local populations take part in planning and execution steps to produce long-lasting ecological preservation results.

a) Kerala Biodiversity Strategy and Action Plan:

The Kerala Biodiversity Strategy and Action Plan (KBSAP) functions as a procedural outline to advance biodiversity preservation within the state. The protection of endangered species and the maintenance of fragile ecosystems and sustainable resource use serves as the main objectives of this plan (Menon, 1997). This plan works to reverse biodiversity decline through a dual effort of protecting endemic living beings and habitats as well as implementing better protected area management while integrating local population involvement in conservation initiatives. As a key part of KBSAP efforts focus on protecting the endangered species living within Western Ghats which remains a biodiversity hotspot. The KBSAP achieves its mission by connecting state policies to international conservation objectives which secures Kerala's ecosystem while implementing sustainable economic practices (Vivekanandan & Rajan, 2012).

b) People's Biodiversity Registers (PBRs):

Local biodiversity documentation takes place through People's Biodiversity Registers (PBRs) that involve active community participation for recording plant animals and ecosystems together with traditional knowledge systems. Biodiversity conservation tools emerge from community activities where members develop these registers (Gadgil & Guha, 1995). Through PBRs local communities obtain power to document their native natural resources that leads to active community involvement for biodiversity preservation. The registers enhance awareness about biodiversity conservation and enable local wisdom to become active elements in the policy formation process. The PBR approach enables Kerala to activate rural populations for biodiversity conservation which promotes sustainable environmental management at the local level (Shankar, 2008).

c) Integrated Watershed Management Programs (IWMP):

Kerala operates Integrated Watershed Management Programs (IWMP) to rebuild contaminated watersheds alongside delivering better soil preservation and advancing water resource management systems. The programs target areas destroyed by deforestation while fighting soil erosion and strengthening water availability and restoring natural ecological functions (Singh et al., 2020). Through IWMP sustainable land practices find support while the program promotes local participation in watershed development activities. Through community involvement in reforestation and soil conservation and water harvesting activities Kerala achieves programs that function both environmentally and sociologically sustainable. These programs lead to better access to water together with lower flood threats and stronger rural economic development especially in agricultural territories that rely on their local water resources (Chandrasekaran, 2018).

6. Challenges in Ecosystem Restoration and Rewilding

Kerala successfully implements ecosystem restoration and rewilding through its dedicated conservation efforts although different hurdles now endanger their continued success. Multiple environmental issues consisting of land-use conflicts together with climate change and invasive species and community participation create barriers for successful conservation in Kerala. A sustainable solution to these difficulties emerges from combining scientific information and governmental strategies with direct involvement from the community.

a. Land-Use Conflicts

The primary restraint in Kerala's restoration initiatives stems from oppositions about land usage. The competition between agricultural requirements along with urban expansion projects and infrastructure projects creates conflicts for conservation needs thus resulting in forest clearing and habitat destruction. Plantation expansions and human settlement growth during the Western Ghats region has caused forests to shrink so wildlife species were forced out from their habitats leading to biodiversity loss. The establishment of protected regions alongside wildlife corridors encounters resistance from nearby population sectors who rely on their lands to earn income. Achieving environmental sustainability next to development requires stakeholders from conservation groups and politicians together with local citizens to create sustainable methods that protect biodiversity.

b) Climate Change

The restoration efforts in Kerala face difficulties because of the severe impact of climate change on ecosystems. The state faces environmental instability from increased temperatures combined with unpredictable precipitation patterns and severe climatic disturbances such as damaging floods and droughts that harm both land-based and ocean-based species diversity. The alteration of monsoon patterns reduces water resources and enhances soil loss that harms farming activities. The increasing ocean levels present a danger to mangrove ecosystems and coral reefs in Kerala which serve as fundamental components for protecting the coastline and maintaining marine species diversity. Climate adaptation efforts that combine forest refuelling with wetland preservation along with sustainable water management practices have the potential to minimize these adverse results as well as build up ecological stability.

c) Community Participation

The success of conservation efforts depends heavily on continuous participation from local communities yet their socioeconomic situation regularly keeps them from joining in. Rural along with tribal populations who use natural resources for their survival view conservation measures as potentially damaging their economic security. In addition to poverty there are two more factors that reduce community involvement: education level and limited sources for alternate income. For successful long-term conservation initiatives to thrive local communities need access to both conservation programs like Kudumbashree and tribal-led conservation and sustainable opportunities through eco-tourism and organic farming and forest-based enterprises. Increased community ownership combined with right economic motivation drives greater restoration engagement from community members.

d) Invasive Species

Another important obstacle in Kerala's ecological restoration consists of invasive species. Lantana camara along with Eucalyptus trees together with Water Hyacinth have proven to be aggressive non-native species that drive out native plant and animal species from their habitats while damaging ecosystems. The control of invasive species demands professionals to discover new species early as well as remove them actively while planting native species via natural habitat rehabilitation programs. Eradication programs led by the community together with continuous monitoring will enhance the effectiveness of these conservation efforts.

d) Role of Communities and Traditional Knowledge:

The achievements in Kerala rest upon active community participation which combines traditional ecological expertise maintained by many community members. Kudumbashree programs together with tribal community initiatives have established themselves as important tools for community-led conservation practices. The combination of traditional ecological wisdom about fishing methods together with organic farming framework and forest maintenance approaches proves essential for enhancing contemporary restoration techniques. Traditional tactics among local fishing communities allow them to manage their fishing resources sustainably thus supporting marine diversity (Rao & Mohan, 2007). Modern restoration activities in Kerala’s forests utilize modified traditional forest management techniques which incorporate practices including both shifting cultivation and grassland fire applications. Kerala has established a conservation model through the combination of traditional wisdom and modern science which safeguards ecological preservation and sustains local communities.

7. Policy Recommendations

The following measures prioritise different sectors' integration and active community participation and establish partnering networks which enable increased restoration scale.

a) Integrated Policy Frameworks:

Operating synchronized policies between forestry and agriculture sectors as well as water resource sectors ensures environmental compatibility along with policy harmony. Efforts in restoration and rewilding encounter multiple obstacles because current governing policies treat their target environmental elements independently. Agricultural management methods that cause forest destruction and wetlands drainage coexist with conservation-only policies which ignore community sustainable income needs (Sukumar & Singh, 1998). Integrating land use with water management alongside biodiversity conservation practices will generate a unified model for achieving sustainable development. The integration of policies in Kerala will allow sustainable agricultural practices like agroforestry to support ecosystem restoration goals. Such a management approach will boost ecological strength and promote lasting sustainability of Kerala's nature.

b) Incentives for Conservation:

Incentives both monetary and non-monetary should be provided to restorers and their communities to create lasting participation. The protection of ecosystems through PES can be supported by economic payments to landowners and sustainable farming subsidies while eco-tourism joins as another beneficial source. Kerala should implement analogous programs that motivate landowners to participate in biodiversity conservation projects including forest restoration and habitat rehabilitation initiatives. Furthermore the combination of non-financial incentives that include capacity building opportunities and marketplace connections with recognition processes enhances biodiversity conservation results among the population. Kerala can establish a triumph-win arrangement by offering these incentives which will strengthen mutual support between environmental conservation and community livelihoods (Gadgil & Guha, 1995).

c) Research and Monitoring:

The assessment of ecosystem success and strategy adjustments depend on developing strong systems which monitor healthy ecosystems and perform research on restoration methodology. Programs for monitoring enable organizations to track biodiversity patterns together with soil conditions and water purity and ecosystem sustainability which enables them to make important decisions about conservation activities. Extended ecological monitoring of forests along with wetlands allows scientists to monitor species accumulation patterns and spot initial environmental damage symptoms which helps assess restoration practices effectiveness. Scientific knowledge about ideal restoration practice methods such as native species reintroduction, habitat restoration and invasive species control must continue to be studied for improving restoration techniques. The state of Kerala should dedicate its funding to scientific research which will let restoration practices use modern ecological information coupled with adaptive management approaches (Singh et al., 2020).

d) Education and Awareness:

Sustainability development requires both environmental education campaigns alongside widespread awareness promotion about biodiversity protection. Through targeted awareness programs communities will learn to identify the worth of their natural ecosystems which include forests wetlands and coastal regions because these systems preserve ecological stability while fuelling human income. The information about conservation issues with restoration techniques and ecosystem service benefits should reach the public through schools and local community groups and media platforms. Programs that raise public awareness will explain the relationship between biodiversity decline and climate change so people become motivated to use sustainable behaviours at home. The government can gain higher community backing for its restoration and policy programs through educational campaigns.

e) Public-Private Partnerships:

Ecosystem restoration and rewilding projects will achieve greater scale when the public sector collaborates with private organizations and institutions along with non-governmental organizations (NGOs). PPPs serve as essential tools to assemble funding support with creative expertise for better implementation of conservation programs. Respective ecosystem restoration partnerships between private companies and the government could combine to revitalize damaged terrains while providing financial backing to reintroduction studies along with constructivism of sustainable facilities.

The combination of NGO networking with government policy backing and financial support provides communities with access to environmental education programs and local knowledge acquisition and community outreach services. The participation of private companies in such projects facilitates innovation that produces sustainable green technologies for businesses and environmentally friendly farming practices which serve conservation missions. Through partnerships these organizations enhance their resource management and create greater effectiveness for restoration projects (Gowda et al., 2019).

8. Results and Discussions

a) Environmental Challenges Affecting Kerala's Ecosystems

The study describes essential environmental threats that include deforestation alongside habitat fragmentation and industrial pollution alongside climate change. Human development projects and city expansion have dramatically depleted forests and destroyed wetlands which has hurt native populations of species while leading to reduced biodiversity. Industrial pollution has led to severe water contamination that affects aquatic as well as terrestrial life forms. Monsoon unpredictability and temperature elevations together with extreme weather patterns have worsened the state of ecological systems.

b) Effectiveness of Kerala's Conservation Strategies

Several ecosystem recovery projects operate currently in Kerala to restore damaged environments. Forest restoration projects in Kannur Alappuzha and Kasaragod regions have reinforced both marine habitats and fish populations. The river restoration projects in Bharathapuzha as well as Periyar and Pamba target riverbed removal of pollutants alongside vegetation recovery with pollution management. The successful rehabilitation of forests together with wildlife conservation occurs at Silent Valley National Park. The programs have improved biodiversity quantities together with ecosystem functions and provide benefits for flood management while storing carbon.

c) Role of Traditional Ecological Knowledge and Community Participation

The people who live in local areas take a central part in protecting Kerala's natural resources because of their traditional understanding of nature. People’s Biodiversity Registers (PBRs) enable both documentation and protection of biodiversity alongside Pokkali rice farming systems which unite aquaculture practices with sustainable agricultural methods. Members of Kudumbashree self-help groups together with tribal communities organize conservation activities. Such community-led environmental governance programs have proved their effectiveness.

d) Impact of Rewilding Initiatives

The rewilding initiatives in Kerala concentrate on bringing back local species including Nilgiri Tahr and lion-tailed macaque. These efforts have helped in, restoring natural predator-prey dynamics. Endangered species benefit from the process of improving their genetic diversity. This practice enhances ecosystem resistance through non-invasive methods of human interaction. The success of these programs faces issues like habitat fragmentation and human-wildlife conflict that need sustained monitoring and policy modifications to be properly addressed.

e) Policy Frameworks and Governance Mechanisms

Kerala Biodiversity Strategy and Action Plan (KBSAP) enables conservation through its organized structure. The Integrated Watershed Management Programs (IWMP) achieves two main targets through watershed restoration using conservation methods and by implementing sustainable agriculture together with sustainable rural development. The land use interests limit implementation of conservation programs while financial support fails to meet the necessary requirements.

f) Challenges for Sustainability

Despite Kerala’s progress, challenges persist. Land-use conflicts between conservation, agriculture, and urban expansion drive deforestation. The environment is deteriorating through rising temperatures as well as modifications in monsoon patterns and coastal erosion which results in additional habitat destruction. Local populations need to both control and monitor invasive species since these intruders endanger natural habitats within their territories. Lack of economic motivation prevents people from participating in conservation activities but eco-tourism and PES schemes offer potential solutions.

9. Conclusion

Kerala's ecosystem restoration and rewilding programs establish an exemplary method to merge biodiversity preservation with sustainable progress initiatives. Several restoration initiatives throughout the state rely on the active collaboration with local communities along with traditional environmental knowledge. Community-led initiatives that prioritize mangrove and wetland landscape preservation in Kuttanad show how well-planned strategies deliver better local sustainability and environmental improvement.

Kerala combines Pokkali rice farming methods with contemporary conservation practices which leads to improvements in agricultural soils together with protected biodiversity and improved rural livelihoods. Through such corridors the protection of endangered species achieves its aims along with decreased human-wildlife confrontations. The program has achieved significant success but additional obstacles still exist. Ongoing land-use differences between agricultural zones and urban growth areas along with conservation zones create ongoing problems. Climate change makes existing difficulties worse through its influence on inconsistent weather patterns and rising ocean levels together with intense weather events. A lack of economic security and insufficient community backing along with socio-economic pressures create barriers that prevent long-term community involvement whereas non-native species endanger local species diversity.

The state of Kerala demands an integrated governmental plan which unites all elements of forestry with agriculture and water supply management along with conservation initiatives. The preservation of restoration initiatives requires three basic components: improved financial benefits and increased research activities and environmental education investment. A strategic cooperation between government agencies and private organizations and local communities and non-government organizations will aid in securing resources and expanding projects.

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FACTORS INFLUENCING CONSUMER BEHAVIOUR TOWARD GREEN PRODUCTS

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Abstract

In the present world, where people are becoming more environmentally conscious, customers are opting for green products, which are beneficial for both the sellers and buyers. The purpose of this study is to explore the factors that influence consumers' preference for green products and the barriers that affect their purchase intention. This paper employs a descriptive research design to collect primary data from 50 consumers through an online questionnaire that probes into the perceptions, knowledge, and actions concerning eco-friendly substitutes. Secondary data was also collected from academic journals, textbooks, and online reports to enhance the information. The results show that although the majority of consumers are aware of green products and their positive impact on the environment, the main barriers include high prices, unavailability of the products, and doubt in eco-labels. Despite the fact that more than half of the respondents agreed with the statement that they prefer to buy green products, only about one-fifth of them actually does so. Some of the factors that were found to act as barriers included; affordability, product accessibility, and packaging transparency. Also, the result shows that almost half of the consumers believe that green products are of high quality, yet three-fourth of them are aware of eco-labels without a clear understanding of their meaning. Nevertheless, there are still barriers that exist, and almost all of the consumers agree that green products are good for the environment and most believe that they are better for your health. The study also found that in order to shift consumer behaviour to sustainable purchasing, there is a need to increase awareness on the affordability of the products, as well as their availability in the market. By addressing these issues, businesses and regulators can promote the growth of a environmentally friendly market.

Keywords: green products, consumer preferences, environmental sustainability, eco-labels, purchasing behaviour, affordability, awareness, transparency, sustainability.

Introduction

As awareness about climate change and environmental issues grows, more consumers are opting for products that are eco-friendly and align with their values (Smith & Jones, 2020). This shift creates both challenges and opportunities for businesses, as factors like price, availability, and quality may hinder purchases (Brown, 2019). For businesses to succeed, it is important to understand what drives consumers to choose green products. By exploring consumer preferences, businesses can adjust their strategies to make sustainable products more attractive (Lee & Kim, 2021). This study aims to identify the key factors that influence consumer choices for green products and how businesses can use these insights to improve their marketing and product offerings (Johnson, 2022).

Statement of the Problem

This study aims to identify the key factors influencing consumer preferences for green products and examine how these factors affect their purchasing behaviour. By understanding these influences, businesses can improve their product offerings and marketing strategies to better meet consumer needs and promote sustainable consumption.

Objectives

1. Identify factors that influence consumer preferences for green products.
2. To explore the impact of green products on purchase decision

Methodology of the Study

This study followed a descriptive research design to gain a clear understanding of the factors influencing consumer behaviour toward green products. Both primary and secondary data were collected and analysed to achieve this objective. The primary data was gathered through an online questionnaire administered to a sample of 50 consumers, chosen to provide insights into their preferences and purchasing behaviours regarding green products. The questionnaire was designed to capture information on various aspects such as consumer attitudes, awareness, and the perceived importance of environmental sustainability in their purchasing decisions.

In addition to primary data, secondary data was collected from various reliable sources, including websites, academic journals, textbooks, and other published reports. This secondary data supported the primary data by providing existing knowledge and context about consumer behaviour, environmental consciousness, and market trends related to green products. Once the data was collected, it was analysed using percentage analysis. The results were presented in a clear and understandable format, using tables, graphs, and pie charts to visually represent the key findings.

Results and Discussion

The survey results indicate a strong preference for green products, driven by growing awareness and environmental consciousness. More than half of consumers express a positive perception of eco-friendly alternatives, with around 40% relying on digital platforms as their primary source of information. However, while 56% agree with choosing green products, only 16% purchase them regularly, and 70% do so occasionally. The gap between awareness and action is influenced by various challenges, including cost (38%), accessibility (36%), and product availability (72%). Although 92% acknowledge that purchasing green products contributes to sustainability, these barriers prevent widespread adoption.

Trust and transparency emerge as key factors in influencing consumer choices, with 50% of respondents checking product labels and 58% considering packaging important. While 46% perceive green products as high quality, many still face trust issues, with 76% aware of eco-labels but not fully understanding their significance. Price remains a major consideration, as 52% are willing to pay a premium of 11-20%, yet affordability remains a concern. Encouragingly, 88% believe in the environmental benefits of green products, and 74% consider them healthier alternatives. Bridging the gap between awareness and action requires efforts in education, affordability, and accessibility to ensure sustainable choices become more practical and widespread.

Conclusion

In conclusion, although consumers' interest in green products exists, several factors hinder their widespread uptake. Cost, absence, and low trust in eco-labels remain barriers to purchasing decisions, despite the increasing concern for the environmental benefits of the purchase. Efforts need to be directed towards making the products more affordable, increasing the market availability and consumer understanding of sustainability. With these barriers in mind, businesses and policymakers can work to change consumer intent into action, and lead the way to a more environmentally responsible and sustainable marketplace.

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TRANSFORMING EDUCATION IN INDIA IN ALIGNMENT WITH SDG 4: A COMPREHENSIVE ANALYSIS OF NEP 2020, SAMAGRA SHIKSHA SCHEME AND RTE ACT

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Abstract

SDG 4 aims to ensure inclusive, equitable, quality education and lifelong learning opportunities for all. India has made significant educational strides through policies and programs to enhance access, infrastructure, and quality. Key initiatives such as the National Education Policy (NEP) 2020, Samagra Shiksha Scheme, and the Right to Free and Compulsory Education Act (RTE), 2009 play a vital role in achieving SDG 4 targets in India. NEP 2020 aims to improve the quality of education in India and make it more accessible, while the Samagra Shiksha Scheme acts as the backbone for executing NEP 2020's recommendations. Samagra Shiksha Scheme, a comprehensive program for the school education sector that spans from preschool to class 12, was created to enhance school performance as evaluated by fair learning results and equal educational opportunities. It encompasses the three programs of Teacher Education (TE), Rashtriya Madhyamik Shiksha Abhiyan (RMSA), and Sarva Shiksha Abhiyan (SSA). India's historic Right to Free and Compulsory Education (RTE) Act, 2009, established education as a child's fundamental right. It ensures free and compulsory education for all children aged 6 to 14 years under Article 21A of the Indian Constitution.

This paper thoroughly examines the development and difficulties these programs face and how far they are achieved, fortifying infrastructure, and promoting teacher preparation. Additionally, it assesses how well they work together to solve resource shortages, advance curricular alignment, and stimulate creativity.

Keywords: *SDG 4, NEP 2020, Samagra Shiksha Scheme, RTE Act, Education*

Introduction

Education is important in developing a nation that fosters innovation, productivity and equality (UNESCO, 2015). Sustainable Development Goals, created by the United Nations Agenda for 2030, aim to ensure inclusive and equitable quality education for all and promote lifelong learning opportunities (United Nations, 2015). To align with this goal India has implemented the National Education Policy (2020), the Samagra Shiksha Scheme and the Right of Children to Free and Compulsory Education Act.

National Education Policy (2020) aims to bring a massive transformation of the education sector in India. It not only focuses on developing cognitive skills but also foundational skills, higher-order skills and soft skills. The policy also aims to universalise pre-primary education. NEP 2020 seeks to ensure the quality of schools, improve infrastructure, transform curriculum, improve teacher training and restructure regulations for education (NEP 2020).

Sarva Shiksha Scheme encompasses Sarva Shiksha Abhiyan(SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and Teacher Education(TE). The scheme not only provides support to the implementation of the RTE Act but also aligns with the recommendations of NEP 2020. It aims to ensure quality education, inclusive classrooms, building foundational literacy and numeracy, bridging social and gender gaps, vocationalisation of education, etc. (Samagra Shiksha, Ministry of Education)

The Right of Children to Free and Compulsory Education Act, 2009 provides free and compulsory education for children's age between 6 and 14 in India under Article 21(A) of the Indian Constitution. The Act ensures that no child is held back, expelled or required to pass the board exam until completion of elementary education. (Ministry of Education)

This study critically examines how India's education policies align with SDG 4 goals, analysing the challenges, effectiveness and policy recommendations for improving the current situation.

Overview of SDG 4, NEP 2020, Samagra Shiksha Scheme, RTE Act

SDG 4- Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

SDG 4 aims to ensure inclusive and equitable quality education for all and also to promote lifelong learning opportunities. It recognises the need for educating vulnerable populations, especially persons with disabilities, children living in rural areas, indigenous people and refugee children.

SDG 4 Targets

- Free primary and secondary education
- Early access to quality pre-primary education
- Equal access to affordable technical, vocational and higher education
- Increase the number of people with relevant skills for financial success
- Eliminate all discrimination in education and ensure education for all including persons with disabilities, Indigenous people and children in vulnerable situations
- Universal literacy and numeracy
- Education for sustainable development and global citizenship
- Build and upgrade inclusive and safe schools
- Expand higher education scholarships for developing countries
- Increase the supply of qualified teachers in developing country

The following initiatives were taken by the government of India to implement SDG 4

- ➢ Samagra Shiksha Abhiyan
- ➢ New India Literacy Programme
- ➢ Mid-day Meal Scheme
- ➢ Pre and Post Metric Scheme for SCs
- ➢ PM SHRI
- ➢ Eklavya Model Residential Schools
- ➢ Rashtriya Avishkar Abhiyan
- ➢ National Means Cum Merit Scholarship
- ➢ Padhe Bharat Badhe Bharat
- ➢ Skill Strengthening for Industrial Value Enhancements
- ➢ PM Uchchatar Shiksha Abhiyan

National Education Policy (NEP) 2020

National Education Policy, 2020 (NEP) envisions a massive change in the education sector. It is based on five pillars: Access, Equity, Quality, Affordability, and Accountability. NEP 2020 aims to revamp all educational policies and create a new system in alignment with SDG 4.

NEP 2020 aims to bring the Gross Enrolment Ratio to 100% by 2030. It aims to ensure universal access to education from three primary classes to class 12. Measures were taken to bring back children dropping out of school. NEP 2020 aims to achieve 100% adult and youth literacy by 2030.

The existing 10+2 structure of the school curriculum is replaced by 5+3+3+4 corresponding to ages 3-8, 8-11, 11-14 and 14-18 years respectively. The new system is divided into 4 stages namely the foundational stage, the preparatory stage, the middle stage and the secondary stage. The foundational stage will cover 3 years in Anganwadi / Pre-School and 2 years in primary school. The preparatory stage covers 3 years of education from classes 3-5. The next 3 years of education from class 6-8 are incorporated in the middle stage. The secondary stage covers the last 4 years of education from class 9-12.

- NIPUN Bharat

The National Initiative for Proficiency in Reading with Understanding and Numeracy was formed to achieve basic literacy to read, write and do basic mathematics.

NEP 2020 wanted to ensure that no child is left behind based on birth or background. Special focus was given to socially and economically backward groups. It wanted to ensure inclusive and equitable quality education. Children with disabilities were able to attend regular schools. Recruitment of special educators was done to support children with disabilities. School infrastructure was in a way supporting such children.

A common National Professional Standards for Teachers (NPST) was developed in 2022 for teachers that would cover the expected roles a teacher should play at different stages.

In higher education, the main aim was to increase the Gross Enrolment Ratio from 26.3% (2018) to 50% by 2035. The undergraduate degree was restructured for 3-4 years of duration providing multiple exit options. A new entity named the National Research Foundation (NRF) was set up to expand research and innovation. The NRF will fund research in all disciplines. Efforts were made to provide scholarships to students belonging to SC, ST, OBC and other SEDGs. Open and distance learning will be expanded by ensuring online courses and digital repositories, research funds, etc. Higher Education Commission of India (HECI) will work in the promotion of higher education.

The National Educational Technology Forum (NETF) was created to exchange ideas on using technology to enhance learning, assessment, planning and administration. Technology-based platforms DISHA/ SWAYAM will be connected across educational institutions.

Samagra Shiksha Scheme

Samagra Shiksha, an integrated scheme for School Education was launched in 2018. It subsumes Centrally Sponsored Schemes of Sarva Shiksha Abhiyan(SSA), Rashtriya Madhyamik Shiksha Abhiyan(RMSA) and Teacher Education(TE). The scheme is made under Sustainable Development Goal 4.

The scheme not only provides support for the implementation of the RTE Act but also aligns with NEP 2020.

The main aim of the scheme was to implement the recommendations given by National Education Policy 2020. It also supports states in the implementation of the Right to Free and Compulsory Education Act, of 2009. It focuses on Early Childhood Care and Education, emphasising Foundational Literacy and Numeracy. It ensures equity and inclusion at all levels of education by bridging social and gender gaps.

- Sarva Shiksha Abhiyan

The flagship programme of the government of India was started in 2001 to achieve the Universalisation of Elementary Education (UEE). It aims to provide education to all children in the age group of 6 to 14 age group.

- Rashtriya Madhyamik Shiksha Abhiyan (RMSA)

RMSA was launched in 2009 to enhance access to secondary education and to improve its quality. It aimed to provide important physical facilities like laboratories, a library, an arts and crafts room, etc.

The Right of Children To Free And Compulsory Education Act, 2009

The RTE Act, 2009, comes under Article 21-A of the Constitution of India to provide free and compulsory education to all children between the ages of six and fourteen as a fundamental right. According to this act, every child has the right to full and elementary education. Article 21-A and the RTE Act came into effect on 1 April 2010.

Right of children to free and compulsory education till elementary education is made compulsory. ‘Compulsory education’ means an obligation of the government to provide free elementary education. ‘Free’ means no child should pay the fee for education. It also lays norms for Pupil Teacher Ratios (PTR). It prohibits physical punishment and mental harassment, screening procedures for admission, donation for admission, private tuition by teachers and working in schools without recognition.

Research Methodology

The primary objective of the research is to study and understand how education in India is transforming in alignment with SDG 4. The various sources from which data is gathered are below

- Secondary data: Official websites, government articles etc.
- Government Report: UDISE+ Reports, SDG index report by NITI Aayog
- Other statistical data by various official organisations

Analysis

SDG 4 Achievements in India

The analysis is done mainly based on UDISE+ REPORTS and SDG Index report by NITI Aayog.

1. Schools, Enrolments and Teachers
    - 24.8 cr students enrolled in pre-primary to higher levels in 2023-24 showing a slight decrease from 25.18 cr enrolments from 2022-23. The highest number of enrolments was from Uttar Pradesh accounting for 41.66 lakhs and the least from Lakshadweep
    - Adjusted Net Enrolment Rate in elementary education (class 1-8) -96.5 %
    - Gross Enrolment Ratio in Higher Secondary Education – 57.6%
    - Gross Enrolment Ratio in Higher Education (18 – 23 years) – 28.4%
    - Social category: 45.2% OBC, 26.9% General, 18% SC and 9.9 % ST
    - The overall teacher Ratio is 25, with Bihar having the highest ratio of 32 and Sikkim having the lowest ratio of 8
    - Pupil-teacher ratio at secondary level- 18
    - Trained teachers at secondary level- 92.2%

2. School Infrastructure
    - 98.3% of schools have drinking water availability
    - 97.2% of schools have girls' toilets and 95.7% have boys' toilets
    - 57.2% of schools have computer facilities, and 53.9% have internet facility
    - Only half of the schools (53.2%) have ramp facilities and 34.4% have toilets friendly for Children with disability showing less consideration in Infrastructure for such children.
    - Schools with computers -47.5%
    - Schools with access to electricity and drinking water- 88.65%

3. Dropout rate
    - Primary- 1.9
    - Upper Primary- 5.2
    - Secondary- 14.1

The average annual dropout rate in higher secondary- 12.6%

4. Retention Rate
    - Elementary- 78
    - Secondary – 63.8
    - Higher secondary- 45.6

- ➢ Persons with Disability (15 years and above) completed at least secondary education- 19.3%
- ➢ Achievement of Minimum Proficiency in Language and Mathematics by class 8 -77.23%
- ➢ Literacy level among persons aged 15 years and above- 76.7%
- ➢ Gender Parity Index (parity between males and females in higher education) – 1.01

SDG Index score for SDG 4 ranges between 32 and 82 for states and 53 and 85 for Union Territories. Kerala and Delhi are the best performers. Assam, Bihar, Madhya Pradesh, Meghalaya, Nagaland and Odisha fall behind in achieving SDG 4.

Adjusted Net Enrolment ratio, Gross Enrolment Ratio (GER) in higher secondary, Student proficiency in class 8, Targeted percentage of the education level of persons with disability, Literacy levels, Schools with access to electricity and drinking water, Schools with computers and Trained teachers were aimed to be 100%, but achieved were only 96.5%, 57.6%, 77.23%, 19.3%, 76.7%, 88.65%, 47.5%,99.2% respectively. The targeted percentage of the education level of persons with disability was 100% but achieved only 19.3%.

Findings

- The target of the Adjusted Net Enrolment ratio is 100, whereas we have achieved only 96.5%.13 states and one union Territory have only achieved it. Nagaland (80.33%) and Ladakh(67.8%) have the lowest number.
- The dropout rate is 12.6% from a target of 7.67 based on the average of 3 best-performing states from 2015-16. Chandigarh and Manipur are the best-performing states.
- Gross Enrolment Ratio (GER) in higher secondary was targeted to be 100%, but achieved was only 57.6. Himachal Pradesh (94.1) and Delhi (94.9) recorded the highest GER and Nagaland (35.8) recorded the lowest
- Student proficiency in class 8 was aimed to be 100% by 2030, now achieved 77.23%. Punjab performs the best with 91.5%
- The targeted enrolment ratio in higher education was 50%, Tamil Nadu has 47% and Chandigarh has 64.8%
- The targeted percentage of the education level of persons with disability was 100%, but what we achieved was too low at 19.3%. None of the stated achieved the target, the better being Goa with an enrolment of 32.4%, and the lowest being Arunachal Pradesh, having only 10.3%
- Gender Parity Index being 1, India has achieved 1.01, with 18 states achieving the targeted value and the lowest being Odisha(0.88)
- Literacy levels with a target of 100%, Mizoram has the highest with a percentage of 99.3% and Bihar has the lowest with 67.3%. among the UT, Lakshadweep has the highest percentage of 97.8
- About 88.65% of schools have access to basic infrastructure of both electricity and drinking water. Tamil Nadu and Goa achieved the target of 100%. While Meghalaya is the least with 20.5%.
- Around 47.5% of schools have computers, whereas Chandigarh, Delhi and Lakshadweep achieved 100%. Where Punjab has also achieved 99.6%, closest to 100%. Whereas Meghalaya stands behind with 18.3%.

- 92.2% of teachers in India are trained. Tamil Nadu (99.9) and Chandigarh (99.1%) have the highest number of trained teachers. Meghalaya has the lowest number of trained teachers with 62%.
- The Pupil-teacher ratio stands at 18, better than the minimum target of 30. Himachal Pradesh has the best PTR of 6. Jharkhand and Bihar are the only states which are yet to achieve the goal.

Challenges and recommendations

SDG score for the country is 71 out of 100 for 2023-24, showing a significant improvement from 66 in 2020-21 and 57 in 2018. The goal-wise performance is categorised into Achiever (100), Front Runner (65-99), Performer (50-64), and Aspirant (0-49). SDG 4 performance in the years 2018, 2019-20, 2020-21, and 2023-24 is 58,58,57,61 respectively. So, it shows that India is only a performer in this regard, and not much progress is evident.

Inclusive Education remains a challenge for our country. Proper ramp facilities and disability-friendly toilets are missing in the majority of educational institutions. Also, many schools lack assistive technologies and special educators. More funds should be utilised to meet the requirements of Children with Special Needs.

Persons with Disability completing secondary education is only 19.3%, which might be due to the lack of proper infrastructure and training facilities to gain jobs based on their expertise and skills. Such children should be trained from the schools itself to get appropriate jobs based on their education.

Only half of the schools in the country have access to the internet in this digital era. The gaps in digitalisation between urban and rural schools continue to be a hindrance for students in online learning and digital skills development. Investment in ICT programmes, teacher training on computer literacy etc. should be done in this regard.

The dropout rates at secondary levels are more in the secondary level. Financial difficulties, transportation facilities, etc., could contribute to the issue. Scholarships from the government and free transportation can aid the situation and reduce the dropout rates.

Conclusion

The analysis of India's educational progress in alignment with SDG 4 shows significant developments, but also challenges persist. While the Adjusted Net Enrolment Ratio has reached 96.5%, states like Nagaland and Ladakh lag. Similarly, the dropout rate is still higher than the target of 7.67%, which required more retention strategies, especially in higher secondary where retention rates are low. Also, the Gross Enrolment Ratio in higher secondary is only 57.6%, which is required to be improved, giving more focus on states like Nagaland with GER 35.8. Student foundational literacy by class 8 has improved to 77.3%, but there are still gaps to be filled by 2030.

The educational level of persons with disabilities is very low to the goal, which requires urgent attention and policies to improve it. Also, the infrastructure facilities of the schools should align with the requirements of Children with Special Needs (CWSN). Improved ramp facilities and CSWN-friendly toilets are to be built.

In conclusion, to achieve the targets of SDG 4 through initiatives like NEP 2020, the Sarva Shiksha Scheme and the RTE Act, gaps persist in enrolment, infrastructure, literacy, retention, digital education, etc. The steady increase in digital access and gender-inclusive facilities shows a positive trend, but certain regions are lagging, especially in internet connectivity and CSWN-friendly infrastructure. Further, it also highlights the need for strengthening foundational literacy. Going forward, data-driven policymaking should be the cornerstone of education reforms and, in the end, achieving the targets of SDG 4 and transforming the educational sector in India.

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ASSESSING THE CREDIT RISK OF LOAN APPLICANTS USING K MEAN CLUSTERING

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Abstract

Assessing credit risk is a critical task for financial institutions when evaluating loan applicants. Traditional methods often rely on linear models or predefined risk categories, which may not capture complex patterns within the data. This abstract explores the use of K-means clustering as an alternative approach to segment loan applicants into distinct risk groups based on their financial characteristics and behaviors.

K-means clustering is an unsupervised machine learning algorithm that groups data points into clusters based on similarity. In the context of credit risk assessment, key features such as credit score, income level, debt-to-income ratio, and past payment behavior are used to form clusters that represent different risk profiles. By applying K-means clustering, financial institutions can better identify applicants who fall into high, medium, or low-risk categories, allowing for more targeted lending decisions.

The results of the clustering process are analyzed to evaluate the effectiveness of this method in accurately predicting credit risk compared to traditional approaches. The advantages of K-means include its ability to handle large datasets and uncover non-obvious relationships in the data. The abstract concludes by suggesting K-means clustering as a valuable tool for enhancing the accuracy and efficiency of credit risk assessments in lending practice

Key words : Credit risk , K-means clustering , Elbow method , Risk assessment , Financial characteristics

1. Introduction

Credit risk assessment is a critical process for financial institutions, particularly banks, when making lending decisions. It involves evaluating the likelihood that a loan applicant will default on their loan obligations, which helps institutions mitigate potential financial losses. Traditional methods for credit risk assessment often rely on scoring systems or predictive models based on historical data and various financial indicators. However, these models can sometimes overlook hidden patterns or fail to identify nuanced relationships in the data.

In recent years, machine learning techniques have gained traction in the financial industry, offering more sophisticated and automated ways to assess credit risk. One such technique is K-means clustering, an unsupervised machine learning algorithm that groups applicants based on their similarities in terms of financial and demographic characteristics. K-means clustering doesn’t require labeled data, making it an attractive tool for identifying patterns in large, unstructured datasets.

By using K-means clustering, financial institutions can segment loan applicants into distinct groups (or clusters) based on features like income, credit score, debt-to-income ratio, and employment status. Each cluster represents a unique set of applicant characteristics, and by analyzing these clusters, banks can gain valuable insights into the creditworthiness of potential borrowers.

This approach not only aids in predicting the likelihood of default but also enhances the efficiency and transparency of the loan approval process. For example, applicants in a cluster with low income and high debt may be classified as high-risk borrowers, while those in clusters with strong financial profiles (high income, low debt) may be classified as low-risk. This clustering method can help prioritize applicants, streamline decision-making, and potentially reduce the risks associated with lending.

Scope of the study

This study is to evaluate the effectiveness of K-Means clustering in assessing the credit risk of bank applicants. The focus is on identifying distinct groups of applicants based on key financial and demographic factors, which can help in predicting their likelihood of default. The study aims to enhance the bank's ability to make more accurate, data-driven lending decisions, improve risk management strategies, and optimize the credit approval process by using K-Means clustering as a tool for segmenting applicants based on risk profiles.

Objectives

1. To determine the optimum number of clusters using elbow method.

2. To apply K-means clustering for segmenting the data into Good and Bad Credit.

3. To analyse and rank the loan purposes across the two clusters.

2. Literature Review

(Nthenge, 2024) The hybrid model combining Artificial Neural Networks (ANN) and K-Means Clustering to enhance risk prediction in life insurance underwriting. The ANN achieved 90% accuracy but struggled with nonlinear relationships, while K-Means identified distinct risk profiles. The hybrid model improved testing accuracy to 98%, demonstrating the potential of combining machine learning techniques to modernize underwriting practices.

(Bouaguel & Silimani, 2022)The COVID-19 crisis significantly impacted the banking sector, affecting customers' ability to repay credit. The study proposed a hybrid behavioral scoring approach using K-Means Clustering and decision trees to identify risk levels. This method helped differentiate between viable and distressed debtors by analyzing clusters of customer behaviors before and during the pandemic.

(Gavira-Duron, Gutierrez-vargas, & Cruz-Ake, 2021)This research applied Markov chains combined with K-Means Clustering to estimate companies' credit risk and default probabilities. The study identified inflection points where hedge credits transition into speculative or Ponzi states, offering insights into companies' credit quality over time. This approach proved useful in predicting defaults in different market conditions.

(Jadwal, Pathak, & Jain, 2022), This study compared clustering techniques such as K-Means, hierarchical clustering, and HK Means for customer segmentation in credit risk evaluation.
Combining K-Means with hierarchical clustering proved to be optimal for

segmenting credit card customers, improving predictive accuracy when followed by machine learning models for risk assessment.

(Machado & Karray, 2022), This paper proposed hybrid machine learning models combining supervised and unsupervised methods to predict commercial customers' credit scores. The hybrid models outperformed individual algorithms, demonstrating that combining both techniques increases the predictive performance for credit risk assessment.

(bao, Lianju, & Yue, 2019)The study explored combining unsupervised and supervised learning algorithms at different stages for credit risk assessment. The results indicated that integrating clustering with supervised models significantly improved the predictive performance, with the best results achieved by combining both consensus and clustering stages.

(Yu Song, et al., 2020), This study introduced a multi-view ensemble learning method, DM- ACME, using adaptive clustering to handle imbalanced datasets in credit risk assessment for P2P lending. By focusing on the identification of real defaults, this approach improved the predictive accuracy and handled the challenges posed by imbalanced data.

(Apitzsch & Ryeng, 2020)This thesis examined the use of unsupervised learning algorithms like PAM and hierarchical clustering for customer segmentation in credit risk assessment. It showed that grouping customers into risk segments allows financial institutions to make more informed and tailored credit decisions.

(dang, chen, yu, & yang, 2022), This research focused on credit ratings for Chinese households using a combination of factor analysis and K-Means clustering. By using household financial fragility, the study was able to classify households into different credit levels, providing valuable insights into household credit risk evaluation.

(Nhat, 2024)This study evaluated various clustering techniques, including K-Means and DBSCAN, for classifying high-risk customers in Vietnam's banking sector. It found that DBSCAN and HDBSCAN excelled in identifying high-risk clusters, emphasizing the importance of density-based methods in customer risk management.

(Yu, Huang, Tang, & Zheng, 2025)This paper proposed a hybrid approach combining spectral clustering with semi-supervised support vector machines to improve the classification of credit risks. The two-stage system overcame challenges like imbalanced data and local optima, enhancing predictive performance in credit risk assessment.

(Bhatore, Latin, & Reddy, 2020), This systematic review of machine learning techniques for credit risk evaluation found that hybrid models, especially those combining neural networks and support vector machines (SVM), were increasingly used for credit scoring and fraud detection. The review emphasized the growing adoption of ensemble and hybrid models for better predictive performance.

(Baser, Koc, & A Sevtap Selcuk-Kestel, 2023), The study proposed a clustering-based fuzzy classification (CBFC) method for credit risk assessment. It showed that fuzzy clustering improves the prediction power of machine learning models by better capturing data structures and enhancing classification results for risk evaluation.

The Clustered support vector machine (CSVM) demonstrated similar performance to traditional support vector machines for credit scoring while being computationally efficient, making it a viable alternative for large-scale credit scoring tasks. (Harris, 2015).

(Han, Liu, Qiang, & Zhang, 2023)This fuzzy clustering analysis (FCA) for loan audit short texts to evaluate credit status. By transforming short texts into fuzzy matrices and clustering them based on similarity, FCA provided better clustering results compared to traditional methods like BIRCH and k-means.

3. METHODOLOGY

3.0 K-MEANS CLUSTERING

K-means algorithm is one of the partitioning based clustering algorithms [2]. The general objective is to obtain the fixed number of partitions/clusters that minimize the sum of squared

Euclidean distances between objects and cluster centroids. Let X= {xi | i=1,2,… ,n} be a data set with n objects, k is the number of clusters, mj is the centroid of cluster cj where j=1,2,…,k. Then the algorithm finds the distance between a data object and a centroid by using the following Euclidean distance formula [1].

The Euclidean distance between two points/objects/items in a dataset, defined by point X and point Y is defined by Equation below [5].

3.1. K-MEANS ALGORITHM

[1] INPUT: // Set of n

items to cluster D= {d1,

d2, d3,… ...., dn}

// No. of cluster

(temporary cluster)

randomly chosen i.e. k

// So below, K is set of subset of D as temporary cluster and C is set of centroids of those clusters.

K= {k1, k2, k3,… ...., kk },

C= {c1, c2, c3,… ...., ck}

Where k1= {d1}, k2= {d2}, k3=

{d3}…… kk= {dk} And c1=d1, c2=d2,

c3=d3,…………………..ck=dk,

// here k<=n

Output: // // K is set of subset of D as final cluster and C is set of centroids of

these cluster. K= {k1, k2, k3,… , kk },

C= {c1, c2, c3,… ...., ck}

Algorithm:

K-means (D, K, C)

1. Arbitrarily choose k objects from D as the initial cluster centers.

2. Repeat

3. (re) assign each object to the cluster to which the object is the most similar, based on the mean value of the objects in the cluster.

4. Update the cluster means, i.e., calculate the mean value of the objects for each cluster.

5. Until no change.

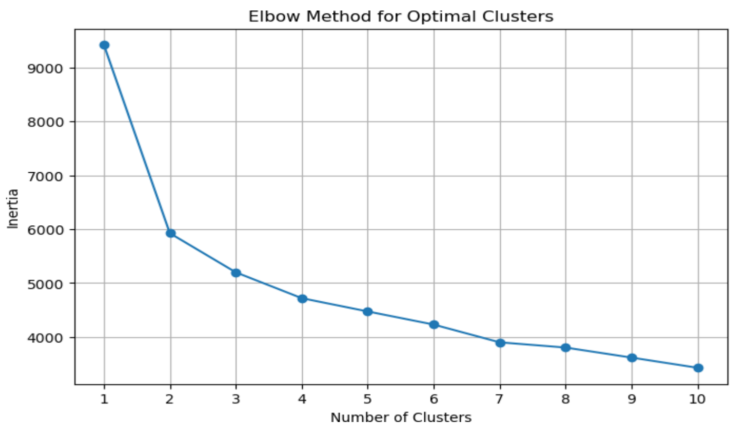
4. Analysis And Interpretation

Key Steps:

1. Data Loading and Preprocessing: Loaded the German credit dataset from a CSV file, handled missing values, encoded categorical variables, and scaled numerical features.

2. K-means Clustering: Applied K-means clustering to the preprocessed data to identify optimal clusters.

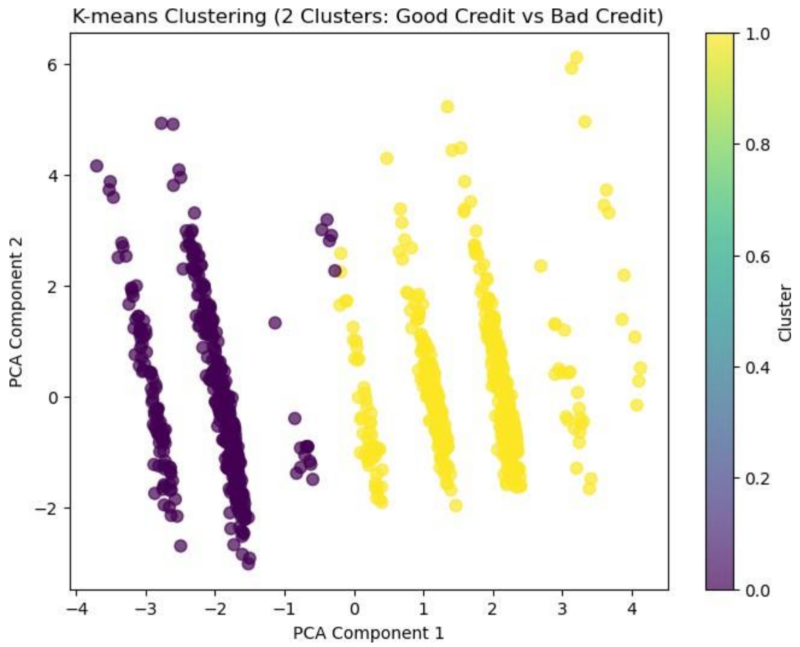
3. Elbow Method: Used the elbow method to determine the optimal number of clusters (k) based on the inertia plot.



The Elbow Method for Optimal Clusters," is a line plot used in data analysis, specifically in determining the optimal number of clusters for algorithms like K-means clustering. The graph displays the relationship between the number of clusters (x-axis) and the inertia (y-axis), which represents the sum of squared distances of samples to their closest cluster center.

The elbow method helps to visually identify the point where adding more clusters does not significantly reduce the inertia, indicating a diminishing return in terms of explained variance.

After that by using K-mean clustering , identified two clusters that is Good And Bad Credit. The purple colour specify the Good credit And the yellow colour specify the Bad credit.



4. Purpose Distribution Analysis: Analyzed the distribution of purposes across clusters and visualized the results using bar plots.

	Purpose	Code
0	radio/TV	0
1	education	1
2	furniture/equipment	2
3	car	3
4	business	4
5	domestic appliances	5
6	repairs	6
7	Vacation/others	7

In this ranking the business and domestic appliances purpose having more probability of bad credits, Radio/TV And Education purpose having more probability of Good credits

5. Conclusion

The study concludes that K-means clustering is an effective tool for assessing credit risk among loan applicants. Traditional credit scoring models often rely on linear approaches that may overlook complex patterns within financial data. By applying K-means clustering, financial institutions can segment applicants into distinct risk categories based on key financial attributes such as credit score, income level, and debt-to-income ratio. This approach enhances risk assessment by uncovering hidden relationships in the data, making it a valuable addition to modern credit evaluation practices.

One of the key findings of the study is the importance of determining the optimal number of clusters using the elbow method. By identifying the most meaningful groupings, financial institutions can ensure more accurate classification of applicants. The study successfully categorized applicants into two primary clusters: “Good Credit” and “Bad Credit.” This classification allows lenders to make more informed decisions regarding loan approvals and interest rate adjustments based on the level of risk associated with each applicant.

Furthermore, the study highlights that certain loan purposes are more likely to be associated with bad credit. For instance, applicants seeking loans for business and domestic appliances showed a higher probability of default, whereas those applying for education or radio/TV-related loans were more likely to have good credit. These insights enable financial institutions to refine their lending policies and mitigate potential financial risks by adjusting approval criteria based on the purpose of the loan.

Overall, the study concludes that K-means clustering is a powerful tool for improving credit risk assessment and loan decision-making. By leveraging machine learning techniques, financial

institutions can enhance the efficiency and accuracy of their risk evaluation processes. This data- driven approach provides a more objective and scalable method for identifying high-risk applicants, ultimately contributing to better risk management and financial stability in the lending sector.

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TECHNICAL ANALYSIS OF AIRLINE COMPANIES' SHARE PRICES USING THE HEAD & SHOULDERS PATTERN.

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ABSTRACT

Technical analysis is widely used in financial markets to predict stock price movements based on historical price patterns. One of the most reliable reversal patterns is the Head & Shoulders pattern, which signals potential trend reversals and is used by traders to make informed investment decisions. This study examines the effectiveness of the Head & Shoulders pattern in predicting share price movements of airline companies. Given the volatility of the airline industry due to factors such as fuel price fluctuations, geopolitical events, and economic downturns, identifying reliable patterns becomes crucial for investors.

The research involves analyzing historical stock price data of selected airline companies, identifying occurrences of the Head & Shoulders pattern, and evaluating its impact on subsequent price movements. By applying technical analysis to airline stocks, this study provides valuable insights into the significance of the Head & Shoulders pattern in market forecasting. The findings can help traders and investors refine their trading strategies and risk management techniques.

Keywords : Technical Analysis, Head & Shoulders Pattern, Airline Industry, Stock Price Forecasting, Market Volatility

Introduction

In the fast-paced world of stock markets, investors and traders are constantly searching for tools and strategies to predict price movements and make informed decisions. One such tool is technical analysis, a method that focuses on analyzing historical price data and trading volumes to forecast future market behavior. Unlike fundamental analysis, which examines a company's financial health, technical analysis is more concerned with patterns, trends, and market psychology. Among the many chart patterns used in technical analysis, the Head & Shoulders (H&S) pattern stands out as one of the most reliable indicators of a potential trend reversal. The H&S pattern is a visual formation that appears on price charts and typically signals a shift from a bullish (upward) trend to a bearish (downward) trend. It consists of three peaks: a higher peak (the head) flanked by two lower peaks (the shoulders), with a "neckline" connecting the lows of the pattern. When the price breaks below the neckline, it is often interpreted as a bearish signal, suggesting that the stock may decline further. Conversely, an Inverse Head & Shoulders pattern indicates a potential reversal from a bearish to a bullish trend. While this pattern has been widely used across various industries and asset classes, its effectiveness in specific sectors, such as the airline industry, remains an area worth exploring.

The airline industry is unique in its sensitivity to a wide range of external factors, including fluctuating fuel prices, economic cycles, geopolitical tensions, and global pandemics. For instance, the COVID-19 pandemic brought the industry to a near standstill, causing share prices to plummet as travel demand evaporated. Similarly, rising fuel costs or labor strikes can have immediate and significant impacts on airline stocks. These factors make the airline sector particularly challenging for investors, as traditional valuation methods may not always capture the rapid shifts in market sentiment that drive short-term price movements. This is where technical analysis, and specifically the Head & Shoulders pattern, can play a crucial role. By identifying key reversal patterns, traders can gain insights into potential turning points in stock prices, allowing them to capitalize on opportunities or mitigate risks. However, the sector’s inherent volatility means that patterns may form and break more frequently, leading to false signals. Additionally, external shocks, such as sudden changes in oil prices or global events, can disrupt the pattern’s reliability. Therefore, it is essential to examine how well this pattern holds up in the context of airline stocks and whether it can be used as a standalone tool or needs to be combined with other indicators for better accuracy.

This study aims to explore the effectiveness of the Head & Shoulders pattern in analyzing the share prices of airline companies. The scope of the study focuses on publicly traded airline companies, including both legacy carriers and low-cost airlines, primarily listed on major stock exchanges such as NSE. The analysis covers historical price data from the last year, considering short-term, medium-term, and long-term trends to assess the pattern’s reliability. The study identifies both Head & Shoulders and Inverse Head & Shoulders patterns, validating them using criteria such as neckline breakout, volume confirmation, and price targets. Statistical methods, including back testing and correlation analysis, are employed to evaluate the pattern's accuracy in predicting price movements. Data sources include historical stock prices from platforms like Yahoo Finance, and BSE historical data, incorporating volume, moving averages, and other technical indicators to strengthen the analysis. The study also conducts a comparative analysis to assess the predictive power of the pattern across multiple airline stocks while considering external factors such as oil prices, economic downturns, and global crises. However, it is limited to technical analysis and does not incorporate fundamental factors like earnings reports or macroeconomic conditions. Ultimately, this research aims to determine the effectiveness of the Head & Shoulders pattern in predicting stock price trends within the airline industry, providing valuable insights for traders, investors, and financial analysts.

Literature Review

The study of technical analysis and its effectiveness in predicting stock price movements has been extensively explored in financial literature. The selected works cover key areas such as chart pattern analysis, market efficiency, stock volatility, and external factors affecting stock prices. These studies provide a foundation for evaluating the Head & Shoulders pattern, one of the most widely used reversal patterns in technical trading.

A foundational book covering chart patterns, trend analysis, and technical indicato**rs** for predicting market movements. (Murphy, 1999). The book provides a structured and comprehensive guide to understanding and applying technical analysis in financial markets. It is designed for both beginners and experienced traders, covering a wide range of topics such as market trends, chart patterns, indicators, and trading strategies. (Martin J, 2002). It is a seminal work that applies statistical and econometric techniques to evaluate the validity of technical analysis. The authors aim to provide a quantitative foundation for traditional charting methods by using pattern recognition algorithms and empirical testing. (Andrew W. Lo, Vadim Mamaysky, & Jiang Wang, 2000). The study is significant because it applies rigorous statistical methods to evaluate the effectiveness of moving average (MA) and trading range break (TRB) rules in predicting stock returns. (Brock, Lakonishok, & LeBaron, 1992).

The authors systematically analyse previous empirical studies to determine whether technical trading strategies generate consistent profits across different markets and time periods. (Cheol-Ho Park & Scott H. Irwin, 2007). It formally introduces and develops the concept of the Efficient Market Hypothesis (EMH), which argues that financial markets incorporate all available information, making it impossible to consistently achieve excess returns. (Eugene F. Fama, 1970). It re-examines the weak-form efficiency of capital markets, a key component of the Efficient Market Hypothesis (EMH) proposed by Eugene Fama (1970). The authors test whether historical stock prices contain any patterns that can be exploited to generate abnormal returns. (Hudson, Dempsey, & Keasey , 1996).

It provides detailed statistical analysis of different chart formations, evaluating their effectiveness in predicting price movements. Unlike academic journal articles, this is a practical guide designed for traders and analysts who rely on technical patterns for decision-making. (Thomas Bulkowski, 2005). It examines the role and effectiveness of technical analysis in the foreign exchange (FX) market. The study discusses whether technical trading strategies can generate excess returns and how they compare to fundamental analysis in currency markets. (Neely & Weller, 2011). This journal investigates the predictive power of the Head and Shoulders pattern in financial markets, The study evaluates whether this well-known technical analysis formation can systematically forecast future price movements and generate profitable trading strategies. (Filho & Cavalcante , 2010).

The study critically examines whether technical trading rules are rational or if their continued use reflects irrational behaviour among traders. The authors analyse how technical patterns influence exchange rate movements and whether these patterns provide predictive power beyond random chance. (Chang & Osler , 1999). This investigates herding behaviour in financial markets, particularly during periods of market stress and volatility, The study develops a new method for detecting herding and examines how investors' collective behaviour deviates from rational asset pricing models. (Hwang, S & Salmon, M, 2004). The paper evaluates whether deregulation has improved competition, efficiency, and consumer welfare, or if persistent market failures and inefficiencies still exist. (Borenstein & Rose , 2007).

The study explores the role of hub-and-spoke vs. point-to-point networks, alliances, and operational efficiencies in shaping airlines' profitability and competitiveness. (Button, Costa, & Rizvanolli , 2009). The paper investigates the financial risks associated with investing in airline stocks, considering industry-specific and macroeconomic variables that contribute to high stock price fluctuations. (Smyth & Nandha, 2003).

Methodology

The methodology for analysing airline companies' share prices using the Head & Shoulders (H&S) pattern involves a systematic approach. First, historical stock price data of five airline companies is collected from NSE historical data on daily closing prices over a year (01/01/2024 to 31/12/2024). The Head & Shoulders pattern is then identified by detecting the left shoulder, head, and right shoulder formations, using trading Python libraries named Jupyter. Automated pattern recognition techniques and visual verification are applied to validate patterns, along with volume analysis and moving averages. The performance of identified patterns is evaluated by analysing post-pattern price movements, comparing stock performance before and after pattern formation, and assessing risk-reward dynamics. A comparative analysis is conducted to examine the frequency and reliability of Head & Shoulders patterns across different airlines, identifying factors that impact their effectiveness. Finally, conclusions are drawn regarding the reliability of the Head & Shoulders pattern in airline stocks, investment implications, and areas for future research.

This study analyses the share price movements of selected airline companies using the Head & Shoulders pattern, a key technical analysis tool. Five publicly traded airline companies are selected based on market capitalization and trading volume. Historical stock price data, including daily opening, closing, high, low. The Head & Shoulders pattern is identified by locating the left shoulder, head, right shoulder, and neckline, confirming potential trend reversals. The breakout point is analysed for bearish or invalid signals, supported by volume analysis. The study interprets these findings to determine whether the pattern is a reliable predictor of airline stock trends. By integrating technical indicators and pattern recognition, this research assesses the effectiveness of the Head & Shoulders pattern in guiding investment decisions in the airline industry.

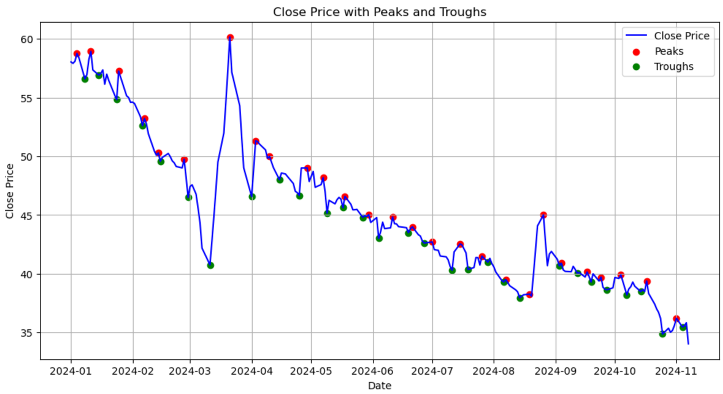
3.1) Data

The data were collected on the basis of Airline companies in India. There are 10 Airline companies in India. Where the data was collected through NSE historical data within a one-year gap from 1-1-2024 to 31-12-2024, there were around 5 telecom companies listed.

4) ANALYSIS

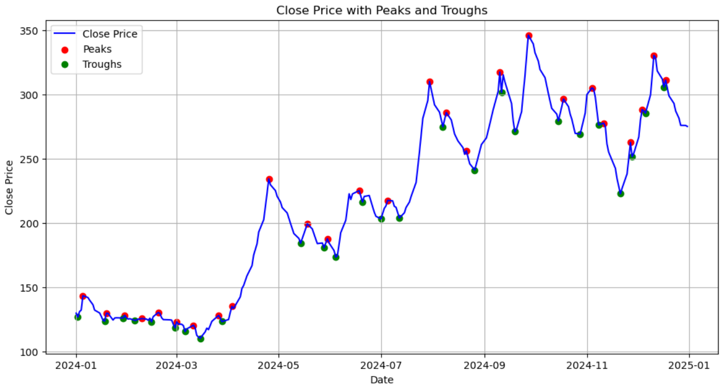
Data analysis was performed using Python. Excel data was uploaded and processed using Python commands. The mplfinance library, a Python package built upon Matplotlib, was installed to facilitate the creation of financial charts. Mplfinance's intuitive API was then used to generate Head & Shoulders pattern in airline stocks.

Global Vectra



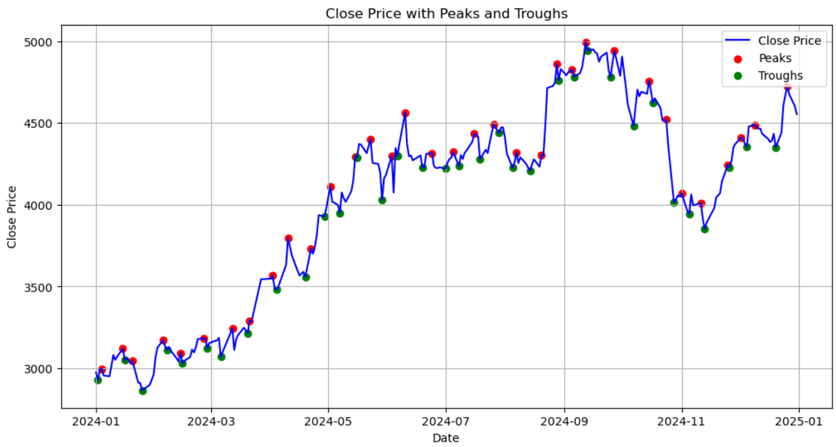
The chart shows the closing price of a stock from January to November 2024, marked with peaks and troughs. Overall, the trend is bearish, with the price declining over the period despite temporary rebounds. Peaks (red) represent resistance levels where the price reverses downward, while troughs (green) indicate support levels where upward reversals occur. Significant volatility is observed around March and September, with sharp price increases followed by rapid declines. These fluctuations suggest potential formation of patterns like Head and Shoulders or Double Tops and Bottoms, which are often used to predict trend reversals or continuations. The overall downward trend, coupled with periodic recoveries, indicates declining investor sentiment. Investors may watch for possible breakouts near support or resistance levels for future price movement predictions.

SpiceJet



The chart shows the closing price of a stock from January 2024 to January 2025, marked with peaks and troughs. The overall trend is bullish, with a significant upward movement from mid-March to May, followed by fluctuations around higher price levels. Peaks (red) represent local resistance levels where price reversals occur, while troughs (green) indicate support levels leading to upward price movements. Volatility increases in the latter half of the year, with frequent price swings around September and November. This price action may suggest potential consolidation after a bullish rally, with investors watching for breakouts to indicate further upward or downward trends.

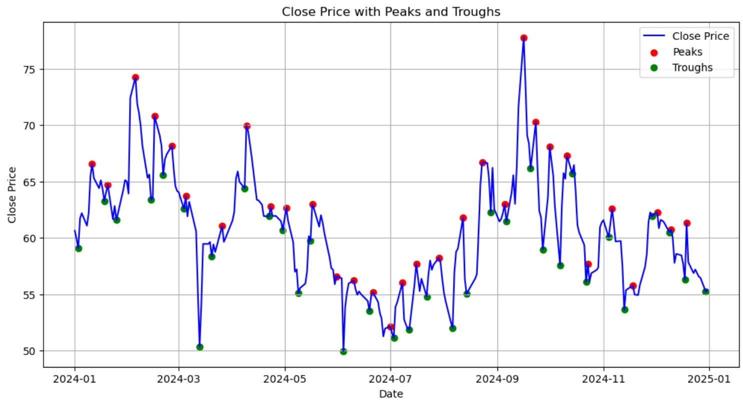
Jet Airways



The chart shows the closing price of a stock from January 2024 to January 2025, highlighting an overall bullish trend. The price steadily rises from early 2024, reaching significant highs around September, indicating strong upward momentum. Peaks (red) represent resistance levels, where prices briefly reversed before continuing their upward trend, while troughs (green) indicate support levels that prompted price recoveries. After

September, the stock experiences increased volatility, including a notable dip in October followed by a recovery in November and December. This suggests possible profit-taking or market corrections after the earlier rally. Investors may monitor for potential breakouts or reversals near recent support and resistance levels for future price movements.

InterGlobe



The chart displays the closing price of a stock from January 2024 to January 2025, showing fluctuating price movements with no clear long-term trend. The price rises sharply in early January, reaching a peak before declining through March, indicating a period of high volatility. Mid-year, another sharp rally peaks around September before another decline. Peaks (red) highlight resistance levels, while troughs (green) represent support zones, marking reversal points. The repeated price reversals suggest a range-bound market, with no sustained upward or downward trend. Investors may view this pattern as a signal to watch for potential breakouts beyond the established range or continued consolidation within the range.

Taneja

The chart illustrates the closing price of a stock from January 2024 to January 2025, showcasing an initial uptrend followed by a significant decline and subsequent consolidation. The price steadily increased from January through July, peaking around mid-year, indicating bullish momentum during this period. However, a pronounced downturn occurred from August to November, marked by lower peaks and troughs, signalling a bearish reversal. In late November, the price began stabilizing, showing a potential consolidation phase or market indecision. Peaks (red) represent resistance levels where the price faced selling pressure, while troughs (green) mark support levels where buyers stepped in. The price behaviour suggests the need for close monitoring of breakouts or further consolidation to identify future market direction.

Conclusion

The technical analysis of airline companies' share prices using the Head & Shoulders (H&S) pattern revealed significant insights into market trends and price behaviour. Global Vectra exhibited a general downward trend, with price rallies and pullbacks suggesting strong resistance at peak levels and a dominant bearish sentiment. Spice Jet experienced an initial sharp upward trend followed by multiple price reversals, indicating a range-bound market and consolidation without a clear breakout. Jet Airways displayed a steady upward trend before peaking mid-2024, followed by a steep decline and stabilization, signalling a shift from bullish to bearish sentiment. Inter Globe Aviation moved within a defined range, characterized by frequent reversals that suggested strong support and resistance levels, indicating consolidation with no sustained trend. Taneja Aerospace had an early-year bullish rally followed by a pronounced bearish decline after mid-2024, with late-year consolidation suggesting potential accumulation or continued market indecision.

Across all stocks, the identification of peaks and troughs highlighted critical price levels and potential turning points for trend reversals or breakouts. While no complete Head & Shoulders pattern was observed, the frequent formation of peaks resembling potential head or shoulder structures indicated market vulnerability to trend changes. Investors should closely monitor price levels and look for clear neckline breaks to confirm the Head & Shoulders pattern, which would provide insights into potential price targets. The analysis underscores the importance of tracking price patterns, support, and resistance levels for making informed investment decisions in airline stocks.

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IMPACT OF FESTIVALS ON INDIAN STOCK MARKET RETURNS

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ABSTRACT

The stock market is a vital component of a nation's financial system, reflecting economic trends and investor sentiment. Various factors influence stock market returns, including economic indicators, political events, and psychological factors. Among these, cultural and religious festivals play a unique role in shaping market movements. This study examines the impact of four major festivals—Diwali, Eid, Navratri, and Christmas—on stock market returns in India, specifically focusing on the Bombay Stock Exchange (BSE) Sensex. Festivals often drive increased consumer spending, heightened market activity, and shifts in investor sentiment, potentially leading to abnormal returns. The research employs an event study methodology to compare actual and expected returns, identifying abnormal returns around the festival periods. By analyzing variations in stock price movements during the event window, the study seeks to determine whether these cultural events lead to statistically significant changes in market performance. Findings from this study can provide valuable insights for investors, traders, and policymakers, enabling them to better anticipate market behavior during festive periods. This research contributes to the broader understanding of behavioral finance and seasonal trends in stock market performance.

Keywords: Stock market returns, festivals, investor sentiment, BSE Sensex, event study, abnormal returns, Diwali, Eid, Navratri, Christmas.

Introduction

The stock market serves as a critical barometer of a nation's economic health, providing a platform for buying and selling shares of publicly listed companies. It acts as a hub for investors, traders, and institutions seeking to generate wealth, allocate resources, and gauge the performance of companies and industries. Stock markets such as the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) in India are integral to the country's financial ecosystem, influencing investment decisions and shaping economic trends. Over time, these markets have evolved into dynamic environments that are sensitive to various factors, including economic indicators, political events, and investor sentiment.

Stock market returns, representing the gains or losses investors achieve through price appreciation, dividends, or other income, are pivotal in assessing the market's performance. These returns fluctuate due to a multitude of reasons, such as macroeconomic data, interest rate changes, and global cues. Investor psychology and behavioral patterns also play a significant role, as sentiments often dictate trading decisions. A deeper understanding of the factors that influence stock market returns is vital for investors and policymakers to make informed decisions and anticipate market trends.

Festivals, deeply embedded in cultural and economic traditions, are among the significant factors influencing stock market returns in India. Celebrations like Diwali, Navratri, Eid, and Christmas often bring about shifts in consumer spending, investor sentiment, and overall economic activity. Diwali, associated with wealth and prosperity, often sees increased market participation and positive trading trends, while Christmas and Eid can also lead to changes in market dynamics due to global and domestic consumer activity. These festive periods can trigger both short-term market rallies and long-term economic impacts, highlighting the intricate relationship between cultural events and financial markets.

The problem addressed by this study is the lack of a comprehensive understanding of how cultural and religious festivals influence stock market returns. While numerous studies have explored traditional economic factors and seasonal trends in the stock market, the specific impact of festivals on market performance remains under-explored. Festivals often bring about heightened consumer spending, changes in public mood, and alterations in investor behavior, yet their effect on stock prices and returns is not always consistent or predictable. This research seeks to bridge this gap by analyzing the influence of major festivals on stock market returns in India, particularly focusing on the BSE indices.

The research on the "Impact of Festivals on Stock Market Returns" aims to achieve three primary objectives: first, to identify the abnormal returns during the study period by comparing actual and expected returns; second, to analyze the variation in abnormal returns during the event window to observe stock price fluctuations; and third, to assess the impact of four major festivals like Diwali,eid, navratri and Christmas on the BSE Sensex, exploring how these cultural events influence stock market performance.

Literature reviews

(Potharla Srikanth, 2013) analyzed the "Diwali Effect" on the Indian stock market, focusing on stock price movements during a 15-day event window around the festival using the market model. They found a positive impact on stock returns, attributed to increased trading volumes and optimistic investor sentiment, highlighting the role of cultural factors in financial markets. Similarly, (Akansha Agrawal, 2014) observed a significant increase in returns and reduced volatility during the Diwali period, indicating a seasonal pattern and a positive influence on investor sentiment. In another study, (Kumar, 2012) examined Diwali's influence on the Indian stock market over a 20-year period, using the Capital Asset Pricing Model (CAPM) to calculate abnormal returns. While some years showed positive returns, the results were mixed, suggesting Diwali influences investor behaviour but does not have a consistent financial impact.

(Kavitha Chaveli, 2020) analysed the response of the Indian stock market to elections using a 30-day event window. Their findings revealed significant market volatility during elections, with notable peaks in market returns and abnormal returns. Similarly, (Meheta, 2014) examined the festival effect on the Indian stock market, focusing on Diwali, Eid, and Christmas. The study found that festival periods were associated with higher stock returns and reduced volatility due to increased consumer spending and market optimism, leading to temporary market inefficiencies.

(Kumari, 2021) used event study to assess the impact of the COVID-19 pandemic on global stock markets, including India, revealing significant changes in market returns and volatility. In corporate finance, event studies like those by analyzed stock price reactions to mergers and acquisitions, showing that stock prices of acquiring firms tend to drop while those of target firms rise. (Ruffer, 2007) examined the effect of European Union regulatory changes, finding stock price declines in affected sectors due to altered investor expectations.

In behavioral finance, event studies have been used to explore psychological biases in investor behavior. Shleifer (2000) highlighted that earnings announcements could trigger overreaction or underreaction, leading to irrational stock price movements. In public policy, ITSA has been applied outside finance, as demonstrated by Penfold and (Zhang, 2013) in healthcare policy evaluations. They used ITSA to assess the impact of health interventions, while (Linden, 2015) reviewed its broader applications in evaluating health outcomes.

The seasonality of stock returns during the Diwali festival was also analyzed by (Akansha Agrawal, 2014), who noted reduced volatility and increased returns during the festival period. In addition, the impact of announcements of host countries for major sporting events, such as the Olympics and FIFA World Cup, was examined by (Potrykus, 2023), who found positive stock market reactions following such announcements, as investors were influenced by heightened optimism.

The impact of cultural and religious festivals on stock returns was further studied by (Sukor, 2012), who found that returns tend to be lower before festivals due to stock sales for holiday expenses, but rise after the festivities as trading activity picks up. (Saleem, 2023) also found significant positive returns during festivals like Diwali, Ramadan, and Christmas, with Diwali showing a particularly strong impact on the Nifty 50 and Nifty Auto indices.

(B.Krueger, 1994) adapted the event study methodology to labor economics, analyzing the effects of minimum wage changes on employment by comparing regions with and without wage increases. Their findings challenged conventional theories, showing minimal adverse effects of higher wages on employment.

The event study methodology's theoretical foundations and practical applications in financial analysis were extensively covered by (John Y.Campbell, 1997), who provided a comprehensive guide to understanding event studies and their significance in testing market efficiency and rational behaviour. Additionally, (Rees, 2017) used ITSA to analyze stock market volatility in response to financial regulations, demonstrating its application in understanding the effects of regulatory changes on financial markets. The impact of the global financial crisis was analyzed using ITSA by several scholars, including (Wong, 2015) who applied ITSA to assess trends in neurosurgery outcomes before and after interventions.

This review provides a thorough understanding of how cultural factors, elections, financial regulations, and public policy interventions influence stock market behavior, showcasing the versatility of event study methodologies and ITSA across various domains.

Methodology

The methodology employed in this research is a combination of event study and interrupted time series analysis. Data will be collected from the BSE indices, focusing on daily closing prices of indices such as Sensex and BSE 500. The analysis will be carried out around four major festivals—Diwali, Eid, Christmas, and Navratri—to capture the cultural and religious diversity of India. An event window will be defined, covering 30 trading days before the festival (pre-event period), the festival date (Day 0), and 30 trading days after the festival (post-event period). The event study methodology will measure abnormal returns by comparing actual returns with expected returns during the event window. Cumulative Abnormal Returns (CAR) will be calculated to evaluate the overall impact. Additionally, interrupted time series analysis will be used to assess changes in stock returns and volatility patterns before and after the festivals, providing a comprehensive understanding of the festivals' impact on market performance.

Event study

The event study methodology examines the impact of festivals on BSE indices by analyzing stock price data within a defined event window of 30 days before and after the event date. The price data is first converted into daily returns using the formula for stock returns. From this, the average return (AR) for each day within the event window is calculated, which serves as a benchmark for comparison. The abnormal return (AR) is then determined by subtracting the expected return (based on a chosen market model or historical average) from the actual return. Finally, the cumulative abnormal return (CAR) is computed by summing up the abnormal returns over the event window, providing a comprehensive measure of the overall impact of festivals on the market. This methodology helps identify whether the festivals have a statistically significant effect on the BSE indices**.**

$$\text{Normal Return}(NR) = \alpha + \beta R_m$$

Where:

- NR = Normal return of the stock
- α = Intercept (constant return independent of the market)
- β = Beta of the stock (its sensitivity to the market)
- R_m = Market return (e.g., BSE Sensex or BSE 500 return)

$$\text{Average Return} = \frac{\sum R_i}{N}$$

Where:

- R_i = Return for each period (daily, monthly, or yearly)
- N = Number of periods

Abnormal Return (AR)

$$AR = R_i - NR$$

Where:

- AR = Abnormal Return
- R_i = Actual Return of the stock on a given day
- NR = Normal Return (calculated using the market model: $\alpha + \beta R_m$)

$$CAR = \sum_{t=T_1}^{T_2} AR_t$$

Where:

- CAR = Cumulative Abnormal Return
- AR_t = Abnormal Return on day t
- T_1 and T_2 = Start and end of the event window

Interrupted Time Series Analysis

Interrupted Time Series Analysis (ITSA) evaluates the impact of an event by comparing trends and levels in data before and after the event. For this research, ITSA analyses BSE indices by dividing the time series into a pre-event (30 days before) and post-event (30 days after) period, with the festival day as the intervention point. It identifies changes in levels and trends, calculates abnormal returns (AR), and measures cumulative abnormal returns (CAR) to assess the event's impact on the indices. This approach helps determine the significance and duration of the observed changes.

Analysis

For this study, data was collected from the Bombay Stock Exchange (BSE) covering the period from 2020 to 2024. The analysis focuses on the impact of major festive events, including Diwali, Christmas, Navratri, and Eid, on market trends and stock performance. To assess the market behaviour surrounding these events, a 60-day event window was established, comprising 30 days before and 30 days after each event. Python was used for this analysis and the first method is event study .The event study was initiated in Python through the following steps

1. **Data preparation**

The data is sorted by date and dates are properly formatted to ensure smooth analysis.

2. Define the Event Date and Windows

- **Event Date:** The date when the festival occurs.
- **Estimation Window:** A period **before the event** (e.g., 60 to 31 days before) to calculate the stock's normal return.
- **Event Window:** A period **around the event** (e.g., 30 days before and after) to study the stock's behaviour.

3. Calculate Daily Returns

Daily returns show how much the stock price changes from one day to the next. This helps measure normal movements versus unexpected reactions.

4. Estimate Normal Return

The average return from the estimation window is calculated. This acts as a baseline to compare stock movements during the event.

5. Calculate Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR)

- **Abnormal Return (AR):** The difference between actual stock return and normal return. If AR is high or low, it suggests the event had an impact.
- **Cumulative Abnormal Return (CAR):** The sum of abnormal returns over multiple days. It shows the long-term effect of the event.

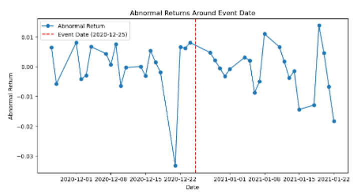
6: Analyze and Interpret Results

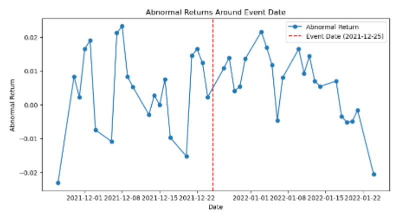
- If AR is significantly positive or negative, it means the event influenced the stock.
- If CAR keeps increasing or decreasing, the event had a lasting impact.
- If there is no major change, the event had little or no effect.

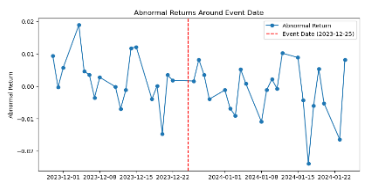
7: Visual Representation

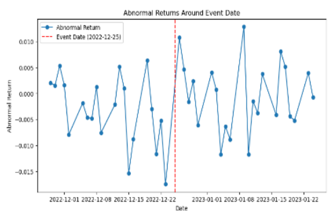
Graphs are used to visualize how abnormal returns change before and after the event, making it easier to see patterns.

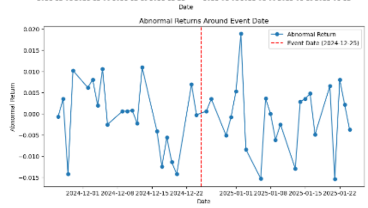
The Abnormal return during Christmas estimated using event study for the years 2020 to 2025 are shown in the figure below



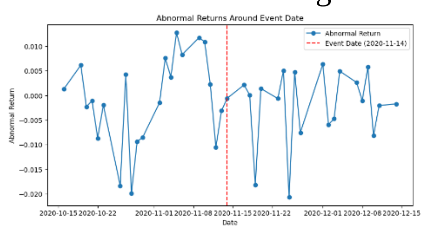


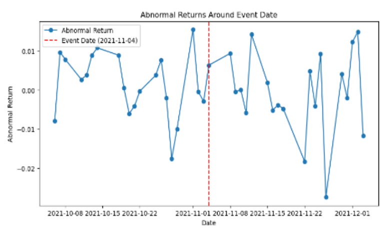


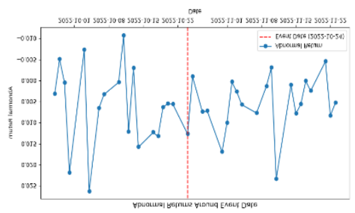


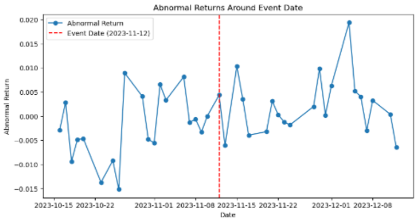


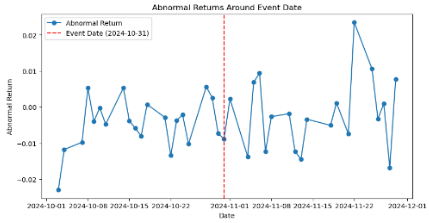
The Abnormal return during Diwali estimated using event study for the years 2020 to 2025 are shown in the figure below



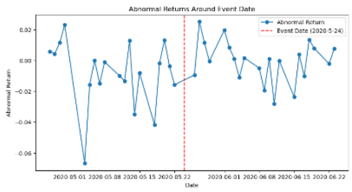


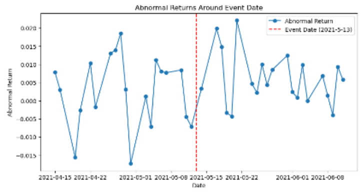


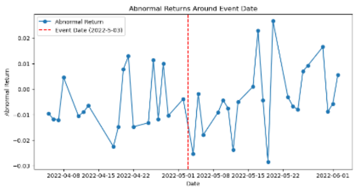


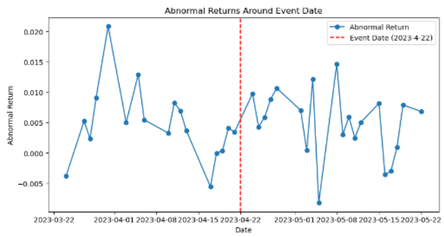


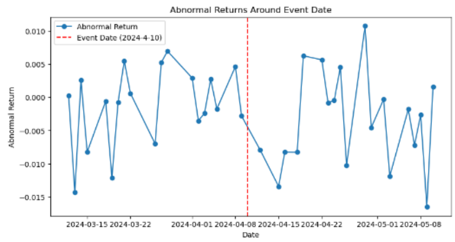
The Abnormal return during Eid estimated using event study for the years 2020 to 2025 are shown in the figure below



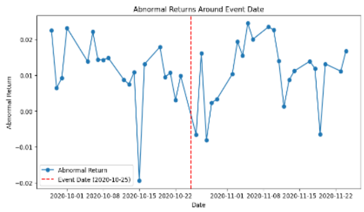


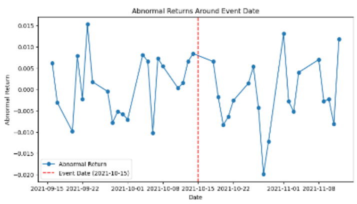


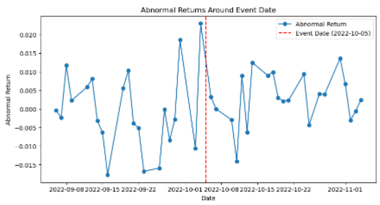


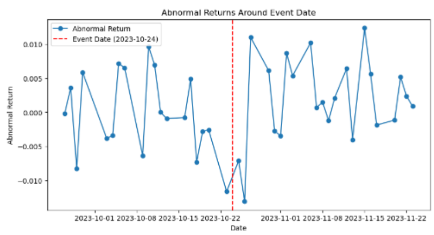


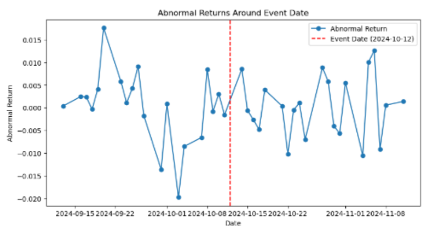
The Abnormal return during Navratri estimated using event study for the years 2020 to 2025 are shown in the figure below











ITSA

Interrupted Time Series Analysis (ITSA) is a statistical method used to analyze how an event or intervention impacts trends over time. In this study, ITSA helps to statistically prove the impact of festivals like Diwali, Christmas, Navratri, and Eid on stock market returns. ITSA works by comparing stock market performance before and after each festival. By using a regression model, it identifies whether there is a significant change in stock prices, trading volumes, or market returns due to the festival. This helps in understanding if the market reacts positively, negatively, or remains unchanged during festive periods.ITSA works by comparing stock market performance before, during, and after each festival. A regression model is used to estimate trends for the pre-event (30 days before), post-event (30 days after), and the event period itself. This model helps detect any significant shifts in stock prices, trading volumes, or market returns due to the festival.

Christmas

Year	pre		Post		After		Inference
	Coefficient	P value	Coefficient	P value	Coefficient	P value	
2020	0.0028	0.000	0.0166	0.010	-0.0014	0.006	All trends are significant
2021	-0.0018	0.000	0.0474	0.000	0.0015	0.011	Significant trend - (Post and After)
2022	-0.0003	0.344	-0.0138	0.031	_-0.0002	0.605	Significant trend-(Post)
2023	0.0037	0.000	-0.0013	0.763	-0.0039	0.000	Significant trend- pre and after
2024	0.0009	0.046	-0.0296	0.002	-0.0019	0.001	All trends are significant

Diwali

Year	Pre		Post		After		Inference
	Coefficient	P value	Coefficient	P value	Coefficient	P value	
2020	0.0024	0.000	0.0265	0.019	0.0005	0.337	Significant trend -pre and post
2021	0.0007	0.017	-0.0075	0.272	-0.0026	0.000	Significant trend – Pre and after
2022	-0.0009	0.063	0.0403	0.000	0.0025	0.002	Significant trend – Post and after
2023	-0.0011	0.000	0.0103	0.050	0.0047	0.000	significant trend -pre and after
2024	-0.0025	0.000	-0.0115	0.065	0.0038	0.000	All trends are Significant

Navratri

Year	Pre		Post		After		Inference
	Coefficient	P value	Coefficient	P value	Coefficient	P value	
2020	0.0025	0.000	-0.0202	0.015	0.0022	0.000	All trends are significant
2021	0.0014	0.000	0.0230	0.000	-0.0035	0.000	All trends are significant
2022	-0.0011	0.001	-0.0077	0.317	0.0039	0.000	Significant trend – Pre and after
2023	-0.0009	0.000	-0.0368	0.000	0.0035	0.000	All trends are significant
2024	0.0002	0.648	-0.0201	0.015	-0.0016	0.001	Significant trend – post and after

Eid

Year	Pre		Post		After		Inference
	Coefficient	P value	Coefficient	P value	Coefficient	P value	
2020	.00001	0.956	0.0288	0.045	0.0038	0.000	Significant trend – post and after
2021	-0.0004	0.111	0.0235	0.000	0.0026	0.000	Significant trend- post and after
2022	-0.0007	0.021	-0.0563	0.000	0.0009	0.127	Significant trend -pre and post
2023	0.0008	0.052	0.0154	0.007	0.0004	0.350	Significant trend- post only
2024	0.0004	0.027	-0.0071	0.161	.00001	0.970	A significant trend in pre-only

Conclusion

The analysis of stock market returns around Christmas across different years reveals varying impacts. In some years, such as 2020 and 2024, all periods—pre, post, and after Christmas—show significant effects, indicating a consistent market reaction. Other years, like 2021 and 2022, exhibit significance only in the post-Christmas period, suggesting a delayed response. In 2023, both pre and after-Christmas trends are notable, implying anticipation before the event and reaction afterward .

The analysis of stock market returns around Diwali across different years indicates varying patterns of significance in pre, post, and after-event periods. In 2020, significant trends were observed in pre and post-Diwali periods, suggesting market movements in anticipation and immediate reaction. In 2021, the impact was notable in the pre and after periods, while in 2022, a significant trend was present in post and after-Diwali returns, reflecting a delayed response. The year 2023 showed significant movements in pre and after-Diwali returns, similar to 2021. In 2024, all three phases—pre, post, and after—exhibited significant trends, indicating a more widespread market reaction to the festival.

The analysis of stock market returns during Navratri reveals varying levels of significance across different years. In 2020, 2021, and 2023, all three phases—pre, post, and after—show significant trends, indicating a consistent market reaction before, during, and after the festival. In 2022, a significant trend is observed only in the pre and after periods, suggesting that the market adjusted before and after Navratri but did not show a strong reaction during the event. In 2024, the post and after periods exhibit significant trends, implying that the market response was more pronounced after the festival.

In the case of Eid in 2020 and 2021, the market exhibited notable reactions in the post and after periods, suggesting a delayed response to the festival. In 2022, significant trends were observed in the pre and post periods, indicating anticipatory movements before Eid and adjustments afterward. In 2023, only the post-period showed significance, implying a reaction after the festival rather than before. In 2024, the only significant trend was in the pre-period, suggesting market expectations played a role, but no major movement followed. Overall, the influence of Eid on stock returns is inconsistent, with varying degrees of market sensitivity before, during, and after the event each year.

For investors, these insights highlight the importance of strategic planning and adaptive decision-making. Those looking to capitalize on Eid-related market trends should analyze past patterns alongside current market conditions to determine potential trading opportunities. Additionally, the inconsistency in trends suggests that a diversified approach, rather than relying on a single event-driven strategy, may be more effective in managing risks. Future research could further explore the role of macroeconomic factors and investor psychology in shaping these market movements, providing deeper insights for more informed investment decisions.

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A STUDY ON THE INFLUENCE OF GREEN INITIATIVES ON CONSUMER BUYING BEHAVIOUR WITH SPECIAL REFERENCE TO COCHIN CITY

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Abstract

This study looks at how environmental efforts affect Cochin City client purchases, with an emphasis on how firms' adoption of eco-friendly practices affects what customers choose. Green initiatives including carbon footprint reduction, packaging that is environmentally friendly, and sustainable production have become growing in popularity in recent decades due to a growing realization of environmental hurdles. The purpose of this study is to look into whether or not these happenings affect the preferences, attitudes, and behaviors of consumers in a city like Cochin. The study aims to pinpoint the fundamental factors that influence consumer behaviour toward sustainability by researching and questioning clients, examining the significance of social media and marketing tactics in promoting eco-friendly products, and beyond.

Keywords: Carbon Footprint ,Green Initiatives , Sustainability

1. Introduction

In recent years, environmental issues have dominated worldwide discussions, compelling both businesses and customers to reconsider their conservation obligations. Sustainable behaviours are becoming essential tactics for addressing worldwide issues like pollution, resource depletion, and climate change. In an attempt to satisfy consumer demand for greener goods and services while additionally safeguarding the environment, businesses are increasingly embracing green initiatives, such as reducing carbon footprints, using packaging that is environmentally friendly, and using green manufacturing methods.

This global trend toward sustainability has also affected Cochin City, an important urban centre in southern India. Cochin is a particular scenario for grasping how green initiatives affect consumer purchasing behaviour because of its fast urbanization and increasing environmental awareness among its citizens. Cochin's corporate sector has been adopting more environmentally friendly methods as the outcome of numerous businesses making efforts to reach a more environmentally conscious market.

This study seeks to look into how these environmental initiatives affect Cochin consumer purchasing choices. It specifically looks at how consumer tastes, attitudes, and behaviors are influenced by green initiatives. This study investigates into how customers react to companies who put sustainability first in an effort to figure out the fundamental causes of the trend toward environmentally friendly products and services. To learn whether corporations can effectively convey their efforts to be sustainable to their audience of choice, the role of marketing and digital media to encourage these programs is further investigated. Businesses grow increasingly aware of the need to match their operations with the values of their customers as the demand for environmentally conscious goods from users keeps growing. In an effort to help businesses in Cochin satisfy the demands of consumers who are environmentally conscious, this study attempts to provide information regarding the major factors influencing consumer behaviour in connection to green activities.

2. Significance of the study

The significance of the present research stems from it's ability to offer important details about the connections between purchasing habits and environmental sustainability, particularly for Cochin City. As worldwide environmental issues appear, businesses must adopt environmentally conscious procedures. Companies that want to meet the growing demand for environmentally friendly goods also need to understand how these eco-friendly initiatives impact consumer choices. By using this study to pinpoint the exact green practices that are important to customers, Cochin businesses will be able to adapt their approach, improve their reputation as a brand, and foster customer loyalty. Further, it will look explore how marketing and digital platforms may seamlessly convey efforts to promote sustainability, helping businesses create campaigns that are attractive to customers who are environmentally conscious.

3. Statement of the problem

Businesses all over the world are implementing conservation efforts, that involve carbon footprint reduction, eco-friendly packaging, and efficient production processes, in response to growing concerns about the state of the planet and the need to promote sustainable development. However, their efficacy of those tactics in affecting consumer purchase decisions is yet undetermined, especially in the city like Cochin City. While many companies tout eco-friendly products, little empirical research has been done on how these environmentally friendly endeavors affect Cochin consumers' options, attitudes, and decisions about purchases. By assessing how much eco-friendly business activities affect consumer behavior and how these attempts affect Cochin City inhabitants' spending patterns, this study seeks to bridge this gap.

4. Objectives of the study

1. To examine how Cochin City the buying choices of customers are affected by green initiatives;
2. To assess how knowledgeable and well-informed Cochin City consumers relate to green initiatives;
3. To look into the challenges and barriers that companies come across when setting green initiatives in effect and how they are expected to impact sales.

4. Research Methodology

Research Design :

The Study is descriptive in Nature.

Collection Of Data:

Both Primary and Secondary Data were used for the data collection.

Primary Data :

They were collected by conducting surveys through the distribution of questionnaires using Google Forms.

Secondary Data :

They were collected from published sources like websites , journals etc.

Sampling Design :

Convenience Sampling.

Population :

The population is limited to the consumers in Kochi.

Sample Size :

A total of 100 is the sample size.

5. Literature Review

A study on Consumer Purchase Intention and Willingness to Pay for Green Products of Uttarakhand (Pratap, 2021) show that health, environmental concerns, and ethical considerations drive consumers towards green products. Purchase intention is influenced by important elements like attitudes, subjective norms, and environmental awareness, especially when it comes to organic food goods. Furthermore, as awareness grows, customers are prepared to pay more for environmentally friendly products. Nonetheless, there is still need for more research on the discrepancy between buy intention and actual customer behaviour.

A study on The Effect of Green Marketing on Consumer Buying Behaviour in India (Trivedi, 2018). explores the growing significance and reach of green marketing, emphasizing the value of consumer care and environmental consciousness. It identifies the main determinants of green product purchases, including eco-friendly attributes, certifications, and health considerations. According to the report, although customers are very concerned about the environment, they frequently don't know enough about green products and their advantages. It also emphasizes the need for marketers to provide accurate information and build credibility through certifications to gain consumer trust. It concludes that green companies can enhance their competitive advantage by aligning with environmental standards.

A study on the Factors and hurdles of green buying behaviour among Rural consumers literature (Srishti, 2022) highlights the growing awareness of consumers regarding the environmental impact of non-green products, emphasizing the demand for eco-friendly FMCG products. It covers a number of topics that affect customer behavior, including financial resources, psychological aspects, and marketing initiatives. The analysis also cites factors including high costs, ignorance, and irresponsible consumer behavior that prevent people from buying green items. With an emphasis on both consumer and business responsibility, the significance of adopting green products for environmental sustainability and health is emphasized. It goes on to discuss how the government can promote the use of environmentally friendly products.

A study on green branding - impact on consumer buying behaviour towards apparel purchase (Dixit, 2021) highlights the necessity of sustainable production methods, such as the use of recyclable materials and localized production, and the growing significance of green brands in the clothing business. It emphasizes how important it is to comprehend how consumers view and interact with businesses, especially for eco-friendly clothing companies. Brand perception is shaped by behavioural, affective, and cognitive aspects that influence customer behaviour, according to prior study. The review also emphasizes how brand attachment, contentment, and trust help to improve customer relationships. It also underscores the potential for co-creation and consumer engagement in enhancing brand loyalty and performance.

6. Data Analysis and interpretation

Table 1

Classification on the basis of familiarity with green marketing

Attributes	No. Of Respondents	Percentage
Very Familiar	29	29
Somewhat familiar	70	70
Not Familiar at all	1	1
Total	100	100

Source : Primary Data

Table 1 shows that 29% of respondents are very familiar with green marketing, indicating a small but significant portion who have a deep understanding of the concept. 70% of respondents say they are at least somewhat familiar with green marketing, indicating that even though it has become more popular, many of them still know little about or are not actively involved in its practices. Nearly everyone polled has some awareness of green marketing, as evidenced by the fact that only 1% of respondents are completely unfamiliar with it. All things considered, this indicates that respondents are largely aware of green marketing, but further education and awareness could be possible.

Table 2

Classification Based on Experience with Green Marketing Services

Attributes	No.of Respondents	Percentages
Excellent	20	20
Very Good	36	36
Good	35	35
Fair	9	9
Poor	0	0
Total	100	100

Source :Primary Data

According to Table 2, 36% of participants gave their experience with green marketing services a Very Good rating, while 35% gave it a good rating. Only 20% of respondents thought their experience was excellent. None of the respondents reported a poor experience, and just 9% thought their experience was fair. A favourable opinion of green marketing services was shown by the fact that most respondents (91%) had a positive overall experience with them.

Table 3

Classification based on Price sensitive customers in relation to green initiatives

Attributes	No. Of Respondents	Percentage
Never	5	5
Rarely	7	7
Sometimes	45	45
Often	33	33
Always	10	10
Total	100	100

Source :Primary Data

Table 3 reveals that 45% of respondents are sometimes price-sensitive when it comes to green initiatives, indicating a moderate level of concern for pricing. Additionally, 33% of respondents often consider price sensitivity in relation to green initiatives, while 10% always factor in price. A smaller portion, 7%, rarely takes price into account, and 5% never consider it. This suggests that price sensitivity plays a significant role for the majority of consumers, though a portion remains less concerned about it when engaging with green initiatives.

Table 4

Classification based on frequency of buing sustainable products

Basis	No.Of Respondents	Percentage
More than once a month	16	16
Once in a month	43	43
Once in a year	35	35
Never	4	4
Rarely	1	1
Often	1	1
Total	100	100

Source :Primary Data

Table 4 shows that majority of respondents (43%) engage with the green initiatives once a month, indicating a consistent level of involvement. A significant portion, 35%, participate once a year, suggesting occasional but not frequent engagement. Meanwhile, 16% of respondents engage more than once a month, showing a higher frequency of interaction. Only a small percentage, 4%, never engage, and 1% rarely or often participate. This distribution indicates a general trend of moderate to frequent involvement in green initiatives among most respondents.

Table 5

Consideration of Environmental Impact in Purchase Decisions

Attributes	No.of Respondents	Percentage
Never	46	46
Rarely	49	49
Sometimes	3	3
Often	2	2
Always	0	0
Total	100	100

Source :Primary Data

Table 5 shows that 46% of respondents **never** consider environmental impact when making purchase decisions, and 49% **rarely** consider it. Only 3% **sometimes** take it into account, and 2% **often** consider it. No respondents **always** factor in environmental impact when purchasing. This suggests that most people give little or no consideration to the environmental impact of their purchases.

Table 6

Sources of Information About Green Products or Sustainable Practices

Sources	**No.of students**	**Percentage**
Social media	45	45
Online Reviews	35	35
Company Websites	17	17
Newspapers / TV	3	3
Total	100	100

Source :Primary Data

Table 6 shows that 45% of respondents use **social media** as their primary source of information about green products or sustainable practices. **35%** rely on **online reviews** for such information, while 17% turn to **company websites**. Only 3% get their information from **newspapers or TV**. This suggests that digital platforms, especially social media and online reviews, are the most common sources for learning about sustainability.

7. Findings

- Of those surveyed, 70% are just vaguely familiar with green marketing, compared to 29% who are extremely familiar. The fact that only 1% are completely unfamiliar shows that green marketing is well known but might use further understanding.
- 36% of the respondents said it was "Very Good" and 35% said it was Good. Green marketing services are usually viewed favourably, as seen by the 91% of respondents who reported having great experiences.
- 33% frequently think about price, and 45% are occasionally price-sensitive regarding green activities. This demonstrates that although many people consider price to be a significant consideration, other people are still less worried about the price of eco-friendly products.
- 35% and 43%, respectively, participate in green projects once a year and once a month. While a tiny group participates more frequently, the bulk exhibit regular or sporadic activity.
- 46% never consider the environmental impact of their purchases, and 49% rarely do. This suggests that most respondents give little thought to the environmental consequences when making purchase decisions.
- 45% use social media, and 35% rely on online reviews for information about sustainable products. This highlights the dominance of digital platforms, especially social media, as sources of sustainability information

8. Suggestion

- Companies must contend with price sensitivity by lowering the cost of environmentally friendly products or providing value-added services to offset the cost.
- By providing rewards like loyalty programs or discounts for recurring purchases, you can encourage more regular consumer involvement with green efforts.
- Use branding and targeted marketing to highlight the environmental impact of items and persuade customers to choose more sustainably.

- Use social media and online reviews to spread informative material and product eco-friendliness testimonies, utilizing digital channels to reach a larger audience of customers.

9. Conclusion

This study clarifies how inhabitants of Cochin City are becoming more conscious of and involved with green initiatives, as well as how these activities affect consumer purchasing decisions. Even though green marketing is widely acknowledged, many respondents still lack in-depth knowledge and frequently do not give environmental impact top priority when making judgments about what to buy. The need for affordability continues to represent an important variable for plenty of individuals, so companies ought to determine out how to strike a compromise between price and environmental friendliness. Additionally, businesses have the chance to successfully convey their green activities to a wider audience via the widespread use of digital channels like social media and online reviews. All things considered, companies in Cochin City should modify their tactics to inform customers, reflect their environmental principles, and offer easily accessible and reasonably priced sustainable solutions.

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AN ANALYSIS OF THE FACTORS INFLUENCING CONSUMER ADOPTION OF FINTECH INNOVATIONS

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INTRODUCTION

Financial technology, shortly known as fintech refers to computer programs and other related technology that are designed and implemented to support or enable banking and financial services. Fintech is an area uprooted with an underlying promise of making financial services easier for people who historically have had little or no access to them. There are a number of services that have branched out in the finance industry with the advent of technology. Mobile banking and digital wallets are at the top of the list. India is witnessing integral growth in the area of digital payment with the increased use of the internet and smartphones. Apart from that demonetization and the covid pandemic forced a lot of people to opt for cashless transactions. In order to ease business transactions, digital payment platforms were accepted on a large scale in almost all business domains. In today's era, it is quickly growing as an easy and handy way to deal with many of our financial transactions. With the inception of the mobile banking domain, every little task that once happened within the four walls of a bank now happens between the four edges of a mobile screen, a hallmark of the fintech era. This fintech era has brought 24X7 access to financial services to consumers which were earlier limited to just banking hours. The times are gone when customers had to pay a visit to their bank to transfer money, check their account balance, or even update their passbook to view recent transactions, etc.

Moreover, the fintech industry's growth has been driven by India's choice to become a cashless economy. The number and volume of transactions using digital platforms have gone up due to the government's digital awareness campaign (VISAKA). Although not directly related to banking apps, digital wallet apps like Google pay, Pay TM, Apple Pay, Samsung Pay, and phone pe, etc. are being downloaded and used much more than their mobile banking counterparts. This growth is visible from the growing user base of the wallet apps and this popularity of digital wallets has encouraged the banks to start their own versions of E-wallets. Even the E-commerce firms like Amazon, Uber, Zomato, Ola, etc provide an additional discount to their customers on using digital wallets for payments. Many Fintech companies have tied up with public sector companies like Indian railways, state electricity boards, water authorities, etc. which provide additional discounts for online payments of customer bills and tickets. There is no doubt that fintech innovations will change the entire future of our business transactions, whether B2B or B2C.

LITERATURE REVIEW

Technological achievements have had a great impact not only in the manufacturing sector but also in the financial sector leading to an efficiency-focused Economy. Fintech has acted as a catalyst for creating a positive change to reclaim environmental sustainability through the Dematerialization of production and consumption. As mentioned earlier, the period of Demonization and pandemic situation has given rise to the need for financial technology and its guaranteed services in customer data privacy, prompt resolution has paved the way towards a cashless society leading to a digital economy.

FinTech is useful for evaluating the fast-paced growth of the financial sector and its associated institutions. Financial services, such as payments, savings, borrowing, risk management, and advice-seeking, have been made more accessible because of technological advancements in core services and the development of new applications for delivery (Tourpe H 2017). Since many other sectors are undergoing digital revolutions, customers are eager for tech-based financial solutions (Saal M, Starnes S, Rehermann T 2017). Companies in the financial technology industry are responding to customer demand for easy and inexpensive money transfers, loans, and investments by creating new products and services. (Berry 2016). Financial technology is no longer just used by banks and investment firms; retail chains and

telecommunications companies are also adopting new methods of providing financial services over their existing infrastructure. FinTech contributes to the evaluation of the fast-paced growth of the financial sector and its associated institutions. Making payments, saving, borrowing, managing risk, and obtaining financial advice are now more accessible than ever, thanks to technological advancements in core services and the development of new applications for delivery (He et al., 2017).

As more and more businesses undergo digital revolutions, consumers have a greater need for financial services that are also rooted in technology (Saal et al., 2017). To satisfy these needs, FinTech firms have developed faster, cheaper, and more accessible means of transferring, borrowing and investing money (Manyika et al., 2016). Retail corporations and telecommunications companies are increasingly using FinTech to expand their service offerings beyond traditional banking and investing funds. Despite the proliferation of FinTech service providers and the steady evolution of the services they offer, only a subset of these services has seen widespread adoption. As a result, investigating the variables that influence the uptake of such services is crucial.

An individual's propensity to change their behavior is significantly affected by the rate of technological change in the financial services industry and the degree to which consumers are aware of this development. If technological development outpaces the rate at which consumers adopt and use it, FinTech firms may miss out on the benefits of the innovation or face a longer gestation period before seeing a return on investment (Abbasi and Weigand, 2017). Numerous studies have found that numerous factors affect people's decisions to act.

The study by **Nisha Rajan, S.V Saravanan, J. Kavitha, Abin George and Gopalakrishnan C S (2022)," An analysis of customer perception towards Fin Tech Adoption"** emphasized the increased use of Fintech services due to its superior user experience and how it can be more useful if security is ensured. Once security is ensured this will lead to enhanced trust. Other variables that could help in adoption are found to be perceived utility, perceived ease of use, perceived risk, compatibility, and effort expectation. The findings of the study proved that trust is a significant factor in developing customer satisfaction and fintech focuses on building the trust of customers, creating transparency of content, and solving customer security issues. The findings of the study pointed towards TAM (Technology Acceptance Model) being the preferred model for Fintech adoption.

Catalin M Barbu, Dorian M Barbu, Dan-Cristian Dabjia, and Mihai Barbu (2021) through their study, **"Customer experience in Fintech"** emphasized identifying various dimensions, and determinants affecting fintech adoption and the outcomes of customer experience demonstrated. SOR (Stimulus, Organism & Response) was the model used to measure customer experience in a different context. A model was proposed and validated on a series of hypotheses framed using partial least square equation modeling. The study concluded that Fintech companies must integrate customer experience into their business model. Determinants like perceived value, ease of use, customer support, speed, and perceived firm innovativeness were assessed based on cognitive experience, Affective experience, and social experience to assess loyalty intentions.

In another study **by Hitendra Lachhwani and Renal Jain(2021)"A study on consumer attitude towards Fintech services" A descriptive research that studies the factors that influenced customer's adoption of FinTech** included prominent applications like mobile payments, robot advisors, cryptocurrencies, and crowdfunding platforms that have enhanced use of fintech technology due to its reduced risk of theft, low cost, convenience and it saves time too. Major findings focused that customers being concerned over the goodwill of service providers, 40% of people were found to have used digital payment services and only 16% used them frequently. The demographic factors were associated with trust and convenience. The study also suggested how fintech service providers can improve their services by designing market strategies to attract customers.

Zhongqing Hu, Shuai Ding, Shiheng Li & Luting Chen's (2019) study, "Adoption intention of fintech services for bank users" is an empirical examination with an extended Technology Acceptance Model (TAM). The study incorporates user innovativeness, government support, brand image, and perceived risk as determinants of trust to investigate how users adopt Fintech services. . The study revealed that trust in Fintech services has a very significant influence on users' attitude toward adoption. It was also found that perceived ease of use and perceived risk don't affect users' attitudes toward the adoption of Fintech services. The study also discussed the major reasons for the adoption and use of Fintech services by bank users and how the Fintech services affect the interaction and behavior between consumers and banking institutions.

A study conducted by **Knewtson and Rosenbaum (2020)** revealed that alternative monetary systems, capital intermediation, investment technology, and infrastructure are the subfactors of the Fintech sector. Money alternatives include services such as cryptocurrencies, traditional banking services, etc, and digital banking and lending technology for parts of capital intermediation. This also includes services like Crowdfunding, algorithmic trading, financial intelligence, and investment apps, etc.

Another related study on the same sector by **Das (2020)** concluded with a suggestion that to fully utilize the potential of FinTech the government should. take all necessary steps towards digital transformation by promoting Fintech firms. The study mainly focused on the objectives of finding out how the clients of various banks view and perceive fintech services, their shift to it and usage, and the barriers that inhibit them. The study also revealed that banks and other financial institutions have understood the need for associating with Fintech companies and have already started doing the same.

A study titled "**Open banking and inclusive growth in India" done by Shailesh Rastogi, Arpita Sharma, and Chetan Panse (2020)** of Symbiosis International University emphasized on the success of UPI (Unified Payment Interface) that was commenced in April 2016. The study was conducted with the objective of exploring how open banking can facilitate inclusion that can pave the way toward the economic development of the nation. The results showed that financial literacy is the key to mediating the relationship between open banking and financial inclusion. The study also revealed the key areas to be focused on by the policymakers to strengthen financial inclusion initiatives.

A study that was commissioned in the year **2022 by Forrester Consulting on behalf of Fiserv Inc.**, revealed that 62% of Indian consumers are highly likely or certain to choose alternative payment options when they are not able to meet their needs with the traditional system. Among them, 46% of the customers showed readiness to cut short their spending until they get access to their preferred payment channel. This shows that customer experience can be enhanced by offering a consistent and integrated payment system. Fintech companies can gain a competitive advantage by optimizing their payment processing and leveraging customer data to customize offers for them too. The same study also revealed that 83% of customers are looking for ease and convenience as key attributes of a reliable payment system.

Based on the above literature review, the research problems were formulated as follows:

1.What are the major factors influencing customer adoption of digital payment platforms?

2. Does the demographic variable have an impact on their choice of the digital payment system?

3. Are the customer satisfied with the services that they are receiving presently from FinTech companies?

4. What are the barriers to customer adoption of FinTech services?

THEORETICAL FRAMEWORK

OPERATIONAL DEFINITIONS

Fintech innovations

The correlation between technological development and finance innovation has been extensively studied from different perspectives by domestic and foreign scholars. Since "Financial Deepening" was first proposed by McKinnon and Shaw in 1973, Sci-tech finance has developed rapidly [1]. Unlike the concept of providing financial services for scientific and technological enterprises, Fintech can be defined as some new tools that use emerging information technologies, such as big data, the Internet of Things, and cloud computing, to broaden financial service areas [2]. Keke Gai et al. described Fintech as a financial technology section in one company that would improve service quality and management efficiency by using a new generation of information technology [3]. Therefore, it might improve the efficiency and scope of financial services through the application of technology in the banking domain. Along with the sustainable development of Fintech, there are many technological breakthroughs in this field, such as big data [4], cloud computing [5], the Internet of Things [6], and data analytic techniques [7]. Du et al. divided the main issues of security and privacy of Fintech into four dimensions—data-oriented, facility and equipment, applications, and service models [8]. Arner et al. explained the dissimilarities between traditional financial services and Fintech and that Fintech is not a simple combination of information technology and financial services but an application of technology to traditional services to broaden their scope [9]. In this paper, Fintech is defined as innovative financial services using new technology tools, such as big data, cloud computing, and mobile technology.

Digital payment platforms/ E-wallets

Digital payment platforms or electronic wallet is a software or an application that allows a user to store, manipulate, and pay with various types of payment instruments such as electronic cash and credit card. They make it unnecessary to retype credit card numbers and addresses each time a purchase is made. Most E-Wallets are software programs that run on a user's personal digital assistant devices. In today's scenario, smartphones have become an important part in the day to day activities. As it has become more affordable, the usage of smartphones is getting drastically high. They now have become part of our day-to-day activities for making payments for various options. E-Wallet is an online prepaid account protected using a password where one can store money, to be used when required. Consumers can buy a range of products from airline tickets to the grocery without swiping a debit or credit card since it is a preloaded facility, provided their wallets are filled with the sufficient amount required for payment. The two components of an E-wallet are software and information. The software component stores personal information and provides security and encryption of the data and the information component is a database of details provided by users which includes their name, shipping address, payment method, amount to be paid, credit or debit card details, etc. For setting up an e-wallet account the user needs to install the software on his or her device and enter the relevant information required. Services like E-Wallet are an innovation facilitating more easier payments at the time of requirement. India's most popular online destination for prepaid mobile and DTH recharges and shopping apps are popularized through Android and IOS apps using an e-wallet facility for the mode of payment. E-wallets can be used for many purposes like online grocery stores, utility payments, buying online, and recharging mobile phones, whereas many e-commerce sites are also encouraging the same. The service sector companies like Uber, ola cabs, book my show, and make my trip also prefer e-wallets for the mode of payment. E-Wallets like Paytm works with mobile operators in all states of India for payments of bills like postpaid bills, DTH bills, landline bills, electricity bills, data cards and recharges like prepaid mobile. It partners with multiple national banks, for the credit card, debit card and net banking payments.

The top digital payment platforms or E-wallets in India are as follows:

- ***PAYTM :***

  Being one of the largest mobile commerce platforms in India, PayTM launched in the year 2010 offers its customers a digital wallet to store money and make quick payments. Paytm works on a semi-closed model that **allows its users to transact money via issuer as well as connected merchants w**ho have operational tie-ups with the company.

- ***AMAZON PAY:***

  Amazon Pay is an online payment processing service that is owned by Amazon. Amazon Pay uses the consumer base of Amazon and focuses on giving users the option to pay with their Amazon accounts on external merchant websites, including apps like Big Bazaar, etc.

- ***GOOGLE PAY (TEZ):***

  Due to its hassle-free services, Google Pay quickly managed to make an impact on Indian customers even after being a late entrant in the market of digital payment platforms in India. With Google Pay, you can send money to friends, pay bills and buy online, recharge your phone. Since Google Pay works with your existing bank account, which means your money is safe with your bank. There's no need to worry about reloading wallets and you don't need to do additional KYC - which is required for all the other apps.

- ***PHONEPE :***

  Starting in the year 2015 PhonePe has been able to cross the 100 million download mark in just 4 years. It is an all-in-one digital app based on UPI. PhonePe is enable to do UPI payments to recharges, money transfers to online bill payments, etc. PhonePe is considered to be one of the safest and fastest online payment experiences in India with a friendly user interface. It is With its daily attractive promotions and offers PhonePe has become one of the most popular digital wallets in India. Being a multi-lingual app PhonePe also assures data security against cyber-criminals.

- ***AIRTEL MONEY:***

  It is the e-wallet app introduced by its parent organization Bharti Airtel, headed by CEO Shashi Arora in 2016. It acts as a financial intermediary to various services offered and it makes transactions secured by creating a secret mPin (4- digit) by the user which is to be entered for every single transaction to process.

- ***BHIM AXIS PAY:***

  BHIM Axis Pay is a UPI banking app that lets you transfer money instantly to anyone using just your smartphone. Make online recharges to your prepaid mobile and DTH set-top boxes directly from the app.

- ***BHIM:***

  Bharat Interface for Money is a mobile application in the form of a virtual wallet created by the National Payment Corporation of India (NPCI) through the Unified Payment Platform (UPI) and using Unstructured Supplementary Service Data (USSD). It is also a payment application that offers various services like any other mobile wallet. Unlike other mobile wallets, the user will receive money as interest since the money is not transferred to an escrow account.

Customer adoption

Kotler defines adoption as an individual's decision to become a regular user of a product. Customer adoption is a multi-stage mental process where a new product acquires new and repeated customers in a marketplace. It's the end-to-end process when an individual decides to become a regular customer of the product and the product becomes an integral part of the customer's life. Even though customers of a product have more or less similar needs, they are different in many aspects. Making purchases at the initial stages of a product is entirely different from purchases made at later stages. There can be changes in their demographics, purchase motives, buying process, etc. the adoption process can explain this concept from the right perspective. The five stages in the adoption process are product awareness, product interest, product trial, product evaluation, and product adoption. In short, this is the buyer's journey in marketing, and is very similar to the product life cycle, but for the product management team, it's customer adoption.

Customer satisfaction

Customer satisfaction is a metric that measures a company's customers' level of satisfaction with its goods, services, and capabilities. Information about customer satisfaction, such as surveys and ratings, can assist a business in deciding how best to adjust or improve its goods and services.

Customer satisfaction must be a company's first priority. This rule is applicable to all types of organisations, including commercial enterprises, retail and wholesale businesses, governmental agencies, service providers, nonprofits, and every division within one. Customer happiness is a crucial idea to comprehend and live by, especially if you work in sales, marketing, or customer success. The consumer experience as a whole is more important than just a money-back promise, despite how straightforward it may seem.

Demographic variables

Researchers gather demographic data to describe the composition and distribution of the sample they will use for inferential statistics. These include variables like age, gender, ethnicity, socioeconomic indicators, and group participation in applied statistics and research. Age, sex, income level, race, employment, location, homeownership, and level of education are typical demographic study factors. To identify clients, demographic data generalizes about various groups. Demographic information is statistical information that is gathered on the characteristics of the population, such as age, gender, and income. It is typically used to investigate a good or service's sales, target audience, and/or geographic hotspots. Individuals are socially categorized according to demographic factors. Education, tenure, age, gender, and job level are a few examples of these variables from the Mowday et al. and Mobley models. In addition to referring to people, demographic variables can also relate to social systems.

Marketing and sales teams use the concept of customer awareness. Customer awareness includes these two essential ideas:

- How well-informed potential customers are about your company, products, or services?
- How aware are clients of their needs or wants in regard to what your business has to offer?

Customers' levels of awareness are typically scaled from the least aware to the most aware by sales and marketing professionals. Some clients might be aware of your business's existence but not that they have a need that your service or product could fill. Similarly, some clients can be aware of a need they now have but be unsure of how your business can meet or alleviate it. A customer's need could be a problem that needs to be solved or a positive incentive to make their lives better. For instance, a pest control company might primarily serve customers who already have a problem with ants, roaches, or mice by getting rid of the pests in the customer's building. However, a luxury beauty company may primarily target customers who are drawn to high-end beauty products for positive reasons.

STATEMENT OF THE PROBLEM

The research titled **"AN ANALYSIS OF THE FACTORS INFLUENCING CONSUMER ADOPTION OF FINTECH INNOVATIONS"** primarily aims to find out the factors that influence customers to shift to digital payment platforms. The study becomes more significant since it also aims to analyze the extent of use of Mobile devices in the fintech industry which provides services anywhere at any time.

OBJECTIVES OF THE STUDY

- To identify the major factors influencing the customer adoption of digital payment platforms
- To analyze customer awareness regarding the digital payment platforms
- To find out the impact of demographic variables on customer adoption of digital platforms
- To examine the people's satisfaction level and problems faced with respect to these platforms

SIGNIFICANCE OF THE STUDY

The financial sector has witnessed a massive shift in the favour of digital. The intersection of mobile technology and financial services has paved a way for increased digital adoption. India is one of the fastest-growing countries in terms of mobile users. Now mobile phones are not only a medium of voice communication but also widely used for mobile services. Mobile Based services or M-services are defined as electronic services that are delivered to consumers via mobile technologies using mobile devices. M-services is a limited concept of E-Services which is able to provide services anywhere at any time. Due to this reason, this concept became popular among people. This research is undertaken due to personal curiosity to gain practical knowledge about mobile payment platforms during the research process in order to understand how consumers perceive this new technological service. The study proposed to throw light into those areas that need to be considered while introducing more advanced fintech innovations in the future.

SCOPE OF THE STUDY

The present study **"AN ANALYSIS OF THE FACTORS INFLUENCING CONSUMER ADOPTION OF FINTECH INNOVATIONS"** covers the factors influencing the customer adoption of mobile-based payment systems. The result of the study helps to identify various factors which lead customers to adopt electronic payment platforms and the association and impact of demographic variables in adoption. The study is extended to representative sample customers of electronic payment platforms from Ernakulam district.

RESEARCH METHODOLOGY

Research design allows the researcher to operationalize the variables so that they can be measured, how to select a sample of interest to the research topic, how to collect data to be used as a basis for testing hypotheses, and how to analyze the results. The research design chosen here by the researchers is a survey method that will allow the researcher to statistically analyze the collected data to draw meaningful research conclusions. The survey method was used as it was deemed fit for the nature of research in terms of identifying the specific objectives, the extent of the study area, and the quantity of Data.

A **sample design** is a definite plan for obtaining a sample from a given population. Here the researchers have used stratified random sampling since the population is too large, including both users and non-users of digital platforms. The number of sampling units selected from the population is called the size of the sample. The sample unit considers for the study consist of only Users of digital payment platforms/e-Wallets from different age groups, from various educational and occupational Background. The questionnaire was administered to 80 respondents irrespective of their place of residence. A structured questionnaire was designed to collect information from the respondents. The survey was conducted online due to the convenience and ease of accessibility. With respect to **methods of data collection**, the primary data was collected through the questionnaire which was distributed as google forms, and secondary data from various publications on the internet as well as in print.

LIMITATIONS OF THE STUDY

- The interpretations of the study are based on the assumption that the respondents have given correct information
- The sample size is limited to 80 respondents, which might be not enough for appropriate generalization.
- Time was another constraining factor

DATA ANALYSIS OF THE USERS

Demographic Profile of the Respondents

The study was conducted with 80 respondents who were selected on a stratified random sampling method. Care was given throughout the sampling that only users of different digital payment platforms were included in the study. Accordingly, out of the 80 respondents, and 68.75% were females and 31.25% were males. Among the 80 respondents, the majority,i.e.,53.75% were from the age group of below 25 years, 8.75% of respondents were between 25-35 years, 5% of the respondents were between 36 to 45 years, 30% between 46-55 years of age and 2.5% respondents were from the age of above 55. The educational Qualification of the sample with reference to 80 respondents is such that the majority of the respondents are Graduates representing 66.25% of the sample, 27.5 are postgraduates and 6.25% of the population are only higher secondary educated.

Next comes the income level of the respondents. Out of 80 respondents, most of them ie; 40% are having income below 2 lakh rupees, 25% fall into the income group between 2 to 4 lakhs, 7.5% are having an income of 5-7 lakhs, 8.7% fall in the income bracket of 8 to 10 lakhs and the rest 18.75% of the sample was from the income scale above 10lakh rupees. In terms of the geographic residence area of the respondents, the majority, i.e., 76.25% are living in urban areas and the rest 23.76% belong to rural areas.

Findings with respect to the objectives of the study

- **Most used digital payment platform**

  It was found that many of the respondents to be using multiple payment platforms. Drawing inference out of the total usage, it is found that out of 80 respondents, 85% are using google pay as their primary payment platform. There are other platforms also being used like Paytm (23.75%), PhonePe (26.25%), Amazon pay (12.5%), Yono by SBI (8.75%), MobiKwik (2.5%), ICICI pockets (2.5%), HDFC payzapp (2.5%) and BHIM Axis pay & Citi Masterpass 1.25% each. From this it can be clearly inferred that Google pay is the most preferred digital payment platform followed by PhonePe and Paytm.

- **Frequency of usage**

  Based on the survey it is clear that most of the sample, i.e., 60% use digital payment platforms very regularly, 27.5% use them only sometimes or on exceptional cases and 12.5% of the respondents use these platforms very rarely.

- **Experience using digital payment platforms**

  The collected data reveals that the majority of the respondents, i.e., 52.5% of them have experience using it for 1 to 3 years, and the rest of the sample have experience of less than I year and more than 3 years at 23.75%.

- **Purpose of using digital payment platforms**

  Respondents expressed multiple purposes for using digital payment platforms with online shopping being the most mentioned purpose (71.25%). Other purposes following are fund transfer(70%), recharge/broadband top-up & food/movie booking each with a preferred rate of 63.75%. Other purposes included are payment of bills, checking account balance/statement, booking train/air/bus tickets, etc.

- **Reasons mentioned for the preference of digital payment platforms**

  Many of the respondents have put multiple reasons for their preference for particular platforms among which the foremost reason is found to be 24*7 availability compared to that of traditional methods. Other reasons for their preferences are they save time, are very convenient and easy to use, have privacy, accept at different physical as well as virtual stores, have discounts and cashback, have the utility of innovations, etc.

- **Satisfaction level with respect to digital payment platforms**

  On surveying 80 respondents who are users of digital payment platforms, 53.75% are satisfied with their experience, 40% are extremely satisfied and 5% have a neutral opinion. On the whole, there is no dissatisfaction reported with the usage of digital payment platforms.

- **Types of issues faced while using digital payment platforms**

  Since many parts of our country still face issues with internet connectivity, this was the major problem mentioned by the respondents (32.5%). Other problems faced while using digital payment platforms as mentioned by the respondents are undue delay in transactions due to bank server issues, scare of losing money and other security issues, delay in reimbursement on cancellation of payments, provider asking for more personal information, restriction in making international transactions, etc.

- **Referring digital payment platforms to others in general**

  From the survey it can be inferred that the majority of the respondents opined that they will strongly refer digital payment platforms to others (76.25%), 22.25% of them have a neutral opinion on it and 1.25% are quite unlikely to refer it to others.

CONCLUSION

Due to the rapid development of information technology and the present changes in the market environment mobile payment services that were provided exclusively by financial institutions until recently developed into various mobile Fintech payment services. The covid pandemic accelerated the growth of Fintech services throughout the world and India is not an exception. Mobile technology is transforming the banking industry worldwide by providing convenience to banking customers and offering new services to unbanked customers in the emerging market of India. With the changing times' technology has developed to this extent that one can do all their personal transactions from home. The only step towards same is the digital literacy. There have to be initiatives taken by the government to educate the citizens regarding the same to move away from a cash-based economy towards the cashless one. The initiative of Digital India was announced by our Prime Minister, Narendra Modi in 2015 to realize the same.

The present study is an attempt to understand customer adoption of digital payment platforms. It was found that demographic factors such as age and education have an impact on the adoption of the choice of digital payment. This study reveals that Google Pay has the highest brand recall among the respondents. Most of the respondents use these platforms for Fund transfers and they use them due to ease of payment. Privacy is one of the major factors which influences users to adopt Fintech services for their transactions and respondents were comfortable and satisfied with using them. Speed of internet & connectivity issues is the challenge which people faced the most.

To make these payment platforms more popular, Fintech companies should try to make these applications more users friendly. It is highly imperative that people need to change with the changing time. Being a new technology, customer education is very important. So, along with government initiatives, these Companies also have the duty to create awareness among the people about their technical know-how If Fintech companies have to survive in India, stereo-typed traditional society has to undergo a tremendous transformation and replace their drawbacks with their plus points. People are afraid due to the recent increase in cyber-crimes which have led to the decrease or avoidance of digital financial transactions. Therefore, Fintech companies should focus on tightening their security interface in order to ensure safe and sound transactions. The time is not far when there will be digitalization in every domain of our lives.

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A STUDY ON CUSTOMER PERCEPTION TOWARDS CASHLESS TRANSACTION APPS

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Abstract

This study looks into how aware people are of cashless transaction apps in India, the challenges they face using them, and how satisfied they are with these services. As India moves more towards a digital economy, the government's push, especially through initiatives like Digital India, has fueled the growing use of smartphones and digital payment systems. The survey found that younger people, especially those between 21 and 35 years old, are the most frequent users of cashless apps, with employees leading the pack. Government sector banks seem to be the top choice for most users, but challenges like network issues and concerns over security still persist. Despite these hurdles, people generally find these apps convenient, particularly for things like paying bills or shopping online. Google Pay stood out as the favourite platform, likely because of its easy-to-use interface and strong marketing. The study also highlights that while people's awareness of these digital payment methods doesn't seem to depend much on their level of education, it does rely heavily on exposure to technology. For the future growth of cashless transactions, it's clear that we need better internet infrastructure and stronger security features. While cashless transactions are becoming more common, addressing these technical challenges is crucial for their long-term success.

Keywords: Cashless transactions, digital payments, consumer awareness, mobile banking, Google Pay, security concerns, Digital India, user satisfaction, government initiatives.

Introduction

The Indian government has been actively promoting a cashless economy, especially following the demonetization wave. Despite cash still being dominant in transactions—

accounting for approximately 85% of total transactions—digital payments are increasingly recognized for their efficiency and economic benefits (World Bank, 2013). According to the 2013 World Bank.

Development Report, electronic payments have the potential to save more than 1% of India's GDP, reducing costs associated with cash handling, transportation, and risks like theft and counterfeiting. Additionally, increased usage of digital transactions could contribute to a 1.6% GDP savings for India (World Bank, 2013).

The Digital India program, a flagship initiative, aims to create a digitally empowered society and a knowledge-based economy (Government of India, 2015). One of its key objectives is to encourage "Faceless, Paperless, Cashless" transactions, eliminating hidden monetary activities and enhancing economic transparency. The rise of smartphones, mobile banking, and electronic payment apps has further accelerated the shift towards digital transactions (Reserve Bank of India, 2020).

Beyond economic efficiency, cashless transactions align with sustainability goals by reducing paper waste from cash production and minimizing the carbon footprint associated with physical currency handling (World Economic Forum, 2021). As the government continues to implement incentives and restrictions to promote digital payments, public perception plays a crucial role in the widespread adoption of cashless transaction apps. This study explores consumer attitudes toward these apps and their contribution to sustainable financial practices.

Problem Statement

A shift away from cash transactions to non-cash ones involving plastic money or payment channels is known as a cashless economy. In order to stimulate the economy and lessen dependency on cash, the Indian government has implemented a number of channels, including micro-ATMs, UPI, mobile wallets, and banking cards. To cut down on the use of cash, the government and the RBI are pushing digital payment options including prepaid cards and devices. Limited cash on hand and the possibility of perpetual financial shortages are the driving forces behind this change. Because digital transactions are more transparent, scalable, and accountable, more merchants are beginning to accept virtual currency. The main forces behind the shift towards a cashless society are government initiatives and technical developments. The present investigation focuses on user knowledge, cashless transaction apps, and reasons why.

Objectives

1. To determine the consumer awareness on Cashless Transaction apps.
2. To analyze the problems faced by the customers while using Cashless Transaction apps.
3. To identify customer satisfaction towards cash less transactions apps.

Research Methodology

The present study is both descriptive and analytical in nature. Both primary data secondary data were used for this study.

Primary data: The primary data collected from 100 respondents residing in Chalakudy Municipality. A well-structured questionnaire is prepared for the study. First part includes the socio-economic profile of the respondents and the secondly the questions related to the objectives formulated for the study.

Secondary data: The secondary data is collected through journals, books and websites.

Results and Discussions

The survey results reveal that cashless transaction apps are more commonly used by men compared to women. Additionally, the majority of users fall within the 21-35 age group, followed by some who are under 20 years old. This suggests that younger generations, who are generally more tech-savvy and adaptable to digital platforms, are leading the shift toward cashless payments. Meanwhile, older individuals, particularly those above 50 years, appear to be less inclined toward digital transactions, possibly due to unfamiliarity or concerns about security. In terms of occupation, employees make up the largest group of users, followed by self-employed individuals and students. This highlights that working professionals, who likely have regular incomes and frequent financial transactions, are more reliant on digital payment methods.

When it comes to banking preferences, the majority of respondents prefer government sector banks, while the rest use private sector banks. This could be due to the perception that government banks offer more security and stability. Notably, every respondent in the survey reported using online banking services, showing how digital transactions have become a norm in everyday life. However, most users do not engage in daily transactions but prefer banking on a monthly basis, with only a few making weekly or occasional payments. Spending habits also reveal that two-fifth of users typically spend ₹1,000 or less per transaction, with only few spending above ₹20,000, indicating that cashless payments are mostly used for small-scale purchases rather than large financial transactions.

Despite the widespread adoption of digital payments, users still face significant challenges. Network failures were reported as the biggest issue, followed by security concerns and worries about fraud or theft. These findings emphasize the need for stronger internet infrastructure and better security measures to build trust in digital payments. On a positive note, awareness levels about cashless transactions are relatively high. Many respondents are well-informed about fund transfers, security risks, cashback offers, bill payments, and transaction fees, suggesting that awareness campaigns and advertisements have been effective in educating users.

User satisfaction with cashless transaction apps is also quite strong. Many respondents rated key banking services such as ATM banking, balance inquiries, bill payments, online shopping, and mobile recharges as excellent. The most appealing factor driving the use of cashless transactions is the convenience of 24/7 accessibility, followed by privacy, ease of use, and small financial incentives. Among digital payment platforms, Google Pay emerged as the most popular choice, surpassing alternatives like PhonePe, Paytm, and MobiKwik. This could be due to Google Pay's strong promotional campaigns, and user-friendly experience. Interestingly, most people discovered cashless payment options through friends and family or through advertisements, while very few learned about them from seminars and conferences, highlighting the power of social influence in digital payment adoption.

A regression analysis conducted in the study found no significant link between a person's level of education and their awareness of cashless transactions (calculated value: $0.542 > 0.05$). This suggests that familiarity with digital payments is shaped more by exposure to financial technology and usage habits rather than formal education. Overall, the findings indicate that young, employed individuals are the primary users of cashless transactions, with government banks being the preferred choice. However, technical and security challenges remain a major concern. As digital financial systems continue to evolve, improvements in internet connectivity, cybersecurity, and user trust will be essential in ensuring the continued growth of cashless transactions.

Conclusion

In conclusion, the shift to cashless transactions in India is picking up pace, largely thanks to initiatives like Digital India and the increasing use of smartphones and mobile apps. The survey shows that younger individuals, especially those between 21-35 years old, are the biggest users of cashless apps, with employees leading the way. Government sector banks are still the preferred choice for most users, who appreciate the security they offer. While awareness about digital payments is high, challenges like network issues and security concerns remain a hurdle for many. However, the convenience of round-the-clock access and ease of use continues to drive the adoption of these payment methods.

The study also highlighted that users are generally satisfied with the services provided by cashless apps, especially when it comes to features like bill payments and online shopping. Google Pay stood out as the most popular platform, and social influences like friends and family played a big role in spreading awareness. However, education levels didn't seem to affect how aware people were about digital payments, showing that exposure and usage matter more. To keep the momentum going, improvements in internet connectivity and security are needed to make these systems even more reliable and trusted. Overall, while cashless transactions are on the rise in India, there's still work to be done to address these challenges and ensure continued growth.

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BEYOND LIKES AND SHARES: UNDERSTANDING CONSUMER ENGAGEMENT IN SOCIAL MEDIA MARKETING.

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Abstract:

Social media's widespread use has drastically altered marketing strategies. For a number of marketing goals, such as branding, research, customer relationship management, customer support, and sales promotions, marketers have quickly embraced social media marketing.In this digital age, social media marketing's ability to engage consumers has drawn a lot of attention. A customer's interaction with a business post on social media can be characterised as consumer engagement in this context. This conceptual paper studies the role of social media marketing in generating consumer engagement. The social media activities identified for the study are entertainment,customization, interaction, word-of-mouth, and trendiness. The study examined the effect of these social media activities on consumer engagement.

Key words: *Social media, Social Media Marketing, Customer engagement*

Introduction

Businesses may now connect with their customers, increase brand exposure, and boost engagement via social media marketing (SMM). Businesses can provide targeted content, communicate with clients, and track customer behaviour in real time by utilising platforms like Facebook, Instagram, X (previously Twitter), LinkedIn, and TikTok. SMM facilitates two-way communication, which strengthens the bonds between brands and customers in contrast to traditional marketing.

The personal bonds that a consumer forms with a brand are referred to as customer engagement (So, Wei, & Martin, 2021). In order to establish and preserve relationships with companies and, eventually, increase client loyalty, customer engagement is essential. Consumer engagement is essential for building trust with the brand. With the advancement of social media, consumer engagement is getting importance. Social media platforms facilitate and promote consumer involvement in a number of ways, including following and interacting with brands and producing, disseminating, and leaving comments on material about companies, goods, and brands (Harrigan, Evers, Miles, & Daly, 2017). The present study evaluates how social media marketing helps in consumer engagement.

Review of Literature

Social Media for business

Social media is mostly used by consumers for networking, relationship building, and relationship strengthening (Chung and Buhalis, 2008). According to Grewal and Levy (2013), social media can be divided into three groups: thought-sharing websites (like blogs), media-sharing websites (like YouTube, Flickr), and social network sites (like Facebook, LinkedIn). According to Sahay et al. (1998), websites and social media are regarded as interactive media since they enable companies to transition from only disseminating one-sided information to allowing customers to interact and participate with the content. According to Pick (2013), 75% of marketers intend to increase their use of social media as it continues to grow, and 93% of marketers utilise it for business.According to NM Incite's research, 66 percent of social media users use it to learn about goods and services, indicating the importance of social media use for businesses (Murtagh, 2013). Additionally, users are more likely to be trusted by customers than by commercial marketing communications (Jain, 2008).

Social Media Marketing

Consumer purchase habits have changed after the use of the internet and social media**.** This change in influenced the mode of operation of the marketers and their marketing strategies.Mangold and Faulds (2009) assert that social media facilitates communication between businesses and their clientele as well as between clients and one another. Beyond conventional techniques, communications between businesses and their clients foster brand loyalty. Kaplan and Haenlein (2010) and Jackson (2011) . Social networking sites provide an almost limitless supply of perspectives on customers and circumstances. The difficulty lies in managing this data in a way that is relevant, significant, and beneficial to the business. Social networking is also a good framework for the main online marketing tasks. Strategically, creating communities around goods and services has long been a tried-and-true way to increase brand loyalty, create exit barriers, and promote viral marketing by using self-emergent consumer reviews. Involving users and identifying their needs on a personal level by enticing them to join enthusiastically and paying attention to their preferences is one of the main success criteria of social software. Assaad et,al(2011)

Consumer Engagement

Schultz and Peltier (2013) contend that engagement may be viewed in light of varied relational constructs, including brand loyalty, relationship marketing, concentric marketing, marketing orientation, customer relationship management, and social networks. In Social Media Marketing Consumer engagement is defined as a collection of quantifiable behaviours that consumers exhibit on social media in response to brand-related content: posting user-generated content (such as product reviews, brand-related Facebook posts), commenting on content (such as Facebook comments, Twitter replies), sharing content with others (such as Facebook shares, Twitter retweets), and reacting to content (such as likes, hearts, +1s, and 1 to 5 star ratings).Consumer engagement includes both behavioural and cognitive reactions, like "liking" and "commenting" on brand posts or producing user-generated content (Simon et al., 2013; Smith et al., 2012), as well as a motivational state that results in increased involvement in online brand activities (Baldus et al., 2015; Brodie et al., 2013). Mollen and Wilson (2010) have distinguished between consumer engagement and consumer involvement, arguing that although both involve a consumption entity, engagement is superior to involvement because it necessitates an "active relationship" with the brand that satisfies both instrumental and experimental values.

HYPOTHESIS DEVELOPMENT

According to five dimensions—entertainment, interaction, trendiness, customization, and word-of-mouth—social media marketing activities are effective marketing communication strategies that capture the perceptions and comprehension of engaged consumers (Chen & Lin, 2019; Kim & Ko, 2010; Yadav & Rahman, 2018).

Entertainment:

When marketers use social media platforms to create experiences that consumers find enjoyable and amusing, they are incorporating entertainment as an SMM aspect. (Agichtein and others, 2008). The study of Kaye, 2007, presented entertainment as a strong motive factor for social media use. Customers' purchasing intentions can be boosted by entertainment that fosters an emotion of connection with the brand (Dessart et al., 2015). Marketers utilize social media to entertain customers and fulfil their desire for fun by posting images and information about products (Lee and Ma, 2012). For example, Facebook brand pages that have images, videos, and narratives can successfully grab customers' interest. Thus following hypothesis formulated,

H1: Entertainment positively influences consumer engagement.

Customization :

According to Godey et al. (2016), customization is the degree to which services, marketing initiatives, and messaging are tailored to meet the individual tastes of customers. Brands can exhibit uniqueness and personalize their websites, increasing brand connection and loyalty (Martin & Todorov, 2010). Customization could include, for instance, letting brands' target customers create their own products based on their preferences (Sangar, 2012) or utilizing social media platforms to offer personalized information and prompt responses to customers' individual questions, which would increase customer satisfaction and retention (Chan and Guillet, 2011). Thus following assumption put forth ;

H2: Customization positively influences consumer engagement.

Interaction

According to Kim and Ko (2012), interaction is the degree to which social media platforms provide chances for mutual exchange of information and opinions. This enables customers to discuss particular brands or goods with like-minded people on social media platforms, which is maybe more efficient than traditional media (Muntinga et al., 2011). In order to encourage interaction, brands must produce original material, represent the profiles of their users, participate actively and transparently in conversations, and offer assistance with real-world issues. Posting content that aligns with the profiles of their target audience on social media promotes conversation and strengthens bonds between customers and companies (Manthiou et al., 2013). Consequently following hypothesis formulated;

H4: Interaction positively influences consumer engagement

E-WOM

It refers to disseminating brand information, posting content from brand pages to blogs, and exchanging viewpoints with colleagues (Chae et al., 2015).The degree to which customers use social media to upload, share, and exchange information is known as the EWOM level (Kudeshia and Kumar, 2017).As social media has developed, more people are using EWOM to assess brands and products (Ananda et al., 2019;). Customers are compelled to put in more mental effort when reading EWOM, which may have a favourable impact on how they evaluate products and services (Krishnamurthy and Kumar, 2018). Thus following hypothesis formulated ;

H4: E-WOM positively influences consumer engagement

Trendiness

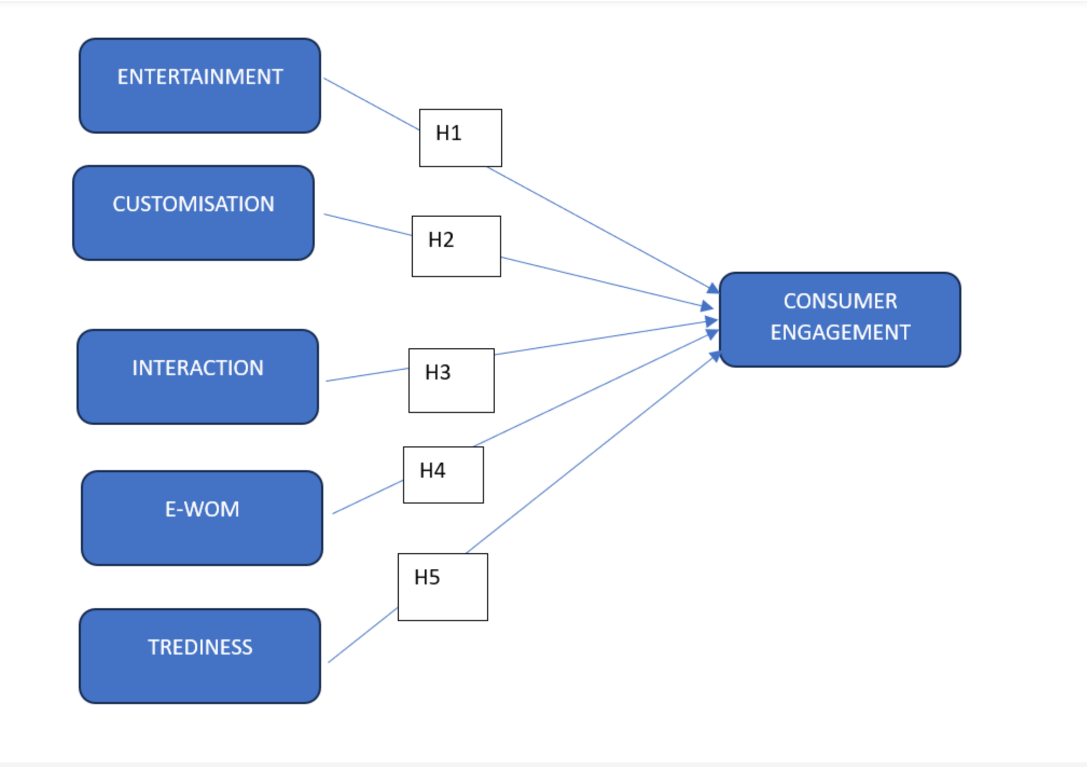
Because social media platforms give the impression that they are more current and helpful than traditional channels, consumers are increasingly using them to look for and get product-related information (Ashley and Tuten, 2015). According to Naaman et al. (2011), trendiness is the degree to which a brand disseminates the most recent, current, and fashionable (i.e., "hot topics") information about the brand. Customers are encouraged to read up-to-date brand information on social media sites in order to stay informed about current brand developments and pertinent trends (Gallaugher and Ransbotham, 2010).

H5: Trendiness positively influence consumer engagement

Consumer Engagement

The personal bonds that a consumer forms with a brand are referred to as customer engagement.Customer engagement is fuelled by reciprocal value exchanges between businesses and consumers, whereby businesses receive market share, social influence, and customer feedback, while customers receive high-quality goods and services, improved image and reputation, reduced prices, etc. (Itani, Kassar, & Lourieiro, 2019). The "degree of a customer's physical, cognitive, and emotional presence in their relationship with a service or organisation" is referred to as consumer engagement (Patterson, Yu, & De, 2006, p.3).It is acknowledged that modern businesses must use social media's impact to interact with customers rather than only leveraging it to boost sales of their goods and brands (Forbes, 2015).

CONCEPTUAL FRAMEWORK



Theoretical Implications

This provides an understanding of consumer engagement in social media marketing. This study investigated the impact of social media marketing activities on consumer engagement. Five factors were selected as social media marketing activities: entertainment, customisation, interactivity, e-wom, and trendiness. These five factors have a positive influence on consumer engagement. Entertainment uses content that is visually beautiful, amusing, or emotionally fascinating to draw in viewers and maintain their interest. As customers actively participate in discussions, leave comments on blogs, or take part in brand-driven activities, interaction strengthens a sense of connection. By providing individualised experiences that accommodate individual tastes and make content more interesting and relevant, customisation increases engagement.

By matching company messaging with current social media concerns, trends, and viral material, trendiness raises visibility and resonance and affects engagement. Lastly, because people spread brand-related experiences, opinions, and suggestions, e-WOM is essential for maintaining engagement and expanding the reach and legitimacy of brands. When combined, these elements produce a vibrant and captivating social media presence that improves customer-brand connections and fosters enduring loyalty.

PRACTICAL IMPLICATIONS

As an environment, social network marketing offers customers an interactive platform that is different from the strategy of traditional marketing methods. Customers converse and exchange information about their preferences for particular goods and services offered by the various businesses throughout these exchanges. It is inferred that these exchanges can affect the customers' intents to buy. More interactions based on common hobbies, political viewpoints, or specific activities like travel and dining services are anticipated As more people spend time engaging with online communities via social media sites , Building brand equity is facilitated by the previously identified social media content qualities of entertainment, interactivity, trendiness, word-of-mouth, and customisation. Three factors in particular—entertainment, interactivity, and trendiness—are important to customers. Brands should now view social media marketing as a valuable and affordable instrument for enhancing their brand's image rather than just a means of reaching consumers. As a result, social media challenge traditional marketing platforms like TV and magazines as a powerful instrument for creating emotional connections with brands.

CONCLUSION

The study emphasised the consumer engagement in social media marketing. It explained the role of entertainment, interactivity, customisation, trendiness and e-wom on consumer engagement. In fact, customers can gain enjoyable and intriguing knowledge from entertaining social media marketing content, which may increase their brand loyalty (Hollebeek et al., 2014). Customised social media marketing can change how customers develop attachment and cognitive experience, which drives activation (Dessart et al., 2015; Merrilees, 2016). As a result, consumers are more likely to think of the targeted brand as their top option when making decisions. When customers actively share their thoughts and opinions about new products, consumer-brand interaction also helps brands with the new product development process . According to Chen et al. (2011), this sharing increases brand trust, purchase intention, and consumer satisfaction. The availability of EWOM on social media platforms and its application help to build favourable feelings and positive brand experiences, which in turn strengthens the bond between the brand and its customers. The perception of a brand as a leader may be influenced by its trendiness, which encourages customers to visit brand pages for the most recent information and helps create a favourable brand experience in their minds. Consequently, social media brand pages can engage customers more successfully if they share trendier content.

As a result, marketers need to adapt to the growing significance of social media. The websites have the power to affect consumers' intentions to buy. By continuously adjusting their internet marketing methods in response to consumer complaints, marketing strategies can be improved. Additionally, since social media allows users to speak freely and directly with one another regardless of time, subject, frequency of conversation, or location, marketers must provide an activity that can engage users in the virtual world.

Limitations and Future Research Directions

There are some limitations on the research paper. The idea or model put out in this conceptual work is not supported by actual research. Because of the author's interpretation of the material, subjectivity may be present in the concepts and models produced in this work. Future research could benefit from examining many perspectives or interpretations. The suffers limitation of lack of actual evidence for measuring consumer engagement in social media marketing. There is wider scope for future studies in this area. A detailed empirical study can be conducted in this area. A comparative study can be conducted regarding consumer engagement in social media and traditional marketing. Also various types of social media marketing like content marketing, story telling marketing, influencer marketing can be considered as area of study.

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TECHNOLOGY ADAPTATION FOR QUALITY EDUCATION: A STUDY AMONG COLLEGE TEACHERS IN TRISSUR DISTRICT

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Abstract

It is important to explore the factors influencing technology adaptation among college teachers, which is essential for enhancing the quality of education in the digital era. This study explores the influence of organizational, personal, social, and demographic factors on the technology adaptation among college teachers, with a specific focus on the role of technology acceptance. The research, conducted in Trissur District, examines the barriers and enablers teachers face when integrating technology into their teaching and assessments. A total of 100 college teachers from government, aided, and self-financing institutions participated in the study, which used both primary and secondary data collected through a well-structured questionnaire. The findings reveal that home environment challenges, personal problems, and a lack of technical knowledge hinder technology adaptation. Teachers also face external distractions, family interruptions, and lack of motivation, which further complicate the transition to online teaching. Additionally, the study finds that perceived usefulness, situational demand, competency, and prior experience have a significant impact on technology acceptance. This research aligns with Sustainable Development Goal (SDG) 4, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. By identifying the factors that affect technology acceptance, the study provides valuable insights to enhance teaching effectiveness and improve digital learning environments.

Keywords: ***Technology Adaptation, Technology Acceptance, Organizational Factors, Personal Factors, Social Factors, Demographic Factors, Barriers to Online Teaching, Quality education, SDG Goal 4.***

Introduction

The rapid advancement of technology has significantly transformed the landscape of education, making it increasingly essential for teachers to adapt to digital tools and platforms. In this context, technology adaptation plays a crucial role in enhancing the quality of education, ensuring that both teaching and learning processes are more effective and engaging. College teachers, in particular, are at the forefront of this transition, as they are expected to integrate technology into their teaching methodologies, assessments, and overall educational practices. However, the process of adapting to technology is influenced by various factors, including organizational support, personal skills, social dynamics, and demographic characteristics. Understanding these factors is critical to identifying the barriers and enablers that affect teachers' technology acceptance and, ultimately, their ability to effectively utilize digital tools in the classroom. This study focuses on the factors influencing technology adaptation among college teachers in Trissur District, exploring how these influences shape the integration of technology in educational settings. By investigating the challenges and opportunities faced by teachers, the research aims to provide valuable insights into how technology can be more effectively adopted to improve the quality of education, in alignment with Sustainable Development Goal (SDG) 4, which emphasizes inclusive and equitable education for all. Through this study, we seek to contribute to the broader conversation on enhancing digital learning environments and supporting educators in navigating the digital transformation of education.

Statement of the Problem

The integration of technology in higher education is essential for improving teaching and learning outcomes; however, college teachers face various challenges in adapting to these technological changes. Understanding the factors influencing technology adaptation, such as organizational, personal, social, and demographic factors, is crucial to addressing these challenges. Despite the growing importance of digital tools in education, there is limited research on how these factors specifically impact technology acceptance among college teachers. This study aims to explore the role of technology acceptance as a mediator in the relationship between these factors and the overall technology adaptation process. By identifying and analyzing these key influences, the research seeks to provide insights that can support more effective technology integration in educational practices.

Scope of the Study

This study focuses on examining the factors influencing technology adaptation among college teachers in Trissur District, with an emphasis on organizational, personal, social, and demographic aspects. It explores the role of technology acceptance in mediating the relationship between these factors and the adoption of technology in teaching. The study includes teachers from government, aided, and self-financing institutions, providing a comprehensive view of the local context.

Importance of the Study

The findings of this study will help identify key barriers and enablers to technology adoption among college teachers, offering valuable insights for improving digital teaching environments. By understanding the factors that impact technology acceptance, the study can guide educational institutions in supporting teachers through targeted interventions and training programs. Ultimately, the research contributes to enhancing the quality of education and aligns with the global objective of ensuring inclusive and equitable education for all, as outlined in Sustainable Development Goal (SDG) 4.

Objectives

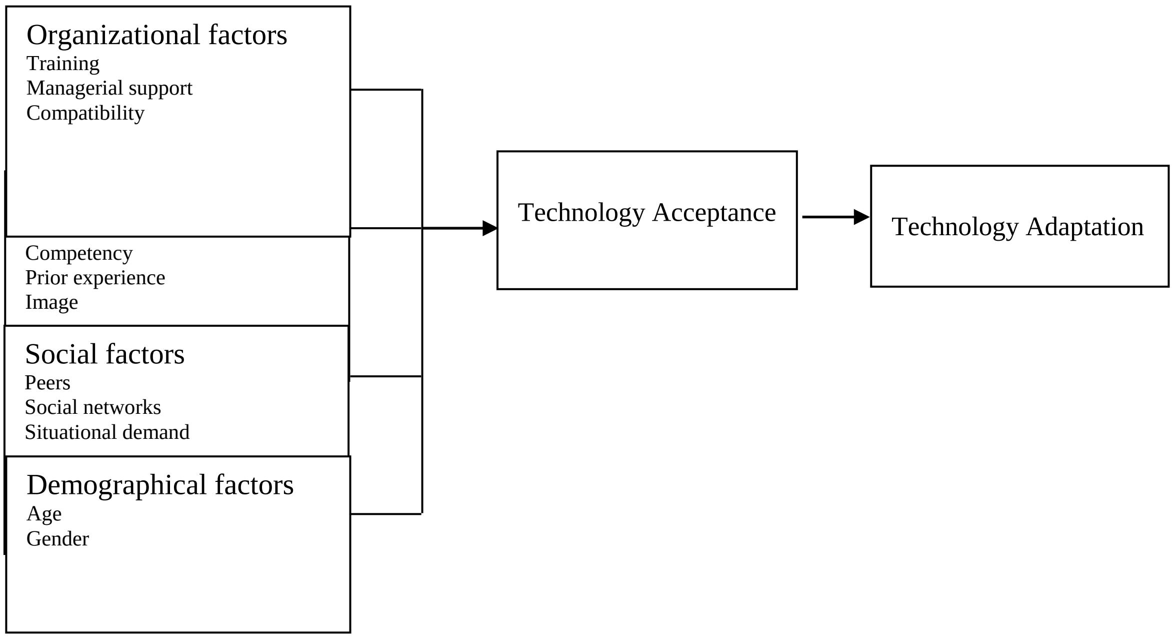
1. To analyse the level of influence of Organisational Factors, Personal Factors , Social Factors and demographic factors on the technology adaptation among college teachers.

Hypotheses

1) Technology acceptance mediates the relationship organizational factors and Technology adaptation.
2) Technology acceptance mediates the relationship personal l factors and Technology adaptation.
3) Technology acceptance mediates the relationship social factors and Technology adaptation.
4) Technology acceptance mediates the relationship demographical factors and Technology adaptation.

The Conceptual Model

On the basis of variables identified, a conceptual model developed for the study is shown in the figure 1.1.



Methodology of the Study

The present study is both descriptive and explanatory in nature and both secondary and primary data were collected and used for the study. The population of the study covers the teachers of government, aided and self-financing colleges in Trissur District. The primary data required for the study were collected from 100 respondents using convenience sampling method. A well-structured questionnaire was developed for the collection of primary data.

Tools used for Analysis of Data

The collected data were tabulated and analysed with the help of SPSS 21.0. The statistical techniques used for analysis include Multiple Regressions Analysis. The reliability of the scale of measurement used was assessed using Cronbach's Alpha coefficient, which was above the minimum acceptable level 0.7, there by confirmed the reliability of the scale of measurement used in the study.

Limitations of the Study

The technology adaptation is analyzed only among college teaches due to paucity of time. It is also noted that since the study depends mainly on the views of the individual, there are chances for their personal bias while responding to the questions; even then maximum care has been taken while analysing and interpreting the data to draw appropriate and logical conclusions.

Review of Literature

- **Agarwal, R. & Prasad, J. (2020)**

  This study investigates the role of perceived ease of use and perceived usefulness in the technology acceptance process among educators. The authors highlight how these factors influence technology adoption in educational settings, emphasizing the need for training and organizational support.

- **Raman, S. & Gupta, S. (2021)**

  This research explores the influence of personal and demographic factors on technology acceptance among higher education faculty in India. It suggests that age, teaching experience, and comfort with technology play significant roles in determining the level of technology adoption.

- **Singh, R. & Reddy, P. (2022)**

  Focusing on social factors, this study looks at the impact of peer influence and institutional culture on technology acceptance. It reveals that supportive social networks and a positive institutional attitude are key enablers of technology adaptation.

- **Kaur, M. & Arora, A. (2023)**

  This study examines the relationship between organizational factors, such as institutional infrastructure and leadership support, and technology adaptation among teachers in Punjab. It finds that strong institutional backing facilitates greater technology integration in teaching.

- **Choudhury, S. & Mishra, R. (2022)**

  The authors explore how personal factors, such as self-efficacy and motivation, influence technology adoption in online education. Their findings suggest that teachers with high motivation and confidence in using digital tools are more likely to adopt technology in their classrooms.

- **Verma, A. & Singh, D. (2021)**

  This study investigates the barriers to technology integration in rural colleges and the role of technology acceptance in overcoming these barriers. The study shows that technical support and access to resources are significant factors influencing technology adoption.

- **Patel, H. & Gupta, S. (2023)**
  Focused on the role of demographic factors, this research highlights the disparities in technology adoption based on age and educational qualifications. Older teachers with less exposure to technology often struggle to adapt, while younger teachers show greater adaptability.
- **Narayan, R. & Joshi, K. (2020)**
  This paper examines the impact of social and cultural factors on the technology acceptance of teachers in remote areas. It concludes that cultural attitudes toward technology and the availability of local support systems are key enablers for technology adaptation.
- **Saha, A. & Kumar, R. (2021)**
  This research focuses on the role of institutional support and leadership in promoting technology use among faculty. It emphasizes that organizational culture and leadership style are pivotal in determining how readily teachers adapt to new technologies.
- **Patil, M. & Rao, R. (2022)**
  This study examines how teachers' prior experience with technology influences their acceptance and use of digital tools in education. The authors argue that prior exposure and training programs are critical in shaping positive attitudes toward technology adaptation.

Research Gap

Despite existing research on technology adoption in education, gaps remain in understanding how organizational, personal, social, and demographic factors interact to influence technology adaptation among college teachers. Most studies focus on broad factors without exploring how these variables specifically mediate technology acceptance in different contexts.

III. ANALYSIS ON MEDIATING EFFECT OF TECHNOLOGY ACCEPTANCE ON TECHNOLOGY ADAPTATION

Test of Reliability

The reliability of the instrument used in the study was tested by computing Cronbach's Alpha (α) value for each of the five variables as well as for the entire set. The test result is presented in the Table1.1.

Table 1.1 Test of reliability

Sl. No.	Variables	No of items	Cronbach's Alpha (α)
1	Organisational Factors	3	0.870
2	Personal Factors	4	0.847
3	Social Factors	3	0.791
4	Demographic Factors	2	0.867
5	Technology Adaptation	6	0.903
6	Technology Acceptance	5	0.832
7	Total	23	0.952

The final values of Cranach's Alpha (α) for the variables used in the study are presented in the above Table. From this it is seen that all factors had Cronbach's Alpha value above 0.7, which justified the reliability of the scale used for measuring variables.

Analysis of the level of influence of Organisational Factors, Personal Factors , Social Factors and demographic factors on the technology adaptation among college teachers.

<table>
<tr><th rowspan="2">Variables</th><th rowspan="2">Beta value</th><th rowspan="2">Sig</th><th rowspan="2">R^2</th><th rowspan="2">Adjusted R^2</th><th colspan="2">Collinearity statistics</th><th rowspan="2">Durbin Watson</th></tr>
<tr><th>Tolerance</th><th>VIF</th></tr>
<tr><td>Organisational Factors</td><td>0.422</td><td>0.000</td><td rowspan="3">0.623</td><td rowspan="3">0.617</td><td>0.620</td><td>1.162</td><td rowspan="4">1.725</td></tr>
<tr><td>Personal Factors</td><td>0.361</td><td>0.000</td><td>0.573</td><td>1.745</td></tr>
<tr><td>Social Factors</td><td>0.378</td><td>0.000</td><td>0.605</td><td>1.654</td></tr>
<tr><td>Demographic Factors</td><td>0.139</td><td>0.000</td><td></td><td></td><td></td><td></td></tr>
</table>

Dependent variable: Technology Adaptation

From the above multiple regression analysis, it is inferred that the Beta value of influence of Organisational Factors, Personal Factors, Social Factors and Demographic Factors are 0.422, 0.361, 0.378 and 0.139 respectively. Beta value shows how strongly independent variables influences Technology Adaptation. Durbin Watson is found in the last column of the table infer that whether the assumption of independent error is tenable. If the value is closer to two the result is better, and for this model the value is 1.725 which is very close to two hence, that assumption has almost certainly met.

So, the result of above analysis reveals that Organisational Factors, Personal Factors, Social Factors and Demographic Factors are significant and organisational and social factors are highly influencing on Technology Adaptation compared to other two independent variables and Demographic factors has comparatively less influence on Technology Adaptation. The Collinearity Statistics in the table indicate the Tolerance value and Variance Inflation Factor (VIF). Tolerance and VIF used for assessing multicollinearity. Multicollinearity is the inter-relationship of independent variables, which should be avoided. VIF is a measure of Collinearity (it is the reciprocal of tolerance) in which a large value indicates a strong relationship between predicted variables. Here the VIF value is less than three which is very low so it can infer that there is no multicollinearity in this model.

Testing of Hypothesis

H1: Technology acceptance mediates the relationship organizational factors and Technology adaptation.

Simple Regression Analysis results for Organisational factors with Technology Adaptation

Variables	B	Beta value	Sig	R^2	Adjusted R^2	Durbin Watson
Organisational Factors	.613	.566	.000	.320	.317	1.669

Dependent Variable: Technology Adaptation

Simple Regression Analysis results for Organisational Factors with Technology Acceptance

Variables	B	Beta value	Sig	R^2	Adjusted R^2	Durbin Watson
Organisational Factors	.531	.593	.000	.352	.348	1.781

Dependent Variable: Technology Acceptance

Multiple Regression Analysis results for Organizational Factors and Technology Acceptance with Technology Adaptation

Variables	Beta value (β)	Sig	R^2	Adjusted R^2	Collinearity Statistics		Durbin Watson
					Tolerance	VIF	
Organisational Factors	0.165	0.003	0.616	0.678	0.648	1.542	1.934
Technology Acceptance	0.676	0.000			0.648	1.542	

Dependent Variable: Technology Adaptation

Here, the adjusted R^2 value of 0.678, point out that the model has accounted for 67.8 per cent of the variance in the Technology Adaptation. From the above result in is inferred that Technology acceptance mediate in the relationship between Organisational Factors and Technology Adaptation.

Mediating effect of Technology Acceptance between Organisational Factors and Technology Adaptation

DV	IV → M	M → DV	IV → DV	IV → DV Mediators controlled
Technology Adaptation	**β =0.593****	**β = 0.774****	**β = 0.613****	**β = 0.165****
			R^2 = 0.320	**R^2 = 0.612**

DV – Dependent Variable (Technology Adaptation)

IV – Independent Variable (Organisational Factors)

M – Mediating Variable (Technology Acceptance)

From the above statistical analysis, it is seen that all the conditions for testing the mediation are satisfied. Technology adaptation was regressed on Organisational Factors and Technology Acceptance. Organisational factors (β = 0.613, $p < 0.05$) and Technology acceptance (β = 0.676, $p < 0.05$) was found to be significant predictor of Technology Adaptation.

H2: - Technology acceptance mediates the relationship personal factors and Technology adaptation.

Simple Regression Analysis results for Personal factors with Technology Adaptation

Variables	B	Beta value	Sig	R^2	Adjusted R^2	Durbin Watson
Personal Factors	0.827	0.684	.000	0.468	0.465	1.555

Dependent Variable: Technology Adaptation

Simple Regression Analysis results for Personal factors with Technology Acceptance

Variables	B	Beta value	Sig	R^2	Adjusted R^2	Durbin Watson
Personal Factors	0.663	0.664	.000	0.441	0.439	1.773

Dependent Variable: Technology Acceptance

Multiple Regression Analysis results for Personal Factors and Technology Acceptance with Technology Adaptation

Variables	Beta value (β)	Sig	R^2	Adjusted R^2	Collinearity Statistics		Durbin Watson
					Tolerance	VIF	
Personal Factors	0.304	0.000	0.650	0.647	0.559	1.790	1.841
Technology Adaptation	0.572	0.000			0.559	1.790	

Dependent Variable: Technology Adaptation

Here, the adjusted R2 value of 0.647, point out that the model has accounted for 64.7 per cent of the variance in the Technology Adaptation. From the above result in is inferred that Technology acceptance mediate in the relationship between Personal Factors and Technology Adaptation.

Mediating effect of Technology Acceptance between Personal Factors and Technology Adaptation

DV	IV $\rightarrow$ M	M $\rightarrow$ DV	IV $\rightarrow$ DV	IV $\rightarrow$ DV Mediators controlled
Technology Adaptation	**β = 0.664**	**β = 0.774**	**β = 0.684**	**β = 0.304**
			R^2 = 0.468	**R^2 = 0.647**

DV – Dependent Variable (Technology Adaptation)

IV – Independent Variable (Personal Factors)

M – Mediating Variable (Technology Acceptance)

From the above statistical analysis, it is seen that all the conditions for testing the mediation are satisfied. Technology adaptation was regressed on Personal Factors and Technology Acceptance. Organisational factors (β = 0.684, $p < 0.05$) and Technology acceptance (β = 0.664, $p < 0.05$) was found to be significant predictor of Technology Adaptation.

H3: Technology acceptance mediates the relationship social factors and Technology adaptation.

Simple Regression Analysis results for Social factors with Technology Adaptation

Variables	B	Beta value	Sig	R^2	Adjusted R^2	Durbin Watson
Social Factors	0.760	0.705	.000	0.496	0.494	1.696

Dependent Variable: Technology Adaptation

Simple Regression Analysis results for Social factors with Technology Acceptance

Variables	B	Beta value	Sig	R^2	Adjusted R^2	Durbin Watson
Social Factors	0.593	0.667	.000	0.445	0.442	1.743

Dependent Variable: Technology Acceptance

Multiple Regression Analysis results for Social Factors and Technology Acceptance with Technology Adaptation

Variables	Beta value (β)	Sig	R^2	Adjusted R^2	Collinearity Statistics		Durbin Watson
					Tolerance	VIF	
Social Factors	0.340	0.000	0.663	0.659	0.555	1.801	1.949
Technology Acceptance	0.547	0.000			0.555	1.801	

Dependent Variable: Technology Adaptation

Here, the adjusted R2 value of 0.659, point out that the model has accounted for 65.9

per cent of the variance in the Technology Adaptation. From the above result in is inferred that Technology acceptance mediate in the relationship between Social Factors and Technology Adaptation.

DV	IV $\rightarrow$ M	M $\rightarrow$ DV	IV $\rightarrow$ DV	IV $\rightarrow$ DV Mediators controlled
Technology Adaptation	**β = 0.667**	**β = 0.774**	**β = 0.705**	**β = 0.340**
			R^2 = 0.496	**R^2 = 0. 659**

DV – Dependent Variable (Technology Adaptation)

IV – Independent Variable (Social Factors)

M – Mediating Variable (Technology Acceptance)

From the above statistical analysis, it is seen that all the conditions for testing the mediation are satisfied. Technology adaptation was regressed on Social and Technology Acceptance. Social factors ($\beta = 0.705$, $p < 0.05$) and Technology acceptance ($\beta = 0.6647$ $p < 0.05$) was found to be significant predictor of Technology Adaptation.

H4: - Technology acceptance mediates the relationship demographical factors and Technology adaptation.

Simple Regression Analysis results for Demographic factors with Technology Adaptation

Variables	B	Beta value	Sig	R^2	Adjusted R^2	Durbin Watson
Demographic Factors	0.760	0.245	.000	0.496	0.494	1.696

Dependent Variable: Technology Adaptation

Simple Regression Analysis results for Demographic factors with Technology Acceptance

Variables	B	Beta value	Sig	R^2	Adjusted R^2	Durbin Watson
Demographic Factors	0.593	0.667	.000	0.445	0.442	1.743

Dependent Variable: Technology Acceptance

Multiple Regression Analysis results for Demographic Factors and Technology Acceptance with Technology Adaptation

Variables	Beta value (β)	Sig	R^2	Adjusted R^2	Collinearity Statistics		Durbin Watson
					Tolerance	VIF	
Demographic Factors	0.340	0.000	0.663	0.619	0.555	1.801	1.949
Technology Acceptance	0.547	0.000			0.555	1.801	

Dependent Variable: Technology Adaptation

Here, the adjusted R2 value of 0.619, point out that the model has accounted for 61.9 per cent of the variance in the Technology Adaptation. From the above result in is inferred that Technology acceptance mediate in the relationship between Social Factors and Technology Adaptation.

DV	IV → M	M → DV	IV → DV	IV → DV Mediators controlled
Technology Adaptation	**β = 0.544**	**β = 0.622**	**β = 0.684**	**β = 0.304**
			R^2 = 0.468	**R^2 = 0.647**

DV – Dependent Variable (Technology Adaptation)

IV – Independent Variable (Demographic Factors)

M – Mediating Variable (Technology Acceptance)

From the above statistical analysis, it is seen that all the conditions for testing the mediation are satisfied. Technology adaptation was regressed on Social and Technology Acceptance. Social factors ($\beta = 0.619$, $p < 0.05$) and Technology acceptance ($\beta = 0.622$ $p < 0.05$) was found to be significant predictor of Technology Adaptation.

Findings

- The multiple regression analysis reveals that Organisational Factors, Personal Factors, Social Factors and Demographic Factors are significant and organisational and social factors are highly influencing on Technology Adaptation compared to other two independent variables and Demographic factors has comparatively less influence on Technology Adaptation.
- Technology acceptance mediates in the relationship between organisational Factors and Technology Adaptation.

- Technology acceptance mediates in the relationship between Personal Factors and Technology Adaptation.
- Technology acceptance mediates in the relationship between Social Factors and Technology Adaptation.
- Technology acceptance mediates in the relationship between demographic Factors and Technology Adaptation.

Conclusion

In conclusion, this study highlights the significant role of organizational, personal, social, and demographic factors in influencing technology adaptation among college teachers. The multiple regression analysis indicates that organizational and social factors have the strongest influence on technology adaptation, while demographic factors have a relatively lesser impact. Furthermore, technology acceptance is found to mediate the relationship between all four factors—organizational, personal, social, and demographic—and technology adaptation. This suggests that fostering a positive attitude toward technology through enhanced acceptance is crucial for successful integration into teaching practices. Overall, the study underscores the importance of addressing these factors to support teachers in effectively adopting and utilizing technology, thereby enhancing the quality of education in the digital era.

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ROLE OF JOB EMBEDDEDNESS AMONG TEACHERS IN EDUCATIONAL SECTOR

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ABSTRACT

Job Embeddedness is a new concept which aims to reduce turnover intention and helps to measure the factors that makes employees intention to stay at work. The Job Embeddedness model developed by Mitchell and Lee (2001) has 6 main dimensions that is Fit to community, fit to organization, Link to Community, Link to Organization, Sacrifice to Community and Sacrifice to Organization. The objective of this paper is to study on Job Embeddedness among College teachers. A sample of 50 teachers were selected using Snowball Sampling method. The data was collected using 30 items Job Embeddedness scale questionnaire. The findings indicate that Job Embeddedness stands on a medium level among college teachers. The dimension Fit considered to be in the highest Rank and Link considered to be in the lowest rank position. There is a greater reliability for the items in the scale. The demographic factors such as age, gender, experience, designation, education qualification etc. and different types of college teachers across Govt, Aided and Selffinancing also shows a significant difference on Job Embeddedness items of Link and Sacrifice.

Key Words: Job Embeddedness, Link, Fit and Sacrifice.

1.1 INTRODUCTION

Retention of employees is very necessary for the survival of the organization. It is very important for the achievement of organizational goals. The organization which cannot retain employees can leads to failure of productivity. This new concept Job embeddedness focus on factors that can make employees to stay on their job. This job embeddedness factor helps to improve work life that can definitely reduce attrition and increases performance and productivity of the organization. Mitchell (2001) says that embeddedness suggests that there are several strands that tie an employee and his or her family in a social, psychological, and financial web that include work and non-work friends, groups, the community, and the physical environment in which he or she lives".

According to Mitchell, Holtom, Lee, Sablynski, & Erez, (2001). "Job embeddedness is defined as the on-the-job and off-the-job factors associated with individual links, fit, and sacrifice". This concept came in education sector from management and organization psychology.

The job embeddedness model by Mitchell and Lee (2001) has 6 original dimensions. Organization links and community links (individual connections with people in the organization and community), organization fit and community fit (individual perception of fit within an organization and community), organization sacrifice and community sacrifice (what the individual gives up when leaving the organization or community. This is a rich concept and it is very necessary to understand to its deepness. The turnover studies are in management and organizational psychology. Later it was studied by different researchers like, Hom and Griffeth (1991), on employee turnover. The number of literatures identified the factors for the turnover. But it is difficult to say that there is a single reason for employee turnover (Afsar & Badir, 2016; Akgunduz & Sanli, 2017; Charlier, et al., 2016; Clinton, NgKnight, & Guest, 2012). Researchers explain that many demographic factors are the reasons for turnover such as age, gender, work experience and marital status etc. Today, researchers are interested in exploring the potential forces that retain an employee on his job. This occurrence of this condition in the life of an employee is called job embeddedness.

1.2 LITERATURE REVIEW A. CONCEPTUAL DEFINITIONS

Job embeddedness (JE) is a construct developed to explain why people stay in their jobs (Mitchell, Holtom, Lee, Sablynski, & Erez, 2001). JE theory suggests that we are held in our jobs and the communities in which we live tries to connect with other people, groups, organizations, places, and things.

B. LITERATURE STUDIES

The applications of JE in relation to the manufacturing and service sectors using different factors. (J. Cheng and O-Yang, 2018). In the services sector, which includes academics, hospital industry, business centres, IT firms, home-based jobs, and banking sectors, JE has been found to be the key issues of job performance, commitment, and turnover intention (Chan et al., 2019). The JE has been discussed in manufacturing sector, including the chamber of commerce and industry, oil and gas companies, and the automotive industry (Wheeler et al., 2007)

Hasnizawati, H (2017). A study on Job Embeddedness and Organizational Climate of 114 disabled employees in the private sector by the Social Welfare Department. The results have shown that organizational climate has a significant positive relationship with the dimensions in job embeddedness namely fit, link and satisfaction which provide support to the hypothesis. The results are consistent with past studies whereby disabled employees are able to embed with their companies due to the support given by the employer by providing a better organizational climate.

Young-bohk Cho etal (2009). In his study on Organizational Citizenship Behaviours in Relation to Job Embeddedness, Organizational Identification, Job Performance, Voluntary Turnover Intention in Korea, for determining whether there is positive or the negative association between Organizational Citizenship Behaviours and Job Embeddedness, Organizational Identification, Job Performance, Voluntary Turnover Intention in Korea. Organization-related sacrifice significantly had negative effects on voluntary turnover intention and positive effects on job performance, organizational identification and that Organizational citizenship behaviour mediated the relationship between on-the-job embeddedness and job performance, voluntary turnover intention, organizational identification.

In a study conducted by Lev and Koslowsky (2014) on the relationship between the job embeddedness of teachers and their organizational citizenship and organizational commitment, the findings indicate a positive relationship between the job embeddedness of teachers and their sense of responsibility, job performance and contextual performance.

1.3 STATEMENT OF THE PROBLEM

Job Embeddedness consists of factors that attract employees to stay within an organization. Their intention to leave the organization will be less as they are surrounded by a network of people and activities around them. The relationship between the people and activities in a network that makes the existing employees to their current job is known as Job Embeddedness. Those who are highly embedded will have more connections to the organization and community. Job embeddedness is necessary as this factor makes employees to predict their work life.

If Quality of Work Life decreases among teachers it can lead to Attrition. Turnover of employees can result in low productivity and job performance.

To know more about it is necessary to investigate into the factors contributing job embeddedness towards the organization and community among college teachers and to find whether any differences exists.

1.4. OBJECTIVES OF THE STUDY

1. To measure the levels of Job Embeddedness among college teachers.
2. To explore the influence of different dimensions of job embeddedness among college teachers
3. To identify Job Embeddedness between different demographic factors such as age, gender, experience, education qualification and designation among college teachers
4. To compare Job embeddedness across different types of college teachers.

1.5. HYPOTHESIS FOR THE STUDY

Hypothesis 1: There is a significant difference in Job Embeddedness between demographic factors among college teachers

Hypothesis 2: There is a significant difference on the Job embeddedness across government, aided and self-financing college teachers.

1.6 RESEARCH METHODOLOGY

1.6.1. RESEARCH DESIGN

The study uses exploratory research method for identifying the factors contributing to job embeddedness among college teachers. The research type is descriptive in nature.

1.6.2 POPULATION AND SAMPLE OF THE STUDY

The total population for the study is 200 teachers which is taken from Perumbavoor, Ernakulam district, Kerala. The sample selected for the study is 50 teachers.

1.6.3 DATA COLLECTION TOOL

Primary data collected through Pretested Questionnaire were used and was distributed through google forms to college teachers. Research data were collected through 30

Items Job Embeddedness scale measuring Link, Fit and Sacrifice developed by Mitchell et al (2001). First 6 variables were the demographic profile of the teachers such as age, gender, experience, designation, educational qualification and type of college. Next were the dimensions used to measure the job embeddedness factors on college teachers which consist of 11 items measuring Fit,7 items measuring Link and 12 items measuring sacrifice.

1.6.4 SCALE OF MEASUREMENT

Total of 30 items of Job embeddedness used. 5-point Likert scale was used to record the responses of the respondents. The scale represented the rating from “strongly disagree” to “strongly agree”. JE questionnaire has good internal consistency. The fit factor consisted of 11 items (α=.775), Link consisted of 7 items (α=.66), and sacrifice contained 12 items (α=.793), the scale has good reliability, with a Cronbach alpha coefficient reported of .939

1.6.5 SAMPLING TECHNIQUE

Sampling technique used here is Random sampling method.

1.6.6 DATA ANALYSIS AND INTERPRETATION

Software packages like SPSS and several statistical tools were used for analysing the data. The Descriptive analysis was done to know the levels of Job embeddedness among college teachers. Exploratory factor analysis was done to analyse the dimensions and ANOVA and t test used to know the differences among different demographic characters such as age, gender, experience, educational qualification, designation and different types of college teachers

Cronbach’s alpha reliability coefficient normally ranges between 0 and 1. However, there is actually no lower limit to the coefficient. The closer Cronbach’s alpha coefficient is closer to 1.0, the greater the internal consistency of the items in the scale. Here alpha is greater than .9 so it is considered to be highly reliable.

OBJECTIVE 1

To Measure the levels of Job embeddedness among college teachers.

Descriptive statistics

Levels of Job Embeddedness

TABLE 1

2.27-3.18	Low
3.19-4.09	Medium
4.10-5.00	High

Factor	N	Mean	Level
Fit to community	50	3.92	Medium
Fit to Organization	50	3.94	Medium
Link to community	50	4.19	High
Link to Organization	50	3.82	Medium
Sacrifice to community	50	3.86	Medium
Sacrifice to Organization	50	3.28	Medium
Overall mean of the study	50	3.83	Medium

Interpretation

College faculties stands on medium level on Job Embeddedness scale with an overall mean of 3.83. It is found that that there is a high level for the dimension Link towards community.

OBJECTIVE 2

To explore the influence of different dimensions of Job Embeddedness among college teachers.

Exploratory Factor analysis was done to check the influence of dimensional factors of Job Embeddedness among College teachers.KMO for the factors Fit, Link and Sacrifice is .775,.666,.793 which is greater than 0.5. thus, it indicates that factor analysis is appropriate for the data. Bartlett's Test of Sphericity tests the null hypothesis; here the null hypothesis is rejected. Significant value of Bartletts Test is .001 which is less than 005.Barteltts test seems to be appropriate. The mean score of the factor Fit is 0.713 is considered to in the highest rank as compared with other dimensions link and sacrifice. Mean value of the factor link 0.53 is considered to be in the lower rank.

OBJECTIVE 3 AND 4

To identify Job Embeddedness between different demographic factors such as age, gender, experience, education qualification and designation among college teachers The demographic factors show differences in certain items of Link and Sacrifice. Overall, there is no significant differences found as all P values are greater than .05.

1.7 DISCUSSIONS

Job Embeddedness stands on medium level among college teachers with an overall mean of 3.83. Job Embeddedness scale constitutes a high reliability with Cronbach's Alpha. 939.The exploratory factory analysis done for the dimensions such as Link, Fit and Sacrifice considered to be appropriate. Fit contributes highest rank among college teachers and Link to the lowest rank position. Demographic factors shows significant difference in certain items of Link and Sacrifice but no such differences regarding the dimension Fit. Age shows differences in the item of sacrifice for the years between 37-47 and 48-58. T test was done to check the differences regarding gender. Male and female shows significant differences in the items of Link.Expereince and Designation also vary significantly with the dimensions Link and Sacrifice. Types of college teachers across Govt, Aided and Self-financing also vary significantly with the dimension Sacrifice.

1.8 SUGGESTIONS AND CONCLUSION

It is suggested to improve the levels of Job Embeddedness among college teachers. Inorder to increase connections towards organization and communities, provide them with a fair working Environment, have more interaction with their co-workers, involves them in a decision-making process. Consider female employees into the priority as most of the colleges are functioning with the female employees. Due to poor promotional facilities, retirement benefits and other incentives, employees sacrifice a lot when they leave an institution. This all are the reasons that shows a difference in Job Embeddedness towards the dimensions Link and Sacrifice. If these factors are improved, they will definitely show an intention to stay in their institution. Only then the work life and productivity can be improved. Otherwise it can lead to attrition among employees. From the previous studies shown a negative impact on demographic factors with Job Embeddedness on various areas. The present study proved that there are differences with regard to the age, gender, experience, designation, qualification, type of college teachers. High age groups, experiences, Professors with higher qualification are less embedded in their jobs.

Thus, study makes contribution to the organization literature to identify the factors that makes them to stay within an organization.

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FINANCIAL INCLUSION AND DIGITAL FINANCE: A PATHWAY TO ECONOMIC EMPOWERMENT

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Abstract

Financial inclusion has emerge as an important issue in accomplishing sustainable improvement, lowering poverty, and fostering economic growth. Digital finance, encompassing mobile banking, online payment platforms, and fintech innovations, has emerged as a transformative tool to bridge the space among the unbanked population and formal financial offerings. This paper examines the interaction between financial inclusion and virtual finance, emphasizing its potential benefits, challenges, and policy implications. Drawing on empirical information and research studies, it highlights how digital finance can power inclusive economic participation, mainly in growing economies, and outlines strategies for maximizing its effect.

Key words: Financial Inclusion, Digital Finance, Economic Empowerment

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1. Introduction

Financial inclusion refers to the availability and accessibility of affordable financial products and services for all individuals, particularly the underserved and marginalized. It is a cornerstone of inclusive economic development, enabling individuals to save, borrow, invest, and manage risks effectively. Despite progress, over 1.4 billion adults globally remain unbanked, with women, rural residents, and low-income groups disproportionately excluded.

Digital finance, driven by technological advancements, offers innovative solutions to address these gaps. By leveraging mobile phones, internet access, and financial technology (fintech), digital finance provides scalable, cost-effective, and convenient financial services. This paper explores the synergies between financial inclusion and digital finance, focusing on its socioeconomic impact and the challenges that must be addressed.

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2. The Role of Digital Finance in Advancing Financial Inclusion

2.1 Enhancing Accessibility

Digital finance significantly reduces physical and cost barriers to accessing financial services. Mobile banking platforms such as M-Pesa, G-Pay etc.. enable users to perform transactions without needing a traditional bank account. Similarly, e-wallets and fintech apps simplify payments, remittances, and savings for individuals in remote areas.

2.2 Fostering Economic Empowerment

Digital finance facilitates access to credit for small businesses and entrepreneurs, particularly through peer-to-peer lending and microfinance platforms. By enabling marginalized groups to participate in the formal economy, it supports income generation, job creation, and poverty reduction.

2.3 Promoting Financial Literacy

Digital platforms often integrate financial literacy tools to educate users about savings, investments, and responsible borrowing. Improved financial literacy enhances decision-making and fosters long-term financial stability.

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3. Case Studies and Impact Assessment

3.1 Mobile Money in Sub-Saharan Africa

The rapid adoption of mobile money services has transformed the financial landscape in Sub-Saharan Africa. Services like M-Pesa, MoMo, and Airtel Money have reached millions of previously unbanked individuals. Studies reveal a significant correlation between mobile money adoption and poverty alleviation, particularly among women-led households.

3.2 Fintech Innovations in Asia

China and India have demonstrated how fintech can drive financial inclusion on a massive scale. Platforms like Alipay, Paytm, and UPI facilitate seamless digital transactions, while government-backed initiatives such as Aadhaar-linked bank accounts ensure last-mile connectivity.

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4. Challenges in Implementing Digital Finance for Financial Inclusion

4.1 Digital Divide

Access to digital finance is contingent on technological infrastructure and digital literacy. Many rural and low-income populations lack internet access or smartphones, limiting their ability to benefit from digital financial services.

4.2 Regulatory and Security Concerns

Ensuring consumer protection, data privacy, and cyber security is a pressing challenge. Weak regulatory frameworks in some regions expose users to fraud, exploitation, and data breaches.

4.3 Gender Disparities

Women face additional barriers to accessing digital finance, including lower digital literacy rates, cultural constraints, and limited control over financial resources.

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5. Policy Recommendations

1. **Infrastructure Development**: Governments should prioritize investments in digital infrastructure, including internet connectivity and mobile networks, to expand the reach of digital finance.
2. **Inclusive Policies**: Tailored strategies are needed to address gender and income disparities, such as subsidized smartphones and targeted financial literacy programs.
3. **Strengthening Regulation**: Robust regulatory frameworks must balance innovation with consumer protection, ensuring data security and fair practices.
4. **Public-Private Partnerships**: Collaboration between governments, financial institutions, and fintech companies can accelerate innovation and scalability.

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6. Conclusion

Digital finance holds immense potential to drive financial inclusion, offering unprecedented opportunities for economic empowerment and poverty reduction. However, realizing its full potential requires addressing systemic challenges, fostering collaboration, and implementing inclusive policies. By leveraging technology responsibly, digital finance can create a more equitable and resilient global financial system.

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SUSTAINABLE HR PRACTICES IN THE HOSPITALITY SECTOR: ENHANCING EMPLOYEE WELL-BEING AND ORGANIZATIONAL PERFORMANCE

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Abstract

The hospitality industry is an essential component of the global economy, offering services that rely heavily on human capital. However, the sector faces significant challenges related to employee well-being, turnover, and job satisfaction, which can negatively impact organizational performance. This paper explores the concept of sustainable HR practices within the hospitality sector and how these practices can enhance both employee well-being and organizational performance. Drawing on relevant literature, we conceptualize how sustainable HR practices, such as employee engagement, work-life balance, professional development, and fair compensation, can contribute to long-term success for hospitality organizations. By aligning employee needs with organizational goals, sustainable HR practices can create a more resilient workforce, reduce turnover, and improve customer satisfaction, ultimately fostering a sustainable and competitive business model.

1. Introduction

The hospitality sector is one of the most labor-intensive industries, with employees often working under stressful conditions, irregular hours, and demanding customer expectations. While the service provided by employees directly impacts customer experience, the well-being of employees is critical for ensuring high performance, retention, and overall job satisfaction. Traditional HR practices in the hospitality sector have often focused on short-term goals, such as operational efficiency and cost reduction, without fully considering the long-term sustainability of the workforce.

Sustainable Human Resources (HR) practices are those that consider the long-term welfare of employees while contributing to the overall success of the organization. In the hospitality industry, where employee turnover rates are high and stress levels are significant, implementing sustainable HR practices is critical for reducing burnout, improving job satisfaction, and enhancing organizational performance. This conceptual paper explores how sustainable HR practices can be strategically employed in the hospitality sector to promote employee well-being and drive long-term business success.

2. Literature Review

2.1. Defining Sustainable HR Practices

Sustainable HR practices are those that aim to balance the needs of the organization with the needs of the employees over the long term, promoting both social responsibility and business success (Renwick et al., 2013). These practices encompass areas such as work-life balance, employee engagement, career development, compensation, and organizational culture. In a hospitality context, sustainable HR practices are those that not only focus on immediate operational goals but also foster a supportive work environment that benefits employees' personal and professional growth.

Sustainable HR practices contribute to a competitive advantage by creating an environment where employees are motivated, committed, and able to perform at their best over the long term. In particular, sustainable HR practices aim to reduce the negative impacts of stress and burnout, improve job satisfaction, and foster a culture of trust and fairness.

2.2. Work-Life Balance and Employee Well-Being

One of the primary sustainable HR practices that can have a significant impact on employee well-being is work-life balance. Hospitality workers often experience high levels of stress due to long working hours, irregular schedules, and the demands of providing exceptional customer service. This can lead to burnout, reduced job satisfaction, and high turnover.

Work-life balance initiatives, such as flexible scheduling, paid time off, and mental health support programs, can help employees manage stress and improve their overall well-being. By offering employees more control over their work schedules and supporting their personal lives, organizations can foster a healthier and more productive workforce (Greenhaus & Allen, 2011). In turn, this enhances organizational performance by improving employee retention, reducing absenteeism, and increasing engagement and motivation.

2.3. Employee Engagement and Motivation

Employee engagement is another critical factor in the success of sustainable HR practices in hospitality. Employee engagement refers to the level of emotional commitment an employee has toward their organization, and it directly influences job satisfaction, performance, and retention. Highly engaged employees are more likely to deliver superior customer service, which is essential in the hospitality industry (Harter et al., 2002).

To foster engagement, hospitality organizations can implement practices such as recognition programs, career development opportunities, and open communication channels. By showing employees that they are valued, organizations can create a sense of purpose and belonging, increasing motivation and job satisfaction. Engaged employees are more likely to stay with the organization, contributing to lower turnover rates and long-term success.

2.4. Fair Compensation and Career Development

Fair and competitive compensation is a cornerstone of sustainable HR practices. In hospitality, where workers often perform physically and emotionally demanding tasks, fair compensation ensures that employees feel valued and fairly treated. Sustainable compensation practices include providing competitive wages, benefits, and incentives that align with employees' needs and market standards.

Furthermore, career development programs that offer opportunities for learning, skill development, and upward mobility are crucial for both employee satisfaction and organizational performance. Employees who feel that they can grow within the organization are more likely to remain committed and perform well. Offering training and development opportunities not only supports individual career goals but also ensures that the organization has a skilled and adaptable workforce (Barrett & Mayson, 2007).

2.5. Organizational Culture and Leadership

A positive organizational culture is a foundational element of sustainable HR practices. Organizational culture refers to the shared values, beliefs, and behaviors that influence how employees interact with each other and with customers. A culture of trust, respect, and inclusivity can have a significant impact on employee morale and performance.

Sustainable leadership within hospitality organizations plays a key role in creating and maintaining this positive culture. Leaders who are empathetic, transparent, and supportive can inspire employees to perform at their best while feeling valued and respected (Bass, 1999). By adopting transformational leadership styles that prioritize employee well-being and ethical business practices, hospitality organizations can foster a sustainable work environment that benefits both employees and the organization as a whole.

3. Conceptual Framework

The following conceptual framework illustrates how sustainable HR practices can enhance employee well-being and organizational performance in the hospitality sector:

Sustainable HR Practices:

- Work-life balance (flexible hours, time-off policies)
- Employee engagement (recognition, feedback, communication)
- Fair compensation (competitive pay, benefits, incentives)
- Career development (training, professional growth)
- Positive organizational culture (trust, inclusivity, ethical leadership)
- Employee Well-Being:
- Job satisfaction
- Reduced stress and burnout
- Increased job engagement and motivation
- Improved mental and physical health
- Organizational Performance:
- Increased employee retention
- Enhanced customer satisfaction
- Improved productivity
- Reduced turnover and absenteeism
- Greater organizational sustainability

This framework highlights the interconnections between sustainable HR practices, employee well-being, and overall organizational performance, demonstrating how investments in human capital can lead to long-term success for hospitality organizations.

4. Discussion

4.1. The Impact of Sustainable HR Practices on Employee Retention

Sustainable HR practices are key to reducing turnover in the hospitality industry, where high turnover is a persistent issue. By offering employees work-life balance, career growth opportunities, and fair compensation, organizations can create a more stable and loyal workforce. Sustainable HR practices address the root causes of turnover, such as burnout, job dissatisfaction, and lack of development, leading to increased retention rates. In turn, this reduces the costs associated with hiring and training new employees, contributing to the long-term financial sustainability of the business.

4.2. Enhancing Organizational Performance through Employee Engagement

Employee engagement is crucial for organizational success in the hospitality sector. Engaged employees are more likely to provide high-quality customer service, leading to greater customer satisfaction and loyalty. By implementing sustainable HR practices that prioritize engagement, such as regular feedback, recognition, and opportunities for professional development, organizations can improve employee motivation and performance. This, in turn, leads to improved business outcomes, including higher profitability, enhanced brand reputation, and greater market competitiveness.

4.3. Creating a Resilient Workforce for Long-Term Success

The hospitality industry is susceptible to external factors, such as economic downturns, pandemics, and changing customer preferences. A resilient workforce, supported by sustainable HR practices, can help organizations navigate these challenges. By promoting employee well-being, offering training and development, and fostering a supportive organizational culture, hospitality organizations can create a workforce that is adaptable, motivated, and capable of thriving in uncertain environments. This resilience is essential for long-term organizational sustainability.

5. Conclusion

Sustainable HR practices are essential for addressing the unique challenges faced by the hospitality sector. By prioritizing employee well-being, engagement, and development, organizations can create a more productive, loyal, and resilient workforce. This not only leads to improved employee satisfaction and retention but also enhances organizational performance, contributing to the long-term success of the business. As the hospitality industry continues to evolve, adopting sustainable HR practices will be critical for fostering a sustainable, competitive, and responsible workforce.

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A STUDY ON THE ACCESSIBILITY AND APPLICATION OF E-LEARNING AMONG HIGHER SECONDARY AND COLLEGE STUDENTS

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Abstract

E-learning has revolutionized the education sector, offering flexibility, accessibility, and an interactive learning experience for students at various levels. This study explores the accessibility and application of e-learning among higher secondary and college students, focusing on factors such as availability of digital resources, technological literacy, internet connectivity, and student engagement. The research examines the effectiveness of e-learning platforms, challenges faced by students, and their impact on academic performance. The study also highlights disparities in access due to socioeconomic conditions and suggests strategies to enhance digital learning inclusivity. This study aims to explore the accessibility and application of e-learning among higher secondary and college students in the Uzhavoor Block Panchayath, with a specific focus on Emmanuel's Higher Secondary School (HSS) Kothanalloor, St. Ann's HSS Kurianad, and Deva Matha College Kuravilangadu. The research population consists of students from the seven higher secondary schools and two aided arts and science colleges within the block. The study investigates the level of access students have to e-learning resources, the effectiveness of e-learning platforms, and the challenges faced by students in utilizing these resources. The findings are expected to provide valuable insights into the current state of e-learning in this region, identify gaps in accessibility, and offer recommendations for enhancing the integration of digital learning tools in the educational process for both secondary and college students. This research will contribute to a deeper understanding of the role of e-learning in rural educational settings and its potential to improve academic outcomes.

Keywords: E-learning, Accessibility, Application, Technological literacy, Socioeconomic disparities

Introduction

E-learning is learning using electronic technologies to access educational curriculum outside of a traditional classroom. In most cases, it refers to a course, program or degree delivered completely online. There are many terms used to describe learning that is delivered online, via the internet, ranging from Distance Education, to computerized electronic learning, online learning, internet learning and many others. We define E-Learning as courses that are specifically delivered via the internet to somewhere other than the classroom where the professor is teaching. It is interactive in that you can also communicate with your teachers, professors or other students in your class. Sometimes it is delivered live, where you can “electronically” raise your hand and interact in real time and sometimes it is a lecture that has been prerecorded. There is always a teacher or professor interacting with you and grading your participation, your assignments and your tests.

Significance of the Study

Technological development and the internet have changed people’s lives on different scales, especially on teaching and learning. The web has become one of the channels of learning that opens the door for people around the world to access education for free, or for fewer costs. Booming of the internet have opened the door of unlimited knowledge, high quality education and training. This easy access using information systems and the web can improve people’s skills for fewer costs. Knowledge delivering to some people would have never been possible without the opportunities offered by technology and the web. As we know that internet now a days became a basic amenity for living the concept of e-learning emerges from an innovative concept that the wider network of internet can be used for accessing knowledge. The barriers of learning contributed to the growth of e-learning and it emerged as one of the most profitable online venture to entrepreneurs. So the study on E-Learning nowadays have greater significance.

Statement of the problem

The study was to analyze the application and accessibility of e-learning among students. This study also aims at the level of adoption and frequency of usage of e-learning platforms among students. As we know that the scope of e-learning is widening day to day but many of the students are less aware about the benefits derived from different e-learning platforms. Now a days most of the students have internet accessibility in their respective educational institutions or at homes. Recent trend shows that the internet consumption among students is increasing in a larger scale but the problem is that the students are not utilizing or extracting the benefits of internet in an academic or educational level. Therefore, this study was conducted to analyze that up to what level students are utilizing the scope of internet to get access to e-learning and also the quality of e-learning infrastructure in their respective educational institutions and was titled as “A study on the accessibility and application of e-learning among higher secondary and college students with reference to Uzhavoor Block Panchayath

Objectives

1. To highlight the significance of e-learning in enhancing knowledge.
2. To know how the benefits of e-learning can be optimally extracted and applied in our academics.
3. To make a comparative analysis between college and higher secondary students on the basis of the e-learning infrastructure provided by their respective institutions.
4. To make valid suggestions for improving the accessibility of e-learning portals.

Scope of the study

The research is conducted among higher secondary and college students who were studying in educational institutions in uzhavoor block panchayath within a time frame of three months (December 2018-february 2019) There is a wider scope in conducting a research on e-learning within this geographical area as there are almost 7 higher secondary schools and 2 arts and science colleges.

Data and methodology of the study

Nature of the problem under investigation requires that, the study should be a combination of descriptive and analytical methods of research. The research is conducted on students for checking their awareness about e-learning and the frequency of their application of e-learning to their regular academics.

a) Sources of data:

- **primary data** required for the study was collected from respondents by using questionnaire method.
- **secondary data** was collected from journals, books, magazines, websites and further discussions with them.

b) Population of study: The population for the study consist of educational institutions in uzhavoor block panchayath with concern to higher secondary schools and aided arts and science colleges. As there are 7 higher secondary schools and 2 aided arts and science colleges in the block. The study is especially concerned with students of Emmanuel's HSS kothanalloor ,St.anns hss kurianad and Deva matha college kuravilangadu.

c) Sample size: Sample size of the study is 60 students (30 higher secondary and 30 college students)

d) Sampling method: convenience sampling method was used for selecting samples from the population.

d) Tools for analysis : The data collected through questionnaire was analyzed with the help of statistical tool like percentages and weighted average method and presented with tables and graphs.

1.7 Limitations of the study

- The area of the study is limited to uzhavoor block panchayath, hence the result could not be generalised.
- Sample size is only 60, which is not very large.
- Lack of co-operation from the taken samples.
- Prejudistic attitude of the samples taken.

REVIEW OF LITREATURE

Misfit and Gembermarim(2020): Education is one among the many social services that enjoyed information technology as an enabler. The digital media and **e-learning** systems have played significant role as a **learning** content as well as **learning** platform with the aim to enhance access to education and quality of **learning.** In this paper, we investigate the practice of adopting digital media (combination of text, images, audio and video) into the school curricula (taking Ethiopia as a case study).

Vilulleh and pee(2021) Several studies have shown that apart from the mechanics of specific technologies involved in such educational solutions, successful implementation of **e-learning** is also based on behavioral and social factors. However, no substantial studies have been conducted to understand the importance of these factors in developing countries as it relates to the acceptance and use of **e-learning**

Toufaily and Elisser(2022)The purpose of this paper is to explore the value of **e-learning** from a student's perspective and develops a dynamic model for evaluating **e-learning** perceived value in an emerging market context. A qualitative research design, via semi-structured interviews, was adopted with a group of respondents composed of undergraduate and postgraduate students

Al-Fraihat and Dimah (2018) The article presents a model for evaluating the effectiveness of **learning** systems. Topics discussed include the improvements in the field of education as a result of advances in the information and communications technology (ICT); the Technology Acceptance Model (TAM) to evaluate **e-learning** systems; and the **e-learning** quality models.

Mnkandla and Ernest(2017) The adoption of social media in **e-learning** signals the end of distance education as we know it in higher education. However, it appears to have very little impact on the way in which open and distance **learning** (ODL) institutions are functioning. Earlier research suggests that a significant part of the explanation for the slow uptake of social media in **e-learning** lies

Meaning of e-learning:

A Learning system based on formalized teaching but with the help of electronic resources is known as e-learning. E-learning can also be termed as a network enabled transfer of skills and knowledge, and the delivery of education is made to a large number of recipients at the same or different times.

Definition

Brandon Hall defines E-learning as: "...instruction that is delivered electronically, in part or wholly via a Web browser, through the Internet or an intranet, or through multimedia platforms such as CD-ROM or DVD."

Elements of e-learning

1. Target audience: Your e-learning should be aimed at specific target audience. when you know your target audience ,you can develop an effective e-learning course that meets the expectations. To do that you need to understand the training needs of your audience, their background, demographics and learning preferences. This will help you develop a relevant and effective e-learning course.

2. learning objectives: amateurs think tossing content in an authoring tool is e-learning. But the intention of e-learning is facilitating learning. For that, your e-learning should have specific and measurable learning objectives.

3. Authentic content: you need to develop content for your e-learning course in co-ordination with Subject Matter Experts (SMEs). This way, you will generate relevant content that meets your learners' needs. Your e-learning content should challenge learners, arouse curiosity, and ignite a desire to learn. However, ensure the course content is easy to read. When I say content, don't think it is text alone. Images, text, videos, animations, and audio – all these elements comprise content. Your e-learning needs to balance all these elements to generate appealing, relevant content. You also need to use neutral (culture, politics, humor, and religion free) language in your e-learning content. This'll make your e-learning translation friendly.

4. Assessments: You can't call e-learning complete without evaluating learners' knowledge. And assessments are crucial to ensure this. You can use formative assessments and summative assessments in e-learning. Formative assessments are diagnostic in nature and used after the completion of each unit to test learners' understanding of the discussed learning points. This also helps you get learners' feedback. You can improve the learning experience with this.

5. Track learner progress: E-learning will be a futile exercise without tracking learners' progress. Tracking the activity of learners gives you valuable insights on their behavior. You can track this conveniently using a Learning Management System.

Benefits of e-learning

1.Time management: The most and least available significant entity offered to humans is time. In this world of physical virtual rush e-learning facilitates us to Learn whenever one feels like to. There is no bracketed time limit for anyone, whenever one feels could learn and whenever one feels could teach.

2.Authentic education: The essential factor in choosing a teacher is the authenticity of facts taught by the teacher. Before hire, any tutor, take their free lesson and check their expertise, skills, and understanding with a student.

3.Cost efficient: All you need is a digital interpreter like pc, laptop, smart phones or tablets and an internet connection and you are on. Just log in to queryfloor.com and you are surrounded by nearly all the available knowledge in the world which you could choose according to your budget. It would prove to be cheaper than what you pay at physical coaching institutes.

4. **Highly interactive:** It is proven that visual learning including colored stats, moving images & content forms are the most long-lasting memory ever. Which seem to be highly interactive in nature.

5. Easy to access: e-learning courses are available both in online and offline through variety of platforms. most of them offer free learning. It is now a days accessed mostly through mobile application which seem to be user friendly when compared to other means of e-learning platforms.

Features of e-learning

1.E-learning is learner-centric learning: The learner centric e-learning model makes an array of resources available to the learner, who is free to choose when, where and how to learn. An e-learning classroom is customized according to the needs and wants of the learner.

2.E-learning for lifelong learning: With increasing access to technologies and its ever increasing sophistication this approach to learning facilitates lifelong learning among various stake holders.

3.E-learning is flexible learning: E-learning has historically been linked with distance education and flexible learning. In distance education, various technologies can be used to link learners, instructors and resources that are removed in time or space. The hallmark of flexible learning, as its name suggests, is its adaptability to learners' needs and circumstances.

Types of e-learning

E-learning can be provided in many ways as given below

1.synchronous versus asynchronous

a. Synchronous: In Synchronous e-learning, communication occurs at the same time between individuals and information is accessed instantly. It is characterized by real time, simultaneous and two-way communication. This is commonly supported by media such as Video Conferencing, Virtual Classrooms and Chat sessions. The most familiar form of synchronous electronic communication is real time two-way text-based online chat, which is widely used in e-learning. More sophisticated forms of synchronous instruction include virtual classrooms, which use information and communication technologies to mimic a traditional classroom environment. This may involve video-conferencing or the use of shared electronic whiteboards, which allow learning materials to be created and modified in real time, either by the instructor or the learners. Learners and Teachers experience synchronous e-learning as more social and avoid frustration by asking and answering questions in real time. Synchronous sessions help e-learners feel like participants rather than isolates.

b. Asynchronous: As you are familiar with the use of e-mail which is also a two-way communication, here the flexibility is that the sender and receiver of the message need not be online at the same time. You can check your e-mail at your convenient time. Thus Asynchronous means you need not be online at the same time. This Asynchronous E-learning is commonly facilitated by media such as e-mail and discussion boards, supports work relations among learners and with teachers, even when participants cannot be online at the same time. It is thus a key component of flexible learning. Asynchronous instruction allows participants to control their own timetables and fit learning around their other commitments. This is a major bonus, especially for adult learners. Asynchronous e-learning makes it possible for learners to log on to an e-learning environment at any time and download documents or send messages to teachers or peers. Students may spend more time refining their contributions, which are generally considered more thoughtful compared to synchronous communication.

2. Individual versus group:

a. Individual: Individualized e-learning refers to situations where an individual learner is accessing learning resources such as a database or course content offline or online via an Intranet or the Internet. A typical example of this is a learner studying alone or conducting some research on the Internet, local network or using a CD or DVD.

b. **Group: In** group-based e-learning refers to situations where groups of learners are working together in real time or with time delay via an Intranet or the Internet. It may include text-based conferencing, online discussion forum, electronic mailing, and one or two-way audio and videoconferencing. Examples of this include learners engaged in a real-time chat or an audio-video conference.

3.Self-paced versus instructor lead:

A. Self-paced: In self-paced approach the e-learning courseware is usually made available through an online learning platform or on CD-ROM. Learners are free to choose the learning activities and learn at their own pace based on individual needs and interests. E-learning content is developed according to a set of learning objectives and is delivered using different media elements, such as text, graphics, audio and video. It must provide as much learning support as possible (through explanations, examples, interactivity, feedback, glossaries, etc.), in order to make learners self-sufficient.

b. Instructor lead: In instructor lead, the course is scheduled and led by an instructor and/ or facilitator through an online learning platform. E-learning content for individual study can be integrated with instructor's lectures, individual assignments and collaborative activities among learners. Learners, facilitators and instructors can use communication tools such as e-mails, discussion forums, chats, polls, whiteboards, and application sharing and audio and video conferencing to communicate and work together. At the end, a final step typically includes an exercise or assessment to measure learning.

E-learning communication tools

E-mail: E-mail stands for electronic mail; e-mail is defined as the transmission of messages over communication networks. There are many e-mail service providers and the most famous ones are Yahoo mail and G mail. Exchanging-mail messages with a mentor or peer is an e-learning experience.

Instant messaging(in): Instant messaging is the exchange of text messages through a software application in real-time. Instant messaging allows learners to chat with one another through text messages. This has become very popular as here, everything is performed in a faster, more reliable and cohesive manner. Instant messaging helps teachers to create subject specific groups for exchange of information and sharing of resources. Instant messaging applications like WhatsApp are extensively used by teaching community as reliable communication tool.

Chat: Chat is synchronous communication tool facilitating online communication. This tool helps teachers and learners to schedule a discussion on a particular question or theme and later save the chat discussion for later use. The chat tool is an integrated tool in all the LMS and there are many standalone chat applications which can be used outside the LMS.

Blogging: A blog is your own website that you are going to update on an on-going basis. A blog is a frequently updated online personal journal or diary. It is a place to express yourself to the world and to share your thoughts and your passions. In blogs entries are commonly displayed in reverse-chronological order. Most blogs are interactive, allowing visitors to leave comments and even message each other via widgets on the blogs and it is this interactivity that distinguishes them from other static websites. Many blogs provide commentary or news on a particular subject; others function as more personal online diaries. A typical blog combines text, images, and links to other blogs, Web pages, and other media related to its topic. The ability of readers to leave comments in an interactive format is an important part of many blogs. Most blogs are primarily textual, although some focus on art (art blog), photographs (photo blog), videos (video blogging), music (MP3 blog), and audio (podcasting).

E-learning collaborative tools for communication

Wiki: A wiki is a collaborative web site that collects and organizes content, created and revised by its users. The most well-known example is Wikipedia. Wikis are a way to grow a knowledge base around a particular content area, be it best practices in a particular field or how to use a specific piece of software. There is many software which help to create online wiki and one of the most famous one among that is WordPress. Wiki is also a feature available in all the Learner Management System. In an e-learning context wiki permits teachers to give many kind of task to the learners to collaborate and create content on any topic. Wiki platforms are used extensively to create and share open educational resources and in Karnataka the KOER initiative is developed on a wiki platform

Social networking site is the phrase used to describe any Web site that enables users to create public profiles within that Web site and form relationships with other users of the same Web site who access their profile. Social networking sites can be used to describe community-based Web sites, online discussions forums, chartrooms and other social spaces online. Examples include Facebook, twitter, LinkedIn

Web conferencing: Web conferencing is highly interactive, Internet-based applications with a rich collaboration feature set (e.g. audio/video from presenters and learners, application sharing, white boarding and markup tools, breakout rooms, polling, quizzing, hand raising and emoticon responses, slides and media, Web site tours, public/private text Chat). It is capable of scaling from small groups to hundreds or thousands of simultaneous users. In "synchronous e-learning," we refer to Web conferencing. Web conferencing technologies offer tremendous potential for robust interactivity and collaboration through their versatility and rich feature options. There are many online tools for organizing video/web conferencing to facilitate collaborative learning. Applications like Big Blue Button.

Disadvantages/limitations of e-learning

1. Difficulty staying motivated: For many people, not having a classroom and set classroom times can make it difficult to remember to check in, or even to want to check in. It's important for you to have all the motivation necessary within yourself to look at the website, complete the assignments and get them in on time, even though everything is still required to be completed on a timely basis, just like with a more traditional classroom atmosphere.

2. Difficulty staying in contact with instructors: If you ever have trouble with assignments, or questions about a lecture while in a traditional class it's generally quite simple to talk to your instructor before or after class or schedule meetings online at a different time. When your distance learning, however, you're going to have more difficulty getting in touch with your instructor.

3. Difficulty interacting with peers: Because there's no classroom and therefore no ability to work on group projects or even converse with fellow students in a face-to-face environment, it's difficult to build relationships of any kind. Not only that, but it's very easy to start to feel isolated from your peers and others because you're working on assignments and all school related activities entirely alone.

4. Difficulty staying connected at all times: For those who don't have a reliable source of electricity or don't have reliable internet, it can be difficult to always get to a friend's house, a café, a library or somewhere else where internet access is readily available.

ANALYSIS AND INTREPRETATION

Classification on the basis of their opinion regarding the significance of e-learning in enhancing knowledge.

Statement	Number of respondents					T
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
Unlimited repository of knowledge	27	26	7	0	0	60
Gives need based information	20	39	1	0	0	60
Knowledge across time constraints	27	23	10	0	0	60
Highly reliable information	12	19	21	7	1	60
TOTAL	86(35.8%)	107(44.58)	39(16.25)	7(2.9%)	1(0.77)	240

Classification of respondents on the basis of their preference of e-learning websites

Applications	No.of respondents	percentage
Wikipedia	40	66.66%
Nptel	12	20%
edex	4	6.66%
coursera	2	3.33%
Others	2	3.33%
total	60	100%

Classification on the basis of the level of optimum utilisation of benefits of e-learning in your academics:

1. Strongly disagree 2. Disagree 3. Netrual 4. Agree 5. Strongly agree

Statements.	No.of respondents					T
	1	2	3	4	5	
Access to Descriptive teaching	4	7	16	26	7	60
Download study materials	5	9	21	14	11	60
Adoption of innovative study methods	8	4	20	11	17	60
Access to online courses	7	12	18	14	16	60
TOTAL	24(10%)	32(13%)	75(31.25%)	65(27.08%)	51(21%)	240

(Source: primary data)

Classification on the basis of the opinion on the argument of ways to extract the benefits of e-learning.

Statements	No.of respondents	Percentage
Making e-learning as a part of syllabus	34	56.66%
Making students aware about the benefits of e-learning	11	18.33%
Converting traditional classrooms to smart classrooms	15	25%
total	60	100%

(Source: primary data)

Comparative study on the e-learning infrastructures of schools and college within the samples selected

Response of higher secondary students

	Statements	1 (5)	2 (4)	3 (3)	4 (2)	5 (1)	Total weight	Weighte Avg.
a	Quality of your e-learning class room	10	19	1	0	0	94	3.13
b	Accessibility to internet and computer	4	16	9	1	0	113	3.76
c	Teachers motivation to use e-learning	5	12	10	0	1	104	3.46
d	e-learning awareness programmes	10	9	8	3	0	116	3.86

(Source: primary data)

Table no: 4.12

Response of college students

	Statements	1 (5)	2 (4)	3 (3)	4 (2)	5 (1)	Total weight	Weight. Avg.
a	Quality of your e-learning class room	9	16	4	1	0	123	4.1
b	Accessibility to internet and computer	10	12	6	2	0	120	4
c	Teachers motivation to use e-learning	12	5	11	1	1	116	3.86
d	e-learning awareness programmes	1	20	8	0	1	110	3.66

(Source: primary data)

Comparison between hss and college

statements	higher secondary	college	Statement favorable for:
Quality of your e-learning class room	3.13	4.1	College
Accessibility to internet and computer	3.76	4	College
Teachers motivation to use e-learning	3.46	3.86	College
E-learning awareness programmes	3.86	3.66	Higher secondary
Total	**14.21**	**15.62**	**College**

(Source: primary data)

Methods to improve the accessibility of e-learning.

statements	No.of respondents	percentage
Conducting e-learning awareness classses within school level	35	**58.33%**
Building good e-learning infrastructure in classrooms.	11	**18.33%**
Making e-learning as apart of academics and syllabus	14	**23.33%**
total	60	**100%**

(Source: primary data)

FINDINGS

- Respondents of the study consist of 60 students who use e-learning.
- Among the total respondents 30 are higher secondary students and 30 are college students.
- It was found that **38%** of the respondents are 17 years old, **21.6%** are 18 years old,**20%** are 20 years old**, 10%** are 16 years old, **6.66%** are 19 years and 3.33% are 21 years old.

- It was found that **43.33%** of the respondents are in plus 1(higher secondary),**26.6%** are in plus 2(higher secondary),**10%** are pursuing 1st year(college) ,**13.33%** are pursuing 2nd year(college), **26.67%** are perusing 3rd year(college).
- It was found that **86.67%**of the respondents are males **13.33%** are females

1) Significance of e-learning in enhancing knowledge

  - Among the respondents **44.58% agree** with the argument that e-learning have significance in enhancing knowledge.
  - Among the respondents **35.8% agree** with the argument that e-learning have significance in enhancing knowledge.

2) Extraction of benefits of e-learning

According to the opinion of the respondents the best way to extract the benefits of e-learning is by **Making e-learning as a part of the syllabus (56.66%)**

a) Level of optimum utilization of benefits

- Majority **(30.36%)** of the respondents have a **neutral** opinion about their level of optimum utilization of benefits of e-learning.
- **(26.31%)** of the respondents **agrees** that they are optimally using the benefits of e-learning.
- **(20.64%)** of the respondents **strongly agrees** that they are optimally using the benefits of e-learning.

b) Adoption towards e-learning

- **mobile applications** are the most frequently used e-learning platform.**75%** of the respondents most frequently uses mobile apps for accessing e-learning.
- The most preferred **mobile application** is **bijou's app (43.33%)** among the respondents.
- The most preferred **website** is **Wikipedia (66.66%)** among the respondents.
- The most preferred **social media** is **YouTube (35%)** among the respondents.

3) Comparative study between higher secondary and college on the basis of e-learning infrastructure facilities.

a. Quality of e-learning class room:

The data shows that **college (weightage 4.1)** students have better quality in their smart class rooms when compared with higher secondary students.

b. Access to computer and internet:

The data shows that **college (weightage 4)** students have better quality in their smart class rooms when compared with higher secondary students.

c. **Motivation of teachers to use e-learning:**

The data shows that **college (weightage 3.86) students** have better quality in their smart class rooms when compared with higher secondary students.

d. **Awareness programmer**

The data shows that **higher secondary (weightage 3.86)** students have better quality in their smart class rooms when compared with higher secondary students.

4) Improve the accessibility of e-learning

According to the opinion of the respondents the accessibility of e-learning can be improved by conducting e-learning awareness classes within school level **(58.33%)**

SUGGESTIONS

- **Making e-learning is part of the syllabus:**

  Most of the educational institutions nowadays provide a smart class room for their students. But it has been experienced by the students at the discretion of the teacher. studies had proved that smart class rooms help in getting more attention to the subject by the students. For that e-learning wanted to be strictly part of the syllabus of the college and higher secondary students i.e. a basic awareness about e-learning its advantages features significance and scope wanted to be included in the academic curriculum and also fix specified hours to students to experience smart class rooms.

- **Improve awareness towards different e-learning platforms:**

  From the study it is clear that the respondents opt their e-learning platform on the basis of its popularity apart from its utility and other features. In the study the most preferred mobile application is bijou's app which nowadays highly popular among youth due to advertisements through social medias and other platforms. There are also option for selecting another application which have more advanced features but people responded to the media which have the maximum popularity.

- **Conducting e-learning awareness classes within school level:**

  According to the opinion of the respondents e-learning awareness programmers are conducted within the elementary or primary level. A wide awareness about the importance scope and advantages of e-learning help in efficiently utilizing the benefits of e-learning and increasing the accessibility of e-learning. There by students can efficiently integrate their study materials with e-learning resources.

CONCLUSION

The study was conducted to understand the application and accessibility of e-learning among students. Today in this technology driven atmosphere electronic gadgets plays a vital role in connecting people. E-learning in that respect can be considered as one of the significant contribution of technology i.e. it connects teachers with potential students in which knowledge is transmitted via internet computers and other electronic devices. The study points out that e-learning is an unlimited repository of knowledge which can be accessed anytime without time constraints. Bijou’s app, Wikipedia and YouTube are the most common platforms that respondents prefer which gives a hint that popularity plays a significant role in their preference. Majority of the respondents have a neutral opinion about their level of optimum utilization of benefits of e-learning.
According to the opinion of the respondents the best way to extract the benefits of e-learning is by making e-learning as a part of the syllabus. The study also made a comparative analysis between the e-learning infrastructure of their educational institution. The study shows that the quality of e-learning class rooms, motivation of teachers to use e-learning and awareness programmers are better in college that higher secondary schools. Access to internet and computer are high in higher secondary schools. so to conclude e-learning plays a very significant role in the new era the scope and accessibility wanted to be widened then it can be transformed into a most vital element in human resource development.

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SUSTAINABLE BRANDING AND YOUTH CONSUMERISM: EXPLORING AWARENESS, BEHAVIOUR, AND TRUST

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Abstract

Although sustainability issues are increasingly discussed, the gap between youth knowledge and their behaviours for sustainable consumption remains large. This study utilizes a mixed-methods approach, that is a combination of quantitative and qualitative analysis. We conducted a survey of 100 respondents aged 18-30 years to assess awareness, attitudes and purchasing behaviour. This study on sustainable consumerism covers the impact of green marketing elements (eco-labels, influencer advocacy), the role of social media, and effectiveness of experiential marketing initiatives. These findings are intended to give insights to marketers, policymakers and educators who are trying to promote sustainable consumer behaviour among youth.

Key words: sustainable branding youth awareness of sustainable branding consumer behaviour youth consumerism green marketing strategies social media activism experiential marketing.

1.Introduction

With societies increasingly facing critical environmental and social issues, sustainable living practices have gained considerable attention. Youth are particularly important in this regard across a wide variety of demographic groups because they are adaptable and more willing to accept change. Although young people are increasingly aware of sustainability issues, there is a significant gap between what they know and what they do. This paper seeks to identify the prominent factors that contribute to this gap in awareness and undertaken practices, particularly examining the impact of green marketing strategies, social media activism, and experiential marketing on consumer behaviour among the youth demographic. The study explores what young consumers think of sustainable brands, how much they trust sustainability claims, and the factors that drive them to buy or not buy sustainable brands. This study provides important insights into how businesses, governments, and educators can promote the transition from awareness to action to enable more sustainable consumption practices by exploring these dynamics.

2.Review of Literature

In recent years, sustainable living practices have become increasingly salient worldwide as societies face critical environmental and social issues. Adaptability and openness make youth one of the key actors' group in achieving sustainable futures. Overview: This literature review explores existing research that identifies youth perspectives towards sustainable living, examining important influencing factors such as environmental awareness, the influence of social media, educational interventions, and general trends in youth behaviour.

Waste Minimization: This theme, refers to behaviours such as minimizing consumption to reduce waste, responsible consumption, energy and water conservation, and ethical lifestyle choices (Collins et al., 2020). Such practices seek to reduce adverse environmental effects, and in some cases enhance social and economic sustainability (Geels et al., 2018). Engaging the youth in practising these things is necessary for long-term sustainability goals.

Attitudes of Young People and Environmental Awareness

Research shows that those who are provided with formal environmental education report greater levels of concerns and active behaviours regarding sustainability across multiple avenues (Kollmuss & Agyeman, 2019). However, in spite of increased awareness, there is a disconnect between knowledge and engagement of sustainable actions (Gifford, 2021).

Influences of Social Media on Perspectives

Youth perspectives on sustainable living, for example, are greatly influenced by social media. Use of Digital Platforms:Digital platforms work like hubs for the dissemination of information, peer influence, and activism (Smith et al., 2022). Research indicates that eco-influencers, as well as digital campaigns, can create positive attitude formation and impact on sustainable consumer behaviour, particularly among youth (Xiao & Xiao, 2021).

Educational Interventions and Their Effects

Sustainability education in schools has been shown to encourage positive perceptions from young people. Educational institutions adopting sustainability curricula teach students to act in an environmentally responsible way (Sterling, 2020). And youth engagement is also further enhanced by experiential learning approaches like eco-clubs and sustainability projects (Barth et al., 2019).

Behavioural trends and barriers

Awareness of the issues has been raised, but youth attitudes do not always lead to sustainable action. Sustainable behaviour can be hindered by barriers such as convenience, cost, and social norms (Verplanken & Roy, 2019). Research has shown that a guided feature boost user motivation to adopt a sustainable lifestyle (Thøgersen, 2021) through incentives, behavioural nudges and community effect.

Youth at the forefront of sustainable consumerism

More young consumers aware of sustainability issues are favouring brands that align their values (Collins et al., 2020). They look for sustainable products, responsible sourcing, and honesty from their businesses. Consumers are looking for sustainable brands, which means companies have an opportunity to make sustainability part of their core brand value.

The Importance of Social Media for Green Marketing

The role of social media in influencing youth attitudes and purchase decisions (Smith et al, 2022). and embrace their preference for authentic content. Some campaigns, such as promoting minimalism, upcycling, or conscious consumption, work well within the younger demographic (Xiao & Xiao, 2021).

Green Marketing as a Value Preposition

Brands that embed sustainability in their core messaging have greater youthful customer loyalty (Thøgersen, 2021). Positive brand image is built around green certifications, eco-friendly packaging, and responsible sourcing. But authenticity matters — youths are quick to sense and abandon "greenwashing" (Verplanken & Roy, 2019).

Challenges Against Sustainable Consumption

Despite knowledge, pricing and availability often stand in the way of sustainable consumer action (Gifford, 2021). A lot of sustainable products are seen as costly or less accessible. To drive sustainability decisions, marketing incentives should focus on cost savings, lasting positive impacts, and seamless adoption.

Nudges for sustainable Buying Decisions

According to theory about behavioral economics, for example, small nudges such as eco-labeling, time-limited discounts on sustainable alternatives and reward programs linked to sustainability can trigger greener choices among youth (Thøgersen, 2021).

Experiential Marketing: Understanding the Role

Brands can reach young consumers through immersion-based experiences in connection to sustainable workshops, eco-focused pop-up stores, and interactive social media challenges (Sterling, 2020). This builds emotional connections and will keep customers with a brand for much longer.

Research Gap

The Gap Between Knowing and Doing

In fact, research shows that even though young people are more conscious of sustainability than ever, their buying habits do not always reflect their values (Gifford, 2021).

There are very few studies focused on what exactly hinders youth from making sustainable consumption decisions and how marketers can and should address these barriers with sustainable marketing strategies.

Effect of green marketing on consumer loyalty

Although sustainability-oriented brands are associated with stronger customer attachment (Thogersen, 2021), to our knowledge, very little is known about how various green branding strategies foster lasting consumer trust and engagement in youth.

More research can examine what components of green marketing (eco-labels, sustainability narratives, influencer advocacy, etc.) most effectively shape purchasing behaviour.

Impact of Social Media Activism on Consumer Behaviour

The role of social media in building awareness and perceptions of sustainability among youth cannot be underestimated (Smith et al., 2022), yet research has not yet explored the transition of engagement into real purchasing behaviour.

It will be interesting to determine in future studies whether such digital eco-campaigns promote long-lasting behavioural change or whether they lead only to short term enthusiasm.

Consumerism without the Environment: Sustainable Consumerism Across Different Socioeconomic Groups

Research on sustainable attitudes among the young typically are framed through a lens of more developed economies. The influence of socio-economic factors on sustainable consumer behaviour in youth in developing countries remains under-explored.

Research may look into whether affordability and accessibility are the key constraints, or whether cultural attitudes to consumption loom larger.

Experiential Marketing: An Instrument of Sustainable Consumption

Although experiential marketing (i.e. sustainability workshops, brand-led ecological initiatives) is becoming a tool to engage young consumers (Sterling, 2020), little research has been conducted on its long-term relevance.

Future studies could clarify whether experiential marketing facilitates habitual behaviour towards sustainable consumerism or if its influence diminishes as time passes.

Approaches to Combat the Myth of greenwashing

While Youth consumers are very sceptical towards “greenwashing” (Verplanken & Roy, 2019), much less is known about how brands can restore trust in their products when accused of greenwashing. Studies are needed to focus insights into how brands can balance transparency and credibility in sustainability communications.

3. Research Objectives

- To explore the difference between youths understanding of sustainable lifestyles against their purchasing behaviour.
- To study how green marketing strategies (eco-labelling, sustainability storytelling, influencer advocacy) affect youth purchase decisions.
- To evaluate the impact of social media activism on youth engagement in sustainable consumer behaviour over the long term.
- To investigate the effect of socioeconomic factors towards youth involvement in sustainable consumerism, especially in developing economies.

- To exemplify how experiential marketing (e.g., brand-led eco-initiatives, workshops) can structure sustainable consumption habits.

4. Research Hypotheses

H1: Awareness vs. Action Gap

H1a: There is a gap between youth awareness of sustainability and their purchasing behaviour.

H1b: Cost perception and convenience perception significantly mediate sustainability awareness and actual consumer behaviour.

H2: Impact of Green Marketing Strategies

H2a: Eco-labeling has a positive effect on youth willingness to purchase sustainable products.

H2b: Brands that communicates its sustainability significantly increase Youth engagement and loyalty

H2c: The effect of influencer advocacy for sustainable brands on youth purchasing decisions is greater than the effect of traditional advertisements.

H3: Sustainable Consumer Behaviour and Social Media

H3a. There is a significant impact of Social media activism on youth perception towards sustainable consumerism.

H4: Socio-Cultural Factors and Sustainable Consumerism

H4a: Youth from higher income groups are more willing to adopt sustainable consumption practices than youth from lower income groups.

H4b: Cultural attitudes toward consumption play a significant moderating role in the relationship between socioeconomic status and environmentally conscious purchasing behavior.

H5: Experimental Marketing effectiveness

H5a: Experience-based marketing strategies (e.g., eco-workshops, pop-up sustainability events) are significantly positively associated with long-term engagement of youth in sustainable consumption.

H5b: Experiential marketing is more effective than advertising strategies in affecting purchase decisions sustainably among the youth.

5.Methodology

Using a mixed-methods approach, the study collects both quantitative and qualitative data.

Quantitative Approach: A structured questionnaire was distributed among 100 youth respondents aged between 18-30 years to measure their awareness of sustainable brands, their trust towards sustainability claims and real purchase patterns.

Qualitative Method: A review of existing literature, including published articles, blogs, and websites focused on sustainable products, provided further in-depth insights. This secondary data analysis was intended to determine market trends and consumer perceptions to provide insight into the sustainable product marketplace.

6. Data Analysis & Interpretation

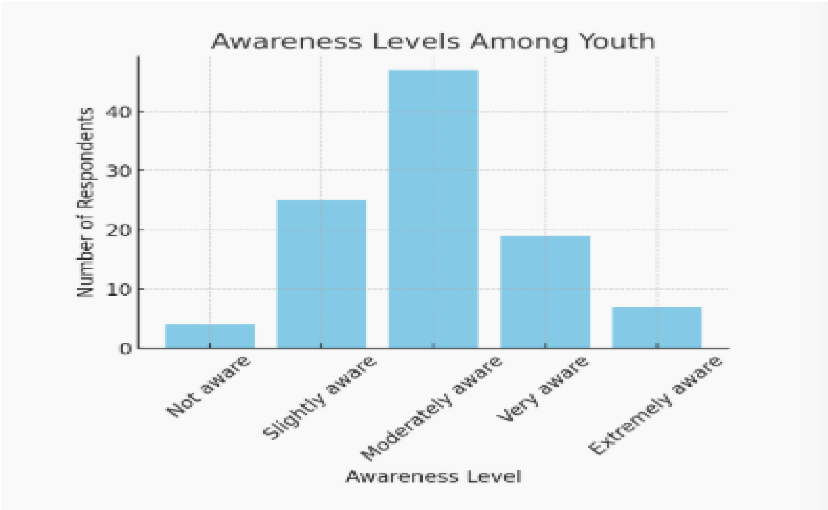
Descriptive Analysis

A number of 100 students between 18-21 years of age completed the questionnaire, which was well representative of the young consumers. Half (50%) of the respondents were male, while 52% were female. With 74% of participants being undergraduates, this suggests the impact of being a student on exposure to knowledge about sustainability. However, this spending behaviour could also impact their purchasing capacity for sustainable products as well as 76% of the respondents spent less than ₹5,000 on consumer goods.

Sustainable Branding Awareness and trust

73% reported high or moderate awareness of sustainable brands. But when it came to trusting sustainable brands, 67% of consumers opted for neutral, and only 26% selected agree to claims made around sustainability. This suggests they are aware of sustainability, they don't trust the sustainability story created by brands, because they might feel like greenwashing. Moderate to high awareness does not always mean high trust, supporting the gap between awareness and action validating the H1a.

Figure 1 showing Awareness levels among youth



Chi-square Test: Awareness vs. Purchase Behaviour

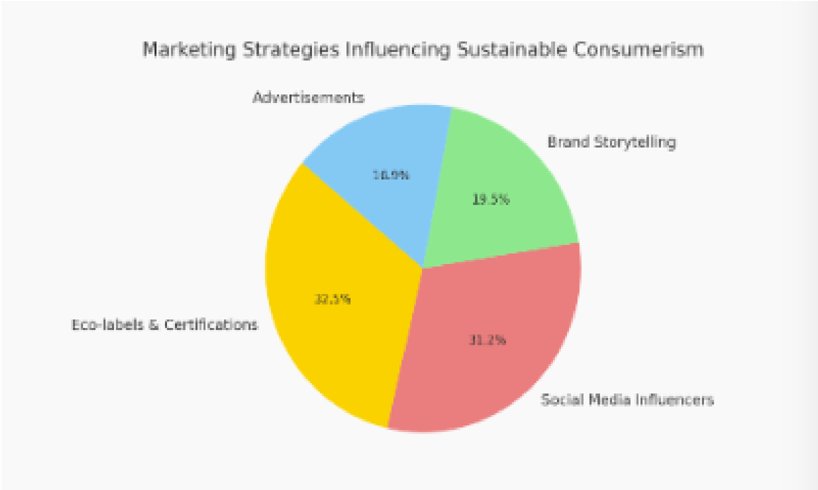
A Chi-square test was performed to explore the relationship between the level of awareness and their purchasing decisions to find out if awareness translates into action. They were asked whether they bought a product based on sustainability claims for which 66% answered yes while 36% answered no. The results showed a statistically significant association ($\chi^2 = 10.52$, df = 4, p = 0.033) which led to the conclusion that respondents with a higher awareness level were more likely to purchase sustainable products. However, 36% of respondents reported never purchasing a sustainable product, implying other factors like price, availability, and scepticism could be barriers to sustainable consumption which supported H1 which proposed that there exists a gap between awareness and actions, more precisely H1a which demonstrated perceived cost and convenience significant mediation.

ANOVA: Influence of Marketing Strategies

Most Effective Marketing Strategies to Influence Youth Perceptions of Sustainability Analyzed with an ANOVA Test There was a significant difference in the effectiveness of different methods of marketing (F-value = 4.67, p = 0.002). The post-hoc analysis, conducted using Tukey's HSD test, demonstrated that eco-labels (M = 4.1, SD = 0.9) and social media influencers (M = 3.9, SD = 1.0) were significantly more influential compared to advertisements (M = 2.7, SD = 1.2). It indicates therefore that young consumers are looking for physical evidence of sustainability like certifications, and rely on social media influencers more than traditional advertising that supports H2 of the five stated hypotheses which represent that there is powerful impact of Green

Marketing Strategies in consumer behaviour and corresponding H2a that Eco-labeling impact positively on youth recommended purchase of sustainable products, H2b that Sustainability storytelling by brands significantly increase youth engagement and brand loyalty and H2c that Influencer recommendations for sustainable brands have a greater effect on youth buying behaviour than traditional advertising.

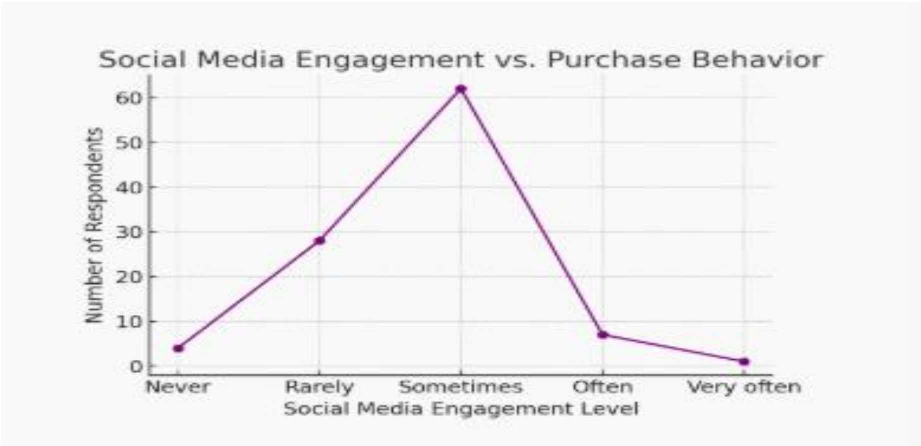
Figure 2 showing Marketing Strategies Influencing Sustainable consumerism



Regression Analyses: Social Media & Sustainable Purchases

A regression analysis was carried out to assess the impact of social media engagement on sustainable purchasing behaviour with the Dependent Variable being the probability of purchasing sustainable products and the Independent Variable being the frequency of engaging with sustainability-related content. Social media engagement significantly predicted sustainable purchasing behaviour in linear regression ($F(1, 100) = 23.87$, $p < 0.001$, $R2 = 0.62$) indicating that 62% of the variance in sustainable purchasing behaviour could be explained by social media. As evidenced in the results a strong positive correlation between ($r = 0.822$, $n = 50$, $p < 0.01$) frequent engagement on social media with sustainability-related content and the probability of purchasing sustainable products confirms Hypothesis 3a which states that social media positively influences sustainable consumer behaviour. These insights underscore the influence of social media on consumer behaviour, and that brands can use social media as a tool to promote sustainable products. This indicates how digital platforms may be able to influence consumer behaviour and that brands can truly benefit by promoting sustainable products on social media.

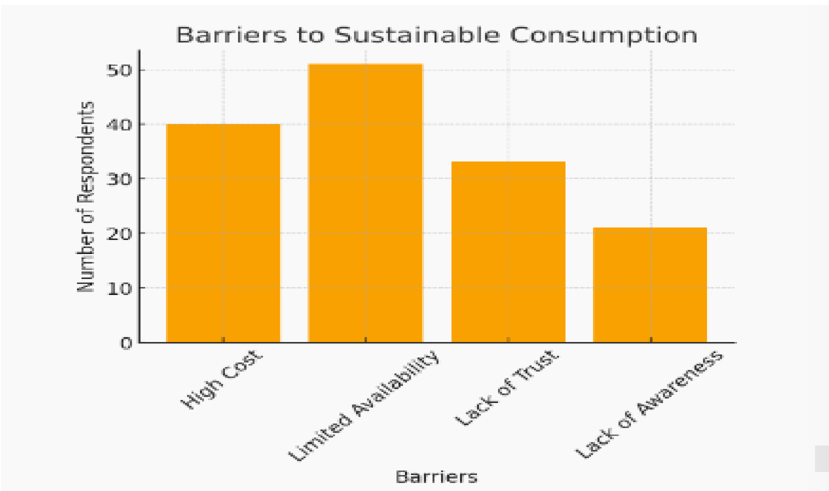
Figure 3 showing Influence of social media engagement over purchase behaviour



Chi-square Test: Hindrances to Sustainable Consumption

The first chi-square test was conducted to assess the main barriers preventing youth to practice sustainable consumption. The resulting Chi-square (χ^2 = 12.74, df = 3, p = 0.005) indicated that we can reject the null hypothesis, providing evidence of statistically significant association between perceived barriers and purchase behaviour. The top five barriers included, limited availability (51%), high cost (40%) and lack of trust (33%). This leads to three key insights which could resolve the above dilemma through the H4 & the corresponding sub hypotheses which demonstrate that even though a consumer of sustainable products is aware of sustainable development and consciousness, issues of price and availability are major impediments to sustainable consumption.

Figure 4 Showing Barriers to Sustainable Consumerism

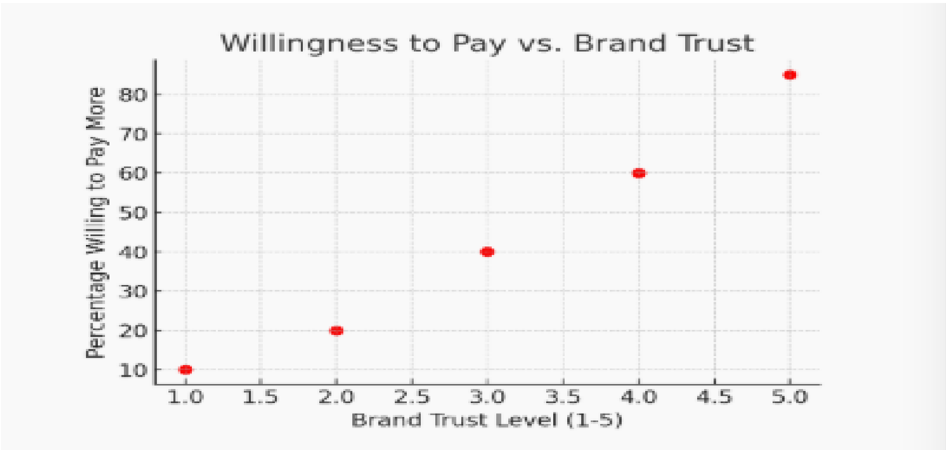


Correlation: Price Sensitivity Vs. Brand Trust

They were asked if they would be willing to pay a premium for products that were sustainable and 82% answered yes. When asked if the respondents preferred, brands with sustainability certifications 85% responded yes. Following this correlation analysis was made to see if this trust influences the willingness of consumers to pay more for sustainable brands. Pearson correlation was $r = 0.71$ ($p < 0.001$). This highlights the role of transparency in the brand for building consumer trust and a prospective investment in sustainable products, thus substantiating the H5 which suggests the impact of Experiential Marketing in purchase behaviour and more specifically H5a which states that Experiential marketing strategies (e.g., eco-workshops, pop-up sustainability events) significantly increase youth's long-term commitment to sustainable consumption.

H5a: Experiential marketing strategies (eco-workshops, pop-up sustainability events) significantly increase youth's long-term commitment to sustainable consumption; and H5b: The impact of experiential marketing is stronger than traditional advertising on youth's sustainable purchase decisions.

Figure 5 showing the Willingness to pay influenced by brand trust



Looking to the Future: Intentions for Sustainable Consumption

The regression analysis was conducted in order to forecast future purchasing behavior in relation to sustainable products. The regression equation was statistically significant, $F(1,100) = 18.92$, $p < 0.001$, $R^2 = 0.58$. This implies that 58% of the variance in the participants' future sustainable purchasing intentions can be attributed to their engagement in sustainability practices at that time. It indicates that youth consumers who practice sustainability will be even more likely to purchase sustainable brands now and five years from now In fact, 87% of those surveyed state that they will prioritise sustainable brands over the next 5 years – this growing tendency demonstrates the future shift in consumer behaviour that supports H5b that experiential marketing has a long-term effect on sustainable consumerism among youth.

Findings and Suggestions

This study corroborates that although youth know about sustainability or have sustainability on their radar, trust continues to be a make-or-break factor in their purchasing decisions. Social media interaction is a high predictor of sustainable consumption, while marketing techniques sequence of eco-labels and influencer endorsement turns out to be most effective. High cost and limited availability such as barriers remain major challenges to sustainable adoption. Branding transparency is instrumental in cultivating trust that helps in the willingness to pay more for sustainable products. Brands must focus on the following aspects to enhance sustainable consumerism among youth

1. Make trustworthy and transparent through third-party certifications
2. Create influencer marketing by connecting with influencers.
3. Leverage experiential marketing (e.g., eco-workshops) to increase long-term loyalty.
4. Overcome price objection: bring in low-cost sustainable lines
5. Make it easy to find sustainable products in stores.

Conclusion

Social media and transparency have a strong influence on youth consumerism, making them a part of sustainable branding. Cost, availability and scepticism about greenwashing are, however, barriers. To build trust and drive adoption, brands should shift towards transparent communication, experiential marketing, and digital engagement strategies. This study examines the nexus between sustainable branding and youth consumerism, uncovering several determinants and inhibitors of sustainable purchasing behaviour. The results also show that youth are familiar with sustainability, but there is a significant gap between awareness and purchasing behaviour. Conversion Trust in sustainability claims is moderate, but here trust is often blocked by concerns of greenwashing, a lack of availability of products and perceptions of expense.

Eco-labeling and social media influencer endorsements as marketing strategies, unsurprisingly, are most effective for creating positive perceptions among consumers. Conversely, a study by Lee et al. (2020) found that engagement on social media enhances sustainable consumer behaviour, with social engagement with communities leading to a greater probability of sustainable purchasing as engagement increases. The statistical analyses confirm that transparency and credibility in branding play a major role in augmenting consumer trust, with the result of the latter influencing their willingness to pay a premium price for sustainable products.

But these findings come with caveats. A significant portion of youth consumers are still unwilling to embrace a more sustainable consumption due to budgetary limitations and lack of access to sustainable products. Brands need to adapt, however, by better integrating experiential marketing means, like sustainability workshops and digital campaigns into eco-friendly offerings to trigger deeper engagement and commitment to sustainability.

Although this research offered rich data, future research can be conducted further in specific paths. A longitudinal study could determine the change in attitudes and behaviours of youth in the pursuit of sustainable branding over an extended period. Also, a comparative examination of different social economic strata being practised in diverse cultures could further illuminate the gap in sustainable consumerism adoption. Future research may also address the impact of government policies and corporate sustainability efforts in encouraging long-term behaviour change of young consumers. Overall, with the right focus, future research can expand the domain of sustainable branding and inform consumers better to adopt sustainable habits.

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BRAND BLINDNESS: INVESTIGATING CONSUMER LOYALTY BEYOND PRICE CONSIDERATIONS

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Abstract

A key area of interest in the field of consumer behaviour is brand loyalty, especially amongst the youth. The research focuses on different aspects while deeming price changes, promotional tactics, and the reputation of the brand as important to the purchase decision of young consumers. The report highlights brand reputation over other factors like price or product features regardless of the career choices or income entailed. Price elasticity has a tremendous influence on loyalty; many indicate that they would be willing to switch brand identities. However, it is noteworthy that most would remain loyal to a brand if a price-rise would be associated with a promise of improving quality. Furthermore, the youth tend to use brands quite unabashedly as a means of showing who they are, especially in the fashion sense. The findings portray the psychological parameters of individual expression, which would have an impact on brand loyalty. Young people have intense loyalty to the brands that resonate with their identity and social standing despite creature constraints. Finally, the findings contend that young people's self-perception and emotional tie are truly associated with brand name reputation, which greatly affects purchase decisions, irrespective of economic class.

Keywords: Brand Loyalty, Price Sensitivity, Emotional Attachment, Consumer Behaviour, Brand Reputation, Promotional strategies

Introduction

Brand loyalty is on the rise due to several factors in the current market environment. Traditional loyalty is based on the quality, reliability, and customer relationships of the brand (Aaker, 1996). However, some consumers act irrationally and are more inclined towards the emotional and psychological aspects of the brand (Keller, 2003). Such consumers are likely to continue purchasing from a particular brand even when prices increase, when better options are available, or when others offer better deals (Oliver, 1999). Understanding the causes of this trend is crucial for helping companies improve customer retention and maintain their market position (Kotler & Keller, 2016).

The aim of this study is to identify the psychological and emotional factors that lead to blind brand loyalty. Factors such as brand trust, identity association, nostalgia, and perceived exclusivity are known to influence consumer behaviour and contribute to a commitment that is blind to rational variables (Fournier, 1998). Furthermore, the study will examine the effects of blind brand loyalty on price sensitivity, whether loyal consumers are less sensitive to price changes or if a specific price point can override their loyalty (Chaudhuri & Holbrook, 2001).

Additionally, the study will explore the impact of promotional strategies, discounts, and competitor pricing on consumer behaviour. Consumers can be divided into two groups: the first group remains unaffected by various marketing strategies, while the second group may switch to another brand due to better deals, loyalty rewards, or price discrimination (Erdem & Swait, 2004). By investigating these influences, this research aims to provide insights into consumers' decision-making processes, brand retention, and the strength of brand loyalty in price-sensitive markets.

Statement of Problem

This study is conducted on the consumer behaviour of the youth generation. The study is based on the blind brand loyalty exhibit by the young generation where their emotional and psychological attachments override rational decision-making despite price increases, better alternatives, or attractive competitor deals. This study aims to investigate the key elements of blind brand loyalty, analyse its impact on price sensitivity, and evaluate the influence of marketing strategies in consumer retention and consumer switching behaviour.

Objectives of the Study

1. To explore the psychological and emotional factors that influence consumers' blind brand loyalty
2. To investigate how blind brand loyalty impacts consumer sensitivity to price changes.
3. To investigate the influence of promotional strategies, discounts, and competitor pricing on customer retention and behaviour.

Research Methodology

Succeeding with descriptive research design to examine brand loyalty and price sensitivity among the youth of the current generation. This study aims to look at the pressures of psychological factors influencing brand loyalty, price affecting changes in purchase decisions, and how promotion strategies shape consumer behaviour and decision-making. The target population comprises youth consumers with active engagement with brands while participants from the target population are selected based on accessibility and willingness to respond, using convenience sampling under non-probability sampling.

The primary data was collected in structured questionnaires, designed to capture brand loyalty, price sensitivity, and responses to promotional strategies, while the secondary data obtained from market reports, academic studies, and industry-insight literature so that these references will help in supporting and relating these activities. The data collected here are analysed through descriptive statistics that include presentation in percentage format, frequency tables, and graphical illustrations of different charts to show some sort of relationship or trend between brand loyalty and price sensitivity of behaviour of youth consumers.

Results and Discussions

This study aims to understand the key factors influencing brand loyalty among young consumers, with 67.7% of participants aged 16 to 30. Since more than half of the respondents earn less than $25,000 and 59.7% are male students, the research will explore how price and promotional changes impact their brand preferences and loyalty.

Previous studies have highlighted the emotional and psychological aspects of brand loyalty. Interestingly, 59% of participants prioritize brand reputation over product features or price, showing how trust and emotional connections play a major role in their purchasing decisions. Additionally, 60.7% of respondents are open to exploring alternatives at the same price point if their preferred brand is unavailable, demonstrating a deep sense of loyalty rooted in perceived brand value.

Fashion and self-expression also play a big role in purchasing habits. 40.3% of respondents regularly buy clothing and fashion items from their favourite brands. This suggests that, for younger consumers, brand loyalty goes beyond just the product itself; it’s also about identity and personal style.

A significant number of consumers value emotional connection and trust in a brand more than just price, with 64.5% believing that brand loyalty is worth the extra cost. However, price still plays a crucial role in their decisions. 32.3% of shoppers would reconsider their brand choice if prices increased by 5–10%, while 21% would switch to a different brand if prices jumped by 20% or more.

Loyalty also depends on the perceived value of a price increase. While 55.7% of customers would leave if a competitor offered a better deal, 70.5% would remain loyal if the price hike came with a promise of higher quality. At the same time, most consumers remain open to exploring new options. 88.7% said they'd be willing to try another brand if it offered a similar price, reinforcing how much competitive pricing influences buying decisions.

General brand loyalty started with 65% of consumers willing to pay more for brand loyalty, yet they wait for sales. This means that loyalty is not absolute but is somewhat conditioned by costs and perceived value.

Consumers are accounting sustainability as the major lever on their choice: Examples will show a decreasing level of commitment-based design of need, furthering the move toward ethical consumption. That is, a brand advocating sustainability can build up loyalty even with price-sensitive customers.

So, striking balance has been a formidable challenge in real-world practice. While sustainability, quality assurance, and emotional connection promise long-term loyalty toward brands in discouraging price-sensitive consumers, the other will attract the short-term, discount-oriented buyers.

Promotional strategies having a prominent influence on the decision should believe that 50% of surveyed consumers would buy the product only if it had been marked on discount or promotion, and at least 80% of the sample respondents would wait for seasonal discount offers to start their purchases. Thus, the level of purchase decision would get shaped through price sensitivity.

That is, though loyalty may exist, it is conditional on the price discount.

Conclusion

This study concludes that, irrespective of career goals or income, brand reputation and promotional strategies stands as a basis for brand loyalty among younger generations, for which the decisions have predominantly been influenced by emotional attachments and attractive promotion plans. Young customers give precedence to brand reputation over attributes about functionality and price comparisons to cement their brand loyalty as long as price increases are supported by improvements in quality. Since self-expression and deriding conformity are notably emphasized in fashion branding, their brand choices had also been highly influenced by this aspect. Besides, promotional strategies could rouse their feelings and increase loyalty, such as special discounts for time-limited offers or a reward program. In the end, this study highlights that, for young people, brand reputation bears more importance than financial limitations, with emotional ties building long-term loyalty.

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THE RISE OF SOCIAL COMMERCE AND INFLUENCER-LED BUSINESS

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Abstract

The rise of social commerce & influencer-led businesses has made a huge impact in the online shopping. Social media is no longer just a place to connect. It has become a shopping platform where influencers shape what people should buy. This paper study explores how social media impacts consumer decisions and what's causing the rapid growth of social commerce.

To analyze these trends, a survey was conducted among our college, gathering insights on shopping habits, favorite platforms, trust in influencers, spending on influencer promoted products and opinions on social commerce versus traditional e-commerce. The results showed that most of them rarely shop online and uses Instagram and other platforms for shopping. The percentage of people who purchase products which are promote by an influencer is almost balanced and people also thinks that social commerce can replace e-commerce. The study recommends that, to maximize social commerce potential, businesses should focus on **trust-building, influencer authenticity and an integrated hybrid approach** while keeping an eye on emerging trends like live shopping and AR experiences. This research offers important findings that can be used to make changes and increase the growth in this area.

Keywords: Social commerce, Influencer-led business, e-commerce, online shopping, Instagram, social media

Introduction

The growth of social commerce and influencer-led businesses has changed the online shopping, making it hard to tell where e-commerce ends and the social media begins. As platforms like Instagram, TikTok, and Facebook keep growing, companies are using influencer marketing to create shopping experiences that feel personal and trustworthy (Campbell & Farrell, 2020). This is different from regular e-commerce, where people search for what they want. In social commerce, the content made by users plays a part in shaping what people decide to buy (Hajli, 2015). Influencers have a big impact on this change. They build trust and keep it real through their content, allowing brands to get closer to consumers. Studies show that para-social interactions—where people feel like they know influencers—boost credibility and affect buying habits (Sokolova & Kefi, 2020). Also, social commerce features like interactive ads and community reviews add value, pushing people to buy more (Zhang & Benyoucef, 2016). As social commerce grows, we wonder if it might overtake regular online shopping. Will influencer marketing lead the way in online sales? Can this model last? This paper looks at what's driving social commerce, how influencers shape what people buy, and where this digital shake-up might go next.

Problem Statement

The purpose of this study is to investigate how influencer-led products affects customer behaviour and the emergence of social commerce. Although social media platforms have grown in popularity, there is still disagreement among consumers over the reliability of influencer marketing. While some consumers are doubtful about the genuineness and quality of products, others rely on the suggestions of influencers. This study investigates how trust affects purchasing decisions and whether social commerce may take the place of traditional e-commerce.

Objective of the Study

- To study the influence of social media on consumer purchasing decisions.
- To analyze the key factors driving the rapid rise of social commerce across different platforms.

Research Methodology

The study is descriptive in nature and focus on the findings that can be used to make changes and increase the growth in this area. The population of the study comprises our college and to gather insights a survey was conducted to ensure unbiased representation.

The primary data for this research was collected directly from the individuals of Naipunnya college through structured questionnaires, enabling the collection of first-hand information regarding their experiences, interest, and perspectives. Secondary data was sourced from various credible outlets, including articles, to provide additional context and support for the analysis.

The study employs percentage calculations, tables, and charts to analyse and interpret the collected data effectively. This methodology facilitates a clear understanding of the current state of the growth of social commerce.

Results and Discussion

Male comprised 42.3%, whereas female constituted 57.7%. With regard to age, it can be clearly shown that most participants fell into the 18-24 category with 69.3% above the age of 30 (19.2%), between the ages of 25 and 30 at 11.5%. From an influencer marketing perspective, this would translate to younger consumers spending more on online shopping.

Though online shopping has increased, only 34.6% of respondents stated that they shop online every month; 61.6% reported they occasionally did so. That is, despite the growth of social commerce, many consumers do not frequently engage in online shopping when it comes to social media platforms used for shopping, Instagram (42.3%) emerged as a key channel, though a majority (53.8%) mentioned using other platforms. This suggests that while Instagram plays a major role in influencer-driven commerce, there are other emerging spaces where consumers explore and purchase products like Amazon, Flipkart etc…

Interestingly, 53.8 percent of respondents have never bought a product that was advertised by an influencer, establishing that there still seems to be a degree of uncertainty about influencer marketing. On the other hand, 46.2 percent have bought a product, thus signifying a significant market for sales under the influence of these personalities.

Purchasers of any kind of products endorsed by influencers preferred gadgets (38.5%) over fashion (30.8%) and home decor items (11.5%). This indicates that consumers are more inclined to purchase tech and apparel following influencer recommendations as opposed to home goods.

The most determining factor in choosing what to buy is that nearly 40% of respondents claimed reviews are the most significant factors. Quality followed with 32%, and discounts accounted for 20%. Trust in influencers was the least at 8%. This means although influence endorsements can quickly stir up interest, consumers deem people's reviews as well as the quality of a product more highly than relying on their influencers to make the recommendation.

Most respondents (52%) said they spend less than Rs.500 on any items promoted by influencers, while 40% spent between Rs.500 and Rs.1000. It would mean that even though influencer marketing has this effectiveness, the consumers are rather being careful and making small purchases instead of buying the more expensive item.

In terms of trust, exactly 53.8% of the respondents expressed doubts in influencers while 46.2% do trust them. This reflects dubiousness concerning purchase behavior and shows that influencer marketing still draws mixed feelings. An interesting 61.5% of respondents believe that social commerce could replace traditional e-commerce, while 38.5% oppose this idea. This implies that while the optimism toward social commerce seems to be healthy, quite a significant number of consumers still prefer traditional e-commerce platforms.

Conclusion

This study lies on the boundary of relatively novel domains: influencer marketing, consumer trust, and the rise of social commerce. While Instagram and social media are among the most significant shopping destinations, many consumers are not assured about their purchases propelled by influencers. The results show that trust is an extent, which reviews and product quality are more indispensable than the credibility of the influencer. In addition, spending habits state that most consumers appear to have a wait-and-see attitude, choosing to buy fewer products championed by influencers compared to heavy investments in such products.

Despite this skepticism, confidence continues to rise that social commerce is to eventually supplant conventional e-commerce; the doubts that consumers reveal, however, that social commerce is to foster and sustain credibility through synergy of transparency, between authentic consumer reviews and assuredly available quality supplies. Overall, whereas influencer marketing is an effective tool, it also should correspond with consumer expectations for long-term capabilities within the digital marketplace.

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WORK-LIFE BALANCE AND ITS INFLUENCE ON FINANCIAL STABILITY- A STUDY AMONG LEGAL PROFESSIONALS

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ABSTRACT

This study explores the relationship between work-life balance and financial stability among legal professionals in the Thrissur District. It focuses on how work-life balance affects financial decision-making, stress, and overall professional efficiency. The research targets attorneys, paralegals, and legal consultants working in law firms, corporate settings, or independent practice. Primary data was collected using surveys and interviews, with a sample size of 25 participants selected through snowball sampling. Quantitative data was analyzed using Microsoft Excel, while thematic analysis was used for qualitative insights.

Findings reveal that mid-career professionals, especially those in high-pressure fields like Criminal, Corporate, and Family Law, struggle the most with maintaining work-life balance. This imbalance leads to longer working hours, emotional stress, and financial instability. Many professionals report poor spending habits and health-related expenses due to stress. However, those working in firms that offer flexible work policies and wellness initiatives experience greater job satisfaction and improved financial decision-making.

The study concludes that better work-life balance contributes significantly to financial stability and professional effectiveness. Legal organizations are encouraged to adopt supportive policies to reduce stress and promote sustainable work habits. These measures are essential for improving both the personal and financial well-being of legal professionals.

Keywords:

Work-life balance, financial stability, legal professionals, stress, flexible work policies, wellness initiatives, professional effectiveness

Introduction:

Finding a healthy balance between work and personal life has grown more difficult for professionals in today's fast-paced environment. The growing demands of the job combined with personal obligations frequently result in stress and burnout, which impacts individuals' health and financial security (Greenhaus & Allen, 2011). The purpose of this study is to investigate how work-life balance affects financial stability both directly and indirectly. Its specific goal is to uncover how work and personal life imbalances contribute to financial instability, poor investment decisions, or decreased financial well-being as a result of deteriorating mental and physical health (Tenney et al., 2016). The study will examine whether those with better work-life balance experience more consistent financial growth and stability than those facing greater work-related stress (Haar et al., 2014).

Statement of the Problem:

Maintaining a work-life balance is needed for overall health in any profession but particularly in stressful professions like law. The study titled, "Work-Life Balance and Its Influence on Financial Stability: A Study Among Legal Professionals" seeks to explore the relationship between a balance on professional duties and personal life on the financial wellbeing of a person.

A key element of both career and private well-being is work-life balance, especially in high-pressure occupations like the legal sector. The purpose of this study, "Work-Life Balance and Its Influence on Financial Stability: A Study Among Legal Professionals," is to explore the relationship between financial stability and establishing a balance between personal and professional obligations.

This research analyzes legal practitioners' responses on aspects such as role conflict, workplace demands, financial well-being, and organizational support. It aims to find out the correlations between balance of work and life with the financial aspects in order to understand the reason how legal professionals attain financial and career stability without having to sacrifice their professional development. These findings will help to gain a comprehensive insight into the work-life balance challenges in the legal field and plan for their sustainable financial and career development.

Objectives of the study

-To evaluate the elements influencing working professionals' work-life balance.
-To investigate how work-life balance affects long-term financial stability and financial decision-making.
-To examine the relationship between financial well-being and stress at work.
-To shed light on the ways that a better work-life balance might benefit one's financial stability and professional effectiveness.

Significance of the Study:

This study holds significance in the current era where both work and personal life are increasingly interconnected. It will offer insightful information to politicians, employers, and professionals alike. Individuals can make more educated decisions about their careers, finances, and stress management by having a clear grasp of how work-life balance affects financial security. The research highlights the significance of companies cultivating a work-life balance-promoting workplace culture, as this may result in increased productivity among workers, less absenteeism, and decreased employee turnover. Furthermore, the research can provide firms with guidance for implementing work-life policies that promote employees' financial well-being. Finally, the results may help legislators craft rules that uphold equal employment opportunities and safeguard employee rights, both of which contribute to long-term financial stability.

RESEARCH METHODOLOGY

POPULATION

The study population consists of professionals in the legal field, including both attorneys, paralegals, and legal consultants, who are working in law firms, corporate legal departments, and independent practice in Thrissur District

TYPE OF DATA

For a study on work-life balance and its influence on financial stability in the legal sector, primary data is optimal over secondary data. it provides first-hand insights directly from professionals. Surveys and interviews with lawyers and legal staff offer quantitative data, such as working hours and income patterns, alongside qualitative insights into their experiences. Online surveys via platforms like Google Forms are efficient, while interviews add depth.

Sample Size

A sample size of 25.

Sampling Method

The snowball sampling is used for the study. Starting with a few known legal professionals and expanding through referrals to gather diverse perspectives from the legal sector.

Tools for Data Collection

1.Questionnaires/Surveys

2.Interviews

Tools for Data Analysis

1. Quantitative Data Analysis:

Statistical Methods: Descriptive statistics will be used to analyse quantitative data like working hours, income level, survey scores, etc.

Data will be analysed in Microsoft Excel, particularly accounting calculations and visual representations such as bar graphs and pie charts, for the needs of statistics.

Software Tools: Excel, which is used for the minor statistical analysis and the visualizations like charts and graphs, is Google Spreadsheet.

2. Qualitative Data Analysis:

Thematic Analysis: identifying corresponding subject areas or patterns across various open-ended interviews and survey responses. The qualitative data gathered from interviews stay on the basic line that is thematic analysis.

Literature Review

Recent studies have shown that professionals across various sectors are increasingly grappling with work-life balance challenges, often due to the dual pressures of personal obligations and professional responsibilities. These challenges have been linked to declines in mental well-being, job performance, and overall productivity, all of which can contribute to financial instability

(Women's Studies International Forum, 2006). The journal featured in *Women's Studies International Forum* (2006) emphasizes the role of societal expectations, particularly those placed on women, in shaping experiences of work-life conflict and their subsequent effects on well-being and financial outcomes. This review explores the existing body of literature on work-life balance, with a focus on its impact in high-pressure fields such as finance and law, thereby contributing to a broader understanding of the intersection between occupational demands, gender roles, and economic security

Work-life balance (WLB) has emerged as a critical area of study in organizational research, particularly within professional services sectors like law. McGraw and Heidtman (2005) examined legal firms in New South Wales, finding that top management support and equal treatment of employees using WLB options significantly influenced uptake, whereas the number of options available and personal life support showed no positive correlation. This aligns with findings from Kossek, Pichler, Bodner, and Hammer (2011), who emphasized that organizational culture and managerial attitudes are more predictive of WLB success than formal policies alone. Similarly, Allen (2001) noted that supportive supervisors enhance the effectiveness of WLB initiatives, leading to better job satisfaction and reduced turnover intentions. On the other hand, merely offering flexible work arrangements without embedded cultural support often results in underutilization (de Menezes & Kelliher, 2011). Together, these studies suggest that leadership commitment and equitable practices are essential to the effectiveness of WLB programs, especially in high-demand fields like law.

Riaz, Shehzad, and Boubaker (n.d.) found that financial liberalization has a significant and positive impact on financial stability, using sovereign credit ratings as an indicator across a global panel dataset. Their findings support earlier work by McKinnon (1973), Shaw (1973), and Levine (2001), who emphasized that liberalization enhances financial efficiency, capital allocation, and economic growth. Additional studies by Lee, Sapriza, and Wu (2016), as well as Bekaert, Harvey, and Lundblad (2006), further indicate that financial liberalization reduces systemic financial risk and macroeconomic volatility.

Operational Definition

1. Work-Life Balance

Work-life balance refers to the equilibrium between the time and energy devoted to work and that allocated to personal life, including family, leisure, and personal interests. Achieving this balance is essential for maintaining overall well-being and preventing burnout. The OECD emphasizes that an important aspect of work-life balance is the amount of time a person spends at work, noting that long work hours may impair personal health, jeopardize safety, and increase stress.

2. Financial Stability

Financial stability denotes a condition where the financial system operates effectively, facilitating economic activities, managing risks, and absorbing shocks. The International Monetary Fund (IMF) defines it as the ability of the financial system to facilitate and enhance economic processes, manage risks, and absorb shocks.

Similarly, the Federal Reserve Board describes financial stability as building a financial system that can function in good times and bad, and can absorb all the good and bad things that happen in the economy at any moment.

3. Influence

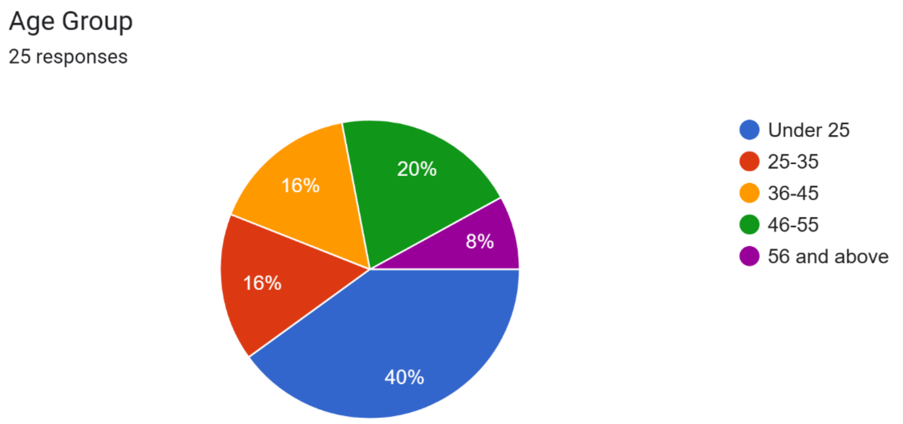
Influence is the capacity to affect the behavior, development, or character of someone or something. It involves the power to shape outcomes through persuasion, authority, or other means. While specific definitions from renowned individuals are not provided in the available sources, the general understanding aligns with the ability to sway decisions or actions.

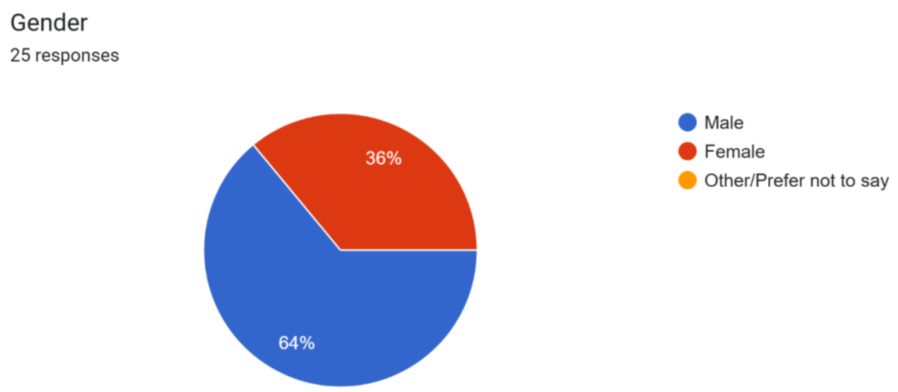
4. Legal Professionals

Legal professionals encompass individuals who are qualified to practice law, including lawyers, judges, and legal advisors. They are responsible for interpreting and applying the law, representing clients, and ensuring justice is served. The American Bar Association defines a lawyer as a person learned in the law, who is licensed to practice law.

The budget should be limited. The lack of limitations enables a flexible response in situations requiring the involvement of public funds. On the other hand, it creates the risk of irresponsible budgetary policy, planning deficit when it could be avoided, and delaying its effects to subsequent years. The legislator has decided to introduce statutory restrictions on the planning of the budget deficit to cover current expenditure and on the amount of funds that local governments may plan to repay the debt already incurred in the form of Articles 242 and 243 of the Public Finance Act1. Failure to comply with the above requirements leads to the impossibility of adopting the budget by the decision-making body of the L.G.U. and its establishment by the council of the relevant regional chamber of audits.

Data Analysis and Interpretation



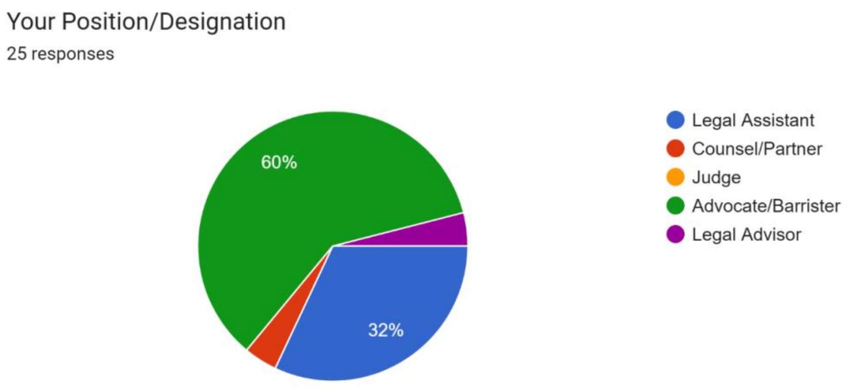


Analysis: The respondents span various age groups, with a significant proportion falling between 25-45 years old. A mix of both male and female legal professionals participated in the study, though the majority were male.

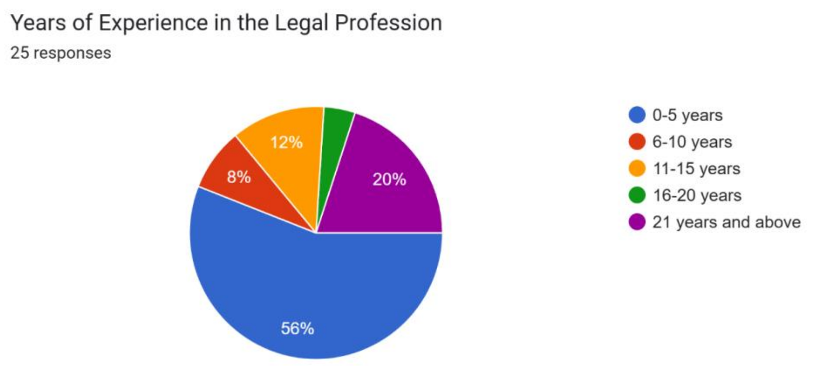
Interpretation: Based to the age distribution, professionals in their mid-career are more prone to talk about work-life balance, maybe as a result of their increased responsibilities. Although female participation is noteworthy, the gender representation shows the ongoing status of the male lead in the legal industry. For all professionals to have equal opportunities and balanced workloads, gender-inclusive policies and support networks are essential.

Data:

Interpretation:MM



Majority of respondents are advocates (60%)followed by legal assistant (32%)

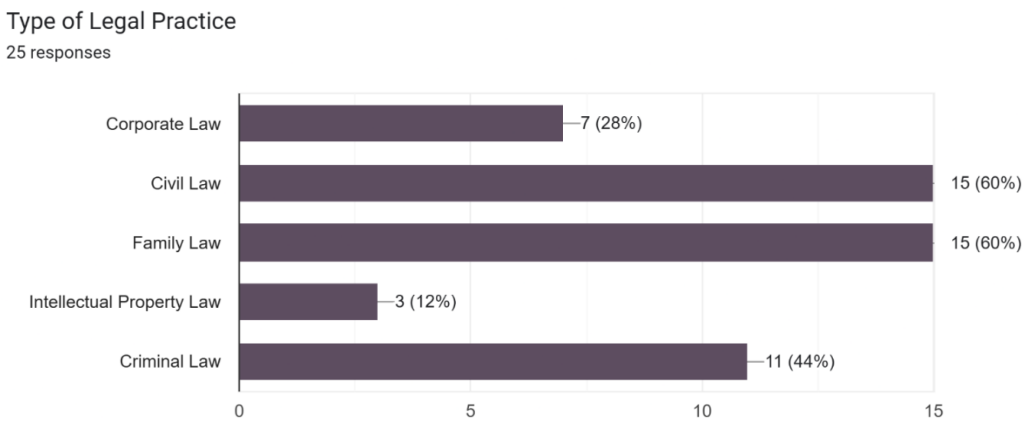


Analysis: The findings are extremely important to working legal practitioners, as seen by the majority of advocates and barristers in the responses. Additional opinions on workload, hierarchy, and job advancement are offered by the assistant and advisor comments.

The respondents represent a variety of career stages, with experience ranging from 0–5 years to 21+ years. A sizable portion have 11–20 years of experience, indicating that they are experienced professionals.

Interpretation: A solid understanding of how work-life balance and financial stability change over time is made possible by the range of experience. While seasoned professionals may face stress from client demands but have greater financial stability, younger professionals may suffer with workload and financial concerns.

Data:

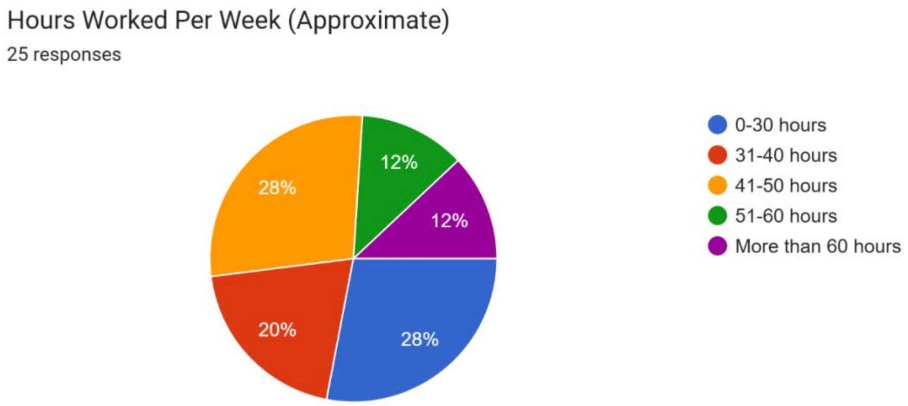


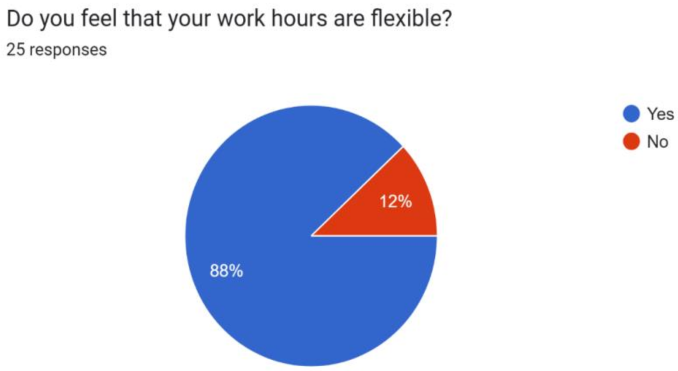
Analysis: Respondents specialize in Civil, Criminal, Family, Corporate, and Intellectual Property Law. Civil and Family Law are the most common areas of expertise.

Interpretation: The volume of work and stress levels in various practice areas vary. A high level of dedication must be shown for criminal and corporate law, which sometimes leads to longer workdays and more stress. Work-life balance may be affected by the emotional tiredness experienced by family law practitioners.

Data Analysis and Interpretation

Data:

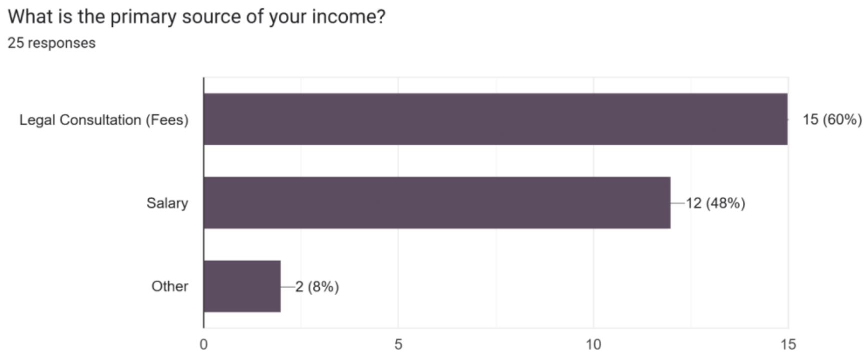


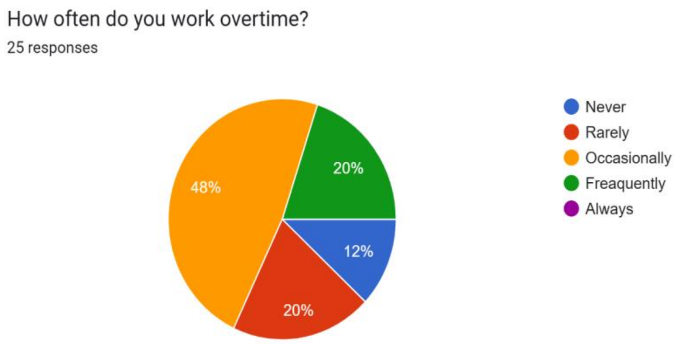


Analysis: Legal professionals often work beyond standard hours, impacting personal life. The higher the experience level, the longer the hours worked, especially for senior advocates and partners. Implementing better time management strategies may help improve work-life balance.

Interpretation: Flexibility depends on job role and legal specialization. Self-employed advocates manage their schedules but may face financial instability, while salaried legal professionals have fixed hours but limited control over workload.

Data:

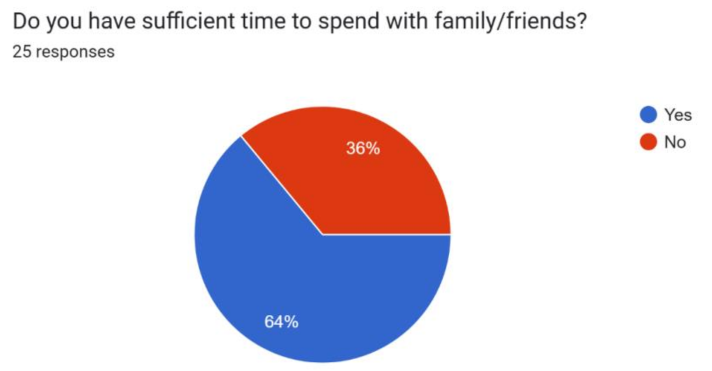


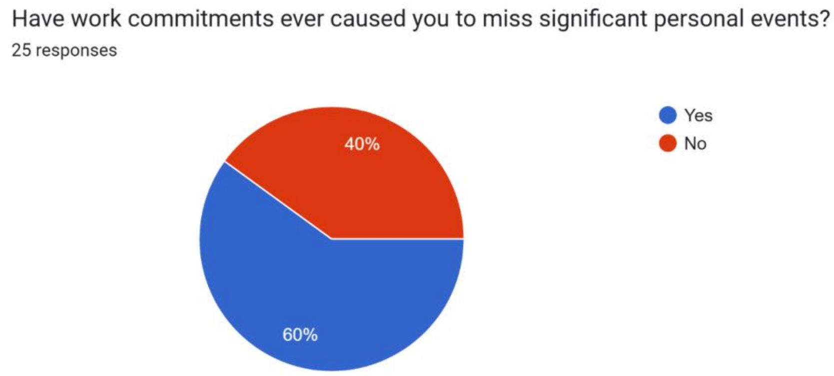


Analysis: Frequent overtime suggests that legal professionals struggle to maintain workload balance. Implementing case delegation strategies and time management techniques could reduce stress and improve efficiency.

Interpretation: Overtime is common, with many working frequently beyond standard hours. Some experience occasional overtime, while very few never work extra hours.

Data:

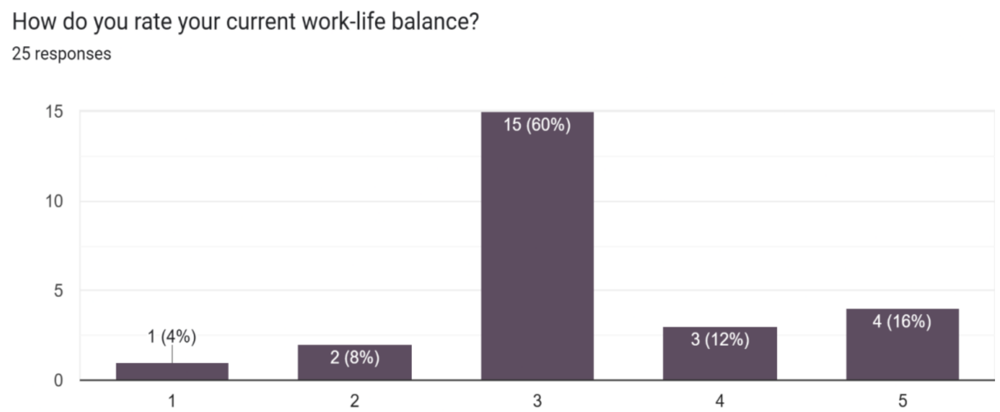


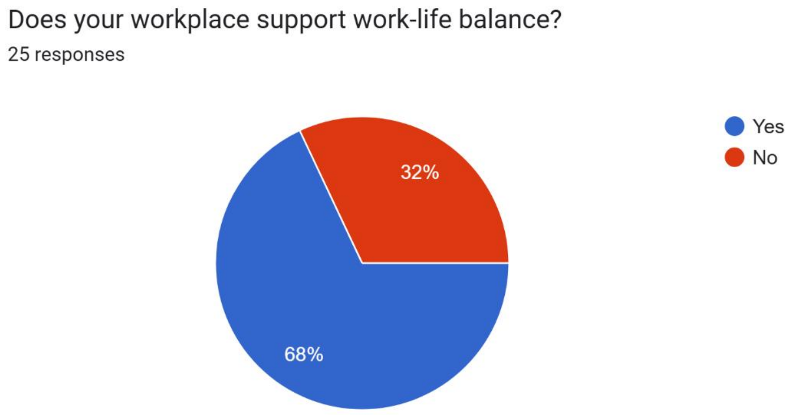


Analysis: These were personal question to determine what aspect of life the population (Legal professionals sought as life).

Interpretation: The majority saw their families as non- work aspects.

Data:

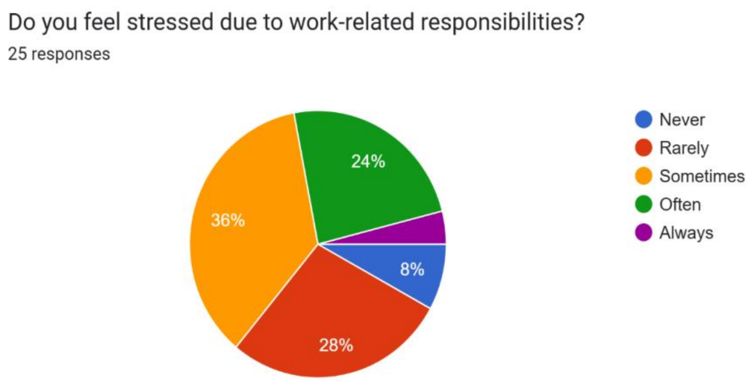


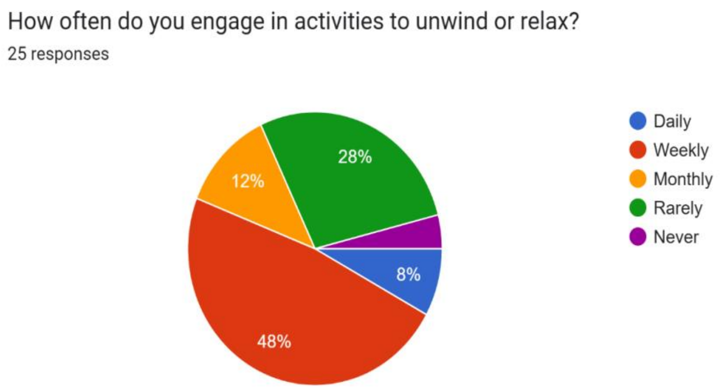


Analysis: Organizations that promote flexibility and wellness initiatives have employees with higher job satisfaction. Firms should consider policy improvements to retain talent.

Interpretation: The legal profession remains demanding, making work-life balance difficult to achieve. Encouraging flexible work arrangements and mental wellness initiatives could help improve overall job satisfaction.

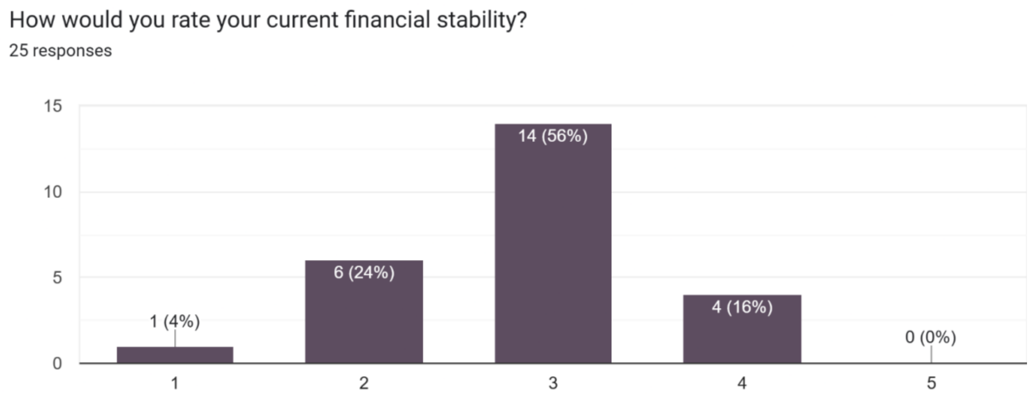
Data:





Analysis: Work-related stress affects not just health but financial security. Encouraging financial literacy programs and stress management solutions could prevent unnecessary financial strain.

Interpretation: Organizations that promote flexibility and wellness initiatives have employees with higher job satisfaction. Firms should consider policy improvements to retain talent**.**



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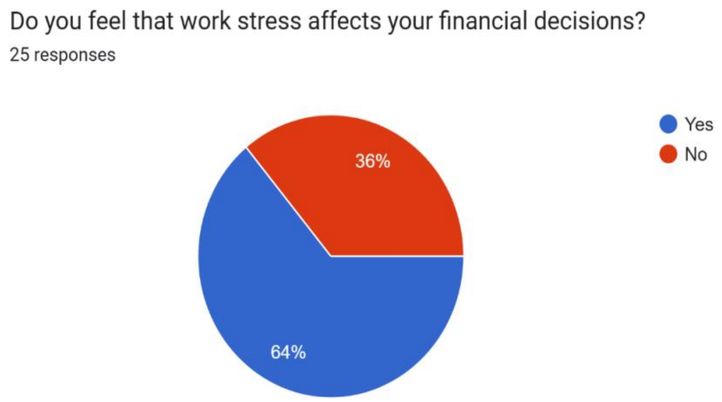
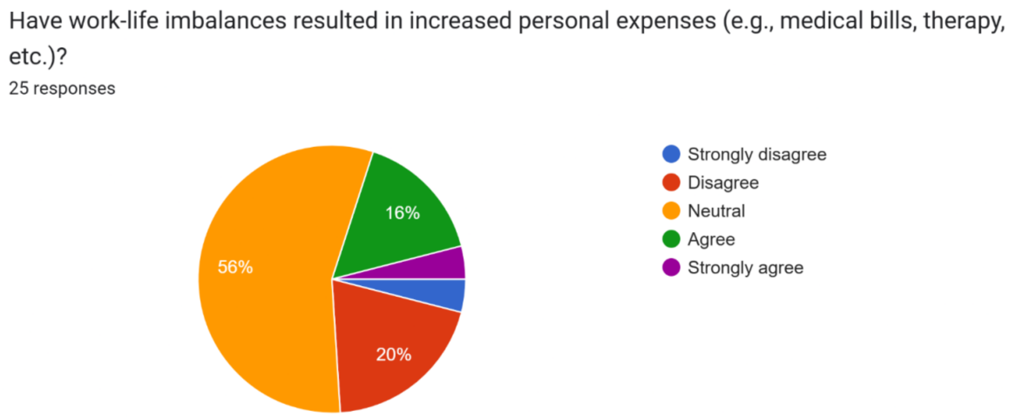
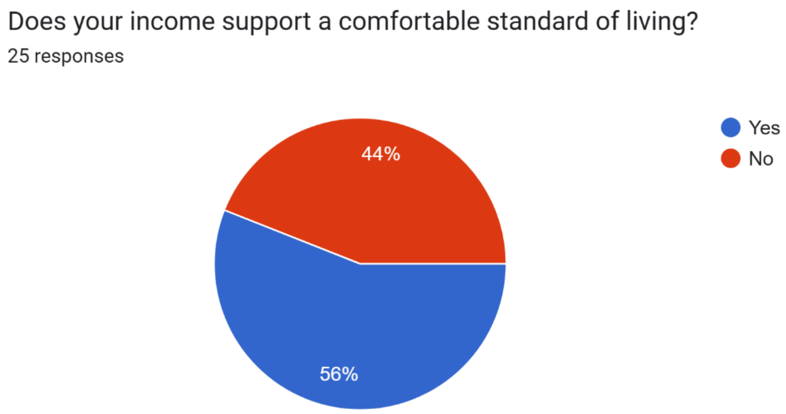


Analysis: Many respondents feel that stress impacts financial decision-making, leading to poor spending habits, medical expenses, or missed savings opportunities.

Interpretation: Work-related stress affects not just health but financial security. Encouraging financial literacy programs and stress management solutions could prevent unnecessary financial strain.

Data:

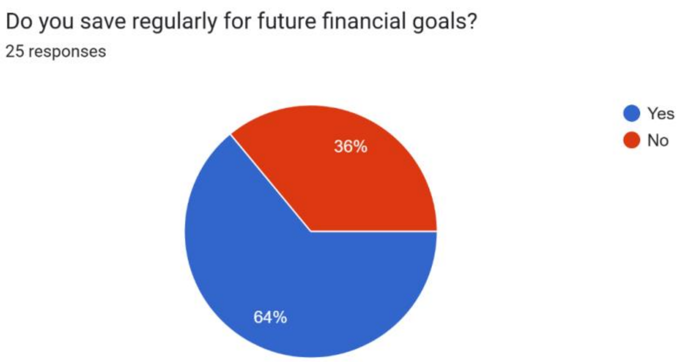


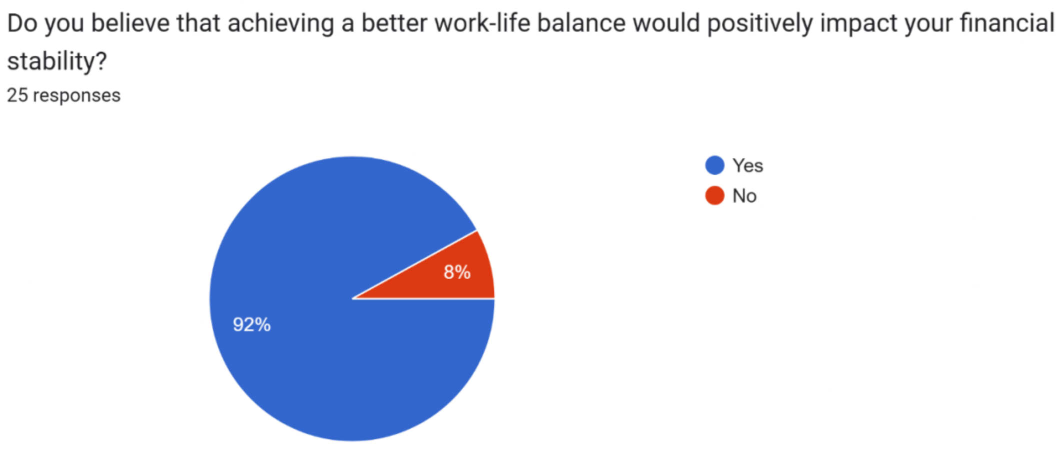


Analysis: Most respondents feel financially stable, but some indicate that high expenses and unpredictable earnings cause concern.

Interpretation: Financial stability depends on job type and specialization. Advocates relying on case-based earnings may face income fluctuations, while salaried legal professionals experience greater stability.

Data:





Analysis: A majority believe that improving work-life balance would enhance financial stability, indicating a strong connection between mental well-being, productivity, and earnings.

Interpretation: This suggests that reducing stress, optimizing workloads, and ensuring flexibility could lead to better financial planning and stability. Legal firms should implement employee well-being initiatives to improve overall professional and financial health.

FINDINGS

Elements Influencing Work-Life Balance

Mid-career legal professionals aged 25–45 experience greater difficulty maintaining work-life balance due to increased personal and professional responsibilities. Senior roles and high-pressure practice areas such as Criminal, Corporate, and Family Law contribute significantly to longer working hours and emotional fatigue. A majority of respondents report consistently working beyond standard hours, with self-employed professionals facing income variability and salaried roles offering limited control. Organizations that provide wellness initiatives and flexible policies report higher job satisfaction among employees, though time management and delegation remain key challenges.

Effect of Work-Life Balance on Financial Stability

Respondents widely believe that improved work-life balance positively impacts financial stability by supporting better decision-making. There is a recognized need for financial literacy and planning programs to help mitigate the effects of stress-related financial mismanagement.

Relationship Between Financial Well-Being and Work Stress

Work-related stress negatively impacts financial security, with many professionals reporting poor spending habits, increased medical expenses, and unstable earnings. High stress levels also reduce focus and professional efficiency, leading to further income-related concerns and career stagnation.

Benefits of Improved Work-Life Balance

A better balance between work and personal life supports increased productivity, enhanced decision-making, and more effective financial planning. Firms are encouraged to adopt flexible work arrangements and inclusive policies to promote long-term financial and professional well-being among legal professionals.

CONCLUSION

The study highlights that work-life balance is a critical factor influencing both the personal well-being and financial stability of legal professionals. Mid-career individuals, particularly those in demanding practice areas, face heightened levels of stress due to long working hours and limited control over their schedules. This stress negatively impacts professional efficiency and leads to financial challenges such as poor spending habits and unstable income. However, improved work-life balance supports better decision-making, increased productivity, and more effective financial planning. Organizations that adopt flexible work arrangements and wellness-oriented policies play a key role in fostering a healthier, more sustainable work environment. Promoting such initiatives is essential for ensuring long-term professional success and financial well-being within the legal sector.

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GREENWASHING IN PRODUCT MARKETING AND CONSUMER PERCEPTION:

A STUDY IN THRISSUR DISTRICT

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Abstract

In recent years, there has been a noticeable shift in consumer preferences toward healthier and more sustainable lifestyles, prompting a growing demand for green products. In response to this trend, many brands and companies have adopted greenwashing practices, aiming to project an image of environmental responsibility while prioritizing revenue generation over genuine sustainability to satisfy the expectations of the green consumers. Greenwashing is particularly concerning because many consumers remain unaware of its existence, leading them to trust misleading advertisements and unknowingly purchase products that do not align with their eco-conscious values. Examining greenwashing can help identify its prevalence, the factors driving it, and its influence on consumer behaviour, corporate accountability, and environmental outcomes. This study is intended to know the consumer perception of greenwashing and related opinions.
Keywords: Consumer preferences, green products, Greenwashing, Environmental responsibility, Revenue generation, green consumers,

1. Introduction

In recent years, there has been a significant rise in consumer awareness regarding environmental sustainability, resulting in a shift toward more eco-conscious purchasing decisions. As consumers increasingly seek products that align with their values of health and sustainability, companies have responded by marketing their products as environmentally friendly. However, this growing demand for green products has also led to the emergence of greenwashing, where brands falsely or misleadingly portray their products as environmentally responsible to capitalize on the eco-conscious consumer segment. The gap between companies' environmental claims and their actual practices has created a marketplace where not all "green" products live up to their promises.

Greenwashing has evolved as a significant concern in modern consumer markets, with companies using vague or exaggerated claims to mislead consumers about the environmental benefits of their products. These practices range from unsubstantiated labels to outright false advertising, which often misrepresents the sustainability of the product. As the green consumer market continues to grow, the issue of greenwashing has become more pervasive, posing challenges not only for individual consumers but also for the integrity of the entire sustainability movement. The lack of clear and standardized definitions for "green" or "eco-friendly" further complicates the problem, making it easier for companies to exploit ambiguous terminology.

While there is increasing awareness of greenwashing, many consumers are still unaware of the deceptive practices occurring in the market. The gap in consumer knowledge allows greenwashing to thrive, with consumers unknowingly purchasing products that do not align with their eco-conscious values. As a result, it is critical to examine the prevalence of greenwashing, the factors driving it, and its impact on consumer behaviour and corporate responsibility. This understanding will empower consumers to make more informed choices and encourage businesses to adopt genuine sustainable practices, ensuring that the green movement is not undermined by deceptive marketing tactics.

2. Statement of the problem

Greenwashing or the practice of making false or misleading environmental claims has become a pervasive issue in product marketing. Consumers are increasingly seeking eco-friendly products but companies misleading claims can lead to consumer deception, erosion of trust and undermine genuine sustainability efforts. This study aims to explore how companies engage in greenwashing, the different forms it takes in product marketing investigate the prevalence, characteristics and impact of greenwashing in product marketing and the implications for both consumers and corporator ethics.

3. Review of literature

Greenwashing, where companies make misleading or false environmental claims, has become a major concern globally and locally, particularly as consumer awareness of sustainability increases. While businesses capitalize on this demand by making eco-friendly claims, many lack substantiation, leading to consumer confusion and undermining genuine sustainability efforts (Delmas & Burbano, 2011). On a global scale, vague claims and ambiguous certifications further contribute to this issue (Lyon & Montgomery, 2015; Parguel et al., 2011). Greenwashing reduces the credibility of environmental marketing and harms sustainability objectives (TerraChoice, 2010).

In India, the growing demand for eco-friendly products has led to increased greenwashing practices, with many companies making unverifiable environmental claims (Prakash & Gupta, 2020). Despite consumer interest, the absence of standardized regulations makes it difficult for consumers to trust sustainability claims (Sullivan, 2019). Kerala, known for its progressive environmental policies, faces the same challenges, with companies using vague claims to attract eco-conscious buyers (Nair & Krishnan, 2021). The lack of stringent regulations exacerbates the situation, as businesses can misrepresent their environmental benefits (KSPCB, 2020).

Consumer education is vital in combating greenwashing. When informed, consumers are better equipped to identify deceptive claims and make ethical purchasing decisions (Chen & Chang, 2013). In Kerala, where environmental awareness is high, educating consumers can significantly reduce greenwashing's impact (Mazur, 2020). Transparent marketing and verifiable proof of sustainability are crucial to maintaining trust (Peattie & Crane, 2005).

On the global stage, companies engaged in greenwashing risk reputational damage and legal consequences, especially in regions with active regulatory bodies like Europe (Clark et al., 2015; European Commission, 2020). In India, enforcement of environmental marketing regulations remains weak, with gaps in applying the Environmental Protection Act and other laws (Prakash & Gupta, 2020; Sullivan, 2019). In Kerala, environmental laws do not directly address greenwashing in marketing, leading to ambiguity in consumer protection (KSPCB, 2020).

Integrating Environmental, Social, and Governance (ESG) standards into corporate practices can help mitigate greenwashing by emphasizing transparency and accountability (Lyon & Montgomery, 2015; Eccles et al., 2012). Companies that adopt ESG principles gain consumer trust and demonstrate genuine commitment to sustainability. Third-party certifications also play a crucial role in verifying sustainability claims and ensuring credibility (Delmas & Burbano, 2011). In Kerala, these certifications could help combat greenwashing by aligning businesses with local environmental values (Mazur, 2020).

Greenwashing remains a significant issue in Kerala, India, and globally, as consumers seek sustainable products amidst misleading environmental claims. Strengthening regulations, promoting transparency, and educating consumers are essential steps in addressing this challenge. Businesses that align with verifiable sustainability practices can contribute to a more sustainable market, fostering trust and reducing greenwashing. To combat this, both consumers and companies must work together to create an ethical, environmentally responsible business environment.

4. Objectives

- To measure consumer awareness about greenwashing.
- To evaluate consumer perception of sustainability claims in greenwashing practices.
- To examine the role of marketing and advertising in perpetuating greenwashing.
- To explore the ethical and legal consequences of greenwashing for businesses.

5. Research Methodology

This study adopts both a descriptive and analytical approach. It is descriptive in nature as it aims to identify the various characteristics of research problems, while it is analytical because it examines and interprets data to draw conclusions. The study focuses on analysing consumer perceptions of environmental claims made by companies. Data collection involved both primary and secondary sources. Primary data were collected through the use of questionnaires and Secondary data were collected from books, websites, articles, and magazines. The study's population was limited to individuals from Thrissur district, with a sample size of 104.

6. Data Analysis and Interpretation

Table 1: Demographic data of respondents

Category	Sub-category	No. of Responses	Percentage (%)
Age	Up to 20	27	26%
	21-30	41	39.40%
	31-40	14	13.50%
	41-50	12	11.50%
	51-60	6	5.80%
	Above 60	4	3.80%
Gender	Male	58	55.80%
	Female	45	43.30%
	Prefer not to say	1	1%
Area of Residence	Urban	36	34.60%
	Suburban	31	29.80%
	Rural	37	35.60%
Income Range	Upto 20,000	67	64.40%
	20,000-50,000	24	23.10%
	50,000-1,00,000	11	10.60%
	Above 1,00,000	2	1.90%
Educational Qualification	10th/12th Equivalent	32	30.80%
	Degree/Diploma	57	54.80%
	Master's Degree	15	14.40%
Occupation	Government Sector	3	2.90%
	Private Sector	19	18.30%
	Business	15	14.40%
	Student	47	45.20%

	Auto Driver	5	4.80%
	Street Vendor	2	1.90%
	Housewife	10	9.60%
	Shopkeeper	2	1.90%
	Agriculture	1	1%

Table 2: Respondent's familiarity with the term 'greenwashing'

Response	No. of response	Percentage (%)
Yes	35	33.7%
No	69	66.3%
TOTAL	**104**	**100%**

Table 3: Source that respondents primarily became aware about greenwashing

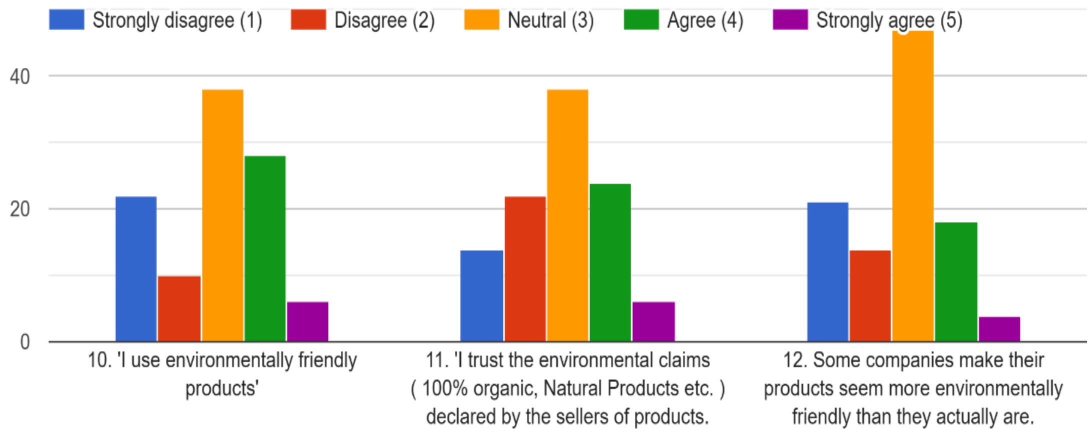
Source	No. of responses	Percentage (%)
Social media	8	7.7%
Friends/Relatives	13	12.5%
Educational Institutions	5	4.8%
Own research	4	3.8%
Advertisements	5	4.8%
Books/Magazines	1	1%
Unaware	68	65.4%
TOTAL	**104**	**100**

Interpretation: The data shows that 12.5% respondents who are familiar with the term "Greenwashing" got came to know about it through friends and relatives while ,7.7% heard about it through social media ,4.8% at their educational institutions , 4.8% through advertisements, 3.8% through their own research and 1% through books/magazines. Whereas 65.4% of the respondents are unaware.

Table 4: Consumer perception on greenwashing

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
'I use environmentally friendly products'	Percentage (%)				
	15.38%	17.31%	37.5%	28.08%	3.85%
'I trust the environmental claims (100% organic, Natural Products etc.) declared by the sellers of products.	8.654%	16.35%	34.62%	35.58%	4.81%
Some companies make their products seem more environmentally friendly than they actually are.	15.38%	16.35%	49.04%	16.35%	2.88%

Figure 1: Consumer perception on greenwashing

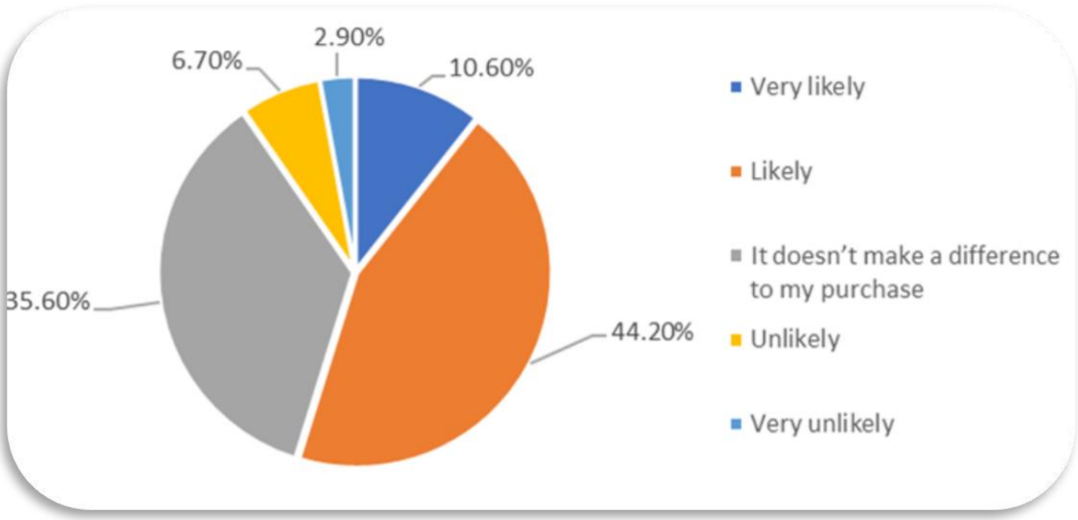


Interpretation: The data analysis provides valuable insights into consumer perceptions of environmental claims. A notable finding is that a large portion of respondents (37.5%) chose to remain neutral when asked whether they use environmentally friendly products, while 28.08% indicated they do. In terms of trust towards environmental claims made by companies, 35.58% of respondents agreed, while 34.62% remained neutral. Additionally, 49.04% of respondents were neutral on the statement that some companies overstate the environmental friendliness of their products. These results highlight a general sense of uncertainty and skepticism among consumers regarding environmental claims made by companies.

Table 5: Impact of greenwashing on consumer buying behaviour

Impact of greenwashing on buying behaviour	No. of responses	Percentage
Very likely	11	10.6%
Likely	46	44.2%
It doesn't make a difference to my purchase	37	35.6%
Unlikely	7	6.7%
Very unlikely	3	2.9%
TOTAL	**104**	**100%**

Figure 2: Impact of greenwashing on consumer buying behaviour



Interpretation: From the above data it is observed that 44.2% of respondents are very likely and 10.6% are likely to buy products advertised as environmentally friendly while , 35.6% stated that it doesn't make a difference to their purchase .

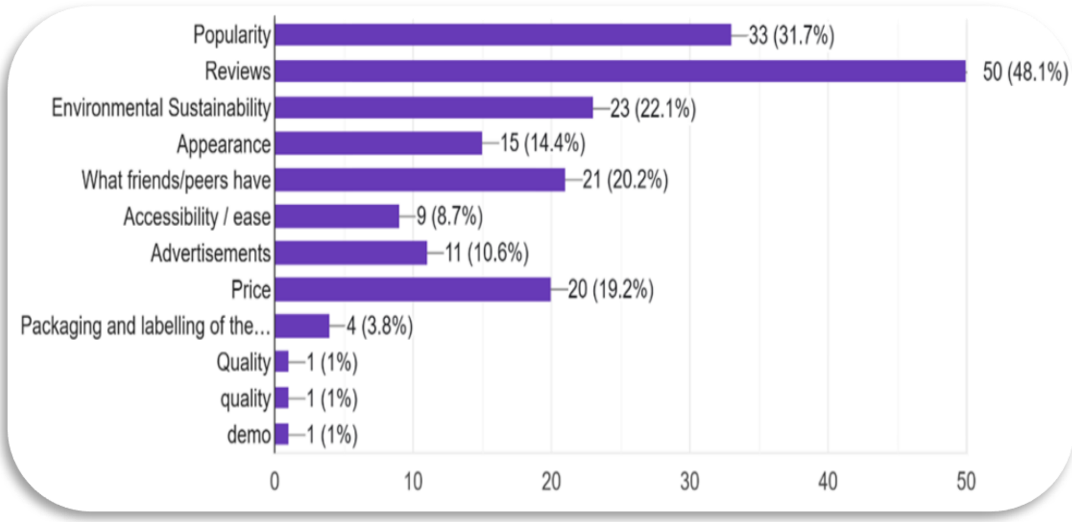
6.7% opted that they are unlikely to buy products advertised as environmentally friendly and 2.9% are very likely to buy products advertised likewise.

Table 6: Impact on purchase decisions of consumers after discovering unethical practices by a company

Consumer's response to unethical practices by a company	No. of responses	Percentage (%)
Yes	28	26.9%
No	30	28.8%
Maybe	46	44.2%
TOTAL	**104**	**100%**

Interpretation: According to the data obtained 26.9% discontinued products of a certain brand or company after discovering an unethical practice and 28.8% remained continuing the use of the product the same brand or company. The majority of 44.2% were unsure of any unethical practice by a brand or company of a product used in their daily lives which can be due to the lack of awareness of any such practice which can cause side effects that might harm the consumer.

Figure 3: Factors influencing consumer decisions



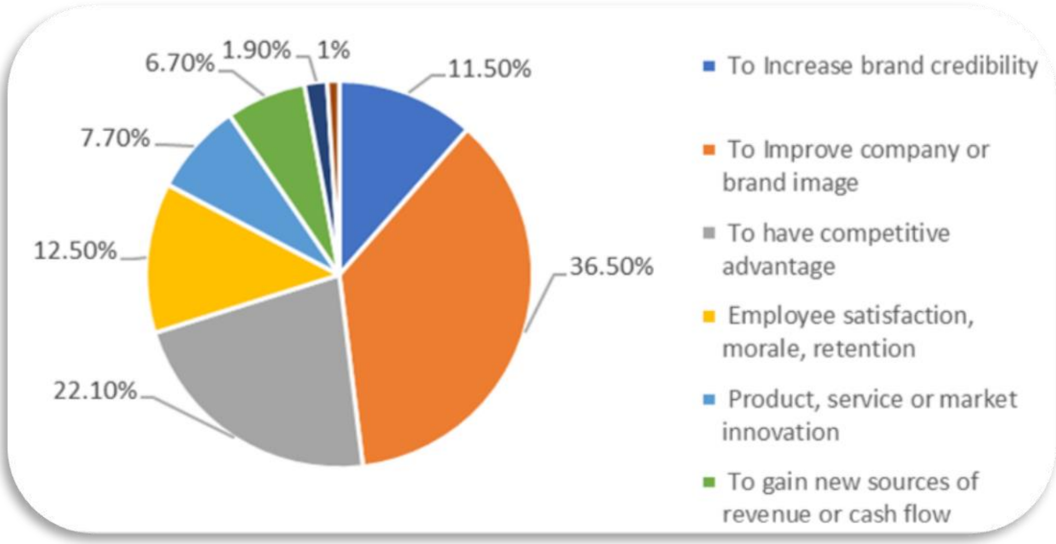
Interpretation: In the above data, we can see that 48.1% of the respondents consider reviews from other people before purchasing a product. 20% of them consider price and about 23% of them consider environmental sustainability before buying something. This suggests that not many people consider environmental factors before buying a product but the number is also not few.

Table 7: Influence of green advertising on consumers from their perspective

Likelihood of being influenced by green advertising	No. of responses	Percentage (%)
Strongly agree	8	7.7%
Agree	44	42.3%
Neutral	36	34.6%
Disagree	15	14.4%
Strongly disagree	1	1%
TOTAL	**104**	**100%**

Interpretation: The data shows that 42.3% of the respondents on buying a product advertised as environmentally friendly makes them feel good and 34.6% of them has a neutral approach on this statement. 7.7% strongly agree to the statement while, 14.4% disagree and 1% strongly disagree. Since greenwashing is closely related to green advertising, this also suggests that the consumers have high chances of being greenwashed through advertisements in the greenwashing scenario.

Figure 4: Consumer perception of factors leading to greenwashing:



Interpretation: The data proves that majority of the respondents believe that companies use greenwashing to improve company or brand image (36.5%) and a 22.1% believe it is to have competitive advantage. Greenwashing being an unethical procedure no reason justifies the act of greenwashing .

7. Results and discussion

Based on the data gathered from 104 respondents, several key findings have emerged regarding consumer awareness, trust, and attitudes toward greenwashing and sustainability claims. These findings offer valuable insights into the broader concerns surrounding environmental marketing practices and consumer behaviour in the context of greenwashing.

Awareness of Greenwashing : A significant portion of the respondents (66.3%) were unaware of the term "greenwashing." This highlights a considerable knowledge gap among consumers regarding deceptive environmental marketing practices. Despite increasing global attention on sustainability and environmental issues, many consumers still lack the tools or understanding to identify misleading claims made by companies. Among those familiar with greenwashing, many discovered the term through informal channels, such as friends, family, and social media. This suggests that awareness is primarily spread through word-of-mouth rather than through formal education or corporate transparency efforts.

Trust and Skepticism Towards Sustainability Claims : The data also reveals a prevailing sense of skepticism among consumers regarding environmental claims made by companies. While 35.58% of respondents expressed trust in sustainability claims, a substantial portion (49.04%) remained neutral, indicating uncertainty about the authenticity of these claims. This suggests that while there is a general interest in purchasing environmentally friendly products, many consumers remain doubtful about the veracity of the claims made by brands. This skepticism is compounded by the prevalence of exaggerated or unverifiable claims, which can lead to consumer confusion and mistrust.

Consumer Behavior and Purchasing Decisions : The data further indicates that a significant portion of respondents (44.2%) is likely to purchase products advertised as environmentally friendly, while 35.6% said such claims do not influence their purchasing decisions. However, the analysis suggests that while eco-friendly claims can influence some consumers, price, convenience, and peer influence continue to be stronger motivators for many. This aligns with the idea that sustainability is just one of several factors influencing consumer choices. Although consumers may express interest in supporting green products, the actual purchasing behavior is more complex and dependent on various factors beyond environmental claims.

Greenwashing Experiences and Perceptions: Interestingly, 25% of respondents reported that they have been greenwashed, with an additional 5.8% strongly agreeing with this statement. This indicates that many consumers are becoming aware of the misleading tactics used by some companies to falsely present their products as environmentally friendly. Additionally, 26.9% of respondents stated they discontinued using a product after discovering unethical practices, while 28.8% continued using the product. This suggests that once consumers recognize greenwashing, they may decide to stop supporting the offending brand, though some may continue using the product out of convenience or lack of alternative options. The fact that many consumers are uncertain about whether they have been greenwashed reflects the ongoing challenge of detecting such practices.

Influence of Reviews and Social Media on Consumer Decisions : The data highlights the growing role of social media and peer reviews in shaping consumer decisions regarding sustainability claims. A majority of respondents (29.8%) trust social media, and 26.9% trust consumer reviews to verify the environmental claims made by companies. This indicates that consumers increasingly rely on peer-driven information to assess sustainability, rather than simply trusting corporate messaging. This shift points to the importance of transparency and independent verification of environmental claims. While some respondents felt positive about purchasing eco-friendly products, others remained neutral or skeptical, further emphasizing the need for companies to offer credible, verifiable information.

The Role of Third-Party Certifications and Transparency : The data also reveals a lack of trust in third-party certifications and eco-labels, with only 21.2% of respondents expressing confidence in such certifications. Many consumers remain doubtful about the credibility of environmental claims, such as those related to recycling, with 35.6% of respondents questioning the reliability of these labels. This points to the need for more robust and transparent certification processes to combat greenwashing and build consumer trust. Additionally, 47.1% of respondents were neutral about whether companies are transparent about their sustainability practices, suggesting that a significant portion of consumers feel unsure about the authenticity of companies' eco-friendly efforts.

Impact of Greenwashing on Brand Perception : Regarding the impact of greenwashing on brand perception, the majority of respondents (38.5%) expressed a neutral stance on purchasing products from companies accused of greenwashing, while 26.9% disagreed with the idea of supporting such brands. This indicates that while many consumers are concerned about greenwashing, they may not always have the knowledge or resources to act on their concerns. However, a large portion of respondents (36.5%) believes that companies engage in greenwashing to improve their brand image, while 22.1% see it as a strategy to gain a competitive advantage. This perception suggests that while greenwashing may be seen as an unethical practice, it is often viewed as a marketing tool used by companies to appeal to environmentally conscious consumers.

In conclusion, the findings from this study provide a detailed understanding of consumer attitudes toward sustainability claims and greenwashing. The results show that while many consumers are interested in supporting environmentally friendly products, there is a significant lack of awareness about greenwashing and skepticism regarding the authenticity of sustainability claims. Trust in these claims is low, and the influence of environmental marketing on purchasing decisions is mixed, with price and convenience continuing to play a major role. As greenwashing becomes more prevalent, it is clear that companies must take greater steps to ensure the transparency and credibility of their environmental claims. Consumers are increasingly seeking trustworthy information, and businesses that fail to provide it risk losing consumer trust and loyalty. To address these concerns, there is a pressing need for clearer communication, independent certification, and more effective consumer education about greenwashing.

8. Suggestions

Based on the findings from this study, several key suggestions can be made to address the awareness gap, reduce the impact of greenwashing, and foster trust in environmental claims. These suggestions are aimed at improving consumer knowledge, enhancing regulatory frameworks, and encouraging companies to be more transparent and ethical in their sustainability practices.

1. *Educational Campaigns*: Increase awareness about greenwashing through government-led initiatives, nonprofit organizations, and educational institutions. Integrate sustainability into curricula to equip individuals with the knowledge to make informed decisions.

2. *Leverage Social Media*: Use social platforms like Instagram, Twitter, and YouTube to engage the public on greenwashing. Collaborate with influencers and environmental advocates to amplify the message.

3. *Enforce Stringent Regulations*: Governments should require companies to back sustainability claims with verifiable data. Independent audits and third-party certifications could be mandated to ensure transparency.

4. *Clear Guidelines for Eco-labels*: Standardize and regulate eco-labels and certifications to improve consumer trust. Certification bodies should maintain transparency and ensure only qualified companies use such labels.

5. *Corporate Transparency*: Encourage businesses to release detailed sustainability reports and adopt transparent practices regarding their environmental impact, carbon footprint, and supply chains.

6. *Voluntary Eco-labeling*: Companies should adhere to recognized eco-labeling standards and provide clear, simple information on how their products support sustainability.

7. *CSR and Ethical Marketing*: Sustainability should be central to business strategies, with companies focusing on educating consumers rather than making vague or misleading claims.

8. *Penalties for Greenwashing*: Governments should impose penalties for companies caught greenwashing and provide an accessible platform for consumers to report deceptive practices.

9. *Encourage Research Before Purchase*: Promote initiatives that encourage consumers to verify sustainability claims, such as providing access to databases or independent resources.

10. *Collaboration with Consumer Advocacy Groups*: Work with advocacy organizations

to ensure sustainability claims are verified and develop industry standards for transparent communication.

11. *Enhance Consumer Protection Laws*: Strengthen consumer protection laws to ensure companies provide accurate, truthful, and verifiable environmental claims.

12. *Greenwashing Monitoring*: Establish an independent body to monitor and investigate greenwashing practices, offering resources for both consumers and businesses.

13. *Global Standards for Environmental Claims*: Develop international frameworks to standardize environmental claims and ensure consistency across borders.

14. *Tax Incentives for Transparency*: Provide financial incentives to companies that adopt transparent sustainability practices and third-party certifications.

9. Implications of the study

The study highlights the need for increased consumer education on greenwashing, greater transparency from businesses, and stronger regulations to protect consumers from misleading environmental claims. Companies must adopt clear, verifiable sustainability practices, and certification bodies should provide reliable and easy-to-understand labels. Policymakers should enforce stricter guidelines and penalties for false advertising, ensuring a more trustworthy and sustainable market for both consumers and businesses.

10. Scope for further research

This study aimed to explore consumer perceptions of greenwashing, focusing on their awareness, skepticism, and behaviours toward environmental claims made by companies. It also examined the role of factors like product advertisements, consumer reviews, and social media in shaping trust. While this research provides valuable insights into consumer skepticism and the prevalence of greenwashing, further research could explore the effectiveness of consumer education programs in reducing greenwashing. Additionally, investigating the impact of local regulatory frameworks and policies on corporate practices in reducing deceptive environmental claims would deepen our understanding of how to foster genuine sustainability in the marketplace.

11. Conclusion

In conclusion, there is a pressing need to address the gap in consumer awareness about greenwashing, enhance transparency and regulations around sustainability claims, and foster a culture of ethical marketing within companies. By implementing educational initiatives, strengthening regulations, promoting transparency, and encouraging responsible corporate behaviour, both consumers and businesses can contribute to reducing the prevalence of greenwashing. It is crucial that businesses, governments, and consumers work together to create an environment in which truthful, meaningful sustainability claims can flourish, enabling consumers to make informed choices and fostering greater trust in environmental marketing practices.

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A STUDY ON THE SAVINGS AND INVESTMENT PATTERNS OF SALARIED PEOPLE IN OLARIKKARA, THRISSUR

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Abstract

Investment patterns among salaried employees vary based on income levels, financial goals, and risk tolerance. This study aims to analyze the saving and investment behaviors of salaried individuals, considering their preferences, awareness, and challenges. Salaried employees receive a fixed income, making their investment decisions crucial in balancing expenses and wealth accumulation. The study explores various investment avenues, including bank fixed deposits, mutual funds, real estate, gold, stocks, bonds, life insurance, and government-backed schemes like PPF and post office savings.

Findings reveal that a significant portion of respondents falls within the 26-35 age group, with a majority being private-sector employees. Most respondents prefer safer investment options such as fixed deposits, mutual funds, and life insurance. Awareness levels vary, with higher familiarity with gold, real estate, and fixed deposits, while stocks and bonds remain relatively less understood. Respondents prioritize high returns, easy access to funds, risk levels, and investment duration when making decisions. Challenges include difficulty in understanding investment options, obtaining reliable financial advice, and concerns about market risks.

However, most investors do not face withdrawal issues, and their confidence is only slightly affected by unexpected losses.

This study highlights the need for better financial literacy, accessible investment guidance, and diversified portfolios to help salaried employees maximize returns while minimizing risks. The insights gained can contribute to policy recommendations and financial planning strategies tailored to the needs of salaried investors.

Keywords: investment patterns, salaried employees, risk, diversification, saving behavior, financial planning, investment challenges, tax benefits

Introduction

The investment patterns of salaried employees vary based on employment nature and income levels, yet a common factor is their regular income, which fosters habitual savings and investments. This study focuses on salaried individuals whose financial decisions are influenced by factors such as safety, returns, tax benefits, and retirement planning. While their stable income supports consistent savings, greater economic incentives could enhance their investment contributions. Investment options include equities, bonds, insurance, and bank deposits, forming diverse financial portfolios. Effective investment is crucial for financial security, mitigating inflation, and ensuring future stability. However, investors often face challenges like risk assessment, market volatility, and limited financial awareness, making informed decision-making essential. Understanding these factors is vital to improving investment strategies and outcomes. This study aims to explore salaried employees' investment behavior, challenges, and awareness levels, providing insights into their financial decision-making process.

Problem statement

Investors often face challenges in choosing the right investment avenues due to factors like risk tolerance, financial goals, and market volatility. Understanding the reasons behind their investment choices and the problems they encounter, such as lack of information or inadequate financial advice, is essential. Additionally, the awareness level of investors regarding various investment options may impact their decision-making. This study aims to explore these issues. So, conducting a study based on this context deserves much significance.

Objectives of the study

1. To study the reasons for choosing different investment avenues by the investors.
2. To study the problems faced by investors towards investment patterns.
3. To analyze the awareness level of investors regarding different investment avenues.

Research methodology

This study is descriptive in nature and focuses on the savings and investment patterns of salaried people in Olarikkara of Thrissur district. The population of this study comprises of 35 samples of the salaried people in Olarikkara. Convenience sampling was used to conduct the study.

The primary data was collected using questionnaires, enabling the collection of first-hand information regarding their experiences, challenges, and perspectives. Secondary data was taken from reliable outlets like websites to gather useful information.

The study employs percentage calculations, tables, and charts to analyze and interpret the collected data. The methodology facilitates a clear understanding about the awareness level, problems faced by investors and the reasons for choosing a particular investment avenue.

Results and discussions

The study reveals that a majority of the respondents (46%) belong to the 26-35 age group, with men making up 63% of the sample. Most respondents (83%) are employed in the private sector, with 34% earning a monthly salary above ₹50,000. When it comes to investment experience, 43% categorize themselves as having intermediate knowledge.

Regarding investment awareness, 54% of respondents are familiar with all available investment options. The most popular choices include mutual funds, real estate, gold, fixed deposits, post office savings, and life insurance policies, with 40% of respondents investing in these avenues. Awareness levels vary across different investment instruments—gold (54%), fixed deposits (51%), and real estate (60%) have the highest awareness levels, whereas stocks (34%), bonds (31%), and cryptocurrency (40%) remain less understood among salaried employees.

Several factors influence investment decisions. The majority of respondents (91%) emphasize the importance of achieving good returns, while 86% consider liquidity crucial. Risk tolerance plays a significant role, with 49% of respondents taking it into account before investing. Investment duration is also a major consideration, with 71% of respondents valuing long-term financial security. Additionally, 34% acknowledge the need for portfolio diversification to mitigate risks.

Despite the importance of investments, many salaried individuals face challenges in making financial decisions. Nearly 46% of respondents find investment options difficult to understand, and 51% report challenges in obtaining reliable investment advice. Market risks concern 54% of investors, while tax implications influence 49% of investment decisions. However, withdrawing investments does not pose a significant issue for 46% of respondents. Unexpected losses impact investor confidence, with 34% reporting a decrease in their willingness to invest further.

These findings highlight the critical need for enhanced financial literacy programs and accessible investment advisory services. Many salaried employees lack the necessary knowledge to navigate the complexities of financial markets, leading to cautious or suboptimal investment choices. By improving awareness and access to professional guidance, investors can make more strategic financial decisions, ensuring sustainable wealth accumulation and economic security.

Conclusion

The study reveals that salaried employees adopt a structured approach to savings and investments, prioritizing safety, liquidity, and returns. While they are aware of various investment options, knowledge gaps exist, particularly in stocks, bonds, and cryptocurrency. Key factors influencing their decisions include risk, tax implications, and ease of access to funds. However, challenges such as understanding investment options and obtaining reliable advice impact their confidence. To enhance financial security, there is a need for improved financial literacy and accessible advisory services, enabling salaried individuals to make informed investment choices and achieve long-term financial stability.

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STUDY ON IMPACT OF MICROFINANCE ON WOMEN EMPOWERMENT THROUGH KUDUMBASHREE UNITS

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ABSTRACT

Kudumbashree, Kerala's flagship poverty eradication and women empowerment initiative, has transformed the lives of thousands of women by providing them with access to microfinance, skill development, and financial literacy programs. Launched in 1997, Kudumbashree functions as a three-tier community network, enabling women to achieve economic independence and self-sufficiency through structured financial support and entrepreneurship opportunities.

This study explores the impact of Kudumbashree's microfinance initiatives on women's financial empowerment, examining how access to credit and financial training contributes to improved livelihoods and decision-making power. The research, conducted in the Kalady locality, combines primary data from 100 Kudumbashree members with secondary sources to assess the program's effectiveness. Findings indicate that microfinance has boosted financial confidence and stability, yet challenges remain in entrepreneurial skill development and market access. While women benefit from credit facilities, many require additional support in business mentoring and financial management.

By addressing these challenges through enhanced training programs, policy improvements, and better financial planning, Kudumbashree can further strengthen its role in empowering women and promoting sustainable economic growth. This study highlights the need for integrated support systems to ensure long-term success for women entrepreneurs.

Keywords: Women empowerment, microfinance, Kudumbashree, financial literacy, entrepreneurship, poverty eradication, rural development, economic independence.

INTRODUCTION

Kudumbashree, meaning "prosperity of the family" in Malayalam, is a poverty eradication and women empowerment initiative launched in 1997 by the Government of Kerala under the State Poverty Eradication Mission (SPEM) (Government of Kerala, 2020). Developed in the context of decentralized governance and the People's Plan Campaign, it operates as a three-tier community network comprising Neighbourhood Groups (NHGs), Area Development Societies (ADS), and Community Development Societies (CDS), making it one of the largest women's collectives globally (Mukherjee & Ghosh, 2019).

A significant component of Kudumbashree is microfinance, which provides financial services to economically disadvantaged women, enabling them to engage in small businesses and achieve economic independence (Nair, 2018). Microfinance institutions facilitate access to credit, savings, and financial education, bridging the gap between formal banking systems and marginalized communities (Sharma, 2021). This study explores the impact of Kudumbashree's microfinance initiatives on women's empowerment and rural economic development, assessing how these financial interventions contribute to poverty alleviation and social progress in India.

STATEMENT OF PROBLEM

Micro finance is a crucial tool for providing financial services to the low-income group women. Their financial viability remains a concern due to high operational expenditures resulting from costly credit risk management systems and low loan portfolios. Over-debtedness is another common problem among for women in low-income groups. This is because borrowers frequently borrow funds from various sources due to their constant need in money. This shall be studied in this research study.

OBJECTIVES

1. To analyse the impact of microfinance in women empowerment through Kudumbashree.
2. To know the level of effectiveness of Kudumbashree in promoting women's financial empowerment

SIGNIFICANCE OF THE STUDY

The study will reveal the importance for understanding how Kudumbashree impacts women's financial empowerment is crucial for shaping effective policies and programs. By identifying key factors contributing to women's financial empowerment, policymakers can tailor interventions to better support women's economic independence. Assessing Kudumbashree's effectiveness provides insights into its strengths and weaknesses, guiding future program improvements. Recognizing and addressing challenges faced by women entrepreneurs shed light on areas needing intervention, ensuring that Kudumbashree's efforts align with the real needs of women in business.

RESEARCH METHODOLOGY

This study follows a Descriptive Research Design to explore the experiences and perspectives of Kudumbashree members in the Kalady locality. The research relies on both primary and secondary data to ensure a well-rounded analysis. Primary data is collected directly from 100 Kudumbashree members using a structured questionnaire, allowing firsthand insights into their experiences. Additionally, secondary data is sourced from credible platforms such as websites, online articles, and journals to supplement the study with existing research and background information. The population for this study consists exclusively of Kudumbashree members in Kalady, and a convenient sampling method is used to select respondents based on accessibility and willingness to participate, ensuring efficient data collection.

To analyze the collected data, the study utilizes graphs, tables, and percentage methods, which help in organizing and interpreting the findings in a structured manner. These tools provide a clear representation of patterns and trends, making it easier to draw meaningful conclusions. By employing a combination of direct responses from participants and supporting secondary data, the study aims to provide valuable insights into the functioning and impact of Kudumbashree in the Kalady locality. The chosen methodology ensures a systematic approach to data collection and interpretation, ultimately contributing to a deeper understanding of the subject matter.

THEORETICAL FRAMEWORK

Finance plays a critical role in economic development and individual prosperity, addressing the management, creation, and allocation of financial resources. It encompasses key aspects such as credit, investment, and debt, all of which influence economic activity through the time value of money, interest rates, and risk assessment. Within finance, microfinance serves as a specialized sector that provides financial services to individuals who lack access to traditional banking systems. Microfinance institutions empower low-income communities by offering microloans, savings options, insurance, and financial education, fostering financial inclusion and self-sufficiency. These financial services play a crucial role in women's empowerment, particularly in underprivileged societies, by providing them with the resources needed to achieve economic independence and social upliftment. Women's empowerment is a multi-dimensional process that enhances their ability to make strategic life choices, contribute to household income, and participate actively in economic and social decision-making. Through financial independence, women experience improved quality of life, increased decision-making power, and better opportunities for education and healthcare for themselves and their families.

One of the most successful initiatives in integrating microfinance with women's empowerment is Kudumbashree, a community-based poverty eradication and women's empowerment program implemented by the Government of Kerala. Kudumbashree operates through a structured three-tier system, comprising Neighbourhood Groups (NHGs), Area Development Societies (ADS), and Community Development Societies (CDS), creating a strong grassroots network for women's financial and social development. Rooted in Kerala's decentralized planning framework, Kudumbashree evolved as part of the People's Plan Movement, drawing inspiration from traditional community organizations and the Self-Help Group (SHG) Bank Linkage Program led by NABARD. The initiative has proven to be a transformative force, providing women with access to microfinance, skill development programs, and income-generating opportunities. By facilitating financial literacy, business education, and credit access, Kudumbashree has empowered thousands of women to become entrepreneurs, significantly contributing to local economic development. In addition to economic benefits, Kudumbashree has enhanced women's self-confidence, social status, and decision-making capabilities, further solidifying its impact as a model for sustainable community development.

RESULTS AND DISCUSSIONS

The findings of this study paint a clear picture of the impact of Kudumbashree's microfinance programs on the lives of its beneficiaries. Most of the respondents belong to the 41-50 age group, showing that middle-aged individuals are the primary participants in these initiatives. Younger and older individuals form a smaller segment, which may indicate that awareness or accessibility of these programs is lower among them. Education levels among the respondents are relatively low, with most having completed only up to the 10th standard or lower, and very few having pursued higher education. This suggests that Kudumbashree primarily caters to individuals with basic educational qualifications, making its financial literacy and training programs all the more valuable in empowering them to make informed economic decisions.

Family size is another important factor in understanding the socio-economic conditions of the respondents. Many of them come from large families with 5-6 members, followed closely by medium-sized families. This means that financial stability is crucial for these individuals, as they are responsible for multiple dependents. Employment data indicates that the majority are private employees or engaged in informal occupations, while a smaller portion are self-employed or government employees. This aligns with income levels, as a vast majority earn less than ₹20,000 per month, highlighting the urgent need for financial support and self-employment opportunities.

One of the most encouraging findings of this study is the overwhelmingly positive impact of Kudumbashree's microfinance services. Most respondents believe that these programs have helped them become economically empowered, allowing them to better manage their finances and improve their overall well-being. The accessibility of these services is another plus—many find the process user-friendly and easy to navigate. However, despite access to financial assistance, a large number of respondents feel that their entrepreneurial skills have not improved significantly. This suggests that while microfinance helps provide capital, there may be a gap in the training and mentorship required to turn these funds into sustainable business ventures.

Looking at the long-term sustainability of Kudumbashree's microfinance programs, most respondents are confident that the model is viable and will continue to provide financial stability. Many also expressed satisfaction with the financial resources provided, stating that they have positively impacted their economic independence. A particularly striking finding is that 96% of respondents feel more confident in managing their finances after participating in Kudumbashree's programs. This shows that microfinance is not just about providing loans—it is also about equipping people with the knowledge and confidence to handle money effectively. However, there are still a few who lack confidence, suggesting that further financial training and support could help bridge this gap.

When it comes to women's entrepreneurship, the results are mixed. While most respondents rate the microfinance services as moderately effective, only a small fraction finds them highly effective. This indicates that while financial assistance is available, other factors—such as market access, business mentoring, and industry-specific training—may be missing. On the other hand, Kudumbashree's financial literacy programs have been highly successful, with a majority of respondents stating that they have gained valuable knowledge about managing money, savings, and credit. These programs are crucial in ensuring that beneficiaries make the most of their financial resources and develop long-term financial stability.

The study also examined the interest rates on loans, and it was found that all respondents received loans at a standardized rate between 5-10%, with most paying 9% interest. This uniformity ensures transparency and fairness in financial transactions. Additionally, Kudumbashree's training programs were widely appreciated, with most respondents agreeing that these programs help bridge technological gaps. This shows that the organization is not only providing financial assistance but also equipping women with the digital and business skills necessary to succeed. Moreover, all respondents confirmed that their training and technical support came through local government agencies, reinforcing the role of decentralized governance in the success of Kudumbashree's initiatives.

A particularly interesting aspect of the study is the impact of Kudumbashree's microfinance on small-scale entrepreneurship. The data reveals that a significant number of respondents have started their own businesses, with tailoring being the most common venture, followed by soap manufacturing, food production, and other small-scale businesses. This shows that microfinance plays a key role in enabling self-employment. However, the concentration of businesses in traditional female-dominated industries suggests that many women may be choosing familiar paths due to societal norms or lack of exposure to other industries. Encouraging diversification into higher-growth sectors and providing targeted training programs could help expand opportunities for women entrepreneurs.

Overall, this study highlights that Kudumbashree's microfinance initiatives have significantly improved financial stability, economic independence, and confidence in financial management among its beneficiaries. However, there is still room for improvement in entrepreneurial skill development and business sustainability. Strengthening training programs, providing mentorship, and improving market access could ensure that financial assistance leads to sustainable and scalable businesses. By addressing these areas, Kudumbashree can further strengthen its impact and continue empowering women towards greater financial self-sufficiency and long-term success.

CONCLUSION

The study highlights the remarkable impact of Kudumbashree's microfinance initiatives on the financial empowerment of women and the overall economic development of marginalized communities. Through accessible credit, financial literacy programs, and entrepreneurial support, Kudumbashree has provided women with the tools to become financially independent and take control of their economic futures. The findings show that while microfinance has significantly improved financial stability and confidence in money management, there are areas that need further attention, particularly in entrepreneurial skill development and business sustainability.

For Kudumbashree's success to be truly transformative, it is crucial to bridge the gap between financial assistance and practical business knowledge. Strengthening training programs, expanding mentorship opportunities, and improving market access will ensure that financial support translates into long-term economic growth. By addressing these challenges, Kudumbashree can continue to empower women, reduce poverty, and foster a more inclusive and sustainable economy, ultimately shaping a future where financial independence is within reach for all.

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CHALLENGES IN ORNAMENTAL FISH RETAILING

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Abstract:

This study aims to investigate the specific challenges faced by ornamental fish retailers in Kerala. The study was conducted in the Thrissur and Ernakulam districts of Kerala, India. A structured questionnaire was administered to a total of 50 ornamental fish retailers in the selected districts. The objective of this study is to identify Challenges and Benefits in Ornamental Fish Retailing. The ornamental fish retail sector in Kerala faces challenges related to licensing and regulations, training and skill development, and access to affordable equipment. Addressing these issues through targeted interventions, such as streamlined licensing procedures, accessible training programs, and subsidized equipment schemes, is crucial for fostering a thriving and sustainable ornamental fish trade.

Keywords: Ornamental fish, Retailers, Challenges, Trade

Introduction

Ornamental fish culture is one of the sunshine sectors in Indian agriculture. Aquarium keeping is the second large hobby in the world (Sharma, 2020). Generally pet care activities are the best for stress-relieving than other conditions. As a hobby, ornamental fish keeping provides greater relaxation and less anxiety so it has become more popular (Sharma, 2020).In other words, ornamental fish aquariums provide lot of positive well-being effect with very less physical contact (Valentin et al., 2019) than any other pet care activity. Generally, Ornamental fishes are in different appearances, small in size, peaceful in nature and in attractive colours capable of living in confined spaces. They are often called 'living jewels' (Pandey and Mandal, 2017).

Ornamental fish retailers are specializing in selling decorative fish species, along with related products such as aquariums, fish food, aquatic plants, and accessories. These retailers cater to hobbyists, aquarium enthusiasts, and commercial clients. They operate through physical stores, online platforms, or both. They are facing a many challenges, perhaps more than other pet care retailers, as they are dealing with highly sensitive pet care products.

Statement of the Problem

This study aims to investigate the specific challenges faced by ornamental fish retailers in Kerala. It seeks to identify the key operational, logistical, and market-related difficulties encountered by these businesses, considering the unique characteristics of the ornamental fish trade and the specific context of the Kerala market. Understanding these challenges is crucial for developing targeted support strategies and promoting the sustainable growth of this promising sector.

Methodology:

The study was conducted in the Thrissur and Ernakulam districts of Kerala, India. A structured questionnaire was administered to a total of 50 ornamental fish retailers in the selected districts. The sampling technique employed was convenience sampling.

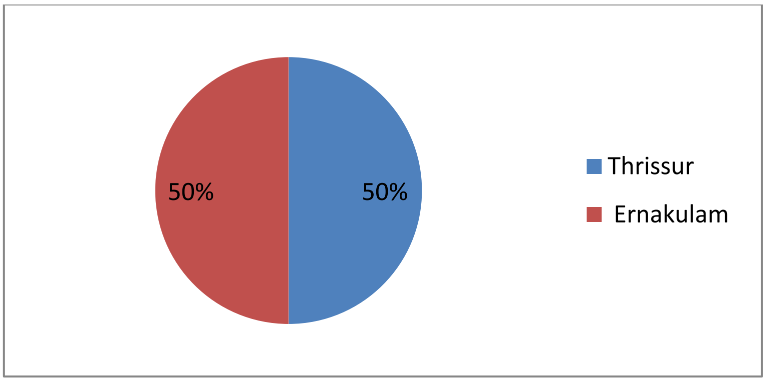
Objectives:

The objective of this study is to identify Challenges and Benefits in Ornamental Fish Retailing.

Analysis:

1. Area of Operation

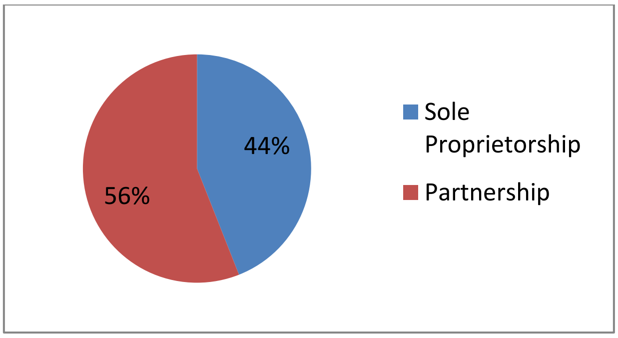
The survey sites were district of Thrissur and Ernakulam.



It shows that the population of this study. The sample size is equally distributed among Thrissur and Ernakulam districts.

2. Type of Business

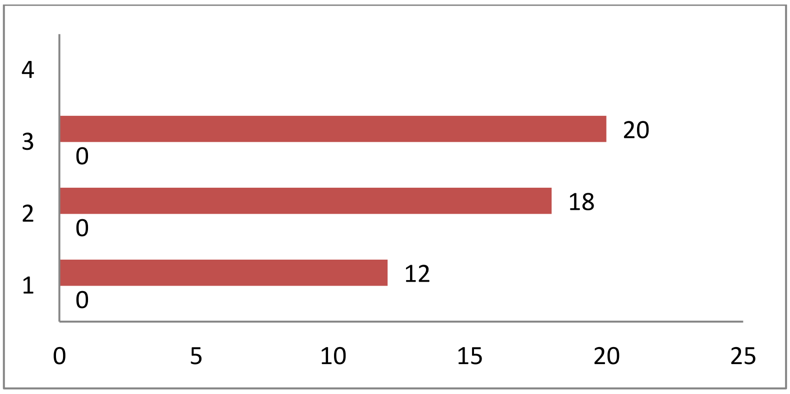
Identifying the prevalent business structure provides insights into organizational challenges.



The chart above shows the distribution of sole proprietorships and partnerships. Partnerships (28) are more common than Sole Proprietorships (22), suggesting a preference for shared resources and responsibilities. Partnerships are the prevalent business structure.

3. Years in Operation

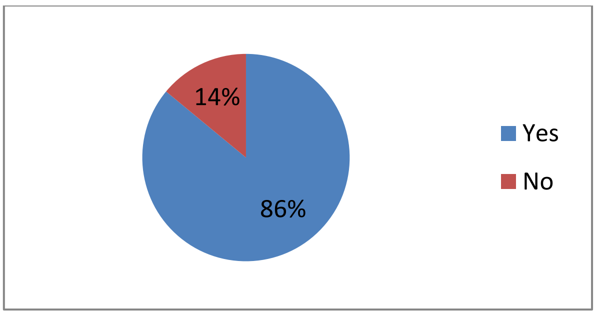
The duration of business operation can indicate experience and resilience to market fluctuations.



It shows different experience levels (Below 5 years, 5-10 years, More than 10 years). The presence of both established businesses (20 over 10 years) and newer ventures (18 below 5 years) suggests a dynamic market with opportunities for both.

4. Online operations

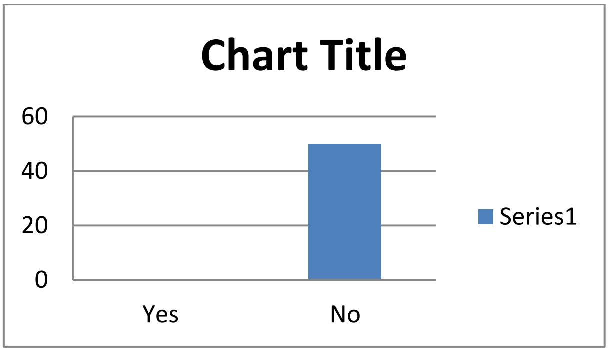
Assessing online presence reveals the adoption of digital platforms for reaching customers.



Pie chart is showing the proportion of retailers operating online. A significant majority (43 out of 50) operate online, demonstrating the importance of e-commerce in this sector.

5. Specialized License

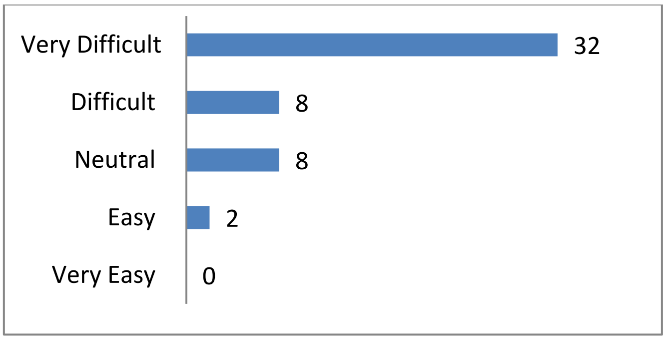
Highly sensitive pet care products require a specialized license for special consideration.



All retailers (50) lack a specialized license for ornamental fish, indicating a potential need for clearer licensing requirements or better enforcement of existing ones.

6. Ease of Implementing Regulations

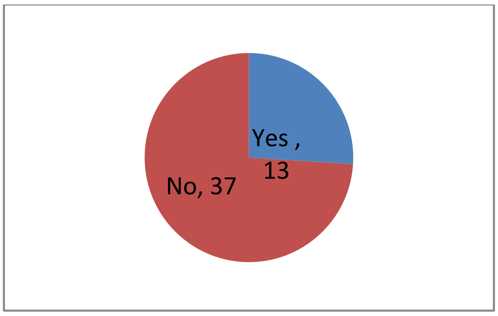
Understanding the perceived ease of implementing regulations reveals potential issues with regulatory frameworks.



A large majority (32 Very Difficult, 8 Difficult) find regulations difficult or very difficult to implement, suggesting a need for regulatory simplification or improved communication and support for retailers.

7. Specialized Training Received

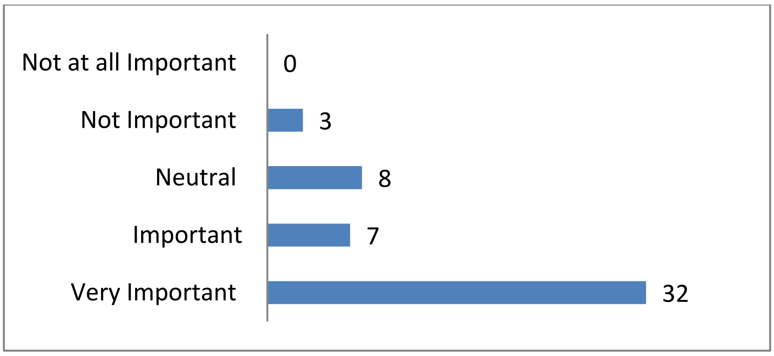
Assessing the level of specialized training reveals potential skill gaps among retailers.



Bar chart showing the number of retailers who have and have not received specialized training. Most retailers (37) have not received specialized training, highlighting a gap in access to professional development opportunities.

8. Importance of Training

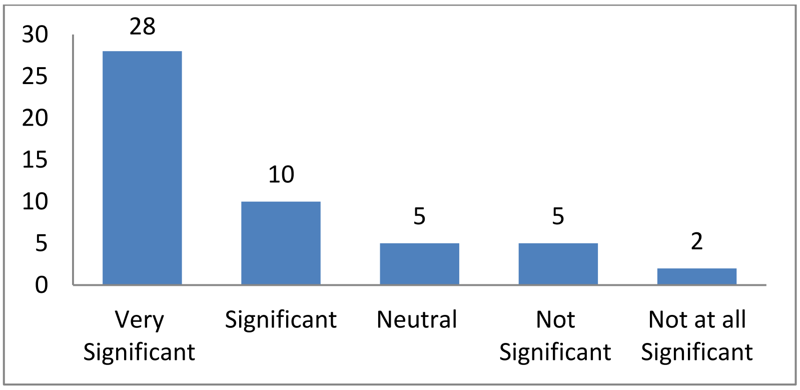
Training is crucial for retailers because it directly impacts customer satisfaction.



Bar chart showing the distribution of responses regarding the importance of training. Retailers highly value (32 Very Important, 7 Important) training programs, indicating a strong demand for knowledge and skill development opportunities.

9. Significance of Equipment Costs

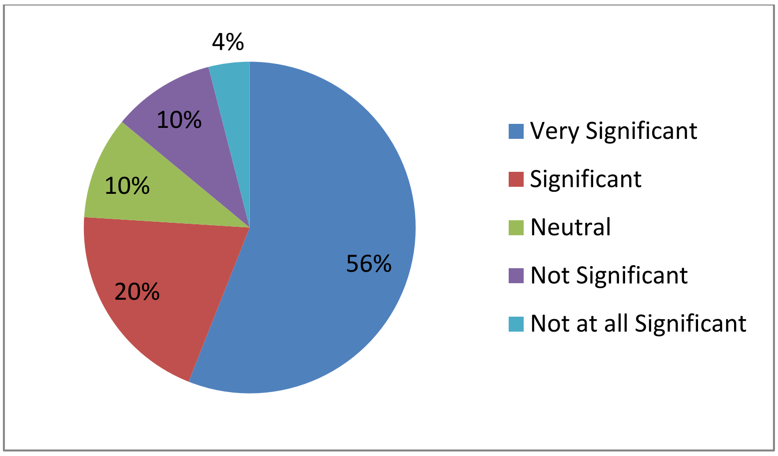
Understanding the impact of equipment costs reveals potential financial burdens on retailers.



Equipment costs are a significant challenge (28 Very Significant, 10 Significant) for many retailers, suggesting a need for financial assistance or alternative solutions.

10. Benefit of Subsidized Equipment

Assessing the perceived benefit of subsidized equipment helps identify potential support mechanisms.



Bar chart illustrating the perceived benefit of subsidized equipment. Subsidized equipment would be highly beneficial (28 Very Beneficial, 10 Beneficial) for retailers.

Hypothesis

Null Hypothesis (H0): There is no significant relationship between the receipt of specialized training and the ease of implementing regulations among ornamental fish retailers.

The statistical test used here is the **One-Sample Proportion Z-Test**. It is used to determine whether the proportion of a specific outcome in a sample differs significantly from a hypothesized population proportion. In this case, we're testing if the proportion of retailers who rate specialized training as "Important" or "Very Important" is significantly greater than 50%.

Since the calculated z-value (3.96) is significantly greater than the critical z-value (1.645) and the p-value (0.0000375) is much less than 0.05, we reject the null hypothesis (H_0).

There is strong statistical evidence to support the alternative hypothesis (H_1), indicating that more than 50% of ornamental fish retailers rate specialized training programs as "Important" or "Very Important" to their business. This highlights a clear demand for specialized training programs in the ornamental fish retail sector.

Findings

- The overwhelming perception that government regulations are difficult or very difficult to implement points to potential issues with the clarity, complexity, or practicality of these regulations. This could also indicate a lack of communication or support from regulatory bodies.
- The low number of retailers who have received specialized training highlights a potential skills gap in the industry. This could impact fish health, business management, and overall sector development.
- The strong demand for free or subsidized training programs indicates a clear need and willingness among retailers to improve their knowledge and skills. This suggests that such programs would be well-received and likely have a positive impact.
- The high cost of equipment is a major challenge for a large proportion of retailers. This could limit their ability to invest in better technology, expand their businesses, and maintain optimal conditions for fish health.
- The widespread belief that subsidized equipment would be beneficial suggests that such subsidies could significantly alleviate financial burdens and encourage investment in the sector.
- The strong online presence of most retailers indicates an adaptation to digital platforms and a potential reliance on e-commerce for reaching customers. Finding: The mix of established and newer businesses suggests a dynamic market with opportunities for both. However, newer businesses may face particular challenges in competing with more established players.
- The dominance of partnerships over sole proprietorships could indicate a preference for shared resources and risk.

Conclusion

The ornamental fish retail sector in Kerala faces challenges related to licensing and regulations, training and skill development, and access to affordable equipment. Addressing these issues through targeted interventions, such as streamlined licensing procedures, accessible training programs, and subsidized equipment schemes, is crucial for fostering a thriving and sustainable ornamental fish trade. These findings contribute valuable insights for policymakers, industry stakeholders, and retailers themselves, providing a foundation for developing strategies that promote the long-term health and prosperity of this promising sector within the Indian economy.

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INVESTORS PERCEPTION TOWARDS MUTUAL FUND WITH SPECIAL REFERENCE TO KORATTY PANCHAYATH, THRISSUR

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Abstract

Investment is a crucial aspect of financial planning, enabling individuals to grow wealth, achieve financial security, and meet long-term financial objectives. Mutual funds have emerged as a widely preferred investment vehicle due to their diversified portfolio, professional management, and relative ease of investment. They provide investors with access to a broad range of asset classes while mitigating risks associated with direct investments in stock markets. The perception of mutual funds among investors varies widely due to several factors such as financial literacy, risk tolerance, market volatility, past investment experiences, and socio-economic conditions.

Investor perception is a key determinant in the adoption of mutual funds as a preferred investment option. Several factors shape investor attitudes, including their awareness of financial markets, risk appetite, investment goals, and trust in fund management companies. Many investors perceive mutual funds as a safer alternative to direct stock investments due to their diversification benefits. However, concerns related to management fees, fund performance, and market downturns can lead to uncertainty. Additionally, investors with limited financial literacy often hesitate to invest in mutual funds due to a lack of knowledge about fund structures and associated risks.

This study examines investor perceptions towards mutual funds in Koratty Panchayath, a semi-urban region where investment behaviour is influenced by socio-economic factors, accessibility to financial advisory services, and general awareness about investment avenues. The research investigates the factors affecting investor decisions, including demographic influences, risk appetite, and market exposure. The study also explores how investor confidence can be enhanced through increased transparency, financial education, and tailored investment strategies.

An important aspect of this study is understanding the role of financial advisors and institutions in shaping investor confidence. Financial institutions play a pivotal role in fostering trust through effective communication, education, and personalized investment guidance. The availability of digital investment platforms has also influenced investment behaviour, making it easier for individuals to track fund performance and manage their portfolios efficiently.

Keywords

Mutual funds, Investor perception, Risk tolerance, Investment behaviour, Financial literacy

INTRODUCTION

Mutual funds are one of the most popular investment options for both retail and institutional investors. They provide an opportunity for investors to pool their resources together and invest in a diversified portfolio of stocks, bonds, or other securities. The primary benefit of mutual funds lies in their ability to offer professional management, which helps investors mitigate risks and make informed decisions. Mutual funds serve as an attractive investment avenue, especially for individuals who may not have the expertise or time to actively manage their investments.

In India, the mutual fund industry has witnessed significant growth in recent years, driven by regulatory reforms, technological advancements, and increased investor participation. The emergence of digital investment platforms and systematic investment plans (SIPs) has further encouraged retail investors to explore mutual funds as a reliable savings and wealth-building instrument. However, challenges such as limited awareness, market risks, and trust issues still persist, highlighting the need for targeted financial literacy initiatives.

This study aims to analyse investor perception towards mutual funds in Koratty Panchayath, examining how demographic, economic, and psychological factors influence investment choices. By identifying key drivers and barriers, the research seeks to provide valuable insights that can help improve mutual fund adoption rates and enhance investor confidence in this financial instrument.

Problem Statement

The growing popularity of mutual funds as an investment avenue has led to increased participation from individual and institutional investors. However, a significant challenge remains in understanding the factors that shape investors' attitudes toward mutual funds, including their awareness levels, trust in fund managers, past experiences, risk tolerance, and overall financial literacy. Many investors either under-invest, over-invest, or avoid mutual funds altogether due to perceived risks or lack of adequate knowledge. This study aims to analyse and evaluate investors' perceptions of mutual funds, identifying the underlying reasons for their attitudes and assessing how these perceptions impact their investment choices. By doing so, the research will provide insights into how mutual fund companies can tailor their marketing and communication strategies to align with investor needs and preferences, thereby fostering a more informed and confident investor base.

Objectives

- To understand the demographic characteristics of mutual fund investors in Koratty Panchayath.
- To analyse the perception of investors towards mutual funds.

Research Methodology

The study employs a descriptive research design to analyse investor perception towards mutual funds in Koratty Panchayath. A structured questionnaire was designed to collect primary data from 50 respondents using a convenience sampling method. The respondents were selected based on their accessibility and willingness to participate. The questionnaire covered various aspects such as demographic details, investment preferences, risk tolerance, and confidence in mutual funds. Primary data was supplemented by secondary sources, including books, journals, and financial reports to provide a broader understanding of mutual fund investments. Statistical tools such as frequency distribution, percentage analysis, and mean were used to analyse the data, allowing for an in-depth examination of investor behaviour and trends. The findings from this methodology help in identifying the key factors influencing mutual fund investment decisions and provide valuable insights for financial institutions to enhance investor participation and market trust.

Results and Discussion

The results of the study reveal that the majority of mutual fund investors in Koratty Panchayath are young professionals with postgraduate qualifications, indicating a well-educated investor base. The significant proportion of respondents in the 25-36 age group suggests a growing interest in mutual fund investments among younger adults, driven primarily by goals such as wealth creation and retirement planning. The preference for SIPs over lump-sum investments indicates a cautious and systematic approach to investing, which aligns with a growing awareness of market volatility and risk management.

Gender distribution shows near parity, highlighting an increasing participation of women in financial markets. However, the income distribution indicates that most investors earn below ₹5 lakh annually, suggesting that mutual fund investments are accessible across various income brackets. The preference for equity funds reflects a growth-oriented mindset among investors, though the perception of moderate risk indicates a balanced approach toward financial planning.

Investor confidence in understanding mutual funds is relatively high, yet transparency concerns persist. This underscores the need for better communication from fund houses regarding performance metrics and investment strategies. The study also found that high returns are the primary motivation for investors, followed by flexibility and diversification benefits. However, the limited allocation to mutual funds in overall investment portfolios suggests that investors may still view these funds as supplementary to traditional investment avenues.

Moreover, the significant influence of professional fund managers indicates the trust investors place in expert guidance. Tracking fund performance is generally considered straightforward, with most respondents using risk-adjusted returns as a key evaluation metric. The willingness of the majority to recommend mutual funds to others indicates overall satisfaction, although the demand for greater variety and improved transparency highlights areas for improvement.

The findings suggest that financial institutions should focus on targeted education programs to demystify mutual funds and alleviate risk concerns. Enhanced digital tools for performance tracking, along with personalized investment recommendations, could further improve investor engagement and confidence.

Conclusion

Mutual funds are gaining popularity, especially among young professionals. However, limited awareness, risk perception, and transparency concerns hinder wider adoption.

Financial institutions should focus on investor education, transparency, and product diversification to increase participation. By addressing these concerns, mutual funds can become a more trusted investment avenue, contributing to overall economic growth.

The study highlights the significant role of demographic and psychological factors in shaping investor perceptions. Younger investors show higher participation, primarily driven by the desire for wealth creation. Despite the benefits, the allocation of funds remains conservative, indicating a need for more robust financial literacy programs. Understanding the underlying reasons for risk perceptions and addressing transparency concerns can foster greater confidence among potential investors.

Furthermore, the research underscores the importance of professional fund managers in guiding investment decisions. Enhanced customer support and personalized advisory services can further strengthen investor trust. As the mutual fund industry evolves, continuous efforts to align product offerings with investor needs will be crucial for sustained growth and development.

Ultimately, mutual funds present a promising investment avenue when supported by comprehensive investor education, transparent practices, and innovative investment options. Financial institutions must adapt to changing investor preferences, ensuring accessibility, simplicity, and reliability in their services.

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