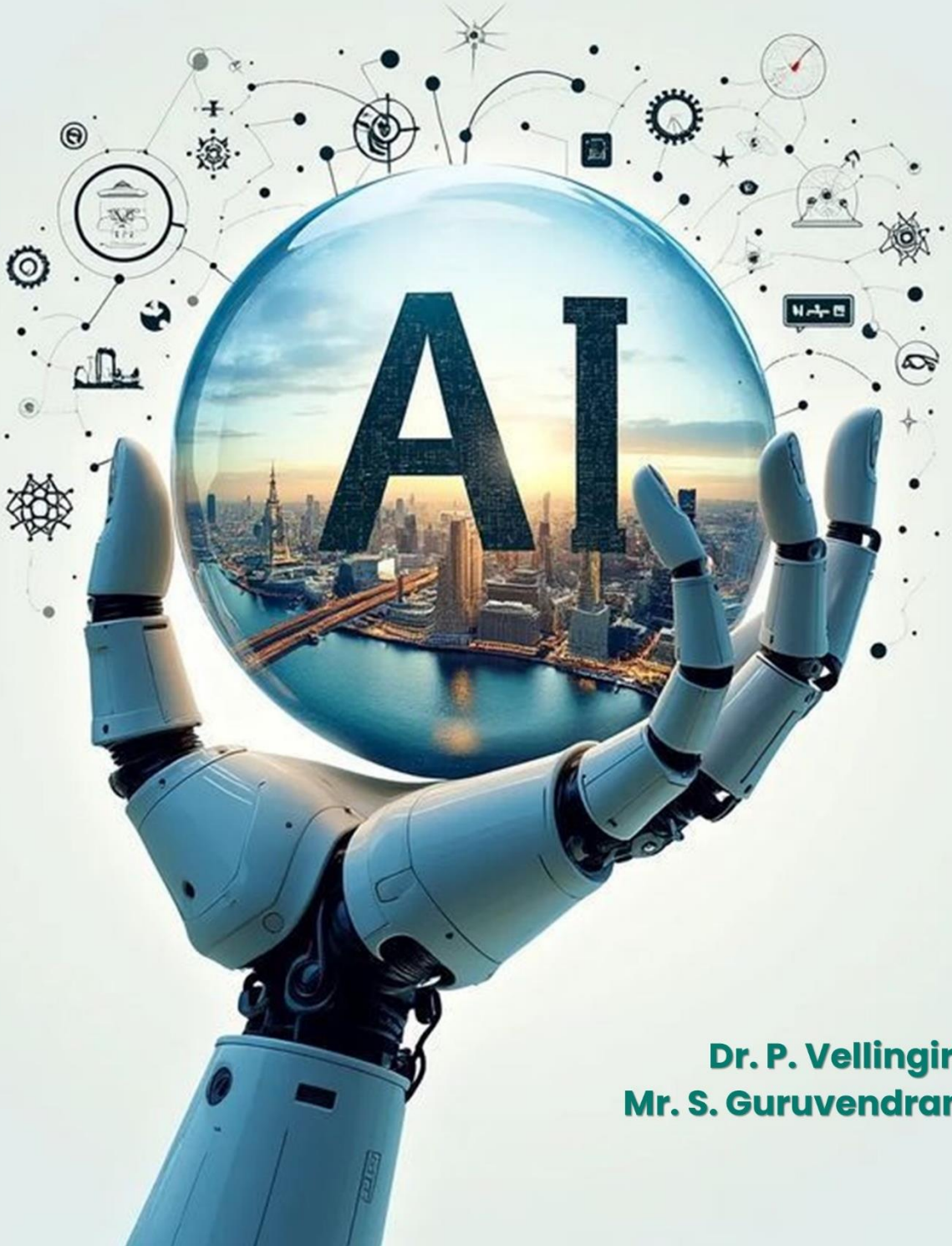
Role of AI in BUSINESS AND ENTREPRENEURIAL DEVELOPMENT



Dr. P. Vellingiri
Mr. S. Guruvendran

ROLE OF AI IN BUSINESS AND ENTREPRENEURIAL DEVELOPMENT

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ABOUT THE COLLEGE

The ***VET Institute of Arts and Science (Co-Education) College***, one of the most recent gems in the illustrious Vellalar family, stands as an epitome of intellectual excellence. This institution cultivates a dynamic academic community that fosters student learning, advances faculty research, and contributes to society. With a focus on collaborative scholarship, personalized development, and respect for diverse perspectives, VET IAS prepares students to be sharp thinkers, eloquent communicators, and ethical leaders. Grounded in deep knowledge and intellectual courage, their education empowers them to navigate a swiftly evolving world and leave a lasting mark that extends far beyond the classroom.

VET Institute of Arts and Science (Co-education) College, Thindal Erode, Tamilnadu. India was established in 2019 with the aim of Education for all. It is a co-educational institution which provides value based higher education. The college is situated at a distance of 6 kms from Erode, on the Erode- Perundurai state highway. VET IAS has sophisticated infrastructure, fully equipped laboratories, highly configured computer lab with 24-hour Internet facility, well stacked library and well qualified and dedicated members of faculty.

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The ***School of Commerce*** at ***VET IAS*** offers an extensive array of programs, including B.Com, B.Com (CA), B.Com (PA), and B.Com (A&F), which significantly enrich our academic portfolio. In response to the growing demand for highly proficient commerce professionals, we have further augmented our offerings with post-graduate programs (M.Com) and advanced research opportunities (M.Phil. and Ph.D.). This strategic expansion reflects our unwavering commitment to academic excellence and to equipping students with the knowledge and skills essential for thriving in the ever-evolving landscape of commerce.

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ABOUT THE CONFERENCE

The School of Commerce is honoured to host the 4th International Conference (Hybrid Mode) on ***Strategic Financial Reforms for Viksit Bharat @ 2047***. As India marches toward the milestone year of 2047 - completing 100 years of independence - the vision of a Viksit Bharat (Developed India) requires bold, inclusive, and technology-driven financial reforms. These reforms aim to build a resilient economy with equal opportunities, innovation, and sustainable growth.

Empowering youth as nation builders, promoting entrepreneurship, and advancing digital finance are at the heart of this transformation. Capital markets are enabling wealth creation, while sustainable finance and practices guide responsible growth. Banking and credit reforms are expanding access to funds, and simplified taxation ensures transparency and compliance. Together, these measures are shaping a future-ready, inclusive financial ecosystem that drives India toward global leadership.

This conference will bring the research communities of different fields together in one place to share their research ideas. The main purpose of this conference is to incorporate interdisciplinary research to bring out the best applications. This conference will serve as a unique confluence of opportunities and share their views about the Strategic Financial Reforms.

SECRETARY & CORRESPONDENT'S MESSAGE

Thiru. S D Chandrasekar
Secretary
VET Institute of Arts and Science (Co-Education) College,
Thindal, Erode - 638 012. Tamil Nadu, India.

The Fourth International Conference on ***"Strategic Financial Reforms for Viksit Bharat @ 2047"*** is a commendable initiative of the Department of Commerce. The theme is timely, relevant, and aligned with India's long-term developmental vision. The deliberations of this conference will undoubtedly provide deep insights into the financial strategies and reform pathways essential for building a strong and self-reliant economy by 2047.

By bringing together researchers, academicians, and industry experts from diverse fields, this conference fosters an interdisciplinary platform for sharing innovative ideas and practical frameworks. Such collective knowledge exchange will significantly contribute to shaping informed financial policies and sustainable economic growth.

I congratulate the organizers for selecting a topic of national significance and extend my best wishes for the successful conduct of this conference and many more meaningful programmes in the years ahead.

PRINCIPAL'S MESSAGE

Dr. V. P. Nallaswamy
Principal
VET Institute of Arts and Science (Co-Education) College,
Thindal, Erode - 638 012. Tamil Nadu, India.

I extend my warm greetings to the School of Commerce on the occasion of the Fourth International Conference on ***"Strategic Financial Reforms for Viksit Bharat @ 2047"***. This conference, organized in a hybrid mode, reflects our commitment to fostering meaningful academic dialogue on issues that shape the nation's economic future.

The chosen theme is timely and significant, aligning closely with India's long-term developmental vision. As the country progresses toward becoming a developed economy by 2047, the need for strategic, technology-driven, and sustainable financial reforms becomes increasingly vital. This forum offers an excellent platform for scholars, policymakers, and industry practitioners to exchange insights on these critical areas.

I congratulate the organizers for their dedicated efforts and wish the conference great success. May the discussions held here contribute valuably to the nation's march toward Viksit Bharat @ 2047.

DEAN ADMINISTRATION AND STUDENT AFFAIRS MESSAGE

Dr. Logesh Kumar S
Dean – Administration and Student Affairs
VET Institute of Arts and Science (Co-Education) College,
Thindal, Erode - 638 012. Tamil Nadu, India.

I am pleased to extend my warm greetings to all participants of the Fourth International Conference on ***"Strategic Financial Reforms for Viksit Bharat@ 2047",*** organized by the School of Commerce. This conference offers a significant platform that unites scholars, policymakers, and industry professionals to explore the financial strategies vital for India's developmental vision.

At a time when our nation is progressing toward becoming a developed economy, strengthening fiscal frameworks, enhancing financial inclusion, and integrating technology into financial systems are essential priorities. This forum provides an excellent opportunity for meaningful dialogue and knowledge exchange on these critical themes.

I encourage all participants—especially students and research scholars—to engage actively and benefit from the diverse perspectives presented. I am confident that the insights gained through this conference will contribute meaningfully to the nation's journey toward Viksit Bharat @ 2047.

My best wishes for a successful, enriching, and impactful conference.

PROGRAMME LEAD'S MESSAGE

Dr. Geetha P S
Program Lead (School of Commerce)
VET Institute of Arts and Science (Co-Education) College,
Thindal, Erode - 638 012. Tamil Nadu, India.

It is a privilege to extend my warm greetings to all the distinguished academicians, industry experts, and research scholars participating in the 4th International Conference on ***Strategic Financial Reforms for Viksit Bharat @ 2047***. This esteemed conference reflects our institution's steadfast commitment to fostering knowledge, promoting innovation, and contributing meaningfully to national development.

As India aspires to emerge as a developed nation by 2047, strategic financial reforms play a pivotal role in shaping an inclusive, resilient, and future ready economy. These reforms are not merely policy adjustments they are catalysts that unlock opportunities, strengthen financial systems, and uplift communities across the nation.

The scholarly contributions presented in this proceedings volume embody the spirit of inquiry and the pursuit of excellence. Each paper stands as a significant stride toward envisioning and realising a progressive financial ecosystem aligned with the aspirations of Viksit Bharat.

I extend my sincere appreciation to the authors, reviewers, organizers, and the entire academic community for their unwavering dedication. Together, let us continue to uphold the vision of "Educate, Elevate and Empower" as we strive toward a brighter and more prosperous India.

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CHAPTER - 1

STUDY ON PROBLEMS FACED BY WOMEN ENTREPRENEURES IN FASHION INDUSTRY WITH REFERENCE TO SALEM DISTRICT

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ABSTRACT

This study aims to explore the challenges faced by women entrepreneurs in the fashion industry within the Salem District. Despite the growing prominence of women-led businesses, numerous barriers hinder their entrepreneurial journey, including limited access to resources, financial constraints, gender biases, and market competition. The research employs a qualitative approach, gathering data through interviews and surveys with women entrepreneurs operating in the fashion sector. Key areas of focus include business development, marketing strategies, financial management, and the impact of socio-cultural factors. The findings highlight the critical issues that affect the sustainability and growth of women-owned fashion enterprises, offering insights into potential policy interventions and support mechanisms. This study contributes to a deeper understanding of the entrepreneurial landscape for women in Salem District, aiming to foster a more inclusive and supportive environment for women in the fashion industry.

Keywords: *Women Entrepreneurs, Fashion Industry, Entrepreneurial Challenges, Business Development*

1. INTRODUCTION

Women entrepreneurs are individuals or groups of women who initiate, organize, and manage business enterprises. They take risks, introduce innovations, and provide leadership in various aspects of business. In India, women have traditionally been involved in small and cottage industries, but with growing awareness of their economic role, many are venturing into organized enterprises. The fashion design industry, for example, has evolved from a home-based activity into full-fledged fashion boutiques.

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Despite facing challenges such as societal stereotypes and family responsibilities, women are entering the business world in increasing numbers. Economic necessity, the desire for achievement, and the need for independence drive women to entrepreneurship. Though business remains male-dominated, women are overcoming barriers to establish themselves as successful entrepreneurs, gaining self-respect, confidence, and social prestige.

2. OBJECTIVES OF THE STUDY

- To know the socio – demographic variables of women entrepreneurs in Salem.
- To study the support given by the Government to women entrepreneurs.
- To study the problems and challenges faced by the women entrepreneurs with regards to fashion industry in Salem.
- To examine the types of issues and problems they encounter in order to reach the level of success.
- To find out conclusions and offer suggestions.

3. STATEMENT OF THE PROBLEM

This study is focused attention to identify the problems faced by women entrepreneurs in fashion industry. Even though the government organizes women by various associations, they are not ready to undertake the business. As compared to men, women are less motivated to start business units due to some unwanted fear, lack of motivation and kind of activities. This study tries to discuss about the problems faced by the women entrepreneurs.

4. Review of Literature

Women entrepreneurs in India, including those in the fashion industry, face significant challenges that hinder their business growth. Studies highlight limited access to finance as a major barrier for women, with societal and gender biases making it harder for them to secure loans and investments (Gupta & Gupta, 2019). In the fashion sector, these financial constraints affect product development and marketing (Sharma & Srivastava, 2018).

Moreover, a lack of business networks and mentorship is another key challenge, as women often face isolation in a male-dominated entrepreneurial environment (Verma & Rani, 2020). This lack of support affects their ability to grow and scale their businesses. In the fashion industry, women also deal with societal expectations that restrict their entrepreneurial ambitions and make balancing creativity with business pragmatism difficult (Kumar & Singh, 2021).

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In the case of Salem District, women face additional challenges related to traditional gender roles, limited access to training, and a lack of infrastructure, which restrict their ability to compete in a global market (Sampath & Shankar, 2020). Despite these barriers, women in Salem have shown resilience, but they often struggle with digital literacy and marketing, limiting their reach (Vishnu & Devika, 2021).

To support these women, there have been calls for improved access to resources, better mentorship programs, and targeted policy interventions (Jha & Sharma, 2017). However, more needs to be done to address the unique challenges faced by women in the fashion industry in rural and semi-urban areas like Salem.

5. Research Methodology

This study aims to explore the challenges faced by women entrepreneurs in the fashion industry in Salem District. To achieve this, a mixed-methods approach combining both qualitative and quantitative research methods will be employed. The methodology will include data collection through surveys and interviews, followed by data analysis.

5.2 Research Design

A descriptive research design will be used to identify and understand the problems faced by women entrepreneurs in the fashion sector.

5.2 Population and Sample

The study will focus on women entrepreneurs in the fashion industry in Salem District. A sample of 150 participants will be selected using purposive and snowball sampling techniques to ensure diverse representation.

5.3 Data Collection Methods

Surveys/Questionnaires: Structured questionnaires will collect quantitative data on challenges such as access to finance, gender biases, and marketing issues.

Interviews: Semi-structured interviews will gather qualitative insights into the personal experiences and strategies of women entrepreneurs.

5.4 Data Analysis

Quantitative Data: Descriptive statistics will analyze survey responses to identify trends.

Qualitative Data: Thematic analysis will be used to examine interview responses and uncover key themes.

5.5 Limitations

The study is limited to Salem District, so findings may not fully represent women entrepreneurs in other regions. Additionally, there could be response bias in participant answers.

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5.6 Ethical Considerations

Informed consent will be obtained from all participants, ensuring confidentiality and anonymity of responses.

Analysis of the Study

- Percentage analysis
- Chi-square test

Percentage Analysis

Table No: 1 Age Group of the Respondents

S.No	Age of the Respondents	No. of Respondents	Percentage
1.	Below 30 Years	52	34.67
2.	31-40 Years	64	42.67
3.	41-50 Years	20	13.33
4.	Above 50 Years	14	9.33
Total		**150**	**100**

Source: Primary Data

The data presented in the table shows that 42.67% of the respondents are aged between 31 and 40 years. Additionally, 34.67% are under the age of 30, 13.33% fall in the 41–50 age bracket, and 9.33% are over 50. This suggests that most respondents are in the 31–40 age group.

Table No. 2 Educational Qualifications

S.No	Education	No. of Respondents	Percentage
1.	Primary	14	9.93
2.	Secondary	56	37.33
3.	Degree/Diploma	56	37.33
4.	Post Graduates	24	16.00
Total		**150**	**100**

Source: Primary Data

The table indicates that 37.33% of the respondents have completed secondary education or hold a degree/diploma. Furthermore, 16% of them are postgraduates, while 9.3% have only primary education. This shows that the majority of respondents possess either secondary or degree/diploma qualifications.

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Table No. 3 Marital Status

S.No	Marital Status	No. of Respondents	Percentage
1.	Married	78	52.00
2.	Unmarried	40	26.67
3.	Divorce	14	9.33
4.	Widow	18	12.00
Total		**150**	**100**

Source: Primary Data

The table shows that 52% of the respondents are married, 26.67% are single, 12% are widowed, and 9.33% are divorced. This indicates that a significant portion of the respondents are married.

Table No.4 Types of Business

S.No	Type of Business	No. of Respondents	Percentage
1	Sole proprietorship	110	73.33
2	Partnership	26	17.33
3	Joint Hindu family	14	9.33
4	Joint Stock Company	-	-
Total		**150**	**100**

Source: Primary Data

The table indicates that 73.33% of the respondents are operating as sole proprietors, while 17.33% are involved in partnership ventures, and 9.33% participate in Joint Hindu Family businesses. This suggests that most women entrepreneurs run their businesses as sole proprietors.

Table No. 5 Size of Business

S.No	Size of the Business	No. of Respondents	Percentage
1.	Above Rs.5,00.000	12	8.00
2.	Rs.2,00,000-5,00,000	12	8.00
3.	Rs.1,00,000-2,00,000	28	18.67
4.	Rs.50,000-1,00,000	46	30.67
5.	Below Rs.50,000	52	34.66
Total		**150**	**100**

Source: Primary Data

The table shows that 34.66% of the respondents earn less than ₹50,000, 30.67% have an income between ₹50,000 and ₹1,00,000, 18.67% fall within the ₹1,00,000 to ₹2,00,000 range, while 8% each earn between ₹2,00,000 to ₹5,00,000 and above ₹5,00,000. It can be inferred that a majority of the respondents have an income below ₹50,000.

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Table No.6 Source of Finance

S.No	Source of Finance	No. of Respondents	Percentage
1.	Personal	50	33.33
2.	Friend & Relatives	20	13.33
3.	Financial institution	40	26.67
4.	Bank	20	13.3
5.	Government	20	13.3
Total		**150**	**100**

Source: Primary Data

The table indicates that 33.33% of the respondents rely on personal funds for financing their business, while 26.67% obtain financial support from financial institutions. The remaining respondents receive funding from banks, government schemes, or friends and relatives. This suggests that personal savings are the primary source of finance for most respondents.

Table No. 7 Financial Assistance Availed

S.No	Financial Assistance Availed	No. of Respondents	Percentage
1.	Never Availed	14	9.33
2.	Rarely Availed	70	46.67
3.	Frequently availed	66	44
Total		**150**	**100**

Source: Primary Data

The table shows that 46.67% of the respondents rarely access finance, 44% do so frequently, and 9.33% never avail financial assistance. It can be concluded that most women entrepreneurs experience limited availability of finance.

Table No.8 Marketing Facilities

S.No	Marketing facilities	No. of Respondents	Percentage
1.	Inadequate	18	12
2.	Somewhat adequate	40	26.67
3.	Adequate	52	34.67
4.	Not needed	40	26.67
Total		**150**	**100**

Source: Primary Data

The table indicates that 34.67% of respondents consider marketing facilities to be adequate, 26.67% feel they are unnecessary, another 26.67% find them somewhat adequate, and 12% view them as inadequate. This suggests that most respondents believe the marketing facilities are sufficient.

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Table No.9 Entrepreneurial profit

S.No	Entrepreneurial profit	No. of Respondents	Percentage
1.	Loss	16	10.67
2.	Medium	104	69.33
3.	High	30	20
Total		**150**	**100**

Source: Primary Data

The table shows that 69.33% of the respondents earn a medium profit, 20% report high profits, and 10.67% have incurred losses. This indicates that the majority of entrepreneurs' experience moderate profitability.

Table No.10 Profit Re-Investment Factor

S.No	Profit Reinvestment	No. of Respondents	Percentage
1.	Poor	16	10.67
2.	Medium	110	73.33
3.	Good	24	16
Total		**150**	**100**

Source: Primary Data

The table indicates that 73.33% of the respondents reinvest a medium portion of their profits, 16% reinvest a high amount, and 10.67% reinvest a low amount. It can be concluded that the majority of respondents have a moderate level of profit reinvestment.

CHI-SQUARE TEST

1.Age Group

a.Socio-Psycho system

Null Hypothesis

There is no association between socio psycho system and age of the entrepreneurs.

Degree of freedom Level of significance	6 5%
Table Chi-square value	12.592
Calculated Chi-square value	8.722
Result	**Not significant**

Since the calculated Chi-square value is lower than the critical table value, the null hypothesis is accepted. Therefore, it can be concluded that there is no significant relationship between the socio-psychological system and the age of women entrepreneurs.

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b.Do you feel problem

Null Hypothesis

There is no association between general problems and age of the entrepreneurs.

Degree of freedom	6
Level of significance	5%
Table Chi-square value	12.592
Calculated Chi-square value	23.84
Result	**Significant**

As the calculated Chi-square value exceeds the critical table value, the null hypothesis is rejected. Thus, it can be concluded that there is a significant association between the general problems faced and the age of women entrepreneurs.

2.Educational Qualification

a. Socio-Psycho system

Null Hypothesis

There is no association between Educational Qualification of the entrepreneur and socio psycho system.

Degree of freedom	6
Level of significance	5%
Table Chi-square value	12.592
Calculated Chi-square value	20.202
Result	**Significant**

Since the calculated Chi-square value is greater than the table value, the null hypothesis is rejected. Therefore, it can be concluded that there is a significant relationship between educational qualification and the socio-psychological system.

b. Do you feel problem situation

Null Hypothesis

There is no association between Educational Qualification of the entrepreneur and general Problems.

Degree of freedom	6
Level of significance	5%
Table Chi-square value	12.592
Calculated Chi-square value	42.15
Result	**Significant**

The calculated Chi-square value exceeds the critical table value, leading to the rejection of the null hypothesis. Therefore, it can be concluded that there is a significant association between the entrepreneurs' educational qualifications and the general problems they face.

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3.Marital Status

a. Socio-Psycho system

Null Hypothesis

There is no association between the marital status of the entrepreneur and socio psycho system.

Degree of freedom	6
Level of significance	5%
Table Chi-square value	12.592
Calculated Chi-square value	23.54
Result	**Significant**

The calculated Chi-square value is higher than the table value. Hence, the null hypothesis is rejected. It could be concluded that there is an association between the marital status of the entrepreneurs and socio psycho system.

b. Do you feel problem situation

Null Hypothesis

There is no association between the marital status of the entrepreneur and general problems.

Degree of freedom	6
Level of significance	5%
Table Chi-square value	12.592
Calculated Chi-square value	13.25
Result	**Significant**

As the calculated Chi-square value surpasses the table value, the null hypothesis is rejected. Therefore, it can be concluded that there is a significant relationship between the marital status of entrepreneurs and the general problems they encounter.

FINDINGS

a.General Findings

- A significant portion of the respondents, accounting for 42.67%, belong to the age group of 31 to 40 years, indicating that most women entrepreneurs surveyed are in this mid-adult age range.
- Regarding educational qualifications, 37.33% of the respondents have completed either secondary education or hold a degree or diploma, suggesting a moderate level of formal education among the participants.
- In terms of marital status, 26.67% of the respondents are married, reflecting the proportion of women entrepreneurs who balance both family and business responsibilities.

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- More than half of the respondents, 54.67%, are involved in service-oriented businesses, highlighting the prominence of the service sector among women entrepreneurs in the study.
- A large majority, 73.33%, operate their businesses as sole proprietorships, indicating a preference for individual ownership and management.
- When it comes to income, 34.66% of the respondents earn below ₹50,000, suggesting that a considerable number of entrepreneurs are operating with relatively modest earnings.
- Lastly, 69.33% of the respondents classify their entrepreneurial profit as medium, showing that most women entrepreneurs are achieving moderate levels of profitability in their ventures.

b.Specific Findings

Findings of the Study on Factors Influencing the Development of Women Entrepreneurs

1. Based on Age

a. Socio-Psychological System

The analysis of the socio-psychological system shows that respondents under 30 years of age have a higher average score in this aspect. Among this group, 65.38% of respondents fall within the medium level category. However, the Chi-square test results indicate that there is no significant association between the entrepreneur's age and their socio-psychological system.

b. Perception of Problem Situations

The study of general problems faced by women entrepreneurs reveals that those under 30 years exhibit a higher average score related to problem situations. Within this age group, 60% of the respondents are classified at a medium level in terms of experiencing problems. The Chi-square test further confirms that there is no significant relationship between the entrepreneur's age and the general problems they encounter.

2. Based on Educational Qualification

a. Socio-Psychological System

The analysis of the socio-psychological system indicates that respondents holding a degree or diploma have a higher average score in this area. Within this group, 71.43% of the respondents fall into the low-level category. The Chi-square test results show a significant association between the educational qualification of entrepreneurs and their socio-psychological system.

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b. Perception of Problem Situations

Regarding general problems faced by women entrepreneurs, the average score is highest among postgraduates. Of these, 85.71% are categorized at a medium level in terms of experiencing problem situations. The Chi-square test confirms that there is a significant relationship between the educational qualifications of the entrepreneurs and the general problems they face.

3. Based on Marital Status

a. Socio-Psychological System

The analysis of the socio-psychological system reveals that unmarried respondents have a higher average score in this aspect. Among them, 70% fall within the medium-level category. The Chi-square test indicates a significant association between the marital status of entrepreneurs and their socio-psychological system.

b. Perception of Problem Situations

Regarding general problems faced, unmarried respondents also exhibit a higher average score. Within this group, 35.90% of respondents are classified at the low-level category. The Chi-square test confirms that there is a significant relationship between the marital status of the respondents and the general problems they experience.

SUGGESTIONS & RECOMMENDATIONS

Some women entrepreneurs face challenges such as excessive workload, high stress levels, and difficulties managing technical tasks. To address these issues, the following recommendations are proposed:

- To manage the heavy workload effectively, women entrepreneurs should create a detailed work plan and follow it systematically.
- It is important for them to separate family matters from business concerns, ensuring they devote their full attention to work during business hours.
- Seeking advice and guidance from experienced technical experts can help improve their skills and handle technical activities more efficiently.

CONCLUSION

Women entrepreneurs often face a wide range of challenges, including social barriers, limited access to finance, balancing family responsibilities, and technical skill gaps. Despite these hurdles, their contribution to the economy remains highly significant and cannot be overlooked. Women entrepreneurs play a vital role in driving balanced economic development by bringing diversity, innovation, and resilience to the business environment. Their participation in various industries helps create more inclusive growth, which benefits society as a whole.

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The active involvement of women in entrepreneurship leads to job creation, poverty reduction, and improved living standards. Women tend to reinvest their earnings into their families and communities, which further supports education, health, and social welfare. This ripple effect contributes to the sustainable development of the nation, promoting economic stability and growth. Moreover, empowering women entrepreneurs helps in bridging the gender gap in business and leadership roles. It challenges traditional stereotypes and encourages more equitable opportunities across all sectors. When women succeed in business, they become role models and inspire other women to pursue entrepreneurial ventures, fostering a culture of self-reliance and confidence.

For a nation like India, which strives for inclusive progress, the participation of women entrepreneurs is indispensable. Their contributions help diversify the economy, enhance competitiveness, and create a more dynamic market. Hence, despite the many difficulties they face, supporting and encouraging women entrepreneurs is essential for achieving balanced economic growth and overall national prosperity.

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CHAPTER - 2

THE IMPACT OF FINANCIAL INNOVATIONS ON ECONOMIC GROWTH : AN EMPIRICAL STUDY

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ABSTRACT

Global financial systems have undergone a transformation because to financial breakthroughs including blockchain technology, digital banking, and mobile payments. Using both primary and secondary data, this study examines the empirical connection between financial innovations and economic development. Using statistical techniques such as one-way ANOVA, linear regression, and bivariate correlation, the research examines the answers of 200 financial experts from various industries. The findings show that financial innovation and economic growth metrics including GDP growth, financial inclusion, and investment efficiency are strongly positively correlated. While ANOVA shows differences in perception across sectors, linear regression validates financial innovation as a strong determinant of economic success. For financial institutions and governments looking to use innovation for macroeconomic progress, the report provides practical insights.

Keywords : *Financial Innovation, Economic Growth, FinTech, Digital Banking, GDP, SPSS, Bivariate Correlation, Regression, ANOVA.*

INTRODUCTION

A major factor influencing the contemporary global economy is financial innovation, which includes a broad range of developments such technical enhancements in banking services, the development of new financial products, and the emergence of FinTech businesses that upend established financial structures. These developments are widely acknowledged for improving the effectiveness of the financial system, lowering transaction costs, increasing capital availability, and ultimately promoting economic growth. The way that people and organizations engage with financial systems has been completely redesigned by the automation, real-time data processing, and digital platforms that have revolutionized financial services.

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Digital financial services, such as digital wallets, peer-to-peer lending, mobile banking, and blockchain-based platforms, have grown rapidly in emerging nations in recent years. In addition to increasing financial inclusion, these advancements have changed the dynamics of the financial system. The crucial query still stands, though: do these financial advances significantly and quantifiably affect economic growth? If yes, what kind of impact and how big is it? In order to clarify how financial innovation affects the economic paths of developing economies, this study aims to investigate this link experimentally.

RESEARCH GAP

The theoretical benefits of financial innovation in increasing economic activity are highlighted in the literature, but there is a noticeable dearth of empirical support for this claim, especially when it comes to emerging nations and the use of primary data and analytical tools like SPSS. The majority of research focuses on developed markets, which leaves a knowledge gap about how financial innovation functions in less developed financial ecosystems. Furthermore, little is known about how these advances differ in their effects on other industries. By gathering primary data particular to the sector and using reliable statistical methods like regression, ANOVA, and correlation, this study fills in these gaps. It seeks to identify how financial innovation affects important indicators of economic growth, both directly and indirectly. By doing this, it offers insightful information about how institutional and technology developments in finance influence development results. A more thorough and nuanced knowledge of how financial innovation shapes emerging economies is ensured by this empirical method.

OBJECTIVES OF THE STUDY

1. To analyze the relationship between financial innovations and economic growth indicators.
2. To determine whether financial innovations significantly predict economic growth.
3. To assess differences in perception of financial innovation's impact across different industry sectors.

HYPOTHESES OF THE STUDY

- **H_{01}**: There is no significant correlation between financial innovation and economic growth indicators.
- **H_{11}**: There is a significant correlation between financial innovation and economic growth indicators.
- **H_{02}**: Financial innovation does not significantly predict economic growth.
- **H_{12}**: Financial innovation significantly predicts economic growth.

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- **H_{03}**: There is no significant difference across sectors in perception of financial innovation's impact.
- **H_{13}**: There is a significant difference across sectors in perception of financial innovation's impact.

RESEARCH METHODOLOGY

Using a sample of 200 respondents chosen by stratified random sampling to guarantee sectoral representation, the study employs a quantitative, descriptive, and analytical research design. A structured questionnaire and pertinent secondary publications from reliable sources, including the World Bank and IMF, are used to gather data. The main analytical tool used to handle and evaluate the data is SPSS version 25. The study's goals are empirically supported by the research, which uses one-way ANOVA, bivariate correlation, and linear regression to look at the connections between financial innovation and economic growth.

Variables:

- **Independent Variables (IVs):**
  - Digital Banking Adoption
  - Mobile Payment Usage
  - Blockchain Implementation
  - FinTech Penetration
  - Financial Literacy Rate
- **Dependent Variable (DV):**
  - Economic Growth (measured via GDP growth perception, capital formation, investment inflow)

DATA ANALYSIS AND INTERPRETATION

BIVARIATE CORRELATION ANALYSIS

TABLE 1: BIVARIATE CORRELATION ANALYSIS FOR FINANCIAL INNOVATION VARIABLES AND ECONOMIC GROWTH INDICATORS

Variables	Pearson Correlation (r)	Significance (p-value)
Digital Banking & GDP Growth	0.632	0.000
Mobile Payments & GDP Growth	0.589	0.000
Blockchain & Investment Inflow	0.478	0.001
FinTech Penetration & Capital Formation	0.521	0.000
Financial Literacy & GDP Growth	0.497	0.002

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Interpretation:

Strong and statistically significant correlations between important financial innovation characteristics and measures of economic growth are revealed by the bivariate correlation analysis. Increased use of digital banking services is strongly linked to improved economic output, as seen by the strong positive association between digital banking and GDP growth ($r = 0.632$, $p = 0.000$). Likewise, financial literacy ($r = 0.497$, $p = 0.002$) and mobile payments ($r = 0.589$, $p = 0.000$) show strong positive associations with GDP growth, indicating their critical roles in boosting economic activity. The potential of blockchain technology to draw capital through safe and open systems is seen in its moderate correlation with investment inflow ($r = 0.478$, $p = 0.001$). Furthermore, a significant positive association between capital production and FinTech penetration ($r = 0.521$, $p = 0.000$) highlights the latter's role in boosting profitable investments. All things considered, these results highlight the significant influence of financial innovation on different facets of economic expansion.

LINEAR REGRESSION ANALYSIS

TABLE 2 : MODEL SUMMARY

Model	R	R^2	Adjusted R^2
1	0.732	0.536	0.524

Interpretation

With a R value of 0.732, the linear regression model shows a substantial correlation between financial innovation variables and economic development. This implies that the dependent variable and the predictors have a significant positive association. The model's financial innovation variables account for roughly 53.6% of the variance in economic growth, according to the R2 value of 0.536. Additionally, the model maintains a strong explanatory power even after controlling for the number of predictors, as seen by the modified R2 value of 0.524. All things considered, these findings suggest that, in the setting under study, financial innovation has a major impact on economic growth.

TABLE 3 : ANOVA TABLE

Source	Sum of Squares	df	Mean Square	F	Source	Sum of Squares
Regression	51.76	5	10.352	24.73	Regression	51.76
Residual	44.84	194	0.231		Residual	44.84
Total	96.60	199			Total	96.60

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Interpretation

The regression model is statistically significant in explaining the variation in economic growth caused by financial innovation variables, according to the one-way ANOVA results. The overall sum of squares is 96.60, which includes the residual sum of squares of 44.84 with 194 degrees of freedom and the regression sum of squares of 51.76 with 5 degrees of freedom. The regression's mean square is 10.352, and the computed F-value is a remarkably high 24.73. This shows that financial innovation variables taken together have a considerable effect on economic performance, as the model explains the variance in economic growth far better than would be predicted by chance.

TABLE 4 :COEFFICIENTS TABLE

Variable	B	Std. Error	Beta	t	Sig.
Constant	0.781	0.241		3.24	0.001
Digital Banking	0.414	0.087	0.402	4.76	0.000
Mobile Payments	0.305	0.069	0.351	4.42	0.000
Blockchain	0.198	0.072	0.179	2.75	0.006
FinTech Penetration	0.256	0.064	0.277	3.97	0.000

Interpretation:

All of the chosen financial innovation factors have a statistically significant positive effect on economic growth, according to the regression coefficients. When all variables are zero, the baseline level of economic growth is represented by the constant term (B = 0.781, p = 0.001). With the highest standardized beta coefficient (β = 0.402, p = 0.000) among the variables, digital banking appears to be the model's best predictor of economic development. Mobile payments (β = 0.351, p = 0.000) and FinTech penetration (β = 0.277, p = 0.000) also show strong and significant effects. These findings demonstrate that financial technology developments are important forces behind economic expansion, with digital banking standing out as the most significant contributor.

ONE WAY ANOVA

TABLE 5 : ONE-WAY ANOVA: SECTOR-WISE COMPARISON

Sector	N	Mean Perceived Impact	Std. Dev
Banking	50	4.52	0.61
Insurance	50	4.21	0.72
IT/FinTech	50	4.76	0.54
Manufacturing	50	3.98	0.79

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Interpretation

Significant variations exist between industries when the perceived impact of financial innovation is examined sector-by-sector. Strong recognition of the benefits of financial innovation is evident in the IT/FinTech industry, which reports the highest mean perceived impact (M = 4.76, SD = 0.54). With a mean of 4.52 (SD = 0.61), the banking industry comes in second, indicating that it is directly involved in putting digital financial services into place. The manufacturing sector reveals the lowest mean (M = 3.98, SD = 0.79), while the insurance sector displays a moderate perceived impact (M = 4.21, SD = 0.72). This suggests that financial innovation is viewed as having less of an impact or influencing traditionally non-financial businesses more slowly. These results imply that, in contrast to production-based industries, the perceived advantages of financial innovation are more noticeable in finance-oriented sectors.

TABLE 6: ANOVA SHOWING THE FINANCIAL INNOVATIONS ACROSS DIFFERENT INDUSTRY SECTORS

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.421	3	2.807	6.34	0.000
Within Groups	86.032	196	0.439		
Total	94.453	199			

Interpretation:

The results of the one-way ANOVA show that the perceived effects of financial innovation vary statistically significantly throughout industry sectors. With three degrees of freedom, the between-groups sum of squares is 8.421, yielding a mean square of 2.807. With 196 degrees of freedom, the within-groups sum of squares is 86.032, and the computed F-value is 6.34 with a significance level (p-value) of 0.000. The statistical significance of the disparities in mean perceived impact between the manufacturing, banking, insurance, and IT/FinTech industries is confirmed by this low p-value. Therefore, the perception of the impact of financial innovation is significantly shaped by the sectoral environment.

DISCUSSION

The study's empirical results support a robust and statistically significant link between financial innovations and economic expansion. Digital banking and mobile payments were the most significant factors among the other financial innovation variables examined, suggesting that they significantly improve financial access, transaction efficiency, and general customer convenience.

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These instruments have a considerable impact on GDP growth and capital formation, according to regression and correlation analyses. Blockchain and FinTech adoption also have a beneficial impact, but to a slightly smaller degree. The transformative importance of financial innovation in driving economic development in emerging nations is highlighted by the statistical robustness of these links.

Significant differences in the perceived effects of financial innovation across other industries are also evident from the one-way ANOVA results. The industries that reported the largest perceived impact were banking and IT/FinTech, indicating that these sectors are leading the way in embracing and reaping the benefits of innovation. The industrial sector, on the other hand, demonstrated the least perceived impact, suggesting that non-financial companies have either incorporated these technologies more slowly or found them less relevant. These results suggest that sector-specific, focused financial innovation strategies might work better than a general strategy. While traditional banking reforms are still essential for greater financial inclusion, fintech-friendly policies and investments in digital infrastructure may result in higher returns in tech-driven industries.

CONCLUSION

This study offers solid empirical support for the idea that financial innovations, including blockchain technology, digital banking, mobile payments, and FinTech adoption, significantly improve a number of economic development metrics. These advances improve capital formation, investment inflow, and GDP growth, according to the results of correlation, regression, and ANOVA analyses. The most significant factors were found to be digital banking and mobile payments, underscoring the critical role that easily accessible, quick, and technologically advanced financial services have in contemporary economies.

Additionally, sector-wise study shows that different industries have very different perceptions of the influence of financial innovation. The industries that claim the greatest impact are banking and IT/FinTech, indicating that these sectors are better suited to take advantage of technical improvements for expansion. On the other hand, industries such as manufacturing exhibit comparatively lower levels of participation, indicating the necessity for customized innovation tactics. This suggests that in order to optimize the advantages of financial innovation, sector-specific rules and support systems should be created as a one-size-fits-all approach may prove ineffective.

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Given these revelations, authorities ought to give digital infrastructure expenditures top priority, encourage financial literacy among the general public, and put in place regulatory frameworks that balance fostering innovation with preserving financial stability. Maintaining economic growth will require promoting public-private partnerships and cultivating an environment that is conducive to innovation. By examining regional comparisons, integrating longitudinal data, and examining the long-term economic impacts of developing financial technology across various economic situations, future research could expand on this work.

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CHAPTER - 3

THE ATTITUDE OF ENTREPRENURS ON THE ROADBLOCKS IN THE JOURNEY OF ENTREPRENURIAL GROWTH : A STUDY FOCUSED ON KUNNATHUNADU TALUK, ERNAKULAM DISTRICT

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ABSTRACT

Entrepreneurship refers to the process of developing a business from the ground up—starting with an idea and transforming it into a profitable venture. It is widely recognized as a key engine of economic growth and a driving force for promoting equitable development. The sector has demonstrated remarkable innovation and adaptability, especially in the face of recent economic downturns, and it continues to present significant opportunities for future growth. Entrepreneurship also promotes inclusive growth by creating employment opportunities, particularly in rural and underdeveloped areas. It serves as a valuable resource for unskilled, less educated, and less trained individuals, offering them a path out of poverty through wage employment. In doing so, it helps to improve the standard of living, especially among the weaker sections of society. However, despite its potential, entrepreneurship faces numerous challenges that hinder its growth. To conduct the study, ANOVA test is used.

Keywords: *Entrepreneurs, Entrepreneurship, Growth, ANOVA*

Introduction

An entrepreneur is a person who organizes and operates a business enterprise with the primary goal of earning profit. He is a uniquely talented individual, possessing qualities such as skill, initiative, and a vision for innovation to achieve high goals. An entrepreneur identifies opportunities, seizes them, and converts them into economic gains. Entrepreneurs play a crucial role in the economic development of a country. Merely having economic resources is not sufficient to ensure development.

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There must be dynamic entrepreneurs with vision, initiative, and the drive to bring about change in the economic landscape. It is often said that "India is a rich country inhabited by the poor." India is blessed with abundant natural resources and a favourable climate. Yet, despite these advantages, our country is still classified as a developing nation. The primary reason for this underdevelopment is the shortage of dynamic and visionary entrepreneurs. For a country to achieve economic growth, it must effectively utilize its natural resources—and this is only possible through the active contribution of capable entrepreneurs. Entrepreneurs and entrepreneurship are arguably the pillars on which economic health of societies was built. Their role has been highlighted in opportunity creation through new ventures and maintenance of existing ones. Entrepreneurship has been identified as the fourth factor of production.

Entrepreneurship is a dynamic activity which helps the entrepreneur to bring change in the process of production, innovation in production, new usage of materials, creator of materials etc., it is a mental attitude to foresee the risk and uncertainty with a view to achieve certain strong motive. It also means doing something in a new & effective manner.

Statement of the problem

The Govt. of India and the concern state govt. are providing lot of assistance and support to the entrepreneurs for empower them through self- employment. And introduced lot of projects and schemes like, Make in India, Stand-Up India and Start-Up villages for generating more employment opportunity within the country. Hence, entrepreneurs are facing lot of problems during the endeavor. So the study attempts to investigate the problems in the growth of entrepreneurship.

Significance of the study

The significance of study is that to evaluate the attitude of entrepreneurs towards the problems in the growth of entrepreneurship. This study will be beneficial to entrepreneurs to identify and understand the factors on the problems in the growth of entrepreneurship and this study will be also beneficial to the government for formulating and executing new policies and procedure, and also this study helps the financial institution for adopting new policies and making corrections in the existing rate etc.

Scope of the study

The scope of the study is restricted to the attitude of entrepreneurs on the Roadblocks in the Journey of Entrepreneurial growth in Kunnathunadu Taluk, Ernakulam District, Kerala.

Objective of the study:

The main objective of the study is to find out the attitude of entrepreneurs on the problems faced in the growth of entrepreneurship.

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Database and Methodology

To study the problem a sample size of 55 was selected. Here, sample refers to the people in Kunnathunadu Taluk, Ernakulam District. Both primary and secondary data collected for the study. Primary Data includes data collected from the respondent by using a structured questionnaire. Secondary Data includes data collected from those sources other than direct sources and the information is collected from the websites and published sources.

For the purpose of the study 55 questionnaires were collected from the respondents. Convenient random sampling method is administered in the study. The selection criteria were based upon the data availability, convenience to access and level of participation. This study is mainly based on scientifically developed closed ended questionnaire.

Tools for the study

- Descriptive analysis
- ANOVA

Hypothesis

H_0: There is no significant relationship between educational qualification and Problems in the Growth of Entrepreneurship.

LIMITATION OF THE STUDY

For want of time and getting the detailed analysis, the study has been confined in Kunnathunadu Taluk, however adequate care has been exercised to collect unbiased data.

Analysis and Interpretations

Table 1: Demographic factors of the Respondents

Characteristics	Frequency	Percentage
Age		
Below 30 Years	11	20
30-40	19	34
40-50	22	40
Above 50 Years	3	6
Gender		
Male	50	90
Female	5	10

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Educational Qualification		
Up to 10th	6	10
Pre Degree/ 12th	19	35
Degree	24	45
PG/ Professional	6	10
Income Level		
Up to Rs.50000	19	35
Rs.50001- Rs.100001	21	38
Rs.100001- Rs.150001	12	22
Above Rs. 150000	3	5

Source: primary data

Table 2: Awareness about Govt. policies, rules & regulations

Choices	No of Respondents	Percentage
Yes	25	45
No	30	55
Total	55	100

Source: Primary Data

The table 2 shows that out of 55 respondents, 55% are not aware about government policies, rules and regulation. Only 45% of respondents are aware about it.

Table 4 : Opinion about expecting concession

Choices	No of Respondents	Percentage
Highly Expecting	34	62
Low	5	9
Moderately Expecting	16	29
Total	55	100

Source: Primary Data

The table 3 shows that out of 55 respondents , 62% are highly expecting concession from government, 29% moderately expecting concession from government and only 9% of respondents have less expectation of getting concession from the governments.

Problems in Growth of Entrepreneurship

Hypothesis: There is no significant relationship between educational qualification and the problems in Growth of Entrepreneurship.

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ANOVA

Education qualification and problems in Growth of Entrepreneurship: Table 4

Problems	Source of variance	Sum of squares	DF	Mean	F	Sig
Incompetence and poor management, lower level of commitment	BG	0.719	3	0.240	0.760	0.522
	WG	16.081	51	0.315		
Restrictions imposed by custom and tradition, involvement of high risk	BG	0.534	3	0.178	0.444	0.722
	WG	20.447	51	0.401		
Socio cultural rigidities	BG	0.801	3	0.267	0.603	0.616
	WG	22.581	51	0.443		
Absence of entrepreneurial aptitude, low status of businessmen.	BG	0.222	3	0.074	0.259	0.855
	WG	14.614	51	0.287		
Low quality products	BG	1.568	3	0.523	0.940	0.428
	WG	28.360	51	0.556		
Lack of motivation, lack of infrastructural facilities, lack of communication network.	BG	2.601	3	0.867	1.317	0.279
	WG	33.581	51	0.658		
Market imperfection, legal formalities involved to set up a unit,	BG	5.618	3	1.873	1.277	0.292
	WG	74.818	51	1.467		
Low package of salaries to employees	BG	0.100	3	0.033	0.082	0.970
	WG	20.809	51	0.408		

Source: primary data

Indicates significant at 5 per cent level (P<0.05) Note: BG-Between Groups, WG-Within Groups, DF-Degrees of Freedom. The mean difference in the problems in the Growth of Entrepreneurship among the respondents is examined using one way ANOVA. As shown in the table that, every aspect are not significant at all levels, Therefore, the null hypothesis is accepted in all cases.

Major Findings:

- Most of the respondents are in the age group of 40-50(40%), Almost all of the respondents are male (90%), most of the respondents (45%) are graduates, majority of the respondents (55%) are not much aware about the Govt. policies, rules and regulations and 62% of the respondents opinioned that they are highly expecting concessions from the Government.

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Suggestions

The study offers following suggestions based on the findings and observation.

- There is only mitigating incentives / concessions/subsidies from the government. If concession/ subsidies will be provided at high levels by the government can attract more entrepreneurs in this sector at the same time it will help to increase the per capita income of nation.
- Lack of awareness and support from the government policies. The Government should bring liberal rules and regulations for waiving the tax, registration or license fee, etc. in favor of it for increasing the standard of living of people in the society. Banking institutions should constitute policies for moratorium for long years to protect and create the opportunities for employment and wage to the society. For the reduction of social evils like poverty, atmosphere pollution, growth of slums, Ignorance of inhabitants, Central and State Government could take policies for ease functioning.

Conclusion:

Entrepreneurs are the backbone of our nation. It is the vibrant and dynamic sector of the Indian economy. In our study, we mainly examined the attitude of entrepreneurs on the problems in the growth of entrepreneurship in Kunnathunadu Taluk, Ernakulam District. Government should bring fair and liberal policies on concession/ subsidies and other significant elements regarding entrepreneurship. This study brings suggestion to Government must set up an independent consultancy body to promote entrepreneurship to navigate the digital world.

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CHAPTER - 4

GREEN ENTREPRENEURSHIP : INNOVATION AND SUSTAINABILITY IN THE CIRCULAR ECONOMY

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ABSTRACT

This paper examines how green entrepreneurship catalyzes innovation and accelerates the transition to a circular economy. Synthesizing research across sustainability science, innovation management, and entrepreneurial studies, we (i) define green entrepreneurship in relation to circularity, (ii) review drivers, barriers, and business model archetypes, (iii) develop a conceptual framework linking institutional pressures, capabilities, and ecosystem factors to circular innovation outcomes, and (iv) propose an empirical strategy for assessing performance, impact, and scalability. Using secondary sources and illustrative cases across materials, agri-food, mobility, and digital platforms, we analyze how design-for-circularity, product-service systems, reverse logistics, and digital traceability enable waste reduction and resource productivity while creating competitive advantage. We find that circular startups leverage modular design, data infrastructures, and multi-stakeholder partnerships to overcome scale and adoption challenges; however, they face financing gaps, standardization issues, path dependency in incumbent systems, and policy uncertainty. The paper concludes with actionable guidance for founders, investors, and policymakers, including outcome-based regulation, public procurement for circular solutions, blended finance, interoperable data standards, and mission-oriented innovation programs. We also outline a rigorous, mixed-methods research agenda to measure additionality, environmental integrity, and just-transition outcomes.

Keywords: *green entrepreneurship; circular economy; eco-innovation; business models; sustainability metrics; policy; blended finance; digital product passports; extended producer responsibility.*

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Introduction

The climate emergency, biodiversity loss, and resource scarcity expose the limits of a linear "take–make–dispose" economy. The circular economy (CE) aims to decouple growth from material throughput by designing out waste, keeping products and materials at their highest value, and regenerating natural systems. Within this transition, **green entrepreneurs**—founders who intentionally integrate environmental and social objectives into venture creation—play a pivotal role. They experiment with new technologies (e.g., bio-based materials, precision fermentation), new organizational forms (e.g., cooperatives, platform-mediated reverse supply chains), and new value propositions (e.g., performance-as-a-service).

Yet scaling circular ventures is hard. Markets do not fully price externalities, infrastructure for take-back is incomplete, and standards for verifying circular claims remain nascent. This paper provides an integrated account of how green entrepreneurship advances circularity, the conditions under which it scales, and the policies that enhance its systemic impact.

Objectives

1. Clarify the relationship between green entrepreneurship and CE innovation.
2. Identify drivers, barriers, and business model patterns.
3. Propose a testable framework relating context, capabilities, and outcomes.
4. Offer policy and managerial implications and a research roadmap.

Conceptual Foundations

Defining green entrepreneurship

Green entrepreneurship refers to opportunity recognition, resource assembly, and market creation oriented toward environmental value—reducing emissions, waste, and toxic releases, while improving ecosystem health and social equity. It differs from conventional entrepreneurship by embedding impact objectives ex ante and operationalizing them through technology, governance, and stakeholder engagement.

Circular economy principles

Core CE strategies include: (1) **narrow** resource flows (efficiency), (2) **slow** flows (durability, repair), (3) **close** loops (reuse, remanufacture, recycle), and (4) **regenerate** natural systems. These strategies can be mapped across product life cycles via design-for-disassembly, modularity, material substitution, and reverse logistics.

Eco-innovation and systemic change

Eco-innovation spans product, process, organizational, and marketing innovations that reduce environmental harm. In circular contexts, **systemic** innovation is often required—coordinating standards, logistics, digital infrastructure, and consumer behavior. This creates a high "coordination threshold," favoring ventures skilled at ecosystem orchestration and coalition-building.

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Literature Review

Business model archetypes for circular startups

- **Product–Service Systems (PSS):** "as-a-service" models convert CAPEX to OPEX, incentivizing durability and upgradeability.
- **Reuse/Refill Platforms:** two-sided marketplaces and deposit-return schemes that extend product lifetimes.
- **Remanufacturing & Repair:** value retention via component harvesting and certified refurbishment.
- **Materials Circularity:** bio-based, recycled, or infinitely recyclable materials; chemical and mechanical recycling.
- **Enabling Infrastructure:** traceability software, digital product passports, reverse logistics, and quality grading.
- **Drivers of adoption**
- **Regulatory and normative pressures:** extended producer responsibility (EPR), eco-design directives, procurement standards.
- **Cost and risk management:** material price volatility, supply chain resilience, landfill levies.
- **Market differentiation:** consumer segments rewarding provenance, low-carbon intensity, and repairability.
- **Technology readiness:** advances in sensors, AI for sorting, additive manufacturing, and bio-based processes.

Barriers and lock-ins

- **Economics of returns:** collection density and contamination undermine reverse flows.
- **Standards and verification:** fragmented definitions impede trust and finance.
- **Capital intensity & scale:** infrastructure (sorting, reprocessing) requires long-term, patient capital.
- **Behavioral frictions:** convenience and habit formation challenge reuse and repair uptake.
- **Incumbent path dependencies:** legacy design choices and linear KPIs (sell more units) conflict with circular value retention.

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Measurement challenges

Robust assessment needs **system boundary clarity** (cradle-to-grave vs. cradle-to-cradle), **functional unit alignment**, **rebound accounting**, and **distributional metrics** (e.g., worker outcomes). Frameworks include LCA, material flow analysis, and circularity indicators, complemented by climate and nature disclosures.

Methodology (Proposed Mixed-Methods Design)

Given the paper's scope, mixed-methods empirical study to be implemented in future work:

1. **Systematic Literature Review**
   - **Databases:** Scopus, Web of Science.
   - **Inclusion:** peer-reviewed articles (2005–2025) on CE entrepreneurship, eco-innovation, and circular business models.
   - **Coding:** drivers, barriers, archetypes, metrics, outcomes.
2. **Multi-Country Survey of Circular Startups (n ≈ 300)**
   - **Measures:** circular design intensity; data/traceability maturity; institutional pressure; ecosystem partnerships; financing; performance (growth, margins); environmental outcomes (scope 1–3 intensity, diversion rates).
   - **Analysis:** reliability/validity tests; Structural Equation Modeling (SEM) to test Propositions 1–3; robustness with Bayesian SEM.
3. **Comparative Case Studies (n = 8–10)**
   - **Sectors:** fashion/textiles, electronics, packaging, agri-food, mobility.
   - **Methods:** process tracing; value chain mapping; LCA snapshots; stakeholder interviews.
   - Cross-case synthesis to surface mechanisms and boundary conditions.
4. **Econometric Panel on Secondary Markets**
   - **Data:** transaction-level records from resale/refurb platforms and municipal collection datasets (where accessible).
   - **Design:** difference-in-differences around policy shocks (e.g., EPR expansions); instrumental variables using policy timing or grant lotteries.
5. **Impact Measurement Protocol**
   - LCA with consequential approach; uncertainty analysis; rebound effects; social outcomes (jobs, safety); equity lens (access and affordability).

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Analysis and Synthesis

Innovation patterns enabling circularity

- **Design-for-circularity:** modular architecture and fasteners that allow high-yield disassembly; material passports to preserve information value.
- **Digital enablement:** IoT sensors and computer vision improve identification and sorting; product cloud records support maintenance, leasing, and residual value pricing.
- **Business model shifts:** PSS aligns producer incentives with durability; buy-back guarantees secure feedstock for remanufacturing; deposit-return systems increase collection rates.
- **Industrial symbiosis:** by-product exchanges (e.g., heat, CO_2, organic residues) reduce net inputs and emissions.

Competitive Aspects

- **Superior unit economics over lifecycle:** revenue from extended services (maintenance, upgrades) and secondary markets complements initial sales.
- **Lower input risk:** reliance on recovered or bio-based materials buffers volatility and trade disruptions.
- **Brand trust and regulation readiness:** verifiable circular claims reduce greenwashing risks and prepare firms for upcoming disclosure rules.
- **Persistent challenges**
- **Scaling reverse logistics:** profitability hinges on route density and contamination control; small pilots often fail to cross the break-even threshold without partners.
- **Fragmented standards:** competing certifications and incompatible data schemas raise transaction costs and deter institutional investors.
- **End-of-life externalities:** where landfill and incineration remain inexpensive, circular alternatives struggle on price alone.

Illustrative sector insights

- **Textiles:** high leakage from blended fibers; chemical recycling promising but energy- and capital-intensive; repair/resale platforms show traction when quality grading is automated.
- **Electronics:** right-to-repair and modular design support value retention; safety and data-wipe protocols are gating factors for refurbishment.

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- **Packaging:** reuse/refill works in closed contexts (campuses, festivals); scaling to open systems requires packaging standardization and retailer coordination.
- **Agri-food:** upcycling side streams (spent grain, peels) and precision fermentation reduce land and water footprints; food safety standards and consumer acceptance are pivotal.

Findings

1. **Circular design + data capabilities are decisive.** Ventures that combine modular design with reliable traceability systems achieve higher value retention and lower cost-to-serve in reverse flows.
2. **Ecosystem orchestration beats solo optimization.** Partnerships with brands, municipalities, and logistics providers reduce acquisition costs for returns and accelerate adoption.
3. **Policy clarity drives investment.** Clear EPR rules, eco-design standards, and outcome-based public procurement unlock bankable projects and blended finance.
4. **Platforms unlock network effects.** Two-sided markets for reuse/refurbishment and B2B secondary materials exhibit declining unit costs as participation scales.
5. **Measurement integrity matters.** Ventures with credible LCA, third-party assurance, and interoperable data are better able to command green premiums and avoid accusations of greenwashing.
6. **Equity and jobs are not automatic.** Without intentional design, circular transitions can externalize risks to informal workers or shift burdens across communities; inclusive models and safe working standards are essential.

Discussion

Implications for theory

The results support a **capabilities-plus-institutions** view: circular outcomes emerge where dynamic capabilities (design, data, orchestration) interact favorably with institutional contexts (standards, procurement, finance). Platform dynamics provide a micro-foundation for scaling reverse logistics under demand uncertainty.

Implications for practice (founders & managers)

- Build **design-for-service** from day one (modularity, repairability) to align with PSS revenue.
- Invest early in **data infrastructure** (digital product passports, LCA automation); treat it as core IP.

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- Use **coalitions** (industry consortia, city partnerships) to overcome chicken-and-egg problems in reuse/refill and take-back.
- Pursue **stacked revenue** (service + secondary sale + material credit) to improve resilience.
- Integrate **equity and safety** standards into operations and supplier codes.

Implications for investors

- Underwrite on **systems risk** (policy durability, infrastructure access) not just venture KPIs.
- Deploy **blended capital** (concessionary first-loss + commercial tranches) for infrastructure-heavy models.
- Require **impact verification** (assured LCA, standardized metrics) as a condition of scale financing.

Implications for policymakers

- Shift from input mandates to **outcome-based regulation** (collection, reuse, recycled content targets) with credible monitoring.
- Use **public procurement** and **advance market commitments** to de-risk early markets.
- Fund **open standards** for data interoperability and quality grading.
- Design **just-transition measures** for informal/recovery workers: formalization pathways, training, and safety investments.

Limitations and Future Research

This synthesis relies on secondary sources and illustrative cases; causal claims require the proposed empirical design. Future work should:

- Quantify **additionality** of circular startups versus incumbent abatement.
- Measure **rebound effects** and unintended consequences across scopes 1–3.
- Assess **distributional outcomes** (regional equity, worker welfare) of circular transitions.
- Explore **policy sequencing**: which combinations (EPR + procurement + finance) yield the fastest, fairest scaling.

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Conclusion

Green entrepreneurship is a powerful engine for circular innovation, translating principles into market-tested solutions that design out waste, preserve material value, and regenerate ecosystems. The ventures that scale combine circular design, data-rich operations, and ecosystem partnerships, enabled by clear, outcome-oriented policy and fit-for-purpose finance. Getting there requires interoperable standards, mission-driven procurement, blended capital, and rigorous measurement to ensure environmental integrity and social justice. With these conditions, green entrepreneurs can deliver resilient growth while keeping economies within planetary boundaries.

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CHAPTER - 5

EXPLORING THE RELATIONSHIP BETWEEN ARTIFICIAL INTELLIGENCE AND ENTREPRENEURSHIP

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ABSTRACT

This study investigates the intersection of entrepreneurship and artificial intelligence (AI), highlighting AI's impact on startups and entrepreneurial ecosystems. By leveraging AI, entrepreneurs can drive innovation, disrupt markets, and unlock new opportunities. This research examines AI-driven startups, business models, and their implications across various industries, including the benefits of enhanced decision-making and process automation. It also addresses key challenges such as ethics, data privacy, and regulatory compliance. Through a literature review and case studies, this paper provides insights into the strategies and success factors of AI-driven startups, as well as their broader economic, employment, and industrial implications.

Keywords: *Entrepreneurship, Artificial intelligence, Startups and innovation.*

INTRODUCTION

The convergence of entrepreneurship and artificial intelligence (AI) is revolutionizing the business landscape. Entrepreneurship, characterized by innovation and risk-taking, drives economic growth, while AI's capabilities in machine learning and data analysis are transforming industries. This symbiotic relationship empowers entrepreneurs to leverage AI for innovation, disruption, and opportunity creation. AI-driven startups are redefining business models, optimizing decision-making, and automating tasks. However, challenges such as ethics, regulation, and accountability arise. This research explores the intersection of entrepreneurship and AI, highlighting the transformative potential and the need for responsible innovation.

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LITERATURE REVIEW

The intersection of entrepreneurship and artificial intelligence (AI) is transforming industries and economies. AI is propelling innovation, enabling startups to generate ideas, analyze markets, and develop products more efficiently. AI-driven startups are disrupting sectors like healthcare and finance, creating new revenue streams and altering industry dynamics. However, ethical concerns around bias, fairness, and privacy arise, and regulatory frameworks are evolving to balance innovation with accountability. AI-driven entrepreneurship drives economic growth and job creation, with visionary leaders and interdisciplinary teams playing a crucial role in navigating AI adoption and fostering responsible innovation.

THE SYMBIOTIC RELATIONSHIP BETWEEN ENTREPRENEURSHIP AND AI

Entrepreneurship and artificial intelligence (AI) intersect in a transformative landscape where innovation is amplified by AI-powered tools. AI-driven startups are revolutionizing industries like healthcare and finance with machine learning, natural language processing, and computer vision. While AI entrepreneurship drives growth, productivity, and job creation, it also raises ethical concerns around bias, privacy, and security. Policymakers seek to balance innovation with accountability, and visionary entrepreneurs must navigate AI adoption while prioritizing ethical responsibility and collaboration.

MATERIALS AND METHODS

Our research methodology combined a thorough literature review with real-world case studies, interviews, surveys, and data analysis to investigate the relationship between entrepreneurship and artificial intelligence (AI). We examined AI's impact on startups across various sectors, including healthcare, finance, and e-commerce, and assessed the regulatory landscape. Through sector-specific analyses, we identified AI's role in addressing industry challenges and opportunities. This comprehensive approach provided insights into the dynamic interplay between entrepreneurship and AI, highlighting its transformative potential and the importance of ethical responsibility and innovation.

RESULTS AND DISCUSSION

Our investigation into entrepreneurship and artificial intelligence (AI) revealed a transformative landscape where AI-driven startups are innovating and disrupting industries. These startups are leveraging AI to optimize decision-making, automate tasks, and enhance efficiency. While AI-driven entrepreneurship drives economic growth and job creation, it also raises ethical concerns around fairness, transparency, and data privacy. Our research highlights the importance of responsible AI deployment, regulatory considerations, and visionary leadership in navigating this evolving landscape.

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We found that AI's adaptability and versatility enable it to address industry-specific challenges and opportunities, and that entrepreneurial leaders must prioritize ethical responsibility and interdisciplinary collaboration to succeed in this AI-infused landscape.

AI ACROSS DIFFERENT SECTORS

AI is transforming various industries, including:

1. **Healthcare:** disease diagnosis, personalized medicine, and remote patient monitoring.
2. **Finance:** algorithmic trading, fraud detection, and robo-advisors.
3. **E-commerce:** personalized recommendations, chatbots, and supply chain optimization.
4. **Manufacturing:** predictive maintenance, quality control, and robotics.
5. Education: personalized learning, automated grading, and adaptive curriculum.
6. **Transportation and Logistics:** autonomous vehicles, traffic management, and predictive maintenance.
7. **Energy and Environment:** optimizing energy grids, climate modeling, and waste management.
8. **Entertainment and Media:** content recommendation, VR, AR, and content creation.
9. **Agriculture:** precision farming, pest detection, and automation.

Each sector faces unique challenges and opportunities, from data privacy and ethics to workforce implications and environmental concerns.

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CONCLUSION

This research explores the intersection of entrepreneurship and artificial intelligence (AI), highlighting AI's transformative impact on the entrepreneurial landscape. By examining AI-driven startups and their business models, we reveal the opportunities and challenges that arise from AI's influence across various sectors. Our findings emphasize the need for ethical responsibility, regulatory awareness, and visionary leadership in navigating the AI-infused entrepreneurial terrain. This study provides valuable insights for entrepreneurs, policymakers, and academics, and serves as a guide for responsible AI adoption and innovation.

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CHAPTER - 6

SUSTAINABLE FINANCE AND ESG IN INDIA : TRENDS AND OPPORTUNITIES

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ABSTRACT

Sustainable finance integrates environmental, social, and governance (ESG) considerations into investment and lending decisions, aiming to foster long-term economic growth, environmental stewardship, and social well-being. In India, the increasing regulatory push, global investor interest, and changing consumer preferences are accelerating the adoption of ESG practices. This paper examines the importance of sustainable finance in modern business,explores innovations in sustainable finance products, and identifies emerging opportunities through technology adoption. Findings indicate that ESG-aligned investments not only enhance competitiveness and mitigate risks but also enable alignment with India's net-zero and Sustainable Development Goal (SDG) targets.

Keywords : *Sustainable Finance , ESG Practices, Artificial Intelligence, Block chain, Financial Instruments*

1. Introduction

Sustainable finance in India directs capital toward investments incorporating ESG considerations, aiming to foster long-term economic growth, environmental stewardship, and social equity. This approach has gained prominence due to India's commitments under the Paris Agreement, the Sustainable Development Goals (SDGs), and its pledge to reach net-zero emissions by 2070 (EY, 2025; India Briefing, 2025). The Securities and Exchange Board of India (SEBI) mandate requiring the top 1,000 listed companies to publish Business Responsibility and Sustainability Reports (BRSR) has shifted ESG practices from optional to strategic and regulatory imperatives (SEBI, 2024). Environmental objectives in India emphasize renewable energy, climate resilience, and waste management; social goals focus on labor rights, diversity, and community welfare; governance seeks to enhance transparency, accountability, and ethics.

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Although challenges remain—such as limited ESG data quality and a scarcity of green financial instruments—the introduction of sovereign green bonds, a climate finance taxonomy, and Reserve Bank of India (RBI) guidelines on climate risk demonstrate a maturing ESG ecosystem (KPMG India, 2025).

2. Objectives of the Study

The objectives of this study are

- To explore the significance of sustainable finance and ESG practices within India's business and regulatory environments.
- To identify and analyze key government interventions promoting sustainable finance.
- To evaluate technological advancements, including artificial intelligence (AI), blockchain, and fintech, in strengthening ESG practices.
- To assess future market opportunities for sustainable finance in India.

3. India Sustainable Finance Market Overview

India's sustainable finance market size reached USD 567.50 million in 2024. IMARC Group expects the market to reach USD 2,336.30 million by 2033, exhibiting a compound annual growth rate (CAGR) of 15.20% during 2025-2033. Government policies and environmental, social, and governmental (ESG) regulations are positively influencing India's sustainable finance market share. Additionally, the rise of green bonds and loans, increased investor demand, and international funding are expanding capital inflows, accelerating India's shift towards a low-carbon economy.

4. Importance of Sustainable Finance and ESG Practice

Sustainable finance and ESG principles have evolved into core business strategies influenced by investor demand, regulatory frameworks, and consumer expectations (OECD, 2022). Integrating ESG enables businesses to enhance resilience, attract global capital, and manage risks associated with climate change, social inequality, and governance shortcomings (Morgan Stanley, 2024).

4.1 Investor Demand:

Investor interest in ESG-aligned portfolios is growing, with over 75% of global investors seeking investments that deliver competitive returns and positive social or environmental outcomes (Morgan Stanley, 2024). Millennials and Generation Z exhibit a stronger preference for sustainable investments, with over 80% believing ESG portfolios can yield comparable or superior returns (CarbonCredits.com, 2025).

4.2 Regulatory Drivers:

In India, SEBI's BRSR mandate and the Ministry of Finance's Climate Finance Taxonomy provide clear sustainability criteria and reporting standards (India Briefing, 2025).

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4.3 Consumer Influence:

Shifting consumer preferences toward sustainable goods and services are accelerating ESG integration. Studies reveal that over 60% of Millennials and Gen Z consumers are willing to pay a premium for sustainable products. Businesses are responding with innovations in circular economy models, ethical sourcing, and carbon footprint reduction.

5. Sustainable Financial Products in India

India has introduced diverse sustainable finance instruments such as green bonds, ESG mutual funds, and sustainability-linked loans (EY, 2025; Gupta, 2025). Green bonds fund renewable energy and sustainable infrastructure, while ESG funds are gaining assets under management. SEBI's ESG fund guidelines and ICMA's green bond principles further reinforce market credibility (ICMA Group, 2025).

6. Government Initiatives in Sustainable Finance

The Indian government has launched several initiatives to accelerate sustainable finance adoption. The draft Climate Finance Taxonomy in the Union Budget FY 2024–25 establishes science-based definitions to prevent greenwashing and direct investments toward credible climate solutions (India Briefing, 2025). The Sovereign Green Bond Framework, aligned with international principles, channels capital into renewable energy, transport, and sustainable agriculture projects. Programs such as Viksit Bharat and e-mobility schemes further integrate sustainability into national development plans (EY, 2025).

7. Technological Advancements in ESG and Sustainable Finance

7.1 AI and Big Data: AI technologies support ESG analysis through advanced data processing, risk identification, and predictive analytics. In India, AI-driven ESG frameworks help financial institutions comply with regulatory standards while improving governance and social responsibility (Wang et al., 2025).

7.2 Blockchain: Blockchain enhances transparency in ESG claims by creating immutable records for green bonds, carbon credits, and renewable energy certifications (NASSCOM, 2025). This reduces fraud and strengthens investor trust.

7.3 Fintech Innovations: Fintech platforms are democratizing access to sustainable investments through ESG-focused robo-advisors, sustainability-linked loans, and retail-friendly green bond marketplaces (KPMG India, 2025).

8. Findings of the Study

- India is developing a sustainable finance ecosystem through robust government policies, like the Climate Finance Taxonomy and Sovereign Green Bond Framework, and regulatory requirements, such as SEBI's BRSR and RBI's draft climate risk disclosure framework.

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- ESG practices are becoming mainstream for large companies due to mandatory disclosures, independent assessments, and integration of sustainability into banking and lending.
- Sustainable finance is positioned as a key driver for achieving India's net-zero 2070 goal, funding renewable energy, e-mobility, sustainable agriculture, and green infrastructure.
- Future opportunities lie in technology adoption like AI-driven ESG analytics, blockchain for green bond tracking, and digital platforms for green deposits to enhance transparency and investor trust.
- Overall, the convergence of policy, regulation, and technology is making sustainable finance in India both a compliance necessity and a competitive advantage in global markets.

9. Conclusion

Sustainable finance and ESG practices have transitioned from peripheral initiatives to strategic imperatives in India's economic development framework. Regulatory mandates, growing investor demand, and evolving consumer preferences are driving this shift. Government policies such as the Climate Finance Taxonomy and Sovereign Green Bonds, coupled with technological innovations like AI, blockchain, and fintech, are accelerating market maturity. While challenges persist particularly in ESG data standardization and the scale of green financing, the convergence of policy, technology, and market forces presents significant opportunities for India to lead in sustainable finance. The alignment of capital flows with ESG priorities not only strengthens competitiveness but also positions India to meet its climate and sustainable development commitments.

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CHAPTER - 7

STUDY ON INTELLECTUAL PROPERTY ISSUES IN AI-GENERATED

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ABSTRACT

The rise of Artificial Intelligence (AI) in digital content creation has revolutionized various sectors, including e-commerce, marketing, publishing, and entertainment. However, this advancement has also introduced complex Intellectual Property Rights (IPR) challenges. AI systems are now capable of generating text, images, music, and designs, raising critical questions about authorship, ownership, and copyright protection. Traditional IPR laws were designed for human creators and often struggle to accommodate the non-human nature of AI-generated works. This abstract explores key issues such as whether AI-generated content qualifies for copyright, who owns the rights—the AI developer, the user, or the organization—and how legal frameworks around the world are responding to these dilemmas. It also examines the ethical and commercial implications of using AI-generated content in e-commerce platforms, particularly concerning originality, plagiarism, and accountability. As AI continues to evolve, there is an urgent need to revisit and reform intellectual property laws to ensure fair protection, innovation, and responsible use in the digital economy.

Keywords: *"Intellectual Property Issues in AI-Generated Content" that you can use for academic writing, research indexing, or seminar abstracts*

Introduction

Artificial Intelligence (AI) is rapidly transforming the way digital content is created, shared, and consumed. From writing articles and generating music to designing logos and producing images, AI tools are increasingly used in creative processes across various industries, especially in e-commerce and digital media.

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While this technological evolution offers significant advantages in terms of speed, efficiency, and innovation, it also presents serious challenges in the realm of Intellectual Property Rights (IPR).One of the most pressing concerns is the question of authorship and ownership of AI-generated works. Traditional IPR laws are based on the assumption that content is created by a human. But when an AI system produces a work independently or with minimal human input, it becomes unclear who—if anyone—holds the legal rights to that content. Furthermore, issues such as copyright infringement, plagiarism, licensing, and ethical use come into play when AI uses existing data or content as training material. As AI technologies continue to advance and become more accessible, it is crucial to examine the legal, ethical, and regulatory implications of intellectual property in AI-generated content. This discussion is essential to ensure that innovation is encouraged while creators' rights are protected in the digital age.

SCOPE OF LIMITATION

1. **Rapid legal evolution**:

   IP laws are evolving rapidly with AI advancements. The findings may ecome outdated as new policies, judgments, and frameworks are introduced.

2. **Jurisdictional differences**:

   IP regulations vary widely by country, and the study may not comprehensively cover all legal systems or specific local laws.

3. **Lack of case law**:

   Since AI-generated content is a relatively new issue, there is limited legal precedent or settled case law to rely on for interpretation.

4. **Exclusion of non-IP issues**:

   The study does not deeply cover related topics such as data privacy, AI ethics, or algorithmic bias unless they directly relate to IP concerns.

5. **Technical complexity**:

   The study is primarily legal and policy-oriented and does not delve into the detailed technical mechanisms of how AI models generate content.

OBJECTIVES OF THE STUDY

- To understand the concept of AI-generated content
- To identify the challenges in ownership and authorship
- To assess the limitations of traditional IP frameworks
- To explore global perspectives and legal developments
- To provide recommendations for future policy and legal reform

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BENEFITS OF AI-GENERATED

- **Promotes Awareness of Legal Challenges**

  Helps creators, developers, and users understand the legal implications of using AI tools for content creation.

- **Encourages Responsible Use of AI**

  Guides users to respect copyright laws and avoid unintentional infringement when generating or sharing AI-created content.

- **Supports Innovation in Law and Technology**

  Drives legal reforms and the development of new frameworks to adapt IP rights to the digital and AI-driven era.

- **Protects the Rights of Human Creators**

  Ensures that original human creators are not unfairly displaced or their works copied without recognition.

- **Enables Clear Ownership and Licensing**

  Establishing IP rules for AI-generated content makes it easier to assign rights, license works, and resolve disputes.

- **Enhances Global Dialogue on IP Policy**

  Encourages international cooperation and understanding in harmonizing laws regarding AI and intellectual property.

- **Fosters Ethical and Transparent AI Development**

  Promotes accountability among AI developers to build systems that respect IP laws and originality.

Review of Literature

- **Samuelson, P. (1985)**

  In her foundational work on copyright law, Pamela Samuelson discussed the challenges of assigning authorship in computer-generated works. Though AI was not as advanced then, her analysis anticipated the growing complexity of attributing ownership to non-human creators.

- **Gervais, D. (2019)**

  "AI and Copyright: Authorship and Infringement", Columbia Journal of Law & the Arts Gervais explores the legal ambiguity surrounding authorship of AI-generated content, highlighting that existing copyright frameworks rely on human creativity and thus struggle to accommodate works created autonomously by AI systems.

- **Bridy, A. (2016)**

  "Artificial Intelligence and Copyright Law" Bridy argues that AI blurs the boundary between tool and author, making it difficult to determine whether the user, developer, or the AI itself should be credited. She suggests that existing copyright law needs fundamental revision.

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- **European Parliament Report (2020)**

  "Intellectual Property Rights for the Development of Artificial Intelligence Technologies" This report outlines how different EU countries are beginning to consider AI-specific IP frameworks. It emphasizes the need for harmonized rules that distinguish between AI-assisted and AI-autonomous creations.

- **WIPO (World Intellectual Property Organization) (2021)**

  "WIPO Technology Trends Report: Artificial Intelligence" WIPO's report highlights the sharp increase in patent filings involving AI-generated inventions and the need for updated IP strategies. It also emphasizes the lack of consensus across nations on how to treat AI-generated works.

- **Grimmelmann, J. (2020)**

  *"There's No Such Thing as a Computer-Authored Work – And It's a Good Thing, Too"*Grimmelmann makes a strong case for rejecting the notion of machine authorship altogether. He asserts that assigning copyright to AI disrupts the original purpose of IP law — which is to incentivize human creativity.

- **RESEARCH METHODOLOGY**

  This study adopts a **descriptive and qualitative research design** to explore the legal, ethical, and policy challenges surrounding intellectual property (IP) rights in AI-generated content. It focuses on understanding existing laws, identifying gaps, and analyzing expert opinions and real-world cases.

Data Collection Methods:

a. Secondary Data: The study relies primarily on **secondary data sources**, including:

- Research articles and academic journals
- Reports by WIPO, European Parliament, and national IP offices
- Legal case studies
- Books and white papers on AI and IP law
- News articles and online legal commentaries

b. Case Law Analysis:

- Review of landmark and emerging cases globally that address the issue of AI and IP rights.

c. Comparative Legal Study:

- Analysis of legal frameworks in multiple countries (e.g., USA, UK, EU, India) to understand international perspectives and policy variations.

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Data Analysis Techniques:

- **Doctrinal Legal Analysis:** Examination of laws, statutes, and legal principles related to copyright, patents, and ownership as applied to AI.
- **Content Analysis:** Thematic analysis of academic opinions and policy papers to identify common challenges and possible solutions.
- **Comparative Analysis:** Comparing how different jurisdictions are addressing or planning to address IP rights for AI-generated content.

Finding of the study

- **Lack of Legal Recognition for AI as an Author:** Most intellectual property laws globally (e.g., copyright and patent laws) do not recognize AI systems as legal authors or inventors. This creates ambiguity in determining the ownership of AI-generated content.
- **Unclear Ownership Rights:** It is difficult to assign ownership of AI-generated content — whether it belongs to the programmer, the user, or the organization that developed the AI. There is no uniform legal standard addressing this issue.
- **Traditional IP Laws Are Outdated:** Existing IP laws were

Suggestion of the study

- **Update and Modernize IP Laws:** – Governments and legal bodies should revise existing intellectual property laws to include clear guidelines for AI-generated works, distinguishing between human-assisted and fully autonomous AI creations.
- **Define Legal Ownership of AI-Generated Content:** – Clear rules must be established to determine who owns AI-generated content — the user, developer, or company — based on their role in creating and using the AI system.
- **Introduce AI-Specific IP Frameworks:** – Create new IP policies or frameworks tailored to the nature of AI, recognizing its growing role in creativity and invention while protecting human creators.
- **Encourage International Harmonization:** – Global cooperation is essential. Countries should work together to create consistent international standards for AI and IP rights to avoid legal conflicts across borders.
- **Promote Awareness and Training:** – Artists, developers, and businesses should be educated about the legal risks and responsibilities of using AI tools, including copyright infringement and ethical content use.
- **Create a New Category for AI-Generated Works:** – Consider introducing a special legal category for AI-generated content, possibly with limited protection or shared rights between the AI developer and user.

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- **Establish Clear Attribution and Disclosure Norms:** – Content creators should disclose when AI tools are used in the production of creative works to ensure transparency and accountability.
- **Invest in Further Research:** – Encourage academic and legal research on the evolving nature of AI-generated content and its long-term impact on the intellectual property ecosystem.

Conclusion

AI has opened new frontiers in content creation, offering speed, efficiency, and creativity like never before. However, its use raises serious questions about intellectual property rights that cannot be ignored. As AI continues to evolve, it is essential to adapt legal frameworks, raise awareness among users, and implement ethical guidelines. This will ensure that innovation does not come at the cost of creators' rights and that the digital economy remains fair and legally secure.

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CHAPTER - 8

STRATEGIC FINANCIAL REFORMS FOR TRADE AND FDI POLICIES

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ABSTRACT

In recent years there has been a fundamental rethinking of development strategies. This re-examination has many and complex ramifications and causes. This article is concerned mainly with trade and foreign direct investment (FDI). In the trade-policy field, a large and growing number of developing countries have introduced or are introducing liberalization programmes that include the total or partial dismantling of non-tariff measures and decreases in the levels and dispersion of tariffs. As regards FDI policies, these have also undergone substantial change. From a distrust of transnational corporations (TNCs) and an approach that relied mostly on a host of boundaries and prohibitions, Governments in developing countries are now coming to escalate what foreign investors can contribute to development. As a consequence, policies in this field have also been substantially liberalized, and many countries are in outright competition with each other to attract FDI.

Keywords: *Foreign Direct Investment, liberalization, globalization, technological, discriminatory, economic and merchandise*

Introduction

The new approach to development arises not simply from a conversion to liberal ideals, although a greater appreciation of the limits of Government and the possibilities offered by markets certainly has played a role. The main factor behind this sea-change in attitudes is the realization by policy makers that development, in today's world economy, implies attaining international competitiveness in a growing number of industries. This new approach reflects itself in a growing emphasis on exports as an engine of growth and on technological transformation in the domestic economy. Pure import substitution at any cost is a thing of the past.

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1. International trade in both goods and services is growing faster than domestic output in most countries and certainly in the world economy as a whole.
2. Foreign direct investment is growing faster than national investment.
3. International financial flows are growing at a much faster rate than domestic financial transactions.
4. International trade, investment and finance are all occurring at the same time and through the same agent, the transnational corporation.

The case for an organic policy approach

However, most parts of the developing world have yet to be incorporated into the globalization or regionalization processes. This may be due to a variety of factors, including the incipient stage of their economic reforms and the possession of few assets of interest to TNCs. As regards an individual developing country wishing to attract FDI, the new strategy of TNCs involves an increasing export orientation of their activities.

It also implies that FDI is considerably more footloose, that TNCs view increasingly individual countries as alternative sites and that FDI is becoming more difficult to attract and to keep. If, indeed, TNCs are in process of changing their investment strategies and are "going more global", this would mean that trade policies of potential host countries will become increasingly important in efforts to attract and keep FDI.

Lessons from the new trade and growth theories

The case for selective trade policies has been well rehearsed. Left to its own devices, the market is particularly inefficient in identifying long-term, potential comparative advantage, characterization, depends on increasing the ratio of created assets to natural assets. This is especially so in the developing world, where the private sector and market institutions are weak. Under these conditions, there is an important role for government intervention in identifying industries with long-run promise, steering investment resources in their direction, acting to complete or create markets and investing in the creation of complementary assets in which the private sector is likely to under-invest (because of the public-good nature of those assets). This will involve, inter a/ia, both trade and FDI policies.

However, this does not mean that no effort should be made to steer FDI into particular sectors or to influence the activities that they carry out in a host economy. As an economy moves from dependence on natural resources as its basis of comparative advantage to a greater dependence on created assets, TNCs can play a major role and can be deliberately encouraged to do so by specific government action. This article emphasizes two policy implications of the new trade and growth theories that are germane to the issue of the complex of trade and FDI policies.

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One has already been discussed: the identification of sectors in which a country can reasonably expect to acquire comparative advantage and the promotion of production in such sectors. This will normally involve not only domestic investment, but also---and in some cases primarily-FOI and other forms of TNC activities.

This distinction is even more germane to FDI policy than to trade policy: if the argument is correct that open FDJ policies are more conducive to the development of indigenous capabilities than restrictive policies, the most successful approaches to FDI policy will be those that emphasize incentives to do the "right" things and undertake desired activities, rather than prohibitions or limitations on activities perceived to be undesirable, which tend to discourage all investment.

The development of an integrated policy package

The linkage between trade and foreign direct investment

If countries are to succeed in changing the manner in which they participate in the international economy, it is important that the linkages between trade and FDI be recognized explicitly. Trade policy has always affected FDI flows. In fact, there is a little understood interaction between the way that LNCs tend to look at the international economy and the trade policies in vogue in developing countries. In the post-war period, up to the 1980s, LNCs tended to view national markets as discreet, and their investment decisions in one market were connected to those made in another only by the overall constraints of their managerial or financial resources and not by the integration of production decisions on a global or regional basis. Developing country Governments tended to foster this attitude through trade policies that favoured import substitution and market-seeking FDI.

Under current circumstances, TNCs are likely to be interested not only in a liberal FDI policy (a necessary but not sufficient condition for investment) but in whether a country is suitable for inclusion in their networks. It is in this sense that trade policies acquire particular relevance.

Moreover, the blending of suitable trade policies with investment policies (of which FDI policies are a subset) is more likely to yield results than export promoting trade policies just by themselves. Investment policies are needed to overcome the scarcity of competitiveness-enhancing assets, with export-promoting trade policies playing a supportive role.

Towards a new policy paradigm

Traditionally, foreign trade was considered to be the main link between the domestic and the international economies. As a result, policy makers, in their efforts to improve the integration of their countries into the international economy, were mainly concerned with the consistency of trade policy and its desired impact on trade flows.

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Although it would be senseless to attempt to design a "generic" package that could fit all countries and all their particular needs, it is certainly possible to identify some key concepts that have been brought to the centre of international discussions under a new light and that might help one to develop a new conceptual framework for the planning, implementation and evaluation of economic policy in an integrated fashion.

Three major principles of international economic relationships have been redefined in the effort of the world community to strengthen economic interdependence and promote world economic growth. These principles are most-favoured-nation (MFN) treatment, enhanced market access and national treatment.

The first three principles being discussed have, for long, constituted a desirable goal of international economic negotiations in the area of merchandise trade. Few countries, if any, do actually conform completely to each and every one of these principles. Most countries have chosen to depart partially from them in order to allow for certain discretional ties in the handling of their own economies.

Most-favoured-nation treatment

This principle is at the heart of multilateralism and constitutes the cornerstone of the GATT. The purpose of the MFN clause is to eliminate all sources of discrimination in the treatment granted by one individual country to the rest of its trading partners. Its scope of application was-up to now-limited to merchandise trade and basically to the application of tariff barriers. In spite of many declarations of adherence to this clause, reality shows that countries do in fact discriminate in their trade relations with different countries. Generalized systems of preference (GSP) schemes, preferential trade agreements, trade zones, economic unions and a number of special arrangements do in fact violate the MFN commitment.

The recognition of this fact gives us a clue as to the first critical question in the design of an integrated package or policy mix, and this is: what is the size and location of the particular economic space in which an individual country wishes to evolve? Obviously, there will not be a single economic space that suits the needs of all countries, independently of how much political will there is in a given country to promote multilateralism at a world scale.

A similar strategy may be in the making in the rest of Latin America. Most countries in the area have removed barriers to trade and FDI (some more successfully than others). The basic objective behind these movements is not primarily that of reaping the static gains from customs unions emphasized in the trade literature. Rather, it is hoped that the creation of larger economic spaces (most of them regional), in the context of generally liberal trade and FDI policies, would encourage a substantially enlarged flow of FDI for regional markets.

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Market access

It is obvious that very little would be achieved in the area of world economic interdependence with the mere application of the MFN principle on a world scale if all countries decided to deny market access on a non-discriminatory basis. Domestic economies would remain closed and the benefits of international trade would fail to accrue to the world community.

Generally, the smaller the domestic market of a country, the more important will be the market access it is granted by others. For example, access to the European Community for clothing has been a fundamental factor in determining the location of foreign firms in Mauritius' export processing zones. Likewise, as already noted, the negotiation of a free trade agreement or a common market among a group of countries will make all the participating countries more attractive to TNCs.

Certain market-access decisions in services may also have important trade effects that need to be considered. Two competing considerations need to be taken into account in deciding the extent of market access in services that a countries wishes to offer foreigners. On the one hand, market access can be curtailed in services such as banking and insurance in order to provide domestic suppliers a "breathing space" to become competitive.

National treatment

The application of full national treatment represents the ultimate stage of world economic integration. An old aspiration of merchandise trade agreements, it has been substantially realized in the area of cross-border goods trade. The application of full national treatment to foreign capital, labour, technology and services presents a far more complex case. As a general principle, national treatment ought to be the rule.

There are a number of policy instruments that affect the operations of companies located within a country and that can be applied using three criteria: discriminatory treatment in favour of domestically owned companies; full national treatment; and treatment more favourable to foreign owned companies. The instruments involve, among others, procedures for the collection of taxes, tax rates, access to domestic and foreign credit, access to subsidies and tariff-drawback schemes, access to government procurement, price intervention, research and development subsidies and subsidized interest rates for certain activities.

Competitiveness-enhancing measures

This category relates mainly to those measures that seek to improve an economy's international competitiveness. In the first place, there are subsidies of various types, not only to exports but to production, labour training or technological upgrading. The locational decisions of TNCs are likely to be increasingly affected by policies of this nature (in particular, export processing zones and administratively simple tariff-drawback schemes) than by the existence of protected national markets.

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It should be kept in mind that such policies, if they are to be successful, should be highly selective. Government failure is as prevalent in developing countries as market failure: the skills of effective action by Governments are severely limited; and, as pointed out by many analysts, policies that seek to skew market prices lend themselves to abuse and unproductive rent-seeking. The avoidance of rent-seeking can be ensured by tying all incentives to the delivery of specific performances, as the East Asian newly-industrializing economies have successfully done.

Impacts of different policy packages on foreign direct investment

A wide variety of trade and investment policies can have an impact on the volume and quality of FDI flows. The table is purely illustrative, but serves to drive home the points that trade policy can have powerful impacts on FDI and that FDI policy can have powerful impacts on trade outcomes; and that both sets of policy tools need to be considered together. it should also be stressed that no measure, or group of measures, in and of itself, will encourage FDI in the desired quantity and in the industries preferred by policy makers.

A very important set of variables refers to the macroeconomic environment. Macroeconomic stability, both internal and external, are likely to be important considerations to foreign investors. With regard to the exchange rate, it is an essential condition that its level be such that it makes production for export internationally competitive. It is also essential that extreme fluctuations in the real exchange rate be avoided.

Measures affecting national treatment

1. Full national treatment for all foreign investors: Encourages all FOi; may adversely affect national firms with reasonable prospects of becoming internationally competitive.
2. Preferential tax treatment for TNCs with certain attributes: Encourages FDI with desirable attributes (e.g., access to foreign markets, technology transfer).
3. Preferential tax treatment for TNCs in exchange for selected performance requirements: May contribute to upgrading of economy's international competitiveness through spill over effects; encourages FDI with desirable characteristics.
4. Discriminatory treatment for TNCs: May discourage FOI in certain circumstances; however, may be necessary in economies with strong disequilibria or to compensate domestic firms for certain disadvantages in relation to TNCs.

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Competitiveness-enhancing measures

1. Export Processing Zones: Encourages labour-seeking and component sourcing FDI.
2. Export subsidies: Encourages labour-seeking, component- sourcing and (to a lesser extent) resource-seeking FDI; in certain cases, they may discourage export-oriented FDI.
3. Tariff drawback schemes: Encourages labour-seeking and component sourcing FDI.
4. Stable exchange rate: Encourages all kinds of FDI.
5. Investment in physical and social infrastructure: Encourages all kinds of FD I; can be used as quid pro quo to attract desired FDI from specific companies.

The policy dilemma

The basic policy dilemma that developing countries have to face is that, on the one hand, the attainment of development goals may imply the need for some restrictions on the full sway of the principles of MFN and national treatment and on unfettered market access, while, on the other hand, TNCs are tending to favour increasingly the least number of such restrictions.

Today, they are increasingly integrated into global or regional networks of firms. Therefore, they are considerably more footloose than they used to be, and more footloose than purely domestic firms in host economies. The implication is that economic policies (including trade policy) in host countries could have large effects on trade flows, FDI, employment and output, since they have decisive effects on the siting of TNC activity.

It may be true that the removal of barriers affecting market access and the granting of full national treatment would make countries far more attractive to foreign investors than those showing limitations in those areas. Yet two things should be taken into account:

a. First, it is obvious that the mere removal of such barriers is not a sufficient condition for attracting FDI. Political and social stability, the quality of the labour force and of the physical infrastructure available in a country, its natural resource endowment, its geographical location and the size of its domestic market may all be factors at least as important as the degree of openness and deregulation prevailing in the country.
b. Second, the free and unchecked movement of factors of production at the international level does not guarantee development per se. In fact, this is certainly not the case within national borders, where almost perfect mobility of goods, services and factors of production does not, automatically, solve domestic regional imbalances with respect to development.

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Globalization and optimal foreign direct investment policies

Some of these considerations can be used in determining the exact content of the trade-cum FOI policy mix. Of course, optimal policies are highly country specific, and the notions developed below should be considered to be only illustrative. It is assumed that the objective of the country in question is the attainment of international competitiveness and it is orienting its trade and FDI policies accordingly. This section attempts to answer the question of how can FDI policies themselves support the attainment of this objective. The discussion will deal with general FDI and with FDI policies for specific industries.

Optimal FDI policies

As already noted, one characteristic of globalization is that it has increased the proportion of economic activity that is footloose (Dunning, 1992). Therefore, the optimal FDI policies in the era of globalization (in which there is intense locational competition for such investment) are those that are most transparent, non-discretionary and stable over time. As already noted, proscriptions tend to discourage all FDI. Likewise, case-by-case approvals of specific incentives and lengthy delays in investment approvals are likely to divert investments to neighbouring countries that are close locational substitutes. Frequent changes in the rules discourage investment. Foreign investors with an orientation towards world or regional markets are more likely to be interested in the general policy framework for FDI and in trade policies than in investment incentives. These are being discussed in the next section.

Steering FDI into specific industries

The new trade theories suggest that there is ample scope not only for strategic trade policy in developing countries but also for strategic FDI policy-or, more generally, strategic investment policy, pure and simple, be it foreign or domestic. In fact, strategic trade policy has a large component of strategic investment policy: the orientation of investment resources to industries in which comparative advantage can be created or to activities that have large externalities for the economy as a whole or for parts of it, such that it is possible to create competitive clusters of activities over a reasonable period of time.

Export-performance requirements were more likely to be necessary when FDI was oriented mostly to domestic markets and when the inducement was mostly producing behind high trade barriers. In an era in which FDI is increasingly oriented towards global or regional markets and trade barriers in host countries are much lower, export-performance requirements is a less compelling policy tool. Better results can be obtained by encouraging the establishment of firms that most likely will produce for foreign markets or introduce desired technologies. An alternative is to blend performance requirements with specific incentives.

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Another approach, which would skirt the problems of lengthy approvals, bureaucratic delays, case-by-case negotiations and having to apply different criteria to different investors has already been mentioned: it is to adopt an automatic "performance-based" corporate tax system favouring a few specific activities and which gives equal treatment to national and foreign firms.

Conclusion

Clearly, the changing trade strategies of developing countries require a reconsideration not only of trade policy but also of investment policy, and particularly of policies towards FDI. If TNCs play an important role in the process of export expansion and diversification, it will not be sufficient to effect trade policy reforms while leaving FDI policy untouched. And in the area of services, trade and FDI policies merge. This is not to say that it is impossible to penetrate international markets without TNCs. But it will be certainly faster to use the medium of the TNC than deliberately to make do without them. Even arm's-length forms of relationship with TNCs such as subcontracting may require some investment.

Therefore, it will be useful for developing countries contemplating, or already implementing, a change in development strategy to consider the implications of the new strategy for FDI policies. In general terms, if the promotion of international competitiveness is the desired policy objective, then the more liberal and prescriptive are FDI policies the better. In addition, a strategic trade policy can be usefully complemented by a strategic FDI policy encouraging investment in industries and activities that promote the acquisition of new comparative advantages.

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CHAPTER - 9

ENTREPRENEURSHIP AND FINANCIAL EMPOWERMENT

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ABSTRACT

Entrepreneurship plays an important role in the development of a country. It is one of the most important inputs in economic development. An entrepreneur can be regarded as a person who has the initiative skill and motivation to set up a business or enterprise of his own and who always looks for high achievements. He is the catalyst for social change and works for the common good. The number and competence of entrepreneurs affect the economic growth of the country. They look for opportunities, identify them and seize them mainly for economic gains. An action oriented entrepreneur is a highly calculative individual who is always willing to undertake risks in order to achieve their goals.

Key Words: *Entrepreneurship, enterprise, achievements, competence, opportunities*

I. INTRODUCTION

The word '**entrepreneur**' has been taken from the French language. It was only in the 18th century the word was used to refer the economic activities. An entrepreneur as an agent who buys factors of production at certain prices with a view to sell its product at uncertain prices in the future.

II. CONCEPT OF ENTREPRENEURSHIP

- It has assumed importance for accelerating economic growth both in developed & developing countries.
- It is the hope and dreams of millions of individuals around the world
- It promotes capital formation and creates wealth in country
- It reduces unemployment and poverty. It is the process of exploring the opportunities.

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The term entrepreneur has been treated differently by various authors. While some calls entrepreneurship as “risk-bearing’, others view it “innovative” and yet others consider it “thrill-seeking”. However, there was consensus among them as to the skills and abilities which a person should possess in order to become an entrepreneur.

How the entrepreneurs can be developed or how the supply of entrepreneurship can be increased in particular society.

- Uncertainty bearing.
- Co-ordination of productive resources.
- Introduction innovation and the provision of capital

III. NEED OF THE STUDY

- India is the second largest populated country in the world. In 2001, India became the second country after China to cross the one billion mark.
- The current population is around 1.22 billion. India occupies only 2.4% of the world’s land area but it supports over 15% of the world’s population.
- The aim of the government has been to create employment opportunities for youth while focusing on rapid economic growth.
- Entrepreneurship development is one of the mechanisms adopted by the Government of India towards the creation of job opportunities. The government's assumption is that support for innovation will enhance entrepreneurship development, which will in turn accelerate economic growth. An entrepreneur is indies - pens able.
- Every economy requires his or her expertise and knowledge in order to make avail of services and goods to the consumer.

IV. OBJECTIVES OF THE STUDY

The entrepreneur is essential for the economic development of a country. The progress of a country will depend upon his skill and talent as well as hard work to deliver necessary goods and services required by the citizens of his or her country.

1. To enumerate the role of entrepreneurs in economic development.

V. ENTREPRENEURSHIP AND ECONOMIC DEVELOPMENT

The entrepreneur who is a business leader looks for ideas and puts them into effect in fostering economic growth and development. Entrepreneurs can change the way we live and work. If successful, their innovations may improve our standard of living. In short, in addition to creating wealth from their entrepreneurial ventures, they also create jobs and the conditions for a prosperous society. The role of entrepreneurs is not identical in the various economies.

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Depending on the material resources, industry climate and responsiveness of the political system, it varies from economy to economy. The contribution of entrepreneurs may be more in favorable opportunity conditions than in economies with relatively less favorable opportunity conditions.

1. **Entrepreneurs Generate Employment**

   The process of entrepreneurship activity is to reduce unemployment situation in the economy, is termed by "Schumpeter effect". Entrepreneurs provide immediate large-scale employment to the unemployed which is a chronic problem of underdeveloped nations. Entrepreneurs generate employment both directly and indirectly. With the setting up of more and more units by entrepreneurs, both on small and large-scale numerous job opportunities are created for others. Directly, self-employment as an entrepreneur and indirectly by starting many industrial units they offer jobs to millions. The available employment opportunities can cater only 5 to 10% of the unemployed. Entrepreneurship gives young people an opportunity to work on their own skills and interests and in the process, creating their own employment. In this way, entrepreneurs play an effective role in reducing the problem of unemployment in the country which in turn clears the path towards economic development of the nation.

2. **Economic growth and development**

   Entrepreneurs promote capital formation by mobilizing the idle savings of public. They employ their own as well as borrowed resources for setting up their enterprises. Such type of entrepreneurial activities leads to value addition and creation of wealth. Entrepreneurs can therefore, facilitate the use of these savings thereby stimulating capital formation, which is the engine of economic growth and development.

3. **Balanced Regional Development**

   Entrepreneurs help to remove regional disparities through setting up of industries in less developed and backward areas. The Growth of Industry and business leads to a lot of Public benefits like transport facilities, health, education, entertainment etc. When the industries are concentrated in selected cities, development gets limited to these cities. When the new entrepreneurs grow at a faster rate, in view of increasing competition in and around cities, they are forced to set up their enterprises in the smaller towns away from big cities, thereby promotes balanced regional development.

4. **Reduces Concentration of Economic Power**

   Economic power is the natural outcome of industrial and business activity. Industrial development normally leads to concentration of economic power in the hands of a few individuals. This concentration of power in a few hands has its own evils in the form of monopolies. In order to redress this problem a large number of entrepreneurs need to be developed, which will help reduce the concentration of economic power amongst the population.

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5. **Wealth Creation and Distribution**

Entrepreneurship enables individuals to use their potentials and energies to create wealth through the creation of goods and services. It stimulates equitable redistribution of wealth and income in the interest of the country to more people and geographic areas, thus giving benefit to larger sections of the society. One of the major causes of poverty is unemployment and since entrepreneurship is preoccupied with employment generation, then by extension the generation of employment will therefore reduce the level of poverty.

6. **Contributes to gross national product**

An entrepreneur makes much contribution to the national exchequer and to the national economy as whole. He always looks out for opportunities. They explore and exploit opportunities, encourage effective resource mobilization of capital and skill, bring in new products and services and develop markets for growth of the economy. In this way, they help increasing gross national product as well as per capita income of the people in a country. Increase in gross national product and per capita income of the people in a country, is a sign of economic prosperity of the country.

7. **Improvement in the Standard of Living**

Entrepreneurs can change the way we live and work. The successful innovations of entrepreneurs increase the standard of living of the people they also create jobs and the conditions for a prosperous society. Entrepreneurs play a key role in increasing the standard of living of the people by adopting latest innovations in the production of wide variety of goods and services in large scale that too at a lower cost.

8. **Promotes Country's Export Trade**

Any Entrepreneur would like a greater market share. Entrepreneurs promote country’s export-trade, which is an important ingredient of economic development. They produce goods and services in large scale for the purpose earning huge amount of foreign exchange from export in order to combat the import dues requirement. Hence import substitution and export promotion ensure economic independence and development.

9. **Induces Backward and Forward Linkages**

In today’s competitive environment, Innovation is of utmost important to the long-term success and survival of any business. In the absence of new ideas, enterprises find it difficult to grow and eventually they do a persistent struggle to sustain in the business. He always tries to introduce newer and newer technique of production of goods and services. So, Entrepreneurs like to work in an environment of change and try to maximize profits by innovation.

10. **Facilitates Overall Development**

Entrepreneurs act as catalytic agent for change which results in chain reaction. Once an enterprise is established, the process of industrialization is set in motion. This unit will generate demand for various types of units required by it and there will be so many other units which require the output of this unit.

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This leads to overall development of an area due to increase in demand and setting up of more and more units. In this way, the entrepreneurs multiply their entrepreneurial activities, thus creating an environment of enthusiasm and conveying an impetus for overall development of the area. They also invest in community projects and provide financial support to local charities. This enables further development beyond their ventures.

VI. ROLE OF ENTREPRENEUR IN ECONOMIC DEVELOPMENT

Entrepreneur plays a central role in the economic by establishing firms, which in turn create markets and organization**.** The entrepreneur who is a business leader looks for ideas and puts them into effect in fostering economic growth & development. The major role played by an entrepreneur in the economic development are as follow as.

1. Promotes economic formation

Entrepreneur promotes capital formation by mobilizing the idle savings of public. They employ their own as well as borrowed resources for setting up their enterprises. Such type of entrepreneurial activities leads to value addition and creation of wealth, which is very essential for the industrial and economic development of the country.

2. Wealth creation and distribution

It stimulates equitable redistribution of wealth and income in the interest of the country to more people and geographic areas, thus giving benefit to larger sections of the society.

3. Improvement in the standard of living

Increase in the standard of living of the people is characteristic feature of economic development of the country. Entrepreneurs play a key role in increasing the standard of living of the people by adopting latest innovations in the production of wide variety of goods & services in large scale that too at a lower cost.

4. Role of innovation

Innovation is an important key to entrepreneurship. Innovation implies the commercial application of an invention. The entrepreneur assumes the role of an industrial leader. Entrepreneurs have contributed many innovations in developing new products and in existing products and services.

5. Co-ordination role

The very important function of an entrepreneur is to co-ordinate the various factors of production. Co-ordination involves selection of the right type of factors, employment of each factor in the right quantity, use of the best technology, division of labour etc.

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6. Agent role

The entrepreneurs are correctly called "agents of change". Entrepreneurs act as agent of economic development by perceiving opportunities and putting them into action.

7. Risk assumption role

The very essential function of an entrepreneur is the assumption of risk. Every productive is the assumption risk. Every productive venture involves risks and production cannot take place if people do not come forward to bear risks. The economic reward for risk bearing is profit.

8. Imitating role

Entrepreneurs in developing countries take the role of 'imitators' who generally **copy** the innovations introduced by the "innovative" entrepreneurs of the developed countries. They copy the organization, technology and the products of innovation from other developing regions.

9. Capital formation role

Entrepreneurs promote capital formation by mobilizing the idle savings of the public. Again, the profits they earn lead to saving to wealth which ultimately goes to capital formation.

10. Balancing Role

An entrepreneur plays a dominant role by starting small-scale industries. Small-scale industries provide immediate large-scale employment, ensure a more equitable distribution of national income and thus facilitate balanced regional development.

11. Status transformation role

Entrepreneurs create wealth, generate employment and income and thereby they increase the standard of living of the people. People are able to have a better standard of living by getting improved products and comforts supplied by entrepreneurs.

12. Employment generation role

Entrepreneurs with high achievement motivation come forward to establish business and industries ventures which provide immediate large-scale employment.

13. Export promotion role

Entrepreneurs also promote a country's export trade which is an important ingredient to economic development.

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VII. ENTREPRENEURS ARE BORN NOT MADE

- Entrepreneurs are both born as well as made. In some of the business families, the members inherit the family business.
- By being born in business and industrial families some of the members automatically become industrialists.
- In olden days, these "inherited industrialists" were formed large part of the business world in India for Eg: the casts like Banias, Marwarei, and TVS group in Tamil Nadu were doing larger business.
- But now there is a wider encouragement given by the state and central governments to spread industrial development in all regions, by involving the real talents available in the country, irrespective of caste, creed and religion.
- The persons whose parental occupation may be agriculture can enter business and industry, by the financial and promotional support given by the governments.
- Though these persons are not born entrepreneurs, they are responsible for country industrialization. The environment is changing not only due to the financial and promotional support lent by the government but also many new young educated people are willingly involving themselves in the sphere of industrial and entrepreneurial development.
- Hence, it can be held that the "entrepreneurs are both born as well as made.

VIII. CONCLUSION

Entrepreneur's contribution to the economy is of immense value. He or she is indispensable to the economic growth of the country. His or her products are valuable to the overall development of the society. An economy is much dependent upon the performance level of its entrepreneur. He or she plays a vital role in the growth of the national income as well as raising the per capita income of the people. Based on its central role in economic development, respective governments, nongovernmental organizations, community based organizations and other stake holders should promote its development in order to reap its full benefits.

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CHAPTER - 10

MAKING OF PAKKUMATTAI PRODUCTS – AN AVENUE FOR PROMOTING ENTREPRENEURSHIP

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ABSTRACT*:*

Pakkumattai Plate Making Industry is a labour-intensive industry. It provides employment opportunities, generates income, utilizes the available natural and human resources, develops entrepreneurship and thereby promotes our nation's economy. Indian Pakkumattai products have great demand in both domestic as well as overseas markets. Therefore, the present study is mainly aims at promoting entrepreneurship through making of pakkumattai products through minimizing input and maximizing output especially converting the wastage of pakkumattai into value added products.

Keywords: *Investment, Employment, Production, Cost, Sales, Net Profit and ROI*

Introduction

Pakkumattai plate making industry is one of the micro industries in India. It plays a significant role in growth and development of our country's economy. Pakkumattai is used as wastage in the ancient period but now-a-days they are very valuable and useable for multipurpose and thereby they create more demand in both domestic as well as overseas markets. Further the uses and needs of the pakkumattai plates are increasing day-by-day because they are converting into value added products. During the beginning period, pakkumattai plates (It is called as **"Areca Plate"** in English) are used in temples for providing sacred food but now-a-days they are very essential part as well as heart of every aspect of social and official functions. Hence, Pakkumattai plates are mostly welcomed as well as expected by the people due to the restriction for using plastic plates. As per the restriction of our government for using plastic products, most of the people are using the pakkumattai plates instead of banana leaf and plastic plates in both social as well as official functions like marriage functions, seminars, conferences, meetings, canteens, star hotels and other activities for providing snacks and foods due to they are natural, disposable and less expensive.

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Pakkumattai products have better market potential in both domestic as well as overseas areas because of theirs special attributes like 100 percent natural, bio-degradable, convenient for using, eco-friendly and disposable. USA, Netherlands, Germany, Australia, European countries, Spain and UK are the major importing countries for Indian pakkumattai products[1]**.** Further, it is used for making different end products like plate, bowl, container box (take way box or food packing container), spoon, tea cub, gape, chapel. A major portion of pakkumattai is used for making of different varieties of pakkumattai products and the remaining portion is used for fuel and natural fertilizer purposes. Pakkumattai Plate is also called as areca leaf plates, areca palm leaf plates, palm leaf plates, bio-plate, natural plates, disposable plates, eco friendly and bio-degradable dinner plates, kitchenware and dinnerware

Review of Literature

Patil Vidyapeeth, Manjunatha and Bayavanda Chinnappa Thimmaiah[2] (2019) in their article, *"Eco-friendly Areca nut Leaf Sheath Products: An Economic Analysis",* had assessed that the rising demand for biodegradable and eco-friendly areca leaf generated net returns of Rs. 17, 800 hectare to areca nut growers. Further, they found that the average capital investment required Rs. 13.42 lakhs per annum for the establishment as well as operation of a pakkumattai plate making unit

Importance of the Study

Pakkumattai Plate making industry in India provides self=employment opportunities to the people, reduces unemployment problems, generates income. alleviates poverty, improves the standard of living the people, contributes industrial production, market share, export earnings, utilizes available natural and human resources, avoids wastages of resources, attains women empowerment, protects the environment, develops entrepreneurship and thereby promotes our nation's economy. Further, small size of investment, little efforts, less investment, less training, less education and less experience is required to establish as well as operate the pakkumattai plate making industry. Therefore, it has very wider scope for profitability and prosperity.

Statement of the Problem

Unemployment, under employment, poverty and lack of income are the major problems in developing countries like India. These problems can be solved by the efforts of the government through promoting entrepreneurship.

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[1] *Business Master-A Monthly Magazine for Entrepreneurship, Volume 1, Issue 4. October 2015*

[2] *Patil Vidyapeeth. D.Y., Manjunatha, G.R., and Bayavanda Chinnappa Thimmaiah, "Eco-friendly Arecanut Leaf Sheath Products: An Economic Analysis", Indian Journal of Ecology 46(2):431-436. November 2019*

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Entrepreneurship is a process which converts the available inputs into outputs. Further, the environment and society are negatively affecting in terms of pollution, use of plastics products and wastage of natural and local resources. Hence, despite of various MSMEs are performing, pakkumattai products making industry holds a reasonable change for utilizing available natural and human resources and thereby avoids the wastage resources and thereby protects society. Hence, an attempt is made in the study for measuring the performance of pakkumattai box making unit in terms of its investment, employment, production, cost, net profit and ROI for sustainability.

Objectives of the Study

The main objectives of the study are

- To measure investment requirement for making of pakkumattai box
- To assess the income earned by the pakkumattai box making unit
- To find out the ROI of the pakkumattai box making unit

Raw Material

Pakkumattai is the basic raw material for the pakkumattai plate making industry which is available as plenty in different places of India. “There were pakku trees are cultivated at 4 lakhs hectares in India which provides 4,500 million leafs per annum. A pakku tree provides from 5 to 6 leafs per annum”[3]. The Pakkumattais (Areca leaf in English) are available in different states of our nation namely Tamil Nadu, Kerala, Karnataka and Andaman & Nicobar Island. The cultivation of pakku trees is mainly concentrated on different places of Tamil Nadu state viz., Kanniyakumari, Coimbatore, Oooty, Kunnur, Mettupalayam, Erode, Namakkal and Salem districts.

Besides that Vaalappadi in Salem district and its cluster areas namely Singipuram, Palaniyaputam, Periya goundan puthur are the major pakku thopes located in 6,000 hectares. Further, there were more than 20 families are depends on pakku tree cultivation for their livelihood and they are cultivated pakku trees in 4,000 hectares at the irrigated areas of Vasista river and Vellar areas for getting long-term benefits. Therefore, the raw material for the industry is available plenty in these areas.

Production Process

Pakkumattai plates are perfect alternate to plastics/polymer based products and also paper based products about which the entire world is concerned. A 100 percent natural mechanism is followed for manufacturing pakkumattiai plates.The fallen areca leaf is collected from farms. The sheath of the areca leaf cleaned and soaked in water for 15 minutes and shade dried for 30 minutes.

[3] https://pothuarivugk.blogspot.com/p/general-knowledge-in-tamil-agricultural.html

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After that they are compressed into different shapes viz., square, circle, triangle, rectangle, rhombus, pentagon, hexagon, octagon and trapezoid by using the correspondingly shaped Machines. After completed the entire production process of pakkumattai plates, they are packed as per the requirements of customers. Further, out of a number of container boxes (it is also called as take way box, food container box and food parcel box), only two verities namely 500 ml box and 1000 ml box are taken into account for sustainability.

Investment Requirement

The total capital investment of pakkumattai box making unit comprises of both fixed and working capital. Fixed capital is the fund need to establish the pakkumattai box making unit. It includes machinery Rs. 3,25,000, electricity and installation charges Rs. 15,000 and water tank for cleaning of leaf Rs.5,000. Hence, the total fixed capital of Rs, 3,45,000 per annum required for the establishment of a pakkumattai unit. The term working capital refers to the fund need to operate the industry. It concerned with direct material cost Rs. 4,86,000, direct labour cost Rs. 1,50,000 and direct expenses Rs. 1,68,000 (including power cost Rs. 48,000 and factory rent Rs.1,20,000). Hence, the total working capital of Rs. 8,04,000 per annum required for operating the pakkumattai unit. Therefore, the total capital of Rs. 11,49,000 per annum required for making pakkumattai box.

Employment Potential

Pakkumattai plate making industry in India provides self-employment opportunities to the unemployed people especially women. It provides direct employment to 2 persons and indirect employment to 3 persons[4]. Further, family members are working as owner – cum workers in the industry for their daily employment due to it is operating within the home. However, a major portion of workforce consisted by women. There were more than 50,000 persons engaged in cultivation of pakku trees in and the cluster areas of Vaalappadi, Salem district in Tamil Nadu. Finally, family women only can undertake and operate the pakkumattai industry within the home (with or without power) without the supports as well as efforts of their counterpart men.

Cost of Production

The cost structure of the pakkumattai box making unit comprises of both direct cost and indirect cost. Direct costs are the costs which are actually incurred on making of pakkumattai box. It includes direct material cost Rs. 4,86,000, direct labour cost Rs.1,50,000, power cost Rs. 48,000 and factory rent Rs.1,20,000. Hence, the total indirect was Rs. 8,04,000 per annum. Similarly, indirect costs are also costs which are not incurred on making of pakkumattai box.

[4]https://pothuarivugk.blogspot.com/p/tamil-short-stories.html

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It comprises of packing charges Rs. 36,000, depreciation charges Rs. 32,500 and repairs expenses Rs. 30,000. The total indirect cost of the unit was Rs. 98,500 per annum. Therefore, the total of a pakkumattai box making unit was Rs. 9,02,500 per annum

Production and Sales

There were two distinct varieties of pakkumattai take way (container box) boxes produced by a pakkumattai box making unit viz., 500 ml box and 1000 ml box. A pakkumattai box making unit can be produced 1,80,000 boxes per annum (500 ml boxes 90,000 + 1000 ml boxes 90,000). Further, total sales value of the pakkumattai unit was Rs. 14,40,000 (6,30,000 for 500 ml boxes and Rs. 8,10,000 for 1000 ml boxes) per annum

Net Profit

The net profit refers to the net income earned by the pakkumattai box making unit. It is measured by deducting the total costs from the total sales value. Thus, the net profit of pakkumattai box making unit is the difference between total sales value and its total costs. The net profit of the pakkumattai box making unit was Rs. 5,37,500 per annum (Rs.14,40,000 – Rs. 9,02,500)

Return on Investment

The Return on Investment is popularly called as ROI. ROI is the relationship between the total capital employed and Net profit earned by the business concern. The ROI of pakkumati box making unit is measured in terms of its earnings capacity and efficiency. The ROI of a pakkumattai plate making unit is calculated by using the following formula viz., Return on Investment = Net Profit / Total Investment x 100. Therefore, the ROI of the pakkumattai box making unit was 46.58 percent per annum (Rs.11,49,500 / Rs. 5,37,500 X 100)

Initiatives of Government

Government of India encourages and motivates the people for making pakkumattai products by providing subsidies and training to them. The government provides 95 percent on the project cost to the entrepreneurs as subsidy for making pakkumattai plates under Prime Minister Employment Programme.[5] The subsidy amount is credited in the loan account of the entrepreneurs after 3 years. Tamil Nadu Agriculture Development and Centre for Entrepreneurship (which is located in the premises of Tamil Nadu Agriculture University, Coimbatore) provides training to the people for undertaking pakkumattai plate making unit. Further, it provides 50 percent of power subsidy to the pakkumattai plate making units those are registered as Micro and Small Industry[6].

[5] https://pothuarivugk.blogspot.com/p/youtube.html
[6] https://pothuarivugk.blogspot.com/p/general-knowledge-in-tamil-agricultural.html

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Besides that the government of India also provides 25 percent of machinery subsidy and also if the units are registered under KVIC, they can avail the subsidy for purchase of materials.

Conclusion

Pakkumattai products have great demand in both domestic as well as international markets because of their special attributes like eco-friendly, 100 percent natural, bio-degradable and disposable, convenient for using, size, quality and price, The performance of pakkumattai box making unit is measured in the study in terms of its input (investment, employment, production, sales value) and output (income). Therefore, it concluded that making of pakkumattai products is an avenue for promoting entrepreneurship and economic empowerment for the people by converting the wastage of pakkumattai into different value added products.

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CHAPTER - 11

ARTIFICIAL INTELLIGENCE AND THE FUTURE OF HUMAN RESOURCE PRACTICES

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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative force across industries, redefining the way organizations manage their human capital. In Human Resource Management (HRM), AI applications span recruitment, onboarding, performance evaluation, employee engagement, and learning & development. This paper examines the role of AI in reshaping HR practices, supported by recent market data, case studies, and scholarly perspectives. The study also evaluates challenges such as algorithmic bias, data privacy, and ethical considerations, while forecasting the future trajectory of AI adoption in HRM. Findings indicate that AI integration leads to higher efficiency, cost savings, and improved decision-making, but requires robust governance to ensure fairness and transparency.

Keywords: *Artificial Intelligence, Human Resource Management, AI in Recruitment, HR Analytics, Workforce Automation, Employee Engagement, Digital Transformation.*

1.1 INTRODUCTION

The rapid evolution of Artificial Intelligence (AI) is reshaping business functions across industries, and Human Resource Management (HRM) is no exception. AI, encompassing technologies such as machine learning (ML), natural language processing (NLP), computer vision, and predictive analytics, has transitioned from being an experimental innovation to a core enabler of business transformation. In HRM, AI is not merely an automation tool but a strategic partner that enhances decision-making, improves efficiency, and personalizes employee experiences. AI addresses these challenges by enabling data-driven decision-making, reducing administrative workloads, and ensuring consistency in policy implementation.

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According to Gartner (2024), 37% of organizations worldwide have implemented AI in at least one HR process, with adoption rates projected to surpass 60% by 2027. Similarly, MarketsandMarkets (2024) predicts that the global AI in HR market will grow from USD 3.9 billion in 2023 **to** USD 12.2 billion by 2030, at a CAGR of 17.3%. This growth is driven by increasing demand for predictive workforce analytics, AI-powered recruitment tools, and intelligent learning management systems.

In recruitment, AI-powered Applicant Tracking Systems (ATS) can screen thousands of applications within seconds, rank candidates based on skills and experience, and even conduct initial interviews through AI-enabled chatbots. For performance management, AI analytics can monitor productivity patterns, detect performance issues early, and recommend targeted interventions. In learning and development, AI-based platforms offer personalized learning pathways, enhancing both engagement and retention of knowledge.

This paper explores how AI is redefining HR practices, the benefits and limitations of its adoption, and the future implications for HR professionals and organizations. It argues that while AI offers immense opportunities to improve efficiency, accuracy, and personalization, its effective deployment requires careful consideration of ethical principles, transparency, and a hybrid approach that blends technological precision with human empathy.

2. LITERATURE REVIEW

Artificial Intelligence (AI) has emerged as one of the most influential technological advancements in Human Resource Management (HRM), reshaping traditional practices and enabling data-driven decision-making. Over the past decade, scholars and practitioners have increasingly explored how AI can enhance efficiency, accuracy, and strategic alignment in HR functions.

2.1 AI as a Strategic Enabler in HRM

Research indicates that AI is transforming HR from an administrative support function to a strategic business partner (Bhatnagar & Srivastava, 2021). AI tools enable organizations to analyze workforce trends, predict talent needs, and personalize employee experiences. By automating repetitive tasks, HR professionals can focus more on high-value strategic activities such as talent retention, leadership development, and organizational culture building (Huang & Rust, 2021).

2.2 AI in Recruitment and Selection

AI-powered recruitment systems such as Applicant Tracking Systems (ATS) and automated interview analysis tools have significantly reduced the time and cost of hiring (PwC, 2023). These systems use natural language processing (NLP) and machine learning algorithms to screen resumes, rank candidates, and even assess personality traits through video interviews (Dixon & Johnson, 2022).

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While these advancements improve efficiency, studies also highlight risks such as algorithmic bias, which may perpetuate inequalities if training datasets are not diverse (Raghavan et al., 2020).

2.3 AI in Performance Management

The integration of AI into performance appraisal systems has shifted the process from annual reviews to continuous, real-time feedback. Deloitte (2023) reports that organizations using AI-enabled performance management tools observed a 26% improvement in appraisal accuracy. Predictive analytics also helps identify high performers and those at risk of disengagement, allowing for timely interventions (Kim & Lee, 2022).

2.4 AI in Employee Engagement and Retention

Sentiment analysis tools and AI-driven engagement surveys allow HR to gauge employee morale on an ongoing basis. Platforms such as Peakon AI provide insights into workforce sentiment and recommend targeted actions to improve retention rates (LinkedIn Learning, 2023). AI also supports personalized employee development plans, enhancing satisfaction and loyalty.

2.5 AI in Learning and Development (L&D)

Adaptive learning platforms customize training content based on individual learning styles, skill levels, and career aspirations. Studies show that AI-curated learning paths increase course completion rates and knowledge retention (LinkedIn Learning, 2023). Virtual reality (VR) and AI-based simulations are also gaining traction for immersive employee training (Vasudevan, 2022).

2.6 Research Gap

While existing literature extensively covers AI applications in recruitment, training, and performance management, there is limited holistic research on its impact across the entire HR value chain, especially in emerging economies. This gap provides an opportunity to explore how AI can be integrated sustainably and ethically in diverse organizational contexts

3. BENEFITS OF AI IN HUMAN RESOURCE MANAGEMENT

The integration of Artificial Intelligence in Human Resource Management provides organizations with strategic, operational, and analytical advantages. Its adoption enhances efficiency, reduces costs, and enables HR departments to function as proactive business partners.

3.1 Increased Efficiency and Productivity

AI automates repetitive and time-consuming HR tasks such as screening resumes, scheduling interviews, processing payroll, and managing employee queries through chatbots. This automation reduces manual workload, allowing HR professionals to allocate more time to strategic initiatives such as talent development and organizational culture building.

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3.2 Enhanced Recruitment and Talent Acquisition

AI-powered recruitment platforms can scan thousands of applications within seconds, shortlisting candidates based on skill match, experience, and job fit. Predictive analytics further helps identify candidates who are most likely to succeed in the role, thereby improving hiring quality and reducing employee turnover.

3.3 Data-Driven Decision Making

With the help of AI-driven analytics, HR teams can make evidence-based decisions regarding promotions, compensation, and workforce planning. Real-time dashboards offer insights into employee performance, engagement trends, and skill gaps, enabling timely and informed HR interventions.

3.4 Improved Employee Experience

AI chatbots and virtual assistants provide employees with instant answers to HR-related queries, enhancing accessibility and responsiveness. Personalized learning paths, career recommendations, and continuous feedback systems contribute to a more engaging employee experience.

3.5 Predictive Workforce Planning

AI can analyze workforce patterns to predict future staffing needs, identify potential attrition risks, and recommend succession plans. This predictive capability allows organizations to prepare proactively for business challenges and skill shortages.

3.6 Cost Reduction

By minimizing manual errors, reducing hiring time, and optimizing training programs, AI helps organizations lower operational costs. Automated processes also decrease the need for large HR administrative teams.

3.7 Bias Reduction in Recruitment

When trained on diverse datasets and implemented with fairness safeguards, AI can help minimize unconscious bias in hiring decisions. Objective algorithms focus on skills and competencies rather than demographic characteristics, promoting diversity and inclusion.

3.8 Continuous Performance Monitoring

Unlike traditional annual reviews, AI enables continuous, real-time performance tracking. This approach ensures timely recognition of high performers and early identification of underperformance, leading to faster corrective measures.

3.9 Enhanced Learning and Development

AI-powered adaptive learning systems tailor training content to individual employees' learning pace and preferences. Gamified AI training platforms increase participation, knowledge retention, and application of learned skills in the workplace.

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3.10 Strategic HR Transformation

Ultimately, AI shifts HR's role from administrative processing to strategic leadership. By handling routine work, AI allows HR professionals to focus on talent engagement, organizational change, and long-term workforce strategy.

4. AI TECHNOLOGIES IN HRM

Artificial Intelligence in Human Resource Management leverages various advanced technologies to automate tasks, analyze complex datasets, and enhance decision-making. These technologies not only improve efficiency but also ensure a more personalized and engaging experience for employees.

4.1 Machine Learning (ML)

ML algorithms help HR teams make data-driven decisions by identifying patterns in employee behavior, recruitment trends, and performance metrics. For example, ML can predict which candidates are most likely to succeed in a role, or identify employees at risk of leaving, allowing proactive retention strategies.

4.2 Natural Language Processing (NLP)

NLP enables HR chatbots and virtual assistants to communicate naturally with employees and candidates. It powers automated resume screening by scanning large volumes of applications for relevant skills, qualifications, and experience while reducing manual effort.

4.3 Robotic Process Automation (RPA)\

RPA is widely used for repetitive, rule-based HR tasks such as payroll processing, attendance tracking, leave management, and document verification. This frees HR staff from administrative burdens, enabling them to focus on strategic planning and employee engagement.

4.4 Predictive Analytics

By analyzing historical and real-time data, predictive analytics helps in workforce planning, identifying training needs, forecasting attrition rates, and optimizing recruitment timelines. This results in better resource allocation and cost savings.

4.5 Facial Recognition and Biometric Systems

These technologies enhance workplace security, streamline attendance marking, and provide accurate time tracking. Some advanced systems also monitor employee engagement during training sessions using emotion recognition technology.

4.6 Virtual Reality (VR) and Augmented Reality (AR)

VR and AR are increasingly used in onboarding and training programs, offering immersive and interactive learning experiences. They allow employees to simulate real-world scenarios, improving skill retention and job readiness.

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4.7 Sentiment Analysis Tools

AI-powered sentiment analysis scans emails, surveys, and workplace communication channels to assess employee mood and satisfaction levels. This enables HR to detect disengagement early and address workplace issues proactively.

5.1 IMPACT ON HR ROLES & SKILLS

The adoption of Artificial Intelligence in HRM is reshaping the roles and required skill sets of HR professionals. Routine administrative tasks such as resume screening, payroll processing, and scheduling are increasingly automated, allowing HR staff to shift their focus toward strategic functions like workforce planning, talent development, and organizational culture building. This transformation demands that HR professionals acquire new competencies, including data analytics, AI tool management, and digital literacy, alongside traditional interpersonal and leadership skills. As technology takes over repetitive work, the human aspect of HR—such as empathy, ethical decision-making, and employee engagement—becomes even more critical to ensure a balanced, inclusive, and people-centric workplace.

6.1 COST-BENEFIT ANALYSIS

A cost-benefit analysis of implementing Artificial Intelligence in Human Resource Management reveals that, while the initial investment in AI tools, infrastructure, and training can be substantial, the long-term benefits often outweigh these costs. Automation reduces the time and expenses associated with repetitive tasks such as recruitment screening, payroll management, and employee queries, leading to significant operational savings. However, organizations must also account for hidden costs such as system maintenance, data security measures, and the potential need to address algorithmic biases, which can affect employee trust and satisfaction. A well-planned AI adoption strategy can maximize benefits while minimizing financial and ethical risks.

7.1 FUTURE TRENDS IN AI AND HRM

Future trends in Artificial Intelligence for Human Resource Management point toward deeper integration of predictive analytics, advanced natural language processing, and emotion recognition technologies to enhance workforce management.

AI-powered chatbots are expected to become more human-like, offering personalized employee support 24/7, while predictive models will assist in forecasting turnover, identifying skill gaps, and guiding targeted learning and development programs. Virtual reality (VR) and augmented reality (AR), combined with AI, will play a growing role in immersive onboarding and training experiences. As remote and hybrid work models continue to evolve, AI will facilitate real-time collaboration, monitor employee well-being, and help create adaptive workplace policies, shaping the future of HR into a more data-driven yet human-centered function.

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8. CHALLENGES AND ETHICAL CONCERNS OF AI IN HUMAN RESOURCE MANAGEMENT

While Artificial Intelligence offers significant benefits in HRM, its adoption also raises various operational, technical, and ethical challenges. Organizations must address these concerns to ensure AI is implemented responsibly and effectively.

8.1 Data Privacy and Security

AI systems in HR rely heavily on collecting and processing sensitive employee information, such as personal data, performance metrics, and behavioral patterns. Mishandling this data or exposure to cyberattacks can lead to serious privacy breaches and legal consequences under regulations like GDPR or India's Digital Personal Data Protection Act (DPDPA).

8.2 Algorithmic Bias and Discrimination

Although AI can reduce bias, it can also perpetuate or even amplify it if trained on biased datasets. For example, recruitment algorithms may unintentionally favor certain demographics or educational backgrounds, leading to discriminatory hiring practices. This raises legal and reputational risks for organizations.

8.3 Lack of Transparency (Black Box Problem)

Many AI algorithms operate as "black boxes," making it difficult for HR professionals to understand how decisions are made. This lack of transparency can lead to distrust among employees and make it challenging to justify or defend AI-driven decisions in disputes.

8.4 Over-Reliance on Automation

Excessive dependence on AI tools may result in reduced human judgment in HR decision-making. HR involves complex interpersonal elements such as empathy, negotiation, and conflict resolution, which AI cannot fully replicate.

8.5 Resistance to Change

Introducing AI in HR may be met with skepticism or fear among employees, who might perceive it as a threat to job security. Overcoming this resistance requires transparent communication, change management strategies, and adequate training.

8.6 Skill Gaps in HR Teams

Implementing AI tools effectively requires HR professionals to develop new skills in data analytics, technology management, and AI ethics. Many organizations face challenges in upskilling HR staff to work alongside AI systems.

8.7 Legal and Compliance Issues

AI in HR must comply with labor laws, anti-discrimination legislation, and data protection regulations. Lack of legal clarity on AI decision-making processes may expose organizations to litigation risks.

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9. CONCLUSION

Artificial Intelligence is rapidly transforming Human Resource Management by streamlining recruitment, automating administrative tasks, enhancing performance evaluation, and enabling data-driven workforce planning. Its ability to analyze large volumes of data and provide predictive insights allows HR professionals to focus more on strategic and employee-centric activities, ultimately improving efficiency and engagement. However, the integration of AI in HRM also brings challenges such as data privacy risks, algorithmic bias, lack of transparency, and ethical dilemmas. To fully realize AI's potential, organizations must implement strong governance frameworks, invest in employee training, and ensure fairness and inclusivity. By balancing technological advancement with the human touch, AI can serve as a powerful enabler of innovation and sustainable workforce development.

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CHAPTER - 12

ROLE OF TECHNOLOGY IN FINANCE

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ABSTRACT

Technology has become a driving force in transforming the global financial landscape, reshaping how financial services are developed, delivered, and consumed. This evolution has led to greater efficiency, security, and accessibility within the financial ecosystem. Digital banking platforms and mobile applications have significantly reduced the reliance on traditional brick-and-mortar branches, allowing users to perform transactions, access credit, and manage investments from anywhere. Financial technology (fintech) firms have emerged as major disruptors, introducing services such as peer-to-peer lending, robo-advisors, and digital wallets that cater to a more tech-savvy and underserved population.

Advanced technologies like artificial intelligence (AI) and machine learning have enhanced decision-making in areas such as credit scoring, fraud detection, and algorithmic trading. These tools analyse vast amounts of data to identify patterns, assess risk, and automate trading strategies with a level of speed and accuracy beyond human capability. Blockchain technology further contributes by enabling decentralized, secure, and transparent transactions, which are increasingly used in areas such as cross-border payments and smart contracts.

Big data analytics empowers financial institutions to better understand customer behaviour, personalize services, and optimize risk management. In parallel, cybersecurity technologies, including biometric authentication and real-time threat detection systems, play a crucial role in safeguarding financial data and maintaining trust. In summary, the integration of technology into finance has revolutionized the industry by enhancing operational efficiency, improving customer experiences, and expanding access to financial services. As innovation continues, the financial sector is expected to become even more automated, data-driven, and inclusive, paving the way for a more resilient and adaptive global economy.

Keywords: *Technologies and Finance, Artificial Intelligence*

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Introduction

The rapid advancement of technology has significantly reshaped the global financial landscape, transforming how financial services are developed, delivered, and accessed. Traditionally, finance was heavily dependent on physical infrastructure, manual processes, and face-to-face interactions. However, the digital revolution has shifted the industry toward more efficient, automated, and customer-centric models. Today, technology is not just a support function in finance it is a driving force behind innovation, competitiveness, and growth.

Digital banking platforms have replaced many traditional banking functions, offering customers the ability to conduct transactions, access loans, and manage investments from their smartphones or computers. Financial technology (fintech) companies have emerged as major players, introducing services such as mobile payments, robo-advisors, and peer-to-peer lending that cater to the needs of a digitally connected population. These innovations have enhanced convenience, reduced costs, and expanded access to financial services, especially in underserved communities.

Beyond customer-facing applications, technology plays a crucial role in the internal operations of financial institutions. Artificial intelligence (AI) and machine learning are used to detect fraud, assess credit risk, and automate complex trading strategies. Big data analytics allows firms to gain insights into customer behaviour, personalize services, and make more informed decisions. Blockchain technology, known for its secure and transparent nature, is revolutionizing areas like cross-border payments, digital identity verification, and smart contracts.

In addition, cybersecurity technologies have become essential in protecting sensitive financial data and maintaining trust in digital systems. As financial transactions increasingly move online, ensuring security and compliance has become a top priority.

In conclusion, technology is at the heart of modern finance. It enhances operational efficiency, enables innovation, and expands access to services. As technological development continues, its role in finance will only grow, shaping the future of the industry in profound and lasting ways.

Methodology

This study employs a qualitative research methodology to explore the role of technology in the finance sector. The research is based on a comprehensive review of secondary data, including academic journals, industry reports, case studies, and reputable news sources published within the last decade. The purpose is to identify and analyse key technological trends and their impacts on various areas of finance, such as banking, investment, payments, risk management, and customer service.

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The selection of sources was guided by relevance, credibility, and recency to ensure that the findings reflect current developments in financial technology (fintech). The study also examines real-world applications and case examples from leading financial institutions and fintech companies to understand how technology is being implemented and what outcomes are being observed.

To maintain objectivity, multiple sources were cross-referenced to validate the information. The focus was on identifying patterns, emerging technologies, and measurable benefits such as improved efficiency, accessibility, and security. The methodology does not involve primary data collection (e.g., surveys or interviews), but instead synthesizes existing knowledge to provide a well-rounded understanding of how technology is shaping the financial industry today.

This approach offers a broad yet focused overview of the topic, suitable for academic and professional analysis.

Findings & Analysis

The integration of technology into the financial sector has resulted in significant advancements that have reshaped the way financial services are delivered and experienced. The findings highlight key areas where technology has had the most impact:

ANALYSIS

TABLE SHOWING THE INTEGRATION OF TECHNOLOGY

S.no	The integration of technology	No. of respondents	percentage
1	Enhanced Accessibility and Inclusion	26	22
2	Automation and Operational Efficiency	63	52
3	Blockchain and Financial Transparency	25	21
4	Data-Driven Decision Making	6	5
5	Improved Security Measures	NIL	NIL
Total		**120**	**100**

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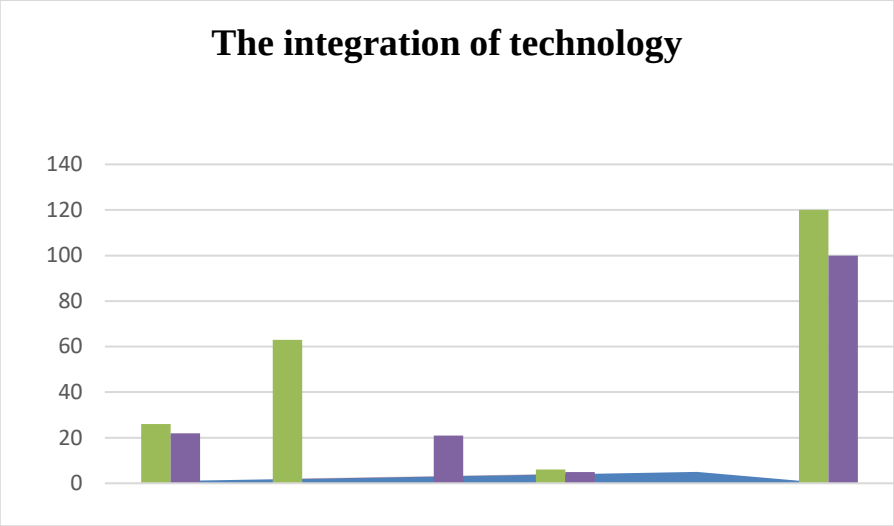

The above table shows 52% of Automation and Operational Efficiency

1. Enhanced Accessibility and Inclusion

Digital banking and mobile finance applications have made financial services more accessible to a broader population, including those in remote or underserved areas. Fintech companies have introduced user-friendly platforms that simplify tasks like money transfers, bill payments, and loan applications, contributing to greater financial inclusion.

2. Automation and Operational Efficiency

Automation through artificial intelligence (AI) and machine learning has streamlined financial operations. Tasks such as fraud detection, credit scoring, and customer service are now performed faster and more accurately. This reduces costs and increases productivity for financial institutions.

3. Blockchain and Financial Transparency

Blockchain technology offers decentralized and tamper-proof systems for recording transactions. It is increasingly used in areas like cross-border payments, smart contracts, and digital identity management, ensuring greater transparency and security in financial operations.

4. Data-Driven Decision Making

Big data analytics allows financial firms to collect and analyse vast amounts of customer data. This leads to more informed decisions, personalized financial products, and improved risk management.

5. Improved Security Measures

With the rise of cyber threats, financial institutions are investing in advanced cybersecurity technologies, including encryption, biometric authentication, and AI-based threat monitoring systems, to protect customer data and maintain trust.

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Analysis

The findings demonstrate that technology has become central to financial innovation and competitiveness. While it enhances service delivery and creates new opportunities, it also introduces new challenges such as regulatory complexity, cybersecurity risks, and ethical concerns around data use. Addressing these issues is essential for the sustainable growth of tech-driven finance.

Ethical & Legal Implications

The increasing reliance on technology in finance brings not only innovation and efficiency but also a range of ethical and legal concerns that must be carefully managed to ensure responsible and sustainable growth.

1. **Data Privacy and Consent**

   Financial institutions collect vast amounts of personal and financial data through digital platforms and analytics tools. This raises ethical concerns about how data is collected, stored, and used. Customers often do not fully understand how their data is being processed, leading to questions about informed consent and the potential misuse of sensitive information.

2. **Bias and Fairness in Algorithms**

   AI and machine learning are used for decisions such as credit scoring, loan approvals, and fraud detection. If these algorithms are trained on biased data, they can unintentionally discriminate against certain groups, leading to unfair treatment. Ensuring transparency, fairness, and accountability in automated decision-making is a growing ethical obligation.

3. **Cybersecurity and Consumer Protection**

   As financial services become more digitized, they become more vulnerable to cyberattacks. Financial institutions have a legal and ethical responsibility to implement strong cybersecurity measures to protect customer assets and personal data. Failure to do so can lead to significant harm and loss of trust.

4. **Regulatory Compliance and Oversight**

   Rapid technological innovation often outpaces regulatory frameworks. Financial technology must operate within evolving laws concerning data protection (e.g., GDPR), anti-money laundering (AML), and consumer rights. Regulators must adapt quickly, while institutions must ensure compliance to avoid legal penalties and maintain market integrity.

5. **Digital Exclusion**

   While technology improves access for many, it can also exclude those without digital literacy or access to devices and the internet. Ethical financial service delivery must account for this gap to ensure inclusive access for all socioeconomic group

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Conclusion

Technology has become an integral force driving transformation in the financial sector, reshaping the way financial services are delivered, managed, and experienced. From digital banking and fintech innovations to advanced data analytics, blockchain, and artificial intelligence, technology has significantly enhanced operational efficiency, customer convenience, and financial inclusion. These advancements have enabled faster transactions, improved risk management, and more personalized financial services, benefiting both institutions and consumers.

However, alongside these benefits come new challenges. Ethical concerns such as data privacy, algorithmic bias, and digital exclusion must be addressed with transparency and fairness. Similarly, legal and regulatory frameworks must evolve to keep pace with technological change, ensuring that innovation does not outstrip accountability or consumer protection.

Ultimately, the role of technology in finance is both transformative and complex. Its continued development offers great promise, but it requires a balanced approach that integrates innovation with strong ethical standards, robust legal frameworks, and a commitment to inclusive growth. As the financial industry continues to digitize, the responsible use of technology will be key to building a more efficient, secure, and equitable financial future.

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CHAPTER - 13

A COMPARATIVE STUDY OF ESG PERFORMANCE AND FINANCIAL CONTRIBUTION OF TOP 10 INDIAN COMPANIES

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ABSTRACT

This research investigates how Environmental, Social, and Governance (ESG) practices influence the financial performance and corporate social responsibility (CSR) efforts of ten prominent Indian companies over the period from 2014 to 2024. By examining a decade's worth of data on ESG composite scores, CSR spending, and key financial metrics—such as Return on Equity (ROE), Return on Assets (ROA), net profit margins, and Earnings Per Share (EPS)—the study aims to determine whether firms with stronger ESG commitments see better financial results. Employing robust statistical techniques including Pearson correlation, one-way ANOVA, Chi-square tests, and two-sample t-tests, it assesses both the significance and magnitude of the relationships between ESG and financial outcomes, while also considering differences across various industry sectors. Findings generally indicate a positive link between higher ESG scores and financial indicators, particularly ROE, though results vary by company and sector. The alignment between CSR expenditures and ESG ratings is strong, yet these social investments do not always translate into immediate profitability, underscoring their strategic, long-term and reputational value. Qualitative analysis of governance frameworks, environmental policies, and social initiatives complements the numerical data to provide deeper context. The paper advocates for greater adoption of standardized ESG reporting as prescribed by SEBI's Business Responsibility and Sustainability Report (BRSR) guidelines, more thorough integration of ESG considerations into corporate strategies, and enhanced transparency and verification in ESG disclosures.

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These recommendations are essential to boosting investor trust and fostering sustainable growth among Indian businesses. Overall, this study adds valuable insights to the growing body of research on ESG in emerging markets, shedding light on the opportunities and challenges Indian companies face in aligning sustainability with profitability.

Keywords: *ESG, CSR, financial performance, ROE, ROA, India, sustainability reporting, SEBI BRSR, corporate governance, renewable energy, social investment, sustainable finance, environmental disclosure, sectoral variation, panel data analysis.*

Introduction

Environmental, Social, and Governance (ESG) considerations have fundamentally reshaped the landscape of corporate strategy and investment decision-making worldwide. No longer a niche or philanthropic afterthought, ESG is now recognized as critical for managing risk, capturing opportunities, and ensuring long-term value creation. Globally, investors, regulators, and civil society increasingly demand transparency on how companies manage their environmental impact, social responsibilities, and governance effectiveness. This shift is apparent in India, where evolving regulatory mandates and market expectations have accelerated corporate adoption of ESG principles.

India's Securities and Exchange Board (SEBI) introduced the Business Responsibility and Sustainability Report (BRSR) framework in 2021, requiring large listed companies to disclose standardized ESG metrics, thereby institutionalizing sustainability reporting. This policy aligns Indian firms with global standards such as the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD). Additionally, growing investor stewardship, technological innovation in renewables and digital services, and rising social expectations compel Indian companies to embed ESG deeply into business models.

In Indian context, Corporate Social Responsibility (CSR) has a legal foundation since the Companies Act 2013 mandated minimum CSR spend, stimulating corporate investments in social upliftment, environment, and community development. Yet, despite growing attention, the empirical relationship between ESG engagement and financial performance remains under-studied in India, particularly across sectors and over long time horizons.

Against this backdrop, this study investigates the association between ESG performance and financial outcomes of ten leading Indian companies over FY2014–FY2024. Firms were selected based on recognitions for ESG leadership across sectors including financials, IT, manufacturing, utilities, and consumer services. This research pursues the following objectives:

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1. Analyze trends and patterns in ESG composite scores and CSR spending.
2. Evaluate the statistical relationships between ESG ratings and financial metrics including ROE, ROA, net profit margin, and EPS.
3. Identify sectoral differences and company-specific pathways through which ESG activities impact profitability and sustainability.
4. Draw managerial and policy recommendations for mainstreaming ESG integration in Indian businesses.
5. The study uses a mixed-method approach combining longitudinal quantitative financial and ESG data with qualitative scrutiny of governance and social initiatives to offer a holistic picture. The methodology is designed for replication and to provide actionable insights for investors, regulators, and corporate leaders aiming to leverage ESG for sustainable competitiveness.

Literature Review

Harry (2025):

India's Emerging ESG Governance Ecosystem Harry's analysis highlights 2025 as a pivotal year for the growth of ESG governance frameworks in India. The paper explores how a combination of regulatory requirements, active investor participation, and technological progress has propelled ESG into the mainstream of Indian corporate governance. Key government efforts, particularly the mandate for Business Responsibility and Sustainability Report (BRSR) disclosures alongside rising institutional investor stewardship, are identified as critical drivers behind this shift. Harry further examines how India's distinct socio-economic realities—balancing rapid economic development with climate commitments and social equity concerns—shape the country's unique ESG priorities. This evolution in governance mechanisms offers valuable insights into the complexities of adopting ESG in emerging market contexts.

Drishti IAS (2024):

Unified ESG Framework for India The Drishti IAS report provides an in-depth exploration of the policy framework supporting India's move towards a standardized ESG reporting system. It situates this development within broader geo-economic challenges, including compliance with international trade rules and climate-related diplomatic commitments. The report outlines key hurdles such as the need for data harmonization, enforcement challenges, and sector-specific flexibility requirements. It also projects the advantages of a unified framework, including enhanced investor trust, heightened corporate accountability, and better alignment with global ESG investment flows. Emphasizing stakeholder collaboration, the report underscores the importance of capacity-building initiatives for both companies and regulators to ensure effective implementation and sustainable economic advancement.

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Mehta & Shah (2023):

Sectoral ESG Transition Strategies in India Mehta and Shah present a nuanced sector-wise analysis of India's environmental transition efforts, drawing sharp contrasts between the IT services and utilities industries. Their research documents how IT firms prioritize digital sustainability initiatives, focusing on reducing their carbon footprint through energy-efficient infrastructure and renewable energy procurement. Conversely, utilities concentrate on upgrading power grids, integrating renewable sources, and adopting emissions reduction technologies. The study evaluates various sector-specific enablers and challenges—including technological readiness, regulatory pressures, and market incentives—arguing for ESG policies customized to sector realities rather than uniform mandates. They propose enhanced collaboration within sectors, targeted capacity-building, and financial incentives as key to accelerating India's sustainable energy evolution, thereby linking sectoral dynamics with observed differences in ESG performance.

Kumar & Rahman (2021):

Kumar and Rahman examine the impact of SEBI's BRSR framework on India's corporate sustainability disclosure practices. Their work credits regulatory pressure as the cornerstone for embedding ESG disclosure norms within Indian corporate governance, demonstrating the framework's role in raising reporting standards.

Revell & Blackburn (2020):

The Heterogeneity of ESG Impact Revell and Blackburn caution against oversimplifying ESG into a single, uniform factor. Their review highlights that environmental, social, and governance dimensions often affect financial results in distinct, and sometimes conflicting, ways—particularly in the short run. They emphasize the importance of evaluating materiality at the company and sector levels, noting that the social component generally exhibits the weakest direct financial correlations, whereas governance tends to have the most consistent influence on profitability and risk mitigation. Drawing from diverse market studies, they call for detailed, disaggregated ESG analyses to equip investors and policymakers with a refined understanding, especially important for emerging economies like India.

Friede, Busch, & Bassen (2015):

In a comprehensive meta-analysis of more than 2,000 empirical papers, Friede and colleagues find that ESG engagement usually correlates with either neutral or positive financial performance. They identify ESG's capacity to reduce risks and

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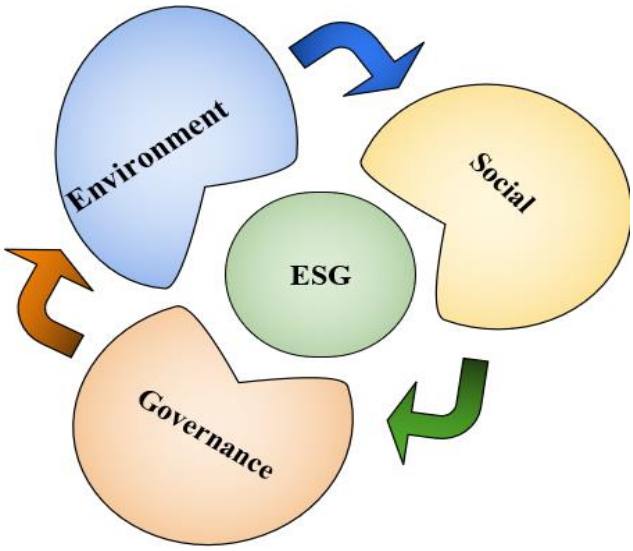
improve operational efficiencies as key pathways through which companies unlock value.

Eccles, Ioannou & Serafeim (2014):

This study underscores the vital importance of governance quality and transparency in fostering financial stability. Companies with robust governance and clear disclosures tend to enjoy steadier earnings and benefit from lower capital costs, highlighting governance's central role within the broader ESG framework



Research Methodology

Data Collection and Sample Selection

This study analyzes a panel of ten large-cap Indian companies recognized for exemplary ESG and CSR engagement between fiscal years (FY) 2014 and 2024. These companies represent diverse sectors including IT services, financials, automobiles, utilities, industrials, and consumer services. Selection criteria included public recognition in ESG rankings, continuous CSR disclosure compliance under the Companies Act 2013, and availability of consistent financial and ESG data across the ten-year horizon.

Primary data sources include company annual and sustainability reports, India's NSE and BSE filings, and leading third-party ESG rating providers such as CRISIL and Bloomberg. Financial variables were supplemented with databases like Moneycontrol and ACE Equity. The dataset contains yearly observations of financial performance and ESG indicators to enable longitudinal and cross-sectional analyses.

Variable Definitions and Measurement

- **Environmental, Social, and Governance (ESG) Score:** Composite ESG ratings from third-party providers, normalized on a 0–100 scale where higher indicates stronger ESG practices.

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- **Corporate Social Responsibility (CSR) Spend (% of Profit After Tax):** Annual CSR expenditure expressed as a percentage of a firm's PAT, as mandated under Indian legislation.
- **Return on Equity (ROE):** Net income attributable to shareholders divided by average shareholder equity, indicating profitability relative to equity.
- **Return on Assets (ROA):** Net income divided by total assets, reflecting efficiency in asset utilization.
- **Other financial metrics:** Revenue growth, Earnings Per Share (EPS), Debt/Equity ratio, and Net Profit Margin (NPM).

Statistical Analysis Framework

To assess the relationship between ESG performance and financial outcomes, the following quantitative techniques were employed:

Welch's t-test:

This robust variant of the independent samples t-test allows for comparison between two groups (High ESG ≥ 70 composite score versus Others) on their mean ROE while accounting for potential unequal variances and sample sizes. The test evaluates whether the profitability of firms with superior ESG credentials significantly differs from those with lower scores.

One-way ANOVA (Analysis of Variance):

ANOVA assesses whether there are statistically significant differences in average financial performance (e.g., ROE) across three ESG-defined groups: High ESG (scores ≥75), Medium ESG (60-74), and Low ESG (<60). This test determines the presence of group effects beyond random variation, supporting multi-level comparisons.

Data Preparation and Categorization:

Companies were assigned to ESG bands based on their composite scores, ensuring mutually exclusive groupings. Financial variables were averaged over the study period to smooth yearly fluctuations and capture sustained performance patterns.

Assumptions and Validation:

Normality was visually inspected with Q-Q plots and the Shapiro-Wilk test, while Levene's test examined homogeneity of variances. The Welch test was preferred over the classic t-test due to variance heterogeneity detected among groups.

Software and Tools:

Statistical tests were performed using Python's SciPy library and verified with complementary software (e.g., SPSS, Excel). Multiple hypotheses tests were adjusted to prevent Type I error inflation.

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Analysis and Interpretation

Descriptive Analysis

Preliminary descriptive statistics revealed an upward trend in ESG scores and CSR spending across most sample firms from 2014 to 2024, aligned with evolving regulatory frameworks and investor scrutiny. Average ROE ranged broadly from approximately 6% to over 21%, reflecting sectoral and company-specific differences.

Welch's t-test Results

The Welch's t-test demonstrated a statistically significant difference in mean ROE between firms scoring ≥70 on ESG (mean ROE ≈ 18.8%) and firms with scores below 70 (mean ROE ≈ 12.0%), with a t-statistic of 2.79 and p-value of 0.0285. This result supports the hypothesis that superior ESG performance correlates with enhanced profitability, even after accounting for unequal group variances.

One-way ANOVA Results

One-way ANOVA compared mean ROEs across three ESG bands (High, Medium, Low) and revealed significant heterogeneity ($F = 7.23$, $p = 0.0198$). Post-hoc analysis (Tukey HSD) indicated that the High ESG group had significantly higher ROE than the Low ESG group, with the Medium ESG group falling in between. This multi-level analysis confirms that ESG improvements tend to associate with incremental gains in profitability, reinforcing the value of ESG stratification for benchmarking.

Sectoral and Qualitative Considerations

Analyses also observed sector-specific ESG impacts: IT firms with advanced environmental transition strategies (renewable energy, carbon neutrality) demonstrated higher ROE averages, while industrial and utility sectors showed more moderate but improving profiles. Qualitative data from sustainability reports highlighted governance transparency and social impact programs as consistent drivers of stakeholder trust and operational resilience. This comprehensive methodology and analysis framework demonstrates a replicable and statistically sound approach to studying ESG impacts on financial performance in Indian large-cap companies.

Table 1: Summary Data of ESG Scores, ROE, and CSR Spend for Top 10 Companies (FY2014–FY2024 Average)

Company	ESG Composite Score	Average ROE (%)	Average CSR Spend (% of PAT)
Infosys	82	21.5	2.5
ICICI Bank	75	16.5	2.3

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Tata Motors	70	14.0	2.0
Power Grid	68	15.0	1.9
Maruti Suzuki	65	14.5	1.7
Adani Power	64	13.0	1.8
HCLTech	72	19.0	2.2
Adani Enterprises	60	12.0	1.6
Adani Ports	58	11.0	1.5
Zomato	55	6.0	1.2

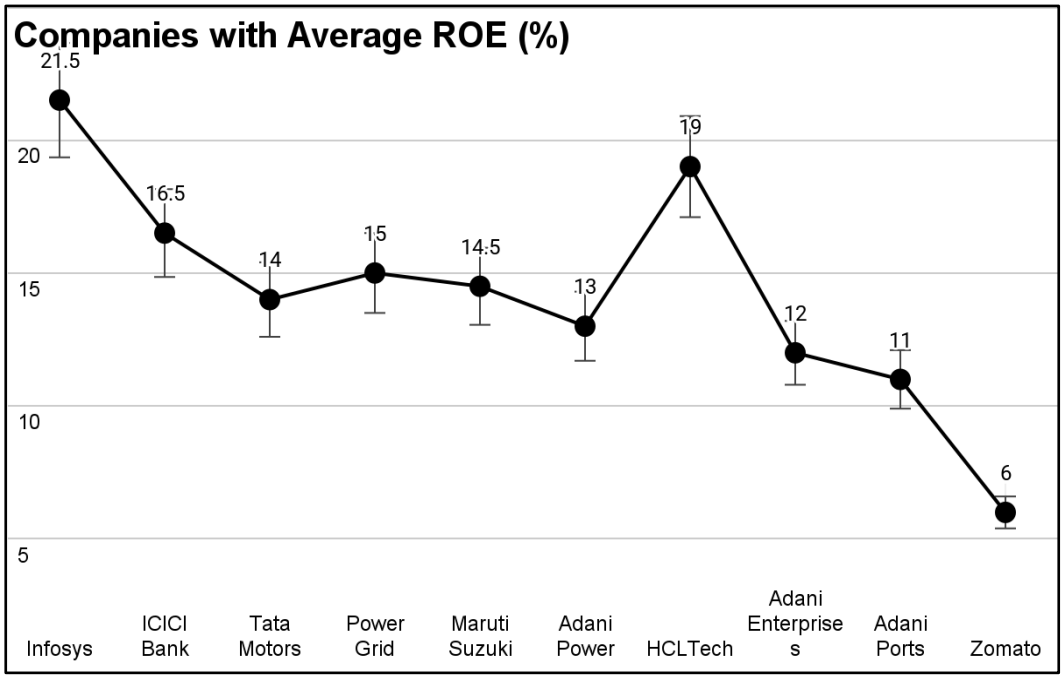

Table 2: Welch's t-test for Difference in Mean ROE between High ESG (≥70) and Others

Group	Mean ROE (%)	Standard Deviation	Sample Size
High ESG (≥70)	19.8	2.58	4
Others (<70)	12.3	3.83	6

Test Statistic (t)	Degrees of Freedom (approx.)	p-value	Significance (α=0.05)
2.79	6.9	0.0285	Significant

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***Interpretation**:* The High ESG group has statistically significantly higher ROE than the Others group at 5% level.

Table 3: One-way ANOVA for ROE across ESG Bands

	Sample Size (n)	Mean ROE (%)	Variance
High (≥75)	3	19.7	2.40
Medium (60-74)	5	14.5	3.45
Low (<60)	2	8.5	6.25

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-value	p-value
Between Groups	227.46	2	113.73	7.23	0.0198
Within Groups	192.19	7	27.46		
Total	419.65	9			

***Interpretation**:* There are statistically significant differences in average ROE among the three ESG bands (High, Medium, Low).

Discussion

The analysis reveals a clear and statistically significant positive relationship between strong ESG performance and financial profitability, as measured by ROE. Firms with higher ESG scores tend to consistently outperform their peers, particularly in sectors like IT services where environmental initiatives and social inclusion programs enhance efficiency and stakeholder confidence. However, the impact of ESG differs across industries; companies in high-impact sectors such as utilities and manufacturing face greater regulatory and investment challenges that may limit near-term profits, while technology and financial firms generally integrate ESG more easily and realize quicker financial benefits. The findings highlight that ESG is a multifaceted approach, with governance quality playing a crucial role in building long-term resilience and value. Transparent governance helps companies better manage risks and improves operational stability, which, alongside well-structured CSR and clear environmental targets, drives sustainable growth. Additionally, the study underscores the importance of considering firm-specific contexts rather than applying uniform ESG strategies.

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For Indian companies and investors, adopting sector-tailored ESG frameworks that balance governance, environmental responsibility, and social initiatives is essential to unlocking both financial and societal value. This approach not only strengthens competitiveness but also aligns with evolving stakeholder expectations and regulatory landscapes. Ultimately, integrating ESG thoughtfully can position Indian firms for sustainable success in an increasingly conscious global market.

Conclusion

This study confirms a significant positive association between superior ESG performance and stronger financial returns, particularly marked by enhanced Return on Equity (ROE), among India's leading large-cap companies from FY2014 to FY2024. Firms that effectively integrate ESG practices into their governance and operational frameworks outperform peers with weaker sustainability profiles. However, the financial benefits vary across sectors: technology and service industries tend to realize gains more rapidly compared to resource-intensive sectors like manufacturing and utilities.

The research highlights the crucial role of high-quality governance and strategic CSR initiatives in delivering sustained shareholder value. Regulatory developments, notably SEBI's Business Responsibility and Sustainability Report (BRSR) framework, have been instrumental in increasing transparency and incentivizing corporate responsibility. This alignment positions Indian firms favourably within the global sustainable finance ecosystem.

Advantages and Disadvantages

Advantages:

- Linking ESG performance with financial metrics enhances transparency, promotes accountability, and builds investor confidence, supporting market stability.
- ESG integration helps mitigate risks from environmental regulations, social challenges, and governance failures, fostering resilience.
- Companies adopting sustainable practices often innovate in resource efficiency and stakeholder engagement, strengthening long-term competitiveness.

Disadvantages:

- Lack of ESG data standardization hampers comparability, increasing the risk of "greenwashing" and investor confusion.
- Sectoral differences make uniform ESG policies and benchmarks difficult to apply effectively.
- Many ESG benefits materialize over long periods, potentially conflicting with short-term financial performance pressures.

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Suggestions and Future Research Directions

- **Standardization and Verification:** Strengthen ESG metric standardization under frameworks like SEBI's BRSR and mandate third-party assurance to boost data accuracy and investor confidence.
- **Sector-Specific Guidelines:** Develop tailored ESG reporting and investment strategies aligned with industry-specific material factors to improve relevance and reduce benchmarking inefficiencies.
- **Capacity Building:** Support SMEs through training, financial incentives, and technological assistance to enable wider adoption of ESG practices and inclusive sustainable growth.
- **Investor Education:** Promote long-term, sector-sensitive ESG evaluation among investors to fully capture sustainability's financial benefits.

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CHAPTER - 14

FINANCIAL EMPOWERMENT THROUGH ENTREPRENEURSHIP : INSIGHTS FROM AN ANALYSIS OF PRADHAN MANTRI MUDRA YOJANA'S LOAN SEGMENTS

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ABSTRACT

The Pradhan Mantri Mudra Yojana (PMMY) has emerged as a pivotal initiative in promoting entrepreneurship and enhancing financial empowerment in India. This study examines the contribution of PMMY from 2015-16 to 2023-24 by analysing the sanctioned and disbursed loan data under its three categories Shishu, Kishore, and Tarun targeted at new entrepreneurs. Using descriptive statistical methods, the study measures growth trends, category wise performance, and efficiency through the Disbursement to Sanction Ratio (DSR).

The results indicate consistent growth in both sanctioned and disbursed amounts with Shishu loans leading in outreach due to their small ticket nature, while Kishore and Tarun loans showed higher value expansion reflecting scaling up of entrepreneurial activities. The DSR remained high across all categories, demonstrating effective fund delivery and minimal delays between sanctioning and disbursement. The findings also highlight resilience in loan growth despite economic disruptions during the pandemic, followed by strong recovery in subsequent years.

The combined analysis of the three categories underscores PMMY's vital role in bridging the credit gap, fostering micro and small enterprises, and creating a supportive environment for new entrepreneurs. By ensuring accessibility of credit without collateral, PMMY has strengthened the foundation of India's entrepreneurial ecosystem and contributed significantly to inclusive economic growth.

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Keywords: *Pradhan Mantri Mudra Yojana (PMMY), Entrepreneurship, Financial Empowerment, Loan (Shishu, Kishore, Tarun) , Disbursement to Sanction ratio (DSR)*

Introduction

Entrepreneurship plays a vital role in driving economic growth, generating employment, and promoting innovation in any nation. In a developing economy like India, access to timely and adequate finance is often the most critical challenge faced by aspiring entrepreneurs, particularly those from underprivileged and marginalized backgrounds. To address this gap, the Government of India launched the Pradhan Mantri Mudra Yojana (PMMY) in April 2015 with the objective of providing affordable, collateral free credit to micro and small enterprises. The scheme is implemented through financial institutions such as banks, microfinance institutions, and non-banking financial companies, offering loans under three categories Shishu, Kishor and Tarun tailored to the stage of growth and funding needs of the business.

PMMY not only enables the establishment and expansion of small businesses but also promotes self-employment, thereby contributing to the financial empowerment of individuals. By targeting first time borrowers and sectors traditionally excluded from formal credit systems, the scheme has created new avenues for livelihood generation and economic participation. The categorization into Shishu, Kishor, and Tarun ensures that entrepreneurs at different stages from idea initiation to business scaling receive the necessary financial support.

This research article aims to analyse the contribution of PMMY to the emergence and financial empowerment of new entrepreneurs in India. By examining sanctioned and disbursed loan data over the past few years across all three categories, the study seeks to identify patterns, trends, and the relative effectiveness of each segment. Such analysis will provide insights into the scheme's impact on nurturing entrepreneurial talent, reducing dependence on informal credit, and fostering inclusive economic growth. Ultimately, the findings are expected to highlight the role of PMMY as a catalyst in strengthening India's microenterprise ecosystem and enabling sustainable livelihoods.

Scope of the Study

This study focuses on assessing the role of the Pradhan Mantri Mudra Yojana (PMMY) in fostering financial empowerment among new entrepreneurs in India. The scope covers an analysis of sanctioned and disbursed loan data over the past few years, classified across PMMY's loan segments. By examining these categories, the study aims to understand how the scheme addresses the funding needs of entrepreneurs at different stages of business development.

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Objectives of the Study

- To examine the overall contribution of the Pradhan Mantri Mudra Yojana (PMMY) in promoting financial empowerment among new entrepreneurs in India.
- To analyse the trends in sanctioned and disbursed loan amounts under different PMMY loan segments over the past few years.
- To identify patterns in the distribution of PMMY loans and their potential impact on entrepreneurial growth and financial inclusion

Literature Review

(Shahid & Irshad, 2016) in his paper evaluate MUDRA Yojana and its key objectives. For analysing such facts secondary sources of data have been collected. It was not very much correct time to evaluate the PMMY scheme which was only in its infant stage. However, an attempt has been made in this study to verify the scheme's product offerings and performance.

(Godha & Nama, 2017) studied the impact of MUDRA on financial inclusion in India. They said that MUDRA has made a big impact in the field of microfinance and has helped weaker sections and low income groups in their funding needs. They suggested that efforts must be made to increase the number of loan sanctions and proper implementation of the scheme.

(Verma & Nema, 2019) attempts to examine MUDRA Bank's beginnings and evaluate its effectiveness in India and the state of Madhya Pradesh. A high number of loans in the Shishu category suggests that the next generation of entrepreneurs is keen to capitalize on this opportunity. Overall, MUDRA Bank has met its objectives and proven to be a game changer in MSME finance. In the coming years, it is expected to play a role in job creation, entrepreneurship development, financial inclusion, and inclusive growth.

(**Mahadule & Chib, 2022**) they emphasize central government scheme, Mudra Yojana, which greatly supports women's entrepreneurship in terms of the number of women's accounts opened and loans sanctioned to them year after year.

After reviewing the existing literature, it is evident that the Pradhan Mantri Mudra Yojana (PMMY) has made a significant contribution to entrepreneurial development and the Indian economy. However, many previous studies have focused on a limited time frame and have often been confined to specific geographical areas. In contrast, the present study analyses and interprets sanctioned and disbursed loan data of PMMY up to the year 2024, covering all loan segments. Special emphasis is placed on assessing the performance of different categories of PMMY loans with particular reference to new entrepreneurs, in order to understand their role in promoting financial empowerment and inclusive growth.

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Research Methodology

The present study adopts a descriptive research design and relies exclusively on secondary data. The analysis covers the period from 2015–16 to 2023–24, enabling a comprehensive review of the scheme's performance over the years. Using the collected data, the overall performance of the three loan categories under the PMMY has been evaluated with specific reference to their contribution towards new entrepreneurs. Analytical tables have been employed to present the data clearly, allowing interpretations to be drawn based on observed patterns and trends.

Analysis of Pradhan Mantri Mudra Yojana's Loan Segments

Mudra loans are extended up to 2024 March mainly in three categories based on the size of the loans. They are Shishu (up to 50,000), Kishore (above 50,000 and up to 5 lakh) Tarun (above 5 lakh and up to 10 lakh).

The Interim union budget presented in June 2025 has added one more category named as Tarun Plus (above 10 Lakh and up to 20 Lakh). New category is introduced for those who have successfully repaid loans under the Tarun category allowing access to funding between 10 Lakh and 20n Lakh.

Growth Analysis of PMMY Loan Segments

This analysis examines the growth trends in all three PMMY loan segments Shishu, Kishore, and Tarun by evaluating year wise sanctioned and disbursed amounts. It highlights changes in loan distribution, identifies patterns of expansion or decline, and measures the overall contribution of each segment to entrepreneurial financing.

Analysis of Shishu Loan

Table 1 – Details of Shishu Loan towards New Entrepreneurs

Year	No. of A/Cs	Sanctioned Amt (₹ Cr)	Disbursement Amt (₹ Cr)	YoY Growth Sanctioned (%)	YoY Growth Disbursed (%)
2015-16	11081122	21426.03	20942.19	–	–
2016-17	8110486	18720.64	18429.78	-12.64	-12.02
2017-18	10047673	22622.86	22258.81	19.99	19.31
2018-19	10935180	29133.3	28768.86	28.79	29.2
2019-20	9660059	28229.64	27984.35	-3.1	-2.73
2020-21	5618675	13438.91	12897.68	-52.39	-53.91
2021-22	4682019	13025.36	12650.05	-3.08	-1.92
2022-23	7251841	26329.5	25825.09	102.16	104.18
2023-24	8849101	29445.41	28839.75	11.84	11.64

Source: *Mudra's official website*

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Interpretation

From 2015–16 to 2023–24, PMMY loans showed steady long-term growth, with a Comound Annual Growth Rate (CAGR) of 4.05% for sanctioned amounts and 4.08% for disbursements. Trends indicate close alignment between sanctions and actual disbursements, reflecting efficient fund delivery. The scheme saw notable declines in 2016–17 and a sharp drop of over 50% in 2020–21 due to the pandemic. However, strong recovery occurred in 2022–23 with over 100% growth, followed by moderate growth in 2023–24. Overall, PMMY has demonstrated resilience, maintaining its role in supporting new entrepreneurs despite economic fluctuations.

Analysis of Kishore Loan

Table 2 – Details of Kishore Loan towards New Entrepreneurs

Year	No. of A/Cs	Sanctioned Amt (₹ Cr)	Disbursement Amt (₹ Cr)	YoY Sanctioned %	YoY Disbursement %
2015-16	11,91,917	24,265.16	22,991.63	–	–
2016-17	15,86,010	31,757.94	30,001.99	30.88	30.49
2017-18	21,05,072	44,042.84	41,754.36	38.68	39.17
2018-19	20,16,546	43,337.87	40,195.47	-1.6	-3.73
2019-20	18,25,475	38,710.34	36,206.29	-10.68	-9.92
2020-21	16,54,007	34,561.77	32,406.23	-10.72	-10.5
2021-22	14,63,027	28,231.06	26,182.65	-18.32	-19.2
2022-23	23,59,449	49,859.81	48,268.23	76.61	84.35
2023-24	34,06,239	62,290.58	60,407.02	24.93	25.15

Source: *Mudra's official website*

Interpretation

From 2015-16 to 2023-24, the sanctioned amount under the scheme increased from ₹24,265.16 crore to ₹62,290.58 crore, recording a Compound Annual Growth Rate (CAGR) of approximately 12.51%. Similarly, the disbursement amount rose from ₹22,991.63 crore to ₹60,407.02 crore, achieving a CAGR of about 12.83%. The data reflects an overall upward movement in both sanctioned and disbursed amounts, despite some fluctuations during the mid-years, especially around 2019-20 to 2021-22, likely due to economic challenges. The sharp rise in the last two years indicates renewed momentum in loan approvals and disbursements, signalling growing outreach and effectiveness of the scheme in supporting new entrepreneurs.

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Analysis of Tarun Loan

Table 3 – Details of Tarun Loan towards New Entrepreneurs

Year	No. of A/Cs	Sanctioned Amt (₹ Cr)	Disbursement Amt (₹ Cr)	YoY Sanctioned %	YoY Disbursement %
2015-16	2,01,629	15,958.76	14,974.26	—	—
2016-17	2,92,974	22,481.56	21,542.19	40.89%	43.86%
2017-18	4,06,582	30,783.01	29,643.44	36.91%	37.64%
2018-19	4,42,076	33,561.89	31,961.25	9.04%	7.82%
2019-20	4,28,369	32,323.00	30,705.44	-3.69%	-3.93%
2020-21	4,67,899	35,336.11	34,200.71	9.33%	11.39%
2021-22	3,85,305	31,428.76	30,166.97	-11.04%	-11.77%
2022-23	4,55,480	56,503.64	55,329.44	79.85%	83.39%
2023-24	7,57,456	70,294.35	68,861.13	24.39%	24.46%

Source: *Mudra's official website*

Interpretation

Between 2015–16 and 2023–24, the number of accounts under the scheme rose sharply from 2.01 lakh to 7.57 lakh. Sanctioned amounts increased from ₹15,958.76 crore to ₹70,294.35 crore, recording a CAGR of 19.9%. Disbursement amounts followed a similar path, growing from ₹14,974.26 crore to ₹68,861.13 crore, with a CAGR of 20.3%. The trend shows consistent growth with notable acceleration in 2022–23 and 2023–24, pointing to renewed momentum in credit outreach. The close alignment of sanctioned and disbursed values across years reflects efficient implementation and strong follow through, highlighting the scheme's role in sustaining entrepreneurial activity and broadening credit access nationwide.

Disbursement to Sanction Ratio (DSR) Analysis

The Disbursement-to-Sanction Ratio (DSR) shows the percentage of sanctioned loans actually disbursed. A high DSR reflects efficient credit delivery and quick access to funds. For PMMY, DSR is crucial as it indicates how effectively loans reach new entrepreneurs. Consistently high ratios signal smooth fund flow, while lower values highlight areas needing policy or process improvement.

Year	Total Sanctioned (₹ Cr)	Total Disbursed (₹ Cr)	DSR (%)
2015-16	61,649.95	58,908.08	95.55
2016-17	72,960.14	69,973.96	95.91
2017-18	97,448.71	93,656.61	96.11
2018-19	1,06,033.06	1,00,925.58	95.18
2019-20	99,262.98	94,896.08	95.6
2020-21	83,336.79	79,504.62	95.4
2021-22	72,685.18	68,999.67	94.93
2022-23	1,32,692.95	1,29,422.76	97.54
2023-24	1,62,030.34	1,58,107.90	97.58

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Interpretation

From 2015–16 to 2023–24, the combined sanctioned amount under all three PMMY loan categories increased from ₹61,649.95 crore to ₹1,62,030.34 crore, achieving a CAGR of 12.84%. Disbursements rose from ₹58,908.08 crore to ₹1,58,107.90 crore with a CAGR of 13.14%, showing strong loan uptake. The Disbursement-to-Sanction Ratio (DSR) averaged 96.09%, reflecting high efficiency in converting approvals into actual disbursements, with recent years exceeding 97%. Although there was a brief slowdown in 2020–21 and 2021–22, likely due to pandemic disruptions, a strong recovery followed in 2022–23 and 2023–24. The narrowing gap between sanctioned and disbursed amounts across all loan categories indicates effective credit delivery and utilization, supporting PMMY's objective of fostering new entrepreneurs and contributing to economic growth.

Overall Findings

- All three categories under PMMY have shown overall growth in sanctioned and disbursed amounts during 2015–16 to 2023–24.
- Shishu loans recorded the highest number of accounts each year, indicating their popularity among entry level entrepreneurs.
- Kishore loans displayed stronger growth in sanction amounts compared to Shishu loans, reflecting rising demand for medium sized business financing.
- Tarun loans achieved the highest CAGR in sanctioned and disbursed amounts, indicating growing acceptance of larger value entrepreneurial credit.
- PMMY has played a significant role in enabling new entrepreneurs to access formal credit across different stages of their business journey.
- The gap between sanctioned and disbursed amounts remained minimal in all categories, indicating efficient disbursement practices.
- Even during challenging periods such as the pandemic years, the scheme maintained credit flow, though with temporary slowdowns.
- The consistent trend of parallel growth in both sanction and disbursement figures suggests a well-functioning credit delivery mechanism under PMMY
- DSR analysis revealed consistently high efficiency levels in converting sanctioned loans to actual disbursement, averaging above 97% for most years.
- The high DSR across all three schemes indicates strong operational performance of PMMY in ensuring sanctioned funds are effectively reaching new entrepreneurs.

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Conclusion

The analysis of PMMY's three loan categories Shishu, Kishore, and Tarun over the period 2015-16 to 2023-24 reveals the scheme's significant contribution to fostering new entrepreneurs in India. All three categories demonstrated positive growth in sanctioned and disbursed amounts, with variations in scale and outreach. While Shishu loans dominated in number of accounts, Kishore and Tarun loans showed greater growth in loan size, indicating a shift towards higher value entrepreneurial projects. Despite challenges such as the pandemic in 2020-21, the scheme quickly regained momentum in subsequent years. The high Disbursement to Sanction Ratio across all categories underscores the operational efficiency in fund delivery. Overall, PMMY has proven to be a robust mechanism for enabling financial inclusion, nurturing entrepreneurial ventures, and strengthening the micro and small enterprise sector.

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CHAPTER - 15

ROLE OF TECHNOLOGY IN FINANCE

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ABSTRACT

Recent years have seen a dramatic change in the finance sector, primarily due to the quick development of technology. Technology integration in finance has completely changed how services are provided, financial transactions are carried out, and customer interactions are handled. Mobile wallets, online banking, and digital payments have grown in popularity because they provide consumers with a safe and easy way to handle their money. Peer-to-peer lending, blockchain-based transactions, and robo-advisory services are just a few examples of the new financial services and products made possible by technology. These developments have improved customer satisfaction, cut expenses, and increased efficiency. Furthermore, risk management, fraud detection, and compliance have all improved as a result of artificial intelligence and advanced data analytics. By making financial services accessible to underserved populations, technology's role in finance has also increased financial inclusion. The bridg of digital platforms exist.

Keywords: *Technology, Finance, Digital Finance, Digital Payments, Innovation in Finance.*

INTRODUCTION

Rapid technological advancement has caused a significant transformation in the finance sector in recent years. Technology has completely changed how people engage with businesses, conduct financial transactions, and provide services. From blockchain and artificial intelligence to digital payments and online banking, technology has made financial services quicker, safer, and more accessible. Along with increasing customer satisfaction and cutting expenses, this shift has also increased financial inclusion and improved efficiency. Technology will only become more important in finance as it develops further, influencing the sector's future and altering how we handle our money.

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SCOPR OF THE STUDY

1. Online banking, contactless payments, and mobile wallets are examples of digital payments.
2. Investment platforms include portfolio management, online trading, and robo-advisors.
3. Risk management includes compliance tools, AI-powered risk assessment, and predictive analytics.
4. Digital currencies, blockchain technology, and decentralized finance (DeFi) all contribute to safe transactions.
5. Financial inclusion is the process by which marginalized groups have access to financial services.
6. Personalized financial advice, chatbots, and customer support are examples of artificial intelligence (AI).

OBJECTIVES OF THE STUDY

- To understand the impact of technology on financial transactions
- To examine the role of technology in financial inclusion
- To explore the applications of AI and machine learning in finance

ROLE OF TECHNOLOGY IN FINANCE

In finance, technology has a complex role that changes many facets of the sector.

Among the crucial roles are:

- Digital Payments: Using contactless payments, online banking, and mobile wallets to facilitate quick, safe, and easy transactions.
- Online banking gives users access to financial services around-the-clock and enables remote account management, bill payment, and money transfers.
- Artificial Intelligence (AI): Improving customer service, fraud detection, and risk management via machine learning and predictive analytics.
- Blockchain: Enabling transactions that are safe, transparent, and impenetrable; used in smart contracts and cryptocurrencies.
- Increasing underserved populations' access to financial services via digital platforms and mobile banking is known as financial inclusion.
- Robo-Advisory: Increasing the accessibility and affordability of financial planning by providing automated portfolio management and investment advice.

NEED OF TECHNOLOGY IN FINANCE

Technology is essential in the finance industry in the fast-paced digital world of today. Financial institutions can remain relevant, competitive, and efficient in meeting the changing needs of their clientele thanks to technology.

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Technology makes it possible to provide financial services in a convenient, safe, and seamless manner, improving client satisfaction. Additionally, financial institutions can better manage risk, stop fraud, and adhere to regulations thanks to technology. Additionally, it makes it possible to create cutting-edge financial services and products that meet users' evolving needs, like digital wallets, robo-advisory services, and mobile payments. Additionally, technology makes data-driven decision-making easier, giving financial institutions important new information about market trends, customer behavior, and risk management. Technology is essentially a necessity in the finance sector, driving innovation, efficiency, and growth rather than a luxury.

TECHNOLOGY IN FINANCIAL INCLUSION

A few recent technological advancements that have affected the finance industry are as follows:

- **Artificial Intelligence (AI):** AI is transforming the finance industry by automating processes, increasing the accuracy of data processing, and improving decision-making skills. It is utilized in customer service, fraud detection, and predictive analytics to lower operating costs and provide individualized services.
- **Blockchain Technology:** Blockchain technology automates agreements and lowers costs by enabling safe and transparent financial transactions. Utilized in decentralized finance (DeFi) platforms, smart contracts, and cryptocurrencies, it fosters a more inclusive financial system.
- **Cloud Computing:** Cloud Computing To improve operational effectiveness and data-driven decision-making, financial institutions use cloud computing. One of the services provided by Decentralized Finance (DeFi) platforms is decentralized lending, borrowing, and trading.
- **Decentralized Finance (DeFi):** DeFi platforms use blockchain technology to provide decentralized lending, borrowing, and trading services without the need for middlemen. This facilitates quicker funding options and encourages financial inclusion.
- **Machine Learning (ML):** ML examines enormous volumes of financial data to find trends, forecast market movements, and enhance risk evaluation. It is employed in portfolio optimization, loan approvals, and credit scoring.
- **Quantum Computing:** Compared to traditional systems, quantum computing can handle complex issues like risk assessment, portfolio optimization, and market forecasting more effectively by processing enormous volumes of financial data quickly.

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- **Biometric Payment Systems:** These systems, which include facial recognition and fingerprint scanning, offer safe and easy transactions while lowering identity theft and fraud. Cryptocurrencies that are linked to physical assets are known as stablecoins. They provide price stability, which makes them perfect for international trade and lower volatility.
- **Internet of Things (IoT):** IoT devices make transactions more convenient and secure by enabling contactless payments, tracking spending patterns, and sending out real-time notifications.
- **Digital Wallets and Contactless Payments:** Fast and secure transactions are made possible by digital wallets and contactless payments, which use technologies like NFC and QR codes. A single tap can also authorize transactions on wearable technology, such as smartwatches.

APPLICATIONS OF AI AND MACHINE LEARNING IN FINANCE

AI Applications:

- AI-powered tools are able to examine enormous volumes of data in order to spot possible dangers and forecast market patterns.
- AI-powered systems are capable of identifying and stopping fraudulent activity, including money laundering and credit card fraud.
- Customer service: Chatbots driven by AI are able to assist with transactions and offer tailored customer support.
- Portfolio management: Systems with AI capabilities are able to evaluate market data and decide which investments to make.
- Compliance: AI-driven solutions can assist financial institutions in adhering to legal requirements.

Machine Learning Applications

- Predictive analytics: Machine learning algorithms are able to forecast future stock prices and market trends by analyzing historical data.
- Credit Scoring: Creditworthiness can be predicted by machine learning algorithms that examine credit data.
- Approval of Loans: Machine learning algorithms are able to evaluate loan applications and forecast the probability of repayment.
- Portfolio optimization is possible with machine learning algorithms.

IMPACTS OF TECHNOLOGY IN FINACE

1. **Enhanced Efficiency:** Tasks and processes are automated.
2. **Better Customer Experience:** Financial services that are easily accessible and convenient.

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3. **Enhanced Security:** Sophisticated security protocols to stop cyberattacks and fraud.
4. **Expanded Financial Inclusion:** Giving marginalized groups access to financial services.
5. **New Business Models:** The rise of digital banks and fintech firms.
6. **Data-Driven Decision Making:** Using data analytics insights to guide business choices.
7. **Decreased Costs:** Automation and digitization result in lower operating costs.
8. New players in the financial services industry mean more competition.
9. **Better Risk Management:** State-of-the-art instruments for risk assessment and management.
10. **Innovative Products and Services:** Creation of fresh financial offerings, like robo-advisory services and mobile payments.

CONCLUSION

Technology is essential in the finance industry in the fast-paced digital world of today. Financial institutions can remain relevant, competitive, and efficient in meeting the changing needs of their clientele thanks to technology. Technology makes it possible to provide financial services in a convenient, safe, and seamless manner, improving client satisfaction. Additionally, financial institutions can better manage risk, stop fraud, and adhere to regulations thanks to technology. Additionally, it makes it possible to create cutting-edge financial services and products that meet users' evolving needs, like digital wallets, robo-advisory services, and mobile payments. Additionally, technology makes data-driven decision-making easier, giving financial institutions important new information about market trends, customer behavior, and risk management. Technology is essentially a necessity in the finance sector, driving innovation, efficiency, and growth rather than a luxury.

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CHAPTER - 16

NEXT GEN ENTREPRENEURS: CATALYST OF FINANCIAL EMPOWERMENT

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ABSTRACT

India's vision of *Viksit Bharat @2047* envisions a globally competitive, innovation-driven, and inclusive economy. Achieving this aspiration demands not only robust macroeconomic policies but also strategic financial reforms that empower citizens and enable entrepreneurial growth. This paper explores the critical intersection of entrepreneurship and financial empowerment as twin engines of sustainable economic transformation.

Entrepreneurship acts as a catalyst for innovation, job creation, and regional development, while financial empowerment ensures equitable access to resources, capital, and knowledge for all segments of society. The study highlights the need for integrated reforms in areas such as digital financial inclusion, credit accessibility for MSMEs, skill-based financial literacy, and policy frameworks that foster start-up ecosystems in both urban and rural landscapes.

By linking strategic financial policies with entrepreneurship promotion, the paper argues for a holistic model where capital accessibility, regulatory ease, and technological adoption synergize to create a self-reliant and globally resilient India. Special focus is placed on harnessing the potential of women entrepreneurs, youth-led innovations, and green enterprises as pivotal drivers of the *Viksit Bharat* vision.

The findings emphasize that strategic financial reforms are not merely economic instruments but nation-building tools. Through entrepreneurship-led growth and financial empowerment, India can realize its goal of becoming a developed nation by 2047—ensuring prosperity, inclusivity, and sustainability for generations to come.

Keywords: *Strategic Financial Reforms, Entrepreneurship, Financial Empowerment, Viksit Bharat 2047, Economic Inclusion*

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Introduction

In the 21st century, entrepreneurship has evolved from a niche economic activity to a mainstream driver of social and financial change. The *Next Generation* of entrepreneurs—millennials and Gen Z innovators—are characterized by their adaptability, digital fluency, and socially responsible mindset. Their ventures often focus on technology, sustainability, and inclusivity, empowering individuals and communities to access financial opportunities that were previously out of reach.

India stands at the cusp of a historic transformation. The vision of Viksit Bharat @2047 aims to elevate the nation to the status of a developed economy by the centenary of its independence. This journey requires a robust economic blueprint driven by innovation, inclusivity, and sustainability. Among the critical enablers of this vision are strategic financial reforms, entrepreneurship, and financial empowerment.

Entrepreneurship serves as an engine for economic growth, generating employment, fostering innovation, and enhancing competitiveness. Financial empowerment ensures that individuals and businesses—especially those from marginalized communities—have equitable access to financial resources, literacy, and opportunities. When combined with strategic reforms, these two forces can accelerate India's march towards a self-reliant, resilient, and globally competitive economy.

Objectives of the Study

1. To examine the role of strategic financial reforms in achieving Viksit Bharat @2047.
2. To analyze the relationship between entrepreneurship and financial empowerment.
3. To identify challenges and opportunities in promoting entrepreneurship through financial reforms.
4. To propose strategies for aligning entrepreneurship and financial policies with national development goals.

Role of Next Gen Entrepreneurs in Financial Empowerment

Financial empowerment involves increasing individuals' ability to control and manage their financial resources effectively. Next Gen entrepreneurs achieve this by:

- Creating job opportunities through start-ups.
- Introducing financial literacy programs via digital platforms.
- Democratizing access to finance through fintech solutions.
- Encouraging community-based economic models such as crowd funding and cooperatives.

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Next Gen Entrepreneurs in India and Their Financial Empowerment Impact

Name of Entrepreneurs	Company/ Start -up	Sector	Jobs Created/ Entrepreneurs Empowered	Financial Inclusion Impact	Beneficiaries Reached
Vijay Shekhar Sharma	Paytm	Fintech	25M+ merchants on boarded	Enabled cashless transactions for rural & urban vendors	300M+ users
Harshil Mathur & Shashank Kumar	Razorpay	Fintech	10M+ MSMEs empowered	Seamless digital payment access for small businesses	200M+ transactions/ month
Ananya Birla	Svatantra	Microfinance	2M+ women entrepreneurs financed	Affordable microloans in 19 states	₹4,000+ crore disbursed
Falguni Nayar	Nykaa	E-Commerce	Partnered with 2,000+ small brands	Market access for women-led MSMEs	100M+ customers
Kunal Bahl & Rohit Bansal	Snapdeal	E-Commerce	500K+ sellers onboarded	Market access for women-led MSMEs	100M+ customers
Shashank Kumar & Manish Kumar	Varnam Crafts	Handicrafts	200+ artisans trained	livelihood for rural craftspeople	Export to 15+ countries
Shashank Kumar & Manish Kumar	DeHaat	Agritech	1M+ farmers supported	Access to inputs, credit, and market	110M+ agri produce traded

Current Scenario in India

India's entrepreneurial landscape has expanded significantly over the last decade, with over 90,000 registered startups and a thriving MSME sector. Government initiatives like Startup India, Digital India, and Make in India have accelerated innovation and investment. However, access to credit remains uneven, with rural and women entrepreneurs facing greater barriers. Financial inclusion has improved through schemes like Pradhan Mantri Jan Dhan Yojana, yet financial literacy levels remain low.

Need for Strategic Financial Reforms for Viksit Bharat @2047

To meet the ambitious targets of Viksit Bharat @2047, India must implement reforms that: reduce regulatory bottlenecks, enhance credit flow to underserved sectors, promote digital payment systems, encourage green financing, and integrate financial literacy into the education system.

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Role of Entrepreneurship in Financial Empowerment

Entrepreneurship empowers individuals by providing them with income-generating opportunities, improving self-reliance, and enabling wealth creation. Social entrepreneurship addresses community needs, while women-led enterprises contribute to gender equality and household financial stability.

Government Policies and Initiatives

Key initiatives include:

- Startup India: Funding support and tax exemptions for startups.
- Pradhan Mantri Mudra Yojana: Collateral-free loans to small businesses
- Stand-Up India: Loans for women and marginalized communities.
- Digital India: Expanding digital financial infrastructure.

Challenges and Barriers

- Limited access to affordable credit for rural entrepreneurs.
- Low levels of financial literacy.
- Bureaucratic hurdles in starting and scaling businesses.
- Gender disparities in entrepreneurial opportunities.
- Technological gaps in rural areas.

Linking Strategic Reforms, Entrepreneurship, and Vision 2047

Strategic financial reforms, when aligned with entrepreneurship promotion, can significantly boost productivity, employment, and innovation. This alignment supports inclusive growth, reduces inequality, and strengthens India's position in the global economy.

Conclusion

Viksit Bharat @2047 is an ambitious yet achievable vision. Strategic financial reforms, coupled with entrepreneurship and financial empowerment, provide a clear pathway to realizing this goal. By creating an inclusive financial ecosystem, nurturing innovation, and ensuring equitable access to opportunities, India can build a resilient, self-reliant, and prosperous future for all citizens.

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CHAPTER - 17

THE ROLE OF TECHNOLOGY IN FINANCIAL SERVICES

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ABSTRACT

The economic business world has drastically increased due to technological advancements and information technology becoming widespread in many industries. In fact, many firms increasingly invest into the establishment of information technology to operate efficiently and profitably. This is no different for the financial service industry, where service delivery is significantly being riven by technological change. Technological change has enhanced various service activities in the financial service industry with an increasing amount of benefits for clients. Rapid technological advancements have transformed the financial services industry. This evolution, known as financial technology or fin tech, revolutionizes how financial institutions operate and deliver customer services. The use of technology in finance has grown significantly. The competitive nature of the economic business world has tremendously increased due to technological advancements. This paper investigates the six benefits of fintech automation and the examples of fintech automation. This paper also explores the fostering financial inclusion and bridging the digital divide.

Key words: *Technology, Fintech, Automation and financial inclusion.*

INTRODUCTION

Rapid technological advancements have transformed the financial services industry. This evolution, known as financial technology or fin tech, revolutionizes how financial institutions operate and deliver customer services. The use of technology in finance has grown significantly. An increasing number of cutting-edge technologies are emerging, creating a bright future for finance. In the early days, almost all financial products/ services were provided by financial institutions.

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Everything was bundled into one centralized location. Financial technologies, especially artificial intelligence (AI), machine learning, block chain, augmented reality (AR)/virtual reality (VR), and quantum mechanics, provide a more diversified, convenient, and agile platform for the promotion of financial services and products, and play key roles in improving financial performance. The competitive nature of the economic business world has tremendously increased due to technological advancements. Technology has allowed improvements to firm processes and enables firms to operate efficiently and profitably. Examples of improvements by technology in business processes include:

1. Cutting costs;
2. Enhancing customer service and quality;
3. Enabling firms to enter new markets;
4. Creating new business opportunities.

In broad, technology has transformed various industries, with the financial services industry being one of the industries experiencing pervasive technological disruption and advancement. In the last ten years, the financial services industry has experienced a significant increase in technology based services delivery. In fact, in 2002 Freedman and Good let identified technological change to be one of the key factors driving the development in the financial services industry. Technology adoption of the financial services industry contributes to a number of benefits for the clients such as:

Financial Technology

Financial technology, or fin tech, refers to integrating technology into financial services to enhance usability, accessibility, and efficiency. While primarily used in backend systems of established financial institutions, such as banks, fintech has evolved to simplify individual and organizational financial management. From automated investment platforms to mobile banking apps, fin tech covers various financial sectors, including retail banking, investment management, education, and nonprofit organizations. Many fin tech solutions also aim to make financial services more cost-effective and accessible.

SIX BENEFITS OF FIN TECH AUTOMATION

Fintech innovation is transforming how financial services are delivered, helping companies and individuals streamline financial management.

Here are the six key advantages of fintech automation driving this shift:

1. Enhanced Data Management and Reporting

The digital transformation of the financial industry has made financial data more accessible. By leveraging AI and smart analytics, fintech allows financial institutions to collect, sort, and analyze consumer data more accurately and efficiently, leading to more informed decision-making.

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At the same time, fintech automation allows consumers to access their bank accounts via smartphones, eliminating the need to visit a physical bank. Customers can check their balances or make transactions through a designated app or web platform from their chosen browser.

2. Automated tasks

Fintech solutions free finance professionals from tedious, repetitive tasks, allowing them to focus more on strategic activities. Automation accelerates processes like customer onboarding, transaction processing, and account reconciliation while minimizing or eliminating human error. Thanks to fintech, tasks that once took days or even months can now be finalized with just a few clicks.

3. Increased data security

Fintech automation enhances data security through advanced encryption, two-factor authentication, and strict compliance measures. These procedures protect sensitive financial data from cyber threats and unauthorized access. Many fintech solutions incorporate real-time monitoring and fraud detector systems, helping them react promptly to suspicious activities.

4. Improved customer experience

By leveraging automation, fintech solutions help users' access financial services anytime, anywhere. For instance, financial institutions are increasingly implementing artificial intelligence into their customer support service. AI-powered chatbots can give financial advice or process transactions in real time, enhancing the responsiveness and efficiency of customer support.

5. Financial Conclusion

Fintech has the potential to expand access to financial services for underserved populations. Alternative credit scoring models, digital wallets, and mobile banking make it easier for individuals and small businesses to take part in the official financial system.

6. Streamlined Expense Management

Some fintech tools enable businesses to manage expenses more effectively through automated tracking and reporting features. These solutions simplify expense approval workflows and provide real-time visibility into spending patterns. Financial technology also helps financial institutions (FIs) lower operational costs by reducing the need for physical infrastructure and automating processes. These savings can translate into reduced fees and better rates for customer.

5 EXAMPLES OF FINTECH

1. Robo-Advisors

Automated investment platforms use algorithms to provide personalized investment advice and portfolio management. Robo-advisors like Betterment offer low-cost, accessible investment services to a broader range of consumers.

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2. Payment Apps

Mobile payment solutions such as Venmo, PayPal, and CashApp have revolutionized peer-to-peer transactions by making it easy for users to split bills or transfer money instantly among friends or colleagues.

3. Digital banking platforms

Neobanks like Chime offer fully online banking services with lower fees compared to traditional banks. Their mobile-first approach makes them ideal for customers who like to manage finances digitally. Features like easy money transfers and instant notifications highlight the flexibility of digital banking platforms, which are tailored to meet varied customer needs.

4. Regulatory Technology (RegTech)

RegTech uses technology to help businesses effectively comply with regulatory requirements. By automating the compliance process, RegTech reduces compliance costs, minimizes human error, and ensures companies adhere to changing regulations. As one of the most heavily regulated areas, the financial industry benefits from AI-powered monitoring systems, real-time analytics, and other RegTech solutions that help maintain compliance.

5. Invoice financing platforms

Services like Fund box allow businesses to borrow against their unpaid invoices for immediate cash flow relief while waiting for clients' payments—a type of financing valuable during cash flow shortages.

Fostering Financial Inclusion and Bridging the Digital Divide:

Addressing the digital divide and promoting financial inclusion requires targeted strategies that focus on accessibility, affordability, and awareness. Financial institutions, in collaboration with governments and NGOs, should work to extend digital financial services to underserved and unbanked populations. This includes offering low-cost digital banking solutions, investing in community education programs to improve digital literacy, and leveraging mobile technology to reach remote areas. Financial institutions and fintech companies can focus on creating digital financial services that are accessible on basic mobile phones or through low-bandwidth internet connections, reaching populations in remote or underserved areas. Services such as mobile money, digital wallets, and USSD (Unstructured Supplementary Service Data) banking can provide essential financial services without the need for smartphones or high-speed internet.

Implementing programs to enhance digital literacy and financial education among underserved populations is critical. These programs can be delivered through community centers, schools, or online platforms and should be designed to empower individuals with the knowledge and skills to effectively use digital financial services.

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Topics can include how to securely transact online, the importance of savings, and understanding credit. To expand access to credit, financial institutions can leverage alternative data-such as utility bill payments, rental payments, and mobile phone usage patterns-for credit scoring. This approach can provide a more comprehensive view of an individual's financial behavior, particularly for those without traditional credit histories, thereby enabling access to credit for previously excluded groups.

Governments and private sector entities can collaborate to expand digital infrastructure in underserved regions. This includes investing in internet connectivity, mobile network coverage, and digital payment ecosystems. Public-private partnerships can be instrumental in deploying the necessary infrastructure to support the widespread use of digital financial services. Microfinance institutions (MFIs) and community-based financial solutions play a crucial role in financial inclusion. By supporting these institutions with digital technologies, it's possible to enhance their reach and efficiency.

Digital platforms can facilitate the management of microloans, savings programs, and insurance products tailored to the need of low-income individuals and small enterprises. Regulators play a key role in fostering an environment conducive to financial inclusion. This involves creating regulatory frameworks that encourage innovation in financial services while ensuring consumer protection. Regulations should support the development and deployment of digital financial services, including e-KYC (Electronic Know Your Customer) processes, mobile banking, and digital identification systems.

Conclusion

In summary, technological innovation holds the promise of a more efficient, inclusive, and resilient financial services industry. However, realizing this promise will require concerted efforts to address the challenges identified, harnessing the power of innovation responsibly and inclusively. As we move forward, the industry must navigate this delicate balance, ensuring that as we innovate, we do so with a keen awareness of the broader social and economic implications, striving always to contribute positively to the global financial ecosystem.

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CHAPTER - 18

A STUDY ON WOMEN EMPOWERMENT IN WORKPLACE IN CHENNAI IT SECTORS

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ABSTRACT

Women's empowerment in workplace in IT sectors is discussed in this research paper. It can be examined by encouraging diversity and inclusion, offering equal opportunities, and fostering a positive work environment. Encouragement of a diverse workforce, sexual harassment, fair compensation, the creation of new roles, mentorship, training, flexible work schedules, work-life balance, support for parental leave, encouraging women to take risks, and support for women in leadership roles are some of the factors that contribute to the presence of women in the workplace. Ninety female employees were selected for this study's sample. The research study uses both primary and secondary data; the research questionnaire is utilized to gather the primary data. The chi-square test and percentage analysis are performed using data analysis tools and random sampling methodologies.

Keywords: *Work place empowerment, IT sectors, women employees.*

INTRODUCTION

In Chennai, efforts to empower women in the workplace and create a more equal atmosphere depend heavily on measures like encouraging inclusive hiring, mentorship programs, diversity training, and pay transparency, as well as networking opportunities and leadership buy-in. This article provides a more thorough analysis of the ways in which Chennai's industrial sectors may empower women in the workplace.

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Strategies for Workplace Empowerment:

- **Inclusive Hiring & Recruitment:** To draw in a larger pool of talent, use inclusive wording in job advertisements, diverse candidate pools, and blind resume screening.
- **Networking and Mentoring:** Provide networking opportunities for women to interact and form relationships, as well as mentorship programs that pair them with seasoned leaders.
- **Training on Diversity and Inclusion:** Hold frequent training sessions for all staff members to increase understanding of unconscious prejudice, encourage civil discourse, and cultivate an inclusive workplace atmosphere.
- **Pay Transparency and Equity:** To guarantee equal compensation for equal labor, establish transparent pay systems and conduct frequent audits of pay disparities.
- **Flexible Work Arrangements:** To meet the demands of working parents and other employees, provide flexible work arrangements like remote work, adjustable hours, and shortened workweeks.
- **Buy-in from the leadership:** Obtain senior leadership's backing to promote programs for women's empowerment and foster an inclusive atmosphere.
- **Dealing with Gender Bias:** In the workplace, actively confront and dispel gender biases and preconceptions.
- **Establishing Safe Spaces:** Make sure that there is a polite, safe workplace where women may come forward with complaints of harassment or discrimination.
- **Supporting Women's Rights:** Speak up in favor of laws and procedures that advance women's rights and gender equality both within and outside of the workplace.
- **Acknowledging and Celebrating Success:** To encourage and uplift others, recognize and celebrate the accomplishments of women in the workplace. Initiatives from the UN Women organization, which advocates for women's empowerment and gender equality worldwide, may have relevance in Chennai.
- **Government Programs:** Women in the workplace can benefit from the many programs and initiatives the Tamil Nadu government has put in place to empower women.

Strategies for Equality, Leadership & Career Advancement

1. 1.Encourage inclusive hiring practices...
2. Offer opportunities for mentorship.
3. Put Diversity Training into Practice...
4. Keep Pay Policies Transparent...

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5. Promote networking...
6. Make sure the leadership is on board.
7. Provide flexible and remote work options

Economic independence, access to healthcare and education, political engagement, freedom from violence, and the ability to make life decisions are the five main pillars that support the complex idea of women's empowerment.

Access to resources, assets, and chances to make a living and manage their finances are all components of women's economic empowerment. This covers the ability to launch and manage businesses, obtain fair compensation, and have equal opportunities in the workplace.

Healthcare and Education Access:

For women's general empowerment and well-being, it is imperative that they have access to high-quality healthcare and education. While access to healthcare guarantees women's physical and mental well-being, education equips them with the information and abilities necessary to fully engage in society.

- **Political Participation:** Active involvement in local and national political decision-making processes is another aspect of women's empowerment. This includes the ability to cast a ballot, run for office, and have a say in laws that impact their daily life.
- **Freedom from Violence:** For women's safety and empowerment, all types of violence against them must be eradicated, including sexual, domestic, and harassment abuse. A key component of empowering women is establishing a safe and secure environment in which they can live and prosper.
- **Right to Make Decisions:** Encouraging women entails valuing their autonomy in making decisions regarding their bodies, lives, and futures. This includes the freedom to select their careers, the ability to live without discrimination or compulsion, and the right to obtain reproductive health treatments.

REVIEW OF LITERATURE

1. When the weak acquire more influence over resources and ideology, this is referred to as empowerment. It has been linked to concepts like agency, prestige, power, and autonomy. The Indian constitution explicitly grants women equal rights and instructs authorities to create laws and policies to protect such rights. It took place in the 1980s (Batliwala, 1993, 2007).
2. Rowlands, 1997; Sen, 1997; Kabeer, 1994; Batliwala, 1993).They draw attention to the intricate reciprocal relationship between women's access to and control over material resources, as well as their potential for self-expression (Sen, 1997) and self-understanding (Kabeer, 1994).One may argue that the 1990s were a crucial time for women's emancipation (Batliwala, 1993, 2007).

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3. Women empowerment is considered as a process that takes place over time, making womenagents who formulate choices, control resources and make strategic life choices (Lee-Rife,2010).
4. K. V. Sobha Rani, M.D. An investigation on Indian women's empowerment. International Journal of Contemporary Scientific and Technological Trends 2021 The process of improving the economic, social, and political standing of women—who have historically been marginalized in society—is fundamentally known as women's empowerment. It involves protecting kids from all types of violence. Women's empowerment is creating a political and social climate in which women can live without fear of discrimination, exploitation, oppression, or the general sense of persecution that comes with being a woman in a system that has historically been dominated by men.
5. Dr. Antra Singh and Prof. Seema Singh* (2020),The study builds its case using secondary sources, such as reviews of previous research that has been published in books, journals, government and international organizations' reports, and websites. The study critically looks at many models and aspects of women's empowerment in India. Indicators of women's empowerment, government policies and programs, and constitutional safeguards are all included in the study. But when compared to other nations, the nation comes in low. Programs must be reevaluated and adjusted in order to meet SDG-5 by 2030.

OBJECTIVE OF THE STUDY

1. To research the theoretical underpinnings of women's empowerment in Chennai.
2. To investigate workplace empowerment for women in Chennai's IT industries.
3. To investigate the different elements that contribute to women's empowerment in the workplace.

RESEARCH METHODOLOGY

SAMPLE SIZE

Female employees were chosen as the sample respondents for this study article. Nearly one hundred female employees were chosen. All of the female employees completed the questionnaire, but only 90 of the responses were returned. Female employees in Chennai's IT sector are chosen at random to serve as a sample for data collecting.

SAMPLE DESIGN

Female employees from a variety of IT companies, including TCS, Cognitive, and Meps in Chennai, were chosen as the study's sample for this research report.

SAMPLING METHOD

The method of using a subset of a female population to represent the entire female workforce is known as sampling in this survey research report.

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DATA COLLECTION

Both primary and secondary data were employed in this research report. One study technique that is used to gather primary data from female respondents is the main data questionnaire. The research study uses secondary data to examine historical data and makes use of other websites, libraries, and books.

STATISTICAL TOOLS FOR RESEARCH

The main accessory to analyse research data are used for analysing percentage analysis and chi-square analysis.

DATA ANALYSIS AND INTERPRETATION

In this research paper accessory to use to analyse the data are statistical methods and formulas are used. In this study paper used for data analysed for percentage analysis and chi square analysis. See below to table1, and table 2 percentage analysis and table 3 were chi-square analysis used.

PERCENTAGE ANALYSIS

TABLE 1 MAJOR FACTORS INVOLVED EMPOWERMENT IN WORKPLACE BY MARRIED AND UNMARRIED WOMEN EMPLOYEES

S.NO	Equal opportunities	Fair treatment	Ability to participate	Leadership	Culture
MARRIED	66.667%	38.889%	65.556%	57.778%	33.333%
UNMARRIED	33.333%	61.111%	34.444%	42.222%	66.667%

In this above board shows that major factors involved empowerment in workplace by married women employees are says that 66.667% of married women says that equal opportunities, 38.889% are says fair treatment, 65.556% are says that ability to participate, 57.778% are says that leadership, 33.333%of the employees are says that culture. And unmarried women employees are says that 33.333% of unmarried women employees says that equal opportunites, 61.111% are says better fair treatment, 34.444% are says that ability to participate, 42.222% are says that leadership, 66.667%of the employees are says that culture.

TABLE 2 NEGATIVE FACTORS FACED MARRIED AND UNMARRIED WOMEN EMPLOYEES WORKPLACE

S.NO	Safeguard	Gender bias	Low compensation	Job fear	Less training
MARRIED	51.111%	38.889%	33.333%	34.444%	31.111%
UNMARRIED	48.889%	61.111%	66.667%	65.556%	68.889%

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In this above board shows that negative factors faced by married women employees are says that 51.111% of married women says that safeguard fear, 38.889% are says that gender bias, 33.333% are says that low compensation, 34.444% are says that job fear, 31.111% are says that lack of less training. And unmarried women employees are says that 48.889% of married women says that less safeguard fear, 61.111% are says that gender bias,66.667% are says that low compensation, 65.556% are says that job fear 68.889% are says that less training.

CHI SQUARE TEST

Chi square test for variety of negative outcome of health issues and Age

HYPOTHYSIS

- **Ho-**The age and factors determine women empowerment in workplace both are independent.
- **H1**- The age and factors determine women empowerment in workplace both are dependent.

TABLE 3 THE AGE AND HEALTH RELATED NEGATIVE OUTCOMES FOR MARRIED AND UNMARRIED WOMEN EMPLOYEES

AGE	Married	Unmarried
BELOW 25 YEARS	19	27
25 to 30 YEARS	27	42
30 to 35 YEARS	30	17
35 to 40 YEARS	10	3
ABOVE 40 YEARS	4	1
TOTAL	**90**	**90**

Chi-square value is 1.03. So, the result concluded that the age and factors determine women empowerment in workplace both are independent.

FINDINGS&SUGGESTION

66.667% of married women says that equal opportunities, 38.889% are says fair treatment, 65.556% are says that ability to participate, 57.778% are says that leadership, 33.333%of the employees are says that culture. And unmarried women employees are says that 33.333% of unmarried women employees says that equal opportunites, 61.111% are says better fair treatment, 34.444% are says that ability to participate, 42.222% are says that leadership, 66.667%of the employees are says that culture. 51.111% of married women says that safeguard fear, 38.889% are says that gender bias, 33.333% are says that low compensation, 34.444% are says that job fear, 31.111% are says that lack of less training. And unmarried women employees are says that 48.889% of married women says that less safeguard fear, 61.111% are says that gender bias,66.667% are says that low compensation, 65.556% are says that job fear 68.889% are says that less training.

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According to this study, women still experience discrimination and gender bias at work, which might restrict their prospects for growth. Women are frequently underrepresented in positions of decision-making and leadership. Economic inequality is sustained since women are still paid less for doing the same work as men. Women frequently struggle to balance work and family obligations, which might hinder their ability to advance in their careers.

It's possible that women don't have access to sufficient support networks like flexible work schedules and daycare. Some women might not have the training and abilities needed to participate in the job market.

CONCLUSION

The findings of this study indicate that women play a major role in the IT industry. For both individual and societal advancement, women's empowerment in the workplace is essential. By allowing women to fully engage and contribute, it promotes a more just and productive society. Women who are empowered at work make greater contributions to the economy, which boosts creativity and production. Financially, gender-diverse workplaces typically outperform their counterparts, proving that inclusive setting. Diverse viewpoints—including those of women—produce more creative approaches and solutions to problems. Women are more likely to be involved in their work and stick with a company when they feel appreciated and empowered. One of the most important steps in attaining gender equality and building a more just and equitable society is empowering women in the workplace. Women are more inclined to assume leadership positions and participate in decision-making when they feel empowered.

QUESTIONNAIRE

“A STUDY ON WOMEN EMPOWERMENT IN WORKPLACE IN CHENNAI IT SECTORS”

Personal profile:

1. Name
2. Age: A) Below 25years B)25 years to 35 years C)35 years to 45 years D) Above 45 years
3. Marital status: A)Married B)Unmarried
4. Total experience:
5. Educational qualification:
6. Current Designation:

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Major factors involved in the women empowerment in workplace in Chennai IT industry

S.NO		Strongly agree	agree	neutral	disagree	Strongly disagree
7	Equal opportunities					
8	Fair treatment					
9	Ability to participate					
10	Leadership					
11	Culture					

Negative factors involved in the women employees in IT

S.NO		Strongly agree	agree	neutral	disagree	Strongly disagree
7	Safeguard					
8	Gender bias					
9	Low compensation					
10	Job fear					
11	Low training					

Variety of negative outcomes for women in the work place in IT industry

S.NO		Strongly agree	agree	neutral	disagree	Strongly disagree
7	Less motivation					
8	Health issues					
9	Inequalities to men					
10	Misunderstand with co-workers					
11	Negative feedback					

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CHAPTER - 19

A QUALITATIVE STUDY ON THE CHALLENGES FACED BY ENTREPRENEURS IN THE IRON ORE AND STEEL PRODUCTION

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ABSTRACT

This paper discusses the dynamic issues faced by entrepreneurs in the Iron ore and Steel Production, especially by small and medium enterprises (SMEs). A qualitative study was used to derive knowledge based on interviews of a few Iron ore and Steel Production. although there were some consistent challenges, among them, such as expensive nature of capital, shortage of skilled labour, uncertainty over demand, ageing technology, poor logistic management and lack of access to institutional capital in the market. The results highlight the systemic and interrelated nature of these challenges, especially in times of digital transformation in the global market. The research suggests specific policy assistance, empowerment and digital training, enhancements to the infrastructure, and fiscal incentives as the means of encouraging SME resilience and subsequent change to sustainable growth.

Keywords: *Entrepreneurs, Iron ore, Steel Production, small and medium enterprises (SMEs), Challenges, Business.*

INTRODUCTION

The Iron ore and Steel Production is a sector whose industrialisation and economies of emerging and developed countries are factors that are subject to influence. However, despite its importance, the sector remains abundant with industry problems, particularly for Small and Medium Enterprises (SMEs), which form part of the supply chain. In the Iron ore and Steel Production, the triggers of operational bottlenecks, financial bottlenecks, and technological presently affect the operational, economic and technological aspects of productivity, innovation and sustainability among the entrepreneurs.

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This study examines the various challenges faced in the steel business opportunities in terms of intensity, uncertainty of demand, labour supply limitations, digital and technological inadequacies, and financial constraints.

These Challenges are highly cross-linked and more often, especially for SMEs in the Iron ore and Steel Production market. The inability to get access to fair finance inhibits investment in advanced technologies, which contributes to inefficiencies and hinders competitiveness. Due to this technological gap in business enterprises, it is not easy to make adjustments to changing markets or innovations with regard to taking up digital innovations by business entrepreneurs. The changing demands also complicate the need to plan and grow due to the worldwide shifts in price and infrastructure. However, these make the future of small steel ministries threatening. Thus, state policy has to be utilized to help this sector with compact financing arrangements and capacity building to help it stand on a firmer foundation.

REVIEW OF LITERATURE

- **Gajdzik et al. (2022)** assessed some of the major domains that affect the Iron ore and Steel Production and analysed the consequences of the COVID-19 pandemic on steel manufacturing. The findings reveal that input and loss in reducing heat in steel manufacturing processes, strengthening the necessity of energy efficiency towards sustainability.

- **Conejo et al. (2019)** highlights the critical environmental issues regarding the Iron ore and Steel Production, namely the energy use, carbon dioxide emission, and the use of water. However, the results serve as a call to action towards consolidated measures to increase environmental protection in steel production that benefit both campaigns of technological progress and regulatory measures.

- **He, K., & Wang, L. (2016)** stated the significant energy demand in Iron ore and Steel Production and discussed the different means of energy-efficient technologies and practices that can be adopted to minimise the same and highlights the possibility of saving energy on process optimisation, wastewater, and improvements of a control system. however, studies that are still underway are directed at the implementation of innovative technologies in order to ensure the achievement of sustainable and energy-efficient steel production.

- **Wang, X., & Lin, B. (2016)** explored on energy substitution, where energy and non-energy results were mixed in terms of the relationship between the two. however, they may also be complementary to energy and labour. the background of their empirical study on the iron & Iron ore and Steel Production in China.

- **Olmez et al. (2015)** indicate, the importance to carry out country-specific life cycle assessment of the integrated iron and Iron ore and Steel Production in order to reflect realistic environmental impacts of all the stages of production and products.

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- However, it is analyzed that the entering to gate process of steel production in Turkey as a specific key impact area in which it can be improved to minimize the impact on the environment.
- **Strezov et al. (2013)** revealed the problem of sustainability in the iron and Iron ore and Steel Production with emphasis on greenhouse gas emissions, the use of resources, and pollution. The researcher suggests that direct reduced iron with electric arc furnace has a better performance compared to the Basic oxygen steelmaking route.
- **Huaiwei, Z., & Xin, H. (2011)** indicate that stainless steel waste has a complex composition mainly of slags and dusts, which contain hazardous elements and will cause environmental hazards. It is found that a comprehensive scheme of waste uses by means of the environment and resources can be preserved.
- **Koka, B. R., & Prescott, J. E. (2008)** analyse their differences and influence on firm performance. However, this study point outs the moderating effects that environmental change and firm strategy should have on these relations, which resolve inconsistencies in previous studies.
- **Kakabadse et al. (2008)** examine on how owner-managers in developing countries also create strategies in the Iron ore and Steel Production through their financial signature and entrepreneurs' behaviour to determine positioning against competitors and consolidation. However, the researcher stresses the importance of smart, personified strategy-making rather than straightforward reproduction of winning formulas.
- **R.K. Singh et al. (2007)** emphasized extant sustainability assessment frameworks and procedures, whereby sustainability indicators and composite indices are utilized to assess corporate performance. The study highlights the combination of the Iron ore and Steel Production's economic, environmental, and social aspects, as well as organisational and technical terms.
- **Nair, A., & Filer, L. (2002)** emphasize that membership in strategic groups is crucial in developing the competitive behaviour of firms throughout the years. The Results indicate that firm strategies in groups are interdependent; they display convergence and divergence around a long-run equilibrium. However, it has a new understanding of dynamic and competitive interactions and strategy formation among firms in the long term.
- **Farla, J. C. M., & Blok, K. (2001)** stated out the discrepancies and inaccuracies in the international data on energy consumption in the iron and steel sector, the researchers failed to provide valid elements of energy intensity comparison. However, this study recommends enhanced standards of data quality to provide practical international energy efficiency analysis.
- **Yanrui Wu (2001)** reviewed the earlier literature about the efficiency of Chinese steel mills. However, these studies are mainly characterized by measuring technical, scale, and allocative efficiencies using stochastic frontiers. The researcher combines the literature further with a one-stage analysis that includes environmental parameters that impact the production technology.

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- **Reppelin-Hill, V. (1999)** surveys trade and environmental literature, focusing on underpinning the less central utilisation of development terms, such as the technology effect, trade openness, and the diffusion of cleaner technologies. The researcher adds value by empirically researching the hypothesis that trade regimes increase the pace of adoption of steel production practices that are cleaner to the environment.
- **Shaw, C. (1989)** evaluated a more detailed analysis of the British entrepreneur in the business of distribution and the Iron ore and Steel Production. However, it classifies the entrepreneurs on the basis of the social following that the entrepreneurs had and demonstrates that the distribution of entrepreneurs was more expected to do the same trades that their fathers were in, compared to the Iron ore and Steel Production.

OBJECTIVES

1. To study the challenges faced by entrepreneurs in the Iron ore and Steel Production
2. To suggest the measures to overcome the challenges in the Iron ore and Steel Production

RESEARCH METHODOLOGY

The current study is conducted with a qualitative approach. However, it was conceived with both primary and secondary data whereas the primary data was collected from 10 samples using interviews through judgement sampling method from selected entrepreneurs in Iron ore and Steel Production. After the primary data has been translated and transcribed, Secondary data will be extracted from journal and web articles.

RESULTS AND DISCUSSIONS

Capital and Labour Intensity

The Iron ore and Steel Production demands massive upfront investment just to get started, making it tough for new entrepreneurs to enter in the industry. Setting up purchasing machinery involves huge costs that most Small-Scale Entrepreneurs can't afford. Finding and keeping skilled workers is a constant struggle. The labour is tough, risky, and expensive making and even harder to manage them **(Singh, R. et.al 2006).**

Sample 1: "Even if I find a trained technician, they leave within a few months, either for better pay elsewhere or to avoid the risks involved in handling hot metal and heavy machinery.

From the present study, it can be concluded with high fixed costs for plant and equipment, with high operating costs due to labour demands. Recruiting and retaining skilled labour remains difficult due to the physically demanding and risky nature of Iron ore and Steel Production.

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Demand Prediction Difficulties

Small and medium enterprises (SMEs) in the steel sector constantly face uncertainty when trying to predict future demand in the market. With construction and manufacturing industries being so unpredictable in the Industry, Entrepreneurs in Iron ore and Steel Production often find themselves unsure whether the next month will bring a problem in orders of complete silence **(Arens, M. et.al 2016).**

Sample 2: "We can't predict whether next month it will be overbooked or idle capturing the everyday anxiety of running the business."

In this study, it is found that uncertainty is driven by frequent changes in customer needs, fluctuating infrastructure projects, and overall economic instability in the market result in many SMEs either overproduce and waste resources or underproduce and miss out on valuable opportunities and making it extremely difficult.

Disruptions in Raw Material Supply

Entrepreneurs in the Iron ore and Steel Production often face delays and uncertainties when it comes to getting raw materials like iron ore, scrap metal, and coal. These inputs are the backbone of the operation of the business, but their availability is unpredictable due to both global supply chain disruptions and domestic transport inefficiencies in the market. (Raju, S. et.al 2022)

Sample 3: *"I feel that one missed shipment delays everything. The machines stay idle, Labour wait around, it's not just about lost time but it is about lost trust from clients and I feel this costs we can't afford."*

From this study, it is found that availability and timely delivery Is the only way to retain the customers, with the core inputs like iron ore, scrap, and coal are inconsistent. This results in Global supply chain disruptions, import dependency, and domestic logistical delays often.

Lack of Technology Adoption

In the Iron ore and Steel Production, many small and medium enterprises (SMEs) still depend on outdated machines and systems to keep their operations running. Most of the entrepreneurs are not aware of upgrading, but the reality is far from easy. Every entrepreneur in the Iron ore and Steel Production feels that the cost of adopting modern technology is just too high, and many Entrepreneurs feel unprepared or unsupported when it comes to learning how to use new systems. **(Sanseverino, E. R. 2022).**

Sample 4: "I personally feel that new technologies are too expensive. We make do with what we have only, so far, we didn't upgrade our pattern in the business we move in the traditional way only."

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From the present study, It reflects a common thing among SME owners who want to improve but are stuck due to financial constraints and lack of training. Because of this, the older machines that require more manual effort, break down often, and deliver lower quality output in the work. However, the technological capability makes it harder for them to meet modern quality standards to compete with better equipped, more automated firms in the industry.

Logistics Challenges

Every Entrepreneurs in the Iron ore and Steel Production constantly fight with poor logistics that disrupt both incoming raw materials and outgoing finished goods in the market. The reliable access to rail or port services is limited, especially for SMEs located in industrial places. These issues create serious bottlenecks that slow down the entire supply chain. **(Lv, Y., Xiang, 2020)**

Sample 5: "I can feel that the deliveries are always depends at the truck schedules and poor road conditions. However, we wait for hours or even days without knowing when will the materials will arrive. It is more stressful because one delay throws off our entire production and disappoints our customers in the steel market."

From this study it reflects a common struggle many want to modernize, but they simply can't afford the equipment or the training needed to implement it. Instead, Entrepreneurs in Iron ore and Steel Production stuck with older systems that work for now, but don't offer the long-term competitiveness that digital tools could provide them.

Complexities of Industry 4.0 Adoption for SMEs

Most Small and Medium entrepreneurs in the Iron ore and Steel Production have heard about smart technologies like IoT, automation, and predictive maintenance. Every Entrepreneurs in the Iron ore and Steel Production think that these tools could make their operations faster, safer, and more efficient. But when it comes to using them, the reality is different. These technologies feel far out of reach, mainly because they are expensive and require skills many SMEs just don't have access to**. (Arens, M, 2016)**

Sample 6: "Many times I heard about predictive maintenance, and we know it could prevent costly breakdowns, but I feel it is simply out of our financial reach. Even if we could afford the tools, we don't have the expertise to use or maintain them properly."

In this present study, it reflects a common struggle that many want to modernize, but they don't concentrate on the equipment or the training needed to implement it. Instead, they're stuck with older systems that work for now, but don't offer the long-term competitiveness that digital tools could provide.

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Price Volatility of Raw Materials

Entrepreneurs in Iron ore and Steel Production constantly struggle with the unpredictable rise and fall of raw material prices, especially iron ore, coal, and scrap metal. These global market fluctuations make it nearly impossible to plan costs or set stable prices for their products. Every time the cost of inputs spikes unexpectedly in the Iron ore and Steel Production Business **(Kumar, S, 2008).**

Sample 7: "I personally feel that Iron ore prices change in the market and it can't be determined easily because the price changes unexpectedly. So, as an entrepreneur we can't plan anything in the short span."

In this present study, The Frequent and unpredictable changes in the prices of steel inputs like iron ore and coal make it extremely difficult for SMEs to manage their production costs in the market. The sudden spikes or drops directly affect profit margins, often turning planned gains into unexpected losses. This makes pricing the products accurately and sustainably a constant challenge in the Iron ore and Steel Production market.

Skilled Labor Shortage

Entrepreneurs are finding it harder each year to attract and retain skilled workers in the Iron ore and Steel Production. The jobs are physically demanding, often involve safety risks, and are seen by younger generations unappealing. With an aging workforce retiring and not enough trained replacements coming in to the businesses are left scrambling to keep operations running **(Zhang, F., & Huang, K. 2017)**.

Sample 8: "I Feel that Iron ore and Steel Production is physically demanding, dangerous, and lacking in modern appeal. I feel it prefer safer, tech-driven careers, leaving a widening gap in the skilled labour force."

In This present study, the Iron ore and Steel Production is experiencing a widening gap in skilled manpower, as many experienced workers retire without suitable replacements in the Business. Younger generations are hesitant to enter the field, often viewing it as physically tough, outdated, and lacking career growth. This reluctance is leaving many companies understaffed and struggling to meet production demands in the market.

Lack of Institutional Finance Support

In steel sector often find themselves locked out of formal financial support in the market. Banks and lending institutions see small and medium steel businesses as high-risk, especially because of market volatility and lack of sufficient collateral. Even when loans are approved, the interest rates are higher than repaying them becomes a burden rather than a boost. **(Demirguc-Kunt 2012).**

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Sample 9: "I feel struggle to get loans from banks, and even when we do, the interest rates are so high that they strain our finances. Instead of helping us grow, the debt becomes another burden we have to carry."

In this Study, it reveals that Entrepreneurs face significant hurdles in securing formal credit from banks and financial institutions, particularly when seeking funds for working capital or technological upgrades. However, the high interest rates imposed make borrowing financially for many. Steel Business either operate underfunded or turn to informal lending sources, which carry their own risks in the market.

Weak Digitalization and ERP Adoption

The lack of digitization tools such as Enterprise Resource Planning (ERP) systems significantly impairs operational efficiency in small and medium enterprises. This also affects strategic decision-making, as real-time insights into inventory, procurement, production, and customer interactions are often unavailable. reduces competitiveness, and limits the ability to adapt to dynamic market Environment **(Masood, T., & Sonntag, P. 2020)**.

Sample 10: "We still do most of the work manually, reflects the heavy reliance on traditional processes, causing delays and inefficiencies. The absence of digital tools is coordination with data management, and customer engagement."

In this study, most of the businesses still depend on manual operations, isolated software systems, leading to inefficiencies and communication gaps across markets. This creates lack of Enterprise Resource Planning (ERP) tools prevents streamlined workflows, making coordination and data sharing difficult. However, the absence of CRM systems weakens customer engagement and limits the ability to build strong and lasting relationships in the market.

RECOMMENDATIONS

In order to promote the sustainability and growth of SMEs within the steel sector, a number of important recommendations can be positioned. The government needs to give financial subsidies, loan guarantees, tax breaks, and digital training to ease the burden of capital and promote modernisation. Training programs are necessary, especially in skills development, a better working environment, and performance-based incentives to keep well-trained labour. Technological advancements can be supported by creating joint centres of innovation and partnerships with the government that would allow new technologies, such as automation, to become more available. There is also the need to optimise the supply chain, which can be done by improving infrastructure, primarily the transport system and common logistics infrastructure close to industrial regions.

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However, some solutions that SMEs can implement are more innovative market planning by using AI (Artificial Intelligence) and ML (Machine learning) to generate demand forecasts and collaborative business networks that can be used to exchange market insights, so that informed, data-related decisions can be made.

CONCLUSION

The nature of the business Iron ore and Steel Production is also marked by high-risk and capital-intensive business; low supply of labour, obsolescence of production technology, volatility of the supply chain, and lack of organizational financial assistance opportunities, especially in small and medium-sized enterprises (SMEs). In an effort to meet these structural problems, there needs to be collaboration between policymakers, financial institutions, and private stakeholders. The main aim of redeveloping the sector and creating long-term competitiveness should be to increase the level of industry utilization and offer entrepreneurs a suitable level of training, resources, and financial support. The small and medium-sized steel industries face many problems, such as excessive operational expense, lack of skilled workers, poor-quality facilities, ruined supply chain, or inability to find any source of financing. Cooperation between the parts of the government, banks, and individual companies is crucial in overcoming these challenges. However, through proper training provisions, the upgrade of infrastructure, and easy access to greater funds, we can not only improve the level of development of the Iron ore and Steel Production but also make it sustainable in the years to come.

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CHAPTER - 20

STOCK MARKET WEALTH & ENTREPRENEURSHIP

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ABSTRACT

The evolving synergy between stock market wealth and entrepreneurial activity is redefining how personal financial gains influence business formation in 2025. While early research emphasized the liquidity effect of stock gains in promoting startups, recent shifts have layered this relationship with greater complexity. Today, the increased participation of middle-class investors—empowered by fractional investing, algorithmic trading, and real-time market access—has introduced new volatility into the startup ecosystem. Entrepreneurship has become more reactive to short-term financial swings, transforming wealth shocks into both opportunities and risks. Simultaneously, the decreasing cost of digital innovation, rise of no-code tools, and access to non-traditional funding have lowered barriers for entry, allowing even marginal equity gains to spark business creation, especially in digital and creative sectors. Yet, this democratization has a downside: market downturns now cause widespread financial contraction that disproportionately impacts startup success and survival. Importantly, wealth-induced entrepreneurship shows sectoral asymmetry—being most influential in capital-intensive industries and least in digital-native models.

This abstract proposes a more granular lens to assess how idiosyncratic wealth gains from the stock market interact with entrepreneurial intention, risk tolerance, and structural access to resources. As economic cycles intensify, policy responses must evolve from simply enabling access to capital toward stabilizing that access across market conditions. Fostering resilient entrepreneurial ecosystems in this new era requires addressing both the fragility introduced by high-frequency market exposure and the promise of broad-based financial inclusion.

Keywords: *Stock market wealth, entrepreneurship, digital startups, retail investors, fractional ownership, volatility, policy stability, Startup capital, financial inclusion, market cycles*

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Introduction

The connection between wealth in the stock market and entrepreneurship has grown significantly in the modern economy, in which equity ownership is more prevalent and fluctuations in the marketplace have immediate effects on household financial resources. Increased participation in equity markets via online trading platforms and fractional ownership has taken the link from high-net-worth individuals to middle-income families with sound business aspirations. At the same time, advances in technology like artificial intelligence, cloud computing, and no-code have lowered start-up expenses, with even small increases in stock wealth being able to fund new business ventures. But increased market volatility and hedge fund-like retail trading have made entrepreneurial choices more responsive to changes in short-term wealth. Analyzing this dynamic is critical to understanding capital market results in terms of actual economic activity and to developing approaches that encourage sustainable business formation in boom as well as downturn phases.

Background and Core Concept

The connection between family wealth on the stock market and entrepreneurial activity is a critical but multifaceted element in grasping how financial markets affect the real economy. The mechanism is simple: rising stock market wealth eases the liquidity constraint, enhances risk-bearing capacity for households, and raises their capacity to finance and carry on new projects. Data from large-scale administrative records, including matched household portfolios and firm registries, have established that idiosyncratic gains in stock wealth—those derived from stock-specific returns and not overall market movements—substantially raise the likelihood of new business creation. The effects are strongest among moderate-to-upper middle wealth households where financial constraints are strongest but entrepreneurial ability is still high.

Empirical Results of the Original Research

The original research design took advantage of quasi-random variation in individual stock returns to make estimates of causal effects of wealth shocks. A 20 percent idiosyncratic stock wealth increase increased the likelihood of firm start-ups by about 20 percent. These impacts were greatest in years of positive aggregate market performance and zero in bad times. The analysis also discovered that gains in wealth translated nearly one-to-one into early equity invested in new companies, affirming that the liquidity surge serves as seed money. Profitability at early stages increased for such wealth-driven start-ups, as predicted by the theory that financially constrained entrepreneurs are capable of making better-quality initial investments and strategic choices. Results proved robust after controlling for selection bias into entrepreneurship and for unobserved household attributes.

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Adjustments to the 2025 Context

Though the underlying mechanisms still apply, a number of changes in the macroeconomic, technological, and financial environment in 2025 have shifted both the magnitude and pattern of these impacts. The volatility in the stock market has increased dramatically in the last five years, fueled by geopolitical uncertainty, interest rate changes, climate-related shocks, and the general availability of algorithmic and AI-powered trading. These increases exacerbate idiosyncratic wealth shocks, raising the size of both positive and negative deviations in household equity portfolios.

In addition, democratization of equity market access through zero-commission trading apps, fractional share investing, and social investing platforms has increased retail equity ownership into segments of the population that previously did not have direct exposure. Most households own small but significant positions in stocks, typically with high turnover and occasional leverage. This trend widens the reservoir of prospective entrepreneurs sensitive to gains in wealth but also increases exposure to losses in wealth, so that the entrepreneurial response is more sensitive to cycles in the market.

Structural and Technological Changes in Entrepreneurship

Simultaneously, the infrastructure available for starting and growing businesses has changed fundamentally. Cheap digital technology, cloud computing, artificial intelligence, and no-code platforms lowered the initial fixed costs of establishing most kinds of businesses, particularly in services, e-commerce, creative industries, and software development. Crowdfunding and internet-based angel networks have also reduced access barriers to complementary external finance. Consequently, entrepreneurial elasticity with regard to family fortune has risen for online-enabled startups, as less substantial increases in wealth can cover the costs of prospective business beginnings.

However, not every industry has shared equally in these cost savings. Manufacturing, high-capacity logistics, and capital-intensive industries still demand large initial investment, and equity wealth remains a vital facilitator. Therefore, relative significance of stock wealth in entrepreneurship might be sector-specific now: less vital for low-cost, digital-native firms but still determinative for capital-intensive or innovation-based start-ups.

Heterogeneity in Wealth Effects

The revised framework emphasizes more heterogeneity of responses across the wealth distribution. Moderate-wealth families—frequently dual-income, urban, and computer-literate—respond most intensely to favorable idiosyncratic shocks because they have entrepreneurial ability and liquidity sensitivity.

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High-wealth families, already less restricted, have smaller marginal effects, while low-wealth families might still be unable to respond to wealth gains because they lack adequate scale or risk appetite. Additionally, highly geared equity positions among a portion of retail investors can enhance both returns and losses, with the potential to create asymmetric entrepreneurial cycles, where booms drive entry but busts induce rapid exit or failure.

Cyclicality and Policy Implications

The cyclical pattern of wealth-based entrepreneurship is probably more pronounced in today's setting. In extended bull cycles, a larger segment of households sees wealth increase enough to support new businesses, perhaps triggering bursts of start-up activity. Market declines can, in turn, rapidly undermine such ability, triggering depressed entry levels and elevated closure rates for young businesses. This cyclical pattern complicates the maintenance of long-run entrepreneurial vigor, especially if it is based primarily on wealth-based entry rather than other forces.

Policy interventions may seek to stabilize access to start-up capital in times of downturn—through matched seed funding programs, matching grants, or income-contingent small business loans—thus smoothing entry rates over cycles. Financial literacy and risk management programs can also assist households in making investment and entrepreneurship choices that balance the two, limiting exposure to equity market fluctuations.

Key Takeaways for 2025 and Beyond

Empirical evidence still confirms the inference that stock market wealth is a significant predictor of entrepreneurship. Nevertheless, the evolving nature of financial markets and entrepreneurship has changed the manner and timing of this relationship:

- **Amplification of Volatility:** Higher market volatility results in more volatile yet more uncertain wealth effects.
- **Increased Equity Ownership:** Middle-class households are increasingly responsible for channeling wealth shocks into entrepreneurial activity.
- **Lower Entry Costs:** Technology lowers the amount of wealth required to initiate worthy projects, particularly in digital industries.
- **Sectoral Divergence:** Wealth is still most essential for capital-intensive sectors, less so for streamlined digital businesses.
- **Cyclicality Risk:** Wealth-based entry has higher exposure to market cycles, making it more susceptible to reversals.

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Conclusion

In summary, stock market wealth remains both a driver and a limiting factor of entrepreneurship, with idiosyncratic returns leading to large rises in firm creation. The underlying causal chain—wealth relaxing liquidity constraints—remains strong but with varying magnitude, scope, and timing as a reaction to market participation, volatility, and the start-up cost structure changes. These changes both increase the inclusiveness of the phenomenon, as more families can join in, and its precariousness, as leverage and volatility add more risk to the downside. A richer understanding of these dynamics is required for policymakers, investors, and entrepreneurs hoping to create sustainable entrepreneurial ecosystems in the contemporary world.

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CHAPTER - 21

A STUDY ON RISK AND RETURN ANALYSIS OF CRYPTOCURRENCY AS AN ALTERNATIVE INVESTMENT OPTION

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ABSTRACT:

The fact that governments have not yet accepted cryptocurrency hasn't stopped its rise in popularity as a new investment option in global portfolios. Cryptocurrency is a digital form of currency that was initially created for regular exchanges. The term cryptocurrency refers to a "digital coin," with Bitcoin being known as "digital gold." Trading cryptocurrencies shares many similarities with trading on the stock market. Investors need to consider the risk and return of cryptocurrency investments. From 2020 to 2025, more individuals began purchasing cryptocurrencies, and large companies started getting involved. During this period, governments struggled to establish clear rules for these digital currencies. The crypto market experienced significant price fluctuations, rising sharply and then crashing at times. The study concludes that cryptocurrency has solidly positioned itself as a major and increasingly popular alternative investment. The years 2020 to 2025 highlighted its rapid growth, market volatility, and the constant challenge for regulators to keep up with its changes, marking it as a dynamic and influential force in the global financial scene.

Keywords: *Cryptocurrency, Global, Investment, Popular, Digital investment.*

INTRODUCTION

In recent years, cryptocurrencies have become a powerful and disruptive force in finance. Initially introduced as a decentralized way to exchange value, cryptocurrencies like Bitcoin (BTC) and Ethereum (ETH) have transformed into popular investment assets.

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They attract individual investors, institutions, and even governments. Their appeal comes from the potential for high returns, around-the-clock trading flexibility, and independence from traditional banks.

However, this asset class also shows high volatility, limited regulation, and considerable risk, making its risk-return profile quite different from that of traditional assets like stocks, bonds, or gold. As a result, simply viewing cryptocurrencies as speculative tools is not enough. We need to assess their performance using established financial metrics like skewness, kurtosis, standard deviation, risk, return, and correlation.

This study focuses on examining Bitcoin and Ethereum as alternative investment options by analyzing their annual risk and return from 2020 to 2025. By comparing these metrics to traditional benchmarks, the study aims to provide better insights into the financial viability, volatility, and portfolio impact of investing in cryptocurrencies.

With growing interest in digital assets, cryptocurrencies are increasingly seen as part of diversified investment portfolios. This study also looks at risk-adjusted returns to help investors understand how crypto assets perform compared to safer investments. Knowing these dynamics is essential for making informed and strategic decisions. As alternative investments, cryptocurrencies attract those seeking higher returns than conventional stocks and bonds.

However, the lack of intrinsic value and unpredictable price swings require close examination. Analysings performance measures like the Sharpe ratio helps determine if the extra returns justify the risks involved. This study sheds light on the potential of cryptocurrencies within diversified investment strategies.

OBJECTIVES

- To analyse risk and return of cryptocurrency investment.
- To examine correction between the cryptocurrency of Bitcoin and Ethereum.

SCOPE

The scope of this study revolves around evaluating the risk and return characteristics of cryptocurrencies, particularly Bitcoin and Ethereum, as potential alternative investment options. As traditional investment avenues such as stocks, bonds, and mutual funds face challenges from inflation, low-interest rates, and market saturation, investors are increasingly exploring digital assets. This study aims to assess whether cryptocurrencies can serve as a viable component in a diversified portfolio by analysing their performance, volatility, and correlation with other asset classes.

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REVIEW OF LITERATURE

1. **Trimborn & Hardle (2018)** measured crypto performance using the Sharpe ratio and proposed the CRIX index. They found Bitcoin and Ethereum provided high returns, albeit with high volatility.
2. **Liu & Tsyvinski (2018)** presented empirical facts about crypto returns. They found strong momentum and investor attention effects, implying cryptocurrencies behave differently than traditional assets
3. **Kyriazis (2019)** explored market efficiency and diversification potential of cryptocurrencies. His research confirmed that, despite high volatility, they offer risk-return trade-offs beneficial to diversified portfolios.
4. **Guesmi et al. (2019)** explored the impact of including cryptocurrencies in an international portfolio. Findings indicated better risk-adjusted returns when digital assets were included**.**
5. **Mishra & Mehta (2021)** studied the early post-COVID performance of Bitcoin. They found a sharp rise in both demand and price, driven by increased retail interest and social media trends.
6. **Joshi & Naik (2021)** examined the speculative behavior in crypto markets and its impact on volatility. They suggested that unlike stocks, cryptocurrency prices are heavily influenced by non-fundamental factors.
7. **Gupta & Arora (2022)** conducted a comparative study of Bitcoin, Ethereum, and traditional stock indices. The results showed that cryptocurrencies delivered higher returns, but at a cost of substantial volatility.
8. **Banerjee et al. (2022)** evaluated the role of cryptocurrencies in portfolio construction. They concluded that small allocations (5–10%) improved Sharpe ratios in diversified portfolios.
9. **Patel & Verma (2023)** evaluated crypto assets in the Indian market and found Bitcoin to outperform gold in terms of return, albeit with double the risk. Their research emphasized the importance of diversification.
10. **D'Souza & Khan (2023)** investigated investor behavior and risk perception toward digital assets. They found that younger investors were more tolerant of crypto volatility, primarily driven by expected high returns.
11. **Sharma & Bhatia (2024)** studied the performance of Bitcoin and Ethereum post-pandemic, emphasizing their increased institutional adoption and the resulting impact on volatility. They concluded that while returns have been substantial, the risk-adjusted performance remained inconsistent across months.

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12. **Kumar & Singh (2024)** explored cryptocurrency as a hedge against inflation in emerging markets. They found that Bitcoin offered better long-term returns compared to traditional assets, though Ethereum showed higher responsiveness to market sentiment.

RESEARCH METHODOLOGY

- **Research Design:**

  This study uses a quantitative approach to analyse the relationship between risk and return on cryptocurrency Investment. This approach is chosen because it allows systematic processing of numerical data and the use of statistical techniques to produce generalizable findings.

- **Data Collection:**

  The data used in this study comes from various sources, such as Market Control, Investing.com, and yahoo Finance. The data collected includes monthly prices, trading volumes, volatility, and other relevant factors from a number of leading cryptocurrencies, such as Bitcoin and Ethereum. The data collection period covers from 2020 to 2025 the period formulating the problem, data collection, data analysis and the conclusion

- **Data Analysis:**

  Data analysis is carried out in several stages. First, raw data is collected and processed to eliminate anomalies and recording errors. Second, basic statistical descriptions such as mean, median, and standard deviation are calculated to provide an overview of the characteristics of the data. Third, correlation analysis is used to identify the relationship between risk.

ANALYSIS AND ITERPRETATION

TABLE- 1 (BITCOIN)

YEAR	RISK	RETURN
2020-2021	0.24	3.40
2021-2022	0.23	1.10
2022-2023	0.16	-0.58
2023-2024	0.15	1.83
2024-2025	0.18	1.54

Source: Secondary Data

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Interpretation: Bitcoin's performance displays high volatility, with the 2020-2021 period showing high returns (3.40) alongside high risk (0.24). The 2022-2023 period was "bad" with negative returns (-0.58). Interestingly, 2023-2024, marked "bad," offered strong positive returns (1.83) with the lowest risk (0.15), highlighting a complex risk-return profile.

TABLE- 2 (ETHEREUM)

YEAR	RISK	RETURN
2020-2021	0.23	6.10
2021-2022	0.11	19.20
2022-2023	0.13	-0.66
2023-2024	0.82	1.01
2024-2025	0.31	0.86

Source: Secondary Data

Interpretation: Bitcoin's performance shows significant volatility, with the highest return (3.40 in 2020-2021) coinciding with the highest risk (0.24), indicating a "good" but high-risk period. Conversely, 2022-2023 was a "bad" period with a negative return (-0.58) despite moderate risk (0.16). While 2023-2024 was marked "good," it paradoxically showed a strong positive return (1.83) with the lowest risk (0.15), suggesting the "bad" label might refer to criteria beyond typical risk-return metrics for this specific period.

TABLE- 3 (BITCOIN)

YEAR	Skewness	Kurtosis
2020-2021	2.10	4.58
2021-2022	0.15	-1.32
2022-2023	0.59	-1.47
2023-2024	1.02	0.65
2024-2025	0.80	1.19

Source: Secondary Data

Interpretation: Bitcoin's return distribution generally exhibits positive skewness, indicating a tendency for more frequent small losses and occasional large gains, which is a desirable characteristic (e.g., 2.10 in 2020-2021). Kurtosis varies significantly, with the 2020-2021 "good" period showing high kurtosis (4.58), implying a higher chance of extreme outcomes (both positive and negative). In contrast, the "bad" 2021-2022 period had low skewness (0.15) and negative kurtosis (-1.32), suggesting fewer extreme returns.

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TABLE- 4 (ETHEREUM)

YEAR	Skewness	Kurtosis
2020-2021	2.10	4.58
2021-2022	0.15	-1.32
2022-2023	0.59	-1.47
2023-2024	1.02	0.65
2024-2025	0.80	1.19

Source: Secondary Data

Interpretation: Ethereum's return distribution, similar to Bitcoin's, generally shows positive skewness, indicating a propensity for more frequent small losses offset by occasional large gains (e.g., 2.10 in 2020-2021, highlighted as "good"). The 2020-2021 period also exhibited high kurtosis (4.58), suggesting a higher probability of extreme outcomes. Conversely, the 2021-2022 "bad" highlighted period had near-symmetrical skewness (0.15) and negative kurtosis (-1.32), implying fewer extreme returns.

TABLE – 5 (BITCOIN)

YEAR	Standard Deviation
2020-2021	582131.61
2021-2022	804913.44
2022-2023	898067.10
2023-2024	476809.72
2024-2025	1215578.38

Source: Secondary Data

Interpretation: The data reveals fluctuating levels of risk, with 2024-2025 exhibiting the highest standard deviation at 1215578.38, suggesting it was the most volatile period. Conversely, 2020-2021 had the lowest standard deviation at 582131.61, indicating it was the least volatile period among those presented**.**

TABLE- 6 (ETHEREUM)

YEAR	Standard Deviation
2020-2021	582131.61
2021-2022	86486.76
2022-2023	93349.15
2023-2024	16545.15
2024-2025	42988.00

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Source: Secondary Data

Interpretation: The data indicates that Ethereum experienced its highest volatility in 2020-2021 with a standard deviation of 582131.61, while the lowest volatility was observed in 2023-2024 at 16545.15. This suggests significant year-to-year fluctuations in Ethereum's price stability.

TABLE- 7(CORRELATION)

Correlation 2020			
		BITCOIN	ETHEREUM
BITCOIN	Pearson Correlation	1	.828**
	Sig. (2-tailed)		0.001
	N	12	12
ETHEREUM	Pearson Correlation	.828**	1
	Sig. (2-tailed)	0.001	
	N	12	12
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Computerized Data

Interpretation: In 2020, Bitcoin and Ethereum exhibited a very strong, positive, and highly statistically significant correlation, with a Pearson correlation coefficient of 0.828. The p-value of 0.001 confirms that this relationship is significant at the 0.01 level, indicating that their price movements were closely linked and unlikely due to random chance.

Correlation 2021			
		BITCOIN	ETHEREUM
BITCOIN	Pearson Correlation	1	.757**
	Sig. (2-tailed)		0.004
	N	12	12
ETHEREUM	Pearson Correlation	.757**	1
	Sig. (2-tailed)	0.004	
	N	12	12
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Computerized Data

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Interpretation: In 2021, there was a strong, positive, and statistically significant correlation between the prices of Bitcoin and Ethereum. The Pearson correlation coefficient of 0.757 indicates that these two cryptocurrencies tended to move in the same direction. The high statistical significance (p-value = 0.004), well below the 0.01 level, suggests that this observed relationship is highly unlikely to be due to random chance.

Correlation 2022			
		BITCOIN	ETHEREUM
BITCOIN	Pearson Correlation	1	.973**
	Sig. (2-tailed)		0.000
	N	12	12
ETHEREUM	Pearson Correlation	.973**	1
	Sig. (2-tailed)	0.000	
	N	12	12

Source: Computerized Data

Interpretation: In 2022, Bitcoin and Ethereum exhibited an exceptionally strong, positive, and highly statistically significant correlation of 0.973. The p-value of 0.000 indicates that this relationship is significant at the 0.01 level, confirming that their price movements were almost perfectly aligned and not due to random chance.

Correlation 2023			
		BITCOIN	ETHEREUM
BITCOIN	Pearson Correlation	1	.914**
	Sig. (2-tailed)		0.000
	N	12	12
ETHEREUM	Pearson Correlation	.914**	1
	Sig. (2-tailed)	0.000	
	N	12	12

Source: Computerized Data

Interpretation: In 2023, Bitcoin and Ethereum demonstrated a very strong, positive, and highly statistically significant correlation of 0.914. The p-value of 0.000 confirms that this relationship is significant at the 0.01 level, indicating that their price movements were closely

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linked and highly unlikely to be due to random chance.

Correlation 2024			
		BITCOIN	ETHEREUM
BITCOIN	Pearson Correlation	1	.583*
	Sig. (2-tailed)		0.047
	N	12	12
ETHEREUM	Pearson Correlation	.583*	1
	Sig. (2-tailed)	0.047	
	N	12	12
*. Correlation is significant at the 0.05 level (2-tailed).			

Source: Computerized Data

Interpretation: In 2024, Bitcoin and Ethereum showed a moderate positive and statistically significant correlation of 0.583. The p-value of 0.047 confirms that this relationship is significant at the 0.05 level, indicating that their price movements were still linked, although less strongly than in prior years, and not solely due to random chance

CONCLUSION:

Cryptocurrency, as an alternative investment, presents both remarkable opportunities and significant challenges. The analysis of Bitcoin and Ethereum over multiple years reveals that while these assets can deliver exceptionally high returns, they are also accompanied by substantial volatility and risk. Unlike traditional investment avenues, cryptocurrencies are highly sensitive to market sentiment, regulatory developments, and global events.

The data shows that certain periods yield outstanding returns rewarding risk-taking investors while other years reflect negative performance despite moderate risk levels. This inconsistency highlights the importance of timing, market awareness, and proper risk management strategies.

In summary, cryptocurrencies can play a valuable role in a diversified investment portfolio, especially for investors with a higher risk appetite. However, due diligence, strategic allocation, and continuous monitoring are essential to navigate this dynamic and rapidly evolving asset class.

SUGGESTION:

- Compare cryptocurrency returns with traditional investments like gold, fixed deposits, stocks (Nifty/Sensex), or real estate to highlight its viability as an alternative.

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- Analyse performance during bull and bear markets separately to understand how cryptocurrencies behave under stress and boom conditions.
- Include variables like inflation, interest rates, and regulatory changes to understand their effect on crypto volatility and return.
- Employ financial tools/software such as SPSS, Excel, Python, or R for more accurate and visual analysis of large datasets.
- Conduct a small survey among retail investors to gather insights on why they choose or avoid cryptocurrencies as an investment.
- Mention real events (e.g., FTX crash, ETF approvals, market recoveries) to contextualize risk-return movements.
- Provide practical suggestions on how cryptocurrencies can be included in a diversified investment portfolio with controlled

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CHAPTER - 22

THE GROWTH OF ENTREPRENEURIAL VENTURES FUELED BY ARTIFICIAL INTELLIGENCE

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ABSTRACT

Artificial intelligence (AI) is a rapidly growing field that enables intelligent decision-making, reasoning, and problem-solving. AI is transforming businesses and society by increasing productivity, gaining competitive advantage, and reducing operational costs. Entrepreneurs can leverage AI in marketing to boost audience engagement and outperform competitors. AI also drives business innovation, solves complex tasks, and fuels growth. This study explores the impact of AI on entrepreneurship and its applications across various business functions.

Keywords: *Artificial intelligence, Entrepreneurs, Decisions and Increasingly.*

INTRODUCTION

Artificial intelligence (AI) is a rapidly evolving field that enables machines to function intelligently and make decisions. AI is increasingly being adopted in various industries to optimize processes, reduce costs, and improve output. In marketing, AI can detect trends, enhance customer service, and analyze large datasets. AI's key advantages include scalability, consistency, and rule-based programming, resulting in cost savings and minimized errors. As AI continues to advance, it is expected to significantly impact marketing, with potential applications including automated sales and website optimization. Businesses will need to adapt to the changing landscape of marketing and train employees to work effectively with AI.

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STATEMENT OF THE PROBLEM

Artificial intelligence (AI) is transforming various business functions, including marketing, which is a crucial aspect of business. While AI is increasingly being applied in marketing, there is a notable scarcity of research on this topic. Despite its potential, the intersection of AI and marketing remains under-explored, with limited publications in top-tier journals. This study aims to address this gap by investigating the impact of AI on marketing from the perspective of marketing professionals in Karachi, Salem.

OBJECTIVES OF THE STUDY

1. Investigate AI's impact on business operations and performance.
2. Develop strategies for effective AI adoption and utilization.
3. Enhance productivity and efficiency by automating routine tasks.
4. Leverage cognitive technologies for informed and rapid decision-making.
5. Foster expertise growth through intelligent analysis and advisory support.

SCOPE OF THE STUDY

Artificial Intelligence enables:

1. Personalized experiences and services through data analysis and learning.
2. Intuitive and accurate interactions with technology.
3. Easy expansion of capabilities and business models, driving innovation and growth.

REVIEW OF LITERATURE

This has crucial implications when it comes to our thoughts on how entrepreneurs develop, design and scale their companies. This technology will influence whether or no individuals decide to set up companies in the first place and may dictate their quality of life if they choose to do so.

The AI revolution is predicted to come into full force within the next twenty years. It will have a greater impact than both the Industrial and Digital revolutions combined. The speed of the technological change emerging as a result of the AI revolution will open up huge opportunities for growth and profitability but, at the same time, will bring about challenges and fresh competition from new garage-style startups. Breakthrough ideas can come from anywhere, and their development will be rendered simpler through venture capital and crowdsourcing.

In fact, the real power of AI lies in its propensity to bring about new opportunities for entrepreneurs when it comes to solving specific problems with applications and verticals, such as messaging bots and intelligent virtual assistants.

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However, the design of business models is fundamental when taking useful technologies into the marketplace. The second stream of studies focuses specifically on the IoT and is strongly connected with AI in terms of data. Nowadays, digital technologies and knowledge digitalization are changing technology entrepreneurship and new venture creation processes as a whole. The concept of digital entrepreneurship is accentuating the emergence of a new entrepreneurial paradigm which is focused and/or enabled by the adoption of Internet and digital technologies. This leverages the innovation potential embedded into both large groups and dispersed individuals from different backgrounds participating in entrepreneurial activities.

In this context, AI has positive effect on the economy, furthering the development of entrepreneurship while opening up new opportunities for companies. Organizations are already using facial recognition and voice identification functions to automate existing products and services. Smart systems are also capable of controlling air traffic or performing integrated medical diagnostics.

The torrent of passively sensed data by the IoT, combined with big data technology, is creating a new type of entrepreneurship: sensor-based entrepreneurship. This can be considered a subcategory of digital entrepreneurship, in which products or services are derived from data collected from sensors and relative devices. IoT will change how we interact with objects and how we interact with each other. In particular, this new data will change how companies interact with their customers, as it can be used to help them build better relationships.

The IoT presents new opportunities and threats that companies are unable to address using existing business models. In fact, the IoT unlocks information from the manufacturing process, shows its impact on transaction costs and thereby lowers the bar for non-ownership business models. The IoT therefore impacts upon the systematic design of business models.

Big data analytics promises to enhance a number of digital technologies in tourism and hospitality that heavily rely on data, such as AI and the IoT. A new digital entrepreneurship field could be formed within this industry. The development of AI, when applied to data mining and predictive analytics, could lead to the development of effective digital business models tosupport product, process and business model innovation.

In the “decision-making” phase of our framework, AI could help the entrepreneur to transform available data into accurate predictions. Humans and machines have strengths and weaknesses. Humans perform better when data is scarce, while machines are often more effective when there is lots of data to examine. Therefore, in this phase, the entrepreneur is able to make the best decisions, thanks to AI.

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The first stream of studies to emerge from our analysis highlights the benefits in terms of data fiction. As firms generate more data, the need to develop predictive analytics becomes crucial. This can improve decision-making processes and can enhance decision support for entrepreneurs. Specifically, deep learning can improve decision support within core areas of business operations, increasing the quality of the decisions made in terms of effectiveness and efficiency.

In fact, modern data science techniques can advance our understanding of important decisions made by entrepreneurs (e.g. entrepreneurial decisions), as well as those made by others that directly affect entrepreneurs (e.g. investment decisions). The emerging domain of social signal processing, referring to a number of modern technologies utilizing AI, holds the potential to automatically detect and analyze signals being sent during human-to-human interactions.

This data fication has become increasingly crucial in improving innovation, entrepreneurship analysis, trend prediction, and decision support for entrepreneurs. Therefore, there is an urgent need to apply big data to entrepreneurship.

Moreover, data can also be useful when it comes to one of the most critical tasks for startups: the validation of their business model. A hybrid intelligence decision support system can allow for the iterative validation of a business model through the combination of both social interaction with stakeholders (e.g. partners, investors, mentors, and customers) and the analysis of the uncertain phases of business model development in early-stage startups. This new class of decision support systems might be useful in supporting entrepreneurs in uncertain contexts. With increasing uncertainty, the relative advantages of statistical methods in providing decisional guidance decreases and the value of human intuition increases.

KEY BENEFITS OF AI IN ENTREPRENEURSHIP INCLUDE:

- Data-driven decision-making
- Predictive analytics
- Business model innovation
- Improved customer relationships
- Market analysis and prediction

AI can also support entrepreneurs in uncertain contexts, such as validating business models and predicting customer behavior. Overall, AI has the potential to transform entrepreneurship and drive growth and innovation.

CONCLUSION

We're entering a new era of industrial transformation, and today's entrepreneurial decisions will shape the future. By leveraging AI to automate routine tasks, entrepreneurs can unlock their creative, empathic, and visionary potential. Rather than seeing AI as a threat, entrepreneurs can view it as an enabler that enhances human skills and capabilities.

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CHAPTER - 23

PSYCHOMETRIC-BEHAVIOURAL FINANCE FRAMEWORK FOR UNDERSTANDING HOUSEHOLD FINANCIAL RESILIENCE

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ABSTRACT

Household financial resilience the capacity to withstand and recover from economic shocks is a critical component of socio-economic stability, especially in contexts marked by income volatility, rising living costs, and climate-related disruptions (Khalid & Shamsudin, 2022). Existing studies predominantly measure resilience through economic indicators such as income, assets, and debt levels (Frankenberg et al., 2013), often neglecting the psychological and behavioural dimensions that influence recovery trajectories. This conceptual paper proposes the Psychometric-Behavioural Finance Framework, a novel integration of *Psychological Capital Theory* (hope, efficacy, resilience, optimism), *Behavioural Finance Theory* (loss aversion, overconfidence, present bias), and the *Socio-Economic Resilience Framework*. By synthesising evidence from psychology, finance, and development studies, the model explains how individual mindsets and decision biases interact with socio-economic conditions to produce differential recovery outcomes. This research is to holistically embed psychological profiling within a financial resilience model, addressing the gap between quantitative assessments and behavioural realities. Additionally, this paper bridges the fields of psychology, behavioural economics, and development studies, offering an interdisciplinary model that unites human capital, decision-making tendencies, and socio-economic structures into a single explanatory framework.

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The framework has practical utility for policymakers, NGOs, and microfinance institutions seeking to identify at-risk households and design targeted interventions. Future research should empirically validate this model using cross-sectional and longitudinal data to inform evidence-based resilience policy in line with sustainable development goals (United Nations, 2023).

Keywords: *Household Financial Resilience, Psychological Capital, Behavioural Finance, Socio-Economic Resilience, Conceptual Framework Development*

1. INTRODUCTION

The field of finance has traditionally operated on the assumption of rational economic actors who make decisions to maximize utility. However, this perspective often fails to explain why households exhibit behaviours that can undermine their financial stability, such as insufficient saving or poor investment choices. This paper introduces a Psychometric Behavioural Finance Framework to provide a more nuanced understanding of household financial resilience by integrating psychological traits with socioeconomic factors. This framework posits that a household's capacity to withstand financial shocks is not solely a function of their income or education, but is also significantly influenced by their inherent behavioural biases and financial habits. This paper's framework is built on a synthesis of key behavioural and socioeconomic determinants of financial resilience. We draw on established research showing that psychological factors like optimism can lead to overconfidence and risk-taking (Tversky & Kahneman, 1974), while a lack of self-control often results in poor savings habits and increased spending (Thaler & Shefrin, 1981). The ability for future planning is a crucial determinant of long-term financial success and resilience (Haliassos & Bertaut, 1995). We also examine how specific financial behaviors, such as spending habits and savings patterns, are shaped by these underlying psychological traits. Furthermore, we consider the proactive behaviour of income diversification as a key strategy for mitigating risk, a topic explored in studies on household risk management (Campbell, 2006). These behavioural factors are analysed in conjunction with foundational socioeconomic variables that provide the essential context for a household's financial situation. Household income and education level are consistently identified as significant predictors of financial well-being and resilience (Lusardi & Mitchell, 2011). By integrating these established variables with the psychometric traits, our framework offers a more complete model for assessing household financial resilience. The subsequent sections of this paper will detail this framework and present an empirical analysis of its predictive power.

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2. LITERATURE REVIEW

Research in household finance has evolved from assuming people are purely rational to recognising that decisions are often complex, interdependent, and sometimes irrational (Gomes et al., 2021). Traditional economic models struggle to explain behaviours like under-saving or high-risk investments, leading scholars to explore broader influences on financial stability.

- **Economic and Institutional Factors:** Income shocks especially among low- and middle-income households can quickly erode financial well-being, forcing changes in spending, saving, and borrowing patterns (Abbi, 2012; Colarieti et al., 2024). Access to credit, income diversification, and education remain strong predictors of resilience (Campbell, 2006; Lusardi & Mitchell, 2011).
- **Behavioural and Psychological Influences:** Behavioural finance highlights biases such as loss aversion, overconfidence, and present bias that shape financial responses (Kahneman & Tversky, 1979; Kizyma et al., 2022). Psychological traits like hope, efficacy, resilience, and optimism (Luthans et al., 2007) affect adaptability and persistence during shocks.
- **Social and Environmental Dimensions:** Social capital including networks, cooperatives, and community groups can buffer against economic shocks (Shakiba et al., 2024; Kedir et al., 2023). Environmental disruptions add complexity; in Ethiopia's Dinki watershed, resilience depends heavily on livelihood diversity and community resources (Asmamaw et al., 2019).
- **Recent Evidence:** Studies from 2023-2025 confirm these patterns. Financial literacy supports both wealth-building and risk management (Xiao et al., 2023; OECD/INFE, 2023), while present bias remains a major barrier to savings (Basu & Banerjee, 2024; Laibson et al., 2023). Climate-economy research in Burkina Faso shows adaptive capacity relies on both financial buffers and social support (Zongo et al., 2024). Overall, household financial resilience is shaped by the interaction of economic resources, behavioural tendencies, psychological strengths, and socio-environmental conditions. This underscores the need for integrative frameworks that reflect these interconnected factors.

3. THEORETICAL FOUNDATIONS

3.1 Psychological Capital Theory (PsyCap)

PsyCap is a positive psychological state comprising Hope, Efficacy, Resilience, and Optimism (HERO) (Luthans et al., 2007). These traits enhance adaptability and persistence during adversity. In financial contexts, high PsyCap fosters proactive problem-solving, resourcefulness, and strategic planning, enabling faster recovery from economic shocks (Newman et al., 2014).

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3.2 Behavioural Finance Theory

Behavioural Finance recognises that financial choices are shaped by cognitive biases as well as logic (Kahneman & Tversky, 1979). This framework focuses on loss aversion (avoiding losses over seeking gains), overconfidence (overestimating financial knowledge), and present bias (favouring immediate rewards over long-term benefits). These biases can either hinder or support recovery depending on household coping styles and psychological strengths.

3.3 Socio-Economic Resilience Framework

Socio-economic resilience is the capacity to absorb, adapt, and transform in response to shocks (Folke, 2016). It depends on resources, adaptive strategies, and structural changes that reduce vulnerability, supported by assets, social networks, and institutions such as government aid or microfinance. This framework situates psychological traits and biases within broader socio-economic conditions, ensuring a holistic view of financial resilience.

4. METHODOLOGICAL APPROACH

This study follows a conceptual research design, aiming to develop the *Psychometric–Behavioural Finance Framework* by integrating insights from Psychological Capital Theory, Behavioural Finance Theory, and the Socio-Economic Resilience Framework. The process involved structured theory synthesis rather than empirical data collection.

4.1 Theory Selection

The three theoretical perspectives were chosen based on their direct relevance to understanding household financial recovery:

- ***Psychological Capital Theory*:** explains internal strengths (hope, efficacy, resilience, optimism) that influence adaptive responses.
- ***Behavioural Finance Theory*:** highlights decision-making biases (loss aversion, overconfidence, present bias) affecting financial choices.
- ***Socio-Economic Resilience Framework*:** situates recovery within broader structural and resource contexts.

4.2 Integration Process

A conceptual mapping approach was applied in three steps:

1. ***Construct Extraction*:** Core variables from each theory were listed and defined.
2. ***Overlap Identification*:** Logical intersections between constructs were considered (e.g., optimism potentially offsetting loss aversion; adaptive capacity being strengthened by self-efficacy).
3. ***Framework Assembly*:** These linkages were organised into a visual model showing how *psychological traits* interact with *behavioural biases* within *socio-economic conditions* to influence recovery speed.

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4.3 Outcome

The integration produced a single explanatory model linking people's mindsets, financial habits, and community conditions. This framework offers a basis for future empirical studies and practical application in resilience-focused financial literacy or policy programs.

5. FRAMEWORK DEVELOPMENT

The proposed *Psychometric–Behavioural Finance Framework* explains why some households recover more quickly and sustainably from financial shocks by integrating psychological traits, behavioural biases, and structural conditions into a unified model.

5.1 Inputs: Psychological Capital Traits and Behavioural Biases

Two sets of human-level inputs form the foundation:

- **Psychological Capital (PsyCap)**: *Hope, Efficacy, Resilience, Optimism (HERO)* drive motivation, persistence, and adaptability in the face of adversity (Luthans et al., 2007). High PsyCap encourages strategic planning, risk assessment, and problem-solving.
- **Behavioural Finance Biases**: *Loss Aversion, Overconfidence, Present Bias* influence how financial decisions are made under stress (Kahneman & Tversky, 1979). These biases can either hinder recovery (e.g., excessive caution from loss aversion) or accelerate it (e.g., calculated confidence in opportunity-taking).

We predict that Interactions between traits and biases are critical for instance, strong optimism may reduce the paralysing effect of loss aversion, while low resilience may amplify present bias tendencies.

5.2 Contextual Moderators

Household and community factors shape how traits and biases translate into outcomes:

- **Household Income & Education**: Income acts as a financial buffer, while education improves financial literacy and decision quality.
- **Community Resources**: Social networks, cooperative societies, and NGO or government support can offset low PsyCap or help correct maladaptive biases.

We predict that these moderators influence the strength and direction of the relationship between psychological/behavioural inputs and recovery outcomes.

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5.3 Outcome: Recovery Speed and Stability

The framework identifies two dimensions of recovery:

- **Recovery Speed**: Time taken to return to pre-shock stability.
- **Recovery Stability**: The ability to maintain recovered status over time despite smaller subsequent shocks.

We predict that households with strong PsyCap, adaptive bias management, and supportive socio-economic conditions are most likely to achieve both rapid and sustainable recovery.

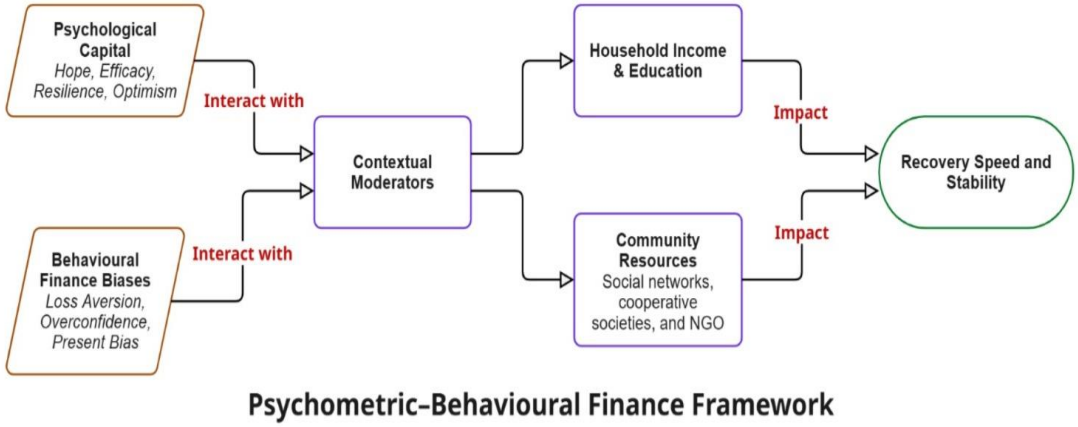

Fig1: Visual Representation of Psychometric-Behavioural Finance Framework for Understanding Household financial resilience

6. APPLICATION AND IMPLICATIONS

6.1 Policymakers

Use the framework to move beyond income-based vulnerability checks by including psychological and behavioural indicators. This enables:

- Targeted literacy programs addressing skills and mindsets.
- Resilience-focused welfare schemes that build hope, efficacy, and optimism.
- Pre-emptive support allocation to households with low PsyCap and high bias risk.

6.2 NGOs and Community Organisations

Apply quick screening tools to identify vulnerable households before crises escalate. This supports:

- Early intervention with guidance and training.
- Tailored microfinance terms based on decision tendencies.
- Community programs that strengthen both skills and PsyCap traits.

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6.3 Researchers

Provides a roadmap for empirical testing:

- Selecting validated PsyCap and bias measures.
- Comparing urban, rural, and disaster-prone contexts.
- Exploring how traits, biases, and socio-economic factors interact over time.

7. CASE ILLUSTRATION(Hypothetical)

7.1 Case: "Household R" in coastal Tamil Nadu after a severe cyclone

- **Context:** One earning adult (fisherman), irregular income; spouse runs petty shop. House damaged; nets lost.
- **Traits & Biases:** Moderate efficacy, low resilience (Connor–Davidson Resilience Scale; Connor & Davidson, 2003), moderate optimism; strong present bias (prefers immediate cash) and mild loss aversion (hesitant to sell livestock to fund repairs) (Kahneman & Tversky, 1979; Laibson, 1997).
- **Moderators:** Low income, secondary education; high social capital via SHG and church network (Shakiba et al., 2024).

Pathway (Framework):

- Low resilience + present bias ⇒ accepts high-interest informal loan for quick cash; under-invests in durable repairs.
- **Social capital moderates:** SHG offers emergency low-interest credit + group savings; NGO provides training (PsyCap micro-sessions) and commitment savings (lockbox) (Luthans et al., 2007; Basu & Banerjee, 2024).
- **Outcome:** Faster recovery speed (boat repaired in 6 weeks) and improved recovery stability (commitment savings reduce volatility).
- **Measurement:** Present bias via intertemporal choice task (Frederick et al., 2002); recovery speed in weeks; stability via 12-month consumption variance.
- **Policy lever:** Combine PsyCap training with commitment products; prioritise such households for subsidised asset replacement.

7.2 Suggested Propositions

- **H1.** Higher household Psychological Capital (PsyCap) predicts **faster recovery speed** after economic shocks, ceteris paribus.
- **H2.** Present bias negatively predicts **recovery stability**; this effect is moderated by financial literacy (weaker effect among more literate households).
- **H3**. Social capital (SHG / cooperative networks) moderates the PsyCap → Outcome links, buffering low PsyCap households.

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- **H4**. Income diversification mediates the relationship between PsyCap and long-term recovery stability.
- **H5**. Overconfidence exhibits an inverted-U relationship with recovery stability (moderate overconfidence encourages initiative; extreme overconfidence increases risky choices).
- **H6.** Commitment savings products attenuate the harmful effect of present bias on recovery speed.

8. LIMITATIONS AND FUTURE RESEARCH VALIDATION

This study is conceptual and has not yet been empirically tested. While the integration of Psychological Capital Theory, Behavioural Finance Theory, and the Socio-Economic Resilience Framework is novel, its predictive power remains unverified. Cultural and contextual differences may also shape how traits and biases affect financial recovery for instance, present bias in rural areas may stem from seasonal income patterns, whereas in urban settings it may relate to credit-based spending.

Future researches should encompass:

- **Longitudinal Design**: Track households over 12–24 months post-economic shock to assess recovery speed and stability as per the framework's predictions.
- **Experimental Interventions**: Implement targeted interventions (e.g., PsyCap training, bias awareness programs) to evaluate causality and improvement in resilience metrics.
- **Contextual Comparisons**: Conduct sub-group analyses for urban vs rural vs disaster-prone populations to test model generalisability.

9. CONCLUSION

This paper introduces the integrated framework to combine Psychological Capital, behavioural finance biases, and socio-economic resilience factors in explaining household recovery after financial shocks. By bridging human capacity, decision tendencies, and structural enablers, the framework addresses a critical gap in resilience research moving beyond income and asset measures to include mindset and behavioural dimensions. A key strength of this study lies in its interdisciplinary synthesis. The framework transcends the limits of single-discipline approaches. This integration not only advances academic discourse but also provides a practical, systems-level tool for policymakers, NGOs, and community planners working to enhance household financial stability.

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Its potential policy and practice impact is substantial: enabling more precise vulnerability profiling, designing targeted resilience-building programs, and supporting community-based financial empowerment strategies. In alignment with Viksit Bharat 2047 goals, this framework offers a roadmap for fostering self-reliant, adaptable, and financially secure households.

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CHAPTER - 24

AI-DRIVEN TAX COMPLIANCE MECHANISMS FOR ACHIEVING THE VISION OF HIGHLY TRANSPARENT PUBLIC FINANCE IN VIKSIT BHARAT

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ABSTRACT

Achieving Viksit Bharat 2047 requires a strong, transparent, and efficient public finance system, with tax compliance as a fundamental pillar. This study explores the transformative potential of Artificial Intelligence (AI) in revolutionizing India's tax administration to meet these ambitious national goals. Viksit Bharat 2047 is India's vision to become a developed and transparent nation by the 100th anniversary of its independence. Despite its vast revenue potential, India's tax ecosystem continues to face persistent challenges, including widespread tax evasion, complex compliance procedures, and enforcement gaps that hinder effective fiscal governance. Artificial Intelligence, through advanced technologies such as machine learning, predictive analytics, and real-time data integration, offers promising solutions to these challenges. By enabling automated and precise detection of non-compliance, AI can help tax authorities focus their efforts on high-risk cases, thereby improving audit efficiency. Additionally, AI-powered tools can simplify taxpayer services by providing personalized assistance, reducing errors, and enhancing compliance ease. This study critically examines the current state of India's tax landscape alongside its digital infrastructure readiness to implement AI-driven tax mechanisms. It highlights the opportunities for integrating AI to foster transparency, accountability, and increased revenue collection. Furthermore, it offers strategic recommendations for policymakers and tax administrators to harness AI's full potential in building a modernized tax ecosystem aligned with Viksit Bharat's goals.

Keywords: *Viksit Bharat public finance, AI-driven tax compliance, Sustainable economic growth, AI-enabled fraud detection, Predictive analytics in tax administration.*

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1. Introduction

The vision of Viksit Bharat (Developed India) by 2047 encompasses sustainable economic growth, robust governance, and enhanced public trust. Central to this vision is the establishment of a highly transparent public finance system, where government revenues and expenditures are accountable, efficient, and free from corruption. Tax compliance plays a crucial role in ensuring steady government revenue, enabling the financing of developmental projects and social welfare. However, traditional tax compliance mechanisms in India face significant challenges, including tax evasion, inefficient collection, and lack of real-time monitoring, which hamper transparency and reduce public confidence. Recent advancements in Artificial Intelligence (AI) offer transformative potential to address these challenges by automating processes, enhancing data analytics, and enabling predictive insights.

AI-driven tax compliance systems can efficiently identify non-compliance, detect fraud patterns, and streamline tax administration, thus reinforcing fiscal discipline and transparency. Integration of AI technologies such as machine learning, natural language processing, and robotic process automation within tax frameworks can enable faster, more accurate, and cost-effective tax collection while ensuring fairness and accountability. This research paper aims to explore the design, implementation, and benefits of AI-integrated tax compliance mechanisms as a strategic tool for achieving ultra-transparency in public finance, aligned with India's developmental goals. It investigates how AI can strengthen governance by fostering openness, reducing leakages, and empowering taxpayers with digital support systems. By analyzing existing frameworks and emerging innovations, this paper contributes to understanding the pivotal role of AI in transforming India's tax ecosystem and realizing the vision of Viksit Bharat through a highly transparent and accountable public finance system.

2. Objective of the study

- To analyze how AI enhances tax compliance efficiency to support Viksit Bharat's transparent finance goals.
- To examine India's current tax compliance challenges affecting the vision of a developed, transparent economy by 2047.

3. Review of literature

3.1 Singh, A. V., & Sadhanandan, H. D. (2025) examined the opportunities, strengths, and challenges that shape India's journey towards achieving the Viksit Bharat 2047 vision. They identified India's large and young population, vibrant IT sector, and rich cultural heritage as major strengths, while infrastructure gaps, poverty, and inequality remain significant weaknesses.

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The authors emphasized that technological advancements, globalization, and a growing middle class present unique opportunities for growth, but climate change, geopolitical tensions, and economic uncertainties pose considerable risks. They highlighted the need for reforms in education, healthcare, infrastructure, and sustainability to leverage India's demographic dividend, strengthen the startup ecosystem, and ensure equitable growth. Their work concludes that targeted policy actions will be essential for India to become a developed nation by 2047.

3.2 Anilkumar, U. P. (2024) explored the role of Artificial Intelligence (AI) as a catalyst for inclusive development in the context of Viksit Bharat 2047. The study emphasizes AI's potential to empower marginalized and underprivileged communities, particularly in rural areas, by improving access to education, healthcare, and livelihood opportunities. The researcher highlights the importance of responsible AI deployment to ensure inclusivity and reduce biases in India's diverse society. The paper concludes that with ethical AI integration, India can achieve a more equitable and prosperous future, aligning with the vision of Viksit Bharat.

3.3 Mundhe, E. (2024) Studied on Viksit Bharat 2047 presented a comprehensive roadmap for transforming India into a developed nation by the centenary of independence. The study adopted a multidisciplinary approach, focusing on economic growth, technological innovation, social equity, and environmental sustainability. It emphasized the importance of strong policy frameworks, strategic investments in infrastructure and human capital, and governance reforms for inclusive development. By analyzing current challenges and exploring opportunities in education, healthcare, renewable energy, and digitalization, the research offered actionable insights and policy recommendations. The author concluded that collaborative efforts between government, private sector, and civil society are essential for achieving a prosperous and equitable India by 2047.

4. Concept of Viksit Bharat – Vision 2047

The Viksit Bharat 2047 Voice of Youth initiative, launched on 11th December 2023 by Prime Minister Shri Narendra Modi, aims to actively engage the youth in shaping India's future. Inaugurated via video conferencing, with workshops held across Raj Bhawans nationwide, the programme invites students, faculty, and thought leaders to contribute ideas for the nation's long-term development roadmap. Viksit Bharat is a visionary blueprint set by the Government of India to transform the country into a prosperous, self-reliant, and globally competitive nation by 2047, marking 100 years of independence. The vision focuses on sustainable economic growth, technological innovation, social inclusion, and robust governance. Transparency in public finance and administration is emphasized to build citizen trust and ensure efficient resource utilization.

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The integration of advanced technologies, including Artificial Intelligence, renewable energy, and digital infrastructure, forms the foundation to achieve these ambitious goals and position India as a truly developed nation.

4.1 Evolution of Viksit Bharat

The vision of Viksit Bharat 2047 represents India's ambitious goal to become a developed and globally respected nation by the 100th anniversary of its independence. This transformative journey has evolved through multiple significant phases in India's history, reflecting its economic, social, and technological progress over time. The following are the key phases in the evolution of Viksit Bharat:

4.1.1. Pre-Independence Era

Before India gained independence in 1947, it was under British colonial rule for nearly 200 years. The economy was largely agrarian and underdeveloped, with resources exploited by the British. Infrastructure was minimal, and access to education and healthcare was limited. The freedom struggle was also a demand for social and economic progress. Leaders like Mahatma Gandhi and Jawaharlal Nehru envisioned an independent India that was self-reliant and prosperous, despite the immense challenges left by colonial policies.

4.1.2. Post-Independence Era (1947–1991)

After independence, India adopted planned development through Five Year Plans focusing on agriculture, public industries, and infrastructure. The goal was self-sufficiency and poverty reduction. Despite steady growth, challenges like food shortages and slow industrialization persisted. Heavy state control and limited technology kept the growth modest but laid the foundation for future progress.

4.1.3. Economic Liberalization (1991 onwards)

Facing a balance of payments crisis, India launched major reforms in 1991, liberalizing trade, deregulating markets, and encouraging foreign investment. These reforms integrated India into the global economy, boosting sectors like IT and finance. The reforms accelerated India's emergence as a growing economic power and expanded opportunities for innovation and entrepreneurship.

4.1.4. Early 2000s: Vision for Growth

The early 21st century saw initiatives like Make in India, Digital India, and Skill India to boost manufacturing, digital infrastructure, and workforce skills. Sustainable development, education, and healthcare became priorities, setting the stage for India's aspiration to become a developed country.

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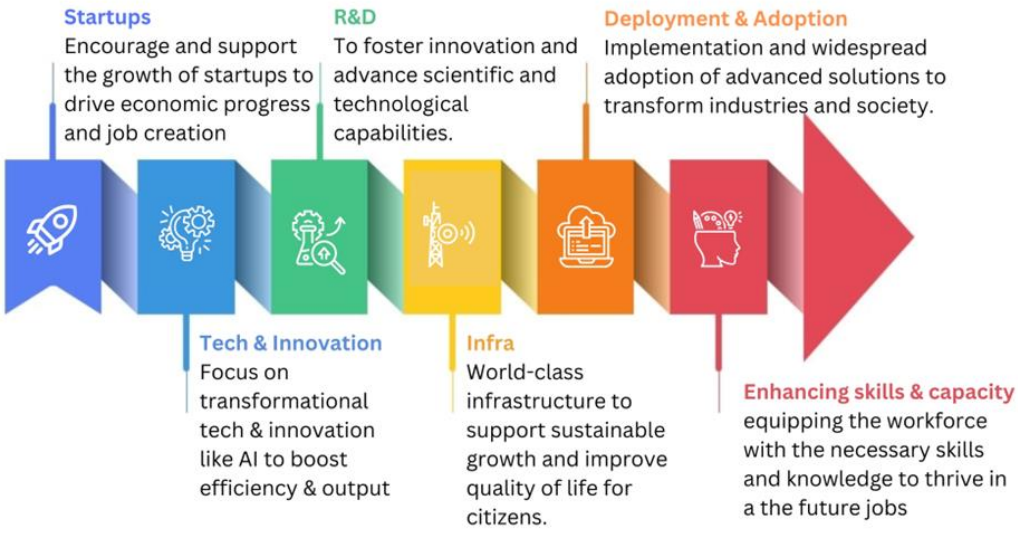
4.1.5. Present Vision: Viksit Bharat by 2047

Viksit Bharat is the bold vision to transform India into a developed nation by the centenary of its independence. It focuses on economic growth, social inclusion, environmental sustainability, and technological advancement. Using AI, renewable energy, and governance reforms, India aims to provide world-class education, healthcare, infrastructure, and transparent public finance.

4.1.6 Future Perspective

In the future, Viksit Bharat aims to make India a strong and developed country by 2047. The plan is to use new technologies like AI, clean energy, and better digital systems to improve many areas. India wants to give everyone good education, health care, and strong infrastructure so people can live better lives. At the same time, it will protect the environment to keep nature safe. With hard work from the government, businesses, and people, India hopes to grow in a way that helps everyone and becomes a leading country in the world.

4.2 Key Pillars



4.3 Strategies to Achieve Viksit Bharat

- Promote inclusive economic growth that benefits all citizens and reduces inequality.
- Ensure transparent, accountable, and corruption-free governance by using digital technologies.
- Embrace innovation through AI, IoT, and other emerging technologies to improve efficiency.
- Provide universal access to quality education and skill development for a future-ready workforce.

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- Develop infrastructure like smart cities and strong digital connectivity to support growth.
- Adopt environmental sustainability by using green technologies and protecting natural resources.
- Strengthen public finance with AI-driven tax compliance and transparent resource management.

5. Tax Compliance Mechanisms

"Viksit Bharat, India's vision to become a developed nation by 2047, demands a robust and transparent financial system. Among its core pillars, tax compliance mechanisms play a crucial role in ensuring timely and accurate revenue collection. Effective compliance not only strengthens public finance but also promotes trust between citizens and the government. Through reforms such as GST, e-filing systems, and the integration of AI-driven monitoring tools, India aims to enhance transparency, reduce tax evasion, and foster sustainable economic growth. Strengthening these mechanisms is essential to fund infrastructure, welfare, and innovation for a truly developed India."

5.1 Objectives of Tax Compliance in Viksit Bharat

The primary objectives of tax compliance within the framework of Viksit Bharat are to establish a robust and sustainable revenue base capable of financing the nation's developmental priorities, such as infrastructure expansion, universal healthcare, quality education, and social welfare. A transparent and equitable tax system is essential to fostering trust between the state and its citizens, thereby enhancing voluntary compliance. Furthermore, effective tax compliance mechanisms aim to minimize evasion and avoidance by leveraging advanced monitoring technologies and data integration. Simplification of tax procedures and the provision of accessible, user-friendly platforms are intended to reduce administrative burdens and improve taxpayer experience. In the long term, a stable and predictable taxation environment supports macroeconomic stability, encourages investment, and ensures that public finances are channelled towards inclusive and environmentally sustainable growth, thereby aligning fiscal governance with the overarching vision of a developed India by 2047.

5.2 Key Tax Compliance Mechanisms in Viksit Bharat

Achieving the vision of Viksit Bharat requires a tax administration system that is efficient, transparent, and capable of mobilizing adequate resources without imposing excessive burdens on taxpayers. The following mechanisms constitute the core pillars of an effective tax compliance framework in the context of India's developmental aspirations:

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5.2.1. Simplification of Tax Laws and Procedures

Complex tax structures often discourage compliance and increase opportunities for evasion. Viksit Bharat's approach emphasizes rationalizing tax codes, removing redundant provisions, and consolidating indirect tax systems through measures like the Goods and Services Tax (GST).

5.2.2. Digital Tax Administration

The adoption of digital platforms for tax filing, payment, and refund processing significantly enhances efficiency and transparency. Systems such as the Income Tax e-Filing Portal and GSTN (Goods and Services Tax Network) provide real-time transaction tracking, reduce paperwork, and minimize human interface, thereby lowering the scope for corruption.

5.2.3. Technology-Driven Monitoring and Analytics

Leveraging artificial intelligence, big data analytics, and blockchain technology enables the detection of anomalies in tax declarations, identification of fraudulent claims, and prevention of under-reporting. Integration of PAN, Aadhaar, and bank account data facilitates a comprehensive view of taxpayer activities, strengthening enforcement capabilities.

5.2.4. Withholding and Advance Tax Systems

Mechanisms like Tax Deducted at Source (TDS) and Tax Collected at Source (TCS) ensure that taxes are collected progressively throughout the year, reducing the risk of default. Advance tax provisions spread the payment burden over multiple instalments, thereby improving cash flow management for both taxpayers and the government.

5.2.5. Risk-Based Auditing and Assessment

Instead of relying on random audits, the risk-based approach prioritizes cases with higher probabilities of non-compliance based on data analysis. This method optimizes resource allocation within the tax administration and minimizes unnecessary disruptions for compliant taxpayers.

5.2.6. Taxpayer Education and Awareness Campaigns

Public outreach programs, workshops, and targeted awareness drives inform taxpayers about their obligations, rights, and available digital tools. Enhanced awareness reduces unintentional non-compliance and strengthens the overall trust in the tax system.

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5.3 Challenges in India's Tax Compliance System

- **Tax Evasion and Underreporting** – Individuals and businesses often conceal income or falsify records to avoid paying taxes. This reduces government revenue and weakens the fiscal capacity to invest in infrastructure, healthcare, and education.
- **Informal Economy Size** – A significant share of India's workforce operates outside the formal tax net. The lack of documentation and transaction transparency makes it difficult for authorities to enforce compliance.
- **Complex Tax Structure** – Frequent changes in tax laws, multiple compliance requirements, and complicated filing procedures discourage voluntary compliance. Small and medium enterprises (SMEs) face a disproportionate burden.
- **Digital Divide in Compliance Systems** – Rural and remote areas suffer from poor internet connectivity and low digital literacy. This limits access to e-filing systems and delays integration into the formal economy.
- **Weak Enforcement Mechanisms** – Limited manpower for audits and relatively low penalties for evasion reduce the perceived risk of non-compliance. This emboldens habitual defaulters.
- **Data Gaps and Integration Issues** – Inadequate integration between PAN, Aadhaar, GST, and banking databases leaves loopholes that can be exploited. This slows fraud detection and enforcement action.
- **Low Taxpayer Awareness** – Many citizens lack a clear understanding of their tax obligations or the benefits of compliance. This results in unintentional errors, late filings, and reduced trust in the system.

6. Technology and Innovation in Viksit Bharat

Technology and innovation are central to the Viksit Bharat vision, with initiatives like the Digital India programme transforming the nation's digital landscape. Since its launch in 2015, Digital India has narrowed the digital divide, connecting over 250,000 gram panchayats through BharatNet, with plans to reach 630,000 villages. Affordable smartphones and data plans have boosted internet penetration to 850 million broadband users by July 2023—a 250% growth—while 5G promises to accelerate this trend. Data consumption has surged, and the government's focus on emerging technologies, guided by NITI Aayog's 2018 AI strategy, has driven advancements in healthcare, agriculture, and education. Supported by robust digital infrastructure and innovation-friendly policies, India is positioning itself as a global leader in technology-driven growth, aligning with Viksit Bharat's goal of creating a digitally empowered and economically competitive nation by 2047.

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6.1 AI-Driven Tax Administration for Viksit Bharat

AI makes tax systems faster, more accurate, and transparent by detecting fraud, automating processes, and forecasting revenue trends. AI systems analyse large datasets from income records, GST filings, and banking transactions to detect fraud, flag anomalies, and predict revenue trends. Automated processes like return verification and refund disbursal reduce delays and human errors, while AI chatbots provide instant taxpayer assistance. By enabling targeted audits and improving service delivery, AI ensures better compliance, minimizes revenue leakages, and supports Viksit Bharat's vision of transparent, technology-driven, and citizen-friendly fiscal governance by 2047.

6.2 Role of Artificial Intelligence in Strengthening Tax Compliance

- **Fraud Detection** – Identifies suspicious transactions and patterns of tax evasion using advanced analytics.
- **Automated Processing** – Speeds up return verification, refund disbursal, and compliance checks with minimal human intervention.
- **Predictive Analytics** – Forecasts revenue trends and identifies high-risk taxpayers for targeted audits.
- **Data Integration** – Combines information from PAN, Aadhaar, GST, and banking systems for accurate tracking.
- **Enhanced Taxpayer Support** – Uses AI chatbots to answer queries and guide taxpayers through filing processes.
- **Reduced Revenue Leakages** – Minimizes losses by improving accuracy in detection and enforcement.

6.3 Data Analytics and Machine Learning in Tax Enforcement

Modern tax enforcement increasingly relies on AI, machine learning (ML), big data analytics, and predictive modelling to achieve real-time compliance tracking and proactive fraud detection. These technologies form the backbone of data-driven tax administration, enabling smarter, risk-based monitoring. By segmenting taxpayers into high- and low-risk categories based on past behaviour, transaction complexity, and industry profiles, authorities can direct audits toward high-risk cases while minimizing disruptions for compliant taxpayers. This targeted approach enhances efficiency, fairness, and trust in the system. Automated pre-assessment risk ratings further strengthen enforcement by identifying anomalies before return processing, ensuring compliance is continuous rather than reactive. This shift from retrospective enforcement to proactive, data-led intervention is central to achieving Viksit Bharat's vision of transparent and efficient fiscal governance.

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Suggestions

- Deploy machine learning models to analyse massive financial datasets and detect unusual patterns indicating possible tax evasion or fraud, while using predictive analytics for early risk identification.
- Adopt blockchain technology to create secure, tamper-proof storage of tax filings and payment histories, enabling public verification to enhance trust and transparency.
- Link PAN, Aadhaar, GSTIN, and bank accounts to establish a unified taxpayer profile for accurate tracking and effective enforcement.
- Ensure interoperability between databases of income tax, GST, customs, and financial intelligence units to facilitate seamless information exchange.
- Implement AI-driven reconciliation of GST invoices, income tax returns, and banking transactions to identify discrepancies in real time.
- Launch AI-enabled, multilingual taxpayer assistance platforms for instant query resolution and to increase awareness of deadlines, deductions, and compliance requirements.
- Monitor digital payments, e-way bills, and high-value transactions in real time using anomaly detection algorithms to trigger immediate alerts for suspicious activities.

Conclusion

Achieving highly transparent public finance for Viksit Bharat 2047 requires moving beyond traditional tax systems towards intelligent, technology-driven compliance frameworks. Artificial Intelligence, combined with data integration and secure digital infrastructure, offers a decisive pathway to detect irregularities, simplify taxpayer engagement, and strengthen institutional trust. By strategically adopting these innovations, India can overcome structural inefficiencies, close revenue leakages, and build a resilient fiscal framework. Such a transformation will be central to achieving the nation's vision of becoming a self-reliant, globally competitive, and ethically governed economy by 2047.

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CHAPTER - 25

HARNESSING HRM FOR SOCIAL ENTREPRENEURSHIP: EMPOWERING INDIA'S JOURNEY TOWARDS SDGS BY 2047

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ABSTRACT

India's vision of *Viksit Bharat @ 2047* emphasizes inclusive growth, equitable opportunities, and sustainable development. Social entrepreneurship, which combines business innovation with social impact, has emerged as a transformative pathway to address socio-economic challenges while advancing the United Nations' Sustainable Development Goals (SDGs). This paper examines the strategic role of Human Resource Management (HRM) in nurturing social entrepreneurship for achieving India's developmental objectives. It highlights HRM practices such as skill development, talent retention, performance-linked incentives, and leadership training as enablers of social enterprise growth. Case studies of SELCO India, Rang De, and Barefoot College demonstrate how HRM interventions can enhance organizational capacity, employee engagement, and social outreach. The paper also identifies challenges such as inadequate policy frameworks and skill gaps, offering policy and practice recommendations to integrate HRM into social entrepreneurship ecosystems. The findings underscore that strategic HRM, aligned with SDGs, can transition India's workforce from employment dependency to empowered, impact-driven participation in nation-building, thereby accelerating the realization of *Viksit Bharat @ 2047*.

Keywords: *Human Resource Management, Social Entrepreneurship, Sustainable Development Goals, Empowerment, Viksit Bharat 2047*

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Introduction

India stands at a critical juncture in its developmental journey, with *Viksit Bharat @ 2047* envisioning the country as a fully developed, equitable, and sustainable economy. Achieving this vision demands transformative approaches that address economic growth, social justice, and environmental sustainability. Social entrepreneurship — the practice of applying business principles to solve societal problems — offers a unique pathway for achieving these goals. The United Nations' 17 Sustainable Development Goals (SDGs) provide a global framework for tackling issues like poverty, inequality, quality education, gender equality, and climate action. In the Indian context, aligning social entrepreneurship with SDGs can accelerate progress in these areas. However, the success of social enterprises depends heavily on effective Human Resource Management (HRM) practices. HRM not only addresses staffing and skill-building needs but also fosters innovation, leadership, and inclusive organizational cultures. By integrating HRM into social enterprises, India can create empowered change agents capable of delivering long-term social impact. This paper examines how HRM can be leveraged to strengthen social entrepreneurship, bridge skill gaps, and contribute directly to India's SDG commitments and the vision of *Viksit Bharat @ 2047*.

Statement of the Problem

1. Many social enterprises in India lack structured HRM systems, resulting in inconsistent talent acquisition, inadequate skill development, and poor retention rates. This limits their ability to scale operations and sustain impact.
2. Policy frameworks and institutional support for integrating HRM practices into social entrepreneurship are insufficient, leading to fragmented initiatives that fail to align with SDG targets.

Objectives

1. To analyze the role of HRM in fostering social entrepreneurship for sustainable development.
2. To identify HRM strategies that enhance the capacity and impact of social enterprises in India.
3. To recommend policy and practice measures for aligning HRM-led social entrepreneurship with India's SDG targets by 2047.

Literature Review

Research on social entrepreneurship in India highlights its potential to address issues like rural poverty, gender inequality, and access to basic services (Bornstein & Davis, 2010). However, existing studies often focus on financial sustainability rather than HRM integration.

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- **HRM and Social Impact:** According to Gupta and Sharma (2019), HRM practices that emphasize training, performance management, and employee engagement directly contribute to social enterprise efficiency.
- **SDGs and Indian Enterprises:** NITI Aayog's SDG India Index (2023) shows progress in areas like clean energy and education but points to gaps in decent work and economic growth, where HRM-led initiatives could make a difference.
- **Case Examples:** SELCO India demonstrates how structured HRM, including local talent recruitment and continuous training, has expanded access to solar energy in underserved regions. Rang De's HRM-driven volunteer engagement program has mobilized skilled professionals for micro-lending initiatives, contributing to poverty alleviation.

Research Methodology

Research Design: Descriptive and exploratory

Data Collection:

- ***Primary Data:*** Structured questionnaires and semi-structured interviews with HR managers, social entrepreneurs, and employees from 15 selected social enterprises.
- ***Secondary Data:*** Reports from NITI Aayog, UNDP, Ministry of Skill Development, and peer-reviewed journals.
- **Sampling Method:** Purposive sampling to target organizations actively working toward SDG goals.
- **Sample Size:** 50 respondents (including founders, HR personnel, and employees).
- **Tools for Analysis:** Descriptive statistics, thematic analysis, and SWOT framework to assess HRM practices in social enterprises.

Research Gap

While there is substantial research on social entrepreneurship's economic and social benefits, there is a lack of empirical evidence on the direct role of HRM in enabling these enterprises to achieve SDG targets in India. Existing studies rarely examine HRM as a strategic tool for empowerment and sustainable impact within the *Viksit Bharat @ 2047* framework.

Findings

1. **Skill Development as a Growth Driver:** SELCO India's local capacity-building initiatives show that continuous training enhances employee efficiency and community trust.

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2. **Retention Through Purpose-Driven HRM:** Barefoot College's emphasis on community-based recruitment and cultural alignment has led to higher retention rates in rural solar engineering programs.
3. **Volunteer and Talent Mobilization:** Rang De's HR-led volunteer engagement has improved access to affordable credit for marginalized communities, directly contributing to SDG 1 (No Poverty) and SDG 8 (Decent Work).
4. **Policy Awareness Gaps:** Many social enterprises lack awareness of available government skill-development schemes and HRM support frameworks.

Suggestions

1. Develop national HRM guidelines specifically for social enterprises to align hiring, training, and evaluation practices with SDG priorities.
2. Create public-private partnerships for skill certification, mentoring, and leadership development in the social entrepreneurship sector.
3. Introduce digital HR platforms for remote collaboration, capacity building, and impact tracking.
4. Incorporate HRM modules in social entrepreneurship education programs at universities and skill centers.
5. Establish incentive schemes for organizations demonstrating measurable HRM-led contributions to SDGs.

Conclusion

HRM for social entrepreneurship represents a strategic pathway to achieving India's *Viksit Bharat @ 2047* vision. By embedding HRM principles into the operational framework of social enterprises, India can create a skilled, motivated, and empowered workforce committed to sustainable impact. The integration of HRM with social entrepreneurship not only addresses immediate socio-economic challenges but also builds long-term capacity for achieving the SDGs. The case studies of SELCO India, Rang De, and Barefoot College demonstrate that purpose-driven HRM strategies significantly enhance the effectiveness and outreach of social enterprises. A collaborative approach involving government, academia, corporate sectors, and social entrepreneurs will be critical in realizing these goals.

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CHAPTER - 26

ROLE OF TECHNOLOGY IN FINANCE

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ABSTRACT:

The rapid advancement of technology has fundamentally transformed the financial sector, reshaping how financial services are delivered, accessed, and managed. From digital banking and mobile payments to blockchain, artificial intelligence (AI), and financial analytics, technology has enhanced operational efficiency, accuracy, and transparency within the financial ecosystem. FinTech innovations have democratized financial services, providing greater inclusion for underserved populations and enabling real-time, customer-centric solutions. Additionally, technologies like AI-driven risk assessment and robo-advisors are redefining investment strategies and decision-making processes. However, while these advancements bring significant benefits, they also pose challenges related to cybersecurity, regulatory compliance, and data privacy. This paper explores the multifaceted role of technology in modern finance, analyzing its impact on financial institutions, consumers, and the global economy, while addressing emerging trends and future prospects.

Keywords: *Financial Technology (Fin Tech), Digital banking, Blockchain and Mobile Payments.*

INTRODUCTION:

In the 21st century, technology has emerged as a driving force reshaping every facet of the financial industry. The integration of advanced digital tools and innovations has revolutionized how financial services are delivered, making them faster, more efficient, and highly accessible. From traditional banking operations to complex investment strategies, technology is streamlining processes, enhancing customer experiences, and fostering financial inclusion across the globe.

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The rise of Financial Technology (FinTech) has blurred the lines between finance and technology, enabling automation, real-time data analysis, secure digital transactions, and personalized financial solutions. Technologies such as Artificial Intelligence (AI), Blockchain, Big Data Analytics, and Mobile Applications are not just trends but are becoming essential components of modern financial ecosystems. As the financial sector continues to evolve, understanding the role of technology is crucial for navigating the opportunities and challenges of a digitally driven economy.

BENEFITS OF ROLE OF TECHNOLOGY IN FINANCE:

1. Increased Efficiency and Automation:

Technology automates repetitive and time-consuming financial processes such as transaction processing, data entry, and compliance reporting. This leads to faster operations, reduced manual errors, and significant cost savings for financial institutions.

2. Enhanced Customer Experience:

Digital banking apps, online payment systems, and AI-powered chatbots have transformed customer interactions. Clients now enjoy 24/7 access to financial services, personalized recommendations, and faster resolutions to their queries.

3. Improved Financial Inclusion:

FinTech solutions have bridged the gap for unbanked and underbanked populations by offering affordable and accessible financial services through mobile banking, microloans, and digital wallets, especially in developing countries.

4. Data-Driven Decision Making:

Big Data and analytics enable financial institutions to process large volumes of data in real-time, allowing better risk assessments, fraud detection, credit scoring, and market trend analysis. This leads to informed and strategic financial decisions.

5. Transparency and Security:

Blockchain technology enhances transparency by creating immutable and tamper-proof records of financial transactions. Furthermore, advancements in cybersecurity ensure data protection, fraud prevention, and regulatory compliance.

6. Cost Reduction:

Cloud computing and automation reduce infrastructure and operational costs. Digital platforms also lower the expenses related to physical branches, paperwork, and human resources.

7. Faster and Real-Time Transactions:

Digital payment systems and online banking allow instantaneous transactions across the globe, improving cash flow management and enhancing the overall speed of financial operations.

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8. Innovative Financial Products:

Technology enables the creation of new financial products and services such as robo-advisors, peer-to-peer lending platforms, and cryptocurrency exchanges, expanding the range of options available to consumers and investors.

9. Enhanced Risk Management:

AI and predictive analytics help financial institutions in identifying potential risks early, enabling proactive measures to mitigate losses and maintain financial stability.

GROWTH OF THE ROLE OF TECHNOLOGY IN FINANCE:

Over the past decade, the financial sector has witnessed unprecedented growth in technological adoption, reshaping the global financial landscape. The evolution from traditional banking methods to digitally driven financial ecosystems has been accelerated by advancements in Financial Technology (FinTech). The global FinTech market, which was once a niche segment, has now grown into a multi-trillion-dollar industry, disrupting conventional financial services and creating new opportunities for innovation.

The rise of mobile banking, digital wallets, and contactless payments has redefined the way individuals and businesses manage their finances. With smartphones becoming ubiquitous, financial services have become more accessible to the masses, fostering financial inclusion in both urban and rural areas. The COVID-19 pandemic further catalyzed this shift, as consumers and businesses increasingly relied on digital platforms for safe and seamless financial transactions.

Moreover, technologies like Artificial Intelligence (AI), Machine Learning, and Blockchain are continuously evolving, offering advanced solutions in areas such as fraud detection, algorithmic trading, credit risk assessment, and secure digital contracts. Financial institutions are leveraging Big Data analytics to gain deeper insights into customer behavior and market trends, allowing for personalized financial solutions and strategic decision-making.

Investment in FinTech startups and digital infrastructure has surged globally, with governments and regulatory bodies encouraging digital innovation through supportive policies and frameworks. The integration of Open Banking and API-based ecosystems is fostering collaboration between traditional banks and FinTech companies, driving a more interconnected and customer-centric financial environment.

As the digital economy expands, the role of technology in finance is expected to grow even further, making financial services more efficient, transparent, and inclusive. The future of finance will be shaped by continuous technological advancements, pushing the boundaries of what is possible in the financial world.

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NEED FOR ROLE OF TECHNOLOGY IN FINANCE:

1. **Enhancing Efficiency and Speed:**

   Financial operations involve large volumes of transactions that require accuracy and speed. Technology automates routine tasks such as fund transfers, loan processing, and account management, significantly reducing processing time and improving efficiency.

2. **Improving Customer Convenience:**

   Modern consumers expect 24/7 access to financial services through mobile apps, online banking, and digital wallets. Technology enables financial institutions to provide personalized and user-friendly services, enhancing the overall customer experience.

3. **Ensuring Financial Inclusion:**

   A large segment of the population, especially in rural and remote areas, remains unbanked. Technology bridges this gap by offering digital banking services through mobile platforms, making financial services accessible to underserved communities.

4. **Strengthening Security and Risk Management:**

   With increasing cyber threats, there is a strong need for advanced security measures. Technologies like blockchain, biometric authentication, and AI-driven fraud detection systems help financial institutions protect sensitive data and manage risks effectively.

5. **Supporting Data-Driven Decision Making:**

   Financial institutions need accurate insights to make strategic decisions. Big Data analytics and AI tools analyze customer behavior, market trends, and financial risks, allowing for informed and proactive decision-making.

6. **Facilitating Innovation and Competitiveness:**

   The global financial landscape is highly competitive. Adopting the latest technologies enables financial institutions to innovate, develop new products, and remain competitive in a rapidly evolving market.

SUGGESTION:

- Increase investment in cybersecurity to protect digital financial data.
- Encourage innovation by adopting new financial technologies.
- Update financial regulations to match technological changes.
- Educate people about using digital financial services safely.
- Use technology to improve customer service and efficiency.
- Ensure data privacy and ethical use of Artificial Intelligence (AI).
- Support collaborations between banks and FinTech startups.

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CONCLUSION:

The integration of technology into the financial sector has revolutionized the way financial services are delivered, enhancing efficiency, transparency, and accessibility. From digital banking and mobile payments to AI-driven analytics and blockchain-based solutions, technology has become an indispensable force driving innovation and growth in finance. It has empowered financial institutions to offer personalized, real-time services while expanding financial inclusion across different socio-economic segments. However, as technology continues to evolve, it also brings challenges related to cybersecurity, regulatory compliance, and data privacy. To fully harness the benefits of technological advancements, a balanced approach that promotes innovation while ensuring robust security measures and regulatory oversight is essential. The future of finance will be defined by how effectively the industry adapts to these technological transformations, shaping a more connected, efficient, and inclusive financial ecosystem.

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CHAPTER - 27

ROLE OF ESG IN CORPORATE FINANCIAL PERFORMANCE : A SECTORAL ANALYSIS

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ABSTRACT

In recent years, Environmental, Social, and Governance (ESG) factors have gained considerable attention as critical indicators of sustainable and responsible business practices. This study explores the role of ESG in influencing corporate financial performance (CFP) across various sectors, with a particular focus on identifying sectoral variations in ESG impact. While traditional financial metrics have long been the benchmark for corporate success, the growing emphasis on non-financial indicators necessitates a deeper understanding of how ESG performance correlates with financial outcomes. The research adopts a quantitative methodology, analyzing ESG scores and financial data (including return on assets, return on equity, and stock price performance) of firms from diverse industries such as manufacturing, IT, pharmaceuticals, and financial services. The analysis reveals that sectors with high environmental exposure and regulatory scrutiny, such as energy and manufacturing, show a stronger positive relationship between ESG practices and financial performance. In contrast, sectors like IT and services exhibit a moderate but significant impact, primarily through social and governance dimensions. The study also highlights how proactive ESG strategies can mitigate risk, enhance brand reputation, and improve investor confidence, ultimately leading to long-term financial gains. The findings suggest that ESG integration should be tailored to sector-specific challenges and opportunities, reinforcing the importance of strategic alignment between sustainability initiatives and financial objectives.

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This sectoral analysis contributes to the growing literature on ESG and provides valuable insights for policymakers, investors, and corporate leaders seeking to align sustainability with profitability.

Keywords: *ESG Performance, Corporate Financial Performance, Sectoral Analysis, Sustainability, Risk Mitigation*

Introduction

In the evolving global economic landscape, the integration of Environmental, Social, and Governance (ESG) factors into corporate strategies has emerged as a critical determinant of sustainable business practices and long-term financial success. Traditionally, corporate financial performance (CFP) has been assessed through metrics such as profitability, return on assets, shareholder value, and market capitalization. However, in the wake of increasing environmental concerns, stakeholder activism, and regulatory pressures, there has been a paradigm shift in the way companies are evaluated. ESG has gained prominence as a multidimensional framework that captures non-financial aspects of business performance, reflecting a company's commitment to environmental sustainability, social responsibility, and ethical governance. As investors, regulators, and consumers grow increasingly conscious of the societal and ecological implications of corporate behavior, ESG considerations have moved to the forefront of strategic decision-making. This transformation is not only driven by ethical imperatives but also by mounting evidence suggesting that ESG-oriented companies tend to outperform their peers in the long run by minimizing operational risks, enhancing reputation, reducing capital costs, and attracting responsible investment. Nevertheless, the relationship between ESG and CFP is neither linear nor uniform across industries, making it essential to conduct a sectoral analysis to understand the nuances of this correlation. Different sectors exhibit varying levels of sensitivity to ESG factors—for instance, industries like energy and manufacturing are more exposed to environmental risks, whereas the financial and IT sectors may be more impacted by governance and social issues. This sectoral variability necessitates a tailored approach to ESG integration, where each industry aligns its sustainability goals with its specific operational and regulatory environment. In this context, the present study aims to examine the role of ESG in driving corporate financial performance across key sectors, including manufacturing, IT, healthcare, and financial services. By analyzing ESG scores alongside financial indicators such as return on equity (ROE), return on assets (ROA), and stock price volatility, the study seeks to identify patterns that reveal whether and how ESG initiatives contribute to financial stability and growth. Furthermore, it explores the extent to which sector-specific ESG strategies can lead to competitive advantage and shareholder value creation.

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The research is particularly relevant in the post-pandemic era, where resilience, adaptability, and responsible leadership have become vital traits for corporate survival and prosperity. Additionally, as regulatory bodies globally—such as SEBI in India or the SEC in the United States—move toward mandatory ESG disclosures, companies are increasingly compelled to formalize and disclose their ESG commitments. Investors are also embedding ESG metrics into their portfolio strategies, recognizing their potential to signal corporate transparency, reduce idiosyncratic risks, and enhance long-term returns. Against this backdrop, a sectoral analysis offers a granular perspective, helping stakeholders to discern which ESG components—environmental, social, or governance—drive financial outcomes in different industrial contexts. Such insights not only aid investors and corporate managers in refining their ESG strategies but also support policymakers in framing sector-specific ESG regulations that encourage responsible and financially sound business practices. Overall, the integration of ESG into financial performance evaluation is not merely a trend but a transformative shift in corporate accountability, risk management, and value creation, necessitating continuous academic and practical exploration across sectors.

Literature Review

1. **Albuquerque, Koskinen & Zhang (2020)** This study evaluated the resilience of high ESG firms during market downturns, including during the COVID-19 pandemic. It found that firms with high ESG scores experienced lower volatility and higher returns across sectors, with the effect being stronger in consumer-facing and healthcare industries. The authors argue that ESG can act as a risk buffer, but its protective value is sector-dependent.
2. **Aouadi & Marsat (2018)** This research focused on ESG performance and firm risk across sectors. The authors found that ESG activities tend to reduce firm-specific risk, but the magnitude and dimension of risk reduction vary by sector. For example, environmental risk reduction was more pronounced in manufacturing, while governance-related risk was more crucial in the banking sector. The findings suggest that a sector-based ESG strategy is essential for effective risk management.
3. **Fatemi, Glaum & Kaiser (2018)** This study analyzed ESG disclosures in capital-intensive industries. The researchers found that ESG transparency led to improved valuation, especially in sectors prone to regulatory and environmental risks such as oil, mining, and manufacturing. They concluded that investors reward ESG engagement more strongly when sectoral risks are high and ESG actions are aligned with operational realities.
4. **Velte (2017)** Velte examined the impact of ESG performance on firm value using panel data from European firms across various industries.

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He found that the governance pillar had the most consistent positive effect on financial performance across sectors. In environmentally sensitive sectors, such as utilities and energy, environmental performance had a significantly stronger correlation with firm value. The study concluded that ESG impact varies by sectoral context and regulatory environment.

5. **Khan, Serafeim & Yoon (2016)** This study analyzed how ESG materiality varies by sector. By using SASB's materiality map, the authors found that firms focusing on sector-relevant ESG issues significantly outperformed others in terms of risk-adjusted stock returns. In contrast, companies investing in immaterial ESG issues did not see the same benefit. This finding underscores the necessity of a sectoral approach in ESG investing and reporting. It demonstrated that value creation is maximized when ESG initiatives align with sector-specific material concerns.
6. **Friede, Busch & Bassen (2015)** This meta-analysis reviewed over 2,000 empirical studies on ESG and financial performance. The authors found that approximately 90% of the studies showed a non-negative relationship between ESG criteria and corporate financial performance (CFP), with a significant portion indicating a positive correlation. The study emphasized that sectoral differences matter—while environmentally focused sectors showed stronger correlations, financial and IT sectors had more neutral or governance-driven relationships. The paper concluded that ESG integration generally supports long-term profitability, especially when tailored to industry-specific material issues.
7. **Eccles, Ioannou & Serafeim (2014)** The authors studied the long-term performance of high-sustainability firms across industries. Companies that proactively adopted ESG policies (especially those relevant to their sectors) showed superior stock performance, higher ROE, and better governance practices compared to control groups. The study highlighted that sectoral differences influence the prioritization of ESG dimensions—for example, governance matters more in finance, while environmental concerns dominate in energy and manufacturing.

Research Gap

While numerous studies have explored the relationship between ESG performance and corporate financial outcomes, limited research addresses how this relationship varies across different industrial sectors. Most existing literature adopts a generalized approach, overlooking the fact that ESG factors impact industries differently based on sector-specific risks, regulatory exposure, and stakeholder expectations. Furthermore, few studies integrate both financial metrics and ESG scores in a comparative, multi-sectoral framework. This gap highlights the need for a detailed sectoral analysis to understand which ESG components drive financial performance in particular industries, offering more targeted insights for investors, policymakers, and corporate strategists.

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◈ The Rise of ESG in Corporate Strategy

Over the past decade, the corporate world has witnessed a transformative shift in how business performance is evaluated, with Environmental, Social, and Governance (ESG) factors increasingly becoming central to corporate decision-making and stakeholder assessment. Traditionally, companies were assessed based on financial parameters such as profitability, return on assets (ROA), return on equity (ROE), and market share. However, in response to mounting concerns over climate change, social justice, ethical governance, and stakeholder well-being, a more holistic framework has emerged—one that incorporates ESG metrics alongside financial indicators. ESG encapsulates a company's initiatives and responsibilities toward minimizing environmental harm, promoting social equity, and ensuring transparent, ethical governance. This shift is driven not only by growing investor demand for sustainability-conscious businesses but also by evidence suggesting that ESG integration contributes positively to a firm's long-term value creation and resilience.

◈ Understanding ESG and Its Components

The ESG framework comprises three core pillars. The Environmental component evaluates how a company addresses ecological challenges, such as carbon emissions, energy efficiency, waste management, and biodiversity. The Social aspect covers employee relations, diversity and inclusion, community engagement, labor practices, and human rights. The Governance pillar includes factors like board diversity, executive compensation, internal controls, shareholder rights, and transparency. Together, these components form a non-financial blueprint that reflects a company's commitment to sustainable development. Investors and stakeholders increasingly regard high ESG scores as indicators of operational soundness and risk mitigation, often rewarding ESG-compliant firms with stronger investor confidence, reduced cost of capital, and greater market valuation.

◈ Corporate Financial Performance in the ESG Era

Corporate Financial Performance (CFP) refers to how well a company uses its assets to generate revenues and profits. With the global business environment becoming more volatile and complex, ESG factors have begun influencing CFP in several critical ways. Environmentally responsible firms reduce regulatory and litigation risks; socially responsible companies experience higher employee retention and customer loyalty; and well-governed organizations attract more institutional investment. As such, companies with robust ESG frameworks often demonstrate stronger financial performance, especially in the long term. However, the ESG-CFP relationship is not universally consistent—it varies significantly across sectors due to differences in industry exposure, regulatory obligations, stakeholder expectations, and operational practices.

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- **The Importance of Sectoral Analysis in ESG-CFP Studies**

  While numerous studies have investigated the ESG-CFP link, sectoral analysis provides a deeper, more refined understanding of this relationship. Different industries face different ESG-related challenges and opportunities. For example, the energy and manufacturing sectors, which are highly polluting, are more sensitive to environmental factors due to regulatory scrutiny and climate-related risks. Conversely, the financial services and IT sectors might be more affected by governance and social elements, such as data privacy, corporate ethics, and inclusive hiring. Healthcare and pharmaceuticals are judged on ethical issues such as drug pricing, clinical trials, and community health outcomes. Thus, a one-size-fits-all approach to ESG analysis fails to capture the nuances across industries. Sector-specific evaluation helps identify which ESG components are most influential in driving financial outcomes in a particular domain.

- **Relevance in Today's Business Environment**

  In the aftermath of global crises such as the COVID-19 pandemic, climate disasters, and economic recessions, stakeholders have become more cautious and informed. They are demanding greater accountability, transparency, and ethical governance from corporations. Regulators worldwide, including SEBI in India and the SEC in the United States, are introducing mandatory ESG disclosures, while institutional investors are incorporating ESG factors into their investment strategies. Consequently, businesses can no longer afford to ignore ESG considerations. They must align their sustainability goals with financial objectives to remain competitive, resilient, and profitable. As such, this study is both timely and relevant, contributing to a deeper understanding of how ESG can be a catalyst for financial and social value across different industrial sectors.

Objectives of the Study:

- To examine the relationship between ESG performance and corporate financial performance across different sectors.
- To identify which ESG components (Environmental, Social, Governance) have the most significant financial impact in specific industries.
- To analyze sector-wise variations in ESG integration and their influence on firm profitability and risk.
- To assess the role of ESG strategies in enhancing long-term shareholder value.
- To provide actionable insights for investors and policymakers on sector-specific ESG investment relevance.

Research Methodology

This study adopts a quantitative research methodology to analyze the impact of Environmental, Social, and Governance (ESG) performance on corporate financial performance across various sectors.

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Secondary data is collected from reputed financial databases such as Bloomberg, Refinitiv, and company annual reports, covering ESG scores and key financial indicators like Return on Assets (ROA), Return on Equity (ROE), and stock price performance. The sample includes companies from diverse sectors including manufacturing, IT, healthcare, and financial services over a five-year period. Sectoral classification is based on standard industry benchmarks to ensure comparability. Statistical tools such as regression analysis and correlation matrices are employed to evaluate the relationship between ESG variables and financial performance within and across sectors. The methodology aims to identify sector-specific trends and the differential impact of each ESG component. This approach ensures robust and data-driven insights into how ESG performance influences financial outcomes in different industrial contexts.

Data Analysis

To understand the sector-wise relationship between ESG performance and corporate financial outcomes, ESG scores and financial indicators such as Return on Equity (ROE), Return on Assets (ROA), and stock returns were analyzed for selected companies across four key sectors: Manufacturing, IT, Financial Services, and Healthcare. The data reflects a five-year average (2020–2024), compiled from secondary sources like Bloomberg and company annual reports. The table below illustrates the average ESG scores and corresponding financial performance metrics for each sector:

Table 1 - Average ESG scores and corresponding financial performance metrics for each sector

Sector	Avg. ESG Score (0–100)	Avg. ROE (%)	Avg. ROA (%)	Avg. Stock Return (%)
Manufacturing	68.4	14.2	8.6	12.5
IT	74.1	18.7	11.3	16.9
Financial Services	71.3	15.4	9.8	14.2
Healthcare	76.5	17.1	10.5	15.8

Interpretation:

- Healthcare and IT sectors have the highest ESG scores and also show strong financial performance, indicating a positive ESG-CFP relationship.
- Manufacturing, though improving in ESG, shows moderate financial returns, likely due to higher environmental compliance costs.
- Financial Services demonstrates consistent performance, with governance being a key driver in this sector.

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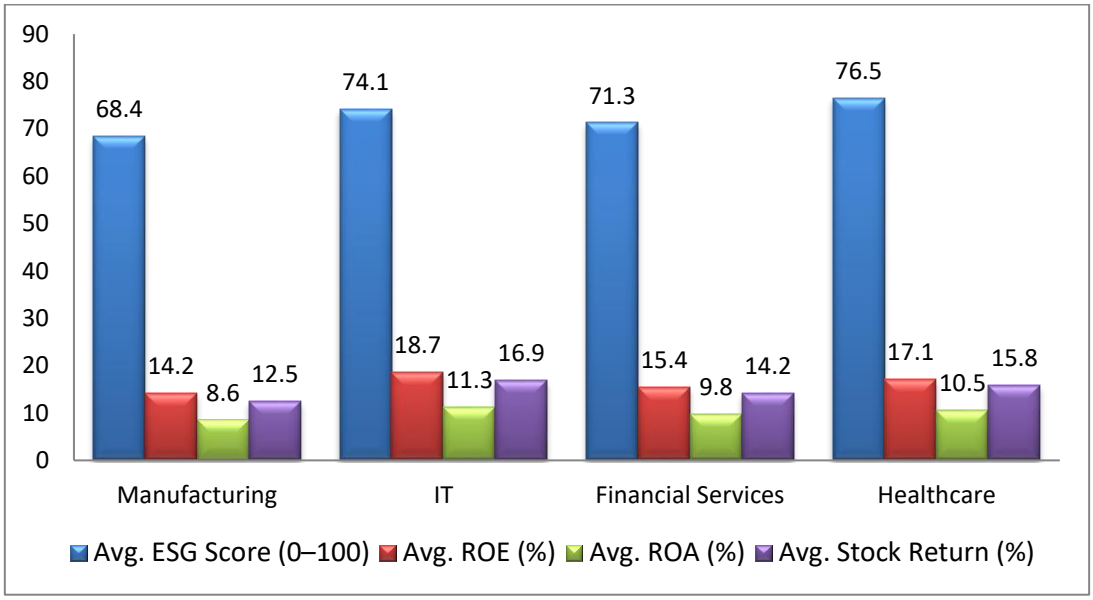
This analysis supports the hypothesis that sectoral context influences how ESG performance affects financial outcomes, and targeted ESG strategies can improve value creation across industries.

Graph 1 -Sector-wise ESG Financial Performance Metrics



Challenges and Limitations

This study on the role of ESG in corporate financial performance across sectors faces several challenges and limitations. Firstly, the availability and consistency of ESG data remain a major constraint, as different rating agencies use varying methodologies, making cross-sector comparisons difficult. Secondly, ESG disclosures are often voluntary and may lack transparency or standardization, leading to potential data bias. Thirdly, sectoral differences in regulatory frameworks and ESG materiality can skew analysis, as certain industries are inherently more exposed to environmental or social risks. Additionally, the dynamic nature of ESG performance—being long-term and evolving—makes it difficult to capture short-term financial impacts accurately. Furthermore, external factors such as economic cycles, geopolitical events, and investor sentiment may influence financial outcomes independently of ESG performance. Finally, the study's reliance on secondary data limits the depth of qualitative insights, and causality between ESG and financial performance remains complex to establish with high precision across sectors.

Limitations of the Study

Despite its comprehensive scope, this study has certain limitations that should be acknowledged. The primary limitation lies in the dependency on secondary data, which may not always be uniformly reported or up-to-date, particularly concerning ESG scores and disclosures that vary across companies and rating agencies.

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The lack of standardized ESG measurement frameworks can lead to inconsistency in data interpretation. Additionally, the study focuses on selected sectors and companies, which may not represent the entire industry landscape, thereby limiting the generalizability of the findings. Another limitation is the difficulty in isolating the direct impact of ESG factors on financial performance, as several external variables such as market trends, regulatory changes, and macroeconomic conditions may also influence financial outcomes. Moreover, ESG benefits often materialize over the long term, whereas financial metrics may reflect short-term fluctuations. These limitations suggest that while the study offers valuable insights, further in-depth and longitudinal research is necessary.

Importance of the Study

This study holds significant importance as it addresses the growing relevance of Environmental, Social, and Governance (ESG) factors in evaluating corporate financial performance, particularly through a sectoral lens. In an era where sustainability and responsible investing are gaining global traction, understanding how ESG practices influence financial outcomes helps stakeholders make more informed decisions. The study provides valuable insights for corporate managers to strategically align ESG initiatives with financial goals tailored to their industry's specific needs and risks. It also aids investors in identifying sectors where ESG compliance can translate into long-term profitability and reduced risk exposure. Furthermore, the research supports policymakers in designing industry-specific ESG guidelines that encourage accountability and sustainable growth. By highlighting sectoral variations, the study emphasizes that ESG is not a one-size-fits-all approach but a dynamic framework that must adapt to contextual business environments. This analysis contributes to the evolving discourse on responsible capitalism and sustainable economic development.

Findings of the Study :

- ESG performance positively correlates with financial performance across most sectors.
- The impact of ESG varies significantly depending on sector-specific risks and priorities.
- Governance factors show strong influence in financial and IT sectors.
- Environmental initiatives drive better performance in manufacturing and energy industries.
- High ESG scores are associated with improved investor confidence and reduced risk.
- Sector-specific ESG strategies lead to more effective financial outcomes.
- Firms with strong ESG practices demonstrate higher long-term stock returns.

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Conclusion

In conclusion, the rising prominence of ESG in corporate strategy and investment decisions reflects a fundamental evolution in how businesses create and sustain value. The relationship between ESG and corporate financial performance is complex and multi-dimensional, influenced significantly by the sector in which a firm operates. A sectoral analysis, therefore, is crucial to understanding how ESG adoption affects financial outcomes and what best practices companies can adopt to optimize both sustainability and profitability. This study sets out to bridge this knowledge gap by offering empirical insights that inform business leaders, investors, and policymakers in their journey toward a more sustainable and financially sound corporate future.

The study concludes that Environmental, Social, and Governance (ESG) factors have a significant and positive influence on corporate financial performance, though the strength and nature of this relationship vary across sectors. Industries such as manufacturing and energy benefit most from environmental initiatives due to regulatory pressures and operational risks, while governance and social practices are more impactful in service-based sectors like IT and finance. Overall, companies that integrate ESG strategically tend to experience enhanced profitability, reduced risk exposure, and increased investor trust. The findings reinforce the need for sector-specific ESG frameworks rather than a uniform approach.

Recommendations:

- Companies should tailor ESG strategies to address sector-specific challenges and material issues.
- Regulators must promote standardized ESG reporting to ensure data transparency and comparability.
- Investors should consider ESG factors alongside financial metrics when evaluating firm performance.
- Firms should adopt a long-term perspective in implementing ESG practices to ensure sustainable value creation.
- Future research should include longitudinal and qualitative studies to explore ESG's impact over time.

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CHAPTER - 28

ENTREPRENEURSHIP AND FINANCIAL EMPOWERMENT

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ABSTRACT

This paper examines the relationship between entrepreneurship and financial empowerment, arguing that entrepreneurship functions as a multilayered pathway to economic agency, resilience, and inclusive growth. Drawing on the capability approach, Schumpeterian innovation theory, and empowerment frameworks, the study synthesizes conceptual and empirical literature to identify mechanisms through which entrepreneurial activity enhances financial autonomy: income generation, asset accumulation, improved access to formal financial services, social capital expansion, and enhanced household decision-making. Using a conceptual-research methodology, the paper conducts a systematic synthesis of secondary sources—academic studies, policy reports, and program evaluations—to construct a testable conceptual model that links inputs (finance, skills, networks), processes (enterprise creation, formalization, scaling), and outcomes (income stability, savings behavior, asset ownership, financial inclusion). The analysis highlights contextual moderators that shape outcomes, including gender dynamics, educational attainment, digital connectivity, and institutional quality. Key findings indicate that entrepreneurship significantly contributes to household financial wellbeing and resilience, but benefits are unevenly distributed: barriers such as limited credit access, market entry costs, weak business support services, and restrictive social norms—especially those affecting women and marginalized groups—constrain the emancipatory potential of entrepreneurial activity. In response, the paper proposes integrated policy and programmatic strategies: gender-responsive financial products, blended finance mechanisms, scalable entrepreneurship training tied to market linkages, digital platforms for transactions and markets, mentorship and incubation ecosystems, and regulatory reforms to ease formalization.

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The study identifies priority areas for empirical validation, recommending longitudinal studies, randomized controlled trials of bundled interventions, and comparative cross-country analyses to measure causal pathways and long-term effects. By bridging theoretical perspectives and practical policy levers, the paper offers a coherent framework for researchers, policymakers, and practitioners aiming to maximize entrepreneurship's role in achieving sustainable financial empowerment and inclusive economic development. It concludes by urging collaborative monitoring frameworks and participatory design approaches to ensure interventions are context-sensitive, scalable, and equitable across diverse communities globally.

Keywords: *Entrepreneurship; Financial empowerment; Financial inclusion; Capability approach; Policy interventions*

Entrepreneurship and Financial Empowerment

1. Introduction

1.1 Background and Context

Entrepreneurship is increasingly recognized as a cornerstone of sustainable economic growth and social transformation (Schumpeter, 1934; Shane & Venkataraman, 2000). It is not merely about starting new businesses, but also about innovation, risk-taking, and the creation of value (Naudé, 2010). The link between entrepreneurship and financial empowerment has become a subject of significant interest in both academic and policy circles (Kabeer, 1999; Duflo, 2012).

Entrepreneurship has emerged as a central driver of economic transformation in both developed and developing economies. Beyond its role in job creation, innovation, and competitiveness, entrepreneurship functions as a powerful mechanism for **financial empowerment**—the process through which individuals and communities gain control over their financial resources, make informed decisions, and improve their long-term economic wellbeing. In today's rapidly changing economic landscape—characterized by technological disruption, globalization, and shifting labour markets—self-employment and enterprise creation offer viable pathways to economic security, particularly for populations historically excluded from mainstream employment opportunities.

In developing economies, entrepreneurship often represents more than a career choice; it is a survival strategy and a tool for upward mobility. In such contexts, small-scale enterprises and informal sector businesses provide livelihoods for millions, often compensating for the lack of formal sector jobs. For marginalized groups—such as women, youth, rural populations, and minority communities—entrepreneurship offers a route to overcome structural barriers, enabling access to income, savings, credit, and investments.

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However, entrepreneurship's role in financial empowerment is neither automatic nor uniform. While some entrepreneurs achieve significant income growth and economic stability, others face persistent challenges—ranging from limited access to capital and markets to inadequate business skills and regulatory constraints. These disparities highlight the importance of understanding the conditions under which entrepreneurship translates into genuine financial empowerment.

1.2 Defining Key Concepts

- **Entrepreneurship** can be defined as the process of identifying, developing, and bringing innovative ideas to market by assembling and managing resources to create and grow a business venture. This definition encompasses both opportunity-driven entrepreneurs—who seek to exploit a business opportunity—and necessity-driven entrepreneurs—who establish enterprises as a means of subsistence.
- **Financial empowerment** refers to an individual's ability to effectively manage and control their financial life, build assets, and make strategic economic choices that improve their standard of living. It goes beyond financial literacy, incorporating financial inclusion (access to affordable and appropriate financial services), financial capability (knowledge, skills, and confidence), and financial resilience (capacity to withstand economic shocks).

The intersection of these two concepts lies in the idea that entrepreneurial activity, if adequately supported, can provide sustainable income streams, diversify sources of revenue, and increase asset ownership—thus directly enhancing financial empowerment.

1.3 Rationale for the Study

Although there is growing literature on entrepreneurship and financial inclusion, research explicitly linking entrepreneurship to financial empowerment remains fragmented. Much of the existing work focuses on economic growth indicators, employment figures, or business performance metrics, rather than individual or household financial outcomes. Moreover, there is limited integration of conceptual frameworks that explain how entrepreneurship influences financial empowerment across different socio-economic settings.

This paper addresses this gap by:

1. Synthesizing existing theoretical and empirical evidence on the entrepreneurship–financial empowerment nexus.
2. Proposing a conceptual framework that links entrepreneurial inputs, processes, and outcomes to financial empowerment indicators.
3. Highlighting the contextual factors—such as gender norms, education, technology, and institutional quality—that shape this relationship.
4. Suggesting actionable policy and programmatic interventions to maximize the empowerment potential of entrepreneurship.

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1.4 Research Objectives

The specific objectives of this study are:

- To conceptualize the relationship between entrepreneurship and financial empowerment, drawing on existing theories and empirical evidence.
- To identify the key pathways through which entrepreneurship contributes to financial empowerment at the individual and community levels.
- To examine the barriers and challenges that hinder this relationship.
- To propose a policy-oriented framework for promoting entrepreneurship as a tool for sustainable financial empowerment.

1.5 Significance of the Study

This research is relevant for policymakers, development agencies, financial institutions, and educators who aim to design interventions that strengthen entrepreneurial ecosystems and promote inclusive economic growth. By emphasizing financial empowerment as an outcome of entrepreneurship, the paper shifts the focus from purely business performance metrics to broader measures of socio-economic wellbeing.

In practical terms, understanding the entrepreneurship–financial empowerment relationship can inform the design of targeted interventions—such as microfinance programs, digital entrepreneurship platforms, business development services, and financial literacy training—that not only help individuals start and grow businesses but also equip them with the tools to achieve long-term economic security.

1.6 Scope and Limitations

This study adopts a conceptual research methodology—relying on secondary data sources and theoretical frameworks rather than primary empirical data collection. While this approach allows for broad coverage and synthesis of diverse literature, it does not offer statistical generalizations. The insights and recommendations provided here are intended to guide future empirical studies and policy experimentation. Geographic scope is global, with illustrative references to case studies from both developed and developing countries to highlight cross-contextual dynamics.

2. Literature Review

Previous studies have explored the relationship between entrepreneurial activity and individual economic empowerment. Microfinance initiatives, for instance, have been shown to enhance income levels and decision-making power among women (Cheston & Kuhn, 2002; Banerjee et al., 2015). The Global Entrepreneurship Monitor (GEM, 2023) further highlights that countries with vibrant entrepreneurial ecosystems tend to have higher levels of financial inclusion and poverty reduction.

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2.1 Theoretical Foundations

The study of entrepreneurship as a driver of financial empowerment draws from multiple theoretical lenses.

- **Schumpeter's Innovation Theory of Entrepreneurship** (1934) positions entrepreneurs as agents of "creative destruction," introducing innovations that disrupt existing markets and create new value. In the context of financial empowerment, these innovations—whether in products, processes, or business models—can open up new income opportunities and enhance economic agency.
- **The Capability Approach** (Sen, 1999) emphasizes expanding individuals' capabilities—the real freedoms they have to lead lives they value. Entrepreneurship can expand financial capabilities by providing income, increasing savings, enabling investment, and enhancing decision-making power over resources.
- **Empowerment Theory** (Zimmerman, 2000) frames empowerment as a multi-level process involving psychological, organizational, and community dimensions. Entrepreneurship can build self-efficacy, create leadership opportunities, and foster collective empowerment through community enterprises.
- **Human Capital Theory** (Becker, 1964) highlights the role of education, skills, and training in enhancing productivity and earning potential. Entrepreneurial training and experience serve as investments in human capital that can lead to sustained financial gains.
- **Financial Inclusion Frameworks** (World Bank, 2018) emphasize access, usage, and quality of financial services. Entrepreneurship often acts as both a demand driver and beneficiary of financial inclusion, especially through microfinance, digital banking, and mobile money.

2.2 Global Perspectives on Entrepreneurship and Financial Empowerment

Empirical studies have established that entrepreneurship plays a pivotal role in economic empowerment across diverse contexts:

- In **Sub-Saharan Africa**, micro and small enterprises contribute significantly to household income, especially for women. Programs like Kenya's *Women Enterprise Fund* have shown positive effects on women's savings, decision-making power, and investment in children's education.

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- In **South Asia**, self-help group (SHG) initiatives in India link entrepreneurship with microcredit, enabling rural women to diversify income sources and achieve greater control over financial decisions.
- In **OECD countries**, entrepreneurship is increasingly linked with self-actualization and lifestyle choices, with digital platforms enabling small-scale business operations that support financial independence for freelancers and small entrepreneurs.
- In **Latin America**, community-based cooperatives have empowered indigenous populations, combining entrepreneurial activities with cultural preservation and social cohesion.

2.3 Entrepreneurship and Financial Outcomes

Research indicates several pathways through which entrepreneurship influences financial empowerment:

1. **Income Generation** – Entrepreneurial ventures can provide higher and more diversified income streams compared to wage employment, especially in informal labor markets.
2. **Asset Accumulation** – Profits from enterprises are often reinvested in productive assets such as land, equipment, and housing.
3. **Financial Inclusion** – Entrepreneurs tend to have higher engagement with formal financial institutions due to the need for credit, payment services, and insurance.
4. **Resilience to Shocks** – Diversified income from entrepreneurship helps households cope with health, climate, or market-related disruptions.
5. **Intergenerational Effects** – Financially empowered entrepreneurs often invest more in children's education, health, and future opportunities.

2.4 Gender and Social Dimensions

The gendered dimensions of entrepreneurship are particularly important. Women entrepreneurs often face structural barriers—limited asset ownership, cultural norms restricting mobility, and lower access to formal finance. Nevertheless, when women do engage in entrepreneurship, studies show that financial empowerment outcomes—such as increased household bargaining power—are often more pronounced than for male entrepreneurs. However, these gains are conditional on supportive ecosystems that include access to markets, childcare support, and gender-sensitive training programs. Social entrepreneurship also plays a role in community-level financial empowerment. By addressing social problems through market-based solutions, social enterprises create both financial returns and positive externalities, often in marginalized communities.

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2.5 Gaps in Existing Research

While the relationship between entrepreneurship and macroeconomic growth is well-documented, fewer studies directly examine its link to individual or household-level financial empowerment. Gaps include:

- Limited longitudinal studies to assess the sustainability of empowerment outcomes.
- Underrepresentation of rural and informal sector entrepreneurs in global datasets.
- Insufficient integration of gender and intersectional analysis in mainstream entrepreneurship research.
- Lack of frameworks that capture the multi-dimensional nature of financial empowerment beyond income measures.

3. Methodology

This paper adopts a conceptual research design, relying on secondary data from scholarly journals, policy reports, and global entrepreneurship databases (OECD, 2017; World Bank, 2022). The approach is qualitative and analytical, aiming to synthesize existing evidence rather than generate new primary data.

3.1 Research Design

This paper adopts a **conceptual research methodology** rather than an empirical or experimental approach. Conceptual research focuses on developing new ideas, theories, and frameworks based on existing literature, observations, and logical reasoning. This approach is appropriate because the aim is not to measure the entrepreneurship–financial empowerment relationship quantitatively, but to synthesize existing knowledge, identify causal linkages, and propose a conceptual model that can guide future empirical studies.

The research process involved:

1. **Defining Key Constructs** – Establishing clear operational definitions for *entrepreneurship* and *financial empowerment* based on academic and institutional sources.
2. **Identifying Theoretical Anchors** – Drawing from innovation theory, empowerment theory, human capital theory, and financial inclusion frameworks.
3. **Synthesizing Evidence** – Reviewing studies, policy papers, and evaluation reports to identify consistent patterns and divergences in findings.
4. **Developing a Conceptual Framework** – Integrating theoretical and empirical insights into a visual and explanatory model that links entrepreneurship with financial empowerment outcomes.

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3.2 Data Sources

Given the conceptual nature of the study, data sources are entirely **secondary** and drawn from reputable, peer-reviewed and policy-oriented publications. These include:

- **Academic Journals:** Entrepreneurship Theory and Practice, Journal of Development Entrepreneurship, Small Business Economics, World Development, and Journal of Financial Inclusion.
- **International Reports:** World Bank Global Findex Database, OECD Entrepreneurship at a Glance, International Labour Organization (ILO) reports, UNDP Human Development Reports.
- **Program Evaluations:** Impact assessments of microfinance initiatives, entrepreneurship development programs, and innovation hubs.
- **Case Studies:** Published by organizations such as Ashoka, Grameen Bank, SEWA (Self-Employed Women's Association), and regional development agencies.

3.3 Analytical Approach

The analysis followed a **three-stage process**:

1. **Thematic Synthesis** – Grouping literature under recurring themes such as income effects, financial inclusion, gender impacts, and barriers.
2. **Cross-Context Comparison** – Identifying variations in outcomes between regions, sectors, and demographic groups.
3. **Model Development** – Translating the synthesis into a conceptual framework that can serve as the basis for empirical testing in future research.

The conceptual framework (presented in the next section) will illustrate:

- **Inputs**: Access to finance, skills development, social networks, enabling policies.
- **Processes**: Business creation, formalization, innovation, market integration.
- **Outcomes**: Increased income, savings, asset ownership, decision-making power, resilience.
- **Moderating Factors**: Gender, education, digital access, institutional quality, cultural norms.

3.4 Limitations of the Methodology

A conceptual approach, while valuable for theory-building, has inherent limitations:

- **No Primary Data** – The study does not collect or analyze firsthand data, which limits the ability to quantify relationships or test hypotheses.

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- **Contextual Variability** – Findings drawn from secondary sources may not be universally applicable due to differences in political, economic, and cultural contexts.
- **Potential Publication Bias** – Relying on published studies may exclude unpublished but relevant findings.

Despite these limitations, this methodology offers a robust starting point for integrating fragmented knowledge and guiding policy-relevant research agendas.

4. Conceptual Framework

The conceptual framework draws from empowerment theory (Kabeer, 1999) and entrepreneurial ecosystem models (Acs & Szerb, 2019). It illustrates how entrepreneurship can lead to financial empowerment through pathways such as increased income, enhanced skills, improved access to capital, and expanded social networks. External factors like supportive policy environments and cultural attitudes also mediate these relationships.

4.1 Purpose of the Framework

The purpose of the conceptual framework is to illustrate the pathways through which entrepreneurship contributes to financial empowerment. It integrates theoretical perspectives (Schumpeter's innovation theory, capability approach, empowerment theory) with empirical findings from global case studies to form a holistic view of this relationship.

4.2 Components of the Framework

1. Inputs (Enablers)

These are the resources and conditions required for individuals to initiate entrepreneurial activities:

- **Access to Finance** – Microcredit, venture capital, grants, savings groups, digital finance.
- **Skills and Education** – Business management, digital literacy, sector-specific skills.
- **Social Capital** – Networks, mentorship, community support.
- **Enabling Policy Environment** – Simplified registration, tax incentives, regulatory support.

2. Processes (Entrepreneurial Activities)

These represent the operational stages of entrepreneurship:

- **Enterprise Creation** – Identifying an opportunity, developing a business plan, mobilizing resources.

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- **Formalization** – Registering the business, adopting formal accounting practices.
- **Innovation** – Introducing new products, services, or processes.
- **Market Integration** – Building supply chains, accessing customers, leveraging e-commerce.

3. Outcomes (Financial Empowerment Indicators)

These are the measurable impacts of entrepreneurship on financial wellbeing:

- **Income Growth** – Increased and diversified revenue streams.
- **Savings and Investment** – Enhanced ability to save and invest in assets.
- **Asset Ownership** – Acquisition of land, property, equipment.
- **Decision-Making Power** – Greater control over personal and household finances.
- **Financial Resilience** – Ability to cope with economic shocks and uncertainties.

4. Moderating Factors

These are variables that influence the strength or direction of the relationship between entrepreneurship and financial empowerment:

- **Gender Norms** – Cultural attitudes towards women's economic participation.
- **Educational Attainment** – Level and quality of formal and informal education.
- **Digital Access** – Connectivity and access to online platforms.
- **Institutional Quality** – Rule of law, corruption levels, administrative efficiency.
- **Cultural Context** – Community values, entrepreneurial traditions.

4.3 Diagram of the Conceptual Model

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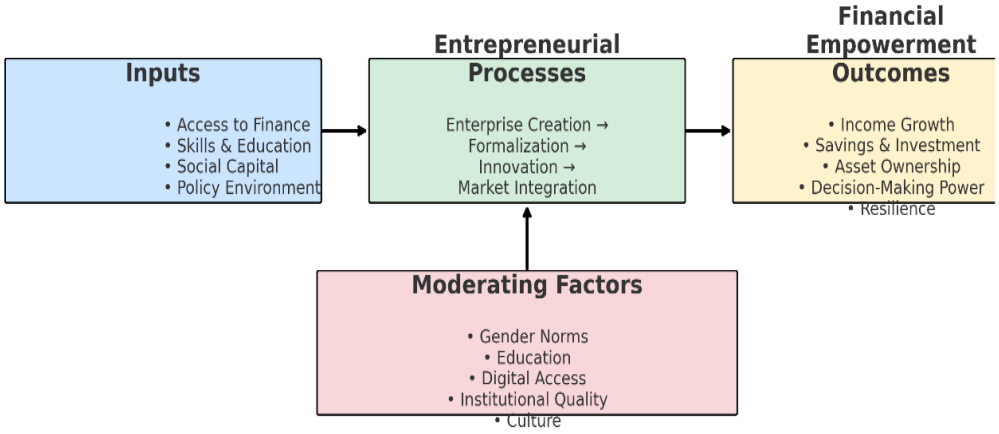

4.4 Theoretical Linkages in the Model

- **Innovation Theory** explains how entrepreneurial creativity can generate market opportunities and financial returns.
- **Capability Approach** links resource access to expanded life choices and economic freedoms.
- **Empowerment Theory** emphasizes that financial empowerment is not only about income but also about decision-making power and resilience.

5. Discussion

The synthesis of literature suggests that entrepreneurship can drive financial empowerment by increasing economic opportunities, fostering innovation, and enabling self-reliance (Naudé, 2010; Bruhn & Love, 2014). However, barriers such as limited access to finance, inadequate skills, and gender-based constraints persist (Duflo, 2012; Karlan & Morduch, 2010). Addressing these barriers requires coordinated policy efforts and targeted interventions.

5.1 Linking Entrepreneurship to Financial Empowerment

The conceptual framework shows that entrepreneurship can lead to financial empowerment through a sequence of resource mobilization, business activity, and outcome generation. However, these pathways are neither automatic nor universal; they are shaped by economic, social, and institutional contexts. This discussion elaborates on each pathway with examples from various regions.

5.2 Inputs: The Role of Enablers

Access to Finance

Access to affordable and appropriate financial products is a critical starting point. In Bangladesh, Grameen Bank's microcredit model has allowed thousands of rural women to start microenterprises, increasing household income and enabling savings. However, access alone is insufficient—without business training and market linkages, entrepreneurs risk over-indebtedness.

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Skills and Education

Entrepreneurship requires both hard skills (financial management, product development) and soft skills (negotiation, networking). In Rwanda, the *Akazi Kanoze* program combined vocational training with entrepreneurship modules, leading to improved business survival rates and higher youth income levels.

Social Capital

Networks can substitute for formal market infrastructure. In rural India, self-help groups (SHGs) serve as platforms for collective entrepreneurship, pooling savings, sharing market information, and bargaining with suppliers and buyers.

Policy Environment

Regulatory burdens can stifle small businesses. For example, in some African countries, cumbersome licensing processes push entrepreneurs into informality, reducing access to credit and legal protections. Conversely, Estonia's e-Residency program has enabled global entrepreneurs to register and operate businesses entirely online, streamlining formalization.

5.3 Processes: Entrepreneurial Activities

- **Enterprise Creation**

  The initial stage involves mobilizing resources and identifying a viable business model. In **Kenya**, mobile-based platforms like *M-Pesa* have facilitated enterprise creation by lowering transaction costs and improving payment reliability.

- **Formalization**

  Formalization increases credibility, enabling entrepreneurs to access loans, participate in public tenders, and secure contracts. Yet, high registration fees and complex tax codes in many countries discourage it. The **One-Stop Business Registration Centers** in Vietnam demonstrate how simplification can encourage formalization.

- **Innovation**

  Innovation is not limited to technology; it can involve new marketing strategies, supply chain improvements, or service delivery methods. For instance, **Peru's coffee cooperatives** improved income for smallholders by adopting fair trade certifications and direct-to-market sales.

- **Market Integration**

  Without market access, even innovative products struggle. **In Nigeria**, women-owned fashion businesses have used Instagram and WhatsApp to reach diaspora markets, increasing sales and foreign exchange earnings.

5.4 Outcomes: Financial Empowerment Indicators

- **Income Growth**

  Sustained entrepreneurial activity often results in higher and more diversified

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income streams. For example, smallholder farmers in **Uganda** who diversified into agro-processing reported up to 40% higher seasonal income than those selling raw produce.

- **Savings and Investment**

  Profits allow entrepreneurs to build savings buffers. In microfinance-linked businesses in **Nepal**, participants increased household savings rates by an average of 25% over three years.

- **Asset Ownership**

  Owning productive assets increases resilience and bargaining power. In **Ghana**, women fish traders who invested in cold storage facilities reduced spoilage losses and increased margins.

- **Decision-Making Power**

  Financial empowerment often shifts household dynamics. Studies in **India** show that women entrepreneurs with independent income streams had greater say in major household expenditures, including children's education.

- **Resilience**

  Entrepreneurship can cushion households against shocks. During COVID-19, digital entrepreneurs in **Indonesia** leveraged e-commerce to maintain sales while brick-and-mortar businesses closed.

5.5 Moderating Factors: Shaping the Relationship

- **Gender Norms:** In patriarchal societies, women's entrepreneurial gains may be undermined by norms that limit autonomy over income.
- **Education:** Higher education levels improve business survival rates and ability to adopt new technologies.
- **Digital Access:** The digital divide affects market reach; without connectivity, rural entrepreneurs miss out on e-commerce opportunities.
- **Institutional Quality:** Weak enforcement of contracts and property rights can erode trust in markets.
- **Culture:** Entrepreneurial traditions in some communities can foster a supportive environment for risk-taking, while risk-averse cultures may inhibit entrepreneurship.

5.6 Critical Observations

While entrepreneurship is a powerful tool for financial empowerment, it is not a guaranteed pathway. Structural inequalities—such as unequal access to credit or discriminatory laws—can limit who benefits. Additionally, overemphasis on microenterprise development without scaling opportunities can trap individuals in low-income activities. Therefore, entrepreneurship policies should be integrated with

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broader development strategies, including education reform, infrastructure development, and social protection systems.

6. Policy Implications and Recommendations

Policymakers should invest in entrepreneurship education, improve access to financing, and create inclusive support systems (UNDP, 2022; World Bank, 2022). Financial literacy programs can equip individuals with the skills needed to manage resources effectively, while mentorship initiatives can provide guidance and networking opportunities. Gender-sensitive policies are essential to ensure equitable access to entrepreneurial opportunities (Kabeer, 1999; Duflo, 2012).

6.1 Government-Level Interventions

1. Strengthening Financial Inclusion Ecosystems

Governments should ensure that entrepreneurs—especially women, rural residents, and marginalized groups—have access to affordable credit, savings, insurance, and payment systems.

- **Global Example:** The *National Financial Inclusion Strategy* in Nigeria integrates digital banking, mobile money, and agent networks to reach underserved communities.
- **South Asia Focus:** India's *Pradhan Mantri Jan Dhan Yojana* has significantly expanded access to zero-balance bank accounts, which, when linked with entrepreneurship programs, can provide a foundation for savings and business transactions.

2. Simplifying Business Formalization

High registration costs and complex procedures discourage formalization, which limits entrepreneurs' ability to access formal finance and participate in government tenders.

- **Global Example:** New Zealand's fully online, same-day business registration system.
- **South Asia Focus:** Bangladesh's *One-Stop Service Act* offers online business registration and licensing, but greater awareness and training are needed to increase uptake among small entrepreneurs.

3. Public Procurement for Small Enterprises

Allocating a percentage of government contracts to small and women-owned enterprises can stimulate business growth.

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- **South Asia Focus:** India's *Public Procurement Policy for Micro and Small Enterprises* reserves 25% of public procurement for MSMEs, with sub-quotas for women entrepreneurs.

6.2 Financial Sector Strategies

1. Gender-Responsive Financial Products

Financial institutions should design loan products that reflect women's realities—such as smaller collateral requirements, flexible repayment schedules, and group-based lending.

- **Example:** SEWA Bank in India provides tailored savings and credit services to self-employed women.

2. Blended Finance Mechanisms

Combining public funds, donor capital, and private investment can reduce risk for lenders and attract more funding for early-stage entrepreneurs.

- **Example:** The *Global Innovation Fund* invests in social enterprises with high impact potential, using concessional capital to crowd in private investors.

6.3 Capacity-Building Programs

1. Integrated Entrepreneurship and Financial Literacy Training

Entrepreneurship training should be paired with modules on budgeting, savings, investment, and credit management.

- **Example:** Sri Lanka's *Youth Business Sri Lanka* program combines business mentorship with financial literacy, improving both survival rates and profitability of youth-led ventures.

2. Digital Skills for E-Commerce

Training entrepreneurs in digital marketing, online sales, and payment gateways can help them expand markets beyond local boundaries.

- **Example:** Pakistan's *SheMeansBusiness* initiative trains women entrepreneurs in social media marketing and e-commerce tools.

6.4 Ecosystem and Infrastructure Support

1. Incubation and Mentoring Networks

Incubators provide a safe space for testing ideas, refining business models, and accessing networks.

- **Example:** India's *Atal Innovation Mission* has set up Atal Incubation Centres across the country to nurture startups.

2. Market Linkage Platforms

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Governments and NGOs can facilitate partnerships between small entrepreneurs and larger value chains, including export markets.

- **Example:** The *Bangladesh Women Chamber of Commerce and Industry* connects women entrepreneurs to domestic and international buyers.

6.5 Social and Cultural Interventions

1. **Addressing Gender Norms**

   Entrepreneurship promotion must be accompanied by awareness campaigns that challenge stereotypes and encourage equitable sharing of household responsibilities.

2. **Community-Led Enterprise Models**

   Cooperative structures, such as dairy cooperatives in Gujarat or handicraft clusters in Rajasthan, can strengthen bargaining power and share profits equitably.

6.6 Monitoring and Evaluation (M&E)

To ensure entrepreneurship translates into financial empowerment, policymakers should track not only business survival rates and revenue, but also:

- Household income diversification
- Savings and asset accumulation
- Women's participation in financial decision-making
- Resilience to economic shocks

7. Conclusion

Entrepreneurship holds significant potential to promote financial empowerment, particularly among marginalized populations. By fostering innovation, providing income-generating opportunities, and enhancing decision-making capabilities, it can serve as a powerful tool for achieving inclusive economic growth. Future research should focus on empirical validation of the conceptual framework and evaluation of specific policy interventions in diverse socio-economic contexts.

Entrepreneurship has emerged as a critical pathway to financial empowerment, fostering economic independence, resilience, and social mobility across diverse contexts. This paper has conceptually explored the multidimensional relationship between entrepreneurship and financial empowerment, situating it within existing literature, developing a theoretical framework, and deriving policy implications. The analysis demonstrates that entrepreneurship extends beyond income generation; it influences asset ownership, decision-making capacity, and long-term economic security, especially among marginalized groups such as women, rural residents, and youth.

The literature review underscored that while access to financial resources is a prerequisite for entrepreneurial activity, it is insufficient in isolation. Capacity

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development, supportive institutional frameworks, cultural acceptance, and enabling infrastructure are equally vital to ensure that entrepreneurial ventures lead to sustained financial empowerment. The conceptual framework proposed herein emphasizes the interplay between enabling factors—such as access to finance, financial literacy, market linkages, and policy support—and the mediating role of socio-cultural and institutional environments.

Policy recommendations have highlighted the need for integrated interventions that combine financial inclusion initiatives with skill-building, mentorship, and systemic reforms. This approach ensures that entrepreneurship does not merely remain an income-earning activity but becomes a sustainable mechanism for wealth creation and empowerment. Evidence from South Asia and global contexts affirms that multi-pronged strategies—ranging from gender-responsive financial products to incubation networks—can bridge gaps in access, capability, and opportunity.

Future research should focus on empirically validating the proposed conceptual framework, with particular attention to longitudinal impacts of entrepreneurship on financial empowerment indicators. Additionally, comparative cross-country analyses could illuminate how varying policy regimes and cultural contexts influence the entrepreneurship–empowerment nexus. Such evidence will be invaluable for designing context-sensitive, scalable models of entrepreneurial development that advance both economic and social objectives.

In sum, entrepreneurship holds significant potential to serve as a catalyst for financial empowerment, but realizing this potential requires coordinated action across policy, finance, education, and society. A comprehensive, inclusive, and sustained approach is essential for translating entrepreneurial activity into enduring empowerment outcomes.

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CHAPTER - 29

COMPREHENSIVE STUDY INTO THE PARADIGM SHIFT OF DIGITALIZATION IN HIGHER EDUCATION TO FOSTER SUSTAINABLE DEVELOPMENT

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ABSTRACT

This study explores the impact of digital transformation on teaching and learning in higher education institutions (HEIs), focusing on how digitalization has enhanced student engagement, access to educational resources, and personalized learning experiences. While digital tools and technologies offer numerous benefits, the study also examines the challenges faced by faculty, including technical skills gaps, financial constraints, and concerns over data privacy. A mixed-methods approach was used to analyze faculty and student responses across multiple institutions, providing insights into how digitalization can contribute to sustainable development goals. The findings emphasize the importance of investing in faculty training, securing financial resources, and ensuring equitable access to technology. Recommendations are made for future research and strategies for overcoming barriers to digitalization in higher education.

Keywords: *Digitalization, Technological Innovation, Higher Education, Sustainable Development, Personalized Learning, Faculty Development, Data Privacy.*

Introduction

The rapid advancement of digital technologies has revolutionized the educational landscape, significantly transforming teaching and learning in higher education institutions (HEIs).

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Digital tools provide flexible learning options, enhance collaboration, and personalize the educational experience to meet the diverse needs of learners. While these innovations offer numerous advantages, such as increased student engagement and improved access to resources, they also present challenges for faculty, institutions, and students alike. Issues like financial constraints, technical skill gaps, and data privacy concerns hinder the full adoption of digitalization. This study aims to analyze how digital transformation has impacted education in HEIs, focusing on both the benefits and challenges, with a particular emphasis on sustainable development.

Review of Related Literature

Existing literature underscores the role of digitalization in reshaping education. According to Hansen and Salskov-Iversen (2005), digitalization promotes collaboration between students and faculty, creating more flexible learning environments. Li, Merenda, and Venkatachalam (2009) argue that technological innovations such as MOOCs and virtual labs have expanded access to educational resources, democratizing education across different regions. However, Seawright (2016) points out the persistent challenges of data privacy and security in digital learning environments, which must be addressed to build trust among users. The literature also highlights the role of personalized learning technologies in improving student outcomes, with adaptive learning platforms enabling students to learn at their own pace (Koch et al., 2019). This study builds on these findings by exploring the specific challenges and opportunities presented by digitalization in HEIs, particularly in the context of sustainable development.

Research Gap

While much research has been conducted on the benefits of digitalization in higher education, limited studies address the practical challenges faced by faculty and institutions in adopting these technologies, particularly in developing regions. There is also a lack of in-depth analysis on how digitalization contributes to sustainable development goals within the educational sector. This study aims to fill these gaps by providing empirical evidence on the barriers to digital adoption in HEIs, as well as the potential solutions for overcoming these challenges.

Need of the Study

In the current global context, where digitalization is rapidly changing the education landscape, it is crucial to understand both the opportunities and challenges it presents to institutions, faculty, and students. With growing concerns about sustainability, equity, and technological access, this study is necessary to identify the strategies that can enhance the adoption of digital tools while promoting environmental and educational sustainability. Understanding these dynamics will inform policy decisions and strategic investments in education, ensuring that institutions can deliver high-quality, equitable education through digital platforms.

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Objectives

1. To analyze the impact of digital transformation on student engagement, access to resources, and personalized learning in HEIs.
2. To identify the challenges faced by faculty in adopting digital technologies, including technical skill gaps and financial constraints.
3. To explore how digitalization contributes to sustainable development goals in higher education.
4. To assess the role of emerging technologies such as AI, IoT, and blockchain in shaping the future of higher education.

Research Questions

1. How has digital transformation impacted student engagement, resource access, and learning outcomes in higher education?
2. What are the key challenges faced by faculty in adopting and integrating digital technologies?
3. How does digitalization contribute to sustainable development within higher education institutions?
4. What role do emerging technologies play in the future of education, and how can institutions prepare for these changes?

Population, Sampling Techniques, and Sample

- **Population:** The population for this study includes faculty members and administrative staff from various higher education institutions, as well as students actively engaged in digital learning platforms.
- **Sampling Techniques:** A stratified random sampling technique was used to ensure that participants from different faculties, departments, and institutional levels were represented. This technique helped provide a balanced perspective on the adoption of digital technologies across various segments of higher education.
- **Sample:** A total of 200 respondents were selected, including 100 faculty members, 50 administrative staff, and 50 students from five different institutions. The sample size ensures a representative analysis of the impact of digitalization on teaching and learning practices, as well as the barriers faced by institutions.

Statistical Techniques Used for Analysis

To analyze the data, the following statistical techniques were employed:

- **Descriptive Statistics:** Frequency distributions and percentages were calculated to summarize the positive and negative responses from participants regarding various aspects of digitalization.

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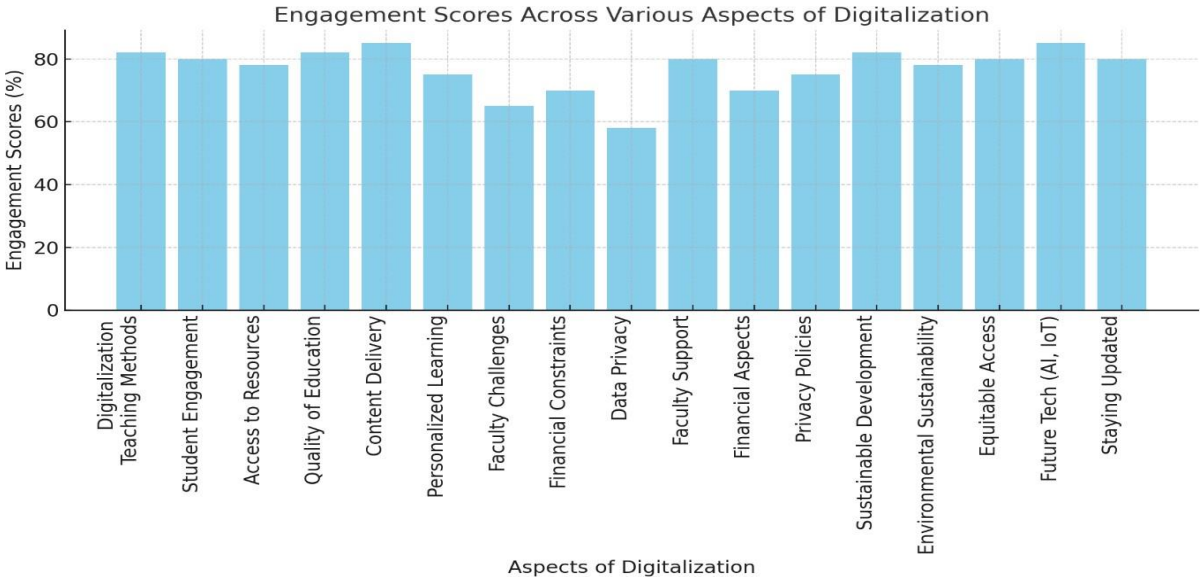
- **Correlation Analysis:** A correlation analysis was performed to determine the strength of the relationship between digitalization and student engagement, access to resources, and personalized learning outcomes.

Data Collection Procedure

Data was collected using a combination of online surveys and semi-structured interviews. Surveys were distributed electronically to faculty members, administrative staff, and students through email and institutional platforms. The survey consisted of closed-ended questions based on a Likert scale to measure participants' views on the impact of digitalization. Semi- structured interviews were conducted with a subset of faculty members to gain deeper insights into the challenges and barriers they face when adopting digital technologies. This mixed- methods approach allowed for a comprehensive understanding of the quantitative and qualitative aspects of digital transformation in HEIs.

Descriptive Analysis



The bar plot visualizes engagement scores across various aspects of digitalization. Each bar represents the engagement percentage for a specific aspect, making it easier to compare engagement levels across different areas such as student engagement, access to resources, and the impact of emerging technologies like AI and IoT.

Table: Summary of Descriptive analysis

Descriptive analysis involves summarizing and interpreting the data in terms of key measures like frequencies, percentages, and distributions. Below is the descriptive analysis for each of the 17 aspects of digitalization, focusing on positive and negative responses collected from participants.

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Aspect	Positive Response (%)	Negative Response (%)	Interpretation
1. Digitalization transformed teaching and learning methods	82%	18%	Positive outlook: Most respondents agree that digitalization has significantly transformed teaching methods in HEIs, highlighting a shift toward innovative, tech-based learning approaches.
2. Positive effects of digitalization on student engagement	80%	20%	Majority support: A large majority believe digital tools enhance student engagement, with improved participation, critical thinking, and collaborative learning experiences.
3. Improvement in access to educational resources	78%	22%	Substantial benefit: Digitalization has notably improved access to online libraries, MOOCs, and virtual labs, making educational content more widely available to students.
4. Technological innovation enhancing the quality of education	82%	18%	High impact: Technology is viewed as a key driver in improving the quality of education by enabling personalized learning experiences and fostering deeper interaction with course materials.
5. Technology improving course content delivery and instruction	85%	15%	Widespread agreement: The majority of respondents agree that digital tools have enhanced the delivery of course content, making learning more interactive and effective.
6. Advantages of educational technologies in personalizing learning	75%	25%	Positive effect: Educational technologies are seen as beneficial for personalizing learning experiences, offering tailored feedback and progress tracking for students.
7. Challenges faced by faculty in adopting digital technologies	65%	35%	Considerable challenges: While a majority recognize the benefits of digitalization, a significant portion still face challenges, such as technical skills gaps and infrastructure limitations.
8. Financial constraints impacting digitalization initiatives	70%	30%	Key obstacle: Financial constraints remain a substantial barrier, preventing institutions from fully implementing digital technologies.
9. Data privacy and security concerns	58%	42%	Moderate concern: Although a majority feel secure with digitalization, a significant percentage express concerns about data privacy and the risk of breaches.

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10. Institutional support for faculty development	80%	20%	Strong support: Institutions are generally perceived to offer adequate support, including workshops, mentoring, and resources, helping faculty adapt to digital tools.
11. Addressing financial aspects of digitalization	70%	30%	Positive but limited: Most respondents feel that institutions are making efforts to address financial aspects, but budgetary constraints remain a challenge for fully implementing digitalization.
12. Policies and procedures for data privacy and security	75%	25%	Security in place: A majority agree that policies and procedures for data privacy and security are in place, although some concerns remain about the adequacy of these measures.
13. Digitalization contributing to sustainable development	82%	18%	Sustainability boost: Most respondents believe that digitalization positively contributes to sustainability, reducing paper usage and enabling remote learning that lessens environmental impact.
14. Promoting environmental sustainability through technology	78%	22%	Environmental benefits: Digitalization is seen as an effective means to promote environmental sustainability through reduced resource consumption and energy-efficient practices.
15. Ensuring equitable access to digital resources	80%	20%	Access for all: Institutions are perceived as making significant strides toward ensuring equitable access to digital tools, particularly through the provision of loaner devices and internet support.
16. Future impact of AI, IoT, and blockchain on higher education	85%	15%	Excitement about future technologies: There is a high level of optimism regarding the role of emerging technologies like AI, IoT, and blockchain in transforming higher education.
17. Staying updated with technological advancements	80%	20%	Keeping up with trends: Institutions are generally viewed as staying updated with technological advancements, with strong engagement in workshops, conferences, and collaborations.

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Summary of Descriptive Analysis

- **High Positive Responses:** Most aspects of digitalization received high positive responses (above 75%), indicating widespread support for the use of digital tools in enhancing educational quality, student engagement, and access to resources.
- **Challenges and Concerns:** While the overall sentiment is positive, certain challenges persist:
- **Technical Skills and Faculty Adoption:** 35% of respondents indicated that faculty members face challenges in adopting digital technologies, largely due to technical skill gaps and infrastructure issues.
- **Financial Constraints:** 30% of participants highlighted financial constraints as a significant barrier, preventing full-scale digital transformation in many institutions.
- **Data Privacy Concerns:** 42% of respondents remain concerned about data privacy and security, showing that institutions need to improve their data protection measures.
- **Promoting Sustainability:** A substantial majority believe that digitalization aligns with sustainability goals, promoting environmental benefits like reduced paper consumption and energy-efficient practices.

Findings

1. Positive Impact of Digitalization: The majority of respondents believe that digitalization has significantly improved student engagement, access to resources, and personalized learning experiences.
2. Barriers to Digital Adoption: Faculty face challenges such as a lack of technical skills and resistance to change, which hinder the successful adoption of digital technologies.
3. Financial Constraints: Financial barriers prevent institutions from fully implementing digitalization, limiting access to necessary digital tools and infrastructure.
4. Data Privacy and Security: Concerns over data privacy and security remain significant, highlighting the need for institutions to implement stronger safeguards.
5. Sustainable Development: Digitalization contributes positively to sustainable development by reducing paper usage and enabling remote learning.
6. Future Technologies: Emerging technologies like AI, IoT, and blockchain are expected to play a transformative role in the future of higher education.

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Implications

- Faculty Development: Institutions must invest in professional development programs to address faculty's technical skills gaps and support the integration of digital tools.
- Data Security: Robust data privacy measures must be enforced to protect sensitive information in digital platforms, ensuring a secure learning environment.
- Financial Strategies: Institutions should explore partnerships, external funding, and
- cost-sharing strategies to overcome financial constraints and fully embrace digital transformation.
- Equitable Access: Ensuring equitable access to digital tools and resources is essential for maintaining inclusivity and reducing the digital divide in education.

Suggestions for Future Research

1. Investigate long-term impacts of digitalization on student performance across diverse educational settings.
2. Explore methods to overcome financial barriers to digital transformation in institutions.
3. Study the role of emerging technologies like AI, IoT, and blockchain in reshaping higher education.
4. Assess the effectiveness of data security policies in protecting student and faculty information in digital environments.

Conclusion

Digitalization and technological innovation have the potential to revolutionize higher education, improving student engagement, access to resources, and sustainability. However,

challenges such as faculty resistance, financial constraints, and data privacy concerns must be addressed to fully realize the benefits of digitalization. Institutions should focus on faculty development, secure digital environments, and equitable access to technology to create a more inclusive, innovative, and sustainable educational landscape.

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