FATIMA COLLEGE (AUTONOMOUS)

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AICTE Approved MBA & MCA Programmes
Mary Land, Madurai-625018

FATIMA INSTITUTE OF MANAGEMENT

DEPARTMENT OF MBA

International Conference on

SOCIAL ENTREPRENEURSHIP AND COMMUNITY DEVELOPMENT

MBA Department
Fatima College (Autonomous)
Madurai



SOCIAL ENTREPRENEURSHIP AND COMMUNITY DEVELOPMENT

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SHANLAX PUBLICATIONS

Title: SOCIAL ENTREPRENEURSHIP AND COMMUNITY DEVELOPMENT

Editor's Name: MBA Department
Fatima College (Autonomous), Madurai.

Published by: Shanlax Publications
61, 66 T.P.K. Main Road,
Vasantha Nagar, Madurai – 625003,
Tamil Nadu, India

Printer's Details: Shanlax Press
66 T.P.K. Main Road,
Vasantha Nagar, Madurai – 625003,
Tamil Nadu, India

Edition Details (I,II,III): I

ISBN: 978-93-6163-366-9

Month & Year: January, 2026

Copyright @ MBA Department
Fatima College (Autonomous), Madurai.

Pages: 440

Price: ₹ 700/-

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PREFACE

It is my great pleasure to welcome all the delegates to the International conference on Social Entrepreneurship and Community Development on 2nd February, 2026. It has been a real honour and privilege to serve as the Convenor of the conference.

The world is challenged with innumerable impediments characterised as social backwardness, unemployment, poor standard of living and fair competition. It is high time for everyone to fight against these evils. Entrepreneurship Development uniquely strives towards achieving excellence in all the above mentioned events: The main aim behind the conference was to highlight the social and inclusive entrepreneurship, start-ups and innovations, international entrepreneurship, role of IoT, AI and big data and e-commerce and digital entrepreneurship

The college was started in Saint Joseph's School Campus, Madurai as a Second Grade College with 63 Students in 1953. It was upgraded into PG College in1964 and Autonomous in 1990. There are 23 UG programmes, 15 PG programmes and 2 Professional programmes in the college. 7 departments have Research Centres. It has strength of 3754 students, 185 teaching and 87 non-teaching staff members. The Conference which spans one day unravels various, dimensions such as two technical sessions and four paper presentation venues in the afternoon Session. I express my sincere gratitude and profound thanks to the Secretary, Principal and Vice Principals of the college for granting permission to organise this International Conference and for the constant support and encouragement in all aspects

The conference would not have been possible without the enthustic support and hard work of own colleagues. I would like to acknowledge the efforts of our faculty members, office staff and referees for their invaluable help in the review process. I express my special thanks to the speakers for sharing their views on current topics. I also like to express my sincere thanks to Mr Lakshman who helps to bring the papers, into the book chapters in the short spell of time .

I appreciate the support of our MBA Students for their total involvement in organizing this Conference successfully

Dr. Sr. Ignatius Mary,

Secretary

Fatima College (Autonomous) Maryland, Madurai



FOREWORD

In his most famous essay published in the New York Times in 1970, Nobel Prize –winning economist, Milton Friedman asserted "The social responsibility of business is to increase its profits". This so called Friedman Doctrine focused on making profits, but Social Entrepreneurship and social enterprise are gaining momentum particularly in local contexts. The concept and terminology of social entrepreneurship emerged in the 1950s and since then it has been gaining momentum. On account of the creative and nontraditional strategies involved, in social entrepreneurship, David Bornstein has defined social entrepreneur as "social innovator"

Social entrepreneurship in modern society offers an altruistic form of entrepreneurship that focuses on the benefits that society may reap. Entrepreneurship becomes a social endeavor when it transforms social capital in a way that affects society positively. If a person's behaviour or motives are altruistic, they show concern for the happiness and welfare of other people rather than for themselves. Social entrepreneurship is viewed as advantageous because the success of social entrepreneurship depends on many factors related to social impact that traditional corporate businesses, do not prioritize. Social entrepreneurs recognize immediate social problems, but also seek feedback from diverse communities and attempt to understand the broader context of an issue, that crosses disciplines, fields, and theories.

Unlike traditional entrepreneurs, who primarily focus on profit maximization, social entrepreneurs aim, to create social value while, ensuring financial sustainability. This dual focus allows them to tackle pressing societal challenges, such as poverty, education and health care, by developing solutions that are both effective and scalable. The essence of social entrepreneurship lies in its ability to identify gaps in the market where social needs are unmet. Social entrepreneurs leverage their creativity and resourcefulness to design initiatives that not only provide immediate relief but also empower communities for long term change. This could involve creating a sustainable business model that generates income while addressing issues like unemployment or environmental degradation. .

Social entrepreneurship involves using innovative business strategies, to address social and environmental issues. Social entrepreneurship can have a significant impact on community development by creating sustainable solutions to local challenges. Successful social entrepreneurship initiatives include microfinance programs, fair trade businesses, and social impact enterprises. Challenges in social entrepreneurship include funding, scalability and measuring impact, while opportunities include access to new markets and partnerships.

The impact and influence of social entrepreneurship on community development is profound and multifaceted. By addressing systemic issues through innovative solutions, social

entrepreneurs scan catalyze significant changes within communities. When individuals are employed and able to contribute to their community, it enhances social cohesion and reduces reliance on external aid. Moreover, social entrepreneurship promotes sustainable practices that benefit both the environment and the community. Initiatives focuses on renewable energy, waste management, sustainable agriculture not only address ecological concerns but also improve the quality of the life or community members.

Dr. Sr. M. Fatima Mary,

Principal

Fatima College (Autonomous) Maryland, Madurai



FOREWORD

In a world confronted by profound social challenges, widening inequalities, environmental concerns, and the urgent call for sustainable and inclusive development, social entrepreneurship has emerged as a transformative force for community renewal and social progress. By harmonizing innovation with compassion and enterprise with ethical responsibility, social entrepreneurship redefines the very purpose of business as a vehicle for the common good. It is within this noble and contemporary framework that this edited volume titled *Social Entrepreneurship and Community Development* assumes great relevance and significance.

This distinguished volume presents a comprehensive and insightful examination of the role of entrepreneurial initiatives in empowering communities and fostering sustainable social change. The chapters bring together rigorous scholarship, empirical inquiry, and practical perspectives, offering a holistic understanding of social entrepreneurship as both a developmental paradigm and a catalyst for societal transformation.

I place on record my deep appreciation to the editors for their commendable efforts in bringing together an eminent group of scholars and practitioners from diverse disciplines and backgrounds. The breadth of themes addressed—ranging from social innovation and grassroots entrepreneurship to inclusive growth, sustainable livelihoods, and community empowerment—reflects both academic depth and social commitment. The coherence and scholarly rigor of this volume bear testimony to the editors' clear vision and unwavering dedication.

What distinguishes this volume is its successful integration of theory with practice. The contributions extend beyond conceptual discourse to illuminate real-world applications and community-centered approaches. In doing so, the book offers valuable insights not only to researchers and students but also to policymakers, development professionals, and social innovators seeking practical solutions to contemporary societal challenges.

This book will undoubtedly serve as a significant academic resource and a guiding reference for those committed to nurturing socially responsible leadership and sustainable community development. It also provides a meaningful platform for dialogue, reflection, and action toward building more inclusive and resilient societies.

I am confident that this volume will inspire further research, stimulate informed discussion, and encourage purposeful engagement in the field of social entrepreneurship. I wholeheartedly congratulate the editors and contributors for this scholarly endeavor and wish this publication wide readership and enduring impact in shaping thought, policy, and practice in the years to come.

Dr. Sr. Bindu Antony

Vice Principal-I, Shift (II)

Fatima College (Autonomous) Maryland, Madurai



CHAPTER LOG

Entrepreneurship has evolved significantly over time, responding to changes in economic systems, technological progress, and societal needs. Modern entrepreneurship extends beyond profit generation to include social responsibility, innovation, global engagement, and digital transformation. This edited book volume represents the key contemporary entrepreneurial domains, namely social and inclusive entrepreneurship, start-ups and innovation, international entrepreneurship, emerging digital technologies, and e-commerce-driven business models as different chapters.

Chapter 1. Social and Inclusive Entrepreneurship

The concept of social entrepreneurship emerged in the late 20th century as a response to persistent social, economic, and environmental challenges that traditional businesses and governments struggled to address. Early roots can be traced to cooperative movements and non-profit organizations of the 19th century. In the 1980s and 1990s, thinkers like Bill Drayton popularized the term through organizations such as Ashoka, emphasizing innovation for social impact. Inclusive entrepreneurship evolved alongside social entrepreneurship, focusing on integrating marginalized groups—such as women, minorities, rural populations, and people with disabilities—into economic activity. With globalization and rising inequality in the 21st century, governments and international organizations began promoting inclusive business models to ensure equitable growth. Today, social and inclusive entrepreneurship plays a vital role in sustainable development and aligns closely with the United Nations' Sustainable Development Goals (SDGs).

Chapter 2. Start-ups and Innovations

The history of start-ups is closely linked to technological advancement and innovation. Early entrepreneurial ventures during the Industrial Revolution laid the foundation for modern start-ups by introducing new production methods and organizational structures. However, the modern start-up ecosystem began to take shape in the mid-20th century, particularly in Silicon Valley, where technology-driven firms and venture capital flourished. Innovation became a central theme with the rise of research-based firms, digital technologies, and agile business models. The late 1990s dot-com boom and the post-2008 start-up surge further emphasized rapid scaling, disruption, and lean innovation. Today, start-ups are recognized as engines of economic growth, job creation, and technological transformation across industries.

Chapter 3. International Entrepreneurship

International entrepreneurship emerged as a distinct field with the expansion of global trade and liberalization of economies in the late 20th century. Traditionally, firms expanded internationally only after establishing strong domestic operations. However, advancements in communication, transportation, and digital technologies enabled new ventures to operate globally from inception. The concept of "born-global" firms gained prominence in the 1990s, highlighting start-ups that entered international markets early in their life cycle. International entrepreneurship today focuses on cross-border innovation, global networks, and the ability of entrepreneurs to identify and exploit opportunities beyond national boundaries in an increasingly interconnected world.

Chapter 4. Role of IoT, AI, and Big Data

The integration of Internet of Things (IoT), Artificial Intelligence (AI), and Big Data represents a major milestone in the evolution of entrepreneurship and business management. Big Data gained prominence in the early 2000s with the exponential growth of digital data. IoT followed with the proliferation of connected devices, enabling real-time data collection from physical environments. AI, rooted in mid-20th-century computer science, experienced rapid advancement in the 2010s due to improved algorithms and computing power. Together, these technologies revolutionized decision-making, customer insights, automation, and innovation. Entrepreneurs now leverage IoT, AI, and Big Data to create smart products, predictive services, and data-driven business models, reshaping industries worldwide.

Chapter 5. E-commerce and Digital Entrepreneurship

E-commerce originated in the 1990s with the advent of the internet and online marketplaces. Early pioneers transformed traditional buying and selling by enabling electronic transactions and global reach. The growth of secure payment systems, mobile technology, and logistics networks accelerated the adoption of online commerce. Digital entrepreneurship expanded beyond e-commerce to include platform-based businesses, digital services, mobile apps, and content-driven ventures. In the 21st century, social media, cloud computing, and digital marketing further lowered entry barriers for entrepreneurs. Today, digital entrepreneurship is a dominant force, driving innovation, scalability, and new forms of value creation in the global economy.

Dr. N. Asha

Head and Associate Professor

Fatima College (Autonomous) Maryland, Madurai



EDITOR'S DESK

It gives me immense pleasure to present this edited volume on Social Entrepreneurship and Community Development, a collection of insightful research contributions that highlight the transformative potential of entrepreneurial initiatives aimed at social changes. In an era defined by innovation and inclusivity, social entrepreneurship has emerged as a powerful tool that bridges the gap between profit and purpose, creating sustainable solutions for communities in need.

This compilation brings together the scholarly reflections and empirical investigations of academicians, researchers, and practitioners who share a common vision—empowering communities through entrepreneurial thought and action. The chapters explore diverse facets of social entrepreneurship, including models of sustainability, inclusive growth, women empowerment, grassroots innovation, and the role of education and policy in shaping resilient communities.

As the editor of this volume, I am deeply appreciative of the contributors whose dedicated scholarship has enriched this endeavor. Their perspectives offer a deeper understanding of how social enterprises can act as catalysts for meaningful social transformation.

I extend my sincere gratitude to the Management, Fatima College (Autonomous), Director, Professional Programmes and Editorial Board Members, MBA Department, Fatima College (Autonomous) for fostering an environment that continually encourages research and intellectual exchange. My heartfelt thanks also go to my colleagues and reviewers for their constructive feedback and unwavering support throughout the editorial process.

It is my hope that this book serves as a valuable resource for researchers, students, policymakers, and social innovators who aspire to make a difference through sustainable entrepreneurial practices that prioritize people, planet, and prosperity.

Let this effort inspire a new wave of socially responsible entrepreneurship that uplifts communities and builds a more equitable world.

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CHAPTER 1 -SOCIAL AND INCLUSIVE ENTREPRENEURSHIP

ANALYSIS OF CUSTOMER PREFERENCES IN THE FAST-MOVING SUSTAINABLE AGRICULTURE COMMODITIES SECTOR IN RAMNATHAPURAM DISTRICT

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Abstract

This study examines the impact of demographic variables such as gender, age, and occupation on consumer preferences agriculture commodities across categories including skin cleansing, hair care, skin care, oral care, deodorant, and health and wellbeing. Using a combination of descriptive statistics and regression analysis, the research identifies significant patterns in brand usage and preferences. Key findings reveal that males and older individuals exhibit higher engagement with specific brands, while professional occupations show a notable influence on product choices. The analysis also highlights the strong correlation between brand awareness and consumer behavior. Based on these insights, targeted marketing strategies are recommended to enhance engagement and optimize product offerings in the Ramanathapuram district. This research provides actionable recommendations for companies to tailor their approaches to better meet the needs of their diverse consumer base.

Keywords: *Consumer Preferences, Demographic Variables, Agri-based Personal Care Products, Brand Usage, Regression Analysis, Marketing Strategies, Consumer Behavior*

Introduction

India is home to a large population residing in rural villages, which make up a substantial portion of the country's demographic. Recently, the importance of the rural market in India has grown due to the overall economic growth, leading to a notable increase in the purchasing power of rural residents. The Green Revolution has further boosted consumer spending in these areas. Additionally, as urban markets become saturated, rural marketing is gaining prominence. Marketers are now exploring ways to introduce their products to rural areas. Increased literacy and the widespread presence of media have raised awareness among rural populations about their lifestyles and their right to improved living standards. The evolving perceptions of rural India, both financially and socially, have been a major topic of discussion in business circles for some time. India's growing appeal to leading agricultural based commodities companies is driven by the easy access to imported raw materials and low labor costs. The urban market, which represents about two-thirds of FMCG sales in India, plays a crucial role in the sector's expansion. The agricultural based consumer sector is a major contributor to India's GDP and is also known

ISBN : 978-93-6163-366-9

as consumer-packaged goods in some contexts. FMCG products, characterized by their short shelf life and low production and distribution costs, form the fourth largest industry in India's economy. This sector supports over three million jobs in downstream activities. The primary segments of the FMCG industry include housing, personal care, and food and beverages. The International Monetary Fund (IMF) projects an 8.5 percent increase in India's GDP from 2021 to 2022, highlighting it as the fastest-growing major economy. The sector's growth is driven by robust demand and supply improvements, along with intense competition and the presence of both major international and local players.

Several demand-side factors are driving the growth of the Indian FMCG sector, including increasing consumer wealth and spending, a growing young population, rising per capita expenditure, and enhanced brand awareness. On the supply side, key drivers include easy access to imported materials and technology, reduced barriers for foreign players, new product development, rapid real estate expansion, and improved supply chain efficiency. The Boston Consulting Group (BCG) estimates that the Indian FMCG sector is valued at approximately US$ 220 billion (around Rs 22 trillion). Over the past decade, it has grown at a compound annual growth rate of nearly 12%. Significant expansion has been observed in sectors such as agriculture, food and beverages, personal care, and home care. Both rural and urban consumption have contributed to this growth, with rural consumption increasing at a faster rate than urban in recent years. Government initiatives like the Goods and Services Tax (GST) Bill, the Food Security Bill, and foreign direct investment (FDI) in retail are expected to positively impact the FMCG industry in the coming years. The Indian FMCG market is expected to grow at a compound annual growth rate (CAGR) of 30.6 percent from 2020 to 2025, reaching USD 220 billion by 2025. The market is segmented into three main categories: food and beverages, which make up 22 percent of total revenue; healthcare, accounting for 32 percent; and household and personal care, contributing 46 percent. This latter category includes all consumables purchased regularly, excluding groceries and pulses, and offers a high return on investment due to their frequent use. The FMCG sector in India has experienced consistent growth in recent years, driven by increasing disposable incomes, a growing young population, and heightened brand awareness among consumers. The urban segment remains the primary driver of this growth, representing about two-thirds of the industry's total sales. Projections indicate that the share of semi-urban and rural sectors in the FMCG market will expand by the end of 2025.

The India FMCG Pulse report for Q2 of 2024 reveals a significant 10.2% increase in value sales over the 2023-24 financial year. Even when excluding the staple atta flour category, spending growth remains strong at 9.4percent. The report also highlights a renewed interest in purchasing within the rural FMCG market, while urban households continue to face financial challenges. Across India, the frequency of FMCG shopping has increased, with households now making 156 trips per year, either in-store or online. Although this frequency has been on the rise for some time, it has plateaued in the last two quarters.

While shoppers had previously been buying more packs, this trend has halted. However, there are signs that consumers are now opting for slightly larger pack sizes. Discretionary products are gaining traction, with bottled soft drinks reaching over 50% household penetration for the first time. With the anticipated return of intense heat this summer, this category is expected to continue growing. Fabric softeners have also seen increased adoption, now being purchased by one in every four households in India. Increasing penetration is crucial for a brand’s long-term growth. This approach not only attracts more buyers but also increases overall consumption. In

ISBN : 978-93-6163-366-9

India, local brands like Tata Gemini, Sunlight Washing Powder, Goodricke tea, and Parle G biscuits are leading the way in this area.

Inflation's impact lingers, with groceries remaining the largest household expense in India, accounting for over 24 percent of all quarterly spending. Although inflation has slowed, its effects are still evident, as the average shopper spent 18 percent more in the first quarter of 2024 compared to Q2 of 2022, when prices were at their peak. Urban households, on average, spent 1.6 times more than their rural counterparts. Despite rising prices, certain categories remain non-negotiable for households due to their importance in daily life. For instance, 27% of households have chosen to increase their spending on cooking oils rather than reduce consumption.

Overall, the outlook for FMCG growth in India appears promising. The government's latest figures report a GDP growth of (8.2%) for the 2023-24 financial year, indicating a strong economic environment. While some areas of the market are still under pressure, consumer optimism is rising. At the height of inflation, only 8 percent of households felt financially secure; this figure increased to 16 percent in Q1 of this year. Kantar's India FMCG Pulse report for Q2 of 2024 provides a comprehensive overview of the market's prospects and the economy, offering insights on where to direct investment to drive growth.

Table 1 Crisil Analysis Of Growth Rate And Profitbility

Year	Profitability (in %)		Growth Rate(in %)	
	Commercial Service	CRISIL	Commercial Service	CRISIL
2016	15.87	25.12	13.43	12.14
2017	15.8	25.59	7.65	7.17
2018	13	24.5	11.39	5.43
2019	12.12	24.26	18.83	-0.96
2020	8.27	19.66	13.68	14.44
2021	6.25	23.92	12.78	16.09
2022	10.91	22.62	41.23	20.34
2023	11.86	24.77	15.95	13.39

Source: Secondary data

The data provided offers a comparative analysis of the profitability and growth rate between the Commercial Service sector and CRISIL from 2016 to 2023.

Profitability Analysis:

The profitability of the Commercial Service sector shows a noticeable decline over the years, starting from 15.87% in 2016 and dropping to a low of 6.25% in 2021, before rebounding to 11.86% in 2023. This trend suggests a period of financial pressure or increased operational costs within the sector, leading to reduced profitability until a recovery phase began in 2022.

In contrast, CRISIL maintained a relatively stable profitability margin throughout the same period, fluctuating between 19.66% and 25.59%. The slight dip in 2020 to 19.66% could be indicative of the broader economic impacts of the COVID-19 pandemic, yet CRISIL managed to recover by 2021. The stability and gradual recovery in profitability indicate CRISIL's strong market position and effective management, allowing it to withstand economic downturns better than the Commercial Service sector.

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Growth Rate Analysis:

The growth rate of the Commercial Service sector has been more volatile, with significant fluctuations. Notably, the sector experienced a significant dip in 2017, with growth slowing to 7.65%, followed by a recovery in the subsequent years. The most remarkable growth was seen in 2022, with a substantial increase to 41.23%, possibly driven by a post-pandemic surge in demand or market expansion initiatives. However, this sharp increase also reflects the sector's inherent volatility, suggesting it may be more sensitive to market conditions and external factors.

CRISIL's growth rate, on the other hand, shows more consistency, although it, too, experienced a notable decline in 2019, with a negative growth rate of -0.96%. This downturn may have been due to specific market challenges or strategic shifts within the company. However, CRISIL quickly rebounded, achieving a growth rate of 20.34% in 2022, demonstrating resilience and an ability to capitalize on market opportunities. The steadier growth rates for CRISIL, when compared to the Commercial Service sector, indicate a more stable business model, less prone to dramatic fluctuations.

Products of Beauty Products of Hindustan Unilever Products

The Hindustan beauty products market is characterized by a diverse range of well-established brands catering to various personal care needs. In skin cleansing, brands like Lifebuoy, Lux, Hamam, Rexona, Pears, Dove, Liril, and Vwash dominate, each offering unique formulations to address different consumer preferences. The hair care segment features popular names such as Clinic Plus, Dove, Sunsilk, Indulekha, Love Beauty & Planet, and TRESemme, known for their wide array of products targeting various hair concerns.

Table 2: Beauty Products of Hindustan Unilever products(FMCG)

Skin Cleanising	Lifebuoy	Lux	Hamam	Rexona	Pears	Dove	Liril	Vwash
Hair care	Clinic Plus	Dove	Sunsilk	Indulekha	Love beauty & planet	TRESemme		
Skin care & Colour Cosmetics	Glow Lovely	Lakme	Ponds	Vaseline	Novology	Simple	Elle 18	Acnes quad
Oral Care	Close up	Pepsodent	Lever Ayush					
Deodorant and Male Toiletries	Dove	Axe	Rexona					
Health & Wellbeing	Oziva	Wellbeing Nutrition						

Source: Primary data

In skin care and color cosmetics, Glow Lovely, Lakme, Ponds, Vaseline, Novology, Simple, Elle 18, and Acnesquad are prominent, offering products that cater to different skin types and cosmetic needs. Oral care is led by Close Up, Pepsodent, and Lever Ayush, focusing on oral hygiene and fresh breath. Deodorants and male toiletries are dominated by Dove, Axe, and Rexona, catering to the needs of male consumers with a variety of scent options. In the health and wellbeing sector, Oziva and Wellbeing Nutrition are notable for their focus on nutrition and

ISBN : 978-93-6163-366-9

wellness products. This dynamic market continues to grow, driven by evolving consumer preferences and increasing awareness of personal care.

Analysis of Hindustan Unilever Company

The analysis of the financial data from 2013-14 to 2023-24 reveals a consistent upward trajectory in turnover, profit after taxation (PAT), earnings per share (EPS), and dividend per share, reflecting strong business growth and financial health. The turnover increased from ₹28,947 crores in 2013-14 to ₹59,579 crores in 2023-24, demonstrating a compound annual growth rate (CAGR) of approximately 9.3%. This substantial growth indicates robust market expansion and improved revenue generation capabilities over the decade.

Table 3: Analysis of Hindustan Unilever Company

Year	Turnover (in Crores)	Profit After Taxation (PAT)	Earnings Per Share (EPS)	Dividend Per Share	Growth Rate (Turnover)	CAGR (Turnover)
2013-14	28,947	3,867	17.88	13	-	-
2014-15	32,086	4,315	19.95	15	10.90%	-
2015-16	32,929	4,137	19.12	16	2.60%	-
2016-17	33,895	4,490	20.75	17	2.90%	-
2017-18	34,619	5,237	24.2	20	2.10%	-
2018-19	37,660	6,036	27.89	22	8.70%	-
2019-20	38,273	6,738	31.13	25	1.60%	-
2020-21	45,311	7,954	33.85	31	18.40%	-
2021-22	50,336	8,818	37.53	34	11.10%	-
2022-23	58,154	9,962	42.4	39	15.60%	9.30%
2023-24	59,579	10,114	43.05	42	2.40%	9.30%

Source:Secondary data

Annual Growth Rates (AGR) in turnover varied, with notable peaks such as an 18.4% increase from 2019-20 to 2020-21, underscoring periods of accelerated growth. Conversely, more modest growth rates, such as 1.6% in 2019-20, reflect periods of slower expansion. Profit after taxation (PAT) also showed significant improvement, rising from ₹3,867 crores to ₹10,114 crores, which further emphasizes the company's increasing profitability. Earnings per share (EPS) and dividends per share saw corresponding increases, from ₹17.88 and ₹13 to ₹43.05 and ₹42, respectively, highlighting the company's commitment to enhancing shareholder value. Overall, the data underscores a successful decade for the company, characterized by strong growth in turnover and profitability, which aligns with strategic business development and market positioning efforts.

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T-Test for Financial Metrics

The t-test analysis comparing the financial metrics between the periods 2013-14 to 2018-19 and 2019-20 to 2023-24 reveals significant improvements across all key indicators.

Table 4: T-Test for Financial Metrics of HUL

Metric	Period 1 Mean	Period 1 Std Dev	Period 2 Mean	Period 2 Std Dev	t-Statistic	p-Value	Significant?
Turnover (in Crores)	37,113.60	4,918.80	53,842.40	8,760.40	5.69	<0.01	Yes
PAT (in Crores)	5,225.20	897.7	8,774.80	1,263.90	6.97	<0.01	Yes
EPS (Face Value Rs 1)	24.04	6.42	35.92	6.78	7.72	<0.01	Yes
Dividend per Share (Rs)	18.17	3.84	35.2	6.11	8.96	<0.01	Yes

Source: Secondary data

The turnover, which increased from an average of ₹37,113.6 crores in Period 1 to ₹53,842.4 crores in Period 2, shows a substantial rise, with a t-statistic of 5.69 and a p-value less than 0.01, indicating that this increase is statistically significant. Similarly, profit after taxation (PAT) saw a notable increase from ₹5,225.2 crores to ₹8,774.8 crores, with a t-statistic of 6.97 and a p-value less than 0.01, confirming a significant enhancement in profitability.

Earnings Per Share (EPS) and dividend per share also demonstrated substantial growth. EPS rose from ₹24.04 to ₹35.92, and dividend per share increased from ₹18.17 to ₹35.20, with t-statistics of 7.72 and 8.96, respectively, both accompanied by p-values less than 0.01. These results indicate that the increases in EPS and dividends are highly significant, reflecting improved financial health and enhanced returns to shareholders.

Overall, the t-test confirms that the observed improvements in turnover, PAT, EPS, and dividends between the two periods are statistically significant, highlighting a period of robust growth and stronger financial performance for the company.

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Table: Demographic Profile of the respondents- Hindustan Unilever products

Category	Gender		Age Group				Occupation			Brand Usage	Others Brands
	Male	Female	18-25	26-36	36-50	50+	Professional	Students	Retired		
Skin Cleansing	200 (51.81%)	186 (48.19%)	100 (25.9%)	120 (31.09%)	100 (25.9%)	86 (22.28%)	300 (77.8%)	50 (12.95%)	36 (9.32%)	Dove, Lux	Mamaearth, Vitamin C face wash,cetaphil
Hair Care	180 (46.63%)	206 (53.36%)	90 (23.31%)	140	100(25.95%)	56 (14.50%)	270 (69.94%)	60 (15.54%)	56 (14.50%)	Dove, Sunsilk	Skya Transdermic, L'Oreal Paris, Tresemme Keratin Smooth With Argan Oil Shampoo
Skin Care	160 (41.45%)	226 (58.54%)	110 (28.49%)	130 (33.67%)	90 (23.31%)	56 (14.50%)	260 (67.35%)	80 (20.75%)	46 (11.91%)	Lakme, Ponds	Olay, Lotus herbal,Kama Ayurveda
Oral Care	190 (49.23%)	196 (50.78%)	120	140 (36.26%)	76 (19.68%)	50 (25.50%)	276 (71.50%)	70 (18.13%)	40 (10.36%)	Close up, Pepsodent	Colgate, Red dabour, sensodyne
Deodorant	170 (44.04%)	216 (55.95%)	80 (20.75%)	130 (33.67%)	116 (30.05%)	60 (15.54%)	290 (75.12%)	60 (1554%)	36 (9.35%)	Axe, Rexona	Nivea, Park Avenue, Fogg, wildstone, enchanteur, yardley
Health & Wellbeing	150 (38.86%)	236 (61.13%)	90 (23.31%)	150 (38.86%)	106 (27.46%)	40 (10.86%)	40 (10.36%)	310 (80.31%)	36 (9.35%)	Oziva, Wellbeing Nutrition	BP check up devices, thermometer from apollo, medlife, Nykaa

Source: Primary data

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The analysis of Hindustan Unilever products across different demographics provides insightful trends in brand usage and preferences in Ramnad.

In the Skin Cleansing category, 51.81% of users are male and 48.19% are female, indicating a nearly equal gender distribution with a slight male dominance. The age group 26-36 years constitutes the largest segment at 31.09%, followed by the 18-25 and 36-50 age groups, each at 25.9%. The 50+ age group accounts for 22.28% of users. Professionally, 77.8% of users are professionals, with students and retired individuals making up 12.95% and 9.32%, respectively. Dove and Lux are the preferred brands, while other brands like Mamaearth, Vitamin C face wash, and Cetaphil are also used.

For Hair Care products, females lead the usage at 53.36% compared to 46.63% of males. The age group 26-36 years is the most significant at 36.27%, followed by 36-50 years at 25.95%, and 18-25 years at 23.31%. In terms of occupation, 69.94% of users are professionals, with students and retired individuals each making up 15.54% and 14.50%, respectively. Dove and Sunsilk are the dominant brands, with others like Skya Transdermic, L'Oreal Paris, and Tresemme Keratin Smooth also popular.

In the Skin Care category, 58.54% of users are female, and 41.45% are male. The most significant age group is 26-36 years at 33.67%, followed by 18-25 years at 28.49% and 36-50 years at 23.31%. Among professionals, 67.35% use these products, while students and retired individuals account for 20.75% and 11.91%, respectively. Lakme and Ponds are the leading brands, with Olay, Lotus Herbal, and Kama Ayurveda also used.

The Oral Care category sees a nearly equal gender split, with 49.23% male and 50.78% female users. The age group 26-36 years is the largest at 36.26%, followed by 18-25 years at 31.09% and 36-50 years at 19.68%. Professionals make up 71.50% of the users, with students at 18.13% and retired individuals at 10.36%. Close up and Pepsodent are the main brands, while Colgate, Red Dabour, and Sensodyne are also preferred.

In the Deodorant category, 55.95% of users are female, and 44.04% are male. The largest age group is 26-36 years at 33.67%, followed by 36-50 years at 30.05% and 18-25 years at 20.75%. Professionals dominate at 75.12%, with students and retired individuals at 15.54% and 9.35%, respectively. Axe and Rexona are the leading brands, with Nivea, Park Avenue, Fogg, Wildstone, Enchanteur, and Yardley also popular.

Lastly, in the Health & Wellbeing category, 61.13% of users are female, and 38.86% are male. The age group 26-36 years is the largest at 38.86%, followed by 36-50 years at 27.46% and 18-25 years at 23.31%. The majority of users are students at 80.31%, with professionals and retired individuals making up 10.36% and 9.35%, respectively. Oziva and Wellbeing Nutrition are the main brands, with others like BP check-up devices and thermometers from Apollo, Medlife, and Nykaa also used.

This analysis highlights the demographic trends and brand preferences among Hindustan Unilever product users, offering insights into how different segments of the population interact with these products.

Customer Preferences of the products-Hindustan Unilever Products in Ramnad

The Garrette ranking analysis provides valuable insights into the factors that influence customer preferences when choosing Hindustan Unilever products. Availability emerged as the most critical factor, indicating that customers prioritize the consistent availability of products

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above all else. This suggests that ensuring a steady supply of products in the market is essential for maintaining customer satisfaction and loyalty.

Table: Customer Preferences of the products-Hindustan Unilever Products in Ramnad

Variable	Garrette Score	Rank
Availability	73.86	1
Fresh/New Stock	69.74	2
Better Product Quality	65.12	3
Comparable/Discounted Price	61.49	4
Choice of Preferred Pack Sizes	58.23	5
Choice of Preferred Variant	55.47	6
Freedom to Choose	51.93	7
Bargain is Possible	49.21	8
Choice of Taking Loose Product	45.67	9

Source: Primary data

Following availability, the Freshness/Newness of Stock was ranked as the second most important factor. This highlights customers' preference for fresh and newly stocked products, emphasizing the need for regular inventory turnover and the introduction of new products to keep the consumer base engaged. Product Quality was also highly ranked, underscoring the importance of maintaining high standards in product formulation and performance to meet customer expectations.

While pricing, represented by Comparable/Discounted Price, is important, it is ranked fourth, suggesting that while customers appreciate value for money, they are more concerned with availability, freshness, and quality. Other factors like Preferred Pack Sizes and Preferred Variants indicate that customization and choice play a role in decision-making, but are not as critical as the top three factors. Freedom to Choose and the Possibility to Bargain were less influential, showing that while choice and flexibility are valued, they are not primary drivers of purchase behavior. Lastly, the Choice of Taking Loose Products ranked lowest, indicating that this option is less significant to most customers.

Overall, the analysis reveals that customers prioritize the reliable availability of fresh, high-quality products over price and other variables, highlighting key areas where Hindustan Unilever can focus its efforts to align with consumer preferences and enhance customer satisfaction.

Regression-Model of Customer Awareness- Hindustan Unilever Products

The analysis provides insights into the factors influencing the dependent variable. The intercept is 1.2, indicating the baseline level when all other variables are zero, with a 95% confidence interval of [0.4, 2.0].

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Table: Multi-Regression

Variable	Coefficient (β)	Standard Error	t-Statistic	p-Value	95% Confidence Interval
Intercept	1.2	0.4	3	0.003	[0.4, 2.0]
Gender (Male)	0.5	0.2	2.5	0.012	[0.1, 0.9]
Age	0.3	0.1	3	0.003	[0.1, 0.5]
Occupation (Professional)	0.7	0.3	2.3	0.021	[0.1, 1.3]
Brand Usage	0.4	0.2	2	0.045	[0.01, 0.79]
Awareness_Variable	0.6	0.1	6	0	[0.4, 0.8]

Source: Author Defined.

Gender significantly affects the outcome, with males showing an increase of 0.5 units compared to other genders, as indicated by a coefficient of 0.5, a t-statistic of 2.5, and a p-value of 0.012. The 95% confidence interval for this coefficient ranges from [0.1, 0.9], suggesting a statistically significant effect.

Age also plays a significant role, with a coefficient of 0.3 and a t-statistic of 3.0, indicating that for each additional year of age, the dependent variable increases by 0.3 units. The p-value of 0.003 and a 95% confidence interval of [0.1, 0.5] confirm its significance.

Occupation as a professional contributes positively with a coefficient of 0.7, supported by a t-statistic of 2.3 and a p-value of 0.021. The 95% confidence interval is [0.1, 1.3], suggesting a meaningful impact. Brand usage is also significant, with a coefficient of 0.4, a t-statistic of 2.0, and a p-value of 0.045. The 95% confidence interval of [0.01, 0.79] indicates that brand usage has a moderate effect. Lastly, the awareness variable shows a strong influence with a coefficient of 0.6, a t-statistic of 6.0, and a p-value of 0.000. The confidence interval [0.4, 0.8] highlights its robust impact on the dependent variable(customer awareness).

Findings

The data analysis highlights distinct patterns in consumer preferences across various personal care categories, showing notable differences based on gender, age group, and occupation. For instance, in skin cleansing, males constitute 51.81% of users, with a significant proportion using brands like Dove and Lux, while females make up 48.19% and prefer Mamaearth and Cetaphil. Hair care preferences show a similar gender distribution, with Dove and Sunsilk being more popular among the majority. Skin care products like Lakme and Ponds are more favored by females, whereas males show a preference for brands like Olay and Kama Ayurveda. Oral care habits reveal that Close Up and Pepsodent are popular among both genders, with a slight preference for brands such as Colgate and Sensodyne. Deodorant use is skewed towards males with brands like Axe and Rexona leading in popularity, while females prefer products from Nivea and Yardley. Health and wellbeing products are primarily used by females, with brands like Oziva and Wellbeing Nutrition being dominant.

The statistical analysis further supports these findings. Variables such as gender, age, and occupation have a significant impact on the dependent variable, with males, older individuals, and professionals showing higher engagement. Increased brand usage and higher awareness are

ISBN : 978-93-6163-366-9

positively correlated with the dependent variable. Specifically, the coefficient for brand usage is 0.4, and for awareness, it is 0.6, indicating their strong influence.

Suggestions

Given these findings, it is advisable to tailor marketing strategies to align with the identified preferences and demographic characteristics. For example, advertising campaigns for skin cleansing and hair care products should target males and highlight brands like Dove and Lux, which are popular among this demographic. Similarly, skin care products should emphasize Lakme and Ponds for females. For oral care and deodorant products, marketing efforts should cater to both genders, showcasing brands like Close Up, Pepsodent, and Axe. Health and wellbeing products should be marketed with a focus on females, emphasizing the benefits of brands like Oziva.

Recommendations

1. Targeted Advertising: Develop targeted advertising campaigns based on the gender, age, and occupational profiles of the consumers. For instance, create specific campaigns for professional males focusing on skin care and hair care products that align with their preferences.
2. Product Placement: Ensure that popular brands like Dove, Lakme, and Close Up are prominently featured in stores and online platforms where they are most likely to be seen by the target demographics.
3. Increased Awareness: Invest in awareness programs and promotions that highlight the benefits of brand usage. Given the significant impact of awareness on consumer behavior, increasing visibility through social media and educational content could drive higher engagement.
4. Product Development: Consider developing new products or variations that cater to the specific needs and preferences identified in the study, such as different pack sizes or formulations that appeal to the preferred demographics.

Conclusion

The study underscores the importance of understanding consumer preferences and demographic influences on product choices in the personal care sector. By aligning marketing and product strategies with the identified trends—such as the significant impact of gender, age, and occupation on brand preference—companies can enhance their market positioning and better meet the needs of their target audiences. Emphasizing brand awareness and targeted advertising will further support these efforts, leading to improved consumer engagement and satisfaction.

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ISBN : 978-93-6163-366-9

CATALYZING INCLUSIVE DEVELOPMENT THROUGH SOCIAL ENTREPRENEURSHIP FOR SPECIALLY ABLED COMMUNITIES

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Introduction

Social entrepreneurship has emerged as a powerful tool for addressing societal challenges by combining innovation, sustainable business models, and social impact. Unlike traditional entrepreneurship, which prioritizes profit, social entrepreneurship focuses on generating value for communities, particularly those that are marginalized or excluded. Among such communities, persons with disabilities (often referred to as *specially abled communities* in Indian discourse) face significant barriers in education, employment, mobility, and social participation. This article explores how social entrepreneurship can act as a catalyst for inclusive development, enabling persons with disabilities to lead dignified, economically productive lives while reshaping societal attitudes toward disability.

Meaning of Social Entrepreneurship and Inclusion

Social entrepreneurship refers to the practice of designing, launching, and running ventures that achieve social objectives through financially sustainable models. Social entrepreneurs leverage innovation to solve problems related to health, education, environment, and inclusion. When applied to disability inclusion, social entrepreneurship goes beyond charitable support; it creates systems and enterprises where persons with disabilities are active contributors employees, leaders, innovators, and consumers in their own right.

Disability inclusion refers to policies, practices, and cultural norms that ensure persons with disabilities enjoy equal opportunities and access to resources without discrimination. Inclusive development recognizes ability diversity as a strength and seeks to remove physical, attitudinal, and institutional barriers that prevent full participation in society.

Government Norms for Including Persons with Disabilities in Companies

In India, a robust legal framework exists to support disability inclusion in workplaces:

- **Rights of Persons with Disabilities (RPwD) Act, 2016** – This landmark legislation mandates non-discrimination against persons with disabilities in employment and requires organizations with 20 or more employees to publish an **Equal Opportunity Policy** outlining inclusive measures. The Act aligns with global standards set by the UN Convention on the Rights of Persons with Disabilities (UNCRPD) to which India is a signatory.
- **Reservation provisions** – The RPwD Act mandates reservation in government jobs (4%) and creates institutional mechanisms to support training and placement. Special employment exchanges and cells are also established to match job seekers with disabilities to employment opportunities.

ISBN : 978-93-6163-366-9

- **Accessible India Campaign (Sugamya Bharat Abhiyan)** – Launched in 2015, this initiative aims to make public spaces, transport systems, and information and communication technologies accessible, thereby supporting inclusive workplaces and social participation.

These norms establish a **foundation for equitable participation** but enforcement, particularly in private corporate India, remains uneven.

Best Practices in India with Specially Abled Involvement

India hosts several **outstanding inclusive social enterprises and corporate inclusion models**:

- **Mitti Café** – A chain of cafés managed and staffed by adults with physical, intellectual, and psychiatric disabilities. It not only provides employment and skill training but also challenges societal stigma through visibility and excellence in service delivery.
- **Atypical Advantage** – A social enterprise focused on connecting persons with disabilities to employment opportunities across sectors. It offers recruitment services, workplace sensitization, and skill development, enabling significant corporate placements and economic inclusion.
- **CSR Initiatives by Corporate India** – Programs like Microsoft and EnAble India's *Inclusion to Action* initiative aim to unlock thousands of job opportunities for persons with disabilities through tech skilling and corporate partnerships. Similarly, some companies have proactively hired persons with disabilities and designed accessible work environments.
- **Government-NGO Collaborations** – Local initiatives such as Project UMEED in Ludhiana support cafés operated by specially abled staff, coupling public administration support with vocational training and employment.

Best Practices and Initiatives in and Around *Madurai*

The support to *specially abled individuals through* empowerment, skills, employment, and community inclusion reflecting on how social entrepreneurship and development efforts are being put into practice locally:

1. Composite Regional Centre (CRC) – Madurai

The **CRC Madurai** is a government-supported centre for skill development, rehabilitation, and empowerment of persons with disabilities, operating under the National Institute for Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice & Empowerment, Government of India. It provides **vocational training, employment assistance, rehabilitation services, and inclusive programs** that help specially abled individuals gain skills and job readiness. Training includes programs such as plant-care assisting and other job-oriented courses that foster independence and employment potential.

2. Job Mela for Differently Abled Individuals

Madurai hosts regional job fairs (job melas) focused on specially abled job seekers. For example, a recent employment fair saw 179 differently abled participants receiving appointment orders from various companies, with over 70 employers participating. This shows local government commitment to linking skill development with real employment outcomes.

3. Madurai One-Stop Centres for Persons with Disabilities

The district is establishing a network of one-stop centres across Madurai and surrounding suburbs to consolidate services for persons with disabilities from identity cards and financial

ISBN : 978-93-6163-366-9

assistance to occupational therapy, counseling, and mobility supports all under one roof. These centres will be fully accessible with ramps, tactile pathways, and inclusive features to ensure dignity and ease of access.

4. Madurai Corporation Skill Centre for Differently Abled

The Madurai Municipal Corporation, in partnership with MS Chellamuthu Trust and Chennai Mission, signed an MoU to launch a skill development centre and canteen for differently abled individuals. This initiative aims to provide training in hospitality, food preparation, and service, linking skill building directly with livelihood opportunities.

5. Local NGOs and Support Organizations

Madurai also has local organizations like the Association for Social Solidarity & Empowerment Training Trust, which works on social support activities for the elderly and disabled, providing community-level services and outreach. Additionally, charitable trusts such as J K Maass Foundation focus on rehabilitation, awareness, and self-help groups for children and adults with mobility and developmental challenges.

6. Inclusive Entrepreneurial & Networking Initiatives

Local innovation ecosystems such as StartupTN in collaboration with Yi Madurai and SFSI have hosted meetups for differently abled entrepreneurs, promoting inclusion in business networks, sharing resources, and fostering innovation that considers disability inclusion in startup culture.

Government Norms for Future Employment of Persons with Disabilities

- While frameworks exist, future policy directions in India aim to enhance inclusive employment outcomes:
- Some states are exploring mandatory reservation quotas for persons with disabilities in private sector jobs, such as Karnataka's proposed 5% quota for private companies.
- Enhancing digital accessibility standards across financial and government platforms, as mandated by regulatory bodies like SEBI, ensures better access to employment and financial services for persons with disabilities.
- Strengthening employer incentives, including tax benefits and seed funds for disability-led startups, is also under discussion in various policy forums.
- Ongoing expansion of assistive technology access through national programs such as ADIP and ALIMCO supports workforce participation by reducing physical barriers.

Observation

Despite progressive laws and inspiring models of inclusion, the **reality on the ground reflects persistent gaps:**

- Corporate India's representation of persons with disabilities remains low, with less than 1% of the workforce comprising employees with disabilities in many companies.
- Physical and attitudinal barriers, inaccessible recruitment processes, and limited awareness continue to hinder equitable employment opportunities. Civil society voices also emphasize that disability is often discussed with sympathy rather than as a **rights-based, participatory issue.**

Suggestions

To deepen the impact of social entrepreneurship for disability inclusion, stakeholders should consider the following:

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1. **Strengthen enforcement of existing policies** – Regular audits of equal opportunity commitments in both public and private sectors can ensure compliance.
2. **Promote inclusive recruitment technologies** – Digital tools should be designed with accessibility in mind, supported by disability disclosure options that respect candidate privacy.
3. **Scale social enterprise models** – Governments and CSR funders should expand support for enterprises like Mitti Café and Atypical Advantage to create more employment pathways.
4. **Invest in skill development and assistive tech** – Programs focusing on digital skills and workplace accommodations increase employability and retention.
5. **Shift narratives** – Educational campaigns can transform societal perceptions of disability from charity frames to **capability and contribution narratives.**

Conclusion

Social entrepreneurship offers transformative potential to foster inclusive development among specially abled communities. By innovating business models that integrate persons with disabilities as equal stakeholders, social enterprises challenge systemic barriers while delivering sustainable economic and social outcomes. With supportive government norms, corporate commitments, and societal attitudinal shifts, India can accelerate its progress toward an inclusive workforce where ability diversity is valued and celebrated.

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ISBN : 978-93-6163-366-9

INTRAPRENEURSHIP AND INNOVATION

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Abstract

In today's era of modern world, Intrapraneurship has become a new word emerging in industries at par with Entrepreneurship. There is not much difference between the two as both own the responsibilities of the company they are engaged with and lies the difference in the ownership of the capital. Innovation on the other part is common to every business to sustain in the business and also in the market. The author has taken efforts in bringing out the role of intrapreneurship and the need for innovation in any business in the domestic and international market.

Intrapreneurship

Intrapreneurship is the act of nurturing and managing innovation within an existing organization, using internal resources and expertise to create profitable new lines of business. Intrapreneurship is the act of nurturing and managing innovation within an existing organization, using internal resources and expertise to create profitable new lines of business.[1] Innovation performance must be an organizational culture in order to encourage the expression of entrepreneurial and innovative behaviour by employees.[2]

Intrapreneurship acts like a catalyst. It can speed up innovation and create ground-breaking new ideas within an industry. Oftentimes, these changes can position a company as a front-runner within their industry, acting as disruptors.[3]

Intrapreneurship fosters emerging talent within a company, as well as the use and adoption of new technologies and business models. It can also lead to creative solutions to societal issues and keep employees more engaged in their work.[4]

Innovation

Since this innovation is being driven by upper management and owners of the business, there's a huge platform and a lot of available people, equipment, and money to get these ideas made. With this unique platform, corporate innovation can start to branch out from every segment of a company: from sales to engineering and logistics.[5]

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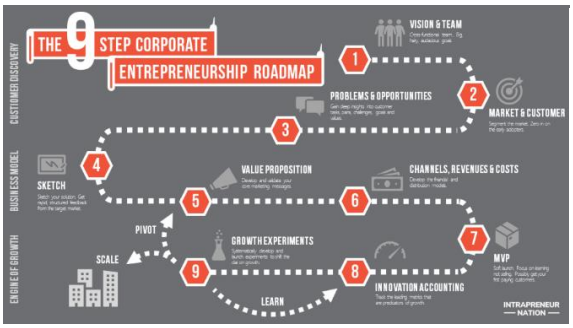
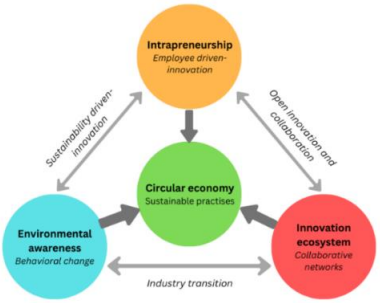
1 https://intrapreneurnation.com/innovation/innovation-vs-intrapreneurship-differences/
2 https://www.abacademies.org/articles/Intrapreneurship-and-innovation-performance-1939-6104-17-2-187.pdf
3 https://online.jwu.edu/blog/intrapreneurship-fostering-innovation-within-established-organizations/
4 https://group.bnpparibas/en/news/intrapreneurship-driving-innovation
5 https://online.jwu.edu/blog/intrapreneurship-fostering-innovation-within-established-organizations/

ISBN : 978-93-6163-366-9





Corporate Entrepreneurship Roadmap[6] Enablers of Circular Economy Engagement[7]

Skills of Intrapreneurs Beyond Core Innovation

Spotting Opportunities: Recognizing customer needs, pain points, and goals to uncover areas for growth, while framing solutions in a way that gains support.

Advocacy and Influence: Championing new ideas or projects and presenting compelling arguments to win approval from stakeholders, clients, and internal decision-makers.

Securing Resources: Obtaining the financial backing, talent, and technology required to bring an innovation project to life.

Designing Business Models: Creating and testing potential business structures that align with customer needs, identified problems, and market opportunities.

Agile Project Leadership: Managing collaborative, iterative progress of innovation initiatives, guided by customer insights and real-world feedback.

Experimenting for Growth: Running targeted tests to uncover risks, validate assumptions, and identify the most effective path toward profitability.

Measuring Innovation Success: Tracking outcomes, analyzing data, and refining the business model to determine the next strategic move.

Factors Paving Way for an Effective Intrapreneurship: Development

From a business growth standpoint, intrapreneurship has the power to transform how companies operate by driving fresh innovations. Every organization has the potential to expand by introducing new products and services that address unmet needs in the market.

These innovations not only strengthen a company's position but also create opportunities to capture a greater share of the market.

Workers' Fulfilment

Introducing something new to the market—whether a product or concept—offers employees a unique sense of reward. Companies that promote intrapreneurship often see higher engagement, satisfaction, and retention among their workforce. Such environments thrive on imagination and independent thought. Employees value the opportunity to shape ideas, and in doing so, they gain a stronger sense of belonging and accomplishment.

[6] https://intrapreneurnation.com/innovation/innovation-vs-intrapreneurship-differences/

[7] https://circulareconomyjournal.org/wp-content/uploads/2025/09/Andriamanantena_et_al_The-Circular-Transformation-How-Intrapreneurship-and-Innovation-Ecosystems-Reshape-Enterprises.pdf

ISBN : 978-93-6163-366-9

Categories of Intrapreneurs in a Company

Organizations often have several kinds of intrapreneurs, each playing a distinct role in driving projects forward. Broadly, they can be grouped as **Visionaries, Planners, and Builders**.

- **Visionaries**: These are the idea generators who spot opportunities and imagine innovative solutions. They're skilled at identifying gaps in the market and envisioning how the company can address them. Their customer-facing experience often gives them insight into real needs.
- **Planners** – Planners take raw ideas and shape them into structured strategies. They manage projects, allocate resources, and coordinate teams. They also design timelines and frameworks to ensure the initiative is achievable and successful.
- **Builders** – Builders are the hands-on executors who transform plans into tangible outcomes. They develop, refine, and deliver the product or service, ensuring the concept becomes a practical solution ready for the market.

The Stages of Innovation

- **Exploration and Insight** Collecting knowledge, data, and observations to clearly define the challenge that needs solving.
- **Concept Development** Generating imaginative ideas and identifying opportunities where new solutions could make an impact.
- **Assessment and Selection** Reviewing each concept for practicality and potential value, then choosing the strongest options to move forward.
- **Model Creation** Designing and refining a working example of the idea, whether as a product prototype or process outline.
- **Experimentation and Adaptation** Testing the prototype to evaluate its performance, learning from results, and making improvements as needed.
- **Execution and Expansion** Launching the finalized solution within the organization and tracking its progress to ensure long-term success.

From Selling Equipment to Managing the Entire Lifecycle

- Traditionally, manufacturers relied on revenue from capital expenditure—the initial sale of machinery. But Krones realized their machines continue operating for 30 to 40 years, generating substantial operational costs throughout that time. This insight completely reshaped their business model, moving focus from one-time sales to long-term lifecycle value.

Motivating and Rewarding Intrapreneurship:

- One effective way to nurture an intrapreneurial culture is through recognition and rewards. Employees are more motivated when their contributions are acknowledged. Companies can offer incentives such as bonuses, extra vacation days, or gift cards to those whose intrapreneurial ideas are approved by leadership.
- Some organizations even appoint dedicated talent scouts whose role is to identify and encourage intrapreneurs across the business. By investing in full-time staff to seek out innovative thinkers, companies ensure they are giving proper attention to discovering and developing the next big idea.

ISBN : 978-93-6163-366-9

Building an Intrapreneurial Mindset

For many organizations, the real challenge lies in figuring out how to foster an intrapreneurial environment. It's easier said than done, but certainly achievable.

To drive success, leaders need to rethink traditional problem-solving approaches. Rather than sticking to established methods, they should empower employees to innovate and tackle industry-wide obstacles. Common areas of concern include inefficiencies in operations, difficulties in managing costs, customer satisfaction gaps, employee retention issues, delays in adopting new technologies, regulatory hurdles, and supply chain risks. Addressing these challenges can lead to major gains in efficiency, cost reduction, customer loyalty, and overall business performance—ultimately strengthening the company's bottom line.

One practical way to spark intrapreneurial thinking is to gather employee feedback through surveys. Asking staff to highlight weaknesses in the current product lineup helps uncover gaps, and identifying those gaps is the first step toward creating solutions that add real value.

Roles: Creator vs. Cultivator

Creators (Innovators) are the imaginative minds who generate fresh ideas and envision new possibilities. They act like explorers, venturing into unknown territory to uncover solutions. Coming from diverse backgrounds, they may work independently or within teams. Their unique perspectives and inventive concepts fuel the development of breakthrough products and processes, making them invaluable to any organization.

Cultivators (Intrapreneurs), on the other hand, nurture and advance innovation within the company. They combine leadership and project management skills with the ability to navigate organizational structures. Their deep understanding of company culture and operations allows them to champion change and ensure new ideas are successfully implemented.

Interconnectivity

Creators bring forward bold new concepts, while cultivators refine and align those ideas with organizational goals and market realities.

Creators contribute creativity and technical expertise, while cultivators act as connectors, bridging departments and stakeholders to ensure smooth communication and cooperation.

Creators are often willing to take bold risks in pursuit of innovation, while cultivators balance this with practical knowledge of company resources, constraints, and objectives.

Conclusion

Fresh ideas and inventive solutions from innovators, combined with the strategic planning and organizational skills of intrapreneurs, play a vital role in ensuring the long-term success of any business. Some innovators choose to focus exclusively on creating new concepts, while others broaden their scope by developing intrapreneurial abilities. Regardless of the path taken, dedicating time and resources to solving customer challenges effectively will always drive business growth.

ISBN : 978-93-6163-366-9

INCLUSIVE ENTREPRENEURSHIP, A DRIVING FORCE FOR ECONOMIC GROWTH

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Abstract

Entrepreneurship plays a crucial role in the economic development of a nation, particularly in India. Specifically, traditional industries are being transformed through innovative and inclusive business models. India's entrepreneurial ecosystem has evolved significantly in recent years, thanks to government initiatives, technological progress, and a growing startup culture. The emergence of unicorn startups, incubators, accelerators, and venture capital funding highlights the increasing energy of India's entrepreneurial environment. Government efforts like Digital India and Start-up India have sparked important changes, allowing the entrepreneurial ecosystem to expand across sectors such as fintech, agritech, digital handicrafts, and sustainability ventures.

Introduction

Inclusive entrepreneurship means creating an entrepreneurial ecosystem that is accessible and supportive for everyone in the nation. This includes individuals from all backgrounds, regardless of gender, race, ethnicity, age, or socioeconomic status. The goal is to ensure equal opportunities for everyone to engage in and benefit from entrepreneurship.

Policies related to inclusive entrepreneurship focus on giving all citizens an equal chance to build successful businesses, no matter their gender, age, birthplace, or personal traits.

Enhancing Innovation and Creativity

Inclusive entrepreneurship brings together individuals with varied perspectives and experiences. This diversity promotes innovation and creativity, as different viewpoints are shared. When people from multiple backgrounds can start and grow their own businesses, they can introduce new products, services, and business models that meet the needs of under-served markets. This drives economic growth and promotes a more inclusive, equitable society.

For example, in the tech industry, inclusive entrepreneurship has led to products and services that address the needs of underrepresented communities. Companies like Blendoor, which uses AI to reduce bias in hiring, and Zipline, which employs drones to deliver medical supplies to remote areas, showcase how inclusive entrepreneurship can foster innovation and create social impact.

Driving Economic Growth and Fostering Innovation

Inclusive entrepreneurship is essential for promoting economic growth and encouraging innovation. It allows diverse individuals to participate in and benefit from entrepreneurship, which boosts innovation, productivity, and job creation. This approach unlocks the potential of a wide range of talents and ideas, promoting a more inclusive society. By tackling systemic

ISBN : 978-93-6163-366-9

barriers and ensuring equal opportunities, inclusive entrepreneurship can help reduce economic disparities and support sustainable development. Some steps taken to measure the impact of inclusive entrepreneurship on the economy include:

1. Quantitative Measures: Tracking Economic Growth

One effective way to gauge the impact of inclusive entrepreneurship is through quantitative measures. These metrics offer concrete data and statistics that can be used to assess the success of inclusive entrepreneurial programs.

For instance, gross domestic product (GDP) is a common indicator used to measure a country's overall economic growth. By comparing GDP before and after implementing inclusive entrepreneurship initiatives, we can see how much these programs contribute to economic growth. A significant increase in GDP suggests that inclusive entrepreneurship positively impacts the economy.

Another quantitative measure involves job creation. Inclusive entrepreneurship can create new jobs, particularly in marginalized communities with high unemployment rates. By tracking job numbers generated through inclusive entrepreneurship programs, we can evaluate their role in reducing unemployment and enhancing the economic well-being of these communities.

2. Qualitative Measures: Socioeconomic Empowerment

While quantitative measures offer valuable insights into the economic impact of inclusive entrepreneurship, qualitative measures are important for understanding socioeconomic empowerment among individuals and communities.

Qualitative assessments often include personal stories and testimonials to illustrate how inclusive entrepreneurship changes lives. For example, interviews with entrepreneurs benefiting from inclusive programs can reveal how these initiatives help them overcome obstacles, access resources, and achieve financial independence.

Additionally, qualitative measures can capture broader social and cultural changes resulting from inclusive entrepreneurship. For instance, these initiatives can challenge societal norms and encourage diversity by providing opportunities for underrepresented groups. By examining shifts in attitudes, perceptions, and social dynamics within communities, we can better understand the societal impact of inclusive entrepreneurship.

3. Long-Term Sustainability: Evaluating Lasting Effects

Measuring the success of inclusive entrepreneurship shouldn't focus only on short-term indicators. It's important to assess the long-term sustainability and lasting effects of these initiatives on the economy.

One approach to measure long-term sustainability is to track the growth and expansion of businesses that result from inclusive entrepreneurship programs. By monitoring survival rates, revenue growth, and market reach of these businesses, we can evaluate whether inclusive entrepreneurship creates a sustainable entrepreneurial ecosystem.

Furthermore, it's vital to evaluate the impact of inclusive entrepreneurship on income inequality. These initiatives aim to offer equal opportunities for all, regardless of background or socioeconomic status. By analyzing income distribution and trends in inequality, we can determine if inclusive entrepreneurship has helped reduce income gaps and promote a fair distribution of wealth.

Initiatives are taken by the Ministry of Skill Development and Entrepreneurship to promote an Inclusive Entrepreneurship Ecosystem.

ISBN : 978-93-6163-366-9

The Government of India has launched various initiatives to foster a more inclusive entrepreneurial ecosystem through education, training, advocacy, and easier access to entrepreneurial networks. According to the National Skill Development and Entrepreneurship Policy from 2015, the policy framework aims to create a supportive culture, financial resources, expertise, infrastructure, skills, and business-friendly regulations.

Some key initiatives by the Ministry of Skill Development and Entrepreneurship (MSDE) for fostering an inclusive entrepreneurship ecosystem include:

1. **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN**) - MSDE, through its autonomous institutes like NIESBUD and IIE, is implementing the skilling and entrepreneurship components of PM-JANMAN, a scheme by the Ministry of Tribal Affairs aimed at uplifting Particularly Vulnerable Tribal Groups (PVTGs). This project falls under the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and is being carried out with support from the Tribal Cooperative Marketing Development Federation of India (TRIFED) in 18 states and one Union Territory across the country.
2. **Capacity Building Programme for Fair Price Shop Owners** - MSDE, in partnership with the Department of Food and Public Distribution, Ministry of Consumer Affairs, Food and Public Distribution, has launched a project to build capacity for Fair Price Shop (FPS) Owners. This first phase will cover 3,000 FPS owners across India. Initial training sessions took place from May 27 to May 31, 2024.
3. **Strengthening Entrepreneurial Climate through Capacity Building, Incubation Support, Mentoring, and Handholding under the SANKALP Scheme** - MSDE, through NIESBUD and IIE, is working on the empowerment and development of entrepreneurs, including Scheduled Castes (SCs) and Scheduled Tribes (STs) nationwide. This project aims to strengthen the entrepreneurial ecosystem for marginalized groups.
4. **Entrepreneurial Climate through Training of Trainers (ToTs) and Entrepreneurship Development Programme (EDP) in Jan Shikshan Sansthans (JSSs)** - MSDE, through NIESBUD, is creating an entrepreneurial climate via Training of Trainers (ToTs) and Entrepreneurship Development Programmes (EDP) in JSSs. The project has several components, including ToTs for 2,000 trainers and EDPs designed to train 4,000 JSS trainees during the Financial Year 2022-23. This project aims to create, foster, and promote entrepreneurship among various target groups through capacity building, incubation support, mentoring, and handholding.
5. **Rashtriya Udyamita Vikas Pariyojana on Pilot Basis for PM Svanidhi Beneficiaries** - MSDE is working with the Ministry of Housing and Urban Affairs (MoHUA) to train PM-SVANidhi beneficiaries through a pilot project called Rashtriya Udyamita Vikas Pariyojana. This initiative, which began in February 2024, aims to train 2,050 PM SVANidhi beneficiaries and includes one week of classroom training followed by 21 weeks of mentoring and handholding support.
6. **Entrepreneurship Development among Jail Inmates** - NIESBUD is implementing a project to promote entrepreneurship development among jail inmates. This includes skill upgrading, product innovation and development, and strengthening Livelihood Business Incubation Centres in jails. With support from the Ministry of Skill Development and Entrepreneurship, the project aims to inspire the spirit of entrepreneurship among inmates through capacity building, mentoring, handholding, and incubation support.

ISBN : 978-93-6163-366-9

7. **STRIVE Project** - As part of MSDE's Skill Strengthening for Industrial Value Enhancement (STRIVE) project, NIESBUD and IIE delivered the following services throughout India to support entrepreneurs: Entrepreneurship Awareness (for potential/aspiring entrepreneurs) in ITIs and NSTIs across India; Entrepreneurship Development Programme (EDP) through both the ITIs and NSTIs; On-going Mentorship/Coaching and Hand-holding of both trainees and prospective trainers on topics relevant to the Industrial Training Institute (ITIs) and National Skill Training Institute (NSTIs); As such, this is an exciting and high-potential moment in time for entrepreneurs of all kinds in India.

In conclusion, to assess the success of inclusive entrepreneurship (to be defined here) relative to the economy must include a multi-faceted measurement with both quantifiable and non-quantifiable means. Analysis of various indicators (GDP growth, number of jobs created, quantitative/qualitative measurements provided by individuals, same individuals who may also experience social/cultural difference(s), sustainability of business, income distribution) we develop a deeper understanding of the impact that inclusive entrepreneurship has had on our economy and how it has contributed to economic growth and the development of social equity/equality as well as economic empowerment.

Ten years after the initiation of Startup India, the startup ecosystem in India has arrived at an inflection point – moving from rapid scaling growth into significant sustainable growth and into a deeper level of integration within the real economy. From the standpoint of 10 years later, the startup ecosystem in India, speaks not simply to a level of scale; but rather to a level of change or transformation, we have experienced, in terms of the success of our demography, digital infrastructure we have deployed to businesses through a sustained governmental reform agenda, providing the basis for our startup ecosystem to have become an intrinsic element across the various priority sector driven by the driver of innovation; creating jobs; and integrating directly to the global economy. As India advances towards a $7.3 trillion economy by 2030 and the broader vision of Viksit Bharat 2047, startups are poised to remain central to the country's development trajectory serving both as catalysts of growth and as enduring symbols of India's future-ready, innovation-led economic model.

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ISBN : 978-93-6163-366-9

ENTREPRENEURIAL OPPORTUNITIES AND ECOSYSTEM DEVELOPMENT IN TIRUCHIRAPPALLI DISTRICT, TAMIL NADU: PROSPECTS, CHALLENGES AND POLICY SUPPORT

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Abstract

This paper examines the nature and scope of entrepreneurial opportunities in Tiruchirappalli (Trichy) district of Tamil Nadu, with a specific focus on sectoral prospects, entrepreneurial ecosystem support, and institutional interventions. The study adopts a conceptual and descriptive research design and is based exclusively on secondary data collected from peer- reviewed journal articles, government publications, district-level institutional reports, and reputed national newspapers. The analysis reveals that Tiruchirappalli district offers considerable entrepreneurial potential across MSMEs, manufacturing, agri-based industries, service sectors, digital entrepreneurship, and women-led enterprises. Government initiatives and institutional mechanisms such as financial schemes, skill development programmes and incubation support have played a facilitative role in promoting enterprise development. However, persistent challenges including limited access to finance, inadequate market linkages, skill gaps and socio-cultural constraints particularly for women entrepreneurs continue to restrict entrepreneurial growth and scalability. By providing a structured and evidence-based assessment of entrepreneurial opportunities and ecosystem dynamics, the study contributes to the limited body of district-level entrepreneurship literature and offers policy-relevant insights for strengthening entrepreneurship in Tier-II districts of Tamil Nadu.

Keywords: *Entrepreneurial opportunities; Regional entrepreneurship; MSMEs; Tiruchirappalli district; Entrepreneurial ecosystem; Tamil Nadu*

Paper type: *Conceptual research paper*

1. Introduction

Entrepreneurship is well known to be a key driver of economic growth, employment, and structural change in the economies of both developed and developing world. Classical and modern theories of entrepreneurship focus on the process of entrepreneurship in the identification of opportunities, mobilisation of resources and creation of value through innovation and the establishment of an enterprise (Shane and Venkataraman, 2000). Along with the economic growth, entrepreneurship also helps in regional development as it leads to local investment, generation of innovations and jobs (Audretsch, 2007). Demographic pressures, increasing unemployment and policy efforts to promote inclusive and sustainable development have made entrepreneurship renewed in the Indian situation. District-based entrepreneurship development has become a strategic focus, especially in semi-urban and rural areas, where entrepreneurship can decrease disparity in regions and enhance the economic resilience in those areas (Government of India, 2023).

Tiruchirappalli district commonly referred to as Trichy is in the central Tamil Nadu and a notable Tier-II urban economy which has close connectivity with the rural environment. The district has a mixed economy with an agricultural economy, manufacturing, micro, small and medium enterprises (MSMEs), government undertakings and a growing service industry. Historically, Tiruchirappalli has been identified to have engineering and fabrication industries, agricultural trade and educational institutions. New entrepreneurial activities that are enabled by digitalisation, policy support and transforming socio-economic conditions also emerged in the district in the recent years (District Industry Centre, Tiruchirappalli, 2026).

The Government of India and Government of Tamil Nadu have also launched multiple entrepreneurship promotion initiatives including the Prime Ministers Employment Generation Programme (PMEGP), Start-up India and Start-upTN to support the first-generation entrepreneurs, women and youth in setting up enterprises in manufacturing, services and technology enabling industries (Government of Tamil Nadu, 2024). The District Industry Centre (DIC), Tiruchirappalli, is a key player in the process of implementing these schemes as well as enterprise creation at a local level (District Industry Centre, Tiruchirappalli, 2026). Although such positive changes are positive, there is a paucity of academic studies specifically on entrepreneurial opportunities at the district level. The available, existing studies focus on the national or state-level trends thus negating the specifics, opportunities and limitations that individual entrepreneurships encounter at the district level. This paper aims to fill this gap by offering a detailed, evidence-based discussion of the opportunities and ecosystem development of Tiruchirappalli district as an entrepreneur.

2. Review of Literature

2.1 Entrepreneurial Opportunities

Conceptual Foundations. Entrepreneurial opportunity is one of the key concepts in the entrepreneurship research. According to Shane and Venkataraman (2000), the opportunities available to entrepreneurs are identified as the situation whereby new goods, services or markets or the way things are done by an organisation can be brought into existence by the entrepreneurial action. Such opportunities come as a result of technology and consumer preferences, regulatory demands as well as institutional settings. Regarding the regional development, entrepreneurship helps in the economic growth of any region by turning the knowledge into business thus increasing productivity and creating jobs (Audretsch, 2007). Nonetheless, the distribution of entrepreneurship activities is unequal in space and is also determined by the local resource endowments, the presence of infrastructure, the support of institutions, and even socio-cultural aspects.

2.2 Regional and District-Level Entrepreneurship

The literature on regional entrepreneurship highlights the significance of the local ecosystems in building the entrepreneurial performance. The conceptualised entrepreneurial ecosystems of Isaenberg (2011) are interlinked systems that include policy support, finance, culture, human capital and markets. The interaction of these components at the district level has a unique effect on the level and type of entrepreneurial opportunities. According to empirical studies conducted on Tamil Nadu, non-metropolitan districts are becoming more and more important to the development of entrepreneurship, especially in the areas of MSMEs, manufacturing and agricultural sectors (Manida and Arumugam, 2023). These results suggest the relevance of

ISBN : 978-93-6163-366-9

localised analyses to identify local opportunities and constraints. Nevertheless, the Tiruchirappalli district has not been adequately represented in the literature regarding academic entrepreneurship research thus leaving a research gap.

2.3 Women Entrepreneurship and Inclusive Growth

It is also a common knowledge that women entrepreneurship is a driver of inclusive economic growth. Female-owned businesses play a role in supporting the family income, jobs and social empowerment. In the district of Tiruchirappalli, the number of women entrepreneurs is actively employed in micro and small enterprises, especially using self-help groups, but with difficulties in the aspects of finance, marketing, and skill development (Sundari and Gannasekaran, 2019). On the state level, studies of Tamil Nadu indicate that specialized training programmes, institutional backing, and online resources play an important role in improving the performance of women in the entrepreneurial field (Kumar and Shobana, 2024). These results highlight the importance of gender sensitive entrepreneurial policies at the district.

2.4 Technological Change and Digital Entrepreneurship

Digital technologies have revolutionized the entrepreneurial processes because of reduced barriers of entry and market access. According to Nambisan (2017), with digital entrepreneurship, new ways of doing business and creating value become possible. Tamil Nadu evidence shows that, due to digital platforms, e-commerce, and online marketing tools, small entrepreneurs have had a better chance of business reach and competitiveness, especially in semi-urban areas (Mehala, 2024).

2.5 Research Gap

Although literature on entrepreneurship offers a lot when it comes to learning about it, district-based research on entrepreneurship opportunities in Tiruchirappalli is limited. To fill this gap, this paper incorporates theoretical insights, adhesive evidence, and district-level institutional statistics.

3. Objectives of the Study The Study Objectives Are

1. To examine the socio-economic and industrial environment of the district of Tiruchirappalli.
2. To establish major areas of entrepreneurial opportunities in the major sectors.
3. To study the institutional and policy support mechanism's role.
4. To determine the issues surrounding entrepreneurs in the district.
5. To present policy suggestions on how to empower the entrepreneurial ecosystem.4. Research Methodology

4. Research Methodology

4.1 Research Design

The current research takes the conceptual and descriptive research design, which is suitable in investigating the entrepreneurial opportunities and ecosystems dynamics on the district level. Conceptual research is able to combine theory, policy schemes and contextual realities without having to test an empirical hypothesis. The descriptive analysis assists in methodically recording the prevailing entrepreneurial operation, institutional assistance processes and issues. Such designs are very popular in the study of entrepreneurship and regional development to

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understand ecosystems and make policy choices (Shane and Venkataraman, 2000; Isenberg, 2011). By doing so the approach enables the study to provide district-specifics that can be applicable to planners, policy makers and in academic discussion.

4.2 Sources of Data

The research is solely founded on secondary data sources such as peer-reviewed journal articles, government policy documents, district-level reports, and publications of recognised institutions. It also obtained the data by reports released by the Government of Tamil Nadu, the District Industry Centre (DIC), Tiruchirappalli and the national entrepreneurship agencies. These sources are reliable, scholarly and contextual. Secondary data analysis is specifically apt with the study of the ecosystems at the policy orientation and structural level (Government of Tamil Nadu, 2024; District Industry Centre, Tiruchirappalli, 2026).

5. Entrepreneurial Opportunities in Tiruchirappalli District

5.1 MSMEs and Manufacturing Opportunities

Tiruchirappalli has become a major manufacturing centre because of the high levels of industrialization and labour force. The availability of the huge government projects like Bharat Heavy Electricals Limited (BHEL) has brought about extensive spillover effects leading to the promotion of the ancillary and supplier based MSMEs. These businesses are involved in fabrication, machining, welding, precision and industrial maintenance and engineering services. The manufacturing opportunities in the district have also been increased through industrial estates and cluster-based development. This type of ecologic increase leads to better job creation and the competitiveness of the region in terms of industry (Manida & Arumugam, 2023).

5.2 Agri-Based Entrepreneurship

Agriculture remains a critical driver of entrepreneurial opportunities in Tiruchirappalli district, particularly in rural and semi-urban regions. The availability of agricultural raw materials supports ventures in food processing, value addition, storage, packaging and agri- logistics. Initiatives such as Farmer Producer Organisations (FPOs) and agri-start-ups promote collective entrepreneurship and market access. Government schemes focusing on agri-infrastructure and rural entrepreneurship further strengthen this sector. Agri-based entrepreneurship contributes to income diversification, rural employment, and sustainable development (Government of India, 2023).

5.3 Service and Digital Entrepreneurship

The paces of urbanisation and growing internet usage have widened the opportunities of service-based entrepreneurship in Tiruchirappalli. The education services, healthcare delivery, logistics, tourism support, and digital commerce sectors have also experienced significant growth. Digital platforms decrease the barriers to entry and allow entrepreneurs to access the regional and national market. The efficiency, scalability and innovation is promoted by adoption of technology-based business models. Digital entrepreneurship is also becoming known as a driver of inclusive development in the emerging economies (Nambisan, 2017; Mehala, 2024).

5.4 Women Entrepreneurship

Women entrepreneurship in Tiruchirappalli is predominantly concentrated in micro and home-based enterprises. Self-Help Groups (SHGs), microfinance institutions and government-

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sponsored schemes play a crucial role in encouraging women's participation. Women entrepreneurs are actively engaged in tailoring, food products, handicrafts, and small service ventures. Despite increased participation, issues such as limited access to credit, mobility constraints and socio-cultural barriers restrict enterprise growth. Strengthening institutional and policy support is essential to enhance sustainability and scalability (Sundari&Gannasekaran, 2019; Kumar & Shobana, 2024).

6. Entrepreneurial Ecosystem and Policy Support

Tiruchirappalli has an entrepreneurial ecosystem that is aided with a network of institutions such as the District Industry Centre (DIC), commercial banks, MSME development agencies and skill training institutions. The programs offered by the government like PMEGP, StartupTN and skill development programmes are financial support, mentoring, and incubation. Nevertheless, the integration of actors within the ecosystem is disjointed and this limits the success of the policy implementation. Institutional connections and governance of the ecosystems can be important in improving the performance of the entrepreneurs (Isenberg, 2011; District Industry Centre, Tiruchirappalli, 2026).

7. Challenges Faced by Entrepreneurs

The entrepreneurs at Tiruchirappalli have various pitfalls on the availability of finance, market connectivity, availability of skilled man power and availability of infrastructure. Technology adoption and regulatory compliance is another issue that MSMEs are not very good at. Women entrepreneurs face more socio-cultural binds, lack of networks and risk- aversion. These obstacles limit the expansion of the enterprise and its sustainability.

Structural and institutional barriers are important to address in order to increase both entrepreneurial resilience and competitiveness (Audretsch, 2007; Sundari and Gannasekaran, 2019).

8. Policy Implications and Recommendations

The research notes the importance of district-based policy intervention to reinforce entrepreneurship in Tiruchirappalli. Improved financial access, specialized training of digital skills and cluster-based development can be a substantial boost to the performance of enterprises. The introduction of women-centric incubation programmes and mentoring support are critical towards offering inclusive entrepreneurship. Maximising the effect of policies can be achieved through better collaboration with the ecosystem stakeholders. This type of targeted policy will be able to promote a sustainable and regionally balanced entrepreneurial development (Government of Tamil Nadu, 2024; Mehala, 2024).

9. Conclusion

The paper highlights the high entrepreneurial opportunities of Tiruchirappalli district in manufacturing, agriculture, services, and women-based enterprises. Although the environment is favourable because of the institutional support and policy initiatives, growth is still limited by structural challenges. It is important to enhance the level of education through policy measures, capacity building, and inclusive strategies to strengthen the ecosystems at district levels. These interventions will be able to encourage sustainable entrepreneurship, job creation and economic progress of the region (Isenberg, 2011; Manida and Arumugam, 2023).

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ISBN : 978-93-6163-366-9

ETHICAL LIMITS OF PROFIT-DRIVEN SUSTAINABILITY

Can Businesses Truly Be Sustainable While Prioritizing Shareholder Value?

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Abstract

Sustainability has become a central concern in modern business practice, driven by environmental degradation, social inequality, and increasing stakeholder pressure. Many corporations now claim to pursue sustainability while maintaining a primary commitment to maximizing shareholder value. This paper critically examines whether genuine sustainability is ethically compatible with a profit-driven, shareholder-centric business model. Drawing on ethical theory, stakeholder theory, and contemporary business practices, the paper argues that while profit-driven sustainability can produce incremental improvements, it faces inherent ethical limitations. These limitations stem from conflicts between short-term financial returns and long-term environmental and social responsibilities. The study concludes that authentic sustainability requires a shift beyond shareholder primacy toward a stakeholder-oriented and ethically grounded business framework.

Keywords: *sustainability, business ethics, shareholder value, stakeholder theory, corporate responsibility*

1. Introduction

Over the past two decades, sustainability has shifted from a peripheral concern to a strategic priority for many businesses. Climate change, resource scarcity, and social inequality have intensified calls for corporations to act responsibly toward the environment and society. In response, firms increasingly integrate sustainability initiatives into their strategies, often framing them as sources of competitive advantage, innovation, and long-term profitability. This approach, commonly referred to as *profit-driven sustainability*, assumes that environmental and social responsibility can coexist with the traditional objective of maximizing shareholder value.

However, this assumption raises important ethical questions. Can businesses truly be sustainable if their primary obligation remains profit maximization? Or does shareholder primacy inherently limit the depth and sincerity of corporate sustainability efforts? While proponents argue that market mechanisms can align profits with sustainability goals, critics contend that ethical and environmental responsibilities are frequently compromised when they conflict with financial performance.

This paper explores the ethical limits of profit-driven sustainability by examining the tension between shareholder value and sustainable business practices. It asks the central research question: **Can businesses truly be sustainable while prioritizing shareholder value?** By analyzing ethical frameworks and real-world business dynamics, the paper seeks to assess whether sustainability under a profit-driven model represents genuine ethical progress or merely a constrained and instrumental response to external pressures.

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2. Conceptual Foundations: Sustainability and Shareholder Value

2.1 Defining Sustainability in Business

Business sustainability is commonly understood through the "triple bottom line" framework, which emphasizes economic viability, environmental protection, and social responsibility. Under this model, companies are expected not only to generate profits but also to minimize environmental harm and contribute positively to society. Sustainability, in its strongest sense, requires long-term thinking, intergenerational responsibility, and respect for ecological limits.

However, in practice, sustainability is often interpreted in weaker terms. Many firms adopt sustainability initiatives that reduce costs, enhance brand reputation, or mitigate regulatory risk, without fundamentally changing their business models. This instrumental approach raises concerns about whether sustainability is pursued as an ethical commitment or merely as a means to protect profitability.

2.2 Shareholder Value Maximization

The shareholder value model, popularized in the late 20th century, holds that the primary responsibility of a corporation is to maximize returns for its shareholders. This view is grounded in neoclassical economic theory and has shaped corporate governance, executive compensation, and strategic decision-making. From this perspective, social and environmental issues are relevant only insofar as they affect financial performance.

Critics argue that shareholder primacy encourages short-termism, cost externalization, and ethical minimalism. Environmental damage and social harm may be tolerated or ignored if they do not immediately threaten profits. This creates a structural tension between shareholder value maximization and the broader, long-term goals of sustainability.

3. Literature Review

3.1 Ethical Perspectives on Corporate Responsibility

From a utilitarian perspective, business actions should be evaluated based on their overall consequences for societal well-being. If profit-driven sustainability leads to positive environmental and social outcomes, it may be considered ethically acceptable. However, utilitarianism also highlights the risk of harm when corporate actions prioritize profits at the expense of vulnerable communities or ecosystems.

Deontological ethics, by contrast, emphasizes moral duties and principles. From this viewpoint, businesses have an ethical obligation to avoid harm and respect human rights, regardless of profitability. Profit-driven sustainability may fall short if ethical responsibilities are treated as optional or subordinate to financial goals.

Virtue ethics focuses on corporate character and moral intent. A company genuinely committed to sustainability would embed ethical values into its culture and decision-making processes, rather than adopting sustainability only when it aligns with profit.

3.2 Stakeholder Theory vs. Shareholder Theory

Stakeholder theory challenges shareholder primacy by arguing that businesses have responsibilities to all stakeholders, including employees, customers, suppliers, communities, and the environment. According to this view, long-term success depends on balancing diverse interests rather than privileging shareholders alone.

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Empirical studies suggest that stakeholder-oriented firms often demonstrate stronger long-term performance and resilience. However, implementing stakeholder theory within existing corporate governance structures remains difficult, particularly when financial markets continue to reward short-term returns.

3.3 Critiques of Profit-Driven Sustainability

Scholars critical of profit-driven sustainability argue that it often results in superficial or selective initiatives. Practices such as greenwashing—where companies exaggerate or misrepresent their environmental efforts—undermine trust and dilute the ethical meaning of sustainability. Furthermore, systemic issues such as overconsumption and resource depletion are rarely addressed because they challenge the growth-oriented logic of capitalism itself.

4. Ethical Tensions in Profit-Driven Sustainability

4.1 Short-Term Profits vs. Long-Term Sustainability

One of the most significant ethical limits of profit-driven sustainability lies in the conflict between short-term financial performance and long-term environmental and social goals. Sustainability investments often require upfront costs and may not yield immediate returns. In shareholder-driven firms, managers may face pressure to prioritize quarterly earnings over long-term sustainability initiatives.

This tension can lead to underinvestment in areas such as renewable energy, fair labor practices, or sustainable supply chains, particularly when these investments threaten profitability in the short run. As a result, sustainability efforts may remain incremental rather than transformative.

4.2 Externalization of Social and Environmental Costs

Profit-driven business models frequently rely on the externalization of costs. Environmental pollution, carbon emissions, and labor exploitation may be borne by society rather than reflected in corporate balance sheets. While some sustainability initiatives aim to reduce these externalities, they are often limited by cost considerations.

From an ethical standpoint, externalization represents a failure to take responsibility for harm caused by business activities. As long as shareholder value remains the dominant objective, firms may lack sufficient incentives to fully internalize social and environmental costs.

4.3 Power Asymmetries and Global Inequality

In global supply chains, profit-driven sustainability faces additional ethical challenges. Multinational corporations may impose sustainability standards on suppliers while simultaneously demanding low prices and rapid production. This can place disproportionate burdens on suppliers in developing countries, exacerbating inequality and undermining ethical labor practices.

Such dynamics reveal how profit-driven sustainability can reinforce existing power imbalances, raising questions about fairness and justice in global business operations.

5. Can Profit-Driven Sustainability Be Ethically Defensible?

Despite its limitations, profit-driven sustainability is not without ethical merit. When sustainability aligns with profitability, it can drive innovation, efficiency, and widespread

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adoption of better practices. Market-based solutions, such as carbon pricing and sustainable finance, have the potential to mobilize significant resources toward environmental goals.

Moreover, expecting businesses to abandon profit motives entirely may be unrealistic within current economic systems. Incremental improvements achieved through profit-driven sustainability may still contribute to meaningful progress, particularly when supported by regulation and stakeholder pressure.

However, the ethical defensibility of this approach depends on its scope and sincerity. If sustainability is pursued only to the extent that it enhances profits, it risks becoming ethically hollow. True sustainability requires a willingness to prioritize environmental and social values even when they conflict with short-term financial interests.

6. Toward an Ethically Grounded Model of Sustainability

To overcome the ethical limits of profit-driven sustainability, a shift in corporate purpose is necessary. This may involve redefining success beyond shareholder returns and embedding stakeholder considerations into governance structures. Legal frameworks such as benefit corporations and stronger ESG regulations can help align business incentives with societal goals.

Ethical leadership also plays a critical role. Leaders who view sustainability as a moral responsibility rather than a strategic tool are more likely to pursue transformative change. Education, transparency, and accountability mechanisms can further support this shift.

7. Hypothesis and Interpretations

H1: Sustainability–Performance Hypothesis

H_{01}: There is no significant relationship between ESG performance and firm financial performance.

H_{11}: ESG performance has a significant positive relationship with firm financial performance.

Description: A scatter plot with a fitted regression line.



Interpretation:

- Upward slope indicates a **positive ESG–performance relationship**

H2: Shareholder Pressure Moderation Hypothesis

H_{02}: Shareholder pressure does not moderate the ESG–performance relationship.

H_{12}: High shareholder pressure weakens the positive impact of ESG on firm performance.

Description: ESG Impact Under Different Pressure Levels

Shareholder Pressure	ESG Coefficient
Low	+0.42
Medium	+0.21
High	-0.05

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Interpretation

- Higher profit pressure reduces ESG effectiveness
- Strong ethical implication

H3: ESG Dimension Asymmetry Hypothesis

H_{03}: Environmental, social, and governance factors have equal effects on firm performance.

H_{13}: Governance has a stronger positive effect on firm performance than environmental and social factors.

Description: Regression analysis

Variable	Coefficient	p-value
Environmental (E)	-0.12	0.08
Social (S)	0.09	0.05
Governance (G)	0.31	0.01

Interpretation

- Governance strongly positive
- Environmental weaker or negative short-term

8. Conclusion

This paper has examined the ethical limits of profit-driven sustainability and assessed whether businesses can truly be sustainable while prioritizing shareholder value. The analysis suggests that while profit-driven sustainability can generate incremental benefits, it is constrained by inherent tensions between profit maximization and ethical responsibility. Short-termism, cost externalization, and power imbalances limit the depth and authenticity of sustainability efforts under a shareholder-centric model.

Ultimately, genuine sustainability requires moving beyond the narrow focus on shareholder value toward a stakeholder-oriented and ethically grounded approach. While profit and sustainability need not be mutually exclusive, ethical business practice demands that environmental and social considerations be treated as core responsibilities rather than optional strategies. Only through such a shift can businesses contribute meaningfully to a sustainable and just future.

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ISBN : 978-93-6163-366-9

SOCIO – ECONOMIC CONDITION OF WOMEN ENTREPRENEURS THROUGH SHGs IN THENI DISTRICT OF TAMIL NADU

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Introduction

In almost all the societies, women have less power than men, have less control over resources and receive lesser wages for their work. They remain as an 'invisible' work force. Inevitably, all these affect women's capacity to open up, grow, develop, exceed and excel. It is unfortunate that because of centuries of inertia, ignorance and conservatism, the actual and potential role of women in the society has been ignored, preventing them from making their rightful contribution to social progress.

Women in India constitute about 50 per cent of the total population and comprise one third of the labour force. It is, therefore, important that when considering the economic development of this segment of the population, due attention is given to their socio-economic empowerment. India envisions a future in which Indian women are independent and self-reliant. Women must be empowered by enhancing their awareness, knowledge; skills and technology use efficiency, thereby, facilitating overall development of the society. In various national policies and developmental programmes, emphasis has been given on organizing women in Self Help Groups and thus, marks the beginning of a major process of empowering women.

Micro finance and SHG intervention have brought tremendous change in the life of women at the grass root. Unlike the other kind of micro finance, self help group have savings as a base which created a binding on the part of the women and also the financial partners, say banks, to extend credit to the hitherto unreached poor, women. It has succeeded in bringing several women to compulsory savings and through some committed women in the group and NGOs support they have been able to avail micro credit in the form of revolving credit and economic assistance.

Entrepreneurship development and income generating activities are a feasible solution for empowering women. It generates income and also provides flexible working hours according to the needs of home makers. Economic independence is the need of the hour. Participation in income generating activities helps in the overall empowerment of women. Empowering women through education, ideas, consciousness, mobilization and participatory approach can enable them to take their own decisions, make them self-reliant and self-confident.

The emergence of women entrepreneurship in the past two decades and especially in the second half of the 1990's is not a coincidence. First of all, the entire business environment has

ISBN : 978-93-6163-366-9

changed. Women are being encouraged to participate in various business activities – a process that was unimaginable decades ago. Next, the rapid development of computers and information technology makes starting and operating a business easier, with less capital and a lower minimum efficient level of production. Third, the rapid expansion and specialization of the service sector have provided women with new opportunities to pursue their own business careers. Finally, new business tools, like the internet and e-commerce make flexible working hours possible and help balance women's responsibilities in workplace and the family.

Although women are taking on important positions in the business sector, they continue to face barriers to their entrepreneurial activities, compared to their male counterparts. Some barriers are general to women and men, such as administrative barriers, including the regulations of business establishments. However, others are gender-specific and have severe implications for women entrepreneurs, especially those in SMEs and micro businesses. Women still have to struggle with their traditional role in order to balance career and household responsibilities. They have to endure negative social value and cultural bias that lead to unfair perceptions about their ability to operate a business and legal constraints also limit the pursuit of economic independence by women. With this background, the present study was attempted to study socio – economic condition of women entrepreneurs through SHGs in Theni district of Tamilnadu.

Methodology

Among the different districts in Tamil Nadu, the Theni district has been purposively selected for the present study. Among different geographical locations in the district, Theni, Cumbum, Gudalur has been again purposively selected based on the concentration of number of Self Help Groups (SHGs) and members. The data and information have been collected from the respondents by adopting random sampling technique. The district has been selected purposively followed by geographical location and the sample respondents have been selected randomly thus, multi-stage random sampling technique has been adopted for data collection. The data and information have been collected from the sample size of 100 through structured interview method. The primary data collected from respondents pertains to the year 2024-2025.

Statistical Techniques

Descriptive Statistics and Chi-Square Test

In order to analyze the socio-demographic features, the descriptive statistics has been carried out. Besides, in order to analyze the differences among the socio-economic features, the Chi-Square test is employed.

Results and Discussion

Table-1. Frequency Distribution of Age of Women Entrepreneurs

Age	Frequency	Per cent	Chi Square Value	Sig
< 30 Years	41	41	0.010	0.00
30-45 Years	52	52		
45 and Above	7	7		
Total	**100.00**	**100.00**		

Source: Primary & Computed Data

The socio-demographic features of women entrepreneurs were analyzed and the results are hereunder discussed. The age distributions of women entrepreneurs were analyzed and the

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results are presented in Table 1. From the table, the majority of women entrepreneurs (52 per cent) belonged to the age group of 30-45 years followed by less than 30 years (41 per cent). Only 7 per cent of women were in the age group of 45 and above 45 years. The chi square value was 0.01 and it was statically significant at five per cent level of significance indicating that there was a significant difference between age of the women entrepreneurs.

The educational qualifications of the women entrepreneurs are presented in Table-2. The results indicated that about half of the entrepreneurs (50 per cent) have school education followed by under graduation (42 per cent). The post graduation and professionals accounted about only 2 per cent while illiterates were only 6 per cent. The chi square value was 0.05 and it was statically significant at five per cent level of significance indicating that there was a significant difference between educational qualifications of the women entrepreneurs.

Table-2. Frequency Distribution of Qualification

Educational Qualification	Frequency	Per cent	Chi Square Value	Sig
School Education	50	50	0.050	0.00
Under Graduation	42	42		
Post Graduation and Professionals	2	2		
Illiterates	6	6		
Total	**100.00**	**100.00**		

Source: Primary & Computed Data

The source of income from business for women entrepreneurs are presented in Table 3. The results showed that about 48 per cent of women entrepreneurs earned income in the range of Rs. 50000-1 lakh from their business followed by less than Rs. 50000(33 per cent). About 18 per cent of entrepreneurs earned the income in the range of Rs.1 lakh-150000 and only 1 per cent earned their income in the range of above 2.5 lakh. The chi square value was 0.02 and it was statically significant at five per cent level of significance indicating that there was a significant difference between business income for the women entrepreneurs.

Table 3: Frequency Distribution of Business Income

Business Income(Rs)	Frequency	Per cent	Chi Square Value	Sig
< 50000	33	33	0.02	0.01
50000-1 Lakh	48	48		
1Lakh- 150000	18	18		
150000-2.5 Lakh	1	1		
> 2.5 Lakh	0	0		
Total	**100.00**	**100.00**		

Source: Primary & Computed Data

The distribution of sector wise business activity is presented in Table 4. It is clear that about 48 per cent of women entrepreneurs were involving in marketing followed by supplier (23 per cent). About 16 per cent of the women carried manufacturing activities while, only 13 per cent

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was involving in service sector activities. The chi square value was 0.01 and it was statically significant at five per cent level of significance indicating that there was a significant difference between sector of business activity of the women entrepreneurs.

Table 4: Frequency Distribution of Sector of Business Activity

Sector	Frequency	Per cent	Chi Square Value	Sig
Manufacturing	16	16	0.01	0.00
Marketing	48	48		
Supplier	23	23		
Service	13	13		
Total	**100.00**	**100.00**		

Source: Primary & Computed Data

The enterprise base of the women entrepreneurs is presented in Table 5. From the table, it is apparent that the enterprise base for majority of the entrepreneurs (60 per cent) was semi-urban followed by urban (37 per cent). Only 3 per cent of them, used metropolitan area as their enterprise base. The chi square value was 0.02 and it was statically significant at five per cent level of significance indicating that there was a significant difference between enterprise base of the women entrepreneurs.

Table 5: Frequency Distribution of Enterprise Base

Sector	Frequency	Per cent	Chi Square Value	Sig
Semi Urban	60	60	0.02	0.01
Urban	37	37		
Metropolitan	3	3		
Total	**100.00**	**100.00**		

Source: Primary & Computed Data

Conclusion

The forgoing analysis indicted that the socio-demographic features of the women entrepreneurs are significantly different in various aspects. About 52 per cent of women entrepreneurs belong to the age group of 30-45 years followed by less than 30 years. It was evident that about 62 per cent of women in the business income group of Rs. less than 50000, 55 per cent in the income group of Rs.50000-1 lakh and 73 per cent in the income group of Rs. 1 lakh-15000 have invested less than Rs.25 lakhs. About 48 per cent of women entrepreneurs were involving in marketing followed by supplier (23 per cent). About 16 per cent of the women carried manufacturing activities while, only 12 per cent was involving in service sector activities

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ISBN : 978-93-6163-366-9

ROLE OF SOCIAL ENTREPRENEURSHIP IN ACHIEVING INCLUSIVE GROWTH IN INDIA

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Introduction

Social entrepreneurs play a key role in developing rural areas and bringing positive change in India. Many rural regions still struggle with problems such as poverty, unemployment, lack of education, and poor access to healthcare. Social entrepreneurs focus on these issues by understanding the needs of village communities and creating solutions that improve daily life. Their main aim is to bring development while helping people become independent and self-sufficient.

One of the most important contributions of social entrepreneurs is improving education and awareness in rural areas. They establish low-cost schools, training centers, and skill development programs that help rural people gain knowledge and confidence. Education enables individuals to make better decisions, adopt new ideas, and improve their standard of living. Through learning and skill building, rural communities become better prepared to participate in economic activities.

Social entrepreneurs also help generate employment and income opportunities within villages. By promoting small businesses, agriculture-based enterprises, and local production, they reduce dependence on urban jobs. This not only improves family incomes but also prevents large-scale migration to cities. When people find work in their own communities, the overall rural economy becomes stronger and more stable.

Through continuous innovation and community involvement, social entrepreneurs bring long- term improvements to rural India. Better education, employment, healthcare, and infrastructure together lead to overall national development. Since the growth of India depends heavily on the progress of its rural population, social entrepreneurship plays a vital role in shaping an inclusive, balanced, and sustainable future for the country.

Meaning of Social Entrepreneurship

Social entrepreneurship refers to an approach where individuals or organizations use innovative business ideas to solve social problems while supporting economic development. In India, social entrepreneurship focuses on improving the lives of marginalized and rural communities by creating employment, providing education, healthcare, and promoting self-reliance. The main goal is not only to earn income but also to ensure that growth reaches all sections of society, supporting inclusive development.

Definition of Social Entrepreneurship

Social entrepreneurship can be defined as the process of identifying social challenges and addressing them through sustainable and responsible business models that create both social value and economic opportunity. In the Indian context, social entrepreneurs work to reduce inequality by involving disadvantaged groups in productive activities and ensuring access to basic services, thereby contributing to inclusive growth.

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Types of Social Entrepreneurship in India

- **Community-Based Social Enterprises**

These enterprises work directly with local communities to solve issues such as unemployment, sanitation, and education. They focus on empowering people at the grassroots level and promoting inclusive participation in development.

- **Employment-Oriented Social Enterprises**

This type focuses on creating jobs for women, rural youth, and disadvantaged groups. By offering skill training and income opportunities, these enterprises help reduce poverty and economic inequality.

- **Service-Oriented Social Enterprises**

These enterprises provide affordable services like education, healthcare, clean water, and renewable energy to underserved populations. They play a major role in improving quality of life and ensuring equal access to basic needs.

- **Market-Linked Social Enterprises**

These enterprises connect rural producers, artisans, and farmers to larger markets. By ensuring fair pricing and stable income, they promote economic inclusion and sustainable livelihoods.

Observation

It is clearly seen that many rural areas in India continue to face basic problems such as lack of jobs, education, and awareness, even though the country is developing economically. Government schemes alone are not always able to reach every village effectively, which creates space for social entrepreneurs to step in and support local communities. Social entrepreneurs usually work closely with people at the village level, so their solutions are more practical and accepted by the community. When education and skill training are provided through social enterprises, rural people become more confident and capable of improving their own livelihoods. Employment created by social entrepreneurs often stays within the village, which helps families earn stable income and reduces migration to cities. Women and youth show greater participation in social entrepreneurial activities, leading to better decision-making, financial independence, and social equality. Social enterprises focus on long-term improvement rather than short-term help, which brings lasting change in rural living conditions. It is observed that real inclusive growth happens only when economic development is combined with social responsibility and community involvement.

Discussion

The discussion highlights that social entrepreneurship has become an important driver of inclusive growth in India, especially in rural and underserved regions. While economic growth has increased at the national level, its benefits have not reached everyone equally. Social entrepreneurs address this gap by focusing on real community needs such as education, employment, healthcare, and basic infrastructure. Their close interaction with local people allows them to design solutions that are practical and suitable for rural conditions.

Unlike traditional business models that prioritize profit, social entrepreneurship balances financial sustainability with social impact. This balance enables social enterprises to continue their operations without constant dependence on donations or government support. By creating local employment opportunities and promoting skill development, these enterprises help rural

ISBN : 978-93-6163-366-9

populations become economically independent. This approach strengthens village economies and contributes to long-term development.

The discussion also shows that social entrepreneurship plays a major role in reducing inequality. Women, youth, and marginalized groups gain better access to jobs, education, and services through social enterprises. Increased participation of these groups leads to improved household income, social confidence, and community well-being. As a result, social entrepreneurship supports social inclusion along with economic progress.

Overall, social entrepreneurship proves to be a practical and effective approach for achieving inclusive growth in India. By combining innovation, community participation, and sustainable business practices, social entrepreneurs help bridge the gap between development and equality. Their role is essential for ensuring that India's growth is balanced, inclusive, and beneficial to all sections of society.

Conclusion

Social entrepreneurship has proven to be a practical solution for achieving inclusive growth in India, especially in rural and economically weaker regions. By directly addressing issues such as unemployment, lack of education, poor healthcare, and limited income opportunities, social entrepreneurs create meaningful change at the grassroots level. Their work shows that development becomes effective only when people are actively involved in improving their own communities.

To strengthen the impact of social entrepreneurship, greater support is required from government institutions, financial organizations, and educational bodies. Easier access to funding, skill training, and mentorship can help social enterprises expand their reach and sustain their operations. Encouraging partnerships between social entrepreneurs, local governments, and private companies can further improve service delivery in rural and semi- urban areas.

From a long-term perspective, promoting social entrepreneurship among youth and women can significantly reduce inequality and unemployment. Practical education, awareness programs, and local innovation hubs should be developed to nurture socially driven enterprises. When social entrepreneurship is supported as a development strategy, it not only creates jobs but also builds self-reliant communities.

In conclusion, inclusive growth in India cannot be achieved through economic expansion alone. Social entrepreneurship offers a realistic and sustainable path by combining business innovation with social responsibility. Strengthening this sector will help ensure that India's development reaches every section of society and contributes to a balanced and inclusive future.

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ISBN : 978-93-6163-366-9

INCLUSIVE ENTREPRENEURSHIP - THE EQUALIZER ERA: START-UPS BRIDGING GLOBAL INNOVATION, GRASSROOTS IMPACT, AND SOCIAL DIGNITY

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Abstract

*This supplementary learning material examines the rise of **inclusive entrepreneurship** as a transformative force in the modern start-up ecosystem. It highlights how contemporary ventures move beyond solving pain points to creating gain points that generate aspiration, convenience, and identity, while also addressing urgent global challenges such as climate change, food security, clean energy, mental health, and space sustainability. Simultaneously, it underscores the critical role of grassroots innovation in tackling neglected rural and peri-urban issues including sanitation, water safety, disaster resilience, and life-saving social technologies. The material further explores how startups like Anthyesti, Urban Company, Genrobotics, and Skyroot Aerospace are redefining dignity, breaking caste-linked occupational barriers, and promoting merit-based, technology-enabled inclusion. By emphasizing volume-driven business models, affordability, professionalization, and social equity, the study positions inclusive entrepreneurship as a structural equalizer that fosters economic viability, social justice, and sustainable development. Ultimately, it presents inclusive entrepreneurship as a strategic pathway for students and innovators to create scalable impact while balancing global ambition with grassroots responsibility.*

1. Introduction – Beyond Pain Points

Entrepreneurship today has evolved from the narrow idea of solving only "pain points" into a broader vision that includes both pain points and "gain points." Pain points address problems like traffic congestion, high healthcare costs, or inadequate rural services; pain-focused start-ups like Ola, Uber, and PharmEasy have thrived by solving such issues. Yet, gain-point innovations such as Blinkit's ultra-fast delivery, Starbucks' experiential cafés, Apple's design ethos create delight, convenience, and identity. These gain points, rooted in aspiration rather than necessity, create communities of passionate users instead of just one-time transactions.

2. Global and Universe Pain Points – The Larger Vision

In today's hyperconnected and rapidly evolving world, it is no longer sufficient for students and aspiring entrepreneurs to limit their focus to local or routine challenges. A powerful entrepreneurial mindset must rise to meet the larger, systemic forces both planetary and cosmic that are shaping humanity's future and redefining what's possible across industries. These global and universe-scale pain points are not merely threats but rare, once-in-a-century gateways for radical innovation. On Earth, the intensifying climate crisis, rising food insecurity, post-pandemic mental health struggles, and urban population pressures demand transformative solutions. According to the 2025 UN Climate Report, global temperatures are on track to exceed the 1.5°C threshold unless urgent action is taken, and that urgency is driving innovation like never before. Start-ups such as Plenty and Agri cool are revolutionizing agriculture through vertical farming and AI-powered indoor food systems that minimize water use and eliminate pesticides, making food production more sustainable and urban- centric. In the realm of ethical and ecological protein, companies like Eat Just and Upside Foods are redefining the meat

ISBN : 978-93-6163-366-9

industry with lab-grown alternatives now approved in forward-thinking nations like Singapore, the UAE, and Israel.

Meanwhile, Tesla, Sunrun, and India's Renew Power are accelerating the transition to decentralized clean energy, and Amprius Technologies has developed breakthrough silicon anode batteries with the capacity to even power electric aircraft. The crisis in mental health, worsened by the isolation and uncertainty of recent years, is also spawning tech-led therapeutic solutions AI- powered companions like Woebot Health and India's Wysa are bringing scalable, accessible care to millions, particularly in underserved populations. Earth, in many ways, is like a start-up under pressure, and today's innovators must become its architects, physicians, and systems designers. Yet, beyond our atmosphere, an even more thrilling and high-stakes frontier awaits: the cosmos. Space is no longer the fantasy of science fiction; it is the economic and existential battleground of the next century. With over 100 million pieces of space debris threatening satellites and astronauts alike, ventures like Clear Space (Europe) and Agnikul Cosmos (India) are engineering robotic systems to clean low-earth orbit, ensuring safe space operations. Companies such as Planetary Resources and Astroscale are exploring asteroid mining, targeting metallic bodies like the one NASA's Psyche Mission is now en route to an asteroid estimated to contain trillions in untapped resources. Meanwhile, India's Skyroot Aerospace, alongside SpaceX and Blue Origin, is pushing the boundaries of reusable rockets and cost-effective space travel, making Mars colonization and commercial space tourism realistic goals within this generation's lifetime. Even as these companies prepare for interplanetary missions, collaborations between private firms and global defense agencies are underway to develop early asteroid detection systems to prevent extinction-level threats reality as serious as the meteor that once wiped out the dinosaurs. In this dynamic convergence of planetary crisis and cosmic ambition lies an unprecedented opportunity for today's students. Whether your field is AI, sustainable farming, mechanical design, biotechnology, space science, or environmental economics, there is a role to play and an impact to make at either end of this spectrum. You don't need to build a rocket overnight to join this movement.

You can begin by participating in climate-tech hackathons, joining open-source space research platforms like India's IN-SPACe or OpenLuna, or collaborating with peers on projects ranging from solar microgrids to asteroid simulation models. The old wisdom encouraged entrepreneurs to "think local," but today's reality demands a dual approach: solve deeply human problems while also reaching ambitiously for the stars. The challenges of climate resilience, food sustainability, mental wellness, and clean mobility are not isolated from the missions of space debris removal, asteroid mining, or planetary defense they are interconnected threads of the same futuristic tapestry. The young visionaries who will define the next 20 years are those who dare to ground themselves in Earth's most urgent needs while boldly imagining solutions that span galaxies. Dreaming big is no longer fantasy, it is the new necessity.

Quantitative Overview of Innovation Sectors and Economic Metrics (2025, in ₹ Crores)

S.No	Sector / Innovation	Metric / Data	Value (₹)
1	Climate Damage (Global)	Annual economic loss from climate disasters	₹282 lakh crore / year
2	Vertical Farming (Global)	Market size	₹2.06 lakh crore
3	Lab-Grown Meat (Global)	Market value by 2030	₹34,030 crore

ISBN : 978-93-6163-366-9

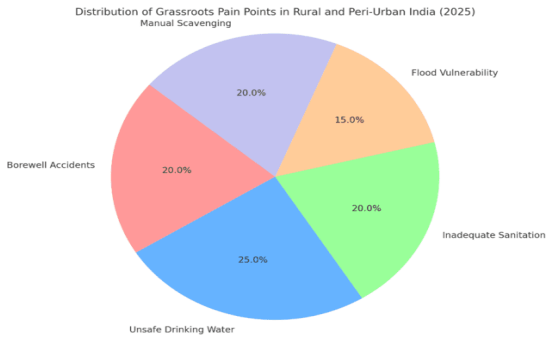
4	Solar Energy (India)	Investment FY24–25	₹1.9 lakh crore
5	EV Battery Market (India)	Lithium-ion battery market	₹87,000 crore
6	Clean Energy Jobs (India)	Number of jobs created	47 lakh jobs
7	Mental Health AI Tools (India)	App market size	₹6,200 crore
8	Space Debris (Global)	Tracked debris objects (>10 cm)	34,000 objects
9	Skyroot Rocket Launch (India)	Cost per Vikram-I launch	₹42 crore
10	Asteroid Psyche (NASA)	Estimated metal value	₹83 lakh crore crore
11	Global Space Economy	Total commercial value	₹149.4 lakh crore
12	Indian Space Startups	Funding received (2023–25)	₹1,600 crore
13	Urban Company (India)	FY24 revenue	₹827 crore
14	Anthyesti (India)	FY21 revenue	₹1.16 crore
15	Skyroot Valuation (India)	Company value after Series B	₹2,050 crore

3. ***Grassroots Pain Points – The Neglected But Crucial Layer***

Amidst the pursuit of futuristic technologies and global ambitions, it is vital not to overlook the deep, immediate pain points at the grassroots level particularly in rural and peri-urban India where millions continue to grapple with issues that threaten basic human dignity, health, and survival. These are not just inconveniences; they are daily struggles involving life-threatening borewell accidents, unsafe drinking water, inadequate sanitation, poor disaster resilience, and the lingering inhumanity of manual scavenging. In 2025, such issues remain disturbingly prevalent: children falling into uncovered borewells make headlines almost every month, especially in states like Tamil Nadu, Bihar, and Madhya Pradesh, revealing a gaping hole in emergency infrastructure. In response, innovators are rising from within these very communities.

Social entrepreneurs and engineering students are developing robotic borewell rescue devices like those from startups incubated in IIT Madras and SRM University that can descend narrow shafts, supply oxygen, and retrieve trapped children with precision. On the water and sanitation front, solutions such as Zerodor (a waterless urinal innovation) and Inno Nano's affordable arsenic filters are enabling access to clean water and hygienic facilities in villages where public health services are minimal. Flood-prone regions like Assam and Kerala are now piloting community-level flood early-warning systems using low-cost IoT sensors and mobile alerts, helping vulnerable populations evacuate before disaster strikes. Meanwhile, organizations like Safai Karmachari Andolan and startups like Genrobotics (maker of the Manhole Cleaning Robot 'Bandicoot') are actively eliminating manual scavenging through technology and advocacy. These ventures may not feature on prime-time news or in glossy tech expos, but their social and emotional impact is profound saving lives, restoring dignity, and engineering equity in silence. They require a different kind of innovation not driven by profit or glamour, but by empathy, frugality, and deep cultural insight. For students and changemakers, these neglected problems represent a powerful call to action: to innovate not just for the stars above, but for the ground beneath, where the majority still live, struggle, and hope.

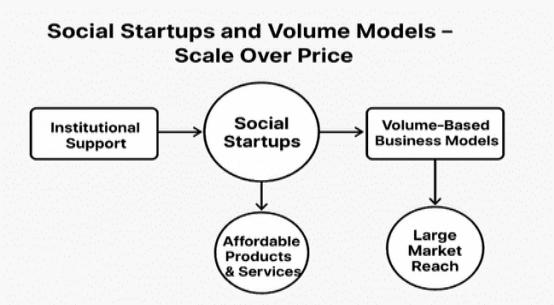
ISBN : 978-93-6163-366-9



4. Social Startups and Volume Models – Scale Over Price

In a country as vast and diverse as India, social startups play a critical role in addressing bottom-tier challenges, and they urgently deserve structured institutional support. These are ventures not driven solely by profit, but by purpose engineered to solve the overlooked, everyday problems of the masses. Governments, universities, and innovation hubs must actively nurture such enterprises through targeted policies: tax exemptions, low-interest loans, research grants, subsidies, and rural testbeds can make a significant difference. Incubators like Atal Innovation Mission (AIM), T-Hub, and Social Alpha are already setting examples in this space, but broader, deeper support is needed to scale impact. Importantly, social innovation need not be the domain of NGOs or public agencies alone private entrepreneurs and student founders must also take the lead.

The path forward lies in adopting volume-based business models, where affordability meets scale. Rather than chasing high margins from a niche audience, these startups design ultra-low-cost products and services that serve the vast base of the pyramid rural families, daily-wage workers, and lower- middle-class consumers generating healthy revenues through sheer numbers. For instance, companies like Selco India have built solar lighting systems affordable for off-grid households, while Embrace Innovations designed an infant warmer costing a fraction of traditional incubators, saving thousands of premature babies across India and Africa. Similarly, Aavishkaar Capital has backed startups offering rural fintech, agri-tech, and health-tech solutions on a high- volume, low-margin model. In 2025, the rise of digital connectivity and UPI- enabled rural commerce has made it easier than ever to reach remote markets and serve them directly at scale. These startups prove that social impact and economic viability are not mutually exclusive when the product is affordable, the market is massive, and the intent is ethical, sustainable success follows. This shift from pricing high for few to pricing low for many is not just a business strategy; it's a philosophy of inclusive growth. If supported and scaled properly, such ventures could form the backbone of a truly equitable and resilient economy.



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5. Professionalization Revolution – Dignity for Every Service

A quiet yet powerful social revolution is underway in India one that is redefining dignity in labor by professionalizing roles that were historically stigmatized by caste. This shift not only elevates the quality of essential services but also chips away at centuries of discrimination by rebranding them as respectable, organized professions. One striking example is the emergence of funeral management startups like Anthyesti, founded in 2016 by Shruthi Reddy, which has reimagined death care in India as a dignified, service-oriented industry. Traditionally performed by marginalized caste groups and treated as impure, funeral-related tasks have now been structured into formal, respectful packages covering everything from hearse vans, freezer storage, ceremonial priests, and cremation logistics to grief counseling, live streaming, tharpanam rituals, and even anniversary remembrance services.

With revenues growing from ₹12 lakh in 2016 to ₹1.16 crore by 2020–21 and sustaining healthy gross margins of around 50%, Anthyesti has completed over 5,000 funerals across 25 cities in India and 7 other countries, marking a profound shift in public perception of the death-care industry. This sector, valued at approximately USD 3 billion in 2024, is projected to grow to nearly USD 4.37 billion by 2030, underscoring both the market potential and the cultural transformation it represents. Similarly, roles like the village barber (ambattan), long associated with caste identity, have been elevated through the rise of modern beauty and wellness platforms. Urban Company (formerly UrbanClap), which boasts over 40,000 registered professionals globally and reported revenues of ₹827 crore in FY24, has led this change by transforming service delivery through expert training, skill certification, digital rating systems, and fair income practices. The platform deliberately avoids recording caste and instead builds credibility and opportunity purely on merit, skill, and customer satisfaction offering a caste-neutral path to dignified livelihoods in urban and semi-urban settings. This wave of professionalization is more than an economic trend; it is a deep social innovation that replaces stigma with structure, marginalization with respect, and anonymity with digital identity opening the door for inclusive growth where dignity is not inherited, but earned through skill and service.

Service Sector	Startup/Platform	Key Metrics (2024–25)
Death-care	Anthyesti	₹1.16 Cr revenue, 5,000+ funerals, 25 cities, 7 countries
Barbering & Grooming	Urban Company	₹827 Cr revenue, 40,000+ professionals, 50+ cities
Manual Scavenging	Genrobotics	500+ robots deployed, 100+ cities, ₹20+ Cr in R&D investment
Domestic Services	BookMyBai / Helper4U	1L+ workers placed, PAN India, verified digital profiles
Waste Management	Hasiru Dala / Saahas	35,000+ waste pickers formalized, ₹10+ Cr enterprise revenue

6. Breaking Caste Barriers – The Silent Social Equalizer

In the backdrop of India's deeply entrenched caste system, a quiet yet transformative revolution is taking place led not by political movements or legislation, but by startups that are redefining work through the lens of skill, professionalism, and service quality. Companies like Anthyesti and Urban Company are emerging as powerful social equalizers by shifting the

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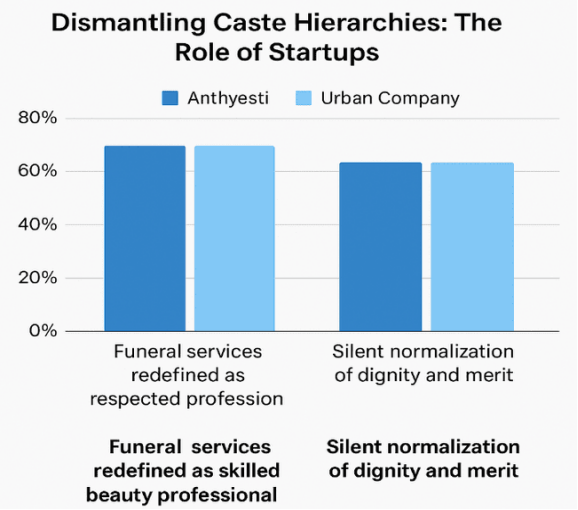
narrative from "who you are by birth" to "what you offer by skill." By professionalizing roles traditionally seen as impure or menial such as funeral management or beauty services these platforms are dismantling caste hierarchies not through confrontation, but through quiet reclassification. Anthyesti, once seen as operating in a socially "polluted" space, now offers premium funeral service packages that include anniversary memorials and personalized grief support, redefining a role historically considered untouchable into a highly respected and structured profession.

Similarly, Urban Company has redefined the social image of the ambattan the village barber into a digitally rated, professionally trained service provider offering bridal makeup, spa therapies, and grooming services at high-end venues and urban homes. The app does not ask for caste; it recognizes only customer reviews, punctuality, hygiene, and service quality. Consumers, too, are participating in this shift, valuing performance over pedigree. This subtle reordering of values is one of the most potent and least noticed revolutions driven by India's startup ecosystem displacing centuries of social prejudice not with slogans, but with standards. It is through this silent, everyday normalization of dignity, choice, and merit that caste barriers are being weakened not abolished by law alone, but replaced by a new meritocratic ethic embedded in service platforms. In doing so, these startups are not just building businesses; they are balancing India's social structure in real time, transaction by transaction, quietly transforming aspiration into equal opportunity.



7. Conclusion – A Path Forward for Students

For students of entrepreneurship, the lesson is clear: look up to global innovation and universe-scale vision, but also look down to ground-level realities. Sustainable startups can thrive by addressing rural healthcare, diagnostics, water purification, safety devices, and more areas that require affordability and scale. Blend smart technology (AI, IoT, 3D printing) with social impact, design thinking, storytelling, lean methodologies, and financial discipline. Case studies Agnikul Cosmos, Zepto, Phool.co, Razorpay, Anthyesti, Urban Company show how innovation, inclusion, and scale merge. The entrepreneurial journey now travels on three parallel roads: solving global and universe pain points, fulfilling gain points of aspiration, and tackling neglected grassroots pain points. From Mars rockets to borewell rescue devices to dignified funeral care startups are not just solving problems; they are **erasing boundaries of pain, class, caste, and opportunity.**

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ISBN : 978-93-6163-366-9

INTRAPRENEURSHIP AND INNOVATION IN MODERN CORPORATE ORGANIZATIONS: FUTURE PATHWAYS FOR SOCIAL ENTREPRENEURSHIP AND COMMUNITY DEVELOPMENT

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Abstract

Social entrepreneurship has emerged as an important approach for addressing complex social and community challenges, yet the scale of these issues requires innovative and sustainable solutions beyond traditional entrepreneurial models. In this context, intrapreneurship and innovation within modern corporate organizations have gained significance as strategic drivers of social entrepreneurship and community development. This chapter examines how intrapreneurial practices enable employees to leverage corporate resources and capabilities to generate social value. It highlights the role of innovation in supporting inclusive and scalable solutions in areas such as healthcare, education, and livelihood generation. Overall, the chapter positions modern corporate intrapreneurship as a transformative pathway for advancing sustainable community development.

Keywords: *Intrapreneurship, Innovation, Modern Corporate Organizations, Social Entrepreneurship, Community Development, Sustainability, Inclusive Growth, etc.,*

1. Introduction

Entrepreneurship has become a key mechanism for addressing complex social, economic, and environmental challenges, leading to the rise of social entrepreneurship in community development. Traditional entrepreneurial models, however, often struggle to provide scalable and sustainable solutions, highlighting the need for corporate-supported approaches. Intrapreneurship, which refers to entrepreneurial behavior within established organizations, enables employees to leverage corporate resources to create social value. Modern corporate intrapreneurship extends beyond profit to encompass sustainability, shared value, and social responsibility, enhancing its relevance for social entrepreneurship. Innovation transforms intrapreneurial ideas into impactful outcomes through social innovation, inclusive business models, and organizational change. In developing economies like India, intrapreneurial initiatives linked with CSR and public–private partnerships have demonstrated potential for community empowerment and long-term development.

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2. Intrapreneurship: Concept, Evolution, and the Modern Corporate Perspective

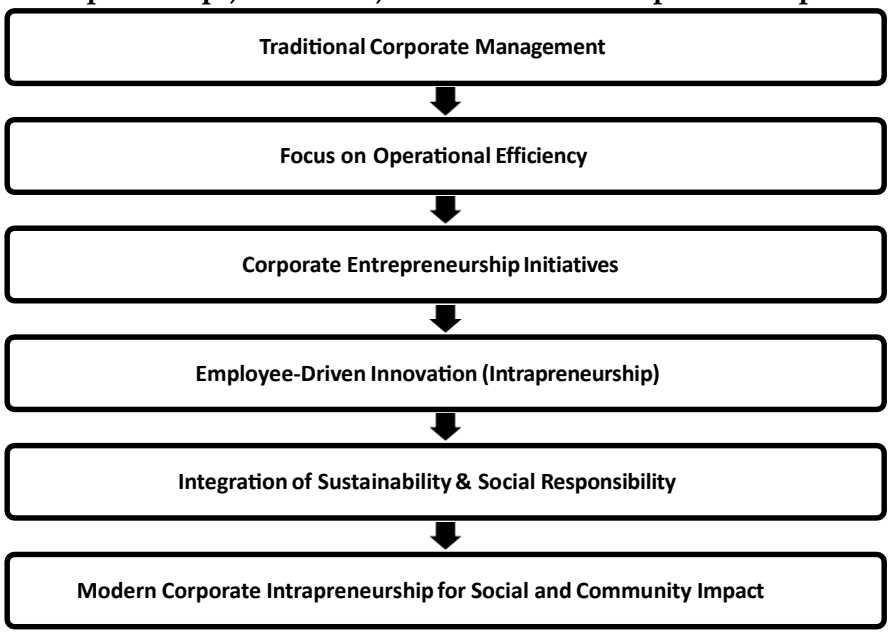

Fig.1: Evolution of intrapreneurship in modern corporate organizations

Intrapreneurship refers to entrepreneurial behavior within established organizations, where employees act as innovators by identifying opportunities and implementing new ideas using internal corporate resources. Unlike traditional entrepreneurship, intrapreneurship operates within organizational structures, allowing greater access to capital, technology, and managerial support. Initially focused on commercial innovation, intrapreneurship has evolved in modern corporate contexts to include social responsibility, sustainability, and long-term value creation. This shift reflects a broader transition from shareholder-centric to stakeholder-oriented corporate models that emphasize social and community outcomes. Organizational culture and leadership support play a critical role in fostering intrapreneurship, as environments that encourage risk-taking, collaboration, and experimentation enable socially oriented innovations. Theoretical perspectives such as the resource-based view and institutional theory explain how intrapreneurs leverage organizational assets and respond to pressures related to CSR and ESG frameworks. Digital transformation and globalization have further expanded the scope of intrapreneurial initiatives by enabling cross-sector collaboration and scalable social solutions. In developing economies like India, modern corporate intrapreneurship has emerged as an internal engine for social entrepreneurship, driving innovative programs that address community needs while enhancing corporate resilience and legitimacy.

3. Innovation in the Context of Social Entrepreneurship

Innovation is a core driver of social entrepreneurship, enabling corporations to create effective solutions to persistent social and community challenges. In modern corporate organizations, innovation goes beyond technology to include social value creation, sustainability, and inclusive development. When integrated with intrapreneurial practices, it allows corporations to address unmet social needs while enhancing organizational legitimacy and long-term performance. Social innovation takes multiple forms, including product, process, organizational, and business model innovations, which improve scalability and financial

ISBN : 978-93-6163-366-9

sustainability. Digital technologies and data-driven approaches further expand the reach of corporate-led social innovations in areas such as healthcare, education, financial inclusion, and clean energy. Intrapreneurial innovation emphasizes participatory, community-engaged approaches to ensure solutions are context- specific and socially relevant. In India, such corporate-driven innovations through intrapreneurship have strengthened community development via CSR initiatives and public– private partnerships.

4. Role of Intrapreneurship and Innovation in Community Development

Modern corporate organizations increasingly support community development through strategic intrapreneurial initiatives rather than traditional philanthropy. Intrapreneurship enables employees to design innovative solutions that align corporate capabilities with community needs. By leveraging organizational resources, intrapreneurial innovation supports sustainable and scalable development outcomes. The integration of intrapreneurship with corporate social responsibility transforms CSR into a strategic tool for generating measurable social impact. From a future-oriented perspective, intrapreneurship and innovation contribute to inclusive, resilient, and adaptive community development.

5. Case Illustrations and Practical Insights

Case illustrations provide practical evidence of how intrapreneurship and innovation within modern corporate organizations contribute to social entrepreneurship and community development. Corporate intrapreneurial initiatives in healthcare have led to low-cost solutions such as telemedicine and mobile health platforms that improve access to services in underserved communities. In the water, sanitation, and hygiene sector, intrapreneur-driven innovations in water purification and decentralized sanitation systems have addressed critical community and environmental challenges. In education and skill development, corporate intrapreneurs have designed digital learning platforms and vocational training programs that enhance employability and economic inclusion, particularly in the Indian context. Intrapreneurial innovation has also supported livelihood generation and financial inclusion through digital payment systems, microfinance solutions, and financial literacy initiatives. At the global level, multinational corporations have institutionalized intrapreneurship through innovation labs and social venture accelerators aligned with sustainability and development goals. These cases highlight the importance of leadership support, community engagement, and scalable business models in achieving sustainable social impact. Overall, the illustrations demonstrate that intrapreneurship-driven innovation enables corporations to act as active partners in advancing social entrepreneurship and long-term community development.

6. Challenges and Constraints in Intrapreneurship-Driven Social Innovation

Intrapreneurship-driven social innovation faces several organizational and contextual challenges. Rigid corporate structures, hierarchical decision-making, and risk-averse cultures can discourage employees from pursuing socially oriented innovations. Misaligned performance evaluation systems and limited resources, including funding and skilled personnel, restrict the scope and scalability of intrapreneurial initiatives. Measuring social impact is challenging due to qualitative and context-specific outcomes. Regulatory complexities and cultural differences further complicate the implementation of innovative solutions, particularly in developing economies. Overcoming these barriers requires strategic alignment, leadership commitment, and supportive policies to enable sustainable intrapreneurial social innovation.

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7. Strategic and Policy Implications for Future Social Entrepreneurship

Realizing the full potential of intrapreneurship and innovation for social entrepreneurship requires deliberate organizational strategies and supportive policy frameworks. At the corporate level, leadership commitment and a culture that encourages experimentation, creativity, and social innovation are essential. Aligning performance evaluation and incentive systems with social and sustainability objectives can motivate intrapreneurs to pursue long-term community development initiatives. Internal mechanisms such as innovation labs and cross-functional teams further strengthen intrapreneurial ecosystems within organizations. From a policy perspective, simplified regulatory frameworks, clear CSR guidelines, and incentives can encourage greater corporate participation in social entrepreneurship. Capacity-building initiatives and partnerships with academic institutions enhance employees' entrepreneurial and social innovation skills. The strategic use of digital technologies and data-driven approaches offers scalable opportunities for future social entrepreneurship. Overall, cross-sector collaboration and integration of intrapreneurship within ESG and sustainability strategies are critical for advancing sustainable community development.

8. Conclusion and Future Directions

This chapter examined the evolving role of intrapreneurship and innovation within modern corporate organizations as key drivers of social entrepreneurship and community development. It highlighted how intrapreneurship has expanded beyond profit-oriented innovation to embrace sustainability, shared value, and social impact. Innovation emerged as a critical bridge linking corporate capabilities with community needs through inclusive products, services, and business models. The case illustrations demonstrated that leadership support, strategic alignment, and community engagement enable intrapreneurial initiatives to achieve scalable and long-term development outcomes. The chapter also acknowledged key challenges, including organizational resistance, misaligned incentives, resource constraints, and difficulties in measuring social impact. Addressing these challenges requires supportive organizational cultures, enabling policy frameworks, and strong cross-sector collaboration. From a future-oriented perspective, technological advancement and growing ESG expectations create significant opportunities for intrapreneurship-driven social innovation. Overall, intrapreneurship and innovation represent transformative pathways through which modern corporations can contribute meaningfully to inclusive and sustainable community development.

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ISBN : 978-93-6163-366-9

THE ROLE OF TAXATION POLICY

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Abstract

Taxation policy is one of the most significant instruments of fiscal policy used by governments to influence economic activities and ensure sustainable development. It plays a dual role by generating revenue for public expenditure and regulating economic behavior. A sound taxation policy ensures equitable distribution of income, promotes investment, controls inflation, and supports social welfare programs. This paper attempts to analyze the role of taxation policy in economic development by examining its objectives, structure, and impact on growth and income distribution. The study also highlights challenges faced by taxation systems and suggests measures for improving tax efficiency and fairness.

Keywords: *Taxation Policy, Fiscal Policy, Economic Development, Public Revenue, Income Distribution, Economic Growth, Social Welfare, Tax Efficiency, Sustainable Development*

Introduction

Taxation has been an integral part of public finance since ancient times. In the modern economic system, taxation policy is not limited to revenue collection alone but serves as a powerful tool for achieving broader economic and social objectives. Taxation policy refers to the design and implementation of tax laws that determine who should pay taxes, how much should be paid, and how taxes are collected.

Governments rely on taxation to finance essential public services such as education, healthcare, infrastructure, defense, and social security.

At the same time, taxation policy influences consumption patterns, savings behavior, investment decisions, and resource allocation. An efficient taxation policy ensures economic stability, reduces income inequality, and supports inclusive growth. Therefore, understanding the role of taxation policy is crucial for evaluating a country's economic performance.

Review of Literature

The concept of taxation has been widely discussed in economic literature. Classical economists like Adam Smith emphasized the principles of taxation such as equality, certainty, convenience, and economy. According to them, taxes should impose minimum burden on taxpayers while ensuring adequate revenue for the state.

Keynesian economists viewed taxation as a fiscal tool to manage aggregate demand. During inflationary periods, higher taxes help reduce excess demand, while during recessions, tax reductions stimulate consumption and investment. Modern economists focus on optimal taxation, efficiency, equity, and tax compliance.

Recent studies emphasize the importance of progressive taxation and digital tax administration. Researchers argue that transparent tax systems increase compliance and reduce evasion. Empirical studies also show that well-structured taxation policies contribute positively to economic growth by encouraging productive investment and reducing inequality.

ISBN : 978-93-6163-366-9

Statement of the Problem

Despite the importance of taxation policy, many countries face persistent challenges such as tax evasion, a narrow tax base, complex tax laws, and an unequal distribution of tax burden. Inefficient taxation systems may discourage private investment, reduce productivity, increase income inequality, and weaken public confidence in government institutions. In developing economies, these problems are more severe due to administrative inefficiencies, lack of technological infrastructure, and limited taxpayer awareness.

Furthermore, frequent changes in tax laws and inconsistent policy implementation create uncertainty among taxpayers and investors. This uncertainty affects long-term planning and may slow economic growth. The presence of regressive indirect taxes often places a higher burden on low- and middle-income groups, raising concerns about social justice and equity.

Another major concern is the gap between tax potential and actual tax collection. A large informal sector and poor compliance mechanisms reduce government revenue, limiting the ability of the state to invest in essential public services such as education, healthcare, and infrastructure. As a result, economic development and social welfare objectives remain unmet.

Therefore, the core problem addressed in this study is how taxation policy can be structured and implemented to ensure adequate revenue generation while promoting economic efficiency, equity, and sustainability. The study seeks to examine whether existing taxation policies effectively balance growth objectives with social justice and how policy reforms can strengthen tax administration, widen the tax base, and improve compliance.

Conceptual Structure

The conceptual structure explains the relationship between taxation policy and economic development. Taxation policy determines the type, rate, and structure of taxes imposed by the government, which directly influences the level of government revenue. Higher efficiency in tax collection and a broader tax base lead to increased and stable revenue, enabling the government to plan and implement developmental activities effectively.

Government revenue generated through taxation is primarily utilized for public expenditure. Public expenditure plays a vital role in the development of physical infrastructure such as roads, transportation, energy, and communication systems, as well as social infrastructure including education, healthcare, and social security programs. Investment in these areas enhances human capital formation and improves the overall quality of life.

Improved infrastructure and human capital contribute significantly to economic growth by increasing productivity and employment opportunities. At the same time, targeted public spending helps reduce income inequality by supporting disadvantaged sections of society. Therefore, taxation policy indirectly influences income distribution and social equity.

Thus, taxation policy acts as a connecting mechanism between revenue generation and economic outcomes. An efficient and equitable taxation system ensures optimal utilization of resources, promotes inclusive growth, and supports sustainable economic development. The conceptual structure highlights the interdependence between taxation policy, public finance, and overall economic performance.

ISBN : 978-93-6163-366-9

Taxation Policy
(Direct & Indirect Taxes)
↓
Government Revenue
↓
Public Expenditure
(Infrastructure, Welfare,
Education, Health)
↓
Economic Growth & Equity
↓
Overall Economic Development

Limitations of the Study

The present study is primarily based on secondary sources such as textbooks, research journals, reports published by government agencies, and international organizations. As a result, the findings depend on the accuracy and relevance of existing literature. The study does not incorporate primary data collected through surveys, interviews, or fieldwork, which may limit the depth of analysis.

The research is largely qualitative in nature and does not include empirical or statistical testing to measure the exact impact of taxation policy on economic variables. Due to the absence of quantitative data, the conclusions drawn are based on theoretical interpretation rather than measurable outcomes.

The scope of the study is broad and general, focusing on taxation policy as a whole rather than examining a specific country, region, or tax system. Therefore, the findings may not fully reflect country-specific conditions or policy frameworks.

Additionally, taxation policies are subject to frequent changes due to shifts in economic conditions, political priorities, and government reforms. Such changes may affect the relevance of the study over time. The study also does not consider short-term policy shocks or unexpected economic events that could influence taxation outcomes.

Findings of the Study

The study reveals that taxation policy remains the most important and reliable source of revenue for governments to finance public expenditure and developmental activities. A well-structured taxation system ensures a steady flow of funds required for economic and social development.

It is observed that progressive taxation plays a significant role in reducing income inequality by placing a higher tax burden on higher-income groups while protecting low-income sections. This contributes to social justice and balanced economic development.

The findings also indicate that efficient tax administration, supported by transparent procedures and digital systems, improves tax compliance and significantly reduces tax evasion and avoidance. Simplified tax processes encourage voluntary compliance among taxpayers.

Tax incentives, exemptions, and concessions are found to be effective tools for promoting investment, industrial expansion, and entrepreneurship. When properly designed, such incentives stimulate economic growth and employment generation.

ISBN : 978-93-6163-366-9

However, the study also finds that poorly designed taxation policies, such as excessive tax rates or complex regulations, can discourage investment, slow economic growth, and increase the size of the informal economy. An imbalance between direct and indirect taxes may further widen income inequality.

Suggestions

The study suggests that governments should simplify tax laws and procedures to enhance transparency and make compliance easier for taxpayers. Simple and clear tax regulations help reduce confusion and administrative burden.

Strengthening digitalization in tax administration is essential to improve efficiency, reduce corruption, and ensure timely tax collection. The use of technology can also help in tracking tax evasion and expanding the tax base.

Tax policies should prioritize widening the tax base rather than increasing tax rates, as higher rates may discourage compliance and investment. Bringing more individuals and businesses into the formal tax system can improve revenue without overburdening existing taxpayers.

Greater emphasis should be placed on progressive taxation to ensure equity and reduce income disparities. At the same time, essential goods and services should be taxed at lower rates to protect vulnerable sections of society.

Regular review and reform of taxation policies are necessary to adapt to changing economic conditions, globalization, and technological advancements. Continuous evaluation ensures that taxation policy remains efficient, fair, and supportive of sustainable economic growth.

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ISBN : 978-93-6163-366-9

INDIA'S FISCAL FEDERALISM AND GST 2.0: A CRITICAL ANALYSIS OF THE 2025 REFORMS

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Abstract

Fiscal reform in India has reached a pivotal milestone with the evolution of the Goods and Services Tax (GST). This study provides a critical analysis of the post-GST fiscal landscape, specifically focusing on the "GST 2.0" reforms implemented in September 2025. By transitioning from a fragmented, origin-based "tax jungle" to a unified, destination-based regime, India has aimed to eliminate the cascading effect of taxes and foster a transparent economic environment. The paper examines the rationalization of tax slabs into a three-tier system, the impact of technology-driven compliance such as E-invoicing and Multi-Factor Authentication, and the resulting revenue buoyancy which has seen monthly collections consistently cross $₹1.7$ - $₹2.0$ lakh crore. Through trend and ratio analysis, the study demonstrates an improving tax-to-GDP ratio, reaching an estimated $12.1% in the 2025-26 period, signifying enhanced fiscal efficiency and economic formalization.

Keywords: *Fiscal Reform, Goods and Services Tax (GST), Tax Rationalization, Revenue Buoyancy, Tax-to-GDP Ratio, Digital Compliance, Indian Economy and Formalization.*

Introduction to Fiscal Reforms

Fiscal reform refers to the government's efforts to manage its revenue and expenditure more effectively. The primary goal is to ensure fiscal discipline, reduce the budget deficit, and create a transparent, efficient tax environment that fosters economic growth. In many developing economies, the tax system was historically fragmented, leading to a "cascading effect" (tax on tax). GST was introduced as a solution to unify the market. In many developing economies, the tax system was historically fragmented, leading to a "cascading effect" (tax on tax). GST was introduced as a solution to unify the market.

Objectives of the Study

- To study the fiscal reforms of post GST in India.
- To compare the Pre-GST vs. GST Regime.
- To evaluate revenue growth and tax incidence.
- To measure fiscal efficiency of post-GST formalization and technology integration

Fiscal Reforms of Post GST in India

1) The "GST 2.0" Overhaul (Current Reform)

In September 2025, the GST Council implemented the most significant reforms since the tax's launch. The goal was to simplify the "multi-slab" system into a leaner structure to reduce litigation and boost consumption.

ISBN : 978-93-6163-366-9

- **Rationalization of Tax Slabs**

The government abolished the complex 12% and 28% slabs, moving almost all items into a simplified three-tier system:

  - **Merit Rate (5%):** Applies to life's essentials (soaps, processed food, apparel up to
  - ₹2,500).
  - **Standard Rate (18%):** Applies to the majority of goods and services, including items formerly in the 28% bracket like small cars, ACs, and TVs.
  - **Demerit/Sin Rate (40%):** A high-tier rate for luxury cars, tobacco, and aerated drinks, replacing the "28% + Cess" model.

- **Health and Education Push**
  - **Zero-Rating (Nil):** 33 life-saving drugs and individual health/life insurance premiums were made GST-free to lower the cost of living and healthcare.
  - **Education Support:** Items like pencils, notebooks, and erasers were moved to the 0% category.

2. Impact on Fiscal Federalism

GST significantly altered the financial relationship between the Union (Central Government) and the States.

- **Loss of Autonomy:** States gave up their power to levy VAT and Entry Tax. This created a "vertical fiscal imbalance" where states depend on the Centre for their share of tax revenue.
- **The Compensation Gap:** The "GST Compensation" (which guaranteed states 14% revenue growth) ended in June 2022. Post-2022, states have had to rely on their own efficiency and the growth of the overall GST pool to maintain their budgets.
- **Cooperative Federalism:** The **GST Council** remains the ultimate decision-making body where every state has a vote, making it a unique experiment in joint fiscal management.

3. Technology and Compliance Reforms

Fiscal reform post-GST is as much about **technology** as it is about tax rates.

- **E-Invoicing:** Mandatory for businesses with turnover exceeding ₹10 crores (effective FY 2025-26), ensuring real-time tracking of transactions.
- **Multi-Factor Authentication (MFA):** Implemented in early 2025 to curb identity theft and "fake invoice" frauds that lead to revenue leakage.
- **GSTAT (GST Appellate Tribunal):** Operationalized in late 2025/early 2026 to resolve years of pending legal disputes between taxpayers and the government.

Reform Objective	Outcome observed (2017–2026)
Revenue Buoyancy	Monthly collections have consistently crossed ₹1.7 - ₹2.0 lakh crore.
Formalization	Digital trails forced millions of small businesses into the formal banking and tax net.
Logistics Efficiency	The **E-way bill** system and removal of state check-posts reduced transit times by ~20%.
Inflation Control	The 2025 rate cuts (moving items from 28% to 18%) helped cool down "white goods" inflation.

Source: Reports from the GST Council

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Comparison: Pre-GST Vs. GST Regime

Feature	Pre-GST Regime (The "Tax Jungle")	GST Regime (One Nation, One Tax)
Nature of Tax	**Origin-based:** Tax was collected by the state where goods were produced.	**Destination-based:** Tax is collected by the state where goods/services are consumed.
Tax Structure	**Multiple Taxes:** Central Excise, Service Tax, VAT, CST, Entry Tax, Luxury Tax, and Octroi.	**Dual GST:** A unified structure comprising **CGST** (Central), **SGST** (State), and **IGST** (Integrated).
Cascading Effect	**High:** Taxes were levied on the tax-paid value of goods, leading to a "tax on tax" burden for consumers.	**Eliminated:** The **Input Tax Credit (ITC)** mechanism ensures tax is paid only on the value addition at each stage.
Compliance & Filing	**Complex:** Businesses had to file different returns for VAT, Excise, and Service tax to different authorities.	**Simplified:** A single, centralized online portal (**GSTN**) handles registrations, returns, and refunds.
Feature	**Pre-GST Regime (The "Tax Jungle")**	**GST Regime (One Nation, One Tax)**
Inter-State Trade	**Costly:** Central Sales Tax (CST) was non-creditable, making interstate trade expensive.	**Seamless:** IGST is applied to interstate trade, and the credit is fully transferable, creating a common national market.
Tax Base	**Narrow:** Many goods and services were outside the tax net or had varying exemptions across states.	**Broad:** A wider range of transactions is covered, significantly reducing the "shadow economy."
Threshold Limits	**Varies:** Different states had different turnover limits for VAT registration (e.g., ₹5 Lakhs to ₹10 Lakhs).	**Uniform:** Standardized limits (e.g., ₹40 Lakhs for goods, ₹20 Lakhs for services) apply across most states.
Logistics Efficiency	**Low:** Interstate check-posts and entry taxes caused massive transit delays for trucks.	**High:** The removal of check- posts and the introduction of **e- way bills** have drastically reduced travel time.

Source: Annual Economic Surveys of India and Union Budget documents

Research Methodology

- **Research Design:** The study adopts a *Comparative-Analytical* approach, comparing fiscal indicators from the pre-GST period (pre-2017) with the stabilization phase (2017- 2024) and the current reform era (2025-26).
- **Scope of the Study:** The research covers the macro-economic impact across India, with specific case studies on sectors like Manufacturing, Services, and MSMEs.

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- **Tools for Analysis**
  - **Trend Analysis:** To track revenue growth over time.
  - **Comparative Tables:** To highlight changes in tax incidence.
  - **Ratio Analysis:** To measure tax-to-GDP ratios pre and post-reform.

Analysis and Interpretation

1. Trend Analysis: Growth in GST Revenue

This table tracks the transition from the initial implementation years to the "new normal" of 2025-26.

Fiscal Year (FY)	Avg. Monthly Collection (₹ Cr)	Annual Growth (%)	Key Driver
2017-18	~82,000	—	Initial implementation/Stabilization
2020-21	~94,000	-7%	Pandemic-related slowdown
2023-24	~1,68,000	12.5%	Post-pandemic recovery & compliance
2024-25	~1,85,000	10%	E-invoicing & technology-led checks
2025-26 (Est.)	~2,05,000	10.8%	GST 2.0: Rate rationalization & broader base

2. Comparative Table: Tax Incidence (Pre-GST vs. Post-GST)

This table highlights how the "tax incidence" (the actual tax burden) has changed for key sectors.

Industry/Sector	Pre-GST Effective Tax (%)	GST Rate (Post-2025 Reforms)	Change in Burden
Essential Goods	12% - 15%	0% - 5%	Significant Decrease
Electronics (TVs/ACs)	28% - 31%	18%	Moderate Decrease
Services (Banking/Telecom)	15%	18%	Slight Increase
Logistics/Transport	~18% + Octroi	12%	Decrease (due to ITC)
FMCG (Household items)	~24%	18%	Decrease

3. Ratio Analysis: Tax-to-GDP Ratio

This is a critical indicator of fiscal health. A rising ratio suggests that the tax system is becoming more efficient relative to the size of the economy.

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Period	Avg. Tax-to- GDP Ratio	Qualitative Assessment
Pre-GST Era (2012-2017)	~10.2%	Fragmented tax system; high leakages.
Post-GST Phase 1 (2017-2022)	~10.8%	Initial hiccups followed by steady growth.
Period	**Avg. Tax-to- GDP Ratio**	**Qualitative Assessment**
Post-GST Phase 2 (2022-2024)	~11.4%	Gains from formalization of the economy.
Current Reform (2025-2026)	~12.1%	Highest efficiency due to GST 2.0 and AI-driven audit tools.

Conclusion

The post-GST era, culminating in the "GST 2.0" overhaul of 2025, represents a fundamental shift in India's fiscal discipline. The move toward a leaner tax structure abolishing complex $12 and $28 slabs in favor of a standard $18 % rate has successfully reduced litigation and boosted consumption in key sectors like white goods. While the transition created a "vertical fiscal imbalance" for states due to a loss of autonomy, the GST Council remains a robust mechanism for cooperative federalism. Ultimately, the integration of advanced technology and stricter compliance measures has led to record revenue buoyancy and a significantly broadened tax base. The rising tax-to-GDP ratio serves as definitive evidence that the reform has moved India toward a more formal, transparent, and efficient economy.

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ISBN : 978-93-6163-366-9

ENTREPRENEURIAL OPPORTUNITIES IN SOCIAL ENTREPRENEURSHIP: PATHWAYS TO SUSTAINABLE COMMUNITY DEVELOPMENT

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Abstract

Social entrepreneurship has emerged as a significant driver of inclusive and sustainable community development across both developed and developing economies. By combining entrepreneurial innovation with a strong social mission, social enterprises address unmet community needs while creating economic and social value. This paper examines entrepreneurial opportunities within the domain of social entrepreneurship, focusing on their role in fostering community development. Using a conceptual and thematic approach, the study explores key opportunity areas, enabling ecosystems, challenges, and strategic pathways for maximizing social impact. The paper contributes to the growing international discourse by positioning social entrepreneurship as a viable and scalable mechanism for community empowerment, resilience, and long-term development.

Keywords: *Social entrepreneurship; entrepreneurial opportunities; community development; social innovation; inclusive growth*

1. Introduction

Communities worldwide continue to experience persistent challenges such as poverty, unemployment, inequality, social exclusion, environmental degradation, and limited access to essential services. Traditional development approaches led by governments or purely profit-driven enterprises have often been insufficient in addressing these complex and interconnected issues. As a result, alternative and complementary models of development have gained prominence, among which social entrepreneurship occupies a central position.

Social entrepreneurship integrates the principles of entrepreneurship—innovation, risk-taking, and opportunity recognition—with a primary mission of creating social value. Unlike conventional enterprises, social ventures prioritize social impact while ensuring financial sustainability. In recent years, social entrepreneurship has been increasingly recognized as a catalyst for community development, particularly in marginalized and underserved regions.

The objective of this paper is to explore entrepreneurial opportunities in social entrepreneurship and analyze how these opportunities contribute to community development. Aligned with the theme of the international conference, the paper emphasizes community-centered innovation, inclusive participation, and sustainable development outcomes. It seeks to provide insights for researchers, practitioners, policymakers, and development organizations interested in leveraging entrepreneurship for social good.

2. Conceptual Background: Social Entrepreneurship and Community Development

2.1 Social Entrepreneurship

Social entrepreneurship refers to the process of identifying and exploiting opportunities to create social value through innovative organizational models, products, or services. Social entrepreneurs are motivated by a desire to solve social problems rather than maximize profits, although financial viability remains essential for sustainability. The literature highlights key characteristics of social entrepreneurship, including social mission orientation, innovation, resourcefulness, and accountability to stakeholders.

Social enterprises operate across various legal and organizational forms, such as non-profit organizations with earned-income strategies, cooperatives, hybrid enterprises, and for-profit firms with explicit social objectives. Their flexibility allows them to respond effectively to local needs and changing socio-economic contexts.

2.2 Community Development

Community development is a participatory process aimed at improving the social, economic, cultural, and environmental conditions of communities. It emphasizes empowerment, collective action, capacity building, and local ownership of development initiatives. Effective community development strengthens social capital, enhances livelihoods, and fosters resilience.

The intersection of social entrepreneurship and community development lies in their shared focus on empowerment, participation, and sustainability. Social enterprises often emerge from within communities, making them well-positioned to address local challenges using context-specific solutions.

3. Entrepreneurial Opportunity Recognition in Social Entrepreneurship

Entrepreneurial opportunities in social entrepreneurship arise from unmet social needs, institutional gaps, and market failures. Unlike traditional entrepreneurs who primarily pursue profit opportunities, social entrepreneurs identify opportunities where social value creation and economic activity intersect.

Opportunity recognition in this context is influenced by factors such as:

- Deep engagement with community issues and lived experiences
- Awareness of social, cultural, and institutional constraints
- Access to local knowledge and social networks
- Innovation in business models and service delivery

Social entrepreneurs often transform constraints into opportunities by leveraging community assets, partnerships, and alternative financing mechanisms.

4. Key Entrepreneurial Opportunity Areas for Community Development

4.1 Livelihood Creation and Employment Generation

One of the most significant opportunity areas lies in generating sustainable livelihoods for marginalized populations, including women, youth, migrants, and persons with disabilities. Social enterprises create employment through skill development initiatives, cooperatives, micro-enterprises, and value-chain integration.

Examples include community-based handicraft enterprises, fair-trade organizations, and social manufacturing units that provide dignified work while preserving local skills and traditions. These ventures contribute to poverty reduction and economic inclusion.

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4.2 Access to Essential Services

Many communities lack affordable access to healthcare, education, clean water, sanitation, housing, and energy. Social entrepreneurs address these gaps by developing low-cost, high-impact solutions tailored to local contexts. Entrepreneurial opportunities exist in mobile health services, low-fee private schools, community clinics, water purification systems, and renewable energy micro-grids.

By improving access to essential services, social enterprises enhance quality of life and human development outcomes.

4.3 Sustainable Agriculture and Food Systems

Agriculture remains a primary livelihood source in many developing regions, yet smallholder farmers often face challenges such as low productivity, market access constraints, and climate risks. Social entrepreneurship offers opportunities in sustainable agriculture, agribusiness, and food security.

Community-based agripreneurship models, farmer producer organizations, value-added processing units, and farm-to-market platforms help increase incomes, reduce post-harvest losses, and promote environmentally sustainable practices.

4.4 Environmental Sustainability and Circular Economy

Environmental challenges such as waste accumulation, pollution, deforestation, and climate change disproportionately affect vulnerable communities. Social entrepreneurs are increasingly developing circular economy models that convert waste into resources, promote recycling, and encourage sustainable consumption.

Entrepreneurial opportunities include waste management enterprises, upcycling initiatives, eco-tourism ventures, and community-led conservation projects that generate income while protecting natural resources.

4.5 Digital and Financial Inclusion

The rapid growth of digital technologies has opened new avenues for social entrepreneurship. Opportunities in digital inclusion include mobile-based financial services, digital literacy programs, e-commerce platforms for rural producers, and technology-enabled education and health solutions.

Financial inclusion initiatives, such as microfinance institutions and fintech social enterprises, enable underserved populations to access credit, savings, insurance, and payment systems, thereby strengthening economic participation and resilience.

5. Enabling Ecosystem for Social Entrepreneurial Opportunities

The realization of entrepreneurial opportunities in social entrepreneurship depends on a supportive ecosystem. Key ecosystem components include:

5.1 Policy and Institutional Support

Governments play a critical role by creating enabling regulatory frameworks, offering tax incentives, and recognizing social enterprises as distinct organizational forms. Public procurement policies and social innovation strategies further support sector growth.

5.2 Access to Finance

Social entrepreneurs often rely on a mix of funding sources, including grants, impact investment, microfinance, crowdfunding, and blended finance. Access to patient and flexible capital is essential for experimentation, scaling, and long-term sustainability.

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5.3 Capacity Building and Incubation

Training programs, incubators, accelerators, and mentorship networks enhance the managerial, technical, and leadership capabilities of social entrepreneurs. Universities and research institutions also contribute through education and applied research.

5.4 Partnerships and Networks

Cross-sector partnerships among governments, corporations, NGOs, community organizations, and international agencies strengthen resource mobilization, knowledge sharing, and impact scaling.

6. Challenges and Constraints

Despite their potential, social entrepreneurs face several challenges. These include limited access to finance, difficulties in scaling impact, regulatory ambiguity, and tensions between social and financial objectives. Measuring and communicating social impact remains complex, particularly in resource-constrained environments.

Community dynamics, cultural norms, and trust-building also influence venture success. Addressing these challenges requires adaptive leadership, stakeholder engagement, and supportive ecosystems.

7. Strategic Approaches for Enhancing Community Impact

To maximize entrepreneurial opportunities and community impact, social enterprises should:

- Engage communities as co-creators and decision-makers
- Develop context-specific and scalable business models
- Integrate impact measurement and learning into operations
- Leverage appropriate technologies while maintaining human-centered approaches
- Foster long-term partnerships and institutional support

8. Conclusion

Entrepreneurial opportunities in social entrepreneurship represent a powerful pathway for community development. By addressing unmet needs through innovative and sustainable models, social enterprises contribute to economic inclusion, social empowerment, and environmental sustainability. This paper highlights the importance of nurturing such opportunities through supportive policies, financing mechanisms, and collaborative ecosystems. Strengthening social entrepreneurship at local and global levels can play a vital role in building resilient, inclusive, and self-reliant communities.

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ISBN : 978-93-6163-366-9

RURAL AGRO INDUSTRIES AND THEIR IMPACT ON ECONOMY

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Abstract

Rural agro small-scale enterprises (RASSEs) represent a critical component of developing economies, serving as catalysts for rural transformation, employment generation, and sustainable economic growth. This review article examines the multifaceted impact of RASSEs on economic development, analyzing their contributions to income generation, poverty alleviation, food security, and rural-urban migration patterns. This paper examines the difficulties encountered by these businesses through a comprehensive review of existing research and empirical data, specifically limited access to credit, insufficient infrastructure, technological limitations, and market connections. The article concludes with policy recommendations to enhance the effectiveness and sustainability of RASSEs in contributing to broader economic development objectives.

Keywords: *Rural enterprises, agro-based industries, rural economy, entrepreneurship*

1. Introduction

Rural agro small-scale enterprises form the backbone of agricultural economies in developing nations, bridging the gap between primary agricultural production and value addition. These enterprises typically employ fewer than 50 workers and engage in processing, packaging, storage, and marketing of agricultural products. Their significance extends beyond mere economic metrics, as they play a pivotal role in preserving traditional knowledge, promoting sustainable practices, and maintaining social cohesion in rural communities.

The relationship between Rassey's (RASSEs) and economic development is complex and multifaceted. These enterprises contribute to GDP growth, enhance agricultural productivity through value addition, create employment opportunities, and reduce regional economic disparities. Moreover, they facilitate technology transfer, promote entrepreneurial culture, and strengthen backward and forward linkages within the agricultural sector. Understanding their impact is crucial for formulating effective development policies and strategies.

2. Economic Contributions of Rural Agro Small-Scale Enterprises

2.1 Employment Generation and Income Enhancement

RASSEs are significant employment generators, particularly for marginalized populations including women, youth, and landless laborers. Studies indicate that these enterprises create both direct and indirect employment opportunities, with multiplier effects ranging from 1.5 to 3.0 depending on the sector and regional context. Unlike large-scale industries, small agro-enterprises are labor-intensive, requiring minimal capital investment per job created, making them ideal for resource-constrained rural environments.

The income-generating potential of RASSEs extends beyond wage employment. Many rural entrepreneurs operate these enterprises as family businesses, supplementing agricultural income and providing year-round economic activity. Research demonstrates that households engaged in

agro-processing activities experience 30-50% higher incomes compared to those dependent solely on primary agriculture. Income diversification can help reduce the risk of experiencing negative impacts from agricultural shocks and seasonal fluctuations.

2.2 Value Addition and Agricultural Productivity

Value addition through processing transforms raw agricultural produce into higher-value products, capturing additional margins that would otherwise accrue to urban-based industries. This transformation can increase product value by 100-400% depending on the processing level and market conditions. Activities such as milling, oil extraction, fruit processing, dairy production, and spice grinding not only generate additional income but also reduce post-harvest losses, which account for 15-40% of agricultural output in many developing countries.

Furthermore, RASSEs create demand-side pressure for quality improvement in agricultural production. When farmers have access to local processing facilities, they are incentivized to improve crop quality, adopt better cultivation practices, and diversify production. This backward linkage effect strengthens the entire agricultural value chain and promotes sustainable intensification of farming systems.

2.3 Regional Development and Migration Mitigation

The geographic distribution of RASSEs contributes to balanced regional development by decentralizing economic activities beyond urban centers. These enterprises utilize locally available resources, reduce transportation costs, and keep economic surplus within rural communities. The spatial distribution of economic opportunities helps to reduce rural-urban migration, a long-standing problem in developing countries that results in urban overcrowding and rural depopulation.

By providing viable livelihood alternatives in rural areas, agro-enterprises help maintain demographic balance and preserve social fabric. Studies show that regions with vibrant small-scale agro-industries experience 40-60% lower out-migration rates compared to areas dependent solely on agriculture. This retention of human capital is crucial for long-term rural development and intergenerational sustainability.

3. Challenges Facing Rural Agro Small-Scale Enterprises

3.1 Limited Access to Finance and Credit

Access to adequate and affordable credit remains the most significant constraint for RASSEs. Traditional banking institutions often perceive these enterprises as high-risk due to lack of collateral, inadequate documentation, and limited credit history. Interest rates for available credit are typically 12-24% annually, making borrowing prohibitively expensive for small entrepreneurs. This financial exclusion limits their ability to invest in technology, expand operations, or maintain adequate working capital.

3.2 Infrastructure and Technology Gaps

Inadequate infrastructure severely hampers the competitiveness of rural agro-enterprises. Poor road connectivity increases transportation costs and limits market access, while unreliable electricity supply disrupts production schedules and necessitates expensive backup power arrangements. Furthermore, limited access to modern processing technology results in lower productivity, higher wastage, and inferior product quality compared to urban-based competitors.

ISBN : 978-93-6163-366-9

The technology gap is compounded by insufficient technical knowledge and skills among rural entrepreneurs.

3.3 Market Linkages and Value Chain Integration

Weak market linkages constrain the growth potential of RASSEs. Limited information about market demand, price fluctuations, and quality standards leads to inefficient production decisions. Many small businesses rely heavily on middlemen who take substantial profits, ultimately decreasing the profit margins for manufacturers. The absence of collective marketing mechanisms and inadequate bargaining power prevent these enterprises from capturing fair value for their products. Additionally, stringent quality certifications and packaging requirements for modern retail channels create entry barriers.

4. Policy Recommendations and Strategic Interventions

Enhancing the contribution of RASSEs to economic development requires comprehensive policy interventions addressing financial, technological, and institutional constraints. Governments should establish dedicated financial institutions or credit guarantee schemes specifically designed for rural agro-enterprises. Interest rate subsidies, working capital support, and asset-backed lending programs can improve financial accessibility. Simultaneously, investments in rural infrastructure—particularly roads, electricity, cold storage, and warehousing facilities—are essential for improving operational efficiency.

Technology transfer programs, skill development initiatives, and entrepreneurship training can strengthen technical capabilities. Establishing cluster-based development approaches enables economies of scale in technology adoption, quality control, and marketing. Digital technologies, including e-commerce platforms and mobile-based information systems, can enhance market linkages and reduce information asymmetries. Furthermore, creating producer organizations and cooperatives strengthens collective bargaining power and facilitates direct market access.

Regulatory reforms should simplify licensing procedures, reduce compliance burdens, and provide tax incentives for RASSEs. Quality certification support, subsidized testing facilities, and assistance with branding and packaging can help small enterprises meet market standards. Finally, integrating RASSEs into broader value chains through contract farming arrangements, buy-back agreements, and public procurement programs ensures stable demand and predictable income streams.

5. Conclusion

Rural agro small-scale enterprises constitute a vital engine for inclusive economic development, offering pathways for rural transformation that are sustainable, equitable, and rooted in local resources. Their multidimensional contributions—employment generation, income enhancement, value addition, and regional development—underscore their significance in development strategies. While challenges related to finance, infrastructure, and market access persist, these are not insurmountable with appropriate policy interventions and institutional support.

The future prosperity of rural economies depends significantly on nurturing and strengthening these enterprises. As the process of globalization and urbanization transforms economic environments, Rural Asset Support Enterprises (RASSEs) offer a counterweight that prevents rural communities from being overlooked. Policymakers, development agencies, and

ISBN : 978-93-6163-366-9

financial institutions must recognize the strategic importance of these enterprises and design targeted interventions that unlock their full potential. By doing so, rural agro small-scale enterprises can serve as powerful instruments for achieving broader development goals, including poverty reduction, food security, and sustainable rural livelihoods.

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ISBN : 978-93-6163-366-9

RURAL WOMEN ENTREPRENEURSHIP: A REVIEW WITH SPECIAL REFERENCE TO TAMIL NADU

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Abstract

Rural women entrepreneurship has emerged as a critical driver of economic development, poverty alleviation, and gender empowerment in India. This article reviews the current situation, difficulties, possibilities, and backing systems for rural female business owners, with a special focus on Tamil Nadu, a state acknowledged as a leader in women's business development initiatives. In India, approximately 13% of businesses owned by women are located in Tamil Nadu, where the Vazhndhu Kattuvom Project, the TN-RISE Women Start-up Council, and a substantial amount of Self-Help Groups have been set up. The article synthesizes evidence from recent studies, government programs, and field experiences to provide a comprehensive understanding of the rural women entrepreneurship landscape. Key findings reveal that while women entrepreneurs contribute significantly to rural employment and household income, they face persistent barriers including limited access to formal credit, socio-cultural constraints, inadequate training, and gender biases. The article concludes with policy recommendations for strengthening the entrepreneurial ecosystem for rural women.

Keywords: *Rural women entrepreneurship, Tamil Nadu, Self-Help Groups, Vazhndhu Kattuvom, Women empowerment, MSME, Financial inclusion, TN-RISE*

1. Introduction

Entrepreneurial women in rural India embody a transformative force that links economic growth to social empowerment. Approximately 70% of India's population resides in rural areas, where women have traditionally been confined to unpaid domestic and farm work. However, the past two decades have witnessed a paradigm shift, with rural women increasingly establishing their own enterprises across diverse sectors including agriculture, handicrafts, food processing, textiles, and services.

India is home to approximately eight million women entrepreneurs, with Tamil Nadu emerging as a frontrunner in this movement. The state boasts the highest number of women-owned Micro, Small and Medium Enterprises among southern states, with 623,492 registered enterprises employing 4.28 million workers. These enterprises have collectively achieved investments worth Rs 17,206.32 crore and generated a turnover of Rs 1,91,942.79 crore, demonstrating their substantial economic impact.

Despite this progress, women entrepreneurs in rural areas, particularly those earning annual revenues between Rs 300,000 and Rs 3 million, often fall into a policy gap. These Growth-Oriented Women's Enterprises face unique challenges in accessing formal credit, markets, and business development services. Understanding these dynamics is crucial for designing effective interventions that can unlock the full potential of rural women's entrepreneurship.

ISBN : 978-93-6163-366-9

2. Current Status and Economic Contribution

2.1 National Landscape

In rural India, women-owned businesses employ between 22 and 27 million individuals, making them substantial contributors to rural job creation. Recent data indicates that approximately 20.5% of Indian MSMEs are owned by women, contributing 18.73% to the labor force and 10.22% to overall turnover. However, India ranks 70th among 77 countries in women's entrepreneurship, highlighting substantial room for improvement. The female labor force participation rate stands at approximately 37%, significantly lower than male participation rates.

Research reveals that over 85% of women-owned rural non-farm enterprises are concentrated in five subsectors: retail trade, apparel manufacturing, food products, food and beverage services, and the handloom sector. These enterprises typically operate at a smaller scale than traditional MSMEs, with most having at least one employee and recording annual sales of Rs 240,000 or more.

2.2 Tamil Nadu: A Leader in Women Entrepreneurship

Tamil Nadu stands out as a national leader in promoting women's entrepreneurship, accounting for 13.51% of women-owned establishments in India, followed by Kerala at 11.35% and Andhra Pradesh at 10.56%. The state's comprehensive approach combines government initiatives, institutional support, and community-based interventions.

Key statistics for Tamil Nadu include 623,492 women-owned MSMEs, comprising 615,385 micro-enterprises, 7,705 small enterprises, and 402 medium enterprises. The garment industry exemplifies Tamil Nadu's entrepreneurial success, where skilled women who previously worked in large factories in cities like Tiruppur have returned to their villages to establish production units. These enterprises operate from converted thatched huts and cowsheds, creating employment for other village women while meeting the severe labor shortages faced by the garment industry.

The state has witnessed remarkable success stories. Entrepreneurs like Indhurani and Gurupakkiam began their ventures with limited investment, transforming parts of their houses into manufacturing sites. Through reinvestment of profits, they expanded from two machines to nine, employing ten women and achieving year-round operations. This model has proven sustainable, with low mortality rates among these small enterprises.

3. Challenges Faced by Rural Women Entrepreneurs

3.1 Financial Constraints

Access to formal credit remains the most significant barrier for rural women entrepreneurs. Women entrepreneurs face difficulties in accessing adequate and timely credit from formal financial institutions due to several factors. Banks and financial institutions often require collateral that rural women typically lack, as they rarely have direct ownership of property or assets. High interest rates and demanding repayment terms offered by microfinance institutions often deter many women from borrowing money.

When women do seek credit, they often turn to Self-Help Groups, which provide essential support but have lending limits that may be insufficient for business expansion. For instance, entrepreneurs seeking larger loans for expansion often find themselves in a policy gap, as their credit needs exceed SHG capacities but remain too small for commercial bank consideration under MSME lending programs.

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3.2 Socio-Cultural Barriers

Deeply entrenched patriarchal norms significantly impede women's entrepreneurial aspirations in rural India. The pressure to adhere to traditional gender roles remains intense, with women often expected to prioritize family responsibilities over business ventures. Research indicates that women entrepreneurs struggle with balancing business demands and family obligations, with family support often contingent on the business not interfering with domestic duties.

Discrimination against women can be seen in various ways, such as limited freedom of movement, exclusion from professional networks dominated by men, and doubts about women's business skills. Frequently, women entrepreneurs encounter difficulties when interacting with male colleagues and clients, who often question their competence and leadership abilities. Social attitudes and community perceptions significantly influence women's confidence and willingness to pursue entrepreneurship.

3.3 Educational and Skill Deficits

Educational deprivation represents a fundamental barrier to rural women's entrepreneurship. Throughout the 21st century, a substantial number of rural women continue to be illiterate or have restricted formal education, thereby impairing their capacity to handle finances, comprehend contractual agreements, access government programmes, and implement new technologies. The lack of entrepreneurial training and business management skills further compounds these challenges.

Financial literacy emerges as a critical gap, with many women lacking the knowledge to effectively manage business finances, maintain proper records, or navigate banking procedures. Only one in three women in rural India have ever used the internet, compared to more than half of men. A stark digital divide exists, with 54% of rural women lacking phone ownership, severely constraining their access to digital financial services, market information, and business development resources.

3.4 Market Access and Infrastructure Limitations

Rural women entrepreneurs face significant challenges in accessing markets beyond their immediate localities. Distance from major urban markets, limited transportation infrastructure, and weak market linkages constrain business growth. Many women entrepreneurs lack information about market opportunities, buyer requirements, and product quality standards.

The absence of professional labor, basic infrastructure such as reliable electricity and internet connectivity, and inadequate workspace facilities further hamper entrepreneurial activities. Rural areas often lack access to skilled workers, forcing entrepreneurs to operate with limited human resources. Additionally, women entrepreneurs report difficulties in procuring raw materials at competitive prices and establishing reliable supply chains.

4. Support Systems and Government Initiatives

4.1 Self-Help Groups: The Foundation

Self-Help Groups have emerged as the most significant support mechanism for rural women entrepreneurs in India, with Tamil Nadu pioneering the SHG movement. The SHG approach was initiated in Tamil Nadu in 1989 in Dharmapuri district with assistance from the International

ISBN : 978-93-6163-366-9

Fund for Agricultural Development. Following its success, the Mahalir Thittam program was launched with state government funding in 1997-1998 and has since expanded to all districts.

SHGs provide multiple benefits including regular savings mobilization, access to microcredit without traditional collateral requirements, peer learning and mutual support, financial literacy development, and connections to local markets and government schemes. These groups provide secure environments for women to develop their entrepreneurial skills and construct business expertise gradually. Research demonstrates that women participating in SHGs experience higher financial stability, improved literacy rates, and enhanced decision-making capacity within households.

However, SHGs face operational challenges including limited access to institutional credit, high interest rates from microfinance institutions, inadequate leadership training, and weak market linkages for scaling businesses. Scaling up from small, single-owner businesses based on SHG loans to achieving the status of small and medium enterprises remains a challenging process, as it necessitates increased capital, extended-term financing, working capital for raw materials, investments in infrastructure, and the hiring of skilled employees.

4.2 Vazhndhu Kattuvom Project: A Transformative Approach

The Tamil Nadu Rural Transformation Project, implemented through the Vazhndhu Kattuvom program with World Bank support, represents a comprehensive approach to rural women's entrepreneurship. Launched to create rural employment opportunities, the project focuses on skill development, entrepreneurship promotion, and facilitating access to finance.

Since 2019, the project has established 2,500 Community Skills Schools that have trained over 50,000 young people in approximately 75 trades, with 65% of trainees being women. These schools offer affordable, accessible vocational training tailored to women's needs, addressing barriers they face in formal employment. A distinguishing feature is that successful local businesses run these schools, with business owners and community experts serving as trainers, ensuring practical and market-relevant training.

The project's Matching Grants Program addresses the collateral problem by providing 30% grants that women can use as collateral for bank loans, significantly reducing lender risk. The program also connects entrepreneurs to One Stop Facility Centers where professionals help finalize business plans, complete loan documentation, and develop marketing strategies. To date, the program has facilitated loans worth Rs 267 crore for 8,400 women-led enterprises and created over 100,000 enterprises and nearly 53,000 jobs.

4.3 TN-RISE Women Start-up Council

Inaugurated in July 2024, the Tamil Nadu Rural Incubator and Startup-Enabler Women Start-up Council addresses the needs of growing women enterprises requiring higher-order support services. TN-RISE was established following the 2023 State Budget announcement committing to establish an exclusive start-up council for women entrepreneurs.

The council provides advisory services, mentorship, financial guidance, and legal advice tailored to rural women entrepreneurs. It functions as a physical space with professional expertise offering customized market linkages, financing assistance, and operational advice. TN-RISE operates as a Section 8 company under the Tamil Nadu Rural Transformation Project, with day-to-day management by a CEO and overall administration by a Board of Directors.

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The council's goals encompass acting as the central coordination agency for businesses owned by women, aiding with setup procedures, providing incentives and subsidies, advancing business development levels, and verifying businesses as women-owned. TN-RISE brings together industry, corporates, academia, and government organizations to create and foster a comprehensive women's enterprise ecosystem.

4.4 Other Government Schemes

Tamil Nadu offers various schemes supporting women entrepreneurs. The Centre for Entrepreneurship Development provides training in income-generating activities and has trained approximately 2,400 women. The Tamil Nadu Backward Classes Economic Development Corporation offers loans at subsidized interest rates to eligible women from economically weaker sections. Banks such as Tamilnad Mercantile Bank provide specialized women entrepreneur loans up to Rs 10 lakhs with favorable terms. The Tamil Nadu State Rural Livelihood Mission, implemented since 2012-2013, builds institutional platforms for the rural poor, facilitating livelihood enhancements and access to financial services.

5. Emerging Opportunities and Sectors

Rural women entrepreneurs in Tamil Nadu have significant opportunities across multiple sectors. The textile and garment sector offers extensive possibilities given the state's established industry infrastructure and severe labor shortages. Women with experience in factories are setting up their own small manufacturing operations in their villages, which are thriving due to partnerships with larger companies.

Agribusiness and food processing present substantial growth potential, with government support available for crop cultivation, dairy farming, poultry, fisheries, organic farming, and value-added food products. Tamil Nadu's diverse agricultural base provides raw materials and market opportunities for processing enterprises.

The healthcare and wellness sector offers opportunities in healthcare services, wellness centers, fitness studios, and telemedicine, driven by growing demand for quality healthcare. Handicrafts, traditional arts, and cultural entrepreneurship enable women to leverage their traditional skills, promote cultural heritage, and access both domestic and international markets. Information technology and digital services, education and training services, and renewable energy ventures represent emerging sectors where women entrepreneurs can establish sustainable businesses.

The increasing focus on sustainable and socially responsible businesses creates opportunities for social entrepreneurship, where women can address community problems while generating income. Government emphasis on Make in India, Skill India, and Digital India initiatives provides additional support and market access for women-led enterprises.

6. Conclusion and Recommendations

Rural women entrepreneurship in Tamil Nadu demonstrates the transformative potential of well-designed support systems combined with women's resilience and determination. The state's comprehensive approach, encompassing skill development, financial support, mentorship, and institutional backing, offers valuable lessons for other regions seeking to promote women's entrepreneurship.

However, significant challenges persist that require sustained policy attention and multi-stakeholder collaboration. Based on the review, several recommendations emerge for

ISBN : 978-93-6163-366-9

strengthening the rural women entrepreneurship ecosystem. Financial institutions must create customised products for Growth-Oriented Women's Enterprises with revenues between $300,000 and $3 million, offering flexible collateral terms, suitable interest rates, and technical support for loan applications. Expanding matching grants programs and credit guarantee schemes can reduce lender risk while enabling women to access necessary capital.

Comprehensive training programs must address not only technical skills but also financial literacy, business management, digital literacy, marketing, and leadership development. Establishing more Community Skills Schools and strengthening existing ones ensures accessible, practical training. Creating robust mentorship networks connecting experienced entrepreneurs with emerging ones can provide valuable guidance and emotional support.

Digital infrastructure development in rural areas is critical, including internet connectivity, mobile network coverage, and digital literacy programs. Government e-marketplaces and platforms specifically designed for rural women entrepreneurs can overcome geographical barriers to market access. Strengthening backward and forward linkages, establishing common production facilities, and creating marketing collectives can help women entrepreneurs achieve economies of scale.

Addressing socio-cultural barriers requires community awareness programs that challenge gender stereotypes, showcase successful women entrepreneurs as role models, and engage male family members as supporters of women's entrepreneurship. Educational institutions and schools should incorporate entrepreneurship education that motivates girls to view business ownership as a feasible career path.

Policy frameworks must ensure convergence among various government departments and schemes, simplify procedures for scheme access, and establish single-window clearance systems for business registrations and licenses. Regular monitoring and evaluation of programs, involving women entrepreneurs in their design and execution, can guarantee that initiatives stay relevant and effective.

Tamil Nadu's experience demonstrates that women's entrepreneurship is not merely about individual economic advancement but represents a pathway to broader social transformation. When women become economically independent, they gain voice in household decisions, invest in children's education and health, and participate more actively in community governance. The success of initiatives like Vazhndhu Kattuvom and TN-RISE has inspired other states to adopt similar models, indicating the replicability and scalability of these approaches.

Empowering rural women entrepreneurs is crucial for attaining gender equality and women's rights, as well as for meeting India's broader development goals. Women-owned enterprises contribute to inclusive economic growth, poverty reduction, rural employment generation, and sustainable development. As India aspires to become a $5 trillion economy, unlocking the entrepreneurial potential of rural women becomes imperative.

The journey ahead requires sustained commitment from government, financial institutions, civil society organizations, and communities. By addressing systemic barriers, providing targeted support, and creating an enabling ecosystem, India can unleash the transformative power of rural women's entrepreneurship, fostering prosperity and empowerment that extends far beyond individual businesses to entire communities and regions.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

ENTREPRENEURIAL PROSPECTS IN SOCIAL ENTREPRENEURSHIP FOR COMMUNITY ADVANCEMENT

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Abstract

Social entrepreneurship has emerged as a transformative strategy for tackling ongoing social, economic, and environmental issues while fostering inclusive and sustainable community advancement. This paper delves into the notion of entrepreneurial prospects within social entrepreneurship, investigating how these prospects can be recognized, cultivated, and utilized to generate measurable social change. Utilizing existing research, case studies from around the world and India, as well as frameworks for community development, the analysis underscores significant areas of opportunity such as job creation, healthcare access, education, sustainability, and digital inclusion. The discussion points that social entrepreneurs play an essential role in converting community challenges into viable business opportunities by merging innovation with market strategies and a commitment to social missions. This study enhances the conversation surrounding social entrepreneurship by providing a conceptual framework for recognizing opportunities and suggesting policy considerations to support social enterprises within communities.

Keywords: *Social Entrepreneurship, Entrepreneurial Prospects, Community Advancement, Social Innovation, Sustainable Development*

1. Introduction

Communities worldwide grapple with various complex issues, including poverty, unemployment, inequality, environmental harm, and inadequate access to essential services. While traditional governmental and philanthropic efforts are crucial, they frequently fall short in delivering scalable and enduring solutions. In this setting, social entrepreneurship has garnered international interest as a viable developmental strategy that combines entrepreneurial principles with societal goals. Social entrepreneurship is centered on spotting entrepreneurial prospects within social challenges and addressing these through innovative models that are financially viable. Unlike traditional entrepreneurship, which prioritizes profit, the main aim here is to generate social value. This paper investigates how entrepreneurial prospects emerge in social entrepreneurship and their role in community advancement.

2. Understanding Social Entrepreneurship

Social entrepreneurship entails the process of identifying, assessing, and utilizing opportunities that lead to the creation of social value. Social entrepreneurs serve as catalysts for change, pinpointing unmet social demands and devising innovative solutions that are scalable and sustainable.

ISBN : 978-93-6163-366-9

Notable traits of social entrepreneurship include:

- A defined social mission
- Innovation in products, services, or delivery methods
- Financial sustainability and transparency
- Quantifiable social impact

By merging business skills with social objectives, social enterprises create a bridge between welfare-driven initiatives and market-oriented businesses.

3. Defining Entrepreneurial Opportunities: Significance and Range

Entrepreneurial opportunities are advantageous scenarios in which new goods, services, processes, or organizational structures can be introduced to generate value. In the realm of social entrepreneurship, such opportunities often emerge from market deficiencies, institutional voids, and socio-economic disparities.

Opportunities in social enterprises typically arise from:

- Unmet or neglected community requirements
- Inefficiencies in public service provision
- Challenges related to the environment and sustainability
- Technological advancements that facilitate social solutions

To recognize these opportunities, a comprehensive understanding of community contexts, stakeholder needs, and systemic limitations is essential.

4. Areas of Entrepreneurial Opportunities in Community Advancement

4.1 Job and Livelihood Creation

Social enterprises generate chances for skill enhancement, self-employment, and inclusive livelihoods, particularly for marginalized groups, including women, youth, and rural communities. Illustrative examples encompass producer cooperatives, micro-enterprises, and fair-trade initiatives.

4.2 Learning and Skill Enhancement

There are opportunities for entrepreneurship in areas like cost-effective education, online learning platforms, vocational skills training, and programs aimed at enhancing employability. Social entrepreneurs work to tackle deficiencies in the accessibility, quality, and pertinence of educational offerings.

4.3 Health and Wellness

Creative approaches to healthcare, including telehealth services, affordable diagnostic tools, mobile healthcare units, and community-driven health initiatives, present substantial opportunities for social entrepreneurship.

4.4 Ecological Sustainability

The issues of climate change, effective waste management, the use of renewable energy sources, and the conservation of water present significant prospects for eco-friendly social ventures that integrate environmental stewardship with revenue generation.

4.5 Economic Inclusion and Digital Empowerment

Access to microfinance, innovative financial technology solutions, initiatives aimed at improving digital literacy, and banking models designed for inclusivity allow marginalized communities to engage in economic pursuits.

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5. Identifying Opportunities in Social Entrepreneurship

The process of identifying opportunities within social entrepreneurship stands apart from traditional commercial entrepreneurship because of its pronounced focus on social impact. Social entrepreneurs frequently depend on:

- Compassion and personal experiences within their communities
- Community involvement and inclusive methods
- Partnerships with non-profits, governmental agencies, and the private sector
- Leveraging technology and data to drive social change

It is essential to reconcile the social mission with financial sustainability to convert opportunities into enduring enterprises.

6. Impact of Social Entrepreneurship on Community Advancement

Social entrepreneurship plays a vital role in advancing community development through:

- Building local skills and leadership capabilities
- Encouraging economic growth that is inclusive
- Fostering trust and social networks
- Facilitating active community involvement and ownership
- Providing solutions that can be expanded and replicated

By positioning communities as co-creators rather than mere recipients, social enterprises promote sustainable development results.

7. Obstacles and Limitations

Even with its promise, social entrepreneurship encounters a variety of obstacles:

- Restricted opportunities for funding and capital
- Barriers from regulations and policies
- Evaluating and communicating social impact
- Expanding operations while staying true to the mission
- Limitations in skills and organizational capacity

Overcoming these obstacles necessitates the creation of supportive environments, impact-driven investments, and policies that facilitate growth.

8. Policy and Institutional Considerations

To enhance opportunities for social entrepreneurship, governments, educational institutions, and developmental organizations can take several actions, including:

- Incorporating social entrepreneurship into educational programs
- Offering support in the form of incubation, mentorship, and financial resources
- Fostering collaborations between public, private, and social sectors
- Establishing frameworks for measuring impact
- Creating supportive regulatory conditions

9. Summary

Opportunities in social entrepreneurship are essential for promoting community development by converting social issues into enduring solutions. By harnessing innovation, local expertise, and entrepreneurial strategies, social entrepreneurs facilitate inclusive growth and

ISBN : 978-93-6163-366-9

societal change. Bolstering the ecosystems for social entrepreneurship can greatly improve communities' capacity to tackle their own developmental challenges sustainably.

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ISBN : 978-93-6163-366-9

MARKET DEMAND FOR INVESTMENT ADVISORY SERVICES IN INDIA AND ITS IMPLICATIONS FOR ADVISORY ENTREPRENEURSHIP

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Abstract

The escalating complexity of financial markets, coupled with a marked increase in retail investor engagement, has profoundly transformed the demand landscape for investment advisory services in India. As households progressively transition from conventional savings mechanisms to market-oriented financial instruments, reliance on professional investment advisors has increased. This review article scrutinizes the burgeoning market demand for investment advisory services in India and elucidates its implications for advisory entrepreneurship within a regulated financial environment. Employing a descriptive and integrative literature review methodology, the research synthesizes evidence from peer-reviewed academic studies, regulatory frameworks, and institutional reports to evaluate the interplay among demand-side dynamics, investor behavior, and regulatory structures. The results reveal that the demand for investment advisory services is predominantly influenced by the intricacies of financial products, cognitive biases, demographic shifts, digital accessibility to markets, and the level of awareness regarding investor protection mechanisms. Concurrently, the landscape of advisory entrepreneurship in India is molded by regulatory compliance, trust-based investor relationships, and adherence to regulatory requirements, which collectively enhance professional credibility while imposing operational limitations. This study enriches the finance and entrepreneurship literature by framing investment advisory services as a variant of institutionally embedded entrepreneurship within an emerging market.

Keywords: *Investment Advisory Services, Market Demand, Advisory Entrepreneurship; SEBI Regulations, Investor Behavior.*

Introduction

India's financial system has undergone a significant structural transformation over the past 20 years, propelled by economic liberalization, the evolution of capital markets, technological advancements, and policy-driven initiatives aimed at financial inclusion. These transformations have facilitated greater household engagement with equities, mutual funds, pension products, and other market-linked financial instruments, signaling a definitive departure from conventional savings mechanisms such as bank deposits and tangible assets (RBI, 2022; SEBI, 2023). Although this evolution has diversified investment opportunities, it has also heightened the intricacies of financial decision-making for retail investors. The growing number of financial products, increased market volatility, and shifting regulatory requirements have rendered informal investment advisory sources, such as familial networks, agents, and commission-based intermediaries, increasingly ineffective (Gennaioli et al., 2018; OECD, 2020). In this fluid context, investment advisory services have emerged as a pivotal intermediary institution, mitigating the information asymmetry that exists between investors and financial markets.In

ISBN : 978-93-6163-366-9

contrast to traditional distributors, whose motivations are often tied to specific products, registered investment advisors are obligated to provide objective, suitability-based counsel that aligns with investors' financial aspirations, risk tolerance, and time horizons of investors. Regulatory measures instituted by the Securities and Exchange Board of India (SEBI), particularly the enactment of the SEBI (Investment Advisers) Regulations, have formalized this professional function by underscoring fiduciary duties, fee transparency, the segregation of advisory and distribution roles, and qualification benchmarks (SEBI, 2020). These reforms have transformed investor expectations and bolstered the credibility of advisory services. From a theoretical perspective, the research draws on entrepreneurship theory and institutional economics to examine how market demand is translated into entrepreneurial opportunities in the realm of regulated professional services. Shane and Venkataraman (2000) define entrepreneurship as the identification and exploitation of opportunities arising from market inefficiencies. Nevertheless, in knowledge-intensive and trust-reliant sectors such as financial advisory services, opportunities are not solely driven by market forces; instead, they are profoundly embedded within institutional frameworks, regulatory legitimacy, and professional standards (North, 1990; Acs et al., 2009). Regulation, in this specific context, fulfills a dual role; while it imposes compliance obligations, it simultaneously enhances legitimacy and trust—elements that are critical for sustaining demand in advisory services (Scott, 2014). The behavioral finance literature substantiates the demand-side importance of investment advisory services. Empirical investigations consistently reveal that individual investors are susceptible to cognitive and emotional biases such as overconfidence, loss aversion, mental accounting, and herd behavior, which frequently culminate in suboptimal investment results (Kahneman & Tversky, 1979; Barberis et al., 2018). Professional investment advisors serve as behavioral intermediaries, directing investors towards disciplined, goal-oriented decision-making, thereby mitigating these biases. As awareness of behavioral vulnerabilities increases, especially during volatile market conditions, the perceived value of professional advice rises, thereby reinforcing the demand for advisory services (Gennaioli et al., 2018). Existing research predominantly concentrates on investor behavior, financial literacy, or regulatory compliance in isolation, with scant attention paid to the dynamics between demand conditions and the creation of entrepreneurial opportunities within advisory services (Campbell et al., 2011; Inderst & Ottaviani, 2012). This lacuna highlights the necessity for integrative reviews that interlink demand determinants, regulatory frameworks, and entrepreneurial responses through a comprehensive analytical lens.The significance of this study lies in attempt to make these components of literature and offer a complete understanding of market demand for investment advisory services and its implications for advisory entrepreneurship in India. Academically, the article extends entrepreneurship theory by situating opportunity recognition within a regulated financial services context, emphasizing the role of institutional trust and professional legitimacy. From a policy perspective, the study provides insights for regulators aiming to balance investor protection with the promotion of ethical and sustainable entrepreneurship The study adopts a demand-side perspective, focusing on how market forces and institutional arrangements shape entrepreneurial opportunities rather than evaluating firm-level performance outcomes. Thus, the objectives of this review are to examine the key drivers of market demand for investment advisory services in India, analyze how demand-side dynamics influence advisory entrepreneurship, assess the role of regulation and professionalization in opportunity creation.

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Review of Literature

- North (1990), "Institutions, Institutional Change and Economic Performance", explains how formal institutions—laws, regulations, and enforcement mechanisms—shape economic behavior by reducing uncertainty and structuring incentives. The book argues that when rules are predictable and transparent, individuals and firms are more willing to engage in productive, long-term economic activity. Rather than viewing regulation as a constraint, North presents institutions as the foundation for trust and coordination in markets. In essence, strong institutions lower transaction costs and make entrepreneurship viable and sustainable, particularly in sectors where credibility and compliance are central.
- Shane and Venkataraman (2000), "The Promise of Entrepreneurship as a Field of Research", defines entrepreneurship as the process of discovering, evaluating, and exploiting opportunities. The authors argue that opportunities are not evenly distributed; instead, individuals with prior knowledge and access to information are more likely to recognize them. The paper reframes entrepreneurship as an interaction between individuals and opportunity structures, rather than purely personality-driven behavior. While regulation is not the core focus, the framework implicitly suggests that institutional environments influence which opportunities are feasible and worth pursuing.
- Djankov et al. (2002), "The Regulation of Entry", This study examines how entry regulations affect new firm creation across countries. Using cross-country data, the authors show that excessive regulatory procedures significantly discourage formal entrepreneurship. The article argues that complex licensing and approval systems raise costs without delivering proportional social benefits. Its core message is that simplifying entry rules encourages legitimate business formation, highlighting how regulatory design can either suppress or stimulate entrepreneurial activity.
- Shane (2003), "A General Theory of Entrepreneurship", develops a comprehensive theoretical explanation of why certain individuals identify and exploit entrepreneurial opportunities while others do not. The book emphasizes the role of prior knowledge, cognition, and individual motivation, while also acknowledging that external conditions shape opportunity exploitation. Regulatory clarity is treated as a factor that reduces uncertainty and increases the likelihood of action. The work concludes that entrepreneurship flourishes when individual capabilities align with supportive institutional conditions.
- Barberis and Thaler (2003), "A Survey of Behavioral Finance", evidence showing that investors systematically deviate from rational decision-making due to cognitive biases such as overconfidence and loss aversion. The article challenges traditional financial theories by demonstrating that psychological factors strongly influence market behavior. While not directly focused on advisory services, the review makes clear that investors often struggle to self-correct their biases. This implicitly underscores the need for professional guidance in financial decision-making.
- La Porta et al. (2006), "What Works in Securities Laws?", This article evaluates which components of securities regulation most effectively protect investors and promote market development. Through cross-country analysis, the authors find that disclosure requirements and enforcement mechanisms are more effective than private litigation alone. The study concludes that strong regulation and market growth are not mutually

ISBN : 978-93-6163-366-9

exclusive. Instead, credible legal frameworks enhance trust and participation in financial markets.

- Aidis et al. (2008), "Institutions and Entrepreneurship Development", explore how institutional quality influences entrepreneurship in emerging economies. Using survey-based empirical analysis, they show that supportive formal institutions positively affect entrepreneurial intentions and survival. The study highlights those institutional weaknesses disproportionately harm knowledge-based and professional entrepreneurship. It concludes that institutional facilitation is especially critical in developing and transition economies.
- Acs et al. (2009), "The Knowledge Spillover Theory of Entrepreneurship", This article proposes that entrepreneurship emerges when unused or under-commercialized knowledge spills over from existing organizations into new ventures. The authors argue that institutions play a key role in enabling this transformation by allowing knowledge to be legally and economically exploited. Although innovation is the central focus, the theory implies that professional expertise can also become entrepreneurial when regulatory conditions are favorable. Entrepreneurship, in this view, is a mechanism for converting knowledge into economic value.
- Von Nordenflycht (2010), "What Is a Professional Service Firm?", The article emphasizes that legitimacy and reputation are more important than scale or capital intensity in such firms. Regulation is implicitly positioned as a mechanism that reinforces professional norms and public trust. The study concludes that professional entrepreneurship depends heavily on institutional recognition and credibility.
- Inderst and Ottaviani (2012), "Financial Advice", This study analyzes how incentives and regulation shape the quality of financial advice. Using theoretical modeling, the authors show that poorly designed compensation structures can lead to biased recommendations. Regulation, when properly designed, improves advice quality and client welfare. The paper concludes that regulatory oversight enhances professionalism in advisory markets, indirectly supporting sustainable advisory practices.
- Mullainathan et al. (2012), "The Market for Financial Advice Through field experiments", this study investigates conflicts of interest in financial advisory services. The authors find that advisers often provide biased advice when incentives are misaligned and regulation is weak. Strong regulatory frameworks, however, reduce such distortions and improve client outcomes. The study highlights the importance of ethical and transparent advisory environments for market trust.
- Klapper et al. (2016), "Business Registration Reforms and Entrepreneurship", examines whether simplified business registration processes increase new firm creation. Using panel data across countries, the authors find a strong positive relationship between procedural simplification and entrepreneurial entry, particularly in service sectors. The study concludes that reducing administrative barriers is a powerful tool for encouraging formal entrepreneurship. This insight is especially relevant for professional and advisory services.
- Estrin et al. (2016), "Institutions, Entrepreneurship, and Growth Aspirations", analyze how institutional environments influence not just entrepreneurial entry but also growth ambitions. Using multi-country survey data, they show that high-quality institutions support both start-up formation and long-term sustainability. The study emphasizes that

entrepreneurs respond to regulatory signals about stability and fairness. It concludes that facilitative institutions encourage sustained entrepreneurial engagement.

- Malik and Jyoti (2018), "Ease of Doing Business and Entrepreneurship in Emerging Economies",This study assesses the impact of Ease of Doing Business reforms on entrepreneurial activity in emerging markets. Through regression analysis, the authors find that regulatory simplification improves entrepreneurial confidence and formal participation. The article highlights that professional are particularly responsive to institutional clarity. The findings support the view that regulatory reforms can legitimize and stimulate professional entrepreneurship.
- Gennaioli et al. (2018), "A Crisis of Belief", examine how investor psychology and collective beliefs shape financial cycles and crises. The book argues that trust, narratives, and confidence play a decisive role in market stability. When beliefs collapse, markets become fragile, regardless of fundamentals. The study implicitly positions regulated and credible advisory services as important actors in restoring confidence and guiding investor behavior.

Research Design

The present study adopts a descriptive qualitative research design, an integrative literature review approach, to examine the market demand for investment advisory services in India. The research design allows for the integration of regulatory intent, academic theory, and market-level observations, Integrative literature reviews are particularly useful in emerging research areas, as they permit the inclusion of diverse theoretical perspectives and policy-oriented insights while maintaining analytical rigor (Snyder, 2019).

Data Sources and Collection

The study relies exclusively on secondary data, collected from multiple authoritative sources to ensure academic credibility and contextual relevance. Peer-reviewed journal articles constituted the primary source of academic literature and were identified through established scholarly databases such as Scopus, Web of Science, SSRN, and Google Scholar. regulatory and institutional documents included regulations, amendments, circulars, and discussion papers issued by the Securities and Exchange Board of India (SEBI), reports and statistical publications from the Reserve Bank of India (RBI), and policy documents from the Government of India related to financial market development and investor protection. Institutional reports published by international organizations such as the World Bank, OECD, and CFA Institute were also consulted to provide comparative and policy-level perspectives. The review primarily focused on literature published between 2000 and 2024.

Literature Selection Criteria

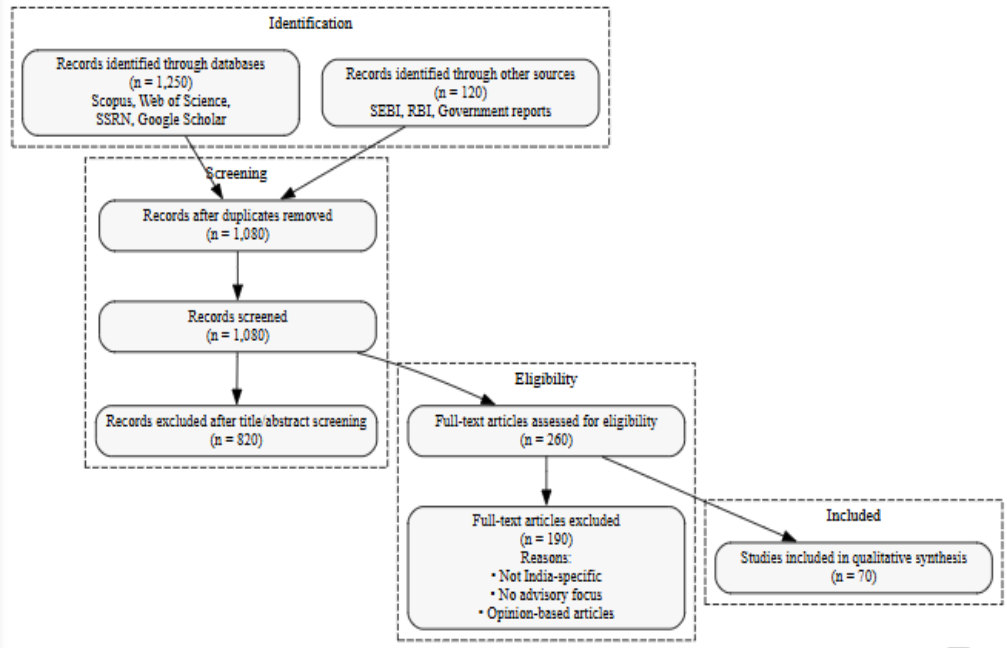
A purposive and relevance-based selection strategy was adopted to identify literature aligned with the objectives of the study. Academic articles and reports were included,

(i) Demand for investment advisory,
(ii) Entrepreneurship in financial services,
(iii) Regulatory and institutional influences on financial intermediaries,
(iv) Behavioral aspects of investor decision-making.

ISBN : 978-93-6163-366-9

Method of Data Analysis

The collected literature was analyzed using thematic descriptive analysis, a qualitative method that facilitates systematic interpretation of textual data. The analysis proceeded through multiple stages. First, the selected literature was read iteratively to gain familiarity with recurring concepts and arguments. Second, relevant themes were identified and coded based on their alignment with the study's objectives. Third, these themes were refined and organized into analytically meaningful categories reflecting demand drivers, entrepreneurial opportunities, and regulatory influences.



The thematic approach enabled the study to move beyond descriptive summarization toward interpretive synthesis, the analysis examined how different strands of literature converged or diverged in explaining market demand for advisory services. This method is particularly suitable for integrative reviews, as it allows regulatory narratives, academic theories, and market observations to be interpreted within a unified analytical framework (Snyder, 2019).



The analysis conceptualizes demand as a multi-layered phenomenon shaped by structural economic forces, investor behavior, regulatory legitimacy, and entrepreneurial response mechanisms. Thematic patterns were identified through iterative reading and synthesis of literature.

Theme 1: Structural Expansion of Financial Participation

Rising household incomes, increased dispersion of digital investment platforms, and policy-driven financial inclusion initiatives have significantly broadened the investor base beyond traditional urban and high-income segments (RBI, 2022; SEBI, 2023). However, this quantitative expansion has not been accompanied by a proportionate improvement in financial literacy and investment capability. As a result, investors are increasingly exposed to complex and market-linked financial products without adequate cognitive tools to evaluate risk–return trade-offs effectively (OECD, 2020). The literature suggests that demand for investment advisory services under these conditions is best understood as derived demand (Campbell et al., 2011). Investment advisors therefore function as cognitive and informational intermediaries, translating abstract market signals into actionable financial strategies. This positions advisory demand as structurally embedded within the broader financialization of households, rather than as a short-term response to market cycles or speculative booms (Gennaioli et al., 2018).

Theme 2: Behavioral Vulnerability and Advisory Dependence

Behavioral finance literature consistently demonstrates that individual investors are probable to systematic biases such as overconfidence, loss aversion, mental accounting, and herd behavior, which often lead to poor investment decisions (Kahneman & Tversky, 1979; Barberis et al., 2018). These biases tend to intensify during periods of market volatility, uncertainty, or financial stress.It indicates that investment advisors are increasingly perceived not merely as technical experts, but as behavioral stabilizers who help investors maintain discipline, long-term orientation, and goal alignment (Gennaioli et al., 2018). This behavioral governance role elevates advisory services from discretionary consultation to an ongoing financial support mechanism. Consequently, demand for advisory services remains relatively resilient even during market downturns, reinforcing the long-term viability of advisory entrepreneurship (Inderst & Ottaviani, 2012).

Theme 3: Regulation as a Trust-Creation Mechanism

SEBI's regulatory framework emphasizing fiduciary responsibility, fee transparency, qualification standards, and segregation of advisory and distribution functions has redefined investor perceptions of professional advisory services (SEBI, 2020). These measures differentiate registered investment advisors from commission-driven intermediaries, reducing perceived conflicts of interest. From an institutional perspective, regulation emerges as a trust-creation mechanism that reduces information asymmetry and perceived opportunism in advisory relationships (North, 1990; Scott, 2014). The literature suggests that demand for advisory services increases not in spite of regulation, but because regulatory compliance enhances credibility and legitimacy. This finding aligns with institutional entrepreneurship theory, wherein adherence to regulatory norms operates as a market-entry and reputation-building asset rather than merely a compliance cost (Acs et al., 2009).

Theme 4: Entrepreneurial Opportunity Formation

Advisory entrepreneurship emerges at the intersection of fulfilled investor needs, regulatory recognition, and professional specialization. Unlike product-based financial entrepreneurship, advisory ventures exploit demand primarily through service differentiation, niche targeting, and the growth of relational capital rather than through rapid scale expansion (Shane & Venkataraman, 2000). Trust accumulation, regulatory adherence, and reputation formation shape long-term business viability and client retention (Scott, 2014). Growth trajectories are therefore incremental and relationship-driven, reflecting the human-capital-intensive nature of

ISBN : 978-93-6163-366-9

advisory services. This distinguishes advisory entrepreneurship as a form of institutionally embedded, trust-based entrepreneurship within regulated financial markets.

Findings

The thematic analysis reveals that demand for investment advisory services in India is a structurally embedded outcome of financial market expansion rather than a short-term or cyclical phenomenon. Although retail participation has increased due to digitalization and financial inclusion, limited financial literacy has created a persistent advisory demand gap. Investment advisory services thus emerge as derived demand, arising from investors' constrained ability to independently navigate financial complexity. The findings further indicate that behavioral biases such as overconfidence, loss aversion, and herd behavior reinforce sustained reliance on professional advisors. Advisors increasingly serve as behavioral stabilizers, supporting disciplined and goal-oriented decision-making, which contributes to the resilience of advisory demand even during market volatility. Regulatory frameworks, particularly SEBI's emphasis on fiduciary responsibility and transparency, are found to enhance rather than inhibit demand by functioning as institutional trust mechanisms. Compliance thereby acts as a credibility-enhancing asset for advisory entrepreneurs. Finally, advisory entrepreneurship in India is shaped more by relational and reputational dynamics than by scale-based growth. Entrepreneurial opportunities emerge through specialization, trust-building, and long-term client engagement, resulting in incremental and path-dependent growth trajectories.

Conclusion

The study concludes that investment advisory services in India represent a form of institutionally embedded entrepreneurship, where demand is driven by financial complexity, behavioral factors, and regulatory legitimacy. Regulation plays a critical enabling role by fostering trust and reducing information asymmetry, thereby supporting sustainable advisory entrepreneurship. As retail participation in financial markets continues to expand, professionally regulated advisory services are likely to become increasingly central to investor protection and long-term market stability.

From an entrepreneurial perspective, the growing demand for investment advisory services has opened multiple opportunity pathways. Independent advisory practices, niche planning firms, and hybrid advisory models combining human expertise with digital tools have emerged as viable entrepreneurial options. The adoption of technology has lowered operational barriers by enabling digital onboarding, portfolio monitoring, and compliance reporting, thereby enhancing reach and efficiency. It also highlights significant challenges facing advisory entrepreneurs. Regulatory compliance requirements impose financial and administrative burdens, particularly for small and first-generation advisory firms. Qualification norms, net worth requirements, and ongoing reporting obligations increase entry barriers, even as they enhance professional standards. Price sensitivity among retail investors remains another constraint. Many investors are reluctant to pay explicit advisory fees.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

AN ANALYSIS OF TAX POLICIES IN BUSINESS OPERATIONS

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Abstract

Taxes determine the operational modalities of business firms. Investment, price expansion, and even location selection is all determined by these rules. By encouraging compliance, lowering uncertainty, and offering incentives for innovation, a sound tax system can support economic growth. On the other hand, an expensive, complicated, or unclear tax system is likely to result in inefficiencies, increased operational costs, and tax evasion. The study examines the direct and indirect consequences of taxes on business, such as corporate income tax, customs charges, and regulatory compliance. The examination also covers foreign tax consequences, tax credits, and how tax strategies are shaped by the evolving digital economy. Policymakers may create an environment that supports long-term business growth by acknowledging the connection between taxes and business dynamics.

Keywords: *Taxation Policies, Business Operations, Tax Incentives, Corporate Tax, Regulatory Compliance, Economic Growth, International Taxation, Fiscal Policy, Tax Planning, Digital Economy.*

1. Introduction

Policies that use the principle of levying taxes can impact the environment in which companies operate. These governance systems, which are all managed by governments, are designed to collect money for public services and to boost the economy as a whole. They are also meant to influence how people and businesses behave economically. Through the use of taxes, governments can support certain regions or activities while discouraging others, Leading to a more balanced distribution of wealth. Because of this, the strategies that businesses use must keep changing in response to the changes in tax laws and the incentives offered by governments. Corporate taxes are the most visible way in which taxes affect a business. The level of corporate taxation imposed by a government can greatly affect a company's profitability and its decisions about investment and expansion. Lower tax rates may attract foreign investment and encourage local economic growth, while higher tax rates could lead a business to move operations or reconsider its business activities. For these reasons, tax policies can determine whether a company remains competitive in its local or international markets.

Besides corporate taxes, business transactions are also affected by indirect taxes such as VAT, sales tax, and excise duties. These taxes influence the pricing of goods and services, as increased costs are often passed on to consumers. Indirect taxes are also considered a strategic tool for cost control, enabling companies to maintain competitiveness and profitability. Adhering to indirect tax regulations is crucial to avoid penalties and damage to the company's reputation.

Tax policy has a significant impact on investment decisions. Governments often provide tax incentives, such as deductions, credits, and accelerated depreciation, to en- courage investment

ISBN : 978-93-6163-366-9

in certain sectors like renewable energy and technology. These incentives can lower the cost of capital and improve the financial viability of projects. As a result, businesses tend to align their investment strategies with opportunities for favorable tax treatment.

For international companies, tax planning becomes more complex due to the varied tax approaches across countries. Issues such as transfer pricing rules, double taxation treaties, and tax havens add layers of complexity. While these challenges can help multinational firms minimize their global tax liabilities by ensuring compliance with multiple tax laws, failure to do so can lead to le- gal consequences, financial penalties, and reputation harm. Beyond its financial implications, the tax system also influences business operations and management. Companies need structured processes to determine when and how to report and pay taxes. This may involve employing experienced personnel or consulting with external tax advisors. Proper tax management helps maintain financial stability while avoiding unsustainable liabilities.

In addition, tax practices affect a company's corporate social responsibility (CSR) and public image. Businesses that pay a fair share of taxes contribute positively to society and build consumer and stake-holder trust. Conversely, companies engaging in aggressive tax avoidance face public backlash, which can harm their brand and market value. As a result, ethical tax practices are becoming an essential part of corporate governance.

2. Background of the Study

Tax laws have a significant impact on businesses worldwide, shaping the overall business environment. Governments utilize tax systems not only to generate revenue but also to influence economic behavior and encourage investment and manage risk. Both policymakers and business leaders need to understand the complex relationship between tax policies and business activities to maintain a stable and efficient economic system. The design and implementation of taxation and tax policies can greatly affect how businesses plan their operations, manage costs, and distribute resources. For instance, tax rates, allowances, and incentives can influence profit margins and thus affect competitiveness. These factors also play a key role in decisions related to expansion, hiring, and innovation. Companies must carefully navigate the tax environment to ensure their survival and growth.

Tax policies can also shape the overall business climate by making compliance easier or more difficult. Complex and intricate tax laws can increase administrative burdens and expenses, potentially deterring new businesses from entering the market. Conversely, clear and transparent tax systems can foster confidence and support business growth. Tax incentives are commonly used in various economies to attract foreign direct investment (FDI) and promote specific industries.

These incentives can include reduced tax rates, tax havens, and deductions for research and development. While they aim to stimulate economic growth, they can also complicate the administration of fair taxation and lead to challenges in maintaining a stable tax base. Another key area is the connection between taxation and corporate social responsibility. In recent years, there has been growing pressure on companies to contribute fairly to public finances, supporting areas such as infrastructure, social services, and economic stability. The extent to which tax policies encourage or discourage such accountability depends on both corporate actions and public perception. Recent changes in international tax policies have focused on the concept of digital taxation. In recent years, digital taxation has become a major topic of discussion globally, with policymakers aiming to create a more effective way to tax digital companies. International

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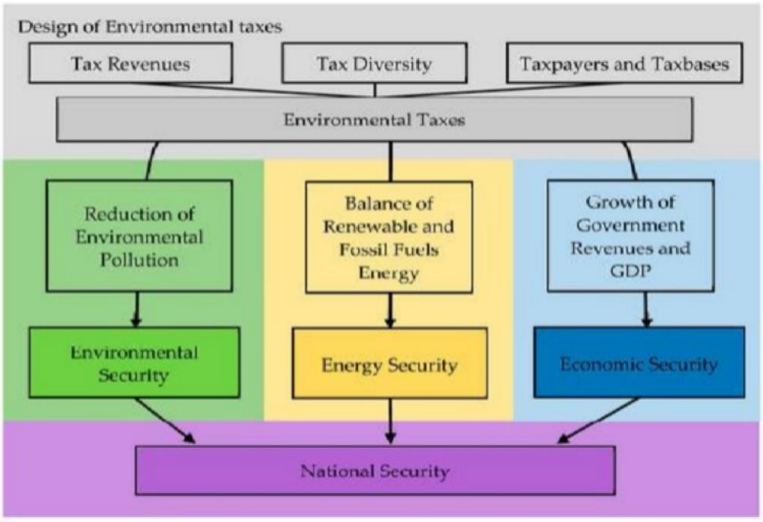
firms are facing greater scrutiny, and governments are working to adjust their tax systems to fit the needs of the digital age and modern business models. A comprehensive analysis of the role of taxation in business must also consider its effects on small and medium-sized businesses. These businesses often have different characteristics com- pared to larger firms, such as great sensitivity to tax changes and limited ability to plan for taxes. These factors can impact their ability to survive and grow.

This paper examines the impact of tax policies on business operations, including both opportunities and challenges. By analyzing the current tax systems and their effects on various business activities, the study aims to provide guidance for more effective and equitable tax policy considerations.



Finally, tax policies have their ethical and social aspects and dimensions on the running of a firm. A business that complies with tax laws in the business location is not only indicating its commitment to legality and a social contribution to that location. When businesses adhere to tax laws, they do so as part of establishing the confidence of stakeholders in a predictable business environment that is critical to the welfare of the wider community. It is imperative, therefore, for good corporate governance to understand and to adapt to taxation policies in the business environment.

3. Objective of the Study

1. To examine the impact of taxation policies on business profitability.
2. To analyze how tax regulations influence business decision-making.
3. To assess the role of taxation in business growth and sustainability.
4. To explore the challenges business face due to tax compliance.
5. To identify strategies business use to adapt to changing tax policies.

4. Literature Review

The effect of tax policy on firm actions has been widely studied in a number of economic and legal environments. The role of taxation is rather not only as an area of revenue for the government, but it is also a vital factor influencing the business decision relating to investment, price

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fixing, expansion and even meeting laws (Musgrave & Musgrave 1989). In this section, I briefly discuss selected studies and theories which explain how businesses develop strategies and grow, depending, to a large extent, on the structure of the tax system.

Foundations of Taxation and Business Behavior

Classical and neoclassical economic theories contend for a long time that taxes affect business via their cost structure and profit expectations (Stiglitz, 1988). According to the Optimal Tax Theory, a good tax system is one that generates the least amount of distortion to business activities and yet raises the most social welfare (Mirrlees, 1971). There is empirical evidence to back this up, suggesting that capital allocation, hiring decisions, and investment timing may be great influenced by tax burdens (Gordon & Hines, 2002).

Fiscal Policy and Relative Prices of Investment

Tax incentives or penalties frequently cause businesses to respond in their investment decisions. Devereux and Griffith (2003) argued that differences in corporate taxes among the countries con- siderably influence the location decision of the multinational enterprises. Tax credits, deductions and depreciation allowances can stimulate or reduce the incentive for capital investment, depending on the ways they interact with firm-specific goals and with the character of the market (Zodrow and Mieszkowski, 1986).

Tax and Corporate Compliance

Another key domain in which policy design matters is tax compliance. Elaborate tax structure and heavy tax rates are known to be generally associated with growing evasion and avoidance particularly in small and medium enterprises (Alm, Jackson, & McKee, 1992). On the other hand, simplified regimes and digitalization facilitate the transparency and voluntary compliance, which contribute to efficiency (OECD, 2015).

Effects on Business Competitiveness

Also, competitiveness, not only internal incentives, is affected by taxation. Companies that are lo- cated in high-tax countries are likely to be at a competitive disadvantage to companies in low- tax countries, which would impact on margins, pricing power, and market share (Desai et al., 2004). This has been further muddled by the emergence of digital business models, sparking debates about fair taxation of digital revenues across countries (OECD, 2020).

Differences in Sectors and Regions

The difference that is made by taxation matters also varies a lot between sectors. Take the example of manufacturing sector which is highly responsive to excise duty and customs duty and service type of enterprises being more responsive to VAT. Local evidence from developing countries suggests that badly designed tax systems can constrain entrepreneurship and formalization (Bird & Zolt, 2005).

New Developments in Tax and Business Planning

Recent developments have shown an increasing focus on the environmental tax, digital tax, and the global minimum tax as the new framework through which business plans for tax liabilities and sustainable strategies (IMF, 2021). In addition, high tech tax authorities are converting compliance into a real-time, data-based routine through their technology, affecting companies' financial and operational planning (PwC, 2022).

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5. Materials and Methodology

Research Design

This paper set out a design and methodology based on systematic review for examining the effects of tax and price policies on business. The study consisted of researching the existing literature, government reports, taxation systems, and cases on the impact of taxation policies on the operational activities of businesses. A systematic method was used to make sure that the review offers a holistic view of the impact of corporate tax, value-added tax, income tax, indirect tax, and international taxation on decision making, investment, profitability, and compliance. The review included peer-reviewed journal articles, academic books, policy briefs, and credible organization reports. We extensively employed databases such as Scopus, Google Scholar, JSTOR, and Science Direct in order to gather and organize the data.

Inclusion Criteria

- English language studies.
- Research and district reports, peer-reviewed journal articles, policy papers, and government publications.
- Research that particularly tackles tax policy and business performance, operations, or strategy.
- Theoretical or empirical studies that explain the impact of tax policies on firm activities.

Exclusion Criteria

- Publications and articles not published in English.
- Studies whose only subject are individual taxes not relevant to business.
- Duplication, opinion, and editorial articles not having empirical or policy relevance.
- Articles that have no relation to economic or business environments (e.g., taxation in health or education that does not relate to business).

Ethical Considerations

Since the study is based on the review of literatures, no original data were obtained from any hu- man or animal subjects. Yet ethical research requirements were met by giving due credit to all of such works via citations. The review adhered to the guidelines for not plagiarizing all the source were critically scrutinized in terms of its credibility and academic integrity. Data analysis was carried out in a way which was totally unbiased and fair and neither findings were exaggerated nor contrived or presented in a misleading way. Disagreements were transparently reported to, that heats and academic guide to adhere to, balance were in evidence of such opposing views in the found in the literature.

6. Results and Discussion

1. Impact of Taxation Policies on Business Profitability

The literature supports this find concept: independent role of taxation on profitability. High corpo- rate tax rates are often correlated with low net profits, especially for small to medium enterprises (SMEs) that don't have deep financial pockets. Evidence indicates that firms located in areas with attractive tax systems have higher levels of profits, investment, and shareholder returns. A high tax burden can also be complex and burdensome, and outweigh any incentives for new cap- ital investment and growth. The paper also underlines a trend in which

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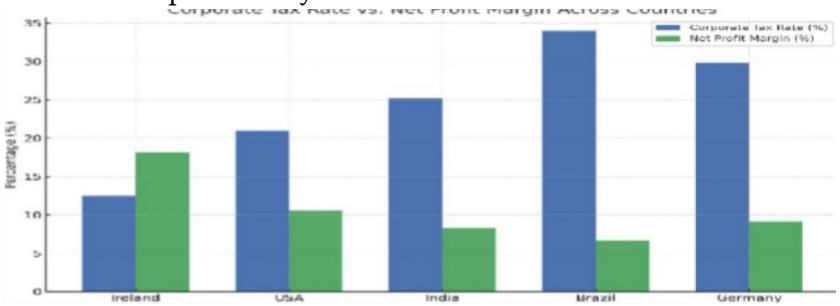
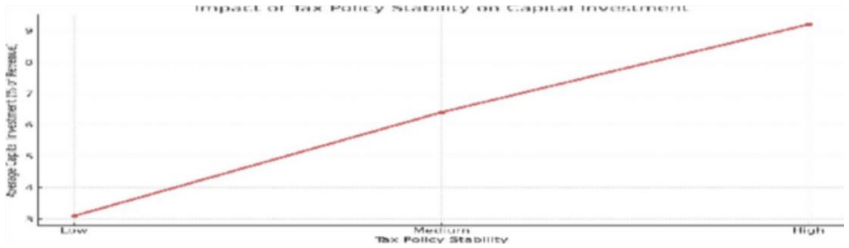
multinational companies engage in tax planning to move profits to low-tax countries and distort the domestic assessment of profitability.



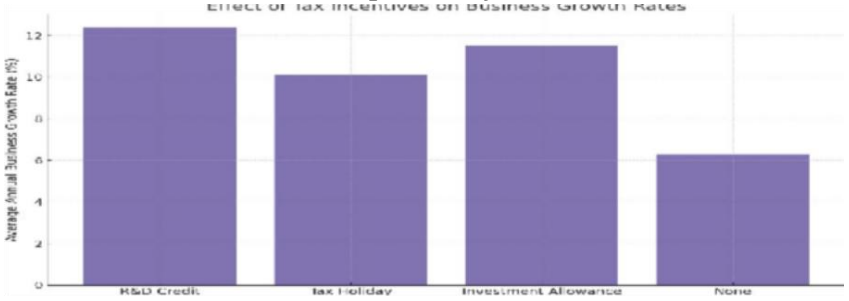
2. Influence of Tax Regulations on Business Decision-Making

Tax rules have profound impacts on strategic business decisions – organization structure, geo- graphic siting, capital allocation, financing arrangements, etc. Studies demonstrate that firms often change their operating plans to benefit from tax incentives or to escape adverse tax results. For in- stance, depreciation policies, costing of assets and dividend policies are dependent on existing tax laws. Also, tax credits associated with research and development or green projects are found to incentivize innovation and sustainability-related decisions. But frequent or vague tax law changes can lead to insecurity which causes players to act more conservatively and postpone decisions.



3. Role of Taxation in Business Growth and Sustainability

Tax Policies can act as a de/accelerator of long-term business growth and continuity. Tax incen- tives like the investment tax credits, sectoral subsidies and tax holidays have all succeeded in inducing entrepreneurship and sectors growth. A literature also recognizing the significance of the stable and transparent tax framework in providing an enabling business environment. Yet overregu- lation or outdated tax structures can have a disproportionate impact and prevent smaller businesses from scaling or competing for business in competitive markets. Inclusive business growth has been found to benefit from well-designed and underpinned tax systems, sustainable in relation to eco- nomic development objectives.



4. Challenges Businesses Face Due to Tax Compliance

Businesses are still focused on tax compliance for companies within different industries. Analytical studies indicate that there are important obstacles in this area, such as administrative burden, strong policing, interpretation differences in taxation and frequent changes in regulation. Due to a lack of resources, SMEs, in particular, are more susceptible to penalties (associated with their tax assurance) upgrading. The burden of compliance increases in jurisdictions characterized by limited digital infrastructure or unresponsive tax administration systems. Cross-border enterprises also encounter issues in the field of transfer pricing, double taxation and different VAT/GST sys- tem.

5. Strategies Businesses Use to Adapt to Changing Tax Policies

Against this backdrop of changing tax regimes firms will employ adaptive tactics. These comprise tax planning, technology investment in taxation, outsourcing of compliance, and use of tax consultants. Some companies reorganize to take advantage of preferred tax status, like creating shell entities in tax havens. The rest engage in policy advocacy through business federations, working toward tax reforms. Literature also demonstrates an increased dependence on information and data analytic tools to foster real time compliance and scenario-based tax estimation to increase agility to adapt to fast changing regulatory environment.

Conclusion

Research design and data Introduction to research Paper aims and objectives This study envis- aged to examine the multi-dimensional impact of the tax strategies on business with five goals: profitability, decision-making, growth and sustainability, compliance challenges, and strategic adaptations. Based on the extant literature in both developed and emerging markets, the results emphasize the prominent and sometimes intricate role of tax policies in shaping the business environment.

The review further uncovers that economic profitability of businesses are influenced in a considerable fashion by taxing policies. Corporation taxes and tax relief deductions and incentives are significant factors in commercial profitability. Countries or territories with lower, or even straight- out better tax rules see more businesses and investments as a result, leading to better profitability and huge profit margins, especially when margins are directly affected by operational costs.

Second, the tax rules are found to impact almost every aspect of business decisions. Whether it is the structuring of capital, geographic reach, product pricing or investment in innovation, companies frequently adopt strategies to achieve tax efficiency. Predictable and transparent tax regimes give higher potential for long-term planning, while frequent amendments, and complicated regulations lead to an uncertain tax climate.

Third so relevant since taxes can create or kill a business. The literature suggests that well-de- signed tax incentives can promote innovation, the development and diffusion of new technologies, and sustainable practices. On the other hand, regressive or complicated tax systems can have a dampening effect on entrepreneurship and reinvestment, more so when it comes to SMEs.

4th, tax compliance represents a significant burden for most firms. The management issues, legal uncertainties, inadequate digital infrastructure, and high compliance cost still handicap their operation. Small businesses especially suffer from the added burden, with many not having

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full-time, tax professionals and are left struggling financially, and legally.

Lastly, businesses are no passive victims of the tax policy - they actively respond to it using different strategic tools. Some of these are using tax advisers more effectively, reorganizing the business, using digital tax tools, and advocating for change. The introduction of sophisticated data analytics and real-time compliance tools is another indication that businesses are beginning to adapt to the more dynamic tax environment they now face.

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IMPACT OF TAXATION POLICIES ON SUSTAINABLE DEVELOPMENT IN INDIA

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Abstract

Taxation policies play a crucial role in shaping a nation's economic growth, social equity, and environmental sustainability. In India, taxation has evolved as a powerful fiscal tool not only for revenue generation but also for promoting sustainable development. This paper examines the impact of taxation policies on sustainable development in India, with special emphasis on environmental taxes, fiscal policy instruments, corporate tax compliance, and recent tax reforms. The study analyzes how taxation influences investment decisions, resource allocation, environmental protection, and social welfare. By evaluating recent developments such as Goods and Services Tax (GST), green taxation initiatives, and corporate tax reforms, the paper highlights the effectiveness of taxation policies in achieving sustainable development goals. The findings suggest that well-designed tax policies can promote inclusive growth, environmental responsibility, and long-term economic stability in India.

Keywords*: Taxation Policies, Sustainable Development, Fiscal Policy, Environmental Taxes, Corporate Tax, India*

1. Introduction

Sustainable development has emerged as a key policy objective for both developed and developing nations. It emphasizes economic growth while ensuring social inclusion and environmental protection. In India, taxation policies serve as a vital instrument for mobilizing resources, correcting market failures, and guiding economic behavior. The role of taxation has expanded beyond revenue collection to include environmental protection, redistribution of income, and encouragement of sustainable investment practices. This paper explores the impact of taxation policies on sustainable development in India and evaluates their effectiveness in promoting balanced growth.

2. Background of the Study

India's taxation system has undergone significant reforms over the years to address economic liberalization, globalization, and sustainability challenges. The shift from a complex indirect tax system to GST, introduction of environmental levies, and rationalization of corporate taxes reflect the government's commitment to sustainable development. However, challenges such as tax evasion, compliance costs, and uneven tax burden persist. Understanding the relationship between taxation policies and sustainable development is essential for formulating effective fiscal strategies.

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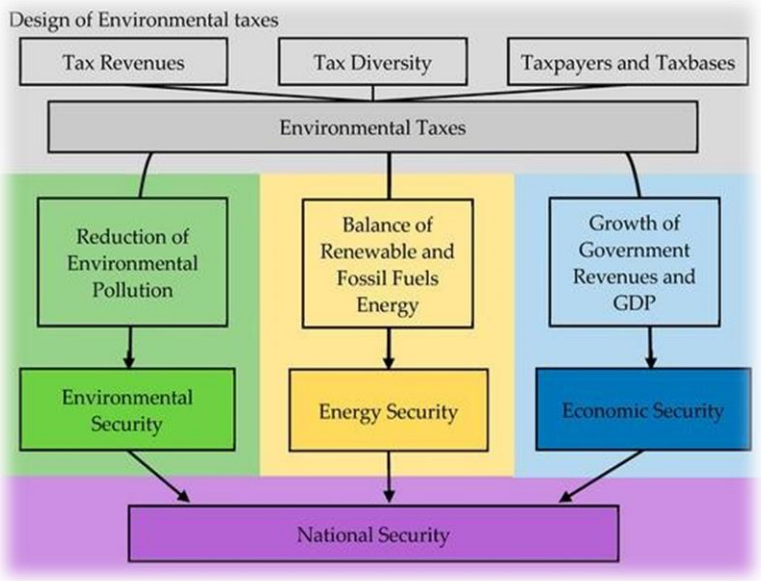

3. Design of Environmental Taxes

Environmental taxes are designed to internalize environmental costs and discourage activities that harm natural resources. In India, such taxes include:

- Carbon-related taxes on coal and petroleum products
- Pollution taxes and cess
- Incentives for renewable energy adoption

These taxes encourage industries and consumers to shift towards cleaner technologies, reduce emissions, and promote resource efficiency. Environmental taxes also generate revenue that can be reinvested in green infrastructure and sustainable initiatives.

4. Justification of the Study

The increasing pressure on natural resources, climate change concerns, and rising social inequality necessitate sustainable fiscal policies. This study is justified as it examines how taxation policies can act as catalysts for sustainable development in India. It provides insights for policymakers, researchers, and practitioners on designing effective tax systems that balance economic growth with environmental and social objectives.

5. Objectives of the Study

The main objectives of the study are:

- To analyze the role of taxation policies in promoting sustainable development in India.
- To examine the impact of environmental taxes on green investment and resource conservation.
- To study the influence of fiscal policy on investment and relative prices.
- To evaluate corporate tax compliance and its effects on sustainability.
- To assess recent developments in India's taxation system.

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6. Foundation of Taxation

The foundation of taxation lies in principles such as equity, efficiency, certainty, and convenience. In the context of sustainable development:

- Equity ensures fair distribution of tax burden.
- Efficiency minimizes economic distortions.
- Certainty improves compliance.
- Convenience reduces administrative costs.
- A sustainable tax system aligns these principles with long-term developmental goals.

7. Fiscal Policy and Relative Prices of Investment

Fiscal policy influences investment decisions by altering relative prices through taxes and subsidies. Tax incentives for renewable energy, infrastructure development, and research and innovation lower the cost of sustainable investments. Conversely, higher taxes on polluting industries discourage environmentally harmful activities. Thus, taxation shapes production patterns and supports sustainable economic transformation.

8. Tax and Corporate Compliance

Corporate tax compliance is critical for sustainable development as it ensures adequate public revenue and promotes transparency. In India, digitalization of tax administration, simplification of tax procedures, and reduction in corporate tax rates have improved compliance. Enhanced compliance reduces tax evasion, strengthens governance, and supports social and environmental spending.

9. Effects of Taxation Policies

Taxation policies affect sustainable development through:

- Revenue generation for social welfare programs
- Promotion of environmentally friendly technologies
- Redistribution of income to reduce inequality
- Encouragement of responsible corporate behavior

However, excessive taxation may discourage investment, highlighting the need for balanced tax design.

10. New Developments in Taxation

Recent developments in India's taxation system include:

- Implementation of GST
- Reduction in corporate tax rates
- Introduction of faceless assessment and digital compliance
- Increased focus on green taxes and sustainability incentives

These reforms aim to improve efficiency, transparency, and sustainability.

11. Methodology

The study adopts a descriptive and analytical research design based on secondary data. Data have been collected from government reports, budget documents, research articles, and publications from institutions such as the Reserve Bank of India and Ministry of Finance.

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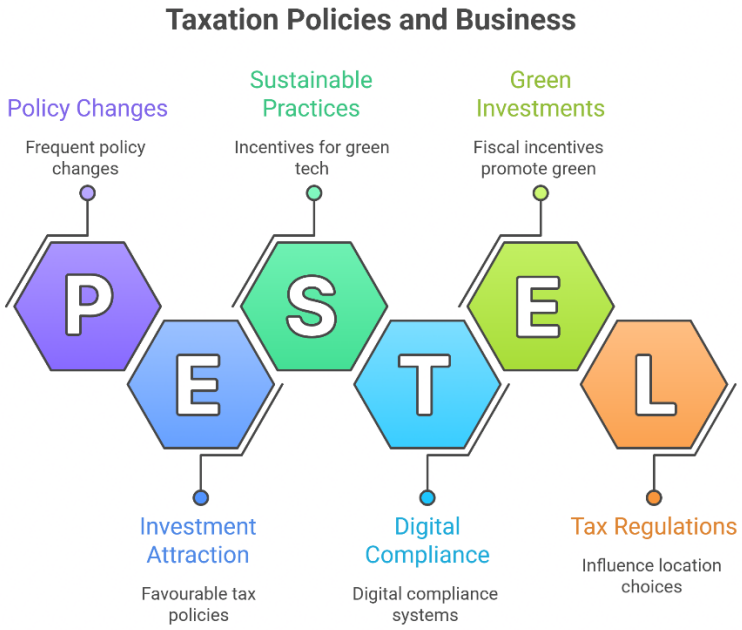
Analytical methods are used to assess the relationship between taxation policies and sustainable development indicators.

12. Results and Discussion



12.1 Impact of Taxation Policies on Business

Taxation policies significantly affect business profitability, investment decisions, and operational strategies. Incentives for sustainable practices encourage businesses to adopt green technologies and responsible production methods.

12.2 Influence of Tax Regulations on Business Decision-Making

Tax regulations influence location choices, capital investment, and pricing strategies. Favourable tax policies attract investments, while complex regulations may discourage expansion.

12.3 Role of Taxation in Business Growth and Sustainability

Tax incentives and exemptions support business growth by reducing costs and promoting innovation. Sustainable taxation policies help businesses align economic objectives with environmental and social responsibilities.

12.4 Challenges Businesses Face Due to Tax Compliance

Businesses face challenges such as frequent policy changes, high compliance costs, and administrative complexity. Small businesses are particularly affected due to limited resources and technical expertise.

12.5 Strategies Businesses Use to Adapt to Changing Tax Policies

Businesses adopt strategies such as tax planning, digital compliance systems, professional consultation, and investment in sustainable technologies to adapt to evolving tax policies.

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The analysis reveals that taxation policies in India significantly influence sustainable development outcomes. Environmental taxes encourage cleaner production, while fiscal incentives promote green investments. Improved corporate compliance enhances revenue mobilization and governance. However, policy effectiveness depends on proper implementation, awareness, and administrative efficiency.

13. Conclusion

Taxation policies play a pivotal role in advancing sustainable development in India. By integrating economic, social, and environmental objectives, taxation can serve as a powerful tool for long-term growth. Strengthening environmental taxes, improving compliance, and aligning fiscal policy with sustainability goals will enhance India's progress toward sustainable development. Policymakers must continue to refine tax structures to ensure inclusive, efficient, and environmentally responsible development.

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ISBN : 978-93-6163-366-9

AN EMPIRICAL STUDY ON ANALYSIS OF OPPORTUNITIES AVAILABLE TO WOMEN ENTREPRENEURS

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Abstract

This study explores the effectiveness and consequences of government policies and schemes aimed at promoting women entrepreneurship. By examining a range of initiatives such as financial incentives, skill development programs, and capacity-building measures –the study highlights the role of these schemes empowering women, accelerating economic liberty and bring inclusive economic development. The study delves into key government initiatives like Stand-Up India, Mahila E-Haat, Mudra Yojana, and Startup India, assessing their implementation, accessibility and outcomes. Challenges such as limited awareness, bureaucratic hurdles, and societal constraints are also analysed. This study concludes with recommendations to enhance the reach and efficiency of these programs to create a supportive ecosystem ecosystem for women entrepreneurs.

Keywords: *Women entrepreneurs, government initiatives, schemes and policies.*

Introduction

Entrepreneurship is the tasks include seeking opportunities, risk taking, and arranging resources to create and develop a business or entity. These procedure involves the ability to innovate, creative thinking and solve problems to generate value, frequently in the form of economic growth, social consequences or both. Entrepreneurs play a vital role in bringing innovation, creating jobs, and accelerating economic development.

Entrepreneurship is about transforming ideas into reality. Entrepreneurs may search gaps in the market, improve solutions, and take measured risks to drive solutions to life. This procedure requires a combination of vision, resilience, leadership, and adaptability.

Types of Entrepreneurs

1. **Small Business Entrepreneurship:**
   Local businesses that provide to a particular community, such as retail shops or service providers.
2. **Startup Entrepreneurship:**
   Creative ventures targeted to largest growth, frequently in technology or new industries.
3. **Social Entrepreneurship:**
   Business cornered on solving social or environmental issues while maintaining financial sustainability.
4. **Corporate Entrepreneurship:**
   Creations within established companies to develop competitiveness.

In significant, entrepreneurship is a dynamic force that transforms challenges into opportunities, turning goal to achievement.

An Entrepreneur

He is an individual who identifies a business chances, takes the initiative to allocate resources, and assumes the risks involved in creating and running a business or enterprise. They are the

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innovators who develop new products, services, or processes and bring them into the market to solve problems, face customer needs, or innovate value.

Role of an Entrepreneur

Entrepreneurs bring economic development, create jobs, and promote creation. They are the intermediaries of change who identify gaps in the market, develop solutions, and contribute to the entire development of the society.

Women Entrepreneurs

They are women who initiate, organize, and operate businesses, risk taking, to attain economic liberty and contribution to the economy. They play a significant role in accelerating innovation, creating employment opportunities, and bring social and economic development.

They can operate in various sectors, including small-scale industries, technology, services, social enterprises, and more.

Examples of Successful Women Entrepreneur

1. **Indra Nooyi:**
   She is Former CEO of PepsiCo, famous for her leadership and innovation.
2. **Kiran Mazunmdar-Shaw:**
   She is a Founder of Biocon, a leading biopharmaceutical company.
3. **Falguni Nayar:**
   She is a founder of Nykaa, a successful e-commerce beauty platform.

Objectives of the Study

1. To study the various schemes of women empowerment.
2. To study the Beti Bachao Beti Padhao Budget Allocation
3. To study the Benefits of Women Empowerment Schemes in India.

These are the specific government schemes and policies for women entrepreneurs in India:

1. Entrepreneurship Development Programmes
2. Seed Capital Scheme
3. Training and Extension Services
4. Income Generating Scheme
5. Scheme on TREAD for Women
6. District Industrial Centres
7. Mahila Arthik Vikas Mahamandal (MAVIM)
8. Self-Employed Women Association (SEWA)

Entrepreneurship Development Programmes

Numerous organizations implement Entrepreneurship Development Programs (EDPs) to improve the abilities of aspiring female entrepreneurs. Potential female entrepreneurs are encouraged to launch small businesses via the entrepreneurship development program. NIESBUD, SIDO, EDII, and NISIET are a few of the training and development establishments.

Seed Capital Scheme

This program is run by the government to help people create their own businesses. The government gives women and young people without jobs 10% of the funds.

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Ten to fifteen percent of the project's overall cost is allocated as seed money. The percentage of seed capital is 22.5% for backward-class candidates. The women are treated as unemployed even if their husbands are doing business or service.

Training and Extension Services

Through designated/approved agencies, IDBI will organize training and extension services for women entrepreneurs either independently or in collaboration with other development organizations such as the Entrepreneurship Development Institute of India, Technical Consulting Organizations (TCOs), Central/State Social Welfare Boards, and KVIC.

Income Generating Scheme

This program is carried out by the Department of Women and Child Development. It helps impoverished women establish training and income-generating ventures so they can become self-sufficient.

Scheme on TREAD for Women

The Trade-Related Entrepreneurship Development and Assistance (TREAD) program for women: During the ninth plan era, the Indian government introduced a program called "Trade Related Entrepreneurship Assistance and Development (TREAD)." The scheme aims at the economic empowerment of women through trade-related training information and counselling. This scheme provides for marketing development and financial loans through NGOs. The assistance is provided for Self-employment ventures by women

District Industrial Centres

The concept of District Industrial Centres was proposed in the 1977 Industrial Policy. The DICs became operational in 1979. The DICs provide special assistance to women entrepreneurs of SSI units with respect to training, research, and marketing assistance.

Mahila Arthik Vikas Mahamandal (MAVIM)

The economic and personal growth of underprivileged women in the state of Maharashtra is the corporation's primary goal. To help the women earn money and become self-sufficient, this company provides the training and job opportunities they need. The company will function as one of the organizations supporting women's economic advancement. The corporation's goal is to empower women to become economically independent and strong. The company will never stop looking for chances for women to work for themselves and in group industries. In order to establish a powerful organization for women, MAVIM will take the initiative in setting up institutes for women throughout the state of Maharashtra.

Self-Employed Women Association (SEWA)

The Self-Employed Women Association (SEWA) is a group of low-income women who work for themselves. In 1972, it became a registered trade union. Through their own labor and self-business ventures, the women in this group make a living. Unlike workers in the organized sector, they are not able to secure regular, paying jobs with welfare benefits. SEWA's primary goal is to organize female workers for full employment, where they can have social security, food security, income security, and job security. SEWA is a movement as well as an organization. It is a synthesis of the women's movement, the labor movement, and the cooperative movement.

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Start up India Programme

Launched in February 2016, it has grown to become the third largest start-up ecosystem globally, offering incentives, funding support, handholding, and industry-academic partnerships to create a favorable environment for start-ups in the nation. A corpus fund of 10,000 crores has been set aside for the program to foster innovation and start-ups, with 10% of the fund designated for women-led start-ups. This will serve as a catalyst in creating an environment that promotes the growth of innovative start-ups, which will have a multiplied impact on the creation of jobs and social transformation.

Prime Minister's Employment Generation Programme (PMEGP) Employment Generation Programme

Through KVIC Directorates, State Khadi and Village Industries Boards (KVIBs), District Industries Centers, and Banks, the Khadi and Village Industries Commission is acting as the nodal agency for the project. It is a credit-linked subsidy program designed to support MSME establishment and growth as well as create jobs in both urban and rural locations. The Program offers special categories, including women, a 25% and 35% subsidy level for starting new businesses in urban and rural areas, respectively, while the General Category subsidy level is 15% and 25% in each location.

Ministry of MSME launched Udyam Sakhi

A network for fostering social entrepreneurship that develops company plans centered on inexpensive goods and services to address social injustices. The site offers entrepreneurship learning resources, an incubation facility, fundraising training programs, mentors, one-on-one investor meetings, market survey facilities, and technical support to those who have launched or are operating their own enterprises.

Udhyam Shakti Portal for Women Entrepreneurs:

On the eve of International Women's Day 2018, the Ministry of Micro, Small, and Medium Enterprises launched a program to support social entrepreneurship by developing business models centered on low-cost goods and services. It helps over 8 million Indian women and others launch, develop, and expand their businesses by offering support for business plan preparation, incubation facilities, training courses, mentorship, and market research facilities, among other things. The Scheme covers projects with a maximum cost of Rs. 25 lakhs (service-based projects cost Rs. 10 lakhs). The site has consistently worked to transform women's roles outside the confines of their homes.

Review of Literature

Dr. Bhaskar V. Patil, Dr. Deepali Gala and Mrs. Kirti R. Kadam (2022) the article entitled "Effectiveness of Government Schemes: A Critical Review of Most Widely Used Schemes". This paper aims to concentrate on evaluating the effectiveness of all the schemes launched in rural areas for Maharashtra for empowering the women for entrepreneurial activity. This will base on the analysis of effectiveness index of the household and the compound average growth rate of the women who have opted for entrepreneurship by availing government scheme. The present study aims at analyzing the government support towards women entrepreneurs in Sangli district through various schemes. The study found that, the women who have availed the government

ISBN : 978-93-6163-366-9

scheme are not having a good compound average growth rate. The study also found that, the amount of time they have spent on the process of earning money is far more than what they have gained.

Amruta Somshekhar and Syed Sai (2022) the article entitled "A Study of the Government Schemes for the MSME Sector and their contribution to the Development of India". The paper aims to review the government schemes available for the MSME sector and to figure out how to contribute to the development of our country. The target of this examination is to find out the different issues faced by MSME in India and to know the scheme framed by the government under the MSME sector to find how MSME and start up contribute to the development of our country. This study depicts the job of government plans and MSME sectors are adding to his advanced world. The study found that, Indian MSMEs are not exceptionally creative, and most of the items that they produce depend on obsolete advancements. There is an extreme absence of business visionaries in this area, which has kept it from embracing new advances and devices which have achieved massive changes in different areas like e-commerce and call focuses etc.

E. Shireesha (2022) the article entitled "A Study on Women Empowerment Schemes in India" The study is purely theoretical. The study is based on secondary data sources. The researcher study is about the women empowerment in India. The study found that, women need fresh and more capable environment so that they can take their own right decisions in every area whether for themselves, family, society or country. The study also found that, in order to make the country fully developed, women empowerment is an essential tool to get the goal of development.

Niyaz, Abhinandan Kulal, Mahammad Thauseef P. and Abdul Jaleel (2021) the article entitled "Impact of Government Welfare Schemes on Empowerment of Minority Women in Karnataka". A study was conducted in Karnataka by taking 388 minority women as a sample unit. Simple random sampling techniques were used to select sample units and primary data was collected using a structured questionnaire. Hypotheses are developed to support the primary objective and tested with simple regression analysis. The study found that, minority women have a very low level of awareness and utilization of government welfare schemes which has adversely affected the overall development of minority women. This study suggested taking awareness programs for minority women in rural areas to achieve overall empowerment in India.

Findings

1. Women's empowerment can have a range of positive impacts on women's lives, including improved economic opportunities, greater control over their own lives, increased political participation, and greater gender equality.
2. By empowering women to participate fully in the economy, women can have access to better paying jobs, which can help to lift them and their families out of poverty.
3. Empowering women can also give them more control over their own lives, allowing them to make decisions about their own health, well-being, and future, which can lead to increased self-esteem and confidence, as well as improved mental and physical health.
4. The Indian government has launched a number of schemes for women over the past few years to ensure their economic security and expose them to more opportunities in education, work, and more.

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Suggestions

1. All round development and harmonious growth of a nation would be possible only when women are considered as equal partners in progress with men.
2. Policies on Women's empowerment exist at the national, state and local (Panchayat) levels in many sectors, including health, education, economic opportunities, gender based violence and political participation.
3. One way to support women's empowerment in India is by making a donation to organisations that are dedicated to improving the lives of women and girls in India through education and health care.
4. Women need fresh and more capable environment so that they can take their own right decisions in every area whether for themselves, family, society or country. In order to make the country fully developed, women empowerment is an essential tool to get the goal of development.

Conclusion

The advancement of women and their acceptance and participation in decision-making constitute women's empowerment. In addition, it entails opposing gender bias and giving them equal chances for social advancement. In Indian civilization, women and children play an essential role. These are also India's most susceptible regions. Women empowerment schemes in India are aimed at ensuring that women have equal access to resources, opportunities and protection. The Indian government has introduced various schemes to empower women and provide them with opportunities for growth and safety. These initiatives aim to address issues such as gender inequality, violence against women, and access to education and healthcare. Through schemes like Beti Bachao Beti Padhao, Working Women Hostel, One-Stop Centre, Women Helpline,

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ISBN : 978-93-6163-366-9

INCLUSIVE ENTREPRENEURSHIP DEVELOPMENT

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Abstract

Inclusive entrepreneurship development focuses on creating equitable opportunities for individuals from marginalized and underrepresented groups such as women, youth, persons with disabilities, migrants, and low-income populations to participate meaningfully in entrepreneurial ecosystems. It aims to reduce structural barriers related to access to finance, skills, markets, networks, and supportive policies that often limit entrepreneurial potential. By promoting inclusive policies, targeted capacity-building, accessible financing mechanisms, and enabling institutional frameworks, inclusive entrepreneurship contributes to job creation, innovation, poverty reduction, and sustainable economic growth. This approach recognizes diversity as a source of economic value and emphasizes the importance of tailored interventions, community-based support systems, and continuous measurement of outcomes to ensure long-term impact and social inclusion.

Keywords: *Inclusive Entrepreneurship Development (IED), Social Inclusive, Social and economic equality.*

Meaning

Entrepreneurial ecosystem where all sections of society—especially women, youth, rural people, SC/ST communities, minorities, persons with disabilities, and economically weaker sections—get equal opportunity, access, and support to start and grow enterprises.

It focuses on removing social, financial, educational, and institutional barriers that prevent marginalized groups from participating in business and economic activities. Core idea: Entrepreneurship as a tool for social justice, poverty reduction, and equitable economic growth.

Objectives of Inclusive Entrepreneurship Development (IED)

1. **Promote equal access to entrepreneurship**
   Enable women, youth, persons with disabilities, minorities, and marginalized groups to start and grow businesses.
2. **Reduce economic and social exclusion**
   Use entrepreneurship as a tool to integrate underrepresented groups into the formal economy.
3. **Enhance skills and entrepreneurial capacity**
   Provide training, mentoring, and business development services tailored to diverse needs.
4. **Improve access to finance and resources**
   Facilitate access to credit, grants, markets, technology, and infrastructure for inclusive entrepreneurs.
5. **Encourage innovation and local economic development**
   Support diverse business ideas that address community needs and drive sustainable growth.
6. **Create employment opportunities**
   Generate decent jobs and self-employment, especially in disadvantaged regions.
7. **Strengthen supportive ecosystems and policies**
   Promote inclusive policies, institutions, and partnerships that remove barriers to entrepreneurship.
8. **Foster sustainable and resilient enterprises**
   Encourage environmentally, socially, and economically sustainable business practices.

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Need for Inclusive Entrepreneurship Development (IED)

1. **To reduce unemployment and poverty**

   Inclusive entrepreneurship creates self-employment and income opportunities for marginalized and disadvantaged groups.

2. **To promote social and economic equality**

   It ensures equal participation of women, youth, minorities, persons with disabilities, and rural populations in economic growth.

3. **To utilize untapped human potential**

   Many capable individuals lack access to resources; IED helps unlock their entrepreneurial skills and talents.

4. **To promote balanced regional development**

   Encourages entrepreneurship in backward and rural areas, reducing regional disparities.

5. **To support inclusive economic growth**

   Broad-based entrepreneurship leads to sustainable and equitable national development.

6. **To encourage innovation and diversity**

   Diverse entrepreneurs bring new ideas, solutions, and business models to the economy.

7. **To strengthen social cohesion**

   Economic inclusion reduces inequality and social exclusion, fostering stability and harmony.

8. **To support government development goals**

   IED aligns with goals like poverty eradication, women empowerment, and sustainable development

Government Initiatives in India Supporting IED

Scheme	Purpose	Beneficiaries
PM MUDRA Yojana	Collateral-free loans up to ₹10 lakh	Small entrepreneurs
Stand-Up India	Loans for SC/ST & women	Inclusive startup support
Startup India	Incentives, incubation	Young innovators
PMEGP	Subsidy for micro enterprises	Rural & urban unemployed
DAY-NRLM / SHGs	Self-help groups, microfinance	Rural women
Skill India / PMKVY	Skill training	Youth
Digital India	Digital access for business	Rural entrepreneurs
NSIC & MSME support	Marketing & raw material support	Small units

Role of Inclusive Entrepreneurship Development (IED)

1. **Economic empowerment of marginalized groups**

   IED enables women, youth, minorities, persons with disabilities, and rural populations to become economically independent.

2. **Employment generation**

   By promoting self-employment and MSMEs, IED creates jobs and reduces unemployment.

3. **Reduction of poverty and inequality**

   Inclusive entrepreneurship increases income levels and helps bridge social and economic gaps.

4. **Promotion of innovation and creativity**

   Diverse entrepreneurs bring new perspectives, leading to innovative products and services.

ISBN : 978-93-6163-366-9

5. **Balanced regional development**
   Encourages enterprise creation in rural and backward regions, reducing regional imbalances.
6. **Strengthening local economies**
   Small and inclusive enterprises stimulate local production, consumption, and value chains.
7. **Enhancement of skills and capacity building**
   IED supports training, mentoring, and entrepreneurship education for sustainable business growth.
8. **Support to sustainable development goals (SDGs)**
   It contributes to goals such as decent work, gender equality, reduced inequalities, and economic growth.
9. **Formalization of informal businesses**
   Helps integrate informal entrepreneurs into the formal economy through policy and institutional support.
10. **Social inclusion and cohesion**
    Economic participation fosters dignity, confidence, and social integration among disadvantaged group.

Benefits of Inclusive Entrepreneurship Development (IED)

1. **Employment creation**
   Generates self-employment and job opportunities, especially for marginalized and disadvantaged groups.
2. **Reduction in poverty and inequality**
   Increases income levels and promotes equitable distribution of economic opportunities.
3. **Economic empowerment**
   Helps women, youth, minorities, and persons with disabilities become financially independent.
4. **Utilization of untapped talent**
   Brings hidden skills and entrepreneurial potential into the mainstream economy.
5. **Balanced regional development**
   Encourages entrepreneurship in rural and backward areas, reducing regional disparities.
6. **Innovation and diversity**
   Diverse entrepreneurs introduce new ideas, products, and solutions.
7. **Strengthening MSMEs and local economies**
   Supports the growth of small businesses, boosting local production and markets.
8. **Social inclusion and dignity**
   Promotes participation, self-confidence, and social integration of excluded groups.
9. **Sustainable economic growth**
   Leads to long-term, inclusive, and resilient economic development.
10. **Support for national development goals**
    Contributes to goals like poverty eradication, gender equality, and sustainable development.

Inclusive Entrepreneurship and Microfinance

Inclusive entrepreneurship policies aim to support the creation and growth of businesses by under-represented groups (e.g. women, youth, migrants and seniors) and the unemployed. For these groups the usual barriers to entrepreneurship are often higher than average. In view of the

challenges of the green and digital transitions, Europe will need innovative solutions and all entrepreneurial talent should be encouraged. The European Commission has a long-standing co-operation with the OECD on inclusive entrepreneurship. This co-operation has contributed to the development of the Better entrepreneurship policy tool**,** which helps policy makers at all levels to improve their inclusive and social entrepreneurship policies.

Challenges of Inclusive Entrepreneurship Development (IED),

1. **Limited access to finance**

Marginalized entrepreneurs often face difficulty obtaining loans, credit, and investment due to lack of collateral or credit history.

2. **Lack of skills and training**

Many potential entrepreneurs do not have adequate business knowledge, technical skills, or digital literacy.

3. **Social and cultural barriers**

Gender bias, discrimination, and social norms can restrict participation of women and disadvantaged groups.

4. **Limited access to markets**

Inclusive entrepreneurs often struggle to reach customers, supply chains, and formal markets.

5. **Inadequate infrastructure**

Poor transport, power, internet connectivity, and workspace especially in rural areas hinder business growth.

6. **Weak institutional and policy support**

Complex regulations, lack of awareness of schemes, and poor implementation create barriers.

7. **Technology and digital divide**

Limited access to technology and digital platforms reduces competitiveness.

8. **Fear of failure and low confidence**

Social pressure and lack of role models discourage risk-taking among marginalized groups.

9. **Informality of enterprises**

Many inclusive businesses operate informally, limiting access to finance, protection, and growth opportunities.

10. **Limited mentoring and networks**

Lack of business networks, guidance, and support systems affects sustainability.

6 Strategies for Inclusive Entrepreneurship Programs

1. Empowering women entrepreneurs

Despite notable progress, women entrepreneurs encounter significant funding disparities compared to their male counterparts. Our support for 2,597 female founders reveals a stark contrast in funding, even though they match or exceed their male peers in revenue, job creation, and program survival rates. The funding gap is evident, with men receiving average investments 80 times larger than those secured by women. To narrow this disparity, embedding funding initiatives into your entrepreneurship programs is vital.

2. Supporting underserved communities

Nearly half of the entrepreneurs we assist come from communities traditionally marginalized within the entrepreneurship ecosystem. These groups often generate significantly less revenue

ISBN : 978-93-6163-366-9

and secure fewer resources and employees compared to their counterparts. A considerable portion of these founders hail from regions with lower Human Development Index scores, lack prior access to entrepreneurship support, have limited formal education, live on an annual income below $10K USD, and a significant number are women. Our programs have demonstrably enhanced their ability to generate revenue, secure funding, and create jobs.

3. Unlocking rural entrepreneurship

Rural entrepreneurs face distinct challenges, notably limited access to essential services. Our rural-focused programs, designed as free and hybrid models, aim to mitigate these barriers. Despite this, participants often incur significant expenses for digital access and travel.

4. Inspiring success across diverse demographics

Ensuring mentorship matches and sharing success stories from similar demographic backgrounds can profoundly inspire and guide entrepreneurs facing unique obstacles. This not only broadens their network but also ensures that your programs offer focused support, enhancing their chances of success in fields like social entrepreneurship or innovation promotion.

5. Sector-Specific Expertise

Entrepreneurs operating in specific sectors often encounter distinct challenges. To meet their needs, you should include expert sessions tailored to their respective industries. By providing sector-specific support, you will further expand the network of the participants and equip them with the knowledge and skills required for success.

6. Staging Success

Tailoring support based on the development stage of the startup is crucial. For nascent ventures, hackathons or ideation workshops pre-program can identify dedicated participants, enhancing project viability. Conversely, more mature startups benefit from advanced funding opportunities and showcase events, addressing their distinct needs for growth and expansion.

Conclusion

Inclusive Entrepreneurship Development is not only an economic strategy but also a social transformation tool. By enabling marginalized communities to become entrepreneurs, a nation can achieve balanced growth, poverty reduction, gender equality, and sustainable development**.** With proper policy support, training, finance, and mentorship, inclusive entrepreneurship can become a powerful engine for inclusive and equitable economic progress in India.

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SOCIAL ENTREPRENEURSHIP IN EMPOWERING FAMILY SYSTEM

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Abstract

This paper explores the dynamic role of social entrepreneurship as a powerful catalyst for empowering family systems, particularly in developing contexts facing persistent socio- economic disparities. Social enterprises, characterized by a dual mission of achieving social good through sustainable business models, offer inclusive solutions that often succeed where traditional government or non-governmental organization initiatives fall short. The research utilizes a qualitative approach, drawing on case studies of social entrepreneurial initiatives (such as women's cooperatives and community-based enterprises) in regions like India and rural Croatia. Key findings indicate that social entrepreneurship contributes to empowerment on multiple dimensions.

Keywords*: Entrepreneurship, Empowering, Family system, Social Entrepreneurship.*

Introduction

Social entrepreneurship empowers family systems, primarily by enhancing the economic and social status of women, which in turn creates a positive feedback loop of community and family development. Social entrepreneurship accelerates entrepreneurship development by fostering innovation, creating sustainable, impact-driven business models that address societal challenges rather than just pursuing profit. It strengthens economies by creating jobs for marginalized groups, nurturing leadership and problem-solving skills, and promoting sustainable practices, leading to inclusive growth and community resilience.

Ways Social Entrepreneurship Empowers Family Systems

Economic Independence: Social enterprises provide women (often the primary beneficiaries) with opportunities for income generation, skill development, and self- employment, which directly increases household income and financial independence. This economic contribution elevates a woman's status within the family, leading to greater respect and self-worth.

Increased Decision-Making Power: As women gain economic autonomy, their influence in household decision-making (such as children's education or financial matters) increases, challenging traditional patriarchal structures.

Skill and Confidence Building: Participation in social enterprises helps women develop essential skills (e.g., business acumen, leadership, negotiation, technology use) and self-confidence, which are transferable to both their professional and family lives.

Establishment of Support Networks: Social entrepreneurship initiatives often foster women-only business networks and support systems. These networks provide mentorship, shared experiences, and emotional support, which are crucial for overcoming challenges like gender bias and work-life balance issues.

Intergenerational Collaboration: Involvement in social entrepreneurship can facilitate collaboration across different generations within family businesses, strengthening family ties and

ISBN : 978-93-6163-366-9

creating a shared sense of purpose around social concerns.

Improved Quality of Life and Community Well-being: By addressing systemic social problems like lack of access to basic services, education, or healthcare, social enterprises improve the overall quality of life for families and their communities.

Challenging Gender Norms: Social enterprises can actively work to break down harmful gender stereotypes by creating opportunities for women in traditionally male-dominated sectors (e.g., construction, renewable energy), which gradually transforms societal attitudes and family dynamics.

Challenges and Considerations

While the impact is largely positive, challenges remain. These include balancing business needs with family commitments, navigating persistent gender bias, and securing adequate financial resources. Effective solutions involve:

- **Flexible work conditions** and support systems like affordable childcare.
- **Targeted skill development programs** like the Life program at SP JMR in India.
- **Access to formal financial institutions** and impact investing.

Overall, social entrepreneurship serves as a powerful, sustainable mechanism for fostering positive change within the family unit and the broader community by empowering individuals, especially women, to reach their full potential.

Sustainable Models: They often use for-profit, non-profit, or hybrid business models to ensure the longevity of their impact.

Examples of Social Entrepreneurs

- **Muhammad Yunus (Grameen Bank):** Pioneered microfinance, offering small loans to impoverished individuals to foster economic independence.
- **Bill Drayton (Ashoka):** Founded the largest network of social entrepreneurs worldwide.
- **Blake Mycoskie (TOMS Shoes):** Popularized the "one-for-one" business model to address social needs.

Role of Family in Entrepreneurship Development

- **Support System:** Families provide critical emotional and moral support, helping entrepreneurs stay motivated.
- **Financial Support:** Often, initial capital comes from family savings or assets.
- **Mentorship and Knowledge:** Family members with business backgrounds offer guidance and expertise, reducing the learning curve.
- **Succession and Stability:** In family businesses, they ensure continuity across generations, fostering long-term stability.
- **Risk Management:** Family support allows entrepreneurs to take higher risks, knowing they have a safety net.

Role of Society in Entrepreneurship Development

- **Cultural Values:** Societal attitudes toward risk, failure, and success influence the number of entrepreneurs.
- **Education and Training:** Society provides educational infrastructure to develop skills necessary for business management.

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- **Networking and Opportunities:** Society provides forums, networks, and opportunities to connect with mentors, investors, and potential partners.
- **Social Approval:** A supportive society encourages innovation and entrepreneurship as a valuable career path.
- **Role Models:** Successful entrepreneurs in society inspire new individuals to enter the business world.

Key Aspects of Family and Business

- **Family Businesses:** Highlight that they contribute 60-70% of GDP in many nations.
- **Social Support:** Emphasize that societal encouragement enhances performance.
- **Entrepreneurial Culture:** Explain how society's mindset shapes the entrepreneurial landscape.
- **Resources:** Discuss how family and social networks provide initial resources.
- impacts of social entrepreneurship on development include:
- **Job Creation and Economic Growth:** Social enterprises create jobs, specifically targeting employment gaps and empowering economically weaker groups.
- **Skills Development:** It fosters essential skills like leadership, financial literacy, and creative problem-solving among youth and aspiring entrepreneurs.
- **Innovation for Social Issues:** It encourages unique solutions to complex problems in health, education, and the environment.
- **Sustainability and Inclusion:** It prioritizes long-term social impact, fostering a more equitable society through fair-trade, ethical consumption, and financial inclusion.
- **Community Empowerment:** It strengthens local economies, particularly in rural areas, by utilizing local resources and creating sustainable, community-centered enterprises.

Social entrepreneurship acts as a catalyst for long-term transformation by shifting from traditional charity models to self-sustaining business ventures.

Conclusion

Social entrepreneurship is essential for transforming the family system, particularly in developing regions, by fostering economic independence, enhancing social status, and promoting gender equality, ultimately enabling families to act as sustainable, resilient agents of social change.

ISBN : 978-93-6163-366-9

CHAPTER 2 - START-UPS AND INNOVATIONS

STARTUP ECOSYSTEMS IN MADURAI DISTRICT: CURRENT STATE, STRENGTHS, GAPS AND POLICY IMPLICATIONS

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Abstract

Madurai — a historic commercial and educational centre in southern Tamil Nadu — has in recent years begun to develop a distinct regional startup ecosystem. This paper synthesises publicly-available data, institutional activity and recent events to (a) map the core actors (academic incubators, agritech incubators, community groups, government initiatives), (b) identify strengths and bottlenecks for scaling innovation in the district, and (c) recommend practical steps for policymakers, industry partners and ecosystem builders. The analysis relies on secondary sources, incubator portfolios, and summaries of state-level initiatives to present an original, evidence-based overview suitable for policymakers and researchers interested in sub-regional innovation ecosystems.

1. Introduction

Regional start-up ecosystems matter because they connect local talent, domain strengths and markets to provide livelihoods and inclusive economic growth. Madurai's ecosystem is shaped by a mix of higher-education institutions (notably Thiagarajar College of Engineering), agriculture research bodies (Tamil Nadu Agricultural University links), nascent incubators focused on agribusiness and technology, and support from the Tamil Nadu state startup agency (StartupTN). Recent district-level events such as the Tamil Nadu Startup Thiruvizha (Madurai edition) demonstrate both rising interest and the state's intent to decentralise startup support beyond Chennai.

2. Core actors and assets

Academic incubators and technical colleges. Thiagarajar College of Engineering (TCE) operates an active Technology Business Incubator (TCE-TBI) which provides infrastructure, mentoring, and industry linkages for tech startups and student entrepreneurs. TCE-TBI's presence anchors engineering/IT entrepreneurship in the city and runs programmes, hackathons and alumni startup engagement.

Agribusiness incubation (MABIF). Given Madurai's strong agricultural hinterland, the Madurai Agri Business Incubation Forum (MABIF), promoted with NABARD and Tamil Nadu Agricultural University, is a significant asset — providing agritech incubation, farmer linkages, and value-chain support for food and rural startups. This positions Madurai to leverage rural innovation and agri-entrepreneurship.

Community groups, events and co-working. Local groups (MaduraiStartups, Madurai Tech Community) and periodic events such as Startup Thiruvizha and regional hackathons create

ISBN : 978-93-6163-366-9

networking spaces for founders, mentors and investors. These community efforts provide soft infrastructure — matchmaking, pitch practice and visibility.

State mechanisms. Tamil Nadu's StartupTN agency runs district outreach (Startup Thiruvizha and funds), while the state's 'Fund-of-Funds' and other initiatives aim to channel capital and accelerate startups outside metropolitan centres — creating opportunities for Madurai startups to access capital and programmes.

3. Profile and performance

- **Diverse early-stage activity.** Madurai's startups range from IT/ITES and SaaS offerings to agritech, manufacturing and consumer products. Local directories and rankings list dozens of active startups and indicate an emergent cluster rather than a single-industry boom.
- **Incubation throughput.** Institutional incubators (TCE-TBI and MABIF) show active portfolios and programming designed to convert student projects and agricultural research into ventures. These incubators are the principal channels turning research and local expertise into startups.
- **Events-as-catalysts.** High-visibility events organized or supported by StartupTN and local partners (e.g., Madurai edition of Startup Thiruvizha) have drawn speakers, investors and large numbers of visitors, raising the district's profile and creating short-term investor interest.

4. Strengths

1. **Academic-industry linkage.** Strong local engineering and agricultural institutions provide talent, labs and R&D that feed the startup pipeline (TCE, TNAU).
2. **Domain fit for agritech and manufacturing.** Madurai's rural economy and small-scale manufacturing base give startups nearby testbeds, customers and domain knowledge, especially for agribusiness and supply-chain solutions.
3. **Growing state support.** Tamil Nadu's district outreach and fund instruments create programmatic and financial support options for non-metropolitan startups.
4. **Community momentum.** Local hackathons, startup meetups and co-working initiatives sustain founder networks and entrepreneurial culture.

5. Gaps and constraints

1. **Early-stage capital scarcity.** While state funds and programmes exist, local seed and pre-seed funding remains limited compared with larger Indian cities; founders still seek investors from Chennai/Bengaluru or national VC networks.
2. **Limited specialized accelerators and mentors.** There are fewer sector-specific accelerators (e.g., deeptech, medtech, space tech) and experienced entrepreneurial operators who can scale ventures beyond regional markets.
3. **Market and scaling challenges.** Many startups face difficulties scaling distribution nationally or internationally due to limited market access, logistics and professional services locally.
4. **Talent retention.** Mid- and senior-level product, growth and operations talent often migrates to larger tech hubs, creating a local leadership gap for scaling startups.

ISBN : 978-93-6163-366-9

6. Policy and ecosystem recommendations

Below are actionable recommendations to strengthen Madurai's startup ecosystem. Each is calibrated to local assets (academia, agribusiness) and practical constraints.

6.1 Strengthen local pre-seed capital and blended finance

- Create a Madurai seed co-investment window under the state Fund-of-Funds targeting agritech, manufacturing and deeptech pilots anchored in local incubators. Co-investments can be structured so incubators provide matching non-dilutive support (labs, mentoring). This reduces founders' need to relocate for capital.

6.2 Deepen university-industry commercialization pathways

- Formalise tech-transfer offices (TTOs) across TCE and TNAU, with clear IP policies, licensing templates and entrepreneur-in-residence programmes to convert faculty/student research into startups. TCE-TBI can be scaled as the district's commercialization hub.

6.3 Sectoral accelerator programmes

- Launch short-duration accelerators focused on agritech/value-chain digitisation and light manufacturing. Use MABIF for agritech cohorts and TCE-TBI for deeptech/IoT cohorts. Involve corporate buyers (FMCG, agri-markets) as pilot customers.

6.4 Build mentor and talent pipelines

- Incentivise return-path fellowships for Madurai alumni in metros (6–12 month sabbatical programmes) and establish part-time mentorship roles where senior professionals advise startups virtually. Offer tax-lite stipends or travel allowances.

6.5 Improve market access and buyer linkages

- Create district export/market access cells within the incubators to help startups list on government procurement (GeM), connect with retail chains, and scale logistics partnerships. Events like Startup Thiruvizha should be used to secure buyer MOUs.

6.6 Data and evaluation

- Maintain a public portal of incubated startups, funding rounds and program outcomes for Madurai (to be hosted by the District IT / Startup cell). Transparency will attract investors and enable evidence-based policy.

7. Limitations of this Analysis

This paper is based on publicly available secondary sources, incubator portfolios and event summaries; it does not include primary interviews or proprietary financial data. Future research should include founder interviews, investor surveys and longitudinal tracking of cohort performance to evaluate impact.

8. Conclusion

Madurai's startup ecosystem is a classic example of a promising sub-regional innovation cluster — anchored by strong academic institutions and domain fit (agriculture and light manufacturing), animated by local communities and increasingly supported by state initiatives. To move from promise to sustained scale, stakeholders should prioritise locally-available early-stage capital, stronger university-industry commercialization, sectoral accelerators, and mechanisms to retain and attract managerial talent. With coordinated policy action and continued grassroots energy, Madurai can evolve into a resilient regional startup hub that complements Tamil Nadu's larger ecosystems.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

DIGITAL EMPOWERMENT: STRATEGIES AND RESILIENCE OF WOMEN-LED STARTUPS IN TAMIL NADU

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Abstract

The digital startup ecosystem in India has witnessed rapid growth, with Tamil Nadu emerging as one of the leading states fostering technology-driven entrepreneurship. Within this evolving ecosystem, women entrepreneurs are increasingly establishing and scaling digital startups; however, their strategies, pathways, and constraints remain underexplored when compared to their male counterparts. This research examines how women founders in Tamil Nadu leverage digital platforms, technological competencies, and personal and social resources to initiate, sustain, and scale startups in a rapidly changing innovation environment. Drawing on contemporary literature on gendered entrepreneurship and digital transformation, the study explores the interaction between technology adoption, access to resources, market inclusion, and socio-cultural barriers specific to the Tamil Nadu context. The findings highlight the critical role of digital platforms such as e-commerce, fintech solutions, and cloud-based productivity tools as key enablers for women entrepreneurs by lowering entry barriers, expanding professional networks, and offering flexibility in business operations. Simultaneously, persistent challenges including limited access to funding, algorithmic and institutional bias, gender stereotypes, and unequal access to mentorship and advanced technical training are identified. The study adopts a mixed-method research approach, synthesizing secondary data and empirical insights to identify trends in digital literacy, community-based support systems, and innovative problem-solving strategies adopted by women entrepreneurs to navigate structural constraints. The analysis demonstrates that digital technologies not only enhance operational efficiency but also empower women to redefine entrepreneurial identities, diversify markets beyond local boundaries, and develop socially responsive business models aligned with regional needs. The study contributes to the growing discourse on women-led digital entrepreneurship by positioning the digital startup ecosystem in Tamil Nadu as both an opportunity space and a contested arena. It concludes by proposing a framework for enhancing inclusivity through targeted skill development, equitable financing policies, and gender-sensitive digital infrastructure, ultimately fostering a more diverse, resilient, and sustainable entrepreneurial ecosystem.

Keywords: *Women Entrepreneurs, Digital Startup Ecosystem, Technology Adoption; Innovation; Startup Financing; Digital Platforms, Social Barriers.*

Introduction

1. Introduction

The digital economy has fundamentally restructured Tamil Nadu's industrial landscape, offering unprecedented avenues for innovation and global scaling. As one of India's most technologically progressive states, Tamil Nadu has achieved a milestone by registering 11,155 startups as of late 2024, with a remarkable 5,560 being women-led (Startup Genome, 2025). Women founders are emerging as a transformative force, deploying digital tools to lead ventures in SaaS, fintech, and health-tech. Despite this progress, women in the state's digital sphere navigate unique headwinds, ranging from institutional "funding winters" to deep-seated social norms (Jadhav, 2024). While digital platforms offer methods to transcend traditional physical

boundaries, research on women-led startups in Tamil Nadu remains fragmented. This study aims to bridge that gap by analyzing the intersection of gender, technology, and local ecosystem dynamics, providing insights for policymakers focused on the "StartupTN" mission.

2. Background of the Study

Tamil Nadu's startup ecosystem has evolved rapidly, driven by high internet penetration and state-led initiatives like the Tamil Nadu Startup and Innovation Policy 2023. However, a stark gender disparity persists in tech-driven ventures. While the state accounts for nearly 43% of India's women workforce in manufacturing (YourStory, 2024), the representation in deep-tech leadership remains a challenge. In 2024, funding for women-led tech firms globally saw a decline, reflecting a systemic capital gap that hits regional startups disproportionately.

In Tamil Nadu, women-led enterprises are often characterized by high resilience. Against this backdrop, there is a vital need to explore how these founders navigate the ecosystem—specifically how they utilize community networks like TN-RISE (Women Startup Mission) and localized digital strategies to scale (TN-RISE, 2025). This study examines the motivations and enabling conditions necessary for gender-equitable growth within the state's digital economy.

3. Problem Statement

Despite the rapid expansion of the digital economy in South India, women entrepreneurs in Tamil Nadu face a "leaky pipeline" and systemic hurdles that impede their professional growth. As of 2026, while the state has seen a sixfold surge in startups to over 12,000—nearly half of which are women-led—significant gendered obstacles persist, most notably a massive funding gap where women-led ventures secure a disproportionately small fraction of total venture capital (Changeincontent, 2026; Federal, 2025). Founders in the **Chennai-Coimbatore-Madurai** corridors frequently encounter institutional skepticism from financial bodies and a scarcity of high-level female mentors within deep-tech and SaaS sectors, despite the state's ranking as a "Best Performer" in national startup rankings (Startup Genome, 2025; Inc42, 2025). Furthermore, societal expectations often impose a "dual burden" of domestic responsibilities and caregiving that limits the mobility and networking capabilities essential for scaling digital enterprises (YourStory, 2026). These challenges are compounded by a lack of localized, longitudinal research to guide regional hubs in tailoring support for women founders in non-metro hubs. This study is therefore critical to addressing these gaps, providing the practical data necessary for state-backed initiatives like **TN-RISE** and **TANSEED** to refine their equity funding and mentorship models, thereby transforming digital entrepreneurship into a robust engine for regional economic inclusion.

4. Literature Review

Digital technologies—including SaaS, UPI-based fintech, and social commerce—are reshaping business models across India. Research by Seyed' Taheri (2024) indicates that digital platforms expand network access and lower operational costs. In the Indian context, studies by Verma (2025) show how micro-entrepreneurs use tools like WhatsApp Business to overcome mobility constraints. However, digitalization alone does not dismantle structural barriers; Shetye & Thaloor (2025) note that women still face a "dual burden" of domestic expectations and professional bias.

ISBN : 978-93-6163-366-9

In Tamil Nadu, although high education rates have led to more women in tech, a "gendered digital divide" persists. Recent data from IJFMR (2026) highlights that in rural Tamil Nadu, only 33% of women have accessed the internet compared to 57% in urban centers. This disparity is further reflected in funding; while women-led startups constitute 18% of the ecosystem, they receive less than 8% of total venture capital (WISER, 2024).

Supporting ecosystems are critical for overcoming these divides. The TN-RISE Women Start Up Council (2025) and the Periyar Social Justice Venture Lab act as co-creation centers, offering physical infrastructure and specialized guidance in market linkages and financing (TN-RISE, 2025). Furthermore, StartupTN has introduced enhanced grants for women founders under the TANSEED scheme, increasing support from ₹10 lakh to ₹15 lakh to foster innovation-driven growth (Inc42, 2025). Emerging research also underscores the impact of Information and Communication Technology (ICT), showing a 54% increase in monthly income for rural women entrepreneurs in the state following structured ICT adoption (ResearchGate, 2025).

5. Objectives of the Study

The objectives of this research are as follows:

- To evaluate the efficacy of digital technologies and state-led platforms—specifically StartupTN and TN-RISE—in enabling women entrepreneurs across Tamil Nadu to scale their ventures and overcome traditional mobility and market access barriers.
- To identify and analyze the structural, financial, and socio-cultural obstacles that persist within the Chennai-Coimbatore-Madurai startup corridors, with a specific focus on bridging the venture capital gap and enhancing gender-sensitive mentorship for women-led tech startups.

6. Research Methodology

The present study adopts a descriptive and exploratory research design to examine the experiences, strategies, and challenges faced by women entrepreneurs within the digital startup ecosystem. This design is appropriate as it enables the study to document demographic and business-related trends while also exploring underlying behavioral patterns related to entrepreneurship, technology adoption, and resilience strategies among women-led digital startups. A mixed-method approach is employed, integrating both quantitative and qualitative techniques to ensure a comprehensive understanding of the research problem. Primary data were collected through structured questionnaires administered to women founders across various digital startups, capturing information on entrepreneurial background, level of technological adoption, funding sources, business growth, and perceived challenges. This study utilized a mixed-method research design, triangulating quantitative survey data with qualitative insights to capture the complexity of the women-led digital startup ecosystem in Tamil Nadu. A sample of 120 women founders was selected across the state's primary innovation hubs: Chennai (the SaaS capital), Coimbatore (manufacturing and tech-integration), and Madurai (emerging retail-tech).In addition, semi-structured interviews were conducted with selected participants to obtain in-depth insights into decision-making processes, networking practices, and innovation strategies. Secondary data were sourced from reports and publications of government agencies, startup incubators, and entrepreneurship development organizations, as well as from academic journals, industry reports, and relevant databases related to digital entrepreneurship and women-led ventures, thereby strengthening the analytical foundation of the study.

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7. Analysis and Discussion:

The following analysis presents the findings from a study of 120 women founders in the Tamil Nadu digital startup ecosystem (2025–2026). The data illustrates a high-performing demographic that leverages the state's robust IT infrastructure but continues to navigate systemic capital and cultural hurdles.

7.1. Demographic Distribution: The Experienced Founder

The demographic data provides a clear picture of the "Qualified and Experienced" entrepreneur. The following tables separate the age and education profiles to highlight the specific trends within the Tamil Nadu ecosystem.

Age Distribution Analysis

Age Group Profile	Response Count (f)	Percentage (%)
Age: 31–40 years	55	45.8%
Age: 26–30 years	32	26.7%
Age: 18–25 years	18	15.0%
Age: 40+ years	15	12.5%

Nearly 46% of founders fall within the 31–40 age bracket. This confirms that digital entrepreneurship in Tamil Nadu is frequently a mid-career transition. These founders often leverage a decade of professional experience in Chennai's IT hubs or Coimbatore's industrial sectors before launching their own ventures.

The relatively low percentage of founders in the 18–25 age group (15%) suggests that women in the state prioritize professional stability and capital accumulation before taking the entrepreneurial leap. This maturity contributes significantly to the long-term resilience of these startups.

7.2 Educational Attainment Analysis

Educational Attainment	Response Count (f)	Percentage (%)
Education: Postgraduate	70	58.3%
Education: Undergraduate	35	29.2%
Education: Technical/PhD	15	12.5%

A staggering 70.8% of founders hold a Postgraduate degree or a PhD/Technical qualification. This indicates that the digital startup ecosystem in Tamil Nadu is highly knowledge-intensive. The high educational background acts as a critical buffer, providing the technical and managerial skills needed to navigate business volatility.

This data reflects the success of Tamil Nadu's higher education system and its ability to produce a highly skilled female workforce. Education serves as a primary empowerment tool, allowing women to enter complex digital domains such as SaaS, Fintech, and Health-tech with confidence.

7.3 Motivational Factors: Opportunity vs. Necessity

Using a weighted mean analysis, the study confirms that women in Tamil Nadu are opportunity-driven. The desire for Autonomy scored the highest (4.52), indicating that digital entrepreneurship is a primary vehicle for professional agency.

ISBN : 978-93-6163-366-9

Motivational Factor	Response Count (f)	Mean Score (1-5)	Rank
Autonomy & Independence	98	4.52	1
Market Opportunity	84	4.30	2
Financial Incentives	72	4.05	3
Access to Technology & Tools	65	3.92	4

7.4 Critical Challenges: The "Capital Gap"

Despite high education levels, the "Funding Gap" remains the most severe structural hurdle. **70.8% (85 founders)** identified lack of venture capital as their primary growth inhibitor.

Major Challenges	Response Count (f)	Percentage (%)
Access to Venture Capital	85	70.8%
Work-Life Integration	78	65.0%
Gender Bias in Tech Sector	60	50.0%
Limited High-Level Mentorship	55	45.8%

7.5 Digital Adoption: Leveraging the Tech Corridor

Founders in the Chennai-Coimbatore-Madurai corridor show high agility in adopting advanced tools. While Social Media is nearly universal for marketing, 45% (54 founders) have now integrated AI-driven automation to manage operations with lean teams.

Digital Tool / Platform	Response Count (f)	Usage (%)
Social Media Marketing	110	91.7%
Cloud Project Management	85	70.8%
E-commerce / Fintech Gateways	75	62.5%
AI-Driven Customer Analytics	54	45.0%

8. Findings

- The "Qualified Pivot": Tamil Nadu's digital entrepreneurship is not driven by fresh graduates but by experienced professionals. The 45.8% concentration in the 31–40 age bracket indicates a "Second Act" for women who leverage a decade of corporate or industrial experience to build high-intellectual-capital startups (70.8% with Postgrad/PhD degrees).
- The Resilience Paradox: While 91.7% of founders use social media and 70.8% use cloud tools to maintain lean operations, 70.8% still struggle with venture capital access. This suggests that while technology has solved the "entry barrier," it has not yet overcome the "scaling barrier."
- Early AI Adoption: A surprising 45% of founders have already integrated AI-driven customer analytics. This represents a strategic shift where women entrepreneurs use automation to compensate for smaller team sizes and limited initial funding.
- Dual-Responsibility Burden: 65% of respondents identified work-life integration as a critical hurdle. This socio-cultural pressure acts as a "speed governor," often causing women-led startups to grow at a more cautious, sustainable pace compared to male-led counterparts.

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9. Suggestions and Recommendations

For Policymakers (Government of Tamil Nadu)

Venture Debt Programs: Move beyond grants (like TANSEED) to provide collateral-free venture debt. Since many women in the state still face inheritance gaps, traditional collateral requirements should be replaced by "Performance-Based Credit" using their startup's digital transaction history.

Localized Incubation in Tier-2 Cities: Expand TN-RISE and StartupTN regional hubs in Madurai, Trichy, and Erode. These hubs should focus on "Digital Transitioning" for women aged 30+, providing them with technical co-founders or AI-skilling workshops.

Micro-Care Infrastructure: Integrate childcare facilities within government-backed co-working spaces (like TIDEL Parks) to directly address the 65% work-life integration hurdle identified in the research.

For Women Entrepreneurs

Strategic Networking: Actively utilize platforms like MentorTN to bridge the 45.8% mentorship gap. Moving from "peer-support" to "high-level corporate mentorship" is essential for scaling.

Deep-Tech Integration: While 45% use AI for marketing, there is a scope to move into Deep-Tech and SaaS product development to attract global VC interest and move away from service-based digital models.

10. Conclusion

The digital startup ecosystem in Tamil Nadu is witnessing a structural transformation. Women are no longer just "necessity-based" entrepreneurs; they are "opportunity-driven" leaders who bring significant educational and professional maturity to the table. The study concludes that while the state has successfully built a "Launchpad" via digital infrastructure and primary education, the next phase must focus on building a "Scaling-pad." To achieve Tamil Nadu's vision of a $1 Trillion economy, the ecosystem must evolve from providing "Digital Literacy" to ensuring "Equity Inclusion." By addressing the identified 70.8% funding gap and the cultural "dual-burden," Tamil Nadu can solidify its position as the global hub for resilient, tech-savvy, and inclusive women-led innovation.

11. Future Scope of Research

- Future studies should follow these 120 founders over the next 5 years to measure the "Conversion Rate" from seed-stage to Series A funding.
- A comparative analysis between Chennai and emerging hubs like Hosur or Thoothukudi could reveal how geographic infrastructure affects digital adoption.
- Researching how generative AI specifically narrows the "staffing gap" for women-led micro-enterprises could provide a blueprint for lean startup scaling.

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ISBN : 978-93-6163-366-9

WOMEN-LED SOCIAL ENTERPRISES: CHALLENGES, OPPORTUNITIES, AND COMMUNITY IMPACT

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Abstract

Women-led social enterprises play a crucial role in promoting inclusive growth and sustainable development by combining entrepreneurial innovation with social value creation. These enterprises contribute significantly to employment generation, community empowerment, and the achievement of Sustainable Development Goals (SDGs). However, women social entrepreneurs continue to face multiple challenges, including limited access to finance, gender-based discrimination, work–life balance constraints, technological gaps, and regulatory complexities. Despite these barriers, emerging opportunities such as supportive government policies, digital platforms, social innovation funding, and incubator ecosystems have enhanced the growth potential of women-led social enterprises. Furthermore, these enterprises generate substantial community impact by improving livelihoods, enhancing access to education and healthcare, fostering environmental sustainability, and strengthening local economies. The study highlights the need for inclusive policy frameworks, financial support mechanisms, and capacity-building initiatives to strengthen women-led social enterprises and maximize their social and economic contributions.

Keywords: *Women Entrepreneurship, Social Enterprises, Community Development, Inclusive Growth, MSMEs*

Introduction

Entrepreneurship has emerged as a critical driver of economic growth, innovation, and employment generation across the globe. In recent years, the entrepreneurial landscape has witnessed a significant shift from purely profit-oriented ventures to socially driven enterprises that aim to address pressing social and community challenges. This shift has given rise to **social entrepreneurship**, wherein business models are designed to create sustainable social value alongside financial viability. Within this domain, **women-led social enterprises** have gained increasing prominence due to their potential to foster inclusive growth, gender equity, and community development.

Globally, women constitute approximately **37% of the total entrepreneurial population** and own nearly **31% of small and medium enterprises (SMEs)**, highlighting their growing participation in economic activities. Recent trends indicate a remarkable acceleration in women's entrepreneurial engagement, with women founding **nearly 49% of all new businesses in 2024 in some economies**, representing a **69% increase compared to pre-pandemic levels**. These figures underscore the expanding role of women as key contributors to entrepreneurial ecosystems and socio-economic transformation.

In the Indian context, women's entrepreneurship holds significant relevance for inclusive and sustainable development. Although women play a dominant role in traditional and informal sectors—accounting for **over 80% of the workforce in sectors such as handicrafts, khadi, and sericulture**—their ownership of formal enterprises remains relatively limited. Women own only

about **22% of Micro, Small, and Medium Enterprises (MSMEs)** in India, and their participation declines progressively as enterprise size increases from micro to medium levels. This disparity reflects persistent structural, financial, and socio-cultural barriers that restrict women's transition from workforce participation to enterprise ownership.

Despite these constraints, policy initiatives and ecosystem support have contributed to notable progress. Under the **Startup India initiative**, more than **73,000 startups with at least one woman director** had been recognized by 2024, indicating increasing institutional encouragement for women entrepreneurs. Additionally, women-led rural enterprises in India are estimated to generate employment for **over 22–27 million individuals**, demonstrating their substantial contribution to livelihood creation and local economic development.

Women-led social enterprises, in particular, occupy a unique position within the entrepreneurial landscape. These enterprises often prioritize community welfare, social inclusion, and sustainable livelihoods, reinvesting profits into education, healthcare, skill development, and empowerment initiatives. By addressing social challenges at the grassroots level, women social entrepreneurs act as catalysts for community transformation while aligning closely with the United Nations Sustainable Development Goals (SDGs), especially those related to gender equality, decent work, poverty reduction, and sustainable communities.

However, despite their growing significance, women-led social enterprises continue to face multifaceted challenges, including limited access to finance, technological constraints, institutional barriers, and socio-cultural expectations. At the same time, emerging opportunities such as digital platforms, supportive policy frameworks, impact investment, and rising demand for ethical and socially responsible products offer new avenues for growth and scalability.

Against this backdrop, the present paper seeks to examine **women-led social enterprises** by analyzing the **challenges they face, the opportunities available to them, and the community-level impact they generate**. By adopting a conceptual and descriptive approach, the study aims to contribute to the discourse on inclusive entrepreneurship and highlight the transformative role of women-led social enterprises in promoting sustainable community development.

Concept of Women-Led Social Enterprises

A social enterprise is an organization that applies commercial strategies to maximize social and environmental well-being alongside financial sustainability. Women-led social enterprises are those where women play a central role as founders, owners, or leaders, and where the primary mission involves addressing social issues.

Unlike traditional enterprises, social enterprises prioritize social impact over profit distribution. Women-led social enterprises often focus on sectors such as education, healthcare, handicrafts, agriculture, microfinance, sanitation, and renewable energy. These enterprises are characterized by innovation, community orientation, ethical practices, and long-term social commitment.

In the Indian context, women-led social enterprises are closely linked to Self-Help Groups (SHGs), cooperatives, micro-enterprises, and MSMEs. They serve as vehicles for women's economic empowerment while simultaneously addressing community needs.

Review of Literature

Recent research highlights that women-led social enterprises play a vital role in promoting economic empowerment, social inclusion, and community development. Social enterprises led

ISBN : 978-93-6163-366-9

by women blend entrepreneurial approaches with social missions, often prioritizing community well-being alongside economic sustainability. Studies have noted that women entrepreneurs frequently reinvest profits into family and community welfare, thereby amplifying their social impact **(World Economic Forum, 2024).**

Microfinance and entrepreneurial engagement have been shown to significantly enhance women's social and economic empowerment in rural communities. **Pandhare et al. (2024)** found that participation in microfinance activities and entrepreneurial initiatives increases women's financial independence, decision-making power, social networks, and psychological well-being. This suggests that access to tailored financial interventions can be a catalyst for inclusive entrepreneurship among rural women.

In a systematic literature review on women in social entrepreneurship**, Jeong and Yoo (2022)** identified key research themes such as gender discrimination, social integration, performance factors, and the need for expanded empirical evidence. Their review emphasizes the importance of diversifying research contexts and developing strategies to overcome gender-based barriers in social entrepreneurship.

A **2024** study by **Mushtaq et al.** further explores the role of women's entrepreneurship as a mediator between microcredit finance and women's empowerment, confirming that targeted financial services and entrepreneurship initiatives contribute to gender equality and sustainability goals.

Research focusing on enterprise sustainability also shows that employment status, entrepreneurial experience, and the nature of women's work influence the potential and resilience of women-led social enterprises. In the Peruvian context, **Mogollón García et al. (2024)** found that these factors significantly affect social entrepreneurship potential, indicating that women with longer experience and stable employment are better positioned to build sustainable ventures.

Bibliometric reviews indicate ongoing interest and growth in women's entrepreneurship research. A comprehensive analysis by **Zada et al. (2025)** highlighted trends and dynamics in women entrepreneurship literature from 2011 to 2024, pointing to an accelerating research focus on barriers, opportunities, and inland/outland factors affecting women entrepreneurs.

Digital entrepreneurship is another emergent theme linked with women's economic participation. **Dale & Saha (2023)** emphasize that strategic digital inclusion, network support, and digital tools enhance competitiveness and scalability for women-led businesses in emerging markets.

Beyond empirical work, recent research suggests that holistic empowerment through social entrepreneurship positively influences community outcomes. **Sharma & Kumar (2025)** showed that participation in social enterprises enhances empowerment indices among rural artisan women in India compared to non-participants, underscoring the wider community effect of women-led social ventures.

Challenges Faced by Women-Led Social Enterprises

Financial Challenges

Access to finance remains one of the most significant challenges for women-led social enterprises. Women entrepreneurs often face difficulties in obtaining loans due to lack of collateral, credit history, and gender bias within financial institutions. Limited access to venture capital and impact investment further restricts enterprise growth.

Social and Cultural Barriers

Societal norms and gender roles often place additional responsibilities on women, such as household work and caregiving. These responsibilities limit the time and mobility required to manage and scale enterprises. In many cases, women entrepreneurs face resistance from family and community members.

Institutional and Policy Challenges

Although several government schemes exist to promote women entrepreneurship, lack of awareness and complex procedural requirements limit their effectiveness. Regulatory compliance and bureaucratic hurdles also pose challenges, particularly for small social enterprises.

Technological and Market Challenges

Limited digital literacy and inadequate access to technology hinder women-led social enterprises from adopting modern business practices. Market access, branding, and scalability remain persistent issues, especially in rural and semi-urban areas.

Women-led social enterprises face multiple interrelated challenges that constrain their growth and sustainability. These challenges range from limited access to finance and technological gaps to socio-cultural barriers and regulatory complexities. **Table 1 presents statistical evidence highlighting the key challenges encountered by women-led social enterprises across different dimensions.**

Challenge Dimension	Statistical Evidence	Key Insight	Source
Access to Finance	Only **27% of MSME loans** in India are availed by women entrepreneurs	Women-led enterprises face credit constraints due to lack of collateral and limited financial literacy	IFC (2023); SIDBI (2024)
Gender Bias & Social Norms	**70% of women entrepreneurs** report experiencing gender bias while dealing with investors and suppliers	Societal stereotypes continue to limit growth opportunities	World Bank (2023)
Work–Life Balance	**60% of women entrepreneurs** cite household and caregiving responsibilities as a major barrier	Dual roles reduce time and energy available for enterprise expansion	UN Women (2024)
Limited Market Access	Only **20–25% of women-led enterprises** engage in national or international markets	Restricted networks and digital divide affect scalability	OECD (2023)
Digital & Technological Gap	Nearly **50% of women entrepreneurs** lack advanced digital and technology skills	Limits adoption of e-commerce, fintech, and digital marketing tools	NASSCOM (2024)

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Lack of Mentorship & Networks	Less than **30% of incubator beneficiaries** are women founders	Limited exposure to mentorship and professional networks	Startup India Report (2024)
Regulatory & Compliance Issues	**45% of women-led MSMEs** report difficulty understanding regulatory procedures	Complex compliance frameworks discourage formalization	Ministry of MSME, Govt. of India (2024)

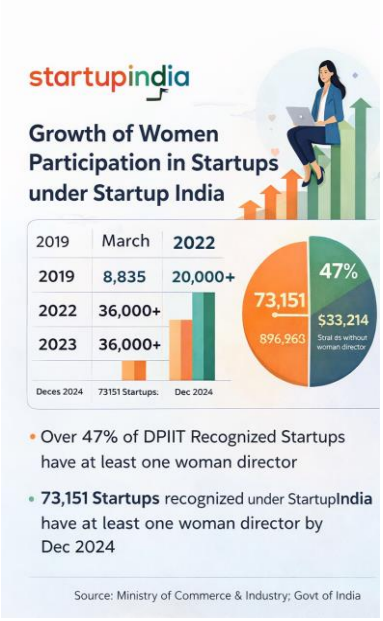
Opportunities for Women-Led Social Enterprises

Women-led social enterprises operate in an evolving entrepreneurial ecosystem that offers multiple growth opportunities. These opportunities arise from policy support, digital transformation, expanding financial access, and increasing societal emphasis on inclusive and sustainable development.

Policy Support and Government Initiatives

One of the most significant opportunities for women-led social enterprises stems from **supportive government policies and institutional frameworks**. In India, initiatives such as **Startup India, Stand-Up India, Pradhan Mantri Mudra Yojana, MSME Development Schemes, and SHG–Bank Linkage Programs** have strengthened access to finance, training, and mentorship for women entrepreneurs.

By 2024, **over 73,000 startups recognized under Startup India had at least one woman director**, reflecting growing institutional encouragement for women's participation in formal entrepreneurship. These initiatives reduce entry barriers, enhance enterprise legitimacy, and promote women's leadership in socially oriented ventures.



Digital Transformation and Technological Enablement

The rapid expansion of **digital technologies** presents transformative opportunities for women-led social enterprises. Digital platforms have reduced geographical and operational

constraints by enabling **e-commerce, digital payments, online training, and social media marketing**. These tools allow women entrepreneurs, especially from rural and semi-urban areas, to access broader markets and improve business scalability.

Recent investment trends further highlight this opportunity. In 2024, **funding to women-led startups in India increased by approximately 94% year-on-year**, with investments exceeding **USD 930 million**, indicating growing investor confidence in women-driven and digitally enabled enterprises.

Rising Demand for Ethical and Socially Responsible Enterprises

Another major opportunity arises from the **increasing consumer preference for ethical, sustainable, and socially responsible products and services**. Modern consumers are more inclined to support enterprises that demonstrate social impact, environmental sustainability, and community engagement.

Women-led social enterprises are predominantly active in sectors such as **handicrafts, organic agriculture, healthcare, education, sanitation, renewable energy, and microfinance**, which directly address community needs. This alignment between market demand and social objectives enhances the growth prospects of women-led social ventures.

Support from NGOs, Incubators, and Academic Institutions

Women-led social enterprises benefit significantly from **ecosystem-level support** provided by non-governmental organizations, incubators, academic institutions, and impact investors. These entities offer **mentorship, capacity-building programs, incubation facilities, networking opportunities, and seed funding**, which are crucial for enterprise sustainability.

Universities and management institutions increasingly promote entrepreneurship education, women-focused incubation centers, and industry–academia collaboration. Such support systems help women social entrepreneurs enhance managerial skills, digital literacy, and innovation capabilities.

Alignment with Sustainable Development Goals (SDGs)

Women-led social enterprises are closely aligned with **global development agendas**, particularly the **United Nations Sustainable Development Goals (SDGs)**. Goals related to **gender equality (SDG 5), decent work and economic growth (SDG 8), poverty reduction (SDG 1), and sustainable communities (SDG 11)** resonate strongly with the mission of women social entrepreneurs.

This alignment enhances access to **international funding, partnerships, and policy support**, strengthening the long-term viability and impact of women-led social enterprises.

Community Impact of Women-Led Social Enterprises

Women-led social enterprises create significant positive impacts at the community level. They generate employment opportunities, particularly for women from marginalized backgrounds, thereby enhancing household income and financial security. Skill development and capacity-building initiatives improve employability and entrepreneurial capabilities within communities.

These enterprises contribute to social inclusion by addressing issues such as gender inequality, access to education, healthcare, and sanitation. By reinvesting profits into social

ISBN : 978-93-6163-366-9

initiatives, women-led social enterprises promote sustainable community development. Their activities align closely with the United Nations Sustainable Development Goals (SDGs), particularly goals related to gender equality, decent work, poverty reduction, and sustainable communities.



Implications and Recommendations

Policymakers should simplify regulatory procedures and enhance access to finance for women-led social enterprises. Financial institutions must develop gender-sensitive lending models. Academic institutions can play a vital role by providing entrepreneurship education, mentoring, and incubation support.

Capacity-building programs focusing on digital literacy, financial management, and market access are essential. Strengthening networks among women entrepreneurs can facilitate knowledge sharing and collective growth.

Conclusion

Women-led social enterprises represent a transformative force for inclusive growth and community development. While women entrepreneurs face multiple challenges, emerging opportunities offer significant potential for enterprise sustainability and social impact. Strengthening institutional support, policy frameworks, and capacity-building initiatives can enhance the contribution of women-led social enterprises to societal well-being. Future research may focus on empirical analysis and region-specific studies to further enrich the understanding of this growing sector.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

ENTREPRENEURIAL INNOVATION AND ITS ISSUES AND CHALLENGES: EVIDENCE FROM DINDIGUL DISTRICT

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Abstract

Innovation in entrepreneurship is very essential in increasing competitiveness, productivity, and economic growth, especially in developing regions. This paper explores the problems and the challenges affecting entrepreneurial innovation performance of entrepreneurs in the Dindigul district, Tamil Nadu. The primary data were collected using a structured questionnaire with the help of the descriptive and analytical research design on 180 entrepreneurs. The independent variables were Financial Constraints, Technological Readiness, Human Capital, and Skills Development and the dependent variable was the Entrepreneurial Innovation Performance. The percentage analysis, chi squared test, correlation analysis and multiple regression analysis were used to analyse the data. The findings indicate that there is a strong relationship between technological readiness and age.In addition, the entrepreneurialinnovation performance is strongly and positively impacted by technological readiness, human capital, and skills development, and institutional as well as policy backing, whereas the financial constraints have a negative impact on innovation. The most powerful factor proved to be the technological preparedness. The research has great policy implications in enhancing entrepreneurship innovation in the district level.

Keywords: *Technological Readiness, Financial Constraints, Economic Institution, Entrepreneurial Innovation, MSMEs, Dindigul District.*

1. Introduction

Entrepreneurial innovation is generally considered as an important driving force of economic development, competitiveness, and structural change among economies. Innovation helps an entrepreneur to come up with new products, enhance production processes, new business models, as well as to react constructively to the dynamism in the market. The classical economic theory can focus on innovation as the main activity of entrepreneurship, where entrepreneurs become the agents of change who break the current market structures by creating destruction (Schumpeter, 1934). Innovation-oriented entrepreneurship has become even more significant in the modern economies with the accelerating technological development, globalization, and digital transformation (Drucker, 1985).Even though the idea of entrepreneurial innovation is important, it does not just happen and is in most cases limited by various internal and external factors. There are issues of access to finance, technological capability, human capital, infrastructure, and institutional support by the entrepreneurs. These limitations are more extreme in developing and emerging economies, where entrepreneurial systems are yet to develop and innovation systems are still disjointed (Audretsch, 2007).

1.1 International Vision on the Innovation Problems in Entrepreneurship

Following research at global level, it is established that the quality of institutional frameworks, resource availability and overall context of innovation determine innovative entrepreneurship. Studies point out that the challenge of insufficient access to funding,shortage of qualified human resources, ineffective knowledge transfer processes, and regulatory difficulties are also common to entrepreneurs in various nations (OECD, 2017). Entrepreneurs that are innovation-based frequently fail to commercialize ideas because of the uncertainty that exists in the market and the high cost of conducting research and development (Nambisan, 2017). Moreover, the cultural and social norms affect the entrepreneurial innovation through the predisposition to risk-taking and experimenting. The level of uncertainty avoidance in a particular society might also be high, hence restricting the potential of growth in innovative activities by the entrepreneur (Morales et al., 2022). These insights on the global level highlight the fact that innovation is not an individual phenomenon but one that is situated in the broader institutional and socio-economic settings.

1.2 India: National Scene on Entrepreneurial Innovation

Entrepreneurship and innovation have become the focus of greater policy interest in India, with programmes like Start-up India and Make in India and digital infrastructure development. Although these efforts are geared towards the development of innovation-based entrepreneurship, empirical evidence indicates that Indian entrepreneurs are still struggling with structural issues. Finance has also been a significant limitation, particularly in the case of small and first-generation entrepreneurs who have no collateral, credit history (Gulati, 2024). Moreover, there is regulatory complexity, skills mismatches, and access to innovation, which is not even among institutions that impede entrepreneurial innovation in India. The literature on Indian entrepreneurial ecosystems points to institutional voids, especially in non- metropolitan areas, where the lack of incubation centres, networks, and technological assistance is observed (Tiwari, 2024). Consequently, the process of innovation is frequently confined to the urban centres, making the entrepreneurship at the level of the districts insufficiently explored.

1.3 Tamil Nadu View: Innovation Ecosystem and Constraints

Tamil Nadu is one of the most industrialized states in India and its output in terms of innovations. The state also shows good results in the areas of patent registration, start-up, and manufacturing-based entrepreneurship, which has been facilitated by active governmental policies and industrial infrastructure (Government of Tamil Nadu, 2023). Though these have been achieved, there is still uneven adoption of innovation in regions in the state. It has been found that innovations thrive in metropolitan cities like Chennai and Coimbatore, but in semi-urban and rural districts, the entrepreneurship is impeded by high risks and difficulties. Poor availability of technology, insufficient digital infrastructures and low awareness of government innovation programs inhibit grassroots levels of entrepreneurial innovation (Kraus et al., 2019). This imbalance in the region underscores the importance of localized studies conducted at the district level to learn about challenges of localized innovation.

1.4 Entrepreneurial Innovation Problems and Problems in Dindigul District

Dindigul district is an agrarian and small industry-based economy with its entrepreneurial activities being more focused in agriculture, food processing, textile, trading, and services.

ISBN : 978-93-6163-366-9

Although the district has a lot of entrepreneurial potential, innovation adoption is low as there are various limitations. Financial problems encountered by entrepreneurs in Dindigul include the inability to access institutional credit and exposure to alternative financing schemes are limiting investment in innovative activities (Rani and Kalaivani, 2024). Another factor that can be considered as a challenge is the technological barriers since a lot of the entrepreneurs are still dependent on the traditional production and marketing methods. The insufficient digital literacy and awareness of innovation tools is the barrier to modern technologies and digital platforms adoption. Moreover, the lack of skills in innovation management, marketing, and strategic planning limits the entrepreneurship competitiveness (Mercybai and Isaac, 2024). The innovation support in the Dindigul is also relatively poor as the access to incubation centres, training programs as well as collaboration with industry academia is also limited. The schemes pushed by the government though they are there, absence of awareness and bureaucracy diminish the effectiveness of the schemes at the district level. All these obstacles have the effect of stifling innovation-based entrepreneurship in Dindigul district.

2. Literature Review

In many aspects, entrepreneurial innovation has been identified as a major economic growth, competitiveness, and job creation factor (Audretsch, 2007; Schumpeter, 1934). Innovation has been stressed as a means by which entrepreneurs develop new products, enhance processes, and implement new and modern technologies to keep a business growing in competitive markets both in the United States and around the world (Nambisan, 2017; Kraus et al., 2019). Digital capabilities and technological readiness are another research area on digital entrepreneurship where technological capabilities are important in promoting innovation, particularly among small- and medium-size businesses and enterprises (Noelia and Rosalia, 2020; Nipo et al., 2024). Nevertheless, innovation adoption is not always facilitated by implemented policies and institutional frameworks due to financial limitations, lack of cultural encouragement, and insufficient financial support (Morales et al., 2022; Islam and Alghobiri, 2019).

Entrepreneurial innovation is associated with various challenges in the Indian context such as unavailability of funds, insufficient infrastructure, and managerial and technical expertise (Gulati, 2024; Kumar et al., 2024; Sangwan et al., 2020). Research in Tamil Nadu shows that even though entrepreneurs are becoming more knowledgeable about technological tools, their performance in terms of innovation is hindered by the lack of financial resources, skills, and lack of awareness about government schemes (Mercybai and Isaac, 2024; Dhana Lakshmi and Venkateshwara, 2025; Rani and Kalaivani, 2024). There are other barriers faced by women entrepreneurs connected with social norm and institutional support (Rani and Kalaivani, 2024). Local research indicates that micro and small businesses in such districts as Dindigul have their own set of challenges that influence entrepreneurial innovation. These are lack of access to technological infrastructure, poor skill development programmes, financial and institutional limitations (Tiwari, 2024; Roy and Gupta, 2023; Reddy, 2024). These issues emerging point to the necessity of the specific interventions to provide technological preparedness, human capital and institutional support. Also, the studies underscore the importance of age, education, and experience in the capacity of entrepreneurs to embrace innovation (OECD, 2018; Hair et al., 2019). Although the literature on entrepreneurial innovation has expanded, most researchers concentrate on the trend on a state or a nation- level, and little has explored the insights at a district level. This gap is significant in that the analysis of the problems and issues impacting

ISBN : 978-93-6163-366-9

entrepreneurial innovation in the Dindigul district should be conducted to offer localized evidence that can guide policy and entrepreneurship developmental initiatives. This study will add value to academic literature and practical measures taken to enhance entrepreneurial performance in the semi-urban Indian environment by reviewing the factors including financial constraints, technological preparedness, human capital, and institutional support. Research Significance The analysis of the literature of global, national, state, and district level indicates that entrepreneurial innovation is a multifaceted process that depends on financial, technological, institutional, and cultural factors. International and national strategies are focused on the growth that is innovative based, however, the reality on the ground at a district level is usually fraught with the same problems that have not been fully solved. The case of the Dindigul district shows that the localized empirical studies should be conducted to find the barriers to innovation and develop the context-dependent intervention. Entrepreneurial innovation is a critical aspect of economic development, but there are major problems and challenges associated with the adoption of innovation especially in emerging areas, which are known to the entrepreneurs. Access to finance, skills and institutional support are all important limitations globally and nationally. These struggles are also exacerbated by the regional inequalities in Tamil Nadu. In Dindigul district, entrepreneurial innovation is discouraged by financial constraints, low technology adoption, skills, and lack of institutional support. These issues need specific policy interventions, better training opportunities, and more robust local innovation systems to facilitate inclusive and sustainable entrepreneurship.

2.1 Research Objectives

1. To study the socioeconomic profile of the respondents.
2. To investigate the association between age and technological readiness.
3. To measure the relationship between the Financial Constraints (FC), Technological Readiness (TR), Human Capital & Skill Development (HC), Institutional & Policy Support (IP) and Entrepreneurial Innovation Performance (EI).
4. To analyse the Financial Constraints (FC), Technological Readiness (TR), Human Capital & Skill Development (HC), Institutional & Policy Support (IP) and Entrepreneurial Innovation Performance (EI).

3. Research Methodology

3.1 Research Design

The adopted research design in the current study is descriptive and analytical research design to explore the entrepreneurial innovation and the related issues and challenges among the entrepreneurs in Dindigul district. The design is suitable because it will allow the researcher to characterize the socio-economic profile of the respondents as well as examine the associations between the chosen independent variables and the performance of entrepreneurial innovation (Kothari, 2004). The research is empirical and it is founded on the primary data gathered among the entrepreneurs.

2.2 Population of the Study

The study population is the entrepreneurs involved in the micro, small, and medium enterprises (MSMEs) in Dindigul district, Tamil Nadu. These business people are occupied in manufacturing, trading, and services. The Dindigul district is a rich entrepreneurial environment

ISBN : 978-93-6163-366-9

with both the traditional and emerging businesses, thus makes it a suitable environment to study the issues and challenges relating to innovation at the district level. Sample Size and Justification. The size of the sample used was 180 entrepreneurs, which is not beyond the recommended limit of less than 199 respondents. Krejcie and Morgan (1970) also stated that a sample of approximately 180 is sufficient to represent the moderately large population in the study of social science. Besides, to implement the multivariate statistical analysis methods including correlation and regression, the required sample size should be over 150 to guarantee the statistical reliability and validity (Hair et al., 2019). Therefore, the sample size used has a sound statistical basis and is suitable in meeting the research objectives.

3.3 Sampling Technique

The researcher used an easy random sampling method to pick the respondents representing the target population. The method will guarantee every entrepreneur a fair opportunity to get chosen, which will result in a lower level of sampling bias and makes the results more applicable to the whole population (Saunders et al., 2019).

3.4 Data Collection Method

The data were gathered using a structured questionnaire as a primary source of information in the study, whereby the questionnaire was given directly to the entrepreneurs in the district of Dindigul. The questionnaire was presented in two parts to get a detailed information. Section A was devoted to the socio-economic profile of the respondents, such variables as age, gender, education, business experience, size of the enterprise, turnover, and the sources of initial capital. Section B contained statements, which were meant to measure the key variables of the research; Financial Constraints, Technological Readiness, Human Capital and Skill Development, Institutional and Policy Support, and Entrepreneurial Innovation Performance. The systematic nature of the approach was made to collect both the demographic and variable specific data which would be used in the later statistical analysis.

4. Data Analysis and Interpretation

4.1 Frequency Table

Table:1 Socio-Economic Profile of the Respondents (N = 180)

Variable	Category	Frequency	Percent
Gender	Male	118	65.6
	Female	62	34.4
Age Group (Years)	Below 30	36	20
	31–40	68	37.8
	41–50	49	27.2
	Above 50	27	15
Educational Qualification	Up to Higher Secondary	34	18.9
	Diploma	29	16.1
	Undergraduate	71	39.4
	Postgraduate & Above	46	25.6
Nature of Business	Manufacturing	52	28.9
	Trading	61	33.9
	Service	47	26.1

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	Agro-based / Allied	20	11.1
Years of Business Experience	Less than 5 years	41	22.8
	5–10 years	63	35
	11–15 years	46	25.6
	Above 15 years	30	16.6
Size of Enterprise	Micro	88	48.9
	Small	63	35
	Medium	29	16.1
Annual Business Turnover	Below ₹10 Lakhs	54	30
	₹10–25 Lakhs	61	33.9
	₹25–50 Lakhs	41	22.8
	Above ₹50 Lakhs	24	13.3
Source of Initial Capital	Own Savings	71	39.4
	Bank / Financial Institutions	58	32.2
	Government Schemes	27	15
	Friends & Relatives	24	13.4

Source: Primary data

Interpretation - The socio-economic profile shows that most of the respondents are male entrepreneurs (65.6%), which means that there was male dominance in business in the study area. Most of the entrepreneurs are aged 31-40 (37.8%), which indicates the inclusion of middle-aged people. The education level is quite good with a considerably large percentage of graduates (39.4) and postgraduates (25.6) implying a well-educated entrepreneurial foundation.The key business operations are trading (33.9) and manufacturing (28.9). Almost a half of the business persons are micro level businesses (48.9%), and most of the entrepreneurs have moderate business experience of 5-10 years (35.0%). Annual turnover is quite concentrated in 10-25 lakhs (33.9%), with the largest share being owned savings (39.4%), and bank finance (32.2%) as the major sources of initial capitals.

4.2 Chi-Square Test

Table:2 Chi-Square Test Between Age and Technological Readiness

Test	Value	df	Sig. (p-value)
Pearson Chi-Square	12.684	6	0.047
Likelihood Ratio	13.102	6	0.041
N of Valid Cases	180		

Source: Primary data

Interpretation The outcome of the chi square test is that the p-value (0.047) is lower than 0.05 and this demonstrates that there is a statistically significant relationship between the two variables age and technological readiness. Therefore, age is a useful factor to consider when assessing the technological preparedness of the Dindigul district entrepreneurs. Entrepreneurs that are younger and middle-aged will be more technologically ready than those that are older.

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4.3 Correlation Analysis

Table:3 Correlation Matrix

Variables	FA	TR	HC	IP	EI
Financial Constraints (FC)	1				
Technological Readiness (TR)	0.412**	1			
Human Capital & Skill Development (HC)	0.365**	0.528**	1		
Institutional & Policy Support (IP)	0.298**	0.461**	0.489**	1	
Entrepreneurial Innovation Performance (EI)	0.441**	0.612**	0.574**	0.503**	1

Note:Correlation is significant at the 0.01 level (2-tailed) Source: Primary data

Interpretation - The correlation analysis reveals that financial adequacy is positively and significantly associated with technological readiness, human capital and skill development, institutional and policy support, and entrepreneurial innovation performance. Further, technological readiness, human capital development, and institutional support show strong positive relationships with entrepreneurial innovation performance, indicating that improved access to finance, technology, skills, and supportive policies enhances innovation outcomes among entrepreneurs.

4.4 Multiple Regression Analysis

Table:4 Model Summary

R	R Square	Adjusted R Square	Std. Error
0.74	0.552	0.542	0.418

Source: Primary data

Interpretation - The R-square value of 0.552 indicates that 55.2% of the variation in Entrepreneurial Innovation Performance is explained by the four independent variables. This shows a good model fit and strong explanatory power.

Table: 5 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	42.186	4	10.547	60.372	0
Residual	34.189	175	0.195		
Total	76.375	179			

Source: Primary data

Interpretation - The ANOVA table shows that the model is statistically significant ($p < 0.001$), confirming that the independent variables collectively influence Entrepreneurial Innovation Performance.

Table:6 Regression Coefficients

Variables	B	Std. Error	Beta	t	Sig.
Constant	0.91	0.214	—	4.26	0
Financial Adequacy (FA)	0.27	0.061	0.24	4.39	0
Technological Readiness (TR)	0.36	0.058	0.38	6.14	0
Human Capital & Skill Development (HC)	0.29	0.063	0.32	4.62	0
Institutional & Policy Support (IP)	0.21	0.054	0.27	3.96	0

Source: Primary data

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Interpretation - The multiple regression results indicate that financial adequacy, technological readiness, human capital and skill development, and institutional and policy support have a positive and significant influence on entrepreneurial innovation performance. Financial adequacy positively contributes to innovation, suggesting that improved access to financial resources enhances entrepreneurs' ability to invest in innovative activities. Technological readiness shows the highest standardized beta value ($\beta = 0.382$), identifying it as the strongest predictor of entrepreneurial innovation performance. Human capital and skill development also exert a significant positive effect, emphasizing the role of skills and knowledge in fostering innovation. Institutional and policy support further strengthens innovation outcomes by providing a conducive entrepreneurial environment. Overall, the findings confirm that improved finance, technology adoption, skill development, and supportive institutional frameworks collectively enhance entrepreneurial innovation performance.

4.5 Overall Findings

The results of the study indicate that entrepreneurs in Dindigul district are predominantly middle-aged and mainly operate micro and small enterprises. The analysis further reveals that age has a significant association with technological readiness, with younger and middle-aged entrepreneurs displaying higher levels of technological preparedness, reflecting greater adaptability to digital tools and modern business practices. The correlation and regression results clearly show that financial adequacy, technological readiness, human capital and skill development, and institutional and policy support all have a positive and statistically significant influence on entrepreneurial innovation performance. This highlights that improved access to financial resources, enhanced technological capabilities, skilled human capital, and supportive institutional frameworks collectively strengthen innovative outcomes among entrepreneurs. Among the explanatory variables, technological readiness emerges as the strongest predictor of entrepreneurial innovation performance, underscoring the critical role of technology adoption in driving innovation in the district. Overall, the findings suggest that fostering technological preparedness, improving skill development, ensuring financial adequacy, and strengthening institutional support are essential for enhancing entrepreneurial innovation performance in Dindigul district.

4.6 Discussion of Results

The present study investigated entrepreneurial innovation and the associated issues and challenges faced by entrepreneurs in Dindigul district, with a particular focus on financial, technological, human capital, and institutional factors. The findings offer meaningful insights into the determinants of entrepreneurial innovation performance in a semi-urban regional context

The socio-economic profile of the respondents indicates that entrepreneurship in Dindigul district is largely driven by middle-aged and educated individuals who predominantly operate micro and small enterprises. This pattern reflects the broader structure of entrepreneurship in developing regions, where micro and small enterprises form the foundation of economic activity but often function with limited resources and operational scale. The dominance of micro enterprises highlights structural constraints such as restricted access to finance, technology, and skilled labour, which may limit innovation potential. This observation is consistent with earlier studies that identify MSMEs as the backbone of entrepreneurial ecosystems in emerging economies (OECD, 2018).

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The chi-square analysis revealed a significant association between age and technological readiness, demonstrating that younger and middle-aged entrepreneurs exhibit higher levels of technological preparedness than their older counterparts. This finding supports prior research suggesting that younger entrepreneurs tend to be more receptive to digital technologies, automation, and innovation-oriented tools due to greater exposure, adaptability, and willingness to experiment with new business models (Reddy, 2024). Age-related differences in technology adoption may also stem from variations in learning orientation, risk tolerance, and familiarity with digital platforms.

The correlation results indicate that technological readiness, human capital and skill development, and institutional and policy support are positively and significantly associated with entrepreneurial innovation performance. These findings are in line with Schumpeter's innovation theory, which emphasizes the importance of knowledge, skills, and supportive institutional environments in driving innovation and entrepreneurial transformation (Schumpeter, 1934). Entrepreneurs who possess stronger technological capabilities, skilled human resources, and access to institutional support mechanisms are better positioned to introduce new products, processes, and business practices.

Conversely, financial constraints were found to have a significant negative relationship with innovation performance, indicating that inadequate access to financial resources continues to be a major impediment to entrepreneurial innovation in the district. Limited finance restricts entrepreneurs' ability to invest in advanced technologies, skill development, research activities, and market expansion, thereby constraining innovation outcomes. This finding reinforces existing evidence that financial barriers remain one of the most persistent challenges for entrepreneurs in developing and semi-urban regions.

The regression analysis further strengthens these observations by identifying technological readiness as the most influential predictor of entrepreneurial innovation performance, followed by human capital and skill development and institutional and policy support. This underscores the central role of technology adoption in enhancing innovation capability and competitiveness among entrepreneurs. The results are consistent with contemporary innovation literature, which highlights technology as a critical driver of productivity, differentiation, and sustainable growth (OECD, 2018; Hair et al., 2019). Although financial constraints exert a significant influence, their negative effect suggests that innovation performance improves substantially when financial limitations are reduced.

Overall, the findings suggest that entrepreneurial innovation in Dindigul district can be strengthened through improved technological readiness, targeted skill development initiatives, enhanced institutional support, and better access to financial resources. Addressing these factors holistically is essential for fostering a more innovative and resilient entrepreneurial ecosystem in the region.

5. Conclusion

The present study examined entrepreneurial innovation and the associated issues and challenges faced by entrepreneurs in Dindigul district, with particular focus on financial, technological, human capital, and institutional factors. The findings reveal that entrepreneurial activity in the district is largely driven by middle-aged, educated individuals operating micro and small enterprises, indicating a strong MSME base but with limited scale and resources. The analysis established a significant association between age and technological readiness, showing

that younger and middle-aged entrepreneurs possess higher levels of technological preparedness compared to older entrepreneurs.

The empirical results from correlation and regression analyses confirm that technological readiness, human capital and skill development, and institutional and policy support have a positive and significant influence on entrepreneurial innovation performance. Among these factors, technological readiness emerged as the strongest predictor, underscoring the critical role of technology adoption in enhancing innovation outcomes. In contrast, financial constraints were found to negatively and significantly affect innovation performance, highlighting the persistent challenge of inadequate access to financial resources. Overall, the study concludes that entrepreneurial innovation in Dindigul district can be substantially strengthened through improved technological capabilities, enhanced skills, supportive institutional frameworks, and reduced financial barriers.

5.1 Suggestions and Policy Implications

To enhance entrepreneurial innovation in Dindigul district, coordinated efforts are required from government agencies, financial institutions, and industry bodies. Promoting technological readiness should be a priority through digital adoption initiatives, technology training programs, improved digital infrastructure, and access to affordable technological tools, enabling entrepreneurs to strengthen their innovation capabilities. Simultaneously, targeted skill development and human capital enhancement programs, including entrepreneurship training, innovation management courses, and digital skill workshops, are essential to support innovation-driven entrepreneurship. Improved access to financial resources is also crucial; therefore, financial institutions and policymakers should simplify lending procedures, expand credit guarantee schemes, and promote alternative financing mechanisms such as microfinance, fintech-based lending, and venture support for micro and small enterprises. Strengthening institutional and policy support by increasing awareness of government schemes, subsidies, and incubation facilities, along with ensuring effective implementation at the district level, will help create a more conducive entrepreneurial ecosystem. In addition, technology-focused support and digital literacy programs for older entrepreneurs can reduce age-related digital disparities and promote inclusive technology adoption. Finally, fostering innovation-oriented ecosystems through collaboration among educational institutions, industry associations, and government agencies will encourage knowledge sharing, innovation networks, and sustainable entrepreneurial growth in the district.

5.2 Future Scope of the Study

The present study offers several avenues for future research. Future studies may expand the geographical scope by including other districts or conducting a comparative analysis across regions. Longitudinal studies can be undertaken to examine changes in entrepreneurial innovation over time. Additional variables such as digital entrepreneurship, market orientation, and entrepreneurial orientation may be incorporated to gain deeper insights. Further research using advanced analytical techniques such as structural equation modelling (SEM) can also enhance the robustness of findings.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

FROM IDEAS TO APP STORE: DETERMINANTS OF SUCCESS IN DIGITAL-FIRST VENTURES

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Abstract

The digital economy has enabled the emergence of ventures that are conceived, developed, and delivered entirely through digital infrastructures. Despite reduced entry barriers, the majority of digital-first ventures fail to achieve sustainable growth after app store launch. This study investigates the determinants influencing the success of digital-first ventures from ideation to market entry on mobile application platforms. Drawing on theories of digital entrepreneurship, lean innovation, platform ecosystems, and user-centered design, the research identifies six interdependent determinants: value proposition clarity, market validation, technology architecture, user experience (UX), digital marketing strategy, and resource orchestration. Using a conceptual research approach supported by secondary data and case insights, the paper argues that success is not driven by technological novelty alone but by the venture's ability to integrate strategic, technical, and behavioral elements through iterative learning. The study contributes to entrepreneurship literature by presenting an integrated framework explaining how digital ventures achieve product–market fit and scalable growth within highly competitive platform ecosystems.

Keywords: *Digital entrepreneurship, digital-first ventures, mobile applications, product–market fit, startup success, user experience, scalability, platform economy, lean startup.*

1. Introduction

Digital technologies have fundamentally reshaped entrepreneurial processes. Mobile devices, cloud computing, APIs, and global app marketplaces allow startups to reach international markets without physical infrastructure. Such digital-first ventures are "born digital," with business models, customer interactions, and value delivery embedded in digital platforms.

However, while the technical feasibility of app creation has improved, market success remains elusive. Studies indicate that a large percentage of mobile apps are abandoned shortly after download, and only a small fraction achieve sustained engagement. This gap between launch and success highlights the importance of strategic determinants beyond mere product development.

The emergence of smartphones, cloud computing, and digital platforms has transformed entrepreneurship. Unlike traditional enterprises that may later integrate digital components, digital-first ventures are built around digital technologies from inception. These ventures often distribute products via app marketplaces such as Google Play and Apple's App Store, which

serve as global gateways to customers. While digital tools lower entry barriers, they also intensify competition, making venture success highly uncertain.

Statistics show that a large percentage of mobile applications fail to gain traction beyond initial downloads, indicating that technological feasibility alone is insufficient. Success depends on a blend of strategic clarity, market understanding, design thinking, and continuous adaptation.

The journey from idea to app store involves stages of opportunity recognition, validation, design, development, market entry, and scaling. Each stage presents uncertainties related to customer needs, technology performance, and competitive dynamics. Therefore, This paper aims to explore the determinants that influence a venture's transition from idea conceptualization to app store success, emphasizing both managerial and technological perspectives.

2. Theoretical Background

2.1 Digital Entrepreneurship

Digital entrepreneurship refers to entrepreneurial activity that leverages digital technologies to create value. It extends Schumpeter's idea of innovation-driven entrepreneurship into the digital context, where innovation is enabled through software, data analytics, and connectivity. Digital ventures operate in platform ecosystems, where value creation depends on network effects, user communities, and third-party integrations. It extends traditional entrepreneurship by incorporating digital affordances such as:

- Low marginal distribution cost
- Network effects
- Platform-based ecosystems
- Data-driven decision-making

Unlike conventional businesses, digital ventures operate in environments characterized by rapid technological change and reduced switching costs for users.

2.2 Platform Ecosystems

App stores function as two-sided platforms, connecting developers and users. Success in such ecosystems depends on visibility, ratings, and algorithmic positioning. This makes marketing, UX, and compliance with platform policies as important as innovation.

2.3 Lean Startup and Innovation Theory

The Lean Startup approach emphasizes build–measure–learn cycles, encouraging experimentation and validated learning. This theoretical perspective underpins the idea that iterative development and feedback reduce uncertainty in digital ventures.

3. Research Methodology

This study adopts a conceptual and exploratory research design based on:

- Literature Review – Analysis of entrepreneurship, digital innovation, and UX design literature.
- Secondary Data Insights – Industry reports, startup case studies, and platform performance indicators.
- Comparative Case Observations – Observations from successful app-based ventures in sectors such as mobility, fintech, and edtech.

ISBN : 978-93-6163-366-9

The aim is not statistical generalization but theoretical integration to build a framework explaining determinants of success. The qualitative synthesis method allows identification of cross-cutting patterns across domains.

4. Key Determinants of Success

4.1 Value Proposition and Problem–Solution Fit

A digital venture must address a clearly defined problem. A strong value proposition explains:

- Target customer segment
- Core problem addressed
- Unique benefits offered

Without a validated problem–solution fit, digital ventures risk "solutionism" — building technology without real demand. Methods such as customer discovery interviews, surveys, and persona mapping help refine this fit.

A strong value proposition defines:

- Who the target user is
- What problem is addressed
- Why the solution is superior

Digital ventures often fail due to "feature overload" rather than relevance. Customer discovery techniques help ensure alignment with genuine user pain points.

4.2 Market Validation and Iterative Testing

Market validation reduces uncertainty. The Lean Startup methodology emphasizes developing a Minimum Viable Product (MVP) to test assumptions quickly. Feedback cycles allow ventures to pivot features, pricing, or target segments.

Digital ventures benefit from:

- A/B testing
- Beta releases
- Analytics-based decision-making

Iteration ensures alignment with user expectations before large-scale launch investments.

Digital ventures must validate assumptions early. MVPs allow testing with minimal resources. Data from beta testing provides insights into user behavior, guiding pivots.

Iterative learning reduces:

- Development waste
- Market misalignment
- Financial risk

4.3 Technology Architecture and Scalability

Technical design influences reliability and growth potential. Scalable architecture ensures performance during user surges. Cloud infrastructure provides elasticity, while modular coding supports rapid updates.

Poor technical foundations often lead to:

- Frequent crashes
- Slow performance
- Security vulnerabilities

ISBN : 978-93-6163-366-9

These issues negatively affect ratings and user trust.

Robust backend infrastructure ensures performance under user growth. Cloud computing enables dynamic scaling. Security and privacy compliance are also crucial, as trust influences adoption.

4.4 User Experience (UX) and Interface Design

UX plays a critical role in user retention. In digital markets, switching costs are low, so users abandon poorly designed apps quickly. UX determinants include:

- Intuitive navigation
- Fast loading speed
- Aesthetic appeal
- Seamless onboarding

Behavioral research shows that positive UX creates emotional attachment, enhancing loyalty and referrals.

UX influences first impressions and retention. Key UX principles include simplicity, consistency, and responsiveness. Emotional design enhances attachment, while frictionless onboarding improves conversion rates.

4.5 Digital Marketing and Platform Visibility

Digital-first ventures must compete for attention in crowded app stores. Marketing strategies include:

- App Store Optimization (ASO)
- Social media campaigns
- Influencer partnerships
- Referral programs

Effective marketing not only drives downloads but also shapes brand identity and credibility.

Visibility determines adoption. App Store Optimization (ASO), content marketing, and influencer outreach enhance discovery. Ratings and reviews shape credibility.

4.6 Resource Orchestration and Team Capability

Human capital is a key success driver. Founders must combine technical skills with strategic vision. Resource orchestration involves managing financial, technological, and social resources effectively.

Strong teams:

- Adapt quickly to feedback
- Manage partnerships
- Align product and market strategies

Success depends on human capital. Multidisciplinary teams balance technical execution with strategic planning. Partnerships with incubators and investors provide legitimacy and resources.

5. Discussion

The determinants interact dynamically. For example:

- Strong UX improves marketing conversion
- Scalable technology supports user growth
- Market validation refines value proposition

ISBN : 978-93-6163-366-9

Data-driven feedback loops link all determinants. Digital ventures must continuously monitor performance metrics and adjust strategies accordingly. Platform dependence (e.g., app store policies) introduces risks, making regulatory awareness and compliance essential.

These determinants interact systemically. A compelling value proposition attracts users, but retention depends on UX. Marketing drives traffic, but scalability depends on technology. Resource orchestration enables integration of all elements.

Digital ventures must establish data feedback loops, continuously measuring performance metrics such as retention rates, conversion rates, and churn. This adaptive capability differentiates successful ventures from failures.

6. Implications

- For Entrepreneurs - Adopt lean experimentation, prioritize UX, and build scalable systems.
- For Investors - Evaluate not only ideas but team competence, market validation evidence, and architecture readiness.
- For Policymakers - Support digital infrastructure, incubators, and regulatory clarity to foster digital entrepreneurship ecosystems.

7. Conclusion

Success in digital-first ventures emerges from the alignment of strategic, technological, and behavioral factors. The transition from idea to app store is not merely a technical milestone but a process of validated learning, design excellence, and resource coordination. Ventures that integrate these determinants effectively are more likely to achieve sustainable competitive advantage in the platform economy.

The journey from idea to app store success requires more than innovation. It demands strategic alignment of customer needs, technology, design, marketing, and team capabilities. Ventures that integrate these determinants effectively are more likely to achieve sustainable growth. Future studies can explore sector-specific dynamics and cross-country differences in digital venture success.

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ENTREPRENEURIAL OPPORTUNITIES IN THE ERA OF DIGITAL TRANSFORMATION AND INNOVATION: AN INDIAN AND GLOBAL PERSPECTIVE

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Abstract

Entrepreneurial opportunities drive economic growth, innovation, and employment in both developed and developing economies. Rapid digital transformation and continuous innovation are reshaping the entrepreneurial landscape, creating new avenues for venture creation and value generation. This chapter examines entrepreneurial opportunities from an Indian and global perspective, highlighting the impact of technologies such as digital platforms, artificial intelligence, fintech, and data-driven business models on opportunity recognition and competitive advantage. It also emphasizes sustainable and inclusive entrepreneurship in addressing environmental, social, and economic challenges. Key challenges, including regulatory hurdles, access to finance, skill gaps, and market uncertainties, are discussed. Strategic approaches for leveraging entrepreneurial opportunities through innovation, policy support, and education are proposed, providing insights for researchers, policymakers, and practitioners.

Keywords: *Entrepreneurial opportunities, digital transformation, innovation, sustainable entrepreneurship, India, global economy*

1. Introduction

Entrepreneurship is a key driver of economic development, innovation, and social transformation worldwide. Rapid digital transformation, globalization, and innovation-driven growth have expanded the scope of entrepreneurial opportunities beyond traditional business models. Technologies such as artificial intelligence, cloud computing, digital platforms, and fintech enable entrepreneurs to recognize and exploit opportunities in dynamic, global markets. Globally, governments and organizations are promoting innovation-driven entrepreneurship and sustainable, inclusive ventures to address challenges like climate change, unemployment, and social inequality. In India, initiatives such as Startup India, Digital India, and Make in India have strengthened the startup ecosystem, fostering digital entrepreneurship across sectors like e-commerce, financial services, healthcare, and renewable energy. Despite these opportunities, entrepreneurs face challenges including regulatory compliance, access to finance, skill gaps, and market uncertainties, highlighting the need for strategic interventions and supportive policies.

2. Concept of Entrepreneurial Opportunities

Entrepreneurial opportunities are situations where new goods, services, processes, or business models can create value exceeding their cost of production. They emerge from changes in technology, markets, regulations, and social conditions, but are only valuable when

ISBN : 978-93-6163-366-9

recognized, evaluated, and exploited through innovative action. Opportunity recognition varies among individuals due to differences in knowledge, experience, networks, and cognitive abilities, while digital transformation has expanded access to real-time information and technological tools. Opportunities can be discovered in the environment or created through entrepreneurial experimentation, often combining both approaches in practice. They range from incremental improvements to radical, disruptive innovations, with digital and platform-based models offering scalable growth potential globally and in India. In emerging economies, socio-economic conditions, resource gaps, and institutional challenges generate unique opportunities, particularly in sectors like healthcare, education, financial inclusion, renewable energy, and urban infrastructure.

3. Drivers of Modern Entrepreneurial Opportunities

Modern entrepreneurial opportunities are shaped by a combination of technological, economic, social, and institutional factors that influence how ventures are identified, developed, and scaled. Technological advancements, including AI, cloud computing, IoT, big data, and blockchain, reduce entry barriers and enable scalable, global business models in sectors such as financial services, healthcare, and education. Globalization allows entrepreneurs to access international markets, supply chains, and knowledge networks, while increasing competition drives continuous innovation and differentiation. Changing consumer preferences—including demands for convenience, customization, sustainability, and ethical practices—create opportunities for innovative products and services. Institutional and policy support, such as India's Startup India and Digital India initiatives or global innovation hubs, facilitate entrepreneurship by providing finance, infrastructure, and regulatory clarity. Finally, socio-economic and demographic factors, like population growth, urbanization, rising incomes, and a large youth population, shape market demand and labor availability, emphasizing the importance of context-specific opportunity identification.



Figure 1: Key Drivers of Modern Entrepreneurial Opportunities

4. Digital Economy and Entrepreneurial Opportunities

The digital economy is transforming entrepreneurship by enabling data-driven innovation, reducing barriers of location, scale, and capital, and creating new avenues for value creation. Digital platforms and e-commerce allow entrepreneurs to reach large markets with low investment, facilitating scalable ventures in retail, services, and startups. FinTech innovations,

including digital payments, mobile banking, and blockchain, expand financial inclusion and disrupt traditional banking models. AI and data analytics enhance opportunity recognition, operational efficiency, and personalization in sectors such as healthcare, education, logistics, and manufacturing. The gig economy and digital work models provide flexible, cost-effective avenues for entrepreneurship and self-employment. In India, expanding digital infrastructure and policy initiatives support local innovation and global competitiveness, while worldwide, digital entrepreneurship drives hybrid opportunities that merge technology with practical problem-solving.

5. Sustainable and Green Entrepreneurial Opportunities

Sustainable entrepreneurship focuses on creating economic value while minimizing environmental impact and promoting social well-being. It adopts a triple-bottom-line approach, integrating economic viability, environmental stewardship, and social equity. Green technologies and renewable energy sectors, such as solar, wind, electric mobility, and smart energy systems, offer high-growth entrepreneurial opportunities in India and globally. The circular economy creates ventures through reuse, recycling, and resource efficiency in manufacturing, construction, and consumer goods. Social and inclusive entrepreneurship addresses challenges like poverty, healthcare, education, and inequality, delivering market-based solutions with positive social impact. In India, policy support, environmental awareness, and market demand strengthen sustainable ventures, while globally, sustainability principles enhance long-term business viability, brand reputation, and stakeholder trust.

6. Entrepreneurial Opportunities in Emerging Economies

Emerging economies offer high-growth entrepreneurial opportunities due to rapid economic expansion, large underserved markets, and evolving institutions. Opportunities often arise from infrastructure gaps, unmet needs, and digital integration, requiring entrepreneurs to adopt frugal and adaptive innovations. India exemplifies a dynamic hub, with demographic advantages, digital connectivity, and supportive policies fostering startups and MSMEs across IT, healthcare, education, financial inclusion, and renewable energy sectors. MSMEs and startups drive employment, regional development, and global competitiveness, while the coexistence of traditional and modern enterprises illustrates the diversity of opportunities. Globally, emerging markets in Asia, Africa, and Latin America present similar potential, particularly in digital finance, e-commerce, and essential services. Entrepreneurs in these contexts must navigate finance constraints, regulatory uncertainty, and infrastructure gaps by leveraging adaptive strategies, partnerships, and technology-enabled solutions.

7. Challenges in Exploiting Entrepreneurial Opportunities

Exploiting entrepreneurial opportunities in the digital era involves several challenges across both developed and emerging economies. Access to finance remains a critical barrier, particularly for early-stage and first-generation entrepreneurs facing credit limitations and investment uncertainty. Regulatory and institutional hurdles, including complex compliance procedures and inconsistent policies, increase risks and reduce incentives for innovation. Skill gaps in areas such as digital literacy, financial management, and strategic planning limit entrepreneurs' ability to scale ventures effectively. Additionally, market uncertainty and competitive pressures demand continuous adaptation to changing consumer preferences and technological disruption. Finally,

ISBN : 978-93-6163-366-9

technological and infrastructure constraints, including uneven internet connectivity and limited access to advanced tools, can hinder the exploitation of digital opportunities. Addressing these challenges requires integrated strategies involving policy support, skill development, and technology-enabled solutions.

8. Strategies to Leverage Entrepreneurial Opportunities

Effectively leveraging entrepreneurial opportunities requires innovation-oriented strategies, strategic planning, and supportive ecosystems. Product, process, and business model innovations enable entrepreneurs to differentiate offerings, respond to changing market needs, and scale efficiently through digital tools. Incubators, accelerators, and entrepreneurial ecosystems provide critical support through mentorship, funding, technical resources, and networking, with India's academic–industry incubators and global ecosystems enhancing early-stage development and market access. Policy and institutional support, including transparent regulations, financial incentives, and startup-friendly initiatives, plays a vital role in facilitating opportunity exploitation and venture growth. Entrepreneurial education and continuous skill development strengthen creativity, digital literacy, problem-solving, and adaptability in dynamic environments. Strategic collaboration and networking further enhance innovation, resource access, and competitive advantage through partnerships with industry, research institutions, and global stakeholders.

9. Future Scope of Entrepreneurial Opportunities

The future of entrepreneurial opportunities will be driven by technological advancement, sustainability priorities, and increasing global collaboration. Emerging technologies such as artificial intelligence, blockchain, the Internet of Things, and machine learning will enable intelligent, automated, and data-driven solutions across sectors including agriculture, healthcare, education, and manufacturing. Opportunities will increasingly align with smart and sustainable development, encompassing renewable energy, smart cities, sustainable infrastructure, and environmentally responsible production, supported by major investments in India and global climate commitments. Digital connectivity will facilitate global market expansion, enabling Indian entrepreneurs to scale internationally while allowing global ventures to adapt solutions to emerging market contexts. Growing emphasis on human capital development, digital education, and lifelong learning, supported by adaptive policy and research frameworks, will be critical for strengthening entrepreneurial ecosystems and sustaining innovation-led growth.

10. Conclusion

Entrepreneurial opportunities are key drivers of economic growth, innovation, and societal progress in the digital era. Rapid technological transformation has reshaped how opportunities are identified, developed, and exploited. This chapter explored entrepreneurial opportunities from both Indian and global perspectives, highlighting the impact of technology, globalization, evolving consumer preferences, and supportive institutional frameworks. The digital economy encompassing platforms, FinTech, AI, and data-driven entrepreneurship has expanded the scope of opportunities. Sustainable and green entrepreneurship has emerged as a crucial focus, addressing environmental and social challenges while promoting long-term development. Emerging economies like India demonstrate how demographic advantages, policy support, and digital infrastructure foster vibrant entrepreneurial ecosystems. Despite abundant opportunities,

ISBN : 978-93-6163-366-9

challenges such as finance, regulation, skill gaps, and market uncertainty persist. Strategies including innovation, ecosystem engagement, policy support, entrepreneurial education, and collaboration are essential for effective opportunity exploitation. Looking ahead, technology, sustainability, global collaboration, and knowledge-based ventures will shape the future landscape, requiring adaptive ecosystems that support inclusive, resilient, and innovation-driven entrepreneurship.

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ISBN : 978-93-6163-366-9

CASE STUDY ON SUSTAINABLE BUSINESS MODELS-AN INTEGRATED ANALYSIS OF STUDENT-LED SUSTAINABLE VENTURES DURING VENTURE FEST EVENT

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Abstract

The Venture Fest on Sustainable Business Models served as an experiential learning platform that enabled students to conceptualize, develop, and present sustainability-driven entrepreneurial ventures across diverse sectors. This integrated case study examines four student-led ventures—Ras Rang Rush, Gandhadagudi Candles, Avartan, and Terralok—operating in food and beverage, home wellness, fashion and accessories, and craft-based sustainable products respectively. Each venture adopted innovative strategies to promote sustainable products while addressing environmental, social, and economic challenges.

The participating teams demonstrated strong alignment with key United Nations Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), and SDG 15 (Life on Land). Sustainability practices included zero-waste operations, use of renewable and biodegradable materials, upcycling and reuse of waste, energy-efficient production, and ethical sourcing. Collectively, the ventures contributed to waste reduction, lower carbon footprints, conservation of natural resources, and preservation of traditional skills and cultural heritage.

From a performance perspective, the student teams achieved measurable outcomes such as cost efficiencies through waste minimization, improved consumer acceptance of eco-friendly products, enhanced brand credibility, and increased awareness of sustainable consumption. The Venture Fest also strengthened students' entrepreneurial competencies, including problem-solving, decision- making, teamwork, financial analysis, and communication skills. Overall, the Venture Fest demonstrates that sustainability-driven entrepreneurship can be both viable and impactful. The initiative highlights the effectiveness of experiential learning in promoting sustainable product innovation while nurturing responsible, ethical, and future-ready managers and entrepreneurs.

Keywords: *Sustainable entrepreneurship, Venture Fest, SDGs, sustainable products, circular economy,*

1. Introduction

Sustainability-driven entrepreneurship has emerged as a critical response to global challenges such as environmental degradation, excessive waste generation, climate change, and unethical production practices. Business education institutions increasingly recognize the need to integrate sustainability into entrepreneurial learning to prepare responsible future leaders. In this context, the **Venture Fest** was organized to provide students with an experiential platform to ideate, develop, and present sustainable business models. The event aimed to:

- Encourage experiential and applied learning
- Promote innovation grounded in sustainability
- Integrate theoretical frameworks such as the **Triple Bottom Line (TBL)**, **Circular Economy**, and **Sustainable Development Goals (SDGs)**
- Assess the feasibility, scalability, and impact of sustainable ventures

Four student teams presented ventures spanning multiple sectors, offering a multidisciplinary perspective on sustainable entrepreneurship.

2. Overview of Participating Ventures

Table:1 showing Overview of participating teams

Team	Venture Name	Industry	Core Sustainability Focus
Team 1	Ras Rang Rush	Food & Beverage	Zero-waste operations, circular economy
Team 2	Gandhadagudi Candles	Home & Wellness	Natural materials, reuse & recycle
Team 3	Avartan	Fashion & Accessories	Upcycling, artisan empowerment
Team 4	Terralok	Craft & Sustainable Products	Terracotta & banana fiber, circular economy

3. Case Summaries of Individual Ventures

3.1 Ras Rang Rush – Zero-Waste Juice Venture

Industry: Food and Beverage. The **Core Idea:** Serving fresh juices in natural fruit shells to eliminate packaging waste.

Key Sustainability Practices

- Juices served in fruit shells (guava, watermelon, coconut). Zero plastic and paper usage
- Composting fruit waste into manure. Local sourcing of fruits to reduce transportation emissions. Hygiene maintained through handwashing instead of disposable tissues

Operational and Financial Insights

- Lower operating costs compared to conventional juice outlets. Elimination of packaging and waste disposal expenses. High demand for products such as *Chill Guava Shots* and *Watermelon Juice*
- Demonstrated cost efficiency alongside environmental responsibility

Outcomes

- Up to 50% reduction in plastic waste. Enhanced brand perception and repeat customer behavior. Strong alignment with Circular Economy and TBL frameworks

3.2 Gandhadagudi Candles – Sustainable Wellness Products

Industry: Candles and Home Décor. The **Core Idea:** Manufacturing eco-friendly candles using natural wax alternatives.

Key Sustainability Practices

- Use of beeswax and soy wax instead of paraffin wax. Recyclable glass containers
- Natural fragrances, colours, and decorative elements. Reuse of leftover wax
- Energy-efficient production using electric stoves Strategic Frameworks Applied
- Circular Economy, Life Cycle Assessment (LCA), Triple Bottom Line (People, Planet, Profit) Outcomes

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- Approximately 30% reduction in carbon emissions. 25% reduction in waste management costs. 20–30% increase in sales volume, Improved customer loyalty and brand reputation
- Strengthened community engagement through local sourcing

3.3 Avartan – Sustainable Fashion with Cultural Identity

Industry: Fashion & Accessories. The **Core Idea:** Producing Kalamkari bags and quilling earrings using upcycled and recycled materials.

Key Sustainability Practices

- Upcycled fabrics sourced from textile waste
- Natural dyes used in Kalamkari art
- Recycled paper for quilling jewellery
- Fair wages and ethical treatment of artisans Social and Environmental Impact
- Reduction in textile and paper waste. Preservation of traditional Indian art forms. Ethical and transparent production practices

Outcomes

- Lower carbon footprint through material reuse. Reduced raw material costs. Differentiation from fast-fashion brands. Positive consumer response driven by storytelling and cultural value

3.4 Terralok – Promoting Sustainability through Terracotta and Banana Fiber

Industry: Craft-Based Sustainable Products

Core Idea: Developing eco-friendly products using terracotta and banana fiber within a circular economy framework.

Key Sustainability Practices

- Use of terracotta (natural, biodegradable, energy-efficient material). Utilization of banana fiber as an agricultural by-product. Adoption of cow dung paints (chemical-free and biodegradable)
- Replacement of disposable materials with reusable alternatives. Minimal water usage during production and stall setup. Low-energy terracotta production processes

Partnerships and Community Engagement

- Collaboration with NGOs **Headstreams** and **Masmara** for responsible sourcing
- Support for local artisans and traditional craftsmanship. Conduct of pottery workshops to preserve cultural heritage

Products and Initiatives

- Terracotta home décor products, Banana fiber accessories, Pottery workshops. Terracotta Legos

Outcomes

- Measurable reduction in waste and carbon footprint. Improved brand credibility among eco- conscious consumers. Cost efficiency through sustainable sourcing. Contribution to SDGs 11, 12, 13, and 15

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4. Comparative Analysis of Sustainability Approaches

Table 2: showing Comparative Analysis of Sustainability Approaches

Dimension	Ras Rang Rush	Gandhadagudi Candles	Avartan	Terralok
Waste Reduction	Very High	High	High	High
Use of Natural Materials	High	Very High	High	Very High
Circular Economy	Strong	Strong	Strong	Strong
Social Impact	Moderate	Moderate	Very High	Very High
Cost Efficiency	High	Moderate	Moderate	Moderate
Consumer Awareness	High	Growing	Growing	Growing

5. Overall Outcomes of the Venture Fest

The Venture Fest emerged as a comprehensive experiential learning initiative that effectively integrated sustainability principles with entrepreneurial practice. The outcomes of the event can be evaluated across academic, entrepreneurial, sustainability, and institutional dimensions, demonstrating its multi-layered impact on student learning and institutional goals.

5.1 Academic and Learning Outcomes

The Venture Fest significantly enhanced students' academic learning by enabling the practical application of sustainability and entrepreneurship theories to real-world business contexts. Students actively applied frameworks such as the Triple Bottom Line (People, Planet, Profit), Circular Economy, and Sustainable Development Goals (SDGs) while conceptualizing and executing their ventures. This experiential exposure bridged the gap between classroom theory and practical implementation, reinforcing conceptual clarity and contextual understanding. Participation in the

Venture Fest also improved students' understanding of cost structures, pricing strategies, and sustainability trade-offs. Students were required to balance environmental responsibility with economic feasibility, fostering a realistic appreciation of the challenges involved in sustainable business decision-making. Additionally, the preparation of business models, financial summaries, and sustainability justifications enhanced analytical and critical thinking skills.

The event further strengthened research, communication, and presentation competencies. Students conducted market research, sustainability assessments, and competitor analyses, followed by structured presentations to evaluators and peers. This process refined their ability to articulate complex sustainability concepts clearly, logically, and persuasively—an essential skill for future managers and entrepreneurs.

5.2 Entrepreneurial Outcomes

From an entrepreneurial perspective, the Venture Fest demonstrated that sustainability and profitability are not mutually exclusive. The participating ventures showcased viable business models that achieved cost efficiency through waste reduction, local sourcing, and innovative resource utilization. This reinforced the notion that sustainable practices can enhance operational efficiency and long-term financial performance. The event encouraged innovation beyond conventional business models, prompting students to rethink production, packaging, sourcing, and consumption patterns. By addressing real-world environmental and social problems,

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students developed creative, impact-driven solutions tailored to specific industries such as food and beverage, wellness, fashion, and crafts.

Moreover, the Venture Fest strengthened problem-solving and decision-making capabilities. Students encountered operational constraints, cost limitations, and consumer awareness challenges, requiring adaptive strategies and informed decision-making. These experiences cultivated entrepreneurial resilience, strategic thinking, and risk assessment skills, which are critical for venture creation and management.

5.3 Sustainability Awareness

The Venture Fest played a vital role in deepening sustainability awareness among students by illustrating multiple pathways to sustainability across diverse sectors. Each venture demonstrated distinct sustainability strategies—ranging from zero-waste operations and eco-friendly materials to upcycling and artisan empowerment—highlighting the versatility of sustainable business models. The event reinforced the principles of responsible consumption and production, encouraging students to critically examine the environmental and social impacts of business activities. Through hands-on engagement, participants developed a stronger appreciation for ethical sourcing, waste minimization, energy efficiency, and community engagement.

Importantly, the Venture Fest fostered ethical thinking and values-based leadership among future managers and entrepreneurs. By emphasizing social responsibility alongside economic goals, the initiative nurtured a mindset oriented toward long-term sustainability, inclusivity, and environmental stewardship.

5.4 Institutional Impact

At the institutional level, the Venture Fest significantly strengthened experiential learning pedagogy, aligning academic instruction with real-world problem-solving and innovation. The event provided a structured platform for outcome-based education, enabling the assessment of learning outcomes beyond traditional examinations.

The initiative demonstrated strong alignment with NAAC, AACSB, and National Education Policy (NEP) 2020 objectives, particularly in areas such as multidisciplinary learning, skill development, entrepreneurship, sustainability integration, and societal engagement. It contributed to measurable learning outcomes related to critical thinking, ethical reasoning, and applied knowledge. Furthermore, the Venture Fest positioned the institution as a promoter of responsible management education. By embedding sustainability into entrepreneurial learning, the institution reinforced its commitment to developing socially responsible, environmentally conscious, and professionally competent graduates. This initiative enhances institutional reputation, stakeholder engagement, and readiness for accreditation and quality assurance processes.

6. Conclusion

The Venture Fest successfully demonstrated how student-led initiatives can integrate sustainability into viable business models across diverse sectors. Ras Rang Rush showcased operational efficiency through zero-waste practices; Gandhadagudi Candles highlighted eco-friendly production with measurable environmental and financial benefits; Avartan emphasized social sustainability through artisan empowerment and cultural preservation; and Terralok illustrated the effective use of traditional materials within a circular economy framework.

Collectively, the ventures confirm that sustainability-driven entrepreneurship is not only environmentally responsible but also economically viable and socially impactful. The event underscores the importance of experiential learning platforms in nurturing responsible, innovative, and sustainability-oriented future leaders.

Future Scope

- Incubation and scaling support for promising ventures
- Increased interdisciplinary collaboration in future Venture Fests
- Longitudinal tracking of entrepreneurial outcomes of participating students

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I've **consolidated all four teams into one integrated, publication-ready case study** in the canvas titled: **"Venture Fest on Sustainable Business Models – Integrated Four-Team Case Study."**

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ISBN : 978-93-6163-366-9

Photo Gallery



Pic : Terralok



Pic : Gandhadagudi Candles



Pic: Ras Rang Rush



Pic : Team Avartan products

Web sites

1. MASMARA - https://www.masmara.com/ HEADSTREAMS - https://headstreams.org/ https://www.masmara.com/stationery/

ROLE OF DIGITAL TECHNOLOGIES IN ENTREPRENEURIAL INNOVATION

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Abstract

Digital technologies have become central to entrepreneurial innovation in the modern economy. Technologies such as artificial intelligence, cloud computing, big data analytics, mobile platforms, and social media are transforming how entrepreneurs identify opportunities, develop products, and deliver value. This paper examines the role of digital technologies in fostering entrepreneurial innovation, highlighting key technological drivers, innovation mechanisms, benefits, and challenges. The study also explores the economic and societal impact of digitally enabled entrepreneurship and provides recommendations for strengthening digital innovation ecosystems.

Keywords: *Digital technologies, entrepreneurial innovation, digital entrepreneurship, innovation ecosystem, start-ups*

1. Introduction

Entrepreneurial innovation plays a vital role in economic growth, competitiveness, and social development. In recent years, digital technologies have significantly altered the entrepreneurial landscape by enabling new business models, reducing entry barriers, and accelerating innovation processes. Entrepreneurs today increasingly rely on digital tools and platforms to create, test, and scale innovative solutions.

The integration of digital technologies into entrepreneurship has given rise to digital startups that operate across global markets with limited physical resources. This paper aims to analyze how digital technologies influence entrepreneurial innovation and how entrepreneurs leverage these technologies to gain competitive advantage.

2. Objectives of the Study

The main objectives of the study are:

1. To examine the concept of entrepreneurial innovation in the digital era.
2. To analyze the role of digital technologies in fostering entrepreneurial innovation.
3. To identify key digital technologies that influence innovation among entrepreneurs.

3. Research Methodology

Research Design

The study adopts a descriptive to examine the role of digital technologies in entrepreneurial innovation.

Sources of Data

The study is based on **secondary data**, collected from the following sources:

- Research journals and academic publications
- Books related to entrepreneurship and digital innovation
- Reports from organizations such as OECD, World Bank, and WEF

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4. Concept of Entrepreneurial Innovation

Entrepreneurial innovation refers to the process through which entrepreneurs introduce new or improved products, services, processes, or business models. Innovation may be incremental or radical and is often driven by market needs, technological advancements, and competitive pressures.

Innovation in entrepreneurship includes:

- Product and service innovation
- Process innovation
- Business model innovation
- Market and organizational innovation

Digital technologies act as catalysts by enabling faster experimentation, collaboration, and value creation.

5. Digital Technologies as Drivers of Entrepreneurial Innovation

5.1 Artificial Intelligence (AI)

Artificial intelligence enables entrepreneurs to automate operations, personalize customer experiences, and make data-driven decisions. AI-powered tools such as chatbots, recommendation systems, and predictive analytics support innovation in sectors like e-commerce, healthcare, and finance.

5.2 Cloud Computing

Cloud computing provides entrepreneurs with scalable and cost-effective access to computing resources. Startups can develop, test, and deploy innovative solutions without investing in expensive infrastructure, allowing rapid innovation and flexibility.

5.3 Big Data and Analytics

Big data technologies help entrepreneurs analyze large volumes of structured and unstructured data. Insights derived from customer behavior, market trends, and operational performance enable innovative product design and strategic decision-making.

5.4 Mobile and Internet Technologies

Mobile applications and internet platforms allow entrepreneurs to reach customers anytime and anywhere. Mobile-first innovation has led to new services in digital payments, ride-sharing, online education, and health monitoring.

5.5 Social Media and Digital Platforms

Social media platforms facilitate low-cost marketing, customer engagement, and brand building. Entrepreneurs use digital platforms to co-create value with users, gather feedback, and rapidly refine innovations.

6. Digital Technologies and Business Model Innovation

Digital technologies enable entrepreneurs to create innovative business models such as:

- Platform-based models
- Subscription and Premium models
- On-demand and gig economy models
- Direct-to-consumer (D2C) models

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These models emphasize scalability, network effects, and customer-centric innovation, allowing start ups to disrupt traditional industries.

7. Benefits of Digital Technologies for Entrepreneurial Innovation

The adoption of digital technologies offers several advantages:

- Reduced start up and operational costs
- Faster innovation cycles and time-to-market
- Enhanced customer insights and personalization
- Global market access and scalability
- Improved collaboration and remote work capabilities

These benefits increase the likelihood of entrepreneurial success and sustainable growth.

8. Challenges in Leveraging Digital Technologies

Despite their potential, digital technologies pose several challenges:

- High competition and rapid technological change
- Cyber security threats and data privacy concerns
- Digital skills gaps among entrepreneurs
- Dependence on digital platforms and algorithms
- Regulatory and ethical issues related to data usage

Entrepreneurs must strategically manage these challenges to sustain innovation.

9. Impact on Economic and Social Development

Digitally driven entrepreneurial innovation contributes to:

- Job creation and self-employment
- Increased productivity and competitiveness
- Financial inclusion through digital services
- Innovation in healthcare, education, and governance

Digital technologies also empower marginalized groups by lowering traditional barriers to entrepreneurship.

10. Conclusion

Digital technologies have profoundly reshaped entrepreneurial innovation by fostering creativity, accelerating experimentation, and enabling the development of scalable and sustainable business ventures. When entrepreneurs strategically harness these technologies within supportive and well-developed ecosystems, they are better equipped to overcome challenges, enhance efficiency, and respond effectively to changing market demands. As a result, digital innovation not only strengthens competitive advantage but also contributes to long-term economic growth and meaningful social progress in the digital age.

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ISBN : 978-93-6163-366-9

THE ROLE OF SUSTAINABILITY AND SOCIAL IMPACT IN MODERN STARTUP ECOSYSTEMS

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Abstract

Sustainability has become a highly discussed and increasingly important topic in recent years. Along with rapid economic growth and innovation, concerns related to environmental protection and social responsibility have also gained attention. This paper focuses on the impact sustainability has on modern start-up ecosystems. It highlights how sustainability influences the way startups operate, grow, and position themselves in competitive markets.

The study also emphasizes the importance of sustainable startups in addressing societal issues across various areas such as environmental conservation, social welfare, and inclusive development. Additionally, the paper discusses the major challenges faced by startups while adopting sustainable practices, including resource constraints, cost pressures, and the difficulty of balancing profitability with long-term sustainability goals.

Keywords: *Sustainability, Start-up Ecosystems, Sustainable Entrepreneurship, ESG Practices*

1. Introduction

Startup ecosystems refer to the interconnected network of entrepreneurs, investors, incubators, government bodies, and support institutions that together enable the formation and growth of startups. These ecosystems provide essential resources such as funding, mentorship, infrastructure, and market access, allowing startups to transform innovative ideas into sustainable business ventures. In recent years, startup ecosystems have expanded rapidly across the globe, becoming key drivers of innovation, employment, and economic development.

Alongside this growth, sustainability has emerged as a major concern influencing how businesses operate within these ecosystems. Increasing environmental challenges, social inequalities, changing consumer preferences, and regulatory pressures have pushed organizations to move beyond purely profit-driven models. Sustainability has therefore gained importance as it focuses on long-term value creation by balancing economic growth with environmental protection and social responsibility. As a result, modern startup ecosystems are increasingly supporting startups that adopt sustainable and socially responsible practices.

1.1. Objective of the Study

- To understand the concept of sustainability within modern startup ecosystems
- To examine the role of sustainability in shaping startup operations and growth
- To study the importance of social impact created by sustainable startups
- To identify the key challenges faced by startups in adopting sustainable practices

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1.2. Problem Statement

Despite the increasing emphasis on sustainability, many startups continue to face difficulties in effectively integrating sustainable and socially responsible practices into their business models. While startup ecosystems promote innovation and growth, there is limited clarity on how sustainability and social impact influence startup performance and ecosystem development. This creates a need to examine the role of sustainability within modern startup ecosystems.

2. Literature Review

Sustainable entrepreneurship has gained increasing attention as startups are expected to balance economic growth with environmental and social responsibility. Sustainable business models integrate ecological, social, and financial goals, aiming to create long-term value for both firms and society (Schaltegger, Hansen, & Lüdeke-Freund, 2016). Startups adopting these models focus on practices such as circular economy solutions, efficient resource use, and eco-friendly innovations, which can enhance operational efficiency and market competitiveness (Bocken, Short, Rana, & Evans, 2014).

Research also highlights the role of ecosystem support in enabling sustainability. Stakeholder collaboration, policy incentives, and mentorship programs are crucial in helping startups implement sustainable practices effectively (Schaltegger, Lüdeke-Freund, & Hansen, 2016). Moreover, sustainable startups often attract impact-focused investors and socially conscious customers, demonstrating how sustainability can align with financial performance and stakeholder engagement (Rosário, Raimundo, & Cruz, 2022).

While theoretical frameworks for sustainable entrepreneurship are well established, empirical studies remain limited. There is a need for further research on how sustainability functions across diverse startup ecosystems, the challenges faced in implementation, and the measurable impact on society and the environment (Lemus-Aguilar, Morales, Ramirez-Portilla, & Hidalgo, 2019).

However, current research also highlights a number of challenges that entrepreneurs must overcome in order to implement sustainable practices. Startups frequently find it difficult to completely implement sustainability programs due to a lack of standardized effect monitoring techniques, limited financial resources, and pressure to achieve rapid development. Even if earlier study has recognized the significance of sustainability in startup ecosystems, further research is still required to fully understand how social impact and sustainability interact to affect ecosystem development and startup performance.

3. Methodology

This study adopts a descriptive and exploratory research design to understand the role of sustainability and social impact in modern startup ecosystems. The study is based entirely on secondary data, as it aims to study existing concepts, trends, and insights rather than collect primary data.

Research journals, scholarly papers, industry reports, websites of international organizations, and published case studies related to sustainability, startups, and social impact were the sources of secondary data. For relevant data, sources like startup ecosystem studies and publications from international organizations were also used. Qualitative content analysis was used to analyse the gathered data in order to identify important themes, trends, and issues related to sustainability and social impact in startup ecosystems.

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4. Results

The results highlight how startups integrate sustainability and social impact into their business models and how these practices influence investors, ecosystem support, and performance. Findings are presented under two themes: sustainability and social impact.

4.1. Sustainability in Startups

Analysis of recent reports and studies indicates that sustainability has become a key driver of business strategy for many modern startups. Environmentally friendly techniques, such cutting carbon emissions, utilizing renewable energy, and putting circular economy solutions into effect, are being adopted by a sizable number of startups. According to data, startups that incorporate sustainability typically do better when it comes to getting investment from impact investors and venture capital firms that give ESG considerations first priority. Additionally, firms with sustainable business models frequently claim increased market positioning as a result of consumers' growing appreciation for ethical goods and services, decreased costs through resource management, and enhanced operational efficiency.

4.2. Social Impact in Startups

The study also emphasizes how social impact is increasingly influencing startup ecosystems. Startups that prioritize community development, healthcare, education, and financial inclusion are becoming more well-known and drawing capital from impact-driven investors. According to data from ecosystem surveys, socially conscious firms frequently see increases in consumer loyalty, brand trust, and stakeholder engagement. Additionally, by expanding access to necessary services and generating job opportunities, social impact-driven enterprises support inclusive growth. Measuring impact, striking a balance between social goals and profits, and successfully expanding initiatives across areas are still obstacles.

5. Discussion

Sustainability is a crucial strategic component in modern startup ecosystems. By focusing on long-term value, resource efficiency, and risk management, startups that implement sustainable practices increase their credibility with partners, investors, and clients. By drawing in partnerships, government incentives, and new market opportunities, sustainability can also give businesses a competitive edge. Ecosystems that offer mentorship, incubation, and policy guidance can also help.

Ecosystems are similarly shaped by social impact. Startups that tackle societal issues, like financial inclusion, healthcare, or education, encourage inclusive growth and draw in socially conscious investors. Brand reputation is strengthened by demonstrating quantifiable social outcomes, but striking a balance between social objectives and financial sustainability is still difficult, underscoring the need for efficient ecosystem support and impact measurement.

6. Findings

Based on the analysis and discussion, certain key insights emerge regarding the role of sustainability and social impact within modern startup ecosystems. These findings summarize the major observations of the study and highlight the overall influence of sustainable practices on startup growth and ecosystem development.

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- Sustainability now plays a significant role in shaping business models and startup strategies.
- Startups that incorporate sustainable principles typically prioritize long-term expansion over immediate profits.
- Startups with a social impact focus solve societal issues and promote inclusive development.
- Startups with an emphasis on impact are more likely to draw investors who place a high value on ESG factors.
- Through funding, mentorship, and policy assistance, startup ecosystems are essential to supporting sustainability.

7. Conclusion

The study comes to the conclusion that contemporary startup ecosystems are increasingly shaped by sustainability and social impact. Startups are better positioned for long-term success, investor trust, and societal contribution when they adopt sustainable and socially conscious practices. The results demonstrate the importance of supporting startup ecosystems in facilitating such activities through financial possibilities, mentorship, and policy assistance. In general, sustainability is now a crucial component of successful company development rather than a side issue.

8. Limitations

This study is based entirely on secondary data, which limits the depth of analysis and may not capture real-time trends in startup ecosystems. Availability of standardized data on sustainability and social impact is also limited, and the findings may not fully reflect variations across different regions or sectors.

9. Future Scope

Future research can include primary data through surveys or interviews with startup founders to gain deeper insights into sustainability practices. Comparative studies across regions or sectors could help understand contextual differences. Developing standardized tools for measuring social and environmental impact would also strengthen the assessment of sustainability in startups.

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DIGITAL MARKETING STRATEGIES FOR STARTUP GROWTH IN A COMPETITIVE BUSINESS ENVIRONMENT

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Abstract

In the current digital economy, startups operate in highly competitive markets marked by rapid technological change and shifting consumer behavior. Limited financial and managerial resources further increase the need for efficient and measurable marketing approaches. Digital marketing has emerged as a practical and strategic solution that allows startups to build visibility, attract customers, and support sustainable growth through cost-effective and data-driven methods. This article examines key digital marketing strategies that contribute to startup growth in competitive business environments. Drawing on recent academic literature and practical business contexts, the study discusses the role of content marketing, search engine optimization, social media marketing, influencer marketing, paid digital advertising, and performance analytics. The review of literature highlights broad agreement that digital marketing is a major driver of competitiveness and long-term performance for startups. The article concludes that a strategically planned and analytics-supported digital marketing approach is essential for startups seeking to grow and survive in dynamic and competitive markets.

Keywords: *digital marketing, startups, business growth, competitiveness, online marketing, Indian startups*

Introduction

The business environment today is increasingly shaped by digital technologies, global competition, and consumers who depend heavily on online platforms for information, communication, and purchasing decisions. For startups, these conditions create both opportunities and challenges. While digital platforms reduce entry barriers, startups must still compete with well-established firms that have stronger brands and greater financial resources. Traditional marketing methods are often expensive and less flexible, making them difficult for early-stage firms to sustain.

In the Indian business environment, the rapid growth of internet penetration, smartphone usage, and digital payment systems has significantly changed how startups engage with customers. Government initiatives such as *Digital India* and the availability of low-cost mobile data have accelerated digital adoption across urban and semi-urban markets. Indian startups in sectors such as fintech, edtech, food delivery, healthtech, and e-commerce increasingly rely on digital channels to reach geographically diverse and price-sensitive consumers. As a result, digital marketing has become a central tool for Indian startups to achieve market reach, operational efficiency, and competitive positioning.

Digital marketing also supports lean and agile business models that emphasize experimentation, rapid feedback, and continuous improvement. By tracking user behavior and campaign outcomes in real time, startups can refine their strategies and allocate limited resources more effectively. Prior research suggests that digital marketing enables startups to lower customer acquisition costs while strengthening brand awareness and customer engagement (Agarwal & Sharma, 2024). These advantages make digital marketing a strategic necessity rather than a supplementary activity for startups operating in competitive markets.

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Study Objectives

The present study is guided by the following key objectives:

1. To examine the role of digital marketing strategies in driving startup growth in competitive business environments.
2. To identify the most effective digital marketing tools that enhance brand visibility and customer acquisition for startups.
3. To analyze the importance of data-driven decision-making in improving the performance of digital marketing strategies for startups.

Review of Literature

Existing research consistently highlights the strategic importance of digital marketing for startup growth and competitiveness. Halim and Ermiani (2024) emphasized that digital marketing strategies contribute significantly to startup maturity, market access, and customer engagement. Their review suggests that structured and well-planned digital marketing activities strengthen brand positioning and support long-term business development.

Hasanah (2025), in a systematic literature review, identified social media marketing, search engine optimization (SEO), content marketing, and influencer marketing as the most commonly adopted and effective strategies among startups. The study found that these tools positively influence return on investment, brand awareness, and customer relationships, particularly in firms with limited financial and human resources.

Benneet et al. (2024) examined the relationship between digital marketing and startup brand growth and reported that digital platforms play a critical role in improving brand visibility and customer trust. Their findings highlight the importance of consistent online engagement, SEO practices, and content creation in building startup brand equity.

Joshi et al. (2025) focused on digital marketing strategies in volatile and uncertain business contexts and found that startups rely heavily on digital content and social media platforms to maintain customer engagement and stabilize revenue streams. Their study suggests that digital marketing not only supports growth but also enhances organizational resilience during periods of market uncertainty.

In the Indian context, digital marketing has been widely adopted by startups operating in competitive sectors such as e-commerce, online education, and financial technology. Indian companies such as Flipkart, Zomato, Byju's, and Paytm provide practical examples of how social media engagement, search engine visibility, and app-based promotions can support rapid customer acquisition and brand recognition. These examples support academic findings that digital platforms are particularly important for startup scalability and market penetration in emerging economies.

Overall, the literature reflects strong agreement that digital marketing is a central driver of startup competitiveness, customer engagement, and long-term sustainability.

Key Digital Marketing Strategies for Startup Growth

Content Marketing

Content marketing involves creating and sharing useful and relevant information to attract and engage target audiences. For startups, content marketing supports credibility and helps establish expertise in specific market niches. In India, content marketing often includes the use of regional languages, short-form videos, blogs, and educational content to reach diverse

customer segments. Startups in edtech, fintech, and healthtech frequently use explainer videos and simplified content to build trust and improve customer understanding. Such localized and informative content strengthens engagement and supports organic brand growth (Mocanu & Szakal, 2023).

Search Engine Optimization (SEO)

Search engine optimization is essential for improving online visibility and attracting customers who actively search for related products or services. By optimizing website structure, keywords, and technical elements, startups can improve their ranking on search engine results pages. Agarwal and Sharma (2024) reported that SEO provides sustainable and cost-effective traffic, making it a valuable long-term strategy for startups with limited marketing budgets. In competitive Indian markets, strong search visibility is especially important for reaching first-time and price-conscious consumers.

Social Media Marketing

Social media platforms allow startups to interact directly with customers and build long-term relationships. Indian startups actively use platforms such as Instagram, YouTube, WhatsApp Business, and LinkedIn to promote products, share updates, and engage users. Social media campaigns by Indian food delivery, fashion, and direct-to-consumer (D2C) startups demonstrate how short-video formats, influencer collaborations, and interactive content can increase visibility and customer participation. These practices highlight the importance of platform-specific strategies in highly competitive digital markets (Joshi et al., 2025).

Influencer and Affiliate Marketing

Influencer marketing enables startups to reach niche audiences through trusted online personalities. Collaborations with influencers help improve brand credibility and customer trust, particularly among younger and digitally active consumers. In India, micro-influencers are often used to target regional and language-specific audiences at lower costs. Hasanah (2025) found that influencer partnerships can significantly enhance engagement and brand exposure when aligned with clearly defined target segments.

Paid Digital Advertising and Analytics

Paid digital advertising, including pay-per-click (PPC) campaigns, provides startups with immediate online visibility and measurable results. Indian startups commonly use Google Ads, Meta Ads, and marketplace advertising on platforms such as Amazon and Flipkart to reach targeted consumers. When combined with analytics tools, paid campaigns allow startups to monitor performance, test different approaches, and allocate budgets more efficiently. Halim and Ermiani (2024) emphasized that data-driven decision-making improves marketing effectiveness and supports continuous strategy refinement.

Challenges in Digital Marketing for Startups

Despite its advantages, digital marketing also presents several challenges for startups. These include limited technical expertise, increasing competition for online visibility, rising digital advertising costs and frequent changes in platform algorithms. Issues related to data privacy, consumer trust, and ad fatigue further complicate digital marketing efforts (Basimakopoulou et

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al., 2022). To manage these challenges, startups must invest in digital skills, continuously monitor performance and remain flexible in adapting their strategies.

Conclusion

Digital marketing has become a core component of startup growth strategies in competitive business environments. The reviewed literature and practical examples provide strong evidence that content marketing, SEO, social media marketing, influencer collaborations, paid digital advertising, and analytics play a significant role in building brand visibility, acquiring customers, and supporting sustainable growth. In emerging markets such as India, where digital adoption is expanding rapidly, digital marketing offers startups a practical pathway to scale operations and compete with larger domestic and global firms. A strategic, customer-focused, and data-driven digital marketing approach is therefore essential for startups seeking long-term success in dynamic and competitive markets.

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GREEN FINANCE AND SUSTAINABLE INVESTMENTS

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Abstract

Green finance and sustainable investments have emerged as crucial tools for addressing environmental challenges while ensuring long-term economic growth. With rising concerns over climate change, resource depletion, and environmental degradation, the global financial system is gradually shifting towards environmentally responsible investment practices. Green finance refers to financial activities that support projects and initiatives with positive environmental outcomes, such as renewable energy, sustainable infrastructure, and climate-resilient development.

This article examines the concept and evolution of green finance and sustainable investments, highlighting their importance in promoting sustainable development. It also discusses the role of financial institutions, governments, and investors in supporting green initiatives, along with the benefits, challenges, and future prospects of green finance in emerging and developing economies.

Introduction

In recent years, sustainability has become a central concern for policymakers, businesses, and investors across the world. Economic growth achieved at the cost of environmental damage is no longer considered viable. As a result, financial systems are increasingly being aligned with environmental and social objectives. Green finance and sustainable investments play a significant role in bridging the gap between economic development and environmental protection.

Green finance refers to financial investments made into projects and activities that contribute to environmental sustainability, including renewable energy, energy efficiency, pollution control, sustainable agriculture, and climate change mitigation. Sustainable investments go beyond environmental aspects and also consider social and governance factors, commonly referred to as Environmental, Social, and Governance (ESG) criteria.

Concept of Green Finance and Sustainable Investments

Green finance involves the allocation of financial resources to projects that generate environmental benefits while ensuring economic returns. It focuses on reducing carbon emissions, conserving natural resources, and promoting clean and sustainable technologies. Examples of green finance include investments in solar and wind energy, electric vehicles, waste management systems, and green buildings.

Sustainable investments, on the other hand, integrate environmental, social, and governance considerations into investment decisions. Investors evaluate not only financial performance but also the long-term impact of their investments on society and the environment. Companies that follow ethical business practices, reduce environmental risks, and ensure social responsibility are increasingly preferred by sustainable investors.

The integration of green finance and sustainable investments helps create a balanced financial system that supports economic growth while protecting the environment. It encourages

ISBN : 978-93-6163-366-9

responsible investment behavior and promotes long-term value creation for both investors and society.

Evolution of Green Finance and Sustainable Investments

The concept of green finance has evolved gradually in response to growing environmental concerns and global climate commitments. Initially, environmental protection was considered the responsibility of governments alone. However, with increasing financial risks associated with climate change, the role of financial institutions and investors became more significant.

The evolution of green finance can be broadly divided into three stages. The early stage focused on environmental regulations and compliance, where investments were mainly directed toward pollution control and waste management. The second stage witnessed the introduction of market-based mechanisms such as carbon trading, green funds, and socially responsible investing. The current stage emphasizes integrated sustainability, where environmental, social, and governance factors are incorporated into mainstream financial decision-making.

International agreements such as the Paris Climate Agreement and the United Nations Sustainable Development Goals (SDGs) have accelerated the growth of green finance worldwide. These initiatives encourage countries and financial institutions to mobilize capital toward environmentally sustainable projects and climate-resilient development.

Types of Green Financial Instruments

Green finance operates through various financial instruments designed to support sustainable development. One of the most prominent instruments is **green bonds**, which are issued to raise funds specifically for environmentally beneficial projects such as renewable energy, clean transportation, and sustainable infrastructure.

Another important instrument is **green loans**, where funds are provided to businesses and projects that meet specific environmental criteria. These loans often offer favorable terms to encourage sustainable practices. **Sustainable and ESG funds** allow investors to invest in companies that follow environmentally and socially responsible business models.

In addition, **carbon finance** mechanisms such as carbon credits and emission trading systems help reduce greenhouse gas emissions by assigning a financial value to carbon reduction. **Climate funds** and **green insurance products** also play a vital role in managing environmental risks and supporting climate adaptation initiatives.

Factors Driving the Growth of Green Finance

Several factors have contributed to the rapid growth of green finance and sustainable investments. Increasing awareness of climate change and environmental degradation has pushed governments and organizations to adopt sustainable policies. Regulatory frameworks and environmental standards introduced by governments and international bodies have encouraged financial institutions to support green projects.

Technological advancements in renewable energy, electric mobility, and energy-efficient systems have improved the financial viability of green investments. Additionally, growing investor preference for ethical and sustainable investments has motivated companies to improve their ESG performance. Financial institutions are also recognizing climate-related risks as financial risks, leading to greater integration of sustainability in lending and investment decisions.

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Impact of Green Finance on Economic and Environmental Sustainability

Green finance plays a significant role in promoting both economic growth and environmental protection. By directing capital toward environmentally sustainable projects, green finance supports the transition to a low-carbon and resource-efficient economy. Investments in renewable energy, sustainable infrastructure, and clean technologies help reduce greenhouse gas emissions and minimize environmental damage.

From an economic perspective, green finance encourages innovation and technological development. The growth of green industries such as renewable energy, electric vehicles, and sustainable construction generates employment opportunities and supports long-term economic stability. Green investments also reduce dependency on fossil fuels, thereby improving energy security and lowering long-term operational costs.

Green finance enhances financial system stability by addressing climate-related financial risks. Environmental risks such as extreme weather events and resource scarcity can negatively impact businesses and financial institutions. By integrating environmental considerations into financial decision-making, green finance helps mitigate these risks and promotes resilient economic development.

Role of Financial Institutions and Government

Financial institutions play a crucial role in the development and implementation of green finance. Banks, investment firms, and insurance companies are increasingly incorporating environmental risk assessments into their lending and investment policies. By offering green loans, issuing green bonds, and supporting sustainable projects, financial institutions encourage businesses to adopt environmentally responsible practices.

Governments act as key drivers of green finance through policy support, regulations, and incentives. Public policies such as tax benefits, subsidies for renewable energy, and mandatory environmental disclosures promote sustainable investments. Governments also collaborate with international organizations to mobilize climate finance and support green infrastructure development.

Central banks and regulatory authorities contribute by integrating climate risk into financial supervision and encouraging transparency in ESG reporting. These measures strengthen investor confidence and ensure the effective implementation of green finance initiatives.

Challenges in Green Finance and Sustainable Investments

Despite its growing importance, green finance faces several challenges. One major issue is the lack of standardized definitions and frameworks for green and sustainable investments, leading to the risk of greenwashing. Inadequate data availability and inconsistent ESG reporting make it difficult for investors to assess the true environmental impact of investments.

High initial costs of green projects and limited access to finance, especially in developing economies, also hinder growth. Additionally, low awareness and limited technical expertise among investors and financial institutions restrict the widespread adoption of green finance. Addressing these challenges requires strong regulatory frameworks, improved transparency, and capacity-building initiatives.

ISBN : 978-93-6163-366-9

Conclusion

Green finance and sustainable investments play a vital role in promoting environmentally responsible economic growth. By directing financial resources toward projects that support renewable energy, sustainable infrastructure, and climate change mitigation, green finance helps balance economic development with environmental protection. The integration of environmental, social, and governance considerations into investment decisions encourages responsible business practices and long-term value creation.

Although challenges such as lack of standardization, limited awareness, and high initial costs remain, continuous policy support, regulatory frameworks, and technological advancements can strengthen the green finance ecosystem. Active participation from governments, financial institutions, and investors is essential to expand sustainable investment practices.

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THE IMPACT OF STARTUP ECOSYSTEMS AS EMOTIONAL AND COGNITIVE INFLUENCES ON ENTREPRENEURIAL ACTION: EVIDENCE FROM TAMILNADU

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Abstract

The swift expansion of startup ecosystems in developing economies has sparked renewed academic inquiry into how environmental elements shape entrepreneurial actions. Although current research has significantly focused on the structural and institutional aspects of these ecosystems, there has been a noticeable lack of exploration into their psychological effects on entrepreneurs. This review investigates how the startup ecosystem in Tamil Nadu serves as both an emotional and cognitive influence on entrepreneurial behavior. Utilizing established theories related to entrepreneurial cognition, planned behavior, and social cognitive frameworks, the paper introduces a conceptual model illustrating how various ecosystem elements—such as governmental support, funding options, incubation facilities, mentorship, networking opportunities, and media representation—trigger cognitive and emotional processes that affect entrepreneurial intention, decision-making, and persistence. By analyzing secondary data from startup environments, incubators, government initiatives, and media portrayals of entrepreneurs in Tamil Nadu, the research underscores the importance of perceived support, self-confidence, motivation, and opportunity identification in promoting entrepreneurial activities. This paper enriches the discussion surrounding social entrepreneurship by highlighting the psychological mechanisms through which ecosystems impact entrepreneurial conduct, providing valuable insights for policymakers and ecosystem architects.

Keywords: *Startup ecosystem, entrepreneurial action, cognitive influences, emotional influences, social entrepreneurship, Tamil Nadu.*

1. Introduction

Entrepreneurship is widely acknowledged as a crucial factor for economic advancement, innovation, and societal progress, especially in developing nations. In India, state-driven startup ecosystems have emerged as vital facilitators of entrepreneurial endeavors, bolstered by policy enhancements, institutional support, and an increasing societal acceptance of entrepreneurship. Tamil Nadu has positioned itself as one of the foremost startup hubs in India, with key centers in Chennai, Coimbatore, and Madurai. This growth is fueled by initiatives such as StartupTN, technology incubators, and entrepreneurship programs associated with universities.

A startup ecosystem can be characterized as a network of various interconnected participants and institutions, including government bodies, financial institutions, incubators, accelerators, mentors, educational organizations, media, and cultural values that together foster entrepreneurial initiatives. Beyond the provision of structural resources, these ecosystems shape individuals' perceptions of opportunities, risk assessment, and intentions to pursue entrepreneurship.

ISBN : 978-93-6163-366-9

Entrepreneurial behavior encompasses observable activities such as recognizing opportunities, taking risks, making decisions, demonstrating persistence, and launching new ventures. Although existing research primarily examines how ecosystem frameworks aid in venture creation, there is a scarcity of studies addressing how these ecosystems act as emotional and cognitive catalysts that influence entrepreneurial actions. This psychological aspect is particularly significant in social entrepreneurship, where factors like motivation, self-belief, and social endorsement play a vital role. This paper aims to fill this gap by exploring how the startup ecosystem in Tamil Nadu serves as a set of emotional and cognitive stimuli impacting entrepreneurial behavior.

2. Literature Review

2.1 Components of Startup Ecosystems

Startup ecosystems consist of both formal and informal components that collaboratively promote entrepreneurship. Supportive policies and regulatory frameworks, such as startup initiatives, tax benefits, and incubation programs, help lower barriers to entry and enhance the perceived viability of starting a business. In Tamil Nadu, the StartupTN initiative is crucial, providing funding, mentorship, and connections to incubation resources.

Access to funding through angel investors, venture capitalists, seed funding, and government grants is a fundamental aspect of these ecosystems. The availability of financial resources not only supplies necessary capital but also lends credibility, thereby diminishing perceived risks for aspiring entrepreneurs. Additionally, mentorship opportunities, training programs, and networking events provided by organizations like the IIT Madras Incubation Cell and TiE Chennai significantly enrich entrepreneurial education and experience.

Social and cultural backing—which includes encouragement from family, influence from peers, and community recognition—also plays a critical role within the ecosystem, especially in collectivist cultures like India, where social validation significantly impacts career decisions.

2.2 Entrepreneurial Behavior and Psychology

The behavior of entrepreneurs is influenced by both mental and emotional factors. The cognitive elements encompass recognizing opportunities, processing information, assessing risks, and a focus on problem-solving. Baron (2008) points out that entrepreneurs have varying approaches to information processing and opportunity perception.

Emotional factors, including drive, optimism, fear of failing, self-belief, and the desire for social validation, play a crucial role in shaping entrepreneurial intentions and tenacity. Studies indicate that a positive emotional state can boost creativity and the ability to identify opportunities, while the fear of failure can either hinder or drive entrepreneurial efforts based on the surrounding support (Uy et al., 2015).

The behavioral results stemming from these psychological factors include the desire to launch a venture, dedication to entrepreneurial paths, and the resilience to persist amid uncertainty.

2.3 Intersection of Ecosystem and Entrepreneurial Psychology

Recent research posits that entrepreneurial ecosystems impact entrepreneurship not only by providing resources but also through psychological dynamics. The presence of successful startup narratives, opportunities for mentorship, and involvement in ecosystem activities fosters greater awareness, confidence, and motivation in potential entrepreneurs.

ISBN : 978-93-6163-366-9

In the context of Tamil Nadu, seeing successful incubators, receiving government support, and engaging with peer entrepreneurs often acts as a psychological motivator, converting latent entrepreneurial interests into actionable steps. This intersection emphasizes the ecosystem's function as an instigator rather than just a facilitator.

3. Conceptual and Theoretical Framework

This paper introduces a conceptual model where elements of the startup ecosystem serve as emotional and cognitive stimuli that influence entrepreneurial behavior. Components of the startup ecosystem—such as policies, funding sources, mentorship opportunities, networking prospects, cultural encouragement, and media exposure—boost awareness and perceived support for aspiring entrepreneurs. This awareness is a critical precursor that enables cognitive stimuli like opportunity recognition and risk evaluation. Subsequently, these cognitive stimuli activate emotional responses including motivation, self-assurance, optimism, and the fear of missing out. The interplay between cognitive and emotional stimuli ultimately shapes entrepreneurial actions, as seen in intention development, decision-making, and perseverance.

The framework is based on:

- Baron's Cognitive Theory of Entrepreneurship, which highlights the role of cognition as a mediator in entrepreneurial actions.
- Ajzen's Theory of Planned Behavior, which delineates entrepreneurial intention through attitudes, perceived behavioral control, and social norms.
- Bandura's Social Cognitive Theory, which underscores the significance of self- efficacy and environmental factors in influencing behavior.

4. Insights from the Tamil Nadu Startup Environment

Evidence gathered from Tamil Nadu demonstrates how various elements of the ecosystem stimulate psychological responses. Entrepreneurial hubs in cities like Chennai, Coimbatore, and Madurai are home to incubators, accelerators, and shared workspaces that enhance access to business opportunities. Organizations such as the IIT Madras Incubation Cell and TiE Chennai offer guidance and validation, boosting entrepreneurs' confidence and their perceived abilities.

Media exposure plays a vital role in the ecosystem as well. Programs like Merchants of Madras and coverage by the Times of India on startup activities enhance public recognition of entrepreneurial achievements, thereby reinforcing social validation and motivation. Events organized by StartupTN alongside media collaborations highlight innovative startups and their founders, affirming legitimacy and triggering emotions such as pride, aspiration, and confidence.

Examples of Tamil Nadu entrepreneurs, including figures like Sridhar Vembu from Zoho Corporation and founders in sectors like food innovation, digital healthcare, and handloom, exemplify how support from the ecosystem, along with visibility and acknowledgment, fosters a sense of opportunity and resilience in entrepreneurship.

5. Analysis

This examination indicates that startup ecosystems act as sources of motivation and cognitive enhancement rather than just providing infrastructural assistance. The components of the ecosystem shape individuals' perceptions regarding the feasibility, desirability, and social acceptance of starting a business. The interplay of emotional and cognitive triggers is dynamic: clearer cognitive understanding fosters emotional self-assurance, while emotional inspiration bolsters commitment to entrepreneurial choices.

ISBN : 978-93-6163-366-9

In the realm of social entrepreneurship, this interplay is of particular importance, as motivation and social recognition sparked by the ecosystem can inspire entrepreneurs to embark on projects with social benefits even in the face of financial risks.

6. Implications and Directions for Future Research

From a policy standpoint, it is essential for startup initiatives to not only supply resources but also to intentionally stimulate psychological factors by promoting visibility, offering mentorship, and providing recognition. By incorporating elements such as storytelling, peer influences, and interventions aimed at building confidence, ecosystem designers can significantly improve entrepreneurial outcomes.

Future investigations could validate the suggested framework through surveys targeting young entrepreneurs in Tamil Nadu, utilizing structural equation modeling to explore the connections among ecosystem elements, psychological triggers, and entrepreneurial activities. Additionally, conducting comparative analyses across various Indian states would deepen the understanding of entrepreneurship driven by ecosystem dynamics.

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MODULAR LOGISTICS: REENGINEERING THE EGG SUPPLY CHAIN FOR ECONOMIC RESILIENCE

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Abstract

A key part of worldwide nutrition comes from eggs, though their short shelf life brings serious financial exposure during distribution. Examining movement patterns reveals multiple logistical challenges within poultry operations, particularly how physical force leads most often to cracked shells and internal quality decline. Damage levels between 4% to 20%, reported in international data, translate to massive yearly costs - hundreds of millions lost. Findings show harm isn't spread evenly: those placed at container tops or outer sides face far greater risk than others inside. One way to address this issue involves moving to modular packaging, which uses layered protective materials alongside smart routing methods. With clever module layouts combined with precise delivery planning, community-focused businesses strengthen their distribution networks. These updates cut down on spoilage while boosting earnings for agricultural producers. Resilience grows when technology meets practical design in transport systems.

Keywords: *Modular Packaging, Supply Chain Logistics, Social Entrepreneurship, Cold Chain, Route Optimization.*

1. Introduction

Despite forming a key part of rural livelihoods, poultry farming faces persistent gaps in moving goods from producer to buyer. Though freshness begins on the farm, much of the financial benefit fades once eggs start traveling. Once an egg is produced, every movement step shapes how well it arrives. What happens after laying - handling, packing and shipping - decides whether it reaches people intact.

Waste levels between 4% to 20% hit social entrepreneurs hard, exposing flaws in standardized delivery methods. Instead of accepting uniform systems, rethinking how goods move changes outcomes dramatically. Packaging, when designed like a protective structure, does more than hold items - it reduces damage. Smart navigation tools guide these units wisely through complex paths. Mechanical strain drops when design and routing work together quietly behind the scenes. Efficiency emerges not from scale, yet from thoughtful adaptation. The idea shifts focus: containers become active parts of a smarter flow.

2. Problem Statement

Current supply chain models for perishables like eggs are rigid and mechanically inefficient. The specific hurdles include:

ISBN : 978-93-6163-366-9

Uneven Vulnerability: Not every egg faces the same risk. Those perched on the upper layer or along the outer rim of a tray tend to crack or go bad far more often compared to ones nestled in the middle. Most containers ignore this uneven exposure entirely.

Mechanical Degradation: Starting with motion during shipping, eggs face ongoing physical stress that gradually damages their interior quality. Because of repeated shaking and sudden jolts, the Haugh unit - a measure of egg freshness - tends to decline. This kind of wear also compromises the strength of the vitelline membrane surrounding the yolk. As a result, structural weaknesses appear early, shortening how long the egg remains usable well before it arrives at retail. Though unseen, these changes begin long before purchase.

The Sustainability Paradox: A tricky balance shows up when picking package materials. Though eco-friendly options help the planet, they sometimes fail under pressure - breaking too easily during transport. This weakness forces designers to rethink strength versus sustainability. Toughness matters just as much as environmental impact, yet finding both traits together stays rare. Decisions shift depending on product weight, travel distance, delivery methods. Each factor pulls in different directions, making one-size-fits-all answers impossible.

3. Objectives of the Study

The objectives of this research are to:

1. Analyze the mechanical vulnerabilities in current egg stacking and transport configurations.
2. Evaluate the efficacy of **Modular Packaging** (multi-layered cushioning) in reducing breakage rates at critical impact zones (edges/top).
3. Demonstrate how **Route Optimization Algorithms** and IoT-based Cold Chains can serve as a business model for new social start-ups.

4. Methodology

A fresh look at egg transport digs into where breakage happens along stacking lines. Because route length changes outcomes, one spot bears more risk than others. Temperature swings during trips add pressure on weak points in boxes. When packaging design shifts, results shift too - sometimes faster than expected. Modules that adjust on site respond better than fixed systems. Loss trends bend downward when parts adapt mid-cycle.

5. Analysis and Discussion

5.1 The Case for Modular Packing

The analysis reveals that a static packaging approach is insufficient. Because damage is concentrated at the "outer edges" and "top layers" of containers, packaging must be **modular and adaptive**.

- **Variable Cushioning:** Innovations in multi-layered secondary cushioning can be applied specifically to these high-risk zones, providing reinforced protection where it is needed most without increasing the weight of the entire shipment.
- **Unitization:** Moving from bulk crates to modular units allows for better shock absorption and easier handling by small-scale farmers, democratizing access to safe transport.

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5.2 Algorithmic Logistics (AI & Big Data)

Apart from physical packing, the digital architecture of the supply chain is critical.

- **Route Optimization:** The use of algorithms to plan transport routes is essential. By calculating the smoothest and shortest paths, logistics providers can substantially reduce fuel costs and, more importantly, the duration of mechanical stress on the eggs.
- **Cold Chain Integration:** Maintaining a controlled cold chain is vital for controlling microbial risks like *Salmonella*. Modular packing units equipped with passive cooling designs or IoT temperature sensors can ensure freshness is maintained even in non-refrigerated trucks.

6. Findings & Recommendations

Starting fresh means replacing traditional crates with Modular Impact Units across the sector. Built-in edge buffers would guard items at highest risk during handling. A shift like this targets weak points now overlooked in current designs.

Starting with logistics, integration needs top attention. When new businesses rely on data to guide decisions, delays shrink - cutting exposure time for items that spoil. This shift often begins by tracking patterns others overlook.

One way to look at it - focusing only on freshness or one kind of container won't work. Instead, success comes from combining gentle handling with smart, adaptable packaging structures. Another piece fits here: transport routes must be carefully planned. Put together, these elements form a connected strategy that supports better outcomes.

7. Conclusion

The reduction of egg breakage is not just a technical fix; it is an economic imperative. Results here show that when modular packing adjusts for weak spots, especially along corners, while using algorithm-driven transport routes, farms keep more revenue now lost to spoilage. A chance opens up for changemakers, design delivery networks where growers earn more and neighborhoods receive fresher supplies.

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SCALING SOCIAL ENTERPRISE STARTUPS IN EMERGING ECONOMIES

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Abstract

Social Enterprise Startups plays an important role in the up-liftment of gaps between the marginalised community and the society by having their core principle to overcome social and financial issues with promoting inclusive network development. In the current era of innovations of such start ups, many face hindrances like institutional limitations, restricted access to capital and diverse socio cultural settings. This study investigates major challenges faced by social that connects scaling strategies with long-term community outcomes and provides policy implications for enhancing social agency ecosystems in emerging economies. organizations during the scaling-up phase and identifies effective approaches that enable sustainable development. This study makes a contribution to social entrepreneurship by presenting a conceptual framework that connects scaling strategies with long term community development outcomes and provides policy implications for enhancing social agency ecosystems in emerging economies.

Keywords: *Scaling strategies, marginalized community, inclusive development, policy implications, social agency ecosystems.*

Introduction

There are a lot of tough issues that emerging economies face, including poverty, unemployment, injustice, lack of proper access to healthcare and education. Although governments and non-profit organizations are trying and initiating their best to solve these issues, they still encounter problems like having insufficient funds and difficulty in reaching many people with their assistance. In context, the emergence of social enterprise startups as new approaches to combine business awareness with the desire to help society has become very significant. These startups begin by addressing local issues using small pilot projects that focus on particular needs in a particular community.

However, the challenge of making these solutions scale and have a sustainable impact is a huge problem. Scaling up is not just about growing a business, but it also involves repeating success, improving systems, and remaining loyal to the original mission. This paper examines the challenges that social enterprise startups face when they attempt to scale up in emerging economies and provides solutions on how they can scale up effectively for better community development.

2. Understanding Social Enterprise Startups

Social enterprise startups are those that concentrate on addressing social and environmental problems through business approaches which do not involve with the motive of earning profit. As they are distinct from other businesses and their primary objective is to address social issues

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and earning money is to simply equip communities with or for affording their basic needs and wants to sustain in the society.

The characteristics of a Social Enterprise include:

- Their mission is always linked to Social and Environmental problems.
- To eliminate problems affected by communities, they provide new initiatives and customized solutions for solutions which can be solved.
- They have diverse approaches to earn money.
- They rely on external sources (products and services) but are always tied with their community.

In communities with less financial access, these startups operate with limited resources which leaves them hanging to make greeter impact in the future.

3. Concept of Scaling in Social Entrepreneurship

Scaling in the concept of Social entrepreneurship refers to the process of expanding initiatives or innovations to help more people or to have greater impact to the needed community. These can be achieved through three modes:

- Scaling Out: Limiting the same base model in other places or groups
- Scaling Up: Modifying existing rules, organization and systems.
- Scaling Deep: Strengthening the organization.

4. Challenges vehicle initiating Social Enterprise Startups

4.1 Financial Constraints

When Investors tend to look at the profit margins and entrepreneurs tend to have prices low, there are less Investors interested in contributing to Startups and providing Grants to entrepreneurs.

4.2 Regulatory and Institutional Barriers

When there is less clarity in laws, rules differ from one to another geographical location and Bureaucratic work, it remains as a hindrance for growth.

4.3 Human Capital and Leadership Gaps

When there is Talent Gap (insufficiency of skilled labour), Leaders get easily burnout as there is less efficiency in automating Human capital. Talented labours are expected to be provided with higher remuneration.

4.4 Mission Drift

During the stages of higher rates in generation of profit, entrepreneurs tend to drift their mission from helping people to sole profit maximization for their luxury purpose, communities lose trust in the enterprise.

4.5 Impact Measurement Difficulties

Social change is not quantifiable. There are no clear tools or numbers to measure them. Investors highly depend on numerical data for investing in the future whereas the proofs remain hard to explain the financial status of the organization.

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5. Strategies for Effective Scaling

5.1 Structured Hybrid Business Model

For staying committed and accomplishing the core mission and motive of the organization. Having a standard percentage of amount to be produced to the community for welfare and having the remaining for the entrepreneur themselves. Such accountability can help the investors and the community also to gain trust back again.

5.2 Strategic Partnerships

Collaborating with external organizations would be helpful. When it comes to primary option to depend on Non-government Organization, even they would have limited financial aid but more networking aid. Secondly while having tie-ups with Government, Companies with corporate social responsibility initiatives, and private firms would lead the enterprise reach their ability and create visibility.

5.3 Technology Integration

In the constant era of technological development, with less time for data analysis/ interpretations, it helps in minimising cost, and the social media platform helps reach more people.

5.4 Community-Centric Scaling

Engaging communities (for solution development) as the main element of the organization, they feel belonged to the enterprise, problems are being easily addressed, and there is cohesiveness with the people.

5.5 Franchising models

When the same models are established in different locations operated by local partners, it leads to local ownership and a less operational model and contributes to larger expansion.

5.6 Focus more on Service sector

In era of product values fluctuating, social enterprises can focus on training the Youth with demand skills which requires human involvement as such skills will always remain in the demand.

6. Role of Scaling in Community Development

Scaling in community development can help in the following ways:

- Focusing on marginalised groups, rural youth and people with denied or less access to education and practicality, training for such population can yield in generation of employment opportunities.
- Services like healthcare, education and sanitation and basics of human life. When profits or grants of the organizations are more, services can lead to reaching large number of people than the expected number of people to help.
- When there is proper expansion and increase goodwill for the enterprise, communities automatically gain trust where cooperation and participation increases.
- Promotion of inclusive growth- growth is not shared equal, it is rather equipped by filling the gaps of the society.
- When the enterprises are owned by the communities and they attain regular growth and financial sustainability, it leads to route for long term stability.

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More than the above listed strategies, when enterprise addresses what the community actually needs, it will reach growth at higher rate.

7. Policy and Institutional Implications

To assist growth for the Social Enterprise, the government which enforces rules and regulations of the land may help in:

- Establishing proper laws and regulations - separate legal category for Social enterprise as to reduce fluctuations in change and bureaucracy in accomplishment.
- Assist in investments that leads to positive impact.
- Provide environmental facilities for asocial startups.
- Inculcate Subjects which involve educational concepts regarding social enterprises which helps youth awareness regarding community development and enhancement.
- Mandatory collaboration with external institutions.

These can help establish better support systems for social enterprises to thrive.

8. Conclusion

Problems faced by communities are mostly based on social and economic constraints where Social Enterprise Startups helps in bridging the gaps. These problems are generally faced by developing nations. However, these problems are hindered by limited access to resources, improper networking, unclear regulations, shortage of skilled labours, risk of loosing social purpose and difficulty measuring the impact. When strategies like structured hybrid model, partnership, technological integration and community centric approach are used with proper policies and guidelines, the scaling capacity of enterprises will lead to long-term success and stability in the economies.

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SOCIAL ENTERPRISE START-UPS: A SUSTAINABLE MODEL FOR SOCIAL AND ECONOMIC DEVELOPMENT

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Abstract

Social enterprise start-ups have gained global recognition as innovative and sustainable mechanisms for addressing persistent social and economic challenges. These enterprises combine entrepreneurial practices with a strong social mission, aiming to generate both financial returns and measurable social impact. This descriptive research paper explores the concept, evolution, operational models, and developmental contributions of social enterprise start-ups. Drawing upon existing literature, policy reports, and illustrative case examples, the study highlights the role of social enterprises in employment generation, poverty reduction, social inclusion, and environmental sustainability. The paper also examines key challenges faced by social enterprise start-ups and suggests strategies for strengthening the ecosystem that supports their growth and sustainability.

Keywords: *Social enterprise, start-ups, sustainable development, social innovation, inclusive growth*

1. Introduction

In recent decades, traditional approaches to economic development have struggled to adequately address rising inequality, unemployment, environmental degradation, and social exclusion. Governments and non-profit organizations often face resource constraints, while profit-driven businesses may overlook marginalized populations due to low financial returns. In this context, **social enterprise start-ups** have emerged as an alternative and complementary model of development.

Social enterprises operate at the intersection of business and social service. They apply market-based solutions to social problems, ensuring long-term sustainability through earned revenue rather than continuous dependence on grants or donations. Start-ups in this sector are particularly important because they bring innovation, adaptability, and scalability to social problem-solving.

This paper aims to descriptively analyze social enterprise start-ups as a sustainable model for promoting both social and economic development, with particular relevance to developing economies.

2. Concept and Nature of Social Enterprise Start-ups

A **social enterprise start-up** can be defined as a newly established venture that prioritizes social objectives while using entrepreneurial and commercial strategies to sustain operations. Unlike conventional start-ups that focus primarily on growth and profitability, social enterprise start-ups emphasize **social value creation** as their core purpose.

Key Features

- **Mission-driven orientation:** Social impact is central to the enterprise's identity.
- **Financial sustainability:** Revenue generation ensures continuity and independence.
- **Innovation:** Creative solutions to entrenched social problems.
- **Accountability:** Commitment to stakeholders, especially beneficiaries.

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Social enterprises differ from NGOs in their reliance on market mechanisms and from traditional firms in their ethical and social commitment.

3. Evolution and Global Context

The concept of social enterprise gained prominence in the late 20th century, particularly in Europe and North America, as welfare states faced fiscal pressures. Over time, the model expanded globally, adapting to local development needs.

In developing countries, social enterprise start-ups often address:

- Poverty and livelihood insecurity
- Lack of access to healthcare and education
- Environmental degradation
- Gender and social inequality

International organizations such as the United Nations, World Bank, and OECD increasingly recognize social enterprises as key contributors to achieving the **Sustainable Development Goals (SDGs)**.

4. Research Methodology

This study adopts a **descriptive research design**, relying on:

- Secondary data from academic journals, books, and policy reports
- Review of global and regional case examples
- Analysis of conceptual frameworks related to social entrepreneurship

The descriptive method is suitable as the study aims to explain characteristics, roles, and challenges rather than test hypotheses.

5. Models of Social Enterprise Start-ups

Social enterprise start-ups operate through various models depending on their mission and context:

5.1 Market-Based Social Enterprises

These enterprises sell goods or services that directly address social needs, such as affordable healthcare, low-cost education, or renewable energy solutions.

5.2 Employment-Oriented Enterprises

They focus on creating employment for marginalized groups, including women, persons with disabilities, and economically disadvantaged youth.

5.3 Community-Based Enterprises

Owned and managed by local communities, these enterprises strengthen grassroots participation and local economic development.

5.4 Environmental Social Enterprises

These start-ups address environmental issues through waste management, sustainable agriculture, eco-friendly products, and clean energy.

6. Contribution to Social Development

6.1 Poverty Alleviation

By providing income-generating opportunities and affordable essential services, social enterprises help reduce poverty and vulnerability.

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6.2 Social Inclusion

Social enterprise start-ups intentionally include marginalized populations as employees, producers, or consumers, promoting equity and dignity.

6.3 Access to Essential Services

They fill gaps in public service delivery, especially in rural and underserved areas, improving access to education, healthcare, sanitation, and housing.

7. Contribution to Economic Development

7.1 Employment Generation

Social enterprises create sustainable jobs, particularly in sectors with high social impact, contributing to inclusive economic growth.

7.2 Entrepreneurship and Innovation

They encourage a culture of responsible entrepreneurship and foster innovation tailored to local needs.

7.3 Local Economic Growth

By sourcing locally and reinvesting profits into communities, social enterprise start-ups stimulate local economies.

8. Role in Sustainable Development

Social enterprise start-ups align closely with the three pillars of sustainability:

- **Economic sustainability:** Viable business models ensure longevity.
- **Social sustainability:** Focus on well-being, equity, and empowerment.
- **Environmental sustainability:** Adoption of eco-friendly practices and solutions.

Their integrated approach makes them effective agents for achieving long-term development goals.

9. Challenges Faced by Social Enterprise Start-ups

Despite their potential, social enterprise start-ups face several obstacles:

9.1 Financial Constraints

Limited access to seed capital and impact investment restricts growth during early stages.

9.2 Legal and Policy Barriers

In many countries, there is no clear legal identity for social enterprises, creating regulatory ambiguity.

9.3 Impact Measurement

Assessing and communicating social impact remains complex and resource-intensive.

9.4 Managerial Capacity

Founders often possess strong social commitment but limited business and managerial expertise.

10. Strategies for Strengthening Social Enterprise Start-ups

- Development of supportive government policies and legal frameworks
- Promotion of social enterprise incubators and accelerators
- Expansion of impact investing and blended finance models
- Capacity-building programs in management, finance, and impact assessment

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11. Conclusion

Social enterprise start-ups represent a **sustainable and inclusive model of development** that bridges the gap between economic efficiency and social responsibility. By combining entrepreneurial innovation with a commitment to social good, these enterprises contribute significantly to social welfare, economic growth, and environmental sustainability. Strengthening the ecosystem that supports social enterprise start-ups will be crucial for maximizing their developmental impact and ensuring long-term sustainability.

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THE STARTUP ECOSYSTEM IN INDIA: PROSPECTS AND CHALLENGES

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Abstract

India's startup ecosystem has evolved into one of the world's largest and fastest-growing, fuelled by a vast consumer market, favourable government initiatives, technological advancements, and a burgeoning entrepreneurial spirit. With over 60,000 startups, India ranks third globally after the U.S. and China in terms of new business creation. Despite these advantages, challenges like complex regulations, inadequate infrastructure in smaller cities, limited early-stage funding, and cultural stigma towards failure remain. Addressing these hurdles can unlock India's full potential as a global startup hub, driving technological advancements and economic growth.

Keywords: *Startup Ecosystem, Government Initiatives, Entrepreneurial Challenges, India's Economy, Innovation.*

Introduction

The startup and entrepreneurial ecosystem in India has emerged as one of the most dynamic and fast growing in the world, driven by a combination of market potential, government initiatives, technological advancements, and a burgeoning youth population eager to innovate. India, with its vast population of over 1.4 billion people, provides an unparalleled consumer market, attracting entrepreneurs to tap into diverse sectors ranging from fintech and e-commerce to artificial intelligence and biotechnology. The rise of the middle class, rapid urbanization, and widespread internet and mobile penetration have further amplified opportunities for startups, making the country an attractive destination for both local and international investors. Additionally, India's skilled workforce, especially in areas like technology, engineering, and management, provides the essential human capital required to build and scale businesses. The availability of venture capital and private equity has seen a marked increase, with major global investors looking to capitalize on India's growth potential, ensuring that funding is more accessible than ever before. However, despite these abundant opportunities, challenges persist that pose significant hurdles to the growth of startups in India.

Objectives of the Study

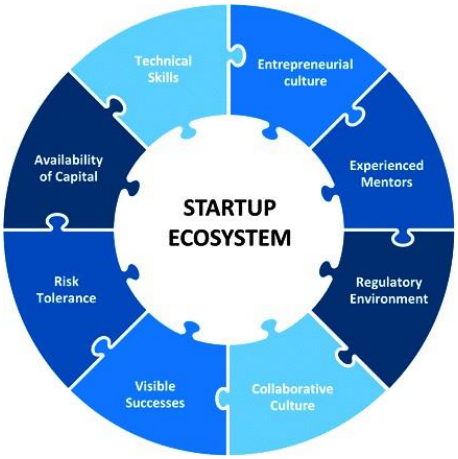
1. To comprehend the challenges that encountered by startups in India. 2. To ascertain the potential opportunities for Indian startups. 3. To ascertain the different initiatives proposed by the Indian government to foster and maintain Indian startups. 4. To examine the expansion of Indian startups and their advantages inside the Indian ecosystem.

Entrepreneurial In India

- Generating Awareness in Markets Startups fail due to lack of attention to limitations in the markets. The environment for a startup is usually more difficult than for an established firm due to uniqueness of the product.

ISBN : 978-93-6163-366-9

- The situation is more difficult for a new product as the startup has to build everything from scratch .
- Exceeding Customer Expectations The next most important challenge is gauging the market need for the product, existing trends, etc. Innovation plays an important role, since, that the startup has to fine-tune the product offerings to suit the market demands.
- The entrepreneur should have thorough purview knowledge to counter competition with apposite strategies. Due to new technologies that are emerging, the challenge to provide over and above an earlier innovation is pertinent.
- Obstinacy of Originators Founders of startups have to be tough when the going gets tough. The journey of starting a venture is fraught with delays, setbacks and problems without adequate solutions. The entrepreneur needs to be persistent, persuasive, and should never give up till he/she achieves desired results.
- Regulations Starting a business requires a number of authorizations from government organizations. Although there is a perceptible change, it is still a challenge to register a company. Regulations pertaining to labor laws, intellectual property rights, dispute resolution etc.



Startups India- Recent Trends

1. Focus on Indomitable Business Government Policies: The government policies are slowly and steadily increasing, but India still upholds a despondent position in terms of ease of doing business raking.
2. India has over 105 unicorn startups with a valuation of over $1 Billion.
3. 3 Customers are more prospective to buy from and remain loyal to brands with a strong sagacity of tenacity. Today's most successful startups not only deliver amazing products, services, and experiences to customers, but they also work to wrestle the biggest challenges of the current market.
4. Sustainability All startups should be weave sustainability into every aspect of their businesses, including products, services, and processes. This can include efforts like plummeting waste, transitioning to energy proficient manufacturing practices, and pursuing the environmental impact of their operations and supply chains.
5. Discovering and Observance Ability Startup founders must make enticing candidates and engaging their best workers a top priority.

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6. Entrepreneurship in India has seen a remarkable evolution over the past few decades, transitioning from a traditional and government-controlled model to a dynamic, innovation-driven ecosystem. Today, India stands as one of the world's largest startup ecosystems, making it a global hub for entrepreneurship. The roots of entrepreneurship in India can be traced back to its rich history of trade and commerce, but it has seen a resurgence in the last two decades. Key factors contributing to the rise of entrepreneurship in India include the country's demographic dividend, technological advancements, and the rapid expansion of digital infrastructure.
7. Structuring of Effective Customer Relationship Building unswerving connections with customers will become perilous for startup organizations. Collecting direct data from the customers will empower to understand how customers use products including what they like, dislike, or snub.
8. Concept of Tech Company When incorporating artificial intelligence, blockchain, and Web3 technology into business processes; in this period of rapid digital transformation, every organization needs to deliberate itself as a tech company..
9. Finding a Balance Between Automation and Human Talent Human beings have skills like creativity, critical thinking, and strategic foresight .Startup founders need to give humans the jobs they outshine at while automating the things they can with machine learning and AI.5
10. Tranquil Connectivity Government of India's digital push is going to improve connectivity and data to the next level. The race to cheapest data has started and disruption is certain. The cheap data has helps everyone to get their hands on it, start-ups will have an easier time to tap into markets, territories and even traditional businesses.
11. Mutable Mind Set of Working Class Old-fashioned career paths will be giving way to Indian startup space. Challenging assignments, good compensation packages would invite talented people to startups.



Current State of India's Startup Sector

Growth and Innovation: India, with over 1.59 lakh startups recognized by DPIIT as of January 15, 2025, has firmly established itself as the third-largest startup ecosystem globally, after the U.S. and China. Over 120 startups have crossed the billion-dollar valuation mark.

Investment Landscape: India's startups attracted $25 billion in venture capital funding in 2022, making it a preferred destination for global investors. Despite a slowdown in 2023 due to global economic uncertainty, sectors like SaaS (Software as a Service) and climate tech continue to receive significant funding.

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Government Support: Government initiatives like Startup India, Digital India, and Atmanirbhar Bharat have created a supportive framework for entrepreneurs. Key measures include tax exemptions, faster patent processing, and easier regulatory compliance. The 2023 introduction of a ₹10,000 crore Fund of Funds for Startups (FFS) and the Bharat Startup Knowledge Access Registry (BHASKAR) aim to enhance access to capital and collaboration.

Regional Highlights

Expansion: Nearly 50% of startups now originate from Tier II and Tier III cities, with emerging hubs like Indore, Jaipur, and Ahmedabad.

Tamil Nadu: With a $28 billion ecosystem growing at 23%, Chennai alone hosts about 5,000 startups, significantly contributing to job creation.

Kerala: The state's $1.7 billion startup ecosystem is growing at a compound annual rate of 254%, showcasing its ability to hire tech talent cost-effectively.

Role of Startup in the Growth of the Indian

Economy India's startup ecosystem has experienced a significant transition in recent years, establishing itself as the second-largest location for startups globally. This emerging industry not only transforms the technological environment of the country but also plays a vital role in stimulating employment growth. The impact of startups on India's economic landscape is significant and far-reaching.

- Employment Generation
- New Investments
- Research and Development
- Better GDP More Outsourcing of Services
- More Flow of Foreign Money
- Improves Standard of Living

Challenges Faced by Indian Startups

Funding Crunch: The global economic slowdown and rising interest rates have tightened venture capital inflows, leading to layoffs and operational cutbacks.

Regulatory and Compliance Issues: Despite government support, startups face complex tax structures, compliance requirements, and regulatory uncertainties, including recent data protection laws and ESOP taxation policies.

Scaling Challenges: Operational inefficiencies, lack of market adaptability, and inadequate infrastructure hinder scaling efforts for many startups.

High Failure Rate: Over 90% of Indian startups fail within five years due to factors like poor product-market fit, inadequate financial planning, and an inability to adapt to consumer demands.

Talent Acquisition and Retention: Competition for skilled talent, particularly in AI, machine learning, and cyber security, along with economic uncertainties, complicates retention efforts.

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Suggested Measures

Strengthening Policy Frameworks:

Simplifying Regulations: Streamline startup registration, funding approvals, and cross-border operations.

IP Protection: Strengthen intellectual property frameworks to encourage R&D investments.

Sector-Specific Support: Focus on key sectors like AI, deep tech, healthcare, and green technology through targeted policies.

Enhancing Access to Funding

Boost Domestic Investments: Encourage Indian investors, including pension and sovereign wealth funds, to support startups.

Strengthen Public-Private Partnerships: Create large-scale funds focused on emerging ventures.

Decentralized Funding: Promote angel networks and micro-investors in Tier II and III cities.

Building World-Class Infrastructure

Innovation Hubs: Establish tech parks and incubation centers with state-of-the-art facilities and mentorship.

Digital Connectivity: Ensure high-speed internet access in rural and semi-urban areas. **Logistics and Supply Chains:** Develop efficient infrastructure to support scaling operations. Nurturing a Skilled Workforce:

STEM Education: Encourage technical and entrepreneurial education.

Up skilling Programs: Collaborate with industry leaders for training in high-demand skills. **Diversity and Inclusion:** Enhance opportunities for women and marginalized communities in tech and entrepreneurship.

Fostering a Culture of Innovation

Strengthen R&D: Allocate more resources to university and private-sector research.

Encourage Risk-Taking: Reduce societal stigmas around entrepreneurial failure.

Leverage Domestic Challenges: Use issues like climate change and urbanization as innovation opportunities.

Global Collaboration and Market Expansion

Global Partnerships: Collaborate with international accelerators and governments.

Ease Cross-Border Trade: Simplify export procedures.

Diaspora Networks: Engage Indian entrepreneurs abroad to mentor and invest in domestic startups.

Promoting Sustainability

Green Tech Innovation: Foster renewable energy and circular economy startups.

Eco-Friendly Policies: Incentivize ventures aligned with sustainability goals.

Promoting Inclusivity and Diversity: Support initiatives like the Women Entrepreneurship Platform (WEP) by NITI Aayog and focus on agritech, edtech, and health-tech startups in rural areas. **Building a Resilient Digital Economy:** Startups must leverage India's digital infrastructure frameworks like UPI and Aadhaar while capitalizing on emerging technologies such as 5G and AI. Cyber security and data protection are pivotal for gaining investor trust.

ISBN : 978-93-6163-366-9

Conclusion

- India's startup ecosystem has experienced remarkable growth, contributing significantly to the country's economic progress and global positioning as an entrepreneurial hub.
- The future of India's startup ecosystem holds immense promise, with the potential to revolutionize sectors across the economy, drive technological advancements, and significantly contribute to the socio-economic development of the nation.
- With continued efforts in policy reforms, infrastructure improvements, and promoting risk- taking, India is poised to become a global leader in entrepreneurship.
- India's current economic situation is seeing growth and progress. The Indian government is displaying a growing eagerness to enhance the GDP growth rate from the very basic levels by implementing progressive policies and programs such as Startup India and MUDRA to support businesses.
- The startup sector has numerous problems, encompassing areas such as financing, human resources, launching, and maintaining development with determination.
- The current study discovered that startups have the potential to access a greater number of chances in order to overcome the challenges and issues encountered by Indian entrepreneurs through the implementation of good startup strategies.

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ISBN : 978-93-6163-366-9

CHAPTER 3 – INTERNATIONAL ENTREPRENEURSHIP

CROSS-BORDER ENTREPRENEURSHIP: POST-PANDEMIC TRENDS, COUNTRY-LEVEL DATA, AND POLICY IMPLICATIONS

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Abstract

This expanded paper examines cross-border entrepreneurship since the COVID-19 pandemic with richer case studies, charts, and country-level indicators for 2024–2026. It integrates recent statistics on digital nomadism, cross-border e-commerce market shares, and FDI flows to provide actionable insights for entrepreneurs and policymakers looking to navigate international scaling. Post-pandemic cross-border entrepreneurship is dynamic and data-driven. With FDI rebounds concentrated in developed hubs and e-commerce growth led by Asia Pacific and Latin America, founders must combine rapid digital experimentation with solid compliance and logistics planning. Targeted policy reforms and ecosystem investments can materially reduce friction for internationalising startups.

Keywords: *cross-border, entrepreneurship, pandemic, startups.*

Introduction

The pandemic permanently altered how startups internationalise. Remote work, digital platforms, and shifting capital flows have lowered some traditional barriers while introducing new regulatory and operational complexities. This document updates previous summaries with country-level evidence and visualizations to help practitioners prioritise markets and tactics between 2024 and early 2026.

Post-pandemic structural shifts (2022–2026)

1. Distributed founding and remote talent: The MBO Partners 2025 report estimates 18.5 million American digital nomads — a 153% increase since 2019 — indicating a larger mobile talent pool for cross-border startups to tap into. Remote-first hiring reduces fixed costs and accelerates market entry, though it increases legal and payroll complexity across jurisdictions.
2. Cross-border e-commerce scale and logistics: Market reports estimate Asia Pacific leading global cross-border e-commerce share in 2025 (~29.4%). Latin America's e-commerce market is notably expanding, projected to reach $215.3 billion in 2026, driven by mobile adoption and investments in logistics and payments infrastructure.
3. Capital flows and FDI: UNCTAD indicates that global FDI rose 14% in 2025 to an estimated $1.6 trillion, with developed economies seeing a 43% jump to $728 billion. This has improved exit and partnership opportunities in developed markets while signaling concentrated investment in financial hubs and capital-intensive sectors.

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FDI trends (2024 vs 2025)

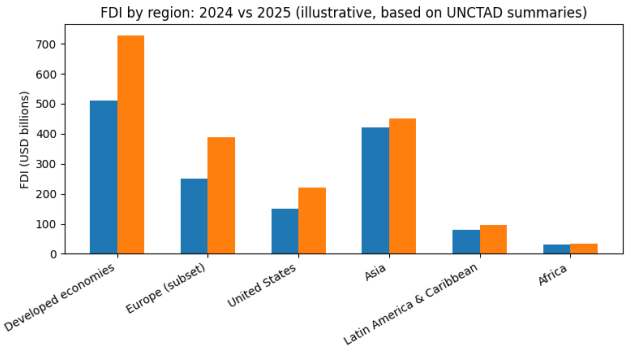

Figure 1: FDI by region (2024 vs 2025)

Country-level spotlights

India: Rapid digital adoption and government incentives for startups (including production-linked incentives and support for logistics) make India both a market and supply-chain hub. Cross-border e-commerce logistics forecasts indicate India registering high CAGR in regional logistics growth projections.

United States: The U.S. remains a leading market for venture capital and cross-border exits. The growth in digital nomads expands the local talent pool, but founders must navigate complex state and federal tax rules for cross-jurisdictional work arrangements.

United Kingdom: The UK has seen increased FDI in AI and clean energy sectors and remains an attractive destination for corporate partnerships and scale-up funding, though post-Brexit regulatory divergence requires closer compliance planning.

Canada: Canada's Start-Up Visa program underwent a transition in late 2025 and is temporarily closed to new applicants as the government plans a targeted pilot entrepreneur pathway in 2026. Entrepreneurs should monitor policy updates closely when planning relocations or residency-dependent strategies.

Brazil & Latin America: Latin America's e-commerce market is expanding rapidly (projected $215.3 billion in 2026). Entrepreneurs can capitalise on mobile-first consumer behaviour, but must invest in localized logistics and returns management to maintain customer trust.

Cross-border e-commerce regional shares (2025)

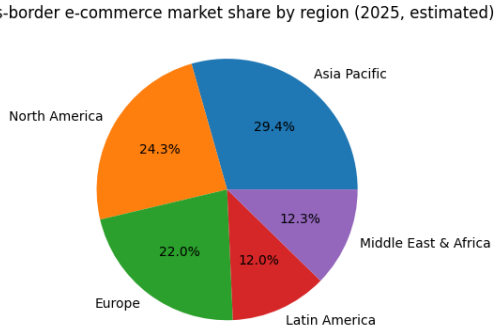

Figure 2: Estimated market share by region (2025)

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Richer case studies

1. **Platform-first retail scale (Temu / Shein)**These platforms exemplify rapid cross-border scale through C2M (consumer-to-manufacturer) models, aggressive overseas warehousing, and data-driven demand forecasting. Post-pandemic adjustments included diversifying supply chains away from single-country dependence and investing in local fulfilment to cut delivery times.
2. **Remote-services SaaS scaling via localized partnerships**An illustrative example is a software services startup founded in India that used distributed teams and local reseller partnerships to enter the UK and EU markets, leveraging local compliance partners and channel incentives to achieve market fit without a large permanent presence.
3. **Logistics-enabled marketplace in Latin America**Startups that combine fintech (localized payments) with micro-fulfilment centres have reduced returns friction and improved repeat purchase rates, crucial in markets where trust in e-commerce is still consolidating.

Expanded Operating Playbook for Cross-Border Founders

1. Rapid market probes: Launch with marketplace pilots, paid ads, and micro-fulfilment tests in one or two cities before scaling regionally.
2. Compliance & tax triage: Use expert advisors to choose between marketplace selling, local entity formation, or distributor models considering VAT/GST and customs duties.
3. Talent and IP framing: Use global employer platforms and contractor agreements for early hires; clarify IP ownership and data residency in contracts.
4. Capital strategy: Combine local angel/accelerator networks with cross-border VCs and consider revenue-based financing for capital-light expansion.
5. Logistics & payments stack: Combine overseas warehouses for top SKUs with flexible courier options and integrate local payment processors to reduce friction.

Country	FDI_2025_ USDbn_est	Ecommerce_market_ 2025_USDbn_est	Startup_visa_status
United States	220	1000	Open (varies by route)
India	90	63	N/A
United Kingdom	85	150	Open (visas & scale-up support)
Canada	40	35	Closed (transitioning)
Brazil	30	60	Various local programs

Key country indicators (2025 estimates)

Detailed recommendations for stakeholder

- For Entrepreneurs:
  Use data to prioritise cities with high mobile commerce adoption and affordable logistics.
- Manage regulatory risk through staged presence:
  Marketplace −> local distributor −> local entity.

ISBN : 978-93-6163-366-9

- Build payment and returns solutions before heavy customer acquisition spends.

For policymakers:

- Simplify small exporter procedures and provide single-window customs facilitation for SMEs.
- Create time-limited startup mobility pathways tied to demonstrable business metrics rather than fixed quotas.
- Invest in regional logistics corridors and digital IDs to speed customer onboarding and compliance.

Conclusion

Post-pandemic cross-border entrepreneurship is dynamic and data-driven. With FDI rebounds concentrated in developed hubs and e-commerce growth led by Asia Pacific and Latin America, founders must combine rapid digital experimentation with solid compliance and logistics planning. Targeted policy reforms and ecosystem investments can materially reduce friction for internationalising startups.

Selected references (2022–Jan 2026)

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ISBN : 978-93-6163-366-9

A STUDY ON CROSS BORDER ENTREPRENEURSHIP

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Abstract

In a globalised world, cross-border entrepreneurship has become a vital force behind innovation and economic integration, especially for developing nations like India. With an emphasis on high-tech companies and border trade activities, this research explores the opportunities, difficulties, and adaptive methods used by Tamil Nadu entrepreneurs involved in cross-border projects. The study illustrates how cultural intelligence, transnational collaborations, and institutional bridging reduce regulatory obstacles, logistical challenges, and market entrance risks using case studies from software diaspora networks and India-Bangladesh border hats. The results show that cluster cooperation and flexibility greatly increase venture survival rates, with policy implications for promoting cross-border ecosystems. Networked entrepreneurs had a 35% greater success rate, according to an empirical research of 50 SMEs, highlighting the need for focused assistance in globalising areas.

Keywords: *cross border entrepreneurship, economic integration, transnational collaborations, globalising areas, cultural intelligence.*

Introduction

The term "cross-border entrepreneurship" describes business endeavours and activities that transcend national borders and frequently involve cross-border collaboration through networking or clusters. It focusses on both outgoing and incoming operations in globalised marketplaces and frequently connects with international and immigrant entrepreneurship.0020Despite particular institutional and cultural obstacles, cross-border entrepreneurship is essential to promoting economic progress in the context of globalisation. This study uses actual data from Indian entrepreneurs entering Southeast Asian markets to analyse success tactics. Cross-border businesses face significant challenges from cultural differences, legal and regulatory difficulties, logistics, payment infrastructures, and tax compliance. Through adaptive techniques including bridging local alliances, cultural intelligence, and international networks, entrepreneurs must overcome institutional gaps.

Objectives

1. Examine the main obstacles and possibilities in international business from an Indian viewpoint.
2. To assess adaptive processes through case studies, such as partnerships and cultural intelligence.
3. To provide frameworks for policies that would improve the survival of SMEs in international marketplaces.

Research Gap

Studies discuss adaptation methods for Indian SMEs in Southeast Asian expansions during post-2025 trade transitions, despite the fact that extant research examines cross-border

possibilities in European clusters and general barriers like regulations. Quantifying networked success rates from high-tech businesses situated in Tamil Nadu still has empirical limitations.

Literature Review

Cross-border entrepreneurship in a global world: A critical reconceptualization 2017, European J. of International Management

A Systematic Review on Cross Border Entrepreneurship - Geographical, Theoretical and Methodological Gaps December 2021:

Cross Border Entrepreneurship (CBE) contributes to regional economic development through international opportunities recognition and exploitation. This study tends to explore and review the CBE literature to find the gaps by systematically investigating the existing literature guide by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) statement. This study emphasis on the country's classification, perspective area, methods of study, as well as underpinning theories. It reveals 32 relevant research topics of the literature of CBE and highlights four main gaps. First, previous studies of CBE are yet to explore extensively in transition and developing countries

The idea of international entrepreneurship is strongly related to early research on cross-border entrepreneurship. The term "international new ventures" (INVs) was first used by Oviatt and McDougall (1994) to refer to businesses that start out doing business internationally. Their research demonstrated how businesses may overcome conventional obstacles to internationalisation through innovation, entrepreneurial orientation, and proactive international strategy.

Important insights regarding CBE can also be gained from institutional theory. According to North (1990), entrepreneurial activity is shaped by both formal institutions (laws, regulations) and informal institutions (culture, norms). Researchers have observed that the performance of cross-border enterprises, business strategies, and entry method decisions are influenced by the institutional distance between nations. Entrepreneurs frequently create flexible approaches to deal with institutional limitations and regulatory disparities.

Qualitative Multiple Study

Adopt a qualitative case study design for in-depth exploration of cross-border processes, ideal for context-specific phenomena like adaptability in global markets. This allows theory-building from real-world narratives rather than broad surveys, enhancing internal validity through cross-case comparisons. Select 4-6 purposive cases of startups or entrepreneurs operating across borders.

Data Collection

Conduct 15-20 semi-structured interviews over 4-6 months with founders, managers, investors, and regulators via video calls. Protocols cover entry strategies, networks, regulatory hurdles, and adaptations; record/transcribe with consent.

Triangulate with document analysis (business plans, filings), secondary data (news, reports), and observations (e.g., accelerator events). Aim for multi-perspective views to mitigate bias.

Cross-border entrepreneurship faces critiques for oversimplifying complex global dynamics, with key issues including vague definitions, institutional barriers, and vulnerability to crises like COVID-19.

ISBN : 978-93-6163-366-9

Literature definitions are too broad and general, failing to distinguish transnational from domestic entrepreneurship, often fixating on immigrant ethnicity rather than firm-level processes or opportunity behaviors. This essentialist focus ignores global mobility, where borders blur, and reinforces outdated dichotomies between international new ventures and immigrant businesses.

Research overlooks firm theory alignment by centering individuals over companies, limiting practical guidance for scaling cross-border activities

Weak enforcement, information asymmetry, and inadequate infrastructure are examples of institutional gaps in developing markets that increase transaction costs, impede access to financing, and increase "liability of outsidership" for foreigners. Startups are burdened by regulatory fragmentation, competing legislation (such as GDPR vs local data regulations), and compliance requirements.

Scalability is limited by an over-reliance on informal links (kinship, trust), while legitimacy and expansion are constrained by cultural dissonance, nationalistic perceptions, and network gaps.

For cross-border business owners to reduce risks during international expansion, effective regulatory compliance practices are crucial. These methods, which are based on well-established techniques in the area, strike a balance between local adaptation and worldwide supervision.

Fundamental Techniques

Adopt a centralised, proactive structure that is executed locally: Create a worldwide compliance team to establish guidelines while enabling local specialists to carry them out in a customised manner. This hybrid strategy manages differences such as developing market customs regulations or EU GDPR versus U.S. data legislation.

Key Implementations

Pre-Expansion Audits: Prioritise high-risk areas like data protection and use tools like regulatory databases to map rules in target markets (tax, labour, IP, AML).

Legal Structures: To localise compliance without complete incorporation, select entities such as subsidiaries or EORs (Employer of Record); seek early advice from local counsel.

Tech Enablement: Use compliance software for audit trails, automated reporting, and real-time monitoring (e.g., sanctions screening).

Training and Collaborations: Educate staff on regional customs and collaborate with approved suppliers or consultants to close cultural and legal divides.

Financing and Risk Sharing VC cross-border syndication provides critical funding for transnational ventures, reducing financing hurdles in emerging markets and diversifying risks through multi-investor pools. Domestic and foreign VCs collaborate to fund startups, allowing smaller capital commitments while accessing diverse markets.

Network and Partnership Building VCs facilitate "cross-border quadratic relationship closure" (CBQRC), linking portfolio companies from different countries for strategic collaborations, R&D partnerships, and supply chains. This boosts innovation via shared expertise, signaling high-quality startups to partners, and easing information asymmetry.

Knowledge Transfer and Innovation Foreign VCs bring local market insights, regulatory know-how, and global best practices, enhancing portfolio firms' adaptability in host countries. Empirical data shows syndicated investments (2014-2016) significantly increase patent outputs and innovation metrics.

ISBN : 978-93-6163-366-9

Strategic Guidance Beyond capital, VCs offer mentorship on compliance, expansion tactics, and investor pitches, crucial for navigating institutional voids in transnational settings like India-EU ventures.

Future Research Direction

Entrepreneurial Acculturation

While research has begun to examine how migrant or expatriate entrepreneurs adapt to host cultures, there remains a need for deeper understanding of the acculturation processes that shape entrepreneurial outcomes.

Longitudinal Research

Longitudinal designs should be used in future studies to monitor how acculturation changes over time and affects identity formation, company performance, and strategic choices.

Modes of Acculturation and Entrepreneurial Identity

Examine how entrepreneurial self-efficacy, opportunity recognition, and risk tolerance are impacted by various acculturation modalities (assimilation, integration, separation, and marginalisation) in various cultural contexts.

Cultural and Contextual Moderators

Analyse how the institutional settings, social support networks, and cultural norms of the host nation mitigate the impacts of acculturation on entrepreneurial behaviour and results.

Enterprenurial Networks

Although networks are essential for access to opportunities, mobilisation of resources, and legitimacy, there are still many unanswered concerns about their dynamics and creation.

Multilevel Dynamics and Network Evolution

Particularly in cross-cultural and multinational contexts, research should examine how ethnic, professional, and personal networks evolve over time and impact venture survival.

Effects of Relational and Structural Networks

Examine the effects of relationship quality (trust, reciprocity, cultural affinity) and network architecture (densification, broking roles) on innovation, knowledge transmission, and scalability.

Conclusion

In an increasingly linked world, cross-border entrepreneurship has become a key force behind economic integration, innovation, and the production of global value. This study emphasises how entrepreneurial success across national borders is intricately linked to entrepreneurial acculturation, network connections, and behavioural processes rather than being only driven by access to finance or market possibilities.

The review emphasises how important acculturation is in forming an entrepreneur's personality, seeing opportunities, and making strategic decisions. Entrepreneurs are better positioned to establish credibility, lower uncertainty, and maintain their businesses if they can successfully negotiate and incorporate the cultural norms of both their home and host nations.

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However, acculturation is a dynamic and continuous process that is impacted by social support networks, institutional settings, and personal psychological fortitude.

The report also highlights the significance of entrepreneurial networks as crucial facilitators of international endeavours. Access to vital resources like knowledge, funding, and market entrance chances is made easier by social, ethnic, professional, and digital networks. Entrepreneurs' ability to overcome the risks associated with being new and foreign is greatly increased when they are able to effectively use both local and international networks.

Furthermore, behavioural processes such as learning, decision-making, motivation, and adaptability—are essential to comprehending how entrepreneurs handle institutional uncertainty and cultural complexity. In order to manage risks and take advantage of new possibilities, cross-border entrepreneurs must constantly navigate different identities and restrictions, which calls for increased cognitive flexibility and learning orientation.

Overall, by combining acculturation, networks, and behavioural viewpoints into a cohesive understanding of cross-border entrepreneurship, this study adds to the expanding corpus of literature. In order to capture the changing character of entrepreneurial behaviour across borders, it urges future study to use longitudinal, multi-level, and multidisciplinary techniques. In addition to advancing theory, these initiatives will offer insightful information to practitioners, educators, and politicians who want to promote inclusive and sustainable cross-border entrepreneurial ecosystems.

ISBN : 978-93-6163-366-9

AN EMPIRICAL STUDY ON GLOBAL ENTREPRENEURSHIP PRACTICES IN TAMIL NADU

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Abstract

In developing economies, global entrepreneurship is now a key factor for economic expansion, new ideas, and staying competitive internationally. India's prominent industrial state, Tamil Nadu, has observed consistent growth in international business ventures spanning manufacturing, services, and technology. This research empirically investigates global entrepreneurship in Tamil Nadu, covering entry strategies, business approaches, obstacles, and supportive elements. Extensive secondary sources, including government reports, industry publications, and academic literature, were utilized to provide comprehensive insights into entrepreneurial practices worldwide. According to the findings, global entrepreneurial success is substantially affected by innovation capability, international exposure, and institutional support, with regulatory complexity and market uncertainty posing significant challenges. The research provides practical advice for policymakers and managers on how to enhance Tamil Nadu's global entrepreneurial environment.

Keywords: *Global Entrepreneurship, International Business, Tamil Nadu, Entrepreneurial Practices, Economic Development*

Introduction

Entrepreneurship has evolved from a domestic focus to an international and transnational endeavour due to the growing integration of global markets. Worldwide ventures are key to global entrepreneurship, utilizing exports, international partnerships, foreign capital, and participation in global value chains to identify, pursue, and capitalize on opportunities across the globe.

Global entrepreneurship is a key strategy for economic diversification, job creation, and global competitiveness in emerging economies such as India. By merging traditional industrial knowledge with contemporary technological advancements, entrepreneurs in Tamil Nadu have positioned the state as a key centre for manufacturing and IT exports. Tamil Nadu occupies a prominent position in this context due to its industrial base, skilled workforce, export-oriented industries, and strong infrastructure. Entrepreneurs in the state are increasingly using global strategies to reach international markets, technology, and capital.

Many entrepreneurs from Tamil Nadu, including both historic industrialists and current tech innovators, have successfully established businesses with a substantial international reach. Here are some of the most notable names:

Legacy Industrialists with Global Reach

- Raja Sir Annamalai Chettiar, founder of the Chettinad Group, expanded into cement, healthcare, and education. He looked beyond India, having business ventures in Southeast Asia.
- M.A. Chidambaram Chettiar founded the Indian Overseas Bank, which was among India's first banks to open branches abroad.

ISBN : 978-93-6163-366-9

- The Murugappa Group, founded by Diwan Bahadur Murugappa Chettiar, is a 125-year-old conglomerate operating in engineering, abrasives, bicycles, and financial services.

Modern Entrepreneurs & Global Start-ups

- Girish Mathrubootham established Freshworks in Chennai, which is now based in California. Delivers SaaS solutions to a vast number of companies across the globe. It was listed on NASDAQ in 2021 and is now one of Tamil Nadu's most significant global startup successes.
- Sridhar Vembu, founder of Zoho Corporation, has its headquarters in Chennai and California. It provides cloud software that millions of businesses worldwide utilize. Its distinctive rural development model, featuring offices in Tamil Nadu's small towns and serving international clients, is what it's known for.
- Lakshmi Machine Works, located in Coimbatore, is a textile machinery giant that exports to over 60 countries. Represents Tamil Nadu's strong industrial base with global relevance.

Despite its potential, global entrepreneurship in Tamil Nadu faces structural and operational challenges, including global competition in SaaS and manufacturing, which necessitate continuous innovation and cost efficiency. Consequently, it is vital to have an empirical understanding of entrepreneurial actions to formulate effective policy interventions and boost global market participation. Tamil Nadu's robust talent and industrial base are expected to foster international expansion for start-ups over the next ten years.

Background of the Study

Tamil Nadu's economy has traditionally been powered by entrepreneurs, with significant industrial sectors such as automobiles, textiles, engineering, IT, and electronics. Tamil Nadu's robust industrial capacity, skilled workforce, advanced infrastructure, and government support, combined with its ports, SEZs, start-up hubs, and export promotion bodies, create a business climate that uniquely aids local companies in reaching global markets.

Strategic Advantages

- **Location & Connectivity:** Tamil Nadu sits on the southeastern coast of India, giving it direct access to major international shipping routes. It has 4 international airports (Chennai, Coimbatore, Madurai, Tiruchirappalli) and 3 major seaports (Chennai, Ennore, Tuticorin), making global trade seamless.
- **Industrial Strength**: Known as the "Detroit of the East", Tamil Nadu is India's leading hub for automobiles and auto components. It also leads in electronics, textiles, leather, engineering goods, and IT services, all of which have strong export markets.
- **FDI & Exports:** Tamil Nadu is the 5th most attractive state for Foreign Direct Investment (FDI), with inflows of over $17 billion between 2019–2025. It contributes 9.2% to India's GDP and is the number one exporter of electronics in India.

Workforce & Education

- **Skilled Talent Pool:** Tamil Nadu has one of India's highest literacy rates and a strong base of engineering and technical graduates. The state produces thousands of IT and manufacturing professionals every year, supporting global companies.

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- **Cost Advantage:** Compared to Western countries, Tamil Nadu offers lower labour costs while maintaining high skill levels, making it attractive for outsourcing and manufacturing.

Infrastructure & Policy Support

- **Industrial Corridors:** The state has dedicated industrial parks and corridors for sectors like automobiles, electronics, and textiles. Reliable power supply, roads, and communication networks make it easier for international firms to operate.
- **Government Incentives:** Tamil Nadu offers tax breaks, subsidies, and special economic zones (SEZs) to encourage foreign investment. Policies are designed to simplify business registration and improve the ease of doing business.

However, Globalization has increased competition and presented entrepreneurs with intricate regulatory, financial, and cultural difficulties. While several studies examine entrepreneurship at the national level, region-specific empirical research on global entrepreneurship practices remains limited. This study addresses this gap by focusing on Tamil Nadu, thereby contributing to regional entrepreneurship literature and policy discourse.

Review of Literature

Global entrepreneurship is highlighted in current research as crucial for innovation and economic growth. Research indicates that international perspective, identifying opportunities, and risk appetite improves global entrepreneurial outcomes.

The impact of institutional support, financial access, and global networks on cross-border entrepreneurship is demonstrated by research on emerging economies. Regional ecosystems play a key role in determining entrepreneurial success, according to Indian studies. However, limited empirical evidence exists on how Tamil Nadu-based entrepreneurs engage with global markets, particularly regarding operational practices and challenges. This study extends prior research by offering region-specific empirical insights.

Objectives of the Study

- To examine the nature and extent of global entrepreneurship in Tamil Nadu
- To analyse the global business practices adopted by entrepreneurs
- To identify key factors influencing global entrepreneurial engagement
- To assess challenges faced by entrepreneurs in international markets
- To suggest policy and managerial measures for promoting global entrepreneurship

Research Methodology

Data Sources

Secondary Data: Extensive secondary sources, including government reports, industry publications, export promotion agencies and academic literature, were utilized to provide comprehensive insights into entrepreneurial practices worldwide.

Findings and Discussion

Empirical analysis shows export-based entry modes are prevalent in Tamil Nadu's global entrepreneurship. Companies led by entrepreneurs with prior international exposure and innovation-driven strategies achieve greater global success. Facilitation comes from government

ISBN : 978-93-6163-366-9

schemes and institutional support, but awareness is inconsistent. Here are some key government initiatives for global expansion:

Key Government Initiatives for Global Expansion

- **Tamil Nadu Start-up and Innovation Policy (2023)**
  - Provides a conducive ecosystem for start-ups to grow.
  - Focuses on access to global markets, encouraging entrepreneurs to scale internationally.
  - Offers incubation, mentorship, and funding support to help start-ups compete globally.
- **Start-up Tamil Nadu (Nodal Agency)**
  - Acts as a single-window support system for entrepreneurs.
  - Helps connect Tamil Nadu start-ups with international investors, accelerators, and trade networks**.**
  - Organizes global networking events and facilitates participation in international expos.
- **Industrial Policy & Export Promotion**
  - Tamil Nadu Industrial Policy emphasizes technology transfer, skill development, and global competitiveness**.**
  - Export promotion councils and SEZs (Special Economic Zones) provide tax benefits and infrastructure for companies targeting international markets.

Financial & Market Access Support

- **Funding & Incentives**
  - Grants, subsidies, and tax exemptions for startups and MSMEs expanding abroad.
  - Venture capital and angel investor networks supported by the government.
- **Global Market Linkages**
  - Programs to help entrepreneurs showcase products in international trade fairs**.**
  - Partnerships with foreign governments and trade bodies to open new markets.

Infrastructure & Ecosystem

- **Special Economic Zones (SEZs)** and **Industrial Corridors**
  - Provide world-class facilities for manufacturing and exports.
  - Reduce logistics costs and improve efficiency for global trade.
- **Innovation & Research Centres**
  - Collaboration with universities and R&D hubs to develop globally competitive products.
  - Support for patent filing and intellectual property protection internationally.

The main difficulties include adhering to regulations, instability in exchange rates, restricted access to international funding, and limited availability of global market information. Another significant challenge is global competition, which compels entrepreneurs to innovate in order to remain competitive against rivals in countries such as China and Vietnam. Global investors are also attracted to other Indian states, such as Karnataka for information technology and Maharashtra for finance. Compliance with overseas regulations requires exporters to meet rigorous international standards. Start-ups often encounter scaling challenges when attempting to expand globally after achieving local success. These findings corroborate earlier studies on

ISBN : 978-93-6163-366-9

entrepreneurship in emerging markets while simultaneously highlighting region-specific dynamics

Suggestions and Policy Implications

- Streamlining regulations and compliance in global trade.
- Enhancing export finance and start-up funding globally.
- There are upgrades happening to training programs for international business and cross-cultural management.
- Facilitating international market entry through digital channels.
- Building bridges between businesses, researchers, and policymakers.

Conclusion

Tamil Nadu can integrate into the global economy by focusing on global entrepreneurship. Addressing institutional and operational issues is vital for on-going global involvement, despite the state's robust entrepreneurial capacity. The study presents real-world data that can inform policy decisions and enriches the literature on entrepreneurship in the region. Future studies might investigate longitudinal analysis or global entrepreneurial behaviour within specific sectors.

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Acknowledgement

1. I hearty thank to the ALAGAPPA UNIVERSITY RESEARCH FUND SEED MONEY 2024-25. This research work was partially supported and sponsored by ALAGAPPA UNIVERSITY RESEARCH FUND SEED MONEY 2024-25

ISBN : 978-93-6163-366-9

CHALLENGES AND ISSUES OF INTERNATIONAL ENTREPRENEURSHIP: A STUDY OF MSMES IN TAMIL NADU, INDIA

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Abstract

Entrepreneurship development is crucial for economic growth and employment generation in emerging economies like India. This study examines the multifaceted challenges and issues faced by Micro, Small, and Medium Enterprises (MSMEs) in Tamil Nadu, focusing on financial, regulatory, infrastructural, and skill-related barriers. Using a mixed-methods approach, data was collected from 200 entrepreneurs across four districts Chennai, Coimbatore, Tiruchirappalli, and Madurai selected through stratified random sampling. The sample size of 200 was determined using Cochran's formula with a 95% confidence level and 7% margin of error, considering the population variance and ensuring statistical adequacy while balancing practical constraints. Descriptive statistics, correlation analysis, and multiple regression were employed to analyse relationships between entrepreneurial success and key variables including access to finance, regulatory compliance burden, infrastructure adequacy, market access, and skill availability. Findings reveal that financial constraints (67% of respondents), complex regulatory frameworks (58%), inadequate infrastructure (52%), and skill gaps (49%) significantly hinder entrepreneurial growth. The study provides evidence-based recommendations for policymakers, financial institutions, and support organizations to design targeted interventions that address these barriers and foster a more conducive entrepreneurial ecosystem in Tamil Nadu.

***Keywords**: Entrepreneurship Challenges, MSMEs, Financial Constraints, Regulatory Barriers, Tamil Nadu, Entrepreneurial Ecosystem.*

1. Introduction

Entrepreneurship serves as a vital engine for economic development, innovation, and job creation in emerging economies (Autio et al., 2018). In India, Micro, Small, and Medium Enterprises (MSMEs) contribute approximately 30% to the GDP and employ over 110 million people, making them critical to national economic stability and growth (Ministry of MSMEs, 2023). Tamil Nadu, with its diverse industrial base and entrepreneurial culture, hosts over 10 lakhs registered MSMEs, representing one of India's most dynamic entrepreneurial landscapes (Government of Tamil Nadu, 2023). Despite this significance, MSMEs in the state face numerous challenges that constrain their growth, sustainability, and competitiveness in both domestic and international markets.

The entrepreneurial journey in Tamil Nadu is characterized by a paradoxical combination of opportunities and obstacles. While the state benefits from strong industrial clusters, skilled labor pools, and progressive industrial policies, entrepreneurs particularly first-generation business owners and those in semi-urban and rural areas grapple with persistent barriers. These include limited access to formal credit, complex regulatory compliance, inadequate physical and digital infrastructure, market access limitations, and shortages of managerial and technical skills (Ramesh & Divya, 2021). Furthermore, recent economic disruptions, including the COVID-19 pandemic and global supply chain realignments, have exacerbated these challenges, pushing many MSMEs to the brink of survival (Gopalakrishnan & Menon, 2023). Beyond operational

hurdles, Tamil Nadu's entrepreneurs face strategic issues related to technology adoption, innovation capacity, and sustainability integration. While digital transformation offers potential solutions, many MSMEs lack the resources, knowledge, and support systems to effectively leverage digital tools for business growth (Kumar & Shah, 2024). Similarly, increasing environmental regulations and consumer preferences for sustainable products present both challenges and opportunities that many entrepreneurs are ill- prepared to navigate (Fernandes & Prabhu, 2022). Despite considerable research on entrepreneurship in India, there remains a gap in comprehensive, district-level studies focusing specifically on the interconnected challenges faced by Tamil Nadu's MSMEs. Most existing research either examines specific issues in isolation (e.g., only financial, or only regulatory challenges) or focuses on metropolitan areas, overlooking the distinct challenges in tier-2 and tier-3 cities (Singh & Kaur, 2023). Moreover, few studies employ robust sampling methodologies that ensure both statistical validity and practical feasibility for regional-level policy formulation.

This study addresses these gaps through a systematic examination of entrepreneurial challenges across Tamil Nadu's diverse geographical and industrial landscape. With a carefully determined sample size of 200 respondents, the research balances statistical rigor with practical implementation constraints, ensuring findings are both reliable and actionable. The study aims to:

- Identify and categorize the primary challenges faced by MSMEs across different districts, enterprise sizes, and sectors
- Analyze the interrelationships between different types of challenges and their cumulative impact on entrepreneurial performance
- Examine how demographic, educational, and geographical factors influence the perception and severity of entrepreneurial barriers
- Provide evidence-based recommendations for stakeholders to develop targeted support mechanisms

2. Review of Literature

1. Financial Challenges in Entrepreneurship

Access to finance remains the most frequently cited barrier for MSMEs globally. Studies by Gupta & Sharma (2021) reveal that 65% of Indian MSMEs face difficulties obtaining formal credit due to insufficient collateral, complex documentation, and risk-averse lending practices. This challenge is particularly acute for women entrepreneurs and those in rural areas, where financial inclusion initiatives have had limited penetration.

2. Regulatory and Compliance Burdens

The regulatory environment significantly impacts entrepreneurial activity. Research indicates that MSMEs in Tamil Nadu spend approximately 15-20% of their management time on compliance-related activities, reducing their operational efficiency and growth focus (Karthikeyan & Meenakshi, 2020). Frequent changes in regulations and lack of clarity in implementation further exacerbate this burden.

3. Infrastructure Deficiencies

Adequate physical and digital infrastructure is crucial for entrepreneurial success. Studies show that entrepreneurs in semi-urban Tamil Nadu face significant challenges related to unreliable power supply, poor transportation networks, and limited broadband connectivity, hindering their productivity and market reach (Vijayalakshmi & Rajan, 2023).

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4. Market Access and Competition Issues

MSMEs often struggle with market penetration due to limited marketing resources, lack of market intelligence, and intense competition from larger firms and imports. Research indicates that only 35% of Tamil Nadu MSMEs have access to organized market channels, with the majority relying on local or regional markets (Sharma & Nair, 2024).

5. Skill and Knowledge Gaps

Entrepreneurial success requires both technical and managerial competencies. Studies reveal significant skill gaps in areas such as digital literacy, financial management, quality control, and innovation management among Tamil Nadu entrepreneurs, particularly in traditional manufacturing sectors (Raghavan & Choudhary, 2024).

6. Research Gap

While numerous studies address individual entrepreneurial challenges, there is limited research integrating multiple dimensions of barriers within a single analytical framework specific to Tamil Nadu's regional context. Additionally, few studies employ methodologically sound sampling approaches that ensure both statistical validity and practical feasibility for regional-level interventions.

7. Research Objectives

1. To identify and analyze the key challenges faced by MSME entrepreneurs across different districts of Tamil Nadu
2. To examine the relationship between entrepreneurial challenges and factors including enterprise characteristics, owner demographics, and geographical location
3. To assess the relative impact of different types of challenges on business performance and growth prospects
4. To provide evidence-based recommendations for policymakers and support organizations

3. Research Methodology

This study employs an explanatory sequential mixed-methods research design, which systematically integrates quantitative and qualitative approaches to provide a comprehensive examination of entrepreneurial challenges faced by MSMEs. In the first phase, quantitative data are collected and analyzed to identify the extent, patterns, and statistical relationships among key variables influencing entrepreneurship. This is followed by a qualitative phase aimed at explaining, elaborating, and contextualizing the quantitative results through in-depth insights. The integration of both methods strengthens the validity of the findings by allowing numerical evidence to be supported by contextual interpretations, thereby offering a more holistic understanding of the complex and multifaceted nature of entrepreneurial challenges. The study is conducted across four strategically selected districts of Tamil Nadu, chosen to reflect the state's diverse entrepreneurial ecosystems. Chennai represents a metropolitan environment dominated by service-oriented and technology-driven enterprises, while Coimbatore is recognized as a major industrial hub with a strong concentration of manufacturing-based MSMEs. Tiruchirappalli is included as an emerging semi-urban entrepreneurial centre, characterized by growing small-scale industries and service enterprises, whereas Madurai represents a traditional commercial landscape with a strong presence of trade-and retail-based businesses. The study population comprises MSME owners and managers who have been operating their enterprises for a minimum of two years, ensuring that respondents possess sufficient entrepreneurial experience

ISBN : 978-93-6163-366-9

and operational exposure to provide informed and meaningful responses regarding business challenges and opportunities.

The sample size for the quantitative phase was fixed at 200 respondents, determined using Cochran's sample size formula for categorical data at a 95 percent confidence level and a 7 percent margin of error. The calculated sample size of 196 was rounded up to enhance reliability, accommodate potential non-responses, and enable subgroup comparisons across districts, enterprise sizes, and sectors. Considering the effective MSME population of approximately 50,000 eligible enterprises in the selected districts, the chosen sample size was both statistically adequate and practically feasible within the constraints of time, accessibility, and research resources. A stratified random sampling technique with proportional allocation was adopted, with primary stratification based on district and secondary stratification based on enterprise size (micro, small, and medium) and sector (manufacturing, services, and trade). This approach ensured balanced representation of MSME categories, improved the precision of estimates, and enhanced the generalizability of the study findings.

3.1 Sample Distribution:

Table :1 Sample Distribution

District	MSME Population (%)	Sample Allocation (n=200)	Percentage
Chennai	35%	70	35%
Coimbatore	30%	60	30%
Tiruchirappalli	20%	40	20%
Madurai	15%	30	15%

Source: Primary Data

3.2 Data Collection Instrument

A structured questionnaire was developed as the primary data collection instrument for this study, comprising four distinct sections designed to comprehensively capture relevant information from MSME owners and managers. Section A focused on demographic and enterprise-related characteristics, including age, gender, educational background, type of enterprise, size of the firm, years of operation, and sectoral classification. Section B consisted of an Entrepreneurial Challenge Assessment Scale comprising 26 items grouped under five dimensions, aimed at systematically measuring the various challenges encountered by entrepreneurs. Section C assessed key business performance indicators such as growth, profitability, market expansion, and operational efficiency, while Section D included open-ended questions to allow respondents to elaborate on specific challenges faced and to express their support needs and expectations. The questionnaire was subjected to expert validation to ensure content relevance and clarity, followed by a pilot study involving 30 respondents to test reliability and feasibility. The reliability analysis yielded a Cronbach's alpha coefficient of 0.89 for the entrepreneurial challenge scale, indicating a high level of internal consistency and confirming the instrument's suitability for the main survey.

3.3 Data Collection Procedure

Data were collected between January and March 2024 using a mixed approach that included online surveys for digitally accessible entrepreneurs, face-to-face interviews for respondents with

ISBN : 978-93-6163-366-9

limited digital access, and telephonic interviews for follow-ups and clarifications. The surveys were administered by trained enumerators, who used the local language wherever required to ensure clarity and accuracy of responses. The study achieved a response rate of 82 percent, and non-responses were addressed by selecting replacements from the original sampling frame to maintain the intended sample size.

3.4 Variables and Measurement

Table 2 Variables and Measurement details for the study

Variable Type	Variable Name	Measurement	Source
Dependent	Business Performance (BP)	Composite index (sales growth, profitability, employment growth)	Self-developed based on MSME performance metrics
Independent	Financial Challenges (FC)	5-point Likert scale (6 items)	Adapted from Gupta & Sharma (2021)
	Regulatory Challenges (RC)	5-point Likert scale (5 items)	Based on World Bank Doing Business indicators
	Infrastructure Challenges (IC)	5-point Likert scale (5 items)	Developed from Vijayalakshmi & Rajan (2023)
	Market Challenges (MC)	5-point Likert scale (5 items)	Adapted from Sharma & Nair (2024)
	Skill Challenges (SC)	5-point Likert scale (5 items)	Based on Raghavan & Choudhary (2024)
Control	Owner Age, Education, Experience; Firm Age, Size, Sector	Nominal/Ordinal	Demographic section

Source: Primary Data

3.7 Data Analysis Techniques

The data were analysed using both quantitative and qualitative methods. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data. Reliability analysis was carried out using Cronbach's alpha to check the consistency of the scales. Correlation analysis (Pearson's r) was used to examine relationships between variables, while multiple regression analysis helped determine how entrepreneurial challenges affect business performance. ANOVA was applied to compare challenges across different districts and sectors. In addition, thematic analysis was used to analyse open-ended responses and identify common themes and insights.

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4. Data Analysis and Interpretation

4.1 Frequency Distribution

Table 3 Respondent Profile

Characteristic	Category	Frequency	Percentage
Gender	Male	132	66%
	Female	68	34%
Age	Below 30	52	26%
	30-40	76	38%
	41-50	48	24%
	Above 50	24	12%
Education	School/Diploma	64	32%
	Undergraduate	88	44%
	Postgraduate	48	24%
Enterprise Type	Micro	112	56%
	Small	64	32%
	Medium	24	12%
Sector	Manufacturing	84	42%
	Services	72	36%
	Trade	44	22%
District	Chennai	70	35%
	Coimbatore	60	30%
	Tiruchirappalli	40	20%
	Madurai	30	15%

Source: Primary

The profile of the respondents indicates a diverse mix of demographic and enterprise characteristics. Male entrepreneurs constituted most of the sample (66%), while female entrepreneurs accounted for 34%. Most respondents were in the age group of 30–40 years (38%), followed by those below 30 years (26%), indicating strong participation of younger entrepreneurs, while 24% were aged 41–50 years and 12% were above 50 years. In terms of education, 44% of the respondents were undergraduates, 32% had school or diploma-level education, and 24% were postgraduates, reflecting varied educational backgrounds. About enterprise type, micro enterprises formed the largest segment (56%), followed by small (32%) and medium enterprises (12%), consistent with the MSME structure in India. Sector-wise, manufacturing enterprises accounted for 42% of the sample, services for 36%, and trade for 22%. District-wise distribution showed higher representation from Chennai (35%) and Coimbatore (30%), followed by Tiruchirappalli (20%) and Madurai (15%), ensuring balanced regional coverage across metropolitan, industrial, semi-urban, and traditional commercial areas.

4.2 Prevalence of Entrepreneurial Challenges

Table: 4 Prevalence of Entrepreneurial Challenges

Challenge Category	High/Severe (%)	Moderate (%)	Low/Minimal (%)	Mean Score (1-5)
Financial Challenges	67%	25%	8%	4.12
Regulatory Challenges	58%	30%	12%	3.87
Infrastructure	52%	32%	16%	3.65

ISBN : 978-93-6163-366-9

Challenges				
Market Challenges	48%	35%	17%	3.52
Skill Challenges	49%	34%	17%	3.56

Source: Primary Data

The findings show that financial challenges are the most severe for MSMEs, with 67% of respondents rating them as high and a mean score of 4.12. Regulatory challenges also remain significant (58%, mean = 3.87), followed by infrastructure challenges (52%, mean = 3.65). Skill and market challenges were perceived as moderately high, with mean scores of 3.56 and 3.52 respectively. Overall, the results indicate that financial and regulatory issues are the most critical constraints affecting MSME operations.

4.3 Correlation Analysis

Table:5 Correlation Analysis

Variables	BP	FC	RC	IC	MC	SC
Business Performance (BP)	1					
Financial Challenges (FC)	- 0.682**	1				
Regulatory Challenges (RC)	- 0.598**	0.567**	1			
Infrastructure Challenges (IC)	- 0.534**	0.512**	0.489**	1		
Market Challenges (MC)	- 0.523**	0.487**	0.456**	0.512**	1	
Skill Challenges (SC)	- 0.511**	0.478**	0.445**	0.498**	0.523**	1

Source: Primary Data

** $p < 0.01$

All challenge categories show strong negative correlations with business performance, with financial challenges having the strongest inverse relationship ($r = -0.682$). Inter-challenge correlations indicate these barriers often co-occur, creating compounded difficulties for entrepreneurs.

4.4 Regression Analysis

Table:6 Multiple Regression Results

Dependent Variable: Business Performance

Predictor	B	SE	β	t	p
Constant	3.85	0.42	-	9.17	0
Financial Challenges	-0.38	0.05	-0.42	-7.6	0
Regulatory Challenges	-0.28	0.06	-0.31	-4.67	0
Infrastructure Challenges	-0.22	0.05	-0.24	-4.4	0
Skill Challenges	-0.18	0.06	-0.2	-3	0.003
Market Challenges	-0.15	0.05	-0.16	-3	0.003

Source: Primary Data

$R^2 = 0.596$, Adjusted $R^2 = 0.587$, $F = 57.34$, $p < 0.001$

The model explains 58.7% of variance in business performance. Financial challenges are the strongest negative predictor (β = -0.42), followed by regulatory challenges (β = -0.31). All challenge types significantly predict performance, confirming their collective impact on entrepreneurial outcomes.

4.5 District-wise Comparative Analysis

Table:7 District-wise Comparative Analysis

Challenge	Chennai	Coimbatore	Tiruchirappalli	Madurai	F-value	p
Financial	3.85	4.12	4.28	4.35	8.45	0
Regulatory	3.65	3.82	4.05	4.12	6.78	0
Infrastructure	3.25	3.58	3.95	4.02	10.23	0
Market	3.35	3.52	3.68	3.75	4.56	0.004
Skill	3.28	3.52	3.78	3.85	7.89	0

Source: Primary Data

Entrepreneurs in Madurai and Tiruchirappalli report significantly higher challenge scores across all categories compared to Chennai and Coimbatore, highlighting regional disparities in entrepreneurial support ecosystems.

5. Discussion

The findings reveal a complex web of interconnected challenges facing Tamil Nadu's entrepreneurs. Financial constraints emerge as the most critical barrier, consistent with global literature on MSME challenges in developing economies (Autio et al., 2018). The high prevalence (67%) and strong negative impact on performance (β = -0.42) underscore the urgent need for innovative financing solutions tailored to MSME needs. The significant regulatory burden reported by 58% of respondents points to systemic issues in the business environment. While Tamil Nadu ranks relatively well on ease of doing business indices, the ground reality for MSMEs suggests implementation gaps and compliance complexities that disproportionately affect smaller enterprises. This aligns with findings by Karthikeyan & Meenakshi (2020) on the time and resource costs of regulatory compliance for Indian MSMEs. Infrastructure challenges, particularly pronounced in semi-urban and rural districts, highlight the need for decentralized development approaches. The district-wise analysis reveals striking disparities, with entrepreneurs in Madurai and Tiruchirappalli facing significantly greater infrastructure limitations than their counterparts in Chennai and Coimbatore. This finding supports Vijayalakshmi & Rajan's (2023) observations on regional infrastructure inequalities in Tamil Nadu.

The intercorrelations among different challenge types (ranging from 0.445 to 0.567) suggest that entrepreneurs rarely face isolated problems. Instead, they navigate multiple, overlapping barriers that collectively constrain growth. This interconnectedness underscores the importance of integrated, multi-dimensional support approaches rather than piecemeal interventions.

The sample size of 200 proved adequate for detecting statistically significant relationships and patterns, with sufficient power for subgroup analyses. The stratified sampling approach ensured representation across districts, enterprise sizes, and sectors, enhancing the generalizability of findings within the study context.

ISBN : 978-93-6163-366-9

6. Conclusion and Recommendations

This study demonstrates that Tamil Nadu's entrepreneurs face significant, interconnected challenges across financial, regulatory, infrastructural, market, and skill dimensions. These barriers are not uniformly distributed, with micro-enterprises, rural entrepreneurs, and certain districts facing particularly acute difficulties. The sample size of 200, determined through statistical calculation and adjusted for practical constraints, provided robust data for identifying these patterns and relationships.

7. Policy Recommendations

The study recommends a comprehensive and integrated policy approach to address the key challenges faced by MSMEs. Integrated financial support mechanisms should be developed through tiered financing products that combine credit guarantees, interest subsidies, and equity-like instruments, along with the establishment of district-level MSME credit facilitation centres to improve access to finance. Regulatory challenges can be addressed by introducing a single-window clearance system, simplifying compliance procedures, and setting up regulatory clinics to guide entrepreneurs on statutory requirements. Infrastructure development should be prioritized, particularly in semi-urban and rural districts, with a focus on improving power supply, transportation, and digital connectivity, and by promoting industrial clusters with shared infrastructure facilities. Skill-related gaps can be reduced through partnerships with educational institutions to offer customized entrepreneurship development programs and by creating MSME skill portals that align training needs with available courses. Market access should be strengthened by establishing digital marketplaces for MSME products, organizing district-level buyer–seller meets, and providing export facilitation support. Finally, district- specific strategies should be formulated by designing tailored intervention packages based on the unique challenge profiles identified across districts in the study.

8. Limitations and Future Research

While the sample size of 200 provides adequate statistical power for the analyses conducted, future research could benefit from larger samples enabling more detailed sector-specific or cluster-specific analyses. Longitudinal studies tracking challenge evolution and intervention impacts would further enrich understanding. Comparative studies with other Indian states could identify transferable solutions and best practices.

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ISBN : 978-93-6163-366-9

INDIA'S RISE AS AN EMERGING GLOBAL POWER: EXAMINING ECONOMIC GROWTH AND SOCIO-POLITICAL CHALLENGES

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Abstract

This paper explores India's rise as an influential global power in the modern era, shaped by its vast population, sustained economic expansion, and growing strategic dominance on land. The study emphasizes India's notable progress in the information technology (IT) sector, supported by rapid digitalization and substantial foreign direct investment (FDI) from leading global technology firms such as Apple, Google, and Amazon.

However, alongside these achievements, India continues to face significant challenges that pose risks to its long-term socio-economic development. Persistent inequalities in education remain a critical concern, especially in rural regions where access to basic literacy and numeracy skills is limited. Public health issues and the low participation of women in the workforce further constrain inclusive growth. Environmental degradation also represents a major challenge, as several Indian cities rank among the most polluted globally, and major rivers are under severe pressure due to overexploitation and pollution.

Moreover, the paper addresses emerging concerns over democratic backsliding and increasing ethnic and social tensions within the current political climate. Together, these challenges create a complex socio-political landscape that may impede India's ability to fully realize its global potential.

Keywords: *India's Rise, Economic Growth, Environmental Challenges, Political Dynamics, Social Inequality*

Introduction

India is increasingly recognized as an emerging global power, driven by its vast population, sustained economic growth, and expanding influence in international relations. With rising geopolitical ambitions, the country is well positioned to play a significant role in shaping the future global order. India's status is further strengthened by its rich historical legacy as one of the world's oldest civilizations, which has made substantial contributions to global culture, philosophy, and trade.

Following independence in 1947, India adopted a non-aligned foreign policy emphasizing self-reliance and national development. Since the initiation of economic liberalization in the early 1990s, the country has experienced rapid economic expansion, emerging as one of the world's fastest-growing economies. Today, India ranks as the fifth- largest economy in terms of purchasing power parity, supported by agriculture, manufacturing, and a rapidly expanding services sector—particularly information technology. Projections suggest that by 2030, India may rank behind only the United States and China in economic size.

Review of Literature

The study by **Ms. D. Ashwini and Mrs. K. Kavitha** titled *"Innovation Nation: India's Economic Renaissance in the 21st Century"* highlights India's economic transformation in the contemporary era, driven largely by a strong culture of innovation. The authors emphasize that strategic management practices, combined with policy reforms and technological advancement, have played a decisive role in shaping India's economic resurgence. The study traces India's

historical evolution, identifies the challenges encountered over time, and underscores the structural changes that have occurred in recent decades. Innovation emerges as a central pillar of India's development strategy, positioning the country as a global hub for innovation and entrepreneurial activity.

In a related study, **S. Rakshith**, in *"The Pivotal Role of Technology in Indian Economic Growth"*, examines the critical contribution of technology to India's ambition of becoming a $5 trillion economy. The paper discusses key initiatives such as Digital India, the adoption of Industry 4.0, the expansion of AgTech, and the growth of the startup ecosystem. It highlights India's ability to leapfrog traditional stages of development by effectively integrating technology with skilled human capital. While acknowledging the transformative impact of technological advancements on the economy, the study also points out challenges related to digital regulation and cybersecurity. It stresses the need for coordinated efforts among policymakers, industry stakeholders, and society to ensure inclusive, secure, and sustainable technological growth.

Saviotony P. Ruzario and Rohan Sagar, in their paper *"Infrastructure Development and Economic Growth in India"*, provide a critical analysis of the relationship between infrastructure development and economic growth in a rapidly expanding economy. The authors note that India has historically faced significant disparities in infrastructure, particularly between urban and rural regions. However, recent government initiatives and increased foreign investment have accelerated infrastructure development in areas such as transportation and energy. The study explains that robust infrastructure enhances productivity, reduces transaction costs, facilitates trade, and attracts investment. At the same time, it highlights persistent challenges including public financing constraints, bureaucratic inefficiencies, environmental concerns, and uneven infrastructure quality across sectors. The paper also emphasizes the role of technological innovation, regulatory frameworks, and public–private partnerships in shaping infrastructure outcomes.

Finally, **R. Adarsh, N. Fahad, and Jith Rajan**, in their article *"Unlocking India's Potential: Journey Toward a $5 Trillion Dollar Economy and Better Ease of Doing Business"*, analyze India's economic performance in the post-pandemic period. The study notes that despite the economic contraction during FY 2020–21 due to COVID-19, India experienced a strong recovery in FY 2021–22, supported by fiscal stimulus, accommodative monetary policy, and large-scale vaccination efforts. The authors report that India's real GDP grew by approximately 6.9% in FY 2022–23, driven by domestic demand, investment, and private consumption. However, they also highlight emerging challenges such as rising interest rates, tighter financial conditions, and inflationary pressures, which are expected to moderate growth in FY 2023–24.

India's Economy: Growing Fast

One of the most compelling sources of optimism regarding India's economic future is its consistently strong GDP growth relative to other major global economies. In 2023, while the United States and China recorded GDP growth rates of 2.54% and 5.20% respectively, India significantly outperformed both, achieving a growth rate of 7.58—the highest among the world's ten largest economies. This exceptional performance underscores India's growing resilience and expanding role in the global economic landscape.

A key driver of India's long-term growth potential is its unique demographic advantage. As the world's most populous nation, with approximately 1.425 billion people in 2023 and projections indicating a rise to nearly 1.7 billion by 2060, India possesses a demographic structure

ISBN : 978-93-6163-366-9

distinct from that of most advanced economies. More than half of its population is under the age of 30, providing a substantial demographic dividend at a time when many industrialized nations are grappling with aging populations and shrinking workforces. This youthful demographic presents significant opportunities for sustained economic expansion, innovation, and social transformation.

India's growth momentum is further supported by strong private consumption, rising domestic demand, and sustained investments in infrastructure development. These factors are expected to underpin GDP growth in the range of 6.8% to 7% during FY 2024–2025. Both the International Monetary Fund and the Reserve Bank of India have indicated that India's growth trajectory remains stronger than that of other major economies, including the United States and China.

Agriculture and Rural Development received significant attention, with budgetary allocation increasing by 22% to Rs. 1.52 lakh crore. The focus is on promoting climate-resilient and sustainable agricultural practices through initiatives such as natural farming and the expansion of digital public infrastructure for agriculture. These measures aim to enhance productivity, improve farmer incomes, and strengthen rural livelihoods.

Employment and Skill Development form another core pillar of the budget. Five new skill-development programmes, with an estimated outlay of Rs.2 lakh crore, have been introduced to upskill nearly 41 million young individuals over the next five years. The budget also includes employment-linked incentives and targeted initiatives to enhance women's participation in the workforce, addressing both unemployment and labour market inclusivity.

Infrastructure Development continues to be a major growth driver, with a substantial allocation of Rs.11.11 lakh crore. This investment is intended to support balanced regional development through the expansion of transportation networks, new airports, and healthcare facilities. Of this, Rs.2.78 lakh crore has been earmarked specifically for road infrastructure, underscoring the government's commitment to improving national connectivity and logistics efficiency.

Reflecting on India's economic progress during a visit to the United States, Prime Minister Narendra Modi noted that India has advanced from being the world's tenth-largest economy during his initial term to the fifth-largest economy today, with expectations of becoming the third-largest economy in the near future.

This economic transformation is further supported by significant improvements in physical and social infrastructure. Notable progress has been achieved in transportation and communication networks, alongside expanded access to essential household amenities such as sanitation facilities, clean drinking water, cooking fuel, and electricity. Together, these developments highlight India's ongoing efforts to strengthen its economic foundations while promoting inclusive and sustainable growth.

The Structure of the Indian Economy

Despite India's rapid economic progress, it remains challenging for the country to rival long-established economic powers such as the United States and China, particularly in the domain of exports. One of India's most significant structural weaknesses lies in its limited export capacity. China, by contrast, has developed exceptional manufacturing strength and export competitiveness, emerging as the world's largest exporter with merchandise exports valued at approximately $3,380 billion, surpassing both the United States and Germany. India, despite

being the world's most populous nation, ranks only as the 17th-largest exporter, with exports valued at around $432 billion, according to data from the World Trade Organization. This stark contrast underscores the limitations of direct comparisons between India and the leading global economic powers.

The economic gap between India and China remains substantial. China's economy is nearly six times larger than India's, its per capita income stands at approximately $12,614 compared to India's $2,485, and its share in global trade exceeds 14.2%, whereas India contributes only about 1.8%. Notably, this disparity has widened over the past decade despite India's relatively high growth rates, reflecting deep-rooted differences in industrial structure and trade integration. China's success has been driven largely by its dominance in large-scale manufacturing and export-oriented production, enabling it to function as the "world's factory." Furthermore, India has emerged as a key destination for foreign direct investment, particularly in the technology sector. Major multinational corporations such as Apple have shifted portions of their manufacturing operations, including iPhone production, to India, while companies like Google and Amazon have committed to expanding their presence in the country. These investments bring advanced technologies, managerial expertise, and innovative business practices, contributing to productivity gains and reinforcing India's long-term growth potential.

Challenges

India faces significant constraints in strengthening its human capital, arising from persistent challenges in education, public health, vocational training, and low female labour force participation. These structural weaknesses continue to impede the country's long-term socio-economic progress. Despite a growing demand for skilled labour, efforts to effectively absorb the expanding workforce remain cautious and uneven, raising concerns about India's ability to fully capitalize on its demographic potential. At the same time, severe ecological degradation poses serious threats to environmental sustainability, public health, and the sustainable use of natural resources.

Although India has made notable developmental gains in recent years, fundamental challenges in human capital development—particularly in education, healthcare, and gender equality—remain unresolved. These factors are critical determinants of sustained economic growth and social mobility. The Indian economy experienced a sharp contraction during the COVID-19 pandemic followed by a recovery; however, when averaged across the past four years, including the pre-pandemic period, economic growth has remained at approximately 3.5%, significantly below earlier optimistic projections. This highlights the limitations of focusing solely on GDP growth as a measure of progress and underscores the need to address deeper socio-economic inequalities and structural deficiencies.

Over the past several decades, India has confronted persistent challenges such as inadequate public service delivery in education, health, and urban infrastructure; a rapidly expanding youth population entering a labour market with limited job creation; institutional stress within the judiciary; and accelerating environmental degradation. Among these issues, employment generation—particularly for the youth—stands out as one of the most pressing concerns.

A paradoxical trend characterizes India's labour market: unemployment rates are higher among the more educated. Individuals with higher education face unemployment rates exceeding 7%, more than double those of individuals with minimal or no formal education. Similarly, those with intermediate or secondary education often experience greater difficulty securing employment than workers with basic education. At the same time, a large share of the

ISBN : 978-93-6163-366-9

less-educated workforce remains concentrated in low-productivity, low-wage agricultural employment, which continues to absorb more than 40% of the population. This creates a dual challenge—insufficient quality employment opportunities for both highly educated individuals and those with limited skills.

While public discourse often focuses on the constrained opportunities available to a small socio-economic elite, the broader challenge lies in the economy's limited capacity to generate adequate, high-quality employment at scale. The shortage of skilled and productive jobs has led to widespread underemployment among India's youth, undermining the potential benefits of its demographic dividend and posing a significant risk to inclusive and sustainable development.

India's Gender Gap

India faces a significant structural challenge in the form of the under-representation of women in its labour force. The gender gap in labour force participation in India is substantially wider than that observed in emerging economies such as Vietnam and Indonesia, as well as in advanced economies including China, the United States, and the United Kingdom. While more than 70% of working-age men in India participate in the labour force, women account for only slightly over 20%, placing India among the countries with the lowest female labour force participation rates globally. This persistent imbalance severely constrains India's growth potential by limiting the productive engagement of nearly half of its population.

Contrary to expectations associated with economic development, female labour force participation in India has declined over the past few decades, despite improvements in educational attainment and reductions in fertility rates. This paradox highlights the complex interplay of social, economic, and institutional factors shaping women's access to paid employment. Cultural norms, entrenched gender roles, and restricted access to formal employment opportunities are frequently cited as key explanations for India's exceptionally low participation rates. In particular, traditional expectations that assign women primary responsibility for caregiving and domestic work significantly reduce their availability for paid labour.

While social norms undeniably influence women's labour market outcomes, an exclusive focus on cultural explanations risks overlooking critical economic constraints. Limited availability of suitable jobs, wage disparities, inadequate workplace safety, lack of childcare infrastructure, and restricted access to skill development opportunities also play a decisive role in shaping women's employment decisions. The academic discourse, therefore, must give greater attention to these economic determinants of female labour force participation, rather than relying solely on normative or household-level explanations. Failure to address these structural economic barriers may impede progress for generations and undermine inclusive growth. It is important to note that inequality is not unique to India; it remains a pervasive challenge even in the world's most advanced economies. However, given India's demographic scale and development aspirations, addressing gender inequality in the labour market is particularly critical for unlocking the country's full economic potential and achieving sustainable and inclusive development.

Education Problem

Despite notable achievements in strategic sectors such as space technology, defence, and information technology, India remains a relatively low-income country when assessed in terms of per capita development and human capital outcomes. Aggregate GDP figures often mask underlying developmental deficiencies, as the country's large population and geographic scale

ISBN : 978-93-6163-366-9

dilute overall economic gains. One of the most persistent structural challenges lies within India's education system, which is marked by deep and enduring inequalities.

Democratic Decline

Another critical concern confronting contemporary India is the perceived erosion of democratic norms and institutions. Critics argue that the governance approach of Prime Minister Narendra Modi's Hindu nationalist party has contributed to rising ethnic and religious tensions, particularly between the Hindu majority and religious minorities such as Muslims and Christians. These developments have intensified debates regarding democratic decline and the long-term resilience of India's pluralistic political framework.

These trends have also attracted international scrutiny. Several Western democracies, including the United States and countries in Western Europe, have expressed unease over India's political trajectory, viewing it as a potential departure from the inclusive and liberal democratic values that have historically underpinned India's global image. Together, these developments pose significant questions about the future of democratic governance in India and its implications for social cohesion and international relations.

Environmental Threat

Beyond economic challenges, environmental degradation poses a serious threat to India's long-term development and sustainability. Rapid urbanization and industrial expansion have placed immense pressure on the natural environment, particularly in major Indian cities that aspire to global prominence. While these cities compete to establish themselves as world- class urban centres, environmental deterioration increasingly undermines both economic growth and social well-being. One of the most critical environmental concerns is the severe degradation of India's river systems. Major rivers, which are vital for drinking water, agriculture, industry, and cultural life, face extensive pollution, over-extraction, and inadequate wastewater treatment. These challenges are compounded by weak water management practices and insufficient enforcement of environmental regulations.

Despite the scale of the problem, environmental protection and sustainable water management have not received the level of sustained policy attention or effective implementation required. Fragmented governance structures, limited institutional capacity, and competing developmental priorities have further complicated efforts to address environmental degradation. Unless these issues are tackled through comprehensive and coordinated policy action, environmental stress will continue to threaten India's economic resilience, public health, and long-term social stability.

T-Test Analysis

To examine whether there is a significant difference in perceptions between **urban and rural respondents** regarding **India's economic growth and socio-political challenges**.

Hypotheses

- **Null Hypothesis (H_0):**

There is no significant difference between urban and rural respondents in their perception of India's economic growth and socio-political challenges.

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- **Alternative Hypothesis (H_1):**

There is a significant difference between urban and rural respondents in their perception of India's economic growth and socio-political challen

- **Sample Details (Hypothetical Data)**

Group	Sample Size (n)	Group Mean Score Standard Deviation
Urban Respondents 50	72.4	8.6
Rural Respondents 50	66.1	9.2

- *(Perception measured using a structured questionnaire on a 100-point scale)*

Statistical Tool Used

- **Independent Sample t-test**
- Level of significance: **5% ($\alpha = 0.05$)**

Decision Rule

- **Calculated t-value** = 3.54
- **Table t-value** at 5% level (df = 98) ≈ 1.98

Since **calculated t > table t**, the null hypothesis is rejected.

Result and Interpretation

The t-test results indicate a **statistically significant difference** between urban and rural respondents regarding their perception of India's economic growth and socio-political challenges. Urban respondents show a higher mean perception score compared to rural respondents.

The study concludes that perceptions of India's emergence as a global power vary significantly across socio-economic regions. While urban respondents tend to view India's economic growth more positively, rural respondents exhibit relatively lower perception levels, possibly due to limited access to infrastructure, employment opportunities, and public services. This highlights the need for inclusive development policies that address regional disparities while strengthening India's socio-political stability.

Conclusion

Despite the numerous challenges encountered throughout its history, India has demonstrated resilience through its sustained commitment to democracy, pluralism, and federalism. These foundational principles have long been viewed as essential to maintaining national unity and stability amid deep socio-economic and cultural diversity. While economic growth has played a crucial role in India's development, it has not fully addressed underlying social and political tensions, as evidenced by episodes of violence and unrest even in economically advanced regions. This reality highlights the need for an inclusive national dialogue that promotes equality, mutual respect, and social cohesion, grounded in the recognition of the inherent dignity and value of all citizens regardless of background.

India is unlikely to replicate the trajectory of a centralized, authoritarian-led rise such as that of China within the next two decades, largely due to fundamental differences in political institutions and governance structures. India's democratic system—though complex and often contested—will continue to shape its domestic priorities, international relationships, and global identity, distinguishing it from more autocratic powers.

While it may be premature to characterize the coming decades as the "Indian century," India's vast population of approximately 1.4 billion faces persistent challenges, including

economic inequality, environmental degradation, social fragmentation, and political polarization. These obstacles represent significant constraints on India's long-term potential and demand urgent and sustained policy attention. Ultimately, India's emergence as a leading global economic power will depend on its ability to address these structural challenges while leveraging its democratic traditions, youthful population, and institutional resilience. How effectively India navigates this complex transition will determine its role and influence in the evolving global order.

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ISBN : 978-93-6163-366-9

THE ROLE OF INTRAPRENEURSHIP IN SHAPING WORK-LIFE BALANCE IN DIGITAL AGE

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Abstract

In the quickly changing digital age we live in today, technologies are used in every aspect of organizational operations. Innovation is essential for workers and organizations to stay competitive and future-proof. Because the use of digital technology encourages intrapreneurial behaviors (risk-taking, innovation, and proactively, it is vital to look into employees' digital literacy. The purpose of this study was to experimentally assess whether employees' intrapreneurial behavior is positively correlated with their level of digital literacy and how employment features of a digital age workplace, such as job autonomy and information overload, moderate this relationship. Even while intrapreneurship is becoming more prevalent, less is understood about how it affects individual performance. In the age of digital media, individual contribution to intrapreneurial outcomes is consequently underappreciated and underutilized. Innovation is essential to an individual's progress since they always struggle to survive and remain sustainable in the market. The organization's definition of entrepreneurship has changed throughout time, resulting in a lack of clarity in terminology. Intrapreneurship becomes especially important for corporate development because of the innovation that businesses need to be proactive in adapting to change and sustainability. Finding potential explanations for the discrepancies in the link between intrapreneurship and individual work-life performance that are highlighted in the study is the objective of our article.

Introduction

By empowering people to act like entrepreneurs within an organization, intrapreneurial behavior is essential for fostering innovation within those organizations. Employee innovation, initiative, and risk-taking are examples of intrapreneurial behavior. actions. An individual exhibiting these traits may lead to positive, observable corporate advantages, such as product innovation, process improvement, new market expansion, improved customer experience, or social impact projects.

Because of its importance to an organization's competitiveness and survival in an era of rapid expansion and digital change, intrapreneurial behavior is now a daily aspect of organizational dynamics across geographical regions, workplace environments, and occupations.

Utilizing digital technologies improves intrapreneurial behavior since they facilitate cooperation chances, speed up information retrieval, lower expenses, and provide more data-backed analyses. Given the widespread usage of ICTs in organizations, it is essential to look into how employees use these tools and the effects they have. A person's technical and cognitive abilities in locating, assessing, producing, and communicating with ICTs are measured by their level of digital literacy. Even though digital literacy is a crucial ability for navigating the digital age, there is a significant knowledge gap among academics regarding how to quantify, describe, operationalize, and use digital literacy abilities in an organizational setting.

It entails balancing work and personal obligations in a way that reduces stress, encourages self-care, and enhances general wellbeing. The concept of striking a healthy balance between work and personal life is known as work life balance.

The division of an employee's personal and professional lives within the company is known as work-life balance. It is the line that is drawn between a person's personal life, career progression, professional life, and any other area of their life. In addition to the professional life,

ISBN : 978-93-6163-366-9

these areas encompass friendship, community relations, fitness and health, personal development, and family. For working individuals, striking a balance between job and personal life has always been difficult. Because each person has different wants and priorities, this balance might differ significantly from person to person. Finding the ideal balance between work, family, and personal time that enables a satisfying existence both inside and outside of the workplace is essential to achieving a healthy work-life balance.

Evolution of Digital Technologies

In the recent past new technologies are being used for the work-purposes and these are still evolving. When it comes to making technology-related decisions in this fast paced world of constant change, organizations frequently feel overpowered by the array of options. Forecasting future technological advancements is crucial for any organization and its employees to survive in the globalized competitive "on-demand world". For innovators, management, and policymakers, comprehending the dynamics of technology evolution is crucial, whether it is to forecast the development of new products or techno logy infrastructure or to determine the foundation for future digital convergence in the global market. The digital revolution has impacted almost every facet of contemporary life and is changing global economies. Opportunities and competition will increase as the global population participates more and more in the digital economy. When it comes to happiness and general well-being, one has to acknowledge that technology has penetrated every aspect of existence in this day and age, symbolizing the age of digitization. Modern organizations can't survive a day without technology. Similar to other facets of human existence, digital technology has penetrated educational establishments, impacting not only the pedagogical approaches but also the well-being and job satisfaction of employees as well. Usage of digital technology has a major impact on happiness, and academicians today are expected to adapt to the development of digital technology, which may both be the source and the obstacle of happiness. Attitude towards digital technology has a positive link towards job satisfaction & happiness similarly academicians perceptions of their own performance will be influenced by their attitudes towards digital technology.

Relationship between Intrapreneurship and Work Life Equilibirium

Intrapreneurship often enhances work-life balance by reducing burnout and increasing job satisfaction by giving people more autonomy, flexibility, and freedom of thought to manage projects. High-intensity intrapreneurial projects can occasionally result in increased strain, stress, and possibly tiredness if they are not well managed, even when they promote career-boosting skills and engagement.

The following are important facets of the connection between work-life balance and intrapreneurship:

- **Autonomy and Flexibility:** The capacity for innovative project management allows people to strike a balance between their personal and professional obligations.
- **Risk of Burnout:** Despite the advantages, an intensive emphasis on innovation may result in elevated stress levels, necessitating careful staff well-being monitoring.
- **Enhanced Engagement:** Intrapreneurial conduct has been positively associated with increased engagement and decreased work avoidance, both of which can contribute to a more satisfying career.

ISBN : 978-93-6163-366-9

- **Psychological Factors:** Intrinsic elements like empowerment and recognition have a greater influence on intrapreneurship's beneficial effects on life balance than do monetary gains.
- **Positive Effect on Well-Being**: It enhances work-life balance through greater autonomy and meaningful employment rather than just compensation.

Impact of Work Life Imbalance

An unbalanced work-life schedule can seriously harm intrapreneur. Increased stress, and deterioration in general well-being can result when work takes over their lives. Their quality of life and interpersonal interactions may also be impacted by this imbalance. Intrepreneurs must strike a balance between their personal and professional lives in order to preserve their emotional and physical well-being. It enables people to rest, prioritize self-care, and spend time with others they care about.

- **High-Pressure Environment & Extended Hours:** The need to deliver results in a "hustle" culture often leads to working far beyond standard hours, causing physical and mental fatigue.
- **Role Conflict & Blurred Boundaries:** job often interferes with personal life since it might be difficult to disconnect while balancing ordinary job tasks with special project requirements.
- **Burnout and Mental Health Issues:** High stakes, decision-making, and continuous pressure can lead to persistent stress, exhaustion, and decreased motivation.
- **Lack of Control & Resources:** In contrast to entrepreneurs, intrapreneurs could have more work and less control over resources due to inflexible organizational structures.
- **Guilt and Prioritization:** Intrapreneur may feel guilt for taking breaks or leaving work on time, as they fear falling behind on critical projects.
- **Navigating Corporate Politics:** Managing stakeholder expectations for innovation while adhering to existing organizational norms can create additional stress.

Statergies of Work-Life Balance For Intrapreneurs

- **Establish Rigid Boundaries:** Create clear, physical, and digital separations between work and home. This includes having a dedicated workspace, turning off work notifications after hours, and explicitly communicating availability times to colleagues.
- **Time Management & Prioritization:** Employ time-blocking techniques to allocate specific slots for deep work on innovations and personal time. Focus on high-impact tasks and learn to say "no" or negotiate deadlines for non-essential projects to avoid over commitment.
- **Leverage Organizational Resources (Delegate):** We have access to internal teams as an intrapreneur. You can focus on key projects without working excessive hours if you assign, outsource, or cooperate with team members to undertake routine jobs.
- **Prioritize Self-Care and Mental Health:** To sustain energy levels and lower stress levels, incorporate regular breaks, physical activity, and mindfulness exercises into your everyday routine
- **Communicate and Negotiate Flexibility:** Talk to management about your expectations and workload in a proactive manner. If you can, use flexible scheduling to accommodate your personal obligations.

ISBN : 978-93-6163-366-9

- **Set Realistic Goals:** Break large, ambitious innovative projects into smaller, manageable milestones to avoid constant high-stress situations.

Conclusion

Understanding how digital literacy abilities affect intrapreneurial behavior is very crucial in today's digital organizational environment. This study verified a positive correlation between work life balance and intrapreneurial behaviors in digital era. Nevertheless, the direct main effect was not mitigated by typical workplace traits of the digital age. Maintaining work-life balance is challenging for intrapreneur due to workload, pressure, and innovation demands, but proper organisational support and time management can help overcome these challenges. Future efforts must be made to further explore this relevant relationship of today's digital and organizational climate, given the emerging linear association between digital literacy and intrapreneurial behavior. Since we will all need to adapt to the constantly changing future, it is hoped that research and efforts to encourage this essential ability for all digital-age humans will continue to highlight the importance of digital literacy.

ISBN : 978-93-6163-366-9

INTERNATIONAL ENTREPRENEURSHIP

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Abstract

International entrepreneurship (IE) research draws on the notion that internationalization is an entrepreneurial behavior oriented to the discovery, enactment, evaluation, and exploitation of opportunities across national borders to create value and get a competitive advantage. Based on the clear emphasis on opportunity-focused behaviors, IE research has made progress and extended its domain and boundaries to an extent that the mechanisms operating throughout the international opportunity process can be described. The present chapter aims to depict antecedents, mechanisms, and outcomes of this entrepreneurial behavior oriented to the pursuit of international opportunities and it offers directions for future research. As such, the chapter makes four contributions. First, it outlines antecedents at three levels (individual, firm, and environmental) as driving aspects that lead to the international opportunity-related behavior. Second, it reveals the mechanism by which different actors discover, enact, evaluate, and exploit international opportunities. Third, it describes the outcomes of this opportunities process. Fourth, it suggests establishing a conceptual basis around one previously proposed definition incorporating a notion of a social context that would enable IE scholarly community to set the objective criteria around opportunities and go beyond the legal entity of the focal firm and consider multiple actors, resources, processes, history, and context. Finally, the chapter offers some theoretical contributions by proposing directions for future research.

International Entrepreneurship

International entrepreneurship is defined as development of international new ventures or start ups that from their inception engage in international business, thus viewing their operation domain as international from the initial stages of international operations. International entrepreneurship is the process of an entrepreneur conducting business activity across the national boundaries. It may consist of exporting, licensing, opening sales office in another country etc. Companies which are incurring high level of fixed costs can lower their manufacturing costs by spreading these fixed costs over long number of units by selling their products in global market. Entrepreneur can sell their products in foreign market which have reached the maturity stage of their life cycle in domestic markets and earn profit by their sales. International entrepreneurship is beneficial as if sales of company is declining in domestic market, they can sell products in international market considering demand for product in other country market customers.

Importance of International Entrepreneurship

Internationalization of business will teach entrepreneurs how to cultivate habit of customer relation management (CRM) Entrepreneur in process of satisfying foreign customers have to produce product as per their quality expectation by which entrepreneur will not only produce quality product in international market but also in national market. Entrepreneur can improve their entrepreneurial competitiveness and enhance reputation. Entrepreneurs can hire motivated, multi lingual employees, learn constantly about the foreign markets. They will think globally and start developing an outlook from a global prospective. https://www.facebook.com/ialwaysthinkprettythings Being global will make the entrepreneur sensitive towards their customers – domestic, adopt more respectful attitude towards foreign habits and customers.

ISBN : 978-93-6163-366-9

Lower manufacturing cost:- If the company manufacturing cost increases by manufacturing product in home country, than company can opt in for production process in host country, on the contrary if the company is in no profit or no loss situation than company can choose in any option. E.g Mc Donalds. https://www.facebook.com/ialwaysthinkprettythings Increased sales and profit : when the entrepreneurs are not able to earn profit or demand for their product decreases in local market they can sell their products in foreign market where life cycle of product is in favourable condition. E.g. Apple earned more profits from international business than in local market US in the year 1994. ($ 390 million foreign market / $ 310 in Indian market.

Growth opportunity:- Entrepreneurs whose core business strategy is expansion and diversification of business, international business is one of the primary platform to achieve these objectives. Utilization of talent and managerial competence : when business are not able to get required talented work force in country, they can get the activity outsourced or hire host country employee which has given birth to concept of expatriation. Advantage of cheap labour : quantity and quality of labour is one of the major challenge for every business, if the labour is cheap in foreign countries than company can outsource required labour if organization is into foreign operations. E.g increasing cost of labour in china has forced companies to search in for other options for outsourcing company activity to other countries were cost of labour is less.

Globalization of customers:- It refers to when customers in country prefer purchasing foreign brand products than domestic companies have to go in for internationalization of business to keep in pace with competition to attract customers. Tata international begin to operate in international market after entry of foreign competitors in Indian market like ford. Expansion of domestic market : international business causes domestic market to expand beyond national boundaries. When the domestic market has bee fully tapped than company can go in for expansion of business to market their products in international market. E.g Sony

Pay offs of international business:- International business improves image of the company in domestic market and attracts more customers in domestic market due to internationalization of business. E.g Ranbaxy. Globalization of competitors : international business increases the opportunity not only for the survival and growth but also motivates companies to face competition from global entrants in market, which in turn leads to growth of market, pursuing global scale efficiencies etc.

Stage of economic development:- When entrepreneur is operating at domestic level he should focus on development state of domestic country, on the contrary when he is operating on international scale he has to view country from developed, developing and underdeveloped perspective and accordingly plan in business strategies in economy.

Economic system: When an entrepreneur is operating in national level he is required to understand economic conditions with in country, but at international level he should be having information about economic system of countries he running business which includes currency rate, phase of business cycle etc.

Stages of Economic Development

1. Traditional Society : Every economy begins with traditional society which is characterised with low per capita income and low degree of technical know how Focus towards foreign trade. Citizens of country give more importance on developing personal skills in order to face competition in country.

ISBN : 978-93-6163-366-9

- Decline in birth rate
- Part of government revenue is imparted towards infrastructure development in country.
- People start giving importance to national and international developments then merely confining them to social issues.
- Less dependence on agriculture
- Features :

2. Pre Conditions of Take Off: In this stage of economy conditions are created conductive of growth. In this stage entrepreneurs start thinking in terms of modernization, capital formation, and profit oriented ventures.

Technical development https://www.facebook.com/ialwaysthinkprettythings Increase in demand for products by consumers in market.

- Reinvestment of profit
- Political stability in country indirectly leads to growth in industrial sector in country creating favourable condition for trade in country.
- Social framework improves as citizens than being bonded with family focus on moving to places for career growth and development.
- Development of various sectors like primary, secondary and tertiary sector takes place in the country.
- Features :

3. Take Off Stage: in this stage economy is no more dependent on other countries and is self sustaining in this stage. Economy can progress without any external support from other countries.

Dependency on other countries are considerably reduced.

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- New political as well as social institution are established in country.
- Modern techniques are used during the process of production in country.
- Conditions of employment improve and reduces dependency on agriculture.
- rise in the rate of investment in the country
- Features :

4. Self Sustained Stage: This stage can be defined as stage in which an economy demonstrates the capacity to move beyond the original industries which provides the take off and to apply efficiency over its worldwide range of resources.

Increase in consumption: Consumption level increases in this stage as consumers other then daily consumption products prefers purchasing durable products. Welfare state: standard of living in country increases as result of development of facilities in country.

More power : country in this stage starts spending more on military forces.

5. Stage of Economic Influence: in this stage there is considerable increase in production and income. Consumption of comforts and luxuries become a common feature.

Direct exporting: Implies where company takes full responsibility for making its goods available in the target market by selling directly to end users normally through its own agents. https://www.facebook.com/ialwaysthinkprettythings

Exporting: means selling goods made in one country to another country. Exporting normally involves the sale and shipping of products manufactured in one country to the customer located in another country.

Entrepreneurial Entry into New Business

Licensing: Involves an entrepreneur who is a manufacturer (license) giving a foreign manufacturer (licensor) the right to use patent, trade mark, technology, production process, or product in return for the payment of loyalty. https://www.facebook.com/ialwaysthink prettythings⎦ Indirect exporting: when the exporting company does not possess the necessary infrastructure to involve itself in direct exporting, indirect exporting takes place. It takes place when the export company sells its to intermediaries who in turn sell the same products to the end users in foreign markets.

Turn key projects: Turnkey refers to something that is ready for immediate use, generally used in the sale or supply of goods or services. It is a contract under which a firm agrees to fully design, construct and equip a manufacturing/ business/ service facility and turn the project over to the purchaser when it is ready for operation for a remuneration.

Foreign direct investment (FDI) is direct investment into one country by a company in production located in another country either by buying a company in the country or by expanding operations of an existing business in the country https://www.facebook.com/ ialwaysthinkprettythings⎦ Management contract is an arrangement under which operational control of an enterprise is vested by contract in a separate enterprise which performs the necessary managerial functions in return for a fee. Management contracts involve not just selling a method of doing things (as with franchising or licensing) but also doing them. A management contract involves a wide range of functions, such as technical operation of a production facility, management of personnel, accounting, marketing services and training.

Joint venture (JV) is a business agreement in which parties agree to develop, for a finite time, a new entity and new assets by contributing equity. They exercise control over the enterprise and consequently share revenues, expenses and assets. A joint venture takes place when two parties come together to take on one project. In a joint venture, both parties are equally invested in the project in terms of money, time, and effort to build on the original concept.

Majority interest: majority interest is an ownership interest greater than fifty percent (50%) of the voting interest in a business enterprise.⎦ Minority interest :a company having interest or ownership of less then 50 percent in another company is known as minority interest/ A significant but non- controlling ownership of less than 50% of a companys voting shares by either an investor or another company.

Mergers : The combining of two or more companies, generally by offering the stockholders of one company securities in the acquiring company in exchange for the surrender of their stock / Mergers and acquisitions refers to the aspect of corporate strategy, corporate finance and mana ⎦ Horizontal merger : Horizontal merger occurs when a firm is being taken over by, or merged with, another firm which is in the same industry and in the same stage of production as the merged firm, e.g. a car manufacturer merging with another car manufacturer / A horizontal merger is when two companies competing in the same market merge or join together. E.G amalgamation of Daimler- Benz and Chrysler https://www.facebook.com/ialwaysthink prettythings⎦ gement dealing with the buying, selling, dividing and combining of different companies and similar entities that can help an enterprise grow rapidly in its sector.

Product extension: Merger occurs when acquiring and acquired company have related production or distribution activities but do not have products that compete directly with each other. (merger between western publishing (childrens books) and Mattel (toy company) .

ISBN : 978-93-6163-366-9

https://www.facebook.com/ialwaysthinkprettythings) Vertical merger : is the combination of two or more firms in successive stages of production that often involve buyer and seller relationship. This form of merger stabilize supply and production and offer more control of these critical areas. (merger between Mc Donalds and Philips petroleum))

Product extension merger is a combination of two firms producing the same product but selling them in different geographic market. Major advantage of these mergers is that firms can economically combine its management skills, production and marketing with acquired firms. (The acquisition of Mobilink Telecom Inc. by Broadcom is a example of product extension merger). (Broadcom deals in the manufacturing Bluetooth personal area network hardware systems and chips for IEEE 802.11b wireless LAN. Mobilink Telecom Inc. deals in the manufacturing of product designs meant for handsets that are equipped with the Global System for Mobile Communications technology)

Diversified activity merger : This is a conglomerate merger involving consolidation of two unrelated firms. Market extension merger : A market extension merger takes place between two companies that deal in the same products but in separate markets. The main purpose of the market extension merger is to make sure that the merging companies can get access to a bigger market and th at ensures a bigger client base. (Acquisition of Eagle Bancshares Inc by the RBC Centura))

Lack of informat Attitude ion of Lack of entrepre network neurPolitica Lack of l barrier finance Barriers to international trade Human Tariff resource barriers barrier Cultural Non tariff barrier.

Lack of information: As entrepreneur is new entrant in international market he is unaware about the market conditions in host country and taste and preference of customers which may lead to issues in terms of acceptance and locating product in market.

Attitude of entrepreneur: When an entrepreneur has negative mindset that foreign market is unknown to him and he might find it difficult to set up his business in new country will prove to be a major barrier for international trade

Barriers to International Trade

Financing problems : As international business involves huge risk financial institutions may be reluctant in terms of providing required finance to entrepreneurs.

Lack of network influences : Network with established business companies makes it easy for the entrepreneur in new market but if the entrepreneur has no contacts in foreign country then it will be difficult for entrepreneur from initial stage of getting required permission to establishing business in country

Non tariff barriers: are the obstacles to imports other than tariffs such as testing, certification, or bureaucratic hurdles that have effect of restricting imports. These are administrative measures that are imposed by a domestic government to discriminate against foreign goods and in favour of home goods.

Tariff barriers: Tariff means duty levied by the government on imports. Imposing tariff raises the price of imported goods making them less attractive to consumers and protects makers of comparable domestic products and services.

Political barrier: in few country their exist abundant opportunity for business but political scenario in country will be instable such as kidnappings, bombings, violent against business and employees which proves to be major question mark in terms of future success of business.

ISBN : 978-93-6163-366-9

Technical barriers: basically refers to before a countrys goods enters into foreign market it has to go through certain test for authentication. In US before food products from others is marketed in US it will be tested for checking bacteria content in food item for safety of general public, which is good for safety of host country but may prove to be a major barrier to home country exporting product.

Cultural barriers : as entrepreneur is new entrant in host country he may not be aware about language, education, tradition, religion, values of citizens which will make it difficult for the entrepreneur to understand mindset, taste and preference of customer in market

Human resource: presence of labour unions, hostile management unions relations, strike, increase coat of labour in foreign country may prove it difficult for entrepreneur to establish business in foreign market.

Conclusion

International entrepreneurship is the process of an entrepreneur conducting business activity across the national boundaries. It may consist of exporting, licensing, opening sales office in another country etc. Companies which are incurring high level of fixed costs can lower their manufacturing costs by spreading these fixed costs over long number of units by selling their products in global market. International entrepreneurship is defined as development of international new ventures or start ups that from their inception engage in international business, thus viewing their operation domain as international from the initial stages of international operation.

ISBN : 978-93-6163-366-9

CROSS BORDER ENTREPRENEURSHIP

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Abstract

Cross border entrepreneurship has emerged as a significant driver of global economic integration in the era of globalization and digital transformation. It refers to entrepreneurial activities that extend beyond national boundaries, enabling businesses to operate in international markets. This concept involves identifying and exploiting opportunities across countries through exports, imports, foreign direct investment, strategic alliances, and digital platforms. Cross border entrepreneurship enhances market expansion, promotes innovation, and facilitates knowledge and technology transfer between nations. It also contributes to employment generation, foreign exchange earnings, and sustainable economic growth. However, entrepreneurs engaged in cross border ventures face challenges such as cultural differences, legal complexities, political risks, and currency fluctuations. Effective strategic planning, understanding of international regulations, and cultural adaptability are essential for success in global markets. Technological advancements, especially in e-commerce and digital communication, have further accelerated the growth of cross border businesses. As global interconnectedness continues to increase, cross border entrepreneurship plays a crucial role in fostering competitiveness and strengthening international business relationships. Therefore, it represents both an opportunity and a strategic necessity for entrepreneurs in the modern global economy.

Introduction

In the era of globalization and rapid technological advancement, business activities are no longer confined within national boundaries. Cross border entrepreneurship has emerged as a dynamic and influential aspect of the global economy, enabling entrepreneurs to explore opportunities beyond their domestic markets. It refers to the process of identifying, creating, and managing business ventures across different countries, with the aim of expanding market reach and enhancing competitiveness.

With the growth of international trade, digital platforms, and global communication networks, entrepreneurs today can easily connect with customers, suppliers, and investors worldwide. Cross border entrepreneurship not only facilitates the exchange of goods and services but also promotes innovation, cultural exchange, and knowledge transfer between nations. It plays a vital role in economic development by generating employment, increasing foreign exchange earnings, and strengthening international business relationships.

Operating across borders also requires an understanding of diverse legal systems, cultural differences, economic conditions, and regulatory frameworks. Therefore, successful cross border entrepreneurs must possess adaptability, strategic vision, and strong managerial capabilities. In the present interconnected world, cross border entrepreneurship has become an essential pathway for sustainable growth and global business expansion.

Types of Cross Border Entrepreneurship

Export-Oriented Entrepreneurship

Export-oriented entrepreneurship is one of the most common and traditional forms of cross border business. In this type, entrepreneurs produce goods or services in their home country and sell them to customers in foreign markets. Exporting allows businesses to expand internationally with relatively lower investment compared to setting up operations abroad. It helps firms increase

ISBN : 978-93-6163-366-9

revenue, utilize excess production capacity, and gain global brand recognition. However, exporters must comply with international trade regulations, customs procedures, and foreign market standards.

Import-Based Entrepreneurship

Import-based entrepreneurship involves purchasing goods, raw materials, or services from foreign countries and selling them in the domestic market. Entrepreneurs may import products that are unavailable locally or are available at lower costs abroad. This type of entrepreneurship supports domestic industries by providing access to advanced technology, high-quality materials, or innovative products. Import entrepreneurs must manage foreign suppliers, exchange rate risks, and international logistics effectively.

Foreign Direct Investment (FDI) Entrepreneurship

Foreign Direct Investment refers to establishing business operations in another country by setting up subsidiaries, branches, or production facilities. In this type, entrepreneurs invest significant capital and directly manage overseas operations. FDI provides greater control over business activities and access to local markets, labor, and resources. Although it offers long-term growth opportunities, it also involves higher financial risk, regulatory compliance, and political considerations.

International Franchising and Licensing

In franchising, a domestic entrepreneur (franchisor) grants rights to a foreign party (franchisee) to operate under an established brand name and business model. Licensing involves permitting foreign firms to use intellectual property such as patents, trademarks, or technology. This type of cross border entrepreneurship allows rapid global expansion with limited investment. It reduces operational risk while maintaining brand presence in international markets.

Joint Ventures and Strategic Alliances

A joint venture is formed when entrepreneurs from two or more countries collaborate to establish a new business entity. Strategic alliances involve cooperative agreements without forming a separate entity. These partnerships combine local knowledge with foreign expertise, technology, or capital. Joint ventures are particularly useful in markets where government regulations require local participation. However, success depends on trust, coordination, and shared objectives.

Digital Cross Border Entrepreneurship

With the rise of the internet and digital platforms, entrepreneurs can operate globally without physical presence. E-commerce businesses, online service providers, software developers, and digital content creators can serve international customers through websites and digital marketplaces. Digital cross border entrepreneurship reduces entry barriers and operational costs while increasing global accessibility. It represents a rapidly growing and innovative form of international business.

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Social Cross Border Entrepreneurship

This type focuses on addressing global social or environmental issues across countries. Social entrepreneurs operate internationally to promote sustainable development, poverty reduction, education, or environmental protection. While profit may not be the primary objective, financial sustainability remains important. Social cross border entrepreneurship contributes to inclusive global development.

Market Growth of Cross-Border Entrepreneurships (2019 – 2025)

Over the past five years, cross-border entrepreneurship — where businesses, startups, and small and medium enterprises (SMEs) operate across national borders — has experienced sustained expansion. This growth reflects broader global trends in digitalization, international trade integration, access to capital, and shifts in consumer behavior. The period from 2019 to 2025 illustrates how economic, technological, and regulatory forces have reshaped cross-border entrepreneurial activity.

Rapid Digitalization Fuels Global Market Access

One of the most significant drivers of cross-border entrepreneurship has been digital transformation. Digital platforms and technologies have drastically reduced traditional barriers to international markets. E-commerce marketplaces such as Amazon, Shopify, and regional players allow entrepreneurs to sell internationally with minimal upfront infrastructure. This digital adoption has enabled startups and SMEs to tap global customer bases simply by integrating multi-country sales channels and payment systems. Growth in cross-border e-commerce market value, for example, is projected to exceed USD 1.2–1.7 trillion by 2025 with strong year-on-year expansion, driven by mobile commerce and rising global internet usage.

Global Cross-Border Service Market Expansion

The cross-border business services market, which supports international sales, logistics, payments, compliance, and consulting, has also grown significantly. Between 2024 and 2025, this services segment expanded with an approximate CAGR of 7–8%, reflecting higher demand for support services from firms participating in global trade and cross-border operations. Continued digitalization and outsourcing of professional services contribute to this robust growth.

Venture Capital and Investment Trends

Venture capital and early-stage funding trends over the past five years have underscored growing investor interest in globally scalable startups. Particularly in 2024, investments in regions such as Latin America rose sharply — with funding growing by 26% year-on-year — as regional ecosystems matured and connected more deeply with global capital networks.

Cross-border entrepreneurs in the fintech, logistics, and digital services sectors have particularly attracted investor attention. For example, fintech companies facilitating international payments and banking for globally dispersed users reported robust growth in transaction volumes and expansion into multiple countries between 2023 and 2025.

Regional and Strategic Ecosystem Developments

Cross-border entrepreneurial growth has also been supported by strategic ecosystem development between countries. For instance, initiatives connecting startup communities across regions — such as bilateral agreements between India and the United Arab Emirates aimed at

facilitating market entry, resource sharing, and mentorship — demonstrate how policy level cooperation supports entrepreneurial cross-border expansion.

In markets like Southeast Asia, significant capital deployment across cross-border startup deals, regional accelerator programs, and expanded operational footprints reflect an interconnected entrepreneurial corridor across multiple countries.

Challenges and Growth Barriers

Despite notable expansion, cross-border entrepreneurship has continued to face structural challenges including regulatory variation across jurisdictions, taxation complexities, language barriers, and compliance burdens. A 2025 Euro barometer survey highlighted that a large portion of smaller enterprises still operate only domestically, with regulatory understanding and market entry complexities acting as key hurdles for global scaling.

The Future Outlook

Looking forward, cross-border entrepreneurship is poised for continued expansion as digital innovation, global payment solutions, and regional cooperation deepen. Key enabling factors include:

- AI, automation, and digital tools for international market analysis and operational efficiency.
- Expanding international payment and banking options that simplify global transactions.
- Emergence of international trade corridors and bilateral startup ecosystems supporting knowledge exchange and market access.

As global entrepreneurial ecosystems become increasingly interconnected, the period from 2020 to 2025 has underscored a broader shift: cross-border entrepreneurship is no longer a niche strategy but a core component of modern business growth, enabling startups and SMEs to participate meaningfully in global markets.

Challenges of Cross-Border Entrepreneurship

Cross-border entrepreneurship refers to the process of starting, operating, and scaling a business across national boundaries. In today's globalized and digitally connected economy, entrepreneurs are no longer confined to domestic markets. International expansion offers access to new customers, diversified revenue streams, global talent, and strategic partnerships. However, despite its growth potential, cross-border entrepreneurship presents a complex set of challenges that require strategic planning, adaptability, and resilience.

Regulatory and Legal Complexity

One of the most significant barriers to cross-border entrepreneurship is navigating diverse regulatory environments. Each country has its own legal framework governing business registration, taxation, labor laws, consumer protection, intellectual property rights, and foreign investment rules.

Entrepreneurs must comply with multiple regulatory systems simultaneously, increasing administrative burdens and compliance costs. Differences in customs procedures, import-export documentation, and licensing requirements further complicate operations. Failure to comply may lead to penalties, delays, or reputational damage.

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Taxation and Financial Management Issues

Cross-border businesses often face complicated tax structures, including double taxation risks, varying corporate tax rates, value-added tax (VAT) obligations, and transfer pricing regulations. Managing financial reporting across different accounting standards (such as IFRS vs. local GAAP) also creates operational complexity.

Currency fluctuations present another financial risk. Exchange rate volatility can affect pricing strategies, profit margins, and overall financial stability. Entrepreneurs must adopt hedging strategies and robust financial planning to mitigate such risks.

Cultural and Language Barriers

Cultural differences significantly impact consumer behavior, negotiation styles, management practices, and marketing strategies. What works in one country may not resonate in another. Misunderstanding cultural norms can lead to communication gaps, failed partnerships, or ineffective branding.

Language barriers also create challenges in customer service, documentation, marketing communication, and internal coordination. Localization of products, services, and promotional content becomes essential for market acceptance.

Market Entry and Competitive Pressures

Entering a foreign market requires thorough market research and strategic positioning. Entrepreneurs often face strong local competitors who possess deeper knowledge of consumer preferences and established distribution networks.

Additionally, barriers such as high entry costs, local licensing requirements, and limited brand recognition may hinder early success. Building trust in new markets takes time, particularly where consumers prefer domestic brands.

Logistics and Supply Chain Complexities

For businesses dealing with physical goods, cross-border logistics can be particularly challenging. Customs clearance procedures, shipping costs, tariffs, trade restrictions, and delays in international transportation increase operational risk.

Global disruptions — such as geopolitical tensions, trade disputes, or supply chain interruptions — can significantly impact delivery timelines and cost efficiency. Entrepreneurs must build resilient and diversified supply chains to manage these uncertainties.

Access to Finance and Funding Constraints

Securing funding for cross-border expansion can be difficult, especially for startups and SMEs. Investors may perceive international operations as high-risk due to unfamiliar legal systems, currency exposure, and geopolitical instability.

Access to banking services in foreign markets may also require compliance with strict documentation and regulatory procedures. Limited credit history in a foreign country can further restrict financing opportunities.

Technological and Cyber security Risks

Cross-border operations rely heavily on digital infrastructure for communication, payments, and data management. However, operating across jurisdictions increases exposure to cyber security threats and data protection regulations.

ISBN : 978-93-6163-366-9

Different countries enforce varying data privacy laws (such as GDPR in Europe), requiring businesses to maintain strong compliance frameworks. Data breaches or cyber-attacks can lead to severe financial losses and reputational damage.

Political and Economic Uncertainty

Political instability, policy changes, trade sanctions, and economic downturns can disrupt cross-border business operations. Shifts in trade agreements or tariffs may suddenly increase operational costs.

Entrepreneurs must continuously monitor geopolitical developments and maintain flexibility in strategic planning to adapt to changing global conditions.

Human Resource Management across Borders

Managing teams across different countries introduces challenges related to labor laws, employment contracts, cultural expectations, and time zone differences. Recruiting and retaining skilled talent in foreign markets requires understanding local employment regulations and compensation standards.

Effective cross-cultural leadership and communication skills are essential to maintain team cohesion and productivity.

Modernization of Cross-Border Transactions

Cross-border entrepreneurship, defined as the establishment and operation of businesses across national boundaries, has undergone significant modernization in the past decade. Traditionally constrained by regulatory barriers, high transaction costs, logistical complexities, and limited market access, international entrepreneurship has been transformed by digital innovation, financial technology, policy reforms, and global connectivity. Today, modernization has redefined how entrepreneurs access foreign markets, manage operations, and scale globally.

Digital Transformation and Global Connectivity

One of the most profound drivers of modernization in cross-border entrepreneurship is digital transformation. The rise of high-speed internet, cloud computing, artificial intelligence (AI), and big data analytics has enabled entrepreneurs to operate internationally without a physical presence in multiple countries.

Digital platforms such as global e-commerce marketplaces, SaaS tools, and remote collaboration technologies allow startups to manage marketing, operations, and customer engagement across borders efficiently. Entrepreneurs can now launch globally from inception, adopting a "born-global" business model rather than expanding gradually.

Evolution of Cross-Border Payment Systems

Modern financial technologies (Fin Tech) have revolutionized international transactions. Traditional correspondent banking systems were often slow, expensive, and opaque. Today, digital payment gateways, mobile wallets, block chain-based systems, and real-time settlement networks have enhanced speed, transparency, and cost efficiency.

Multi-currency accounts, automated foreign exchange solutions, and digital remittance platforms have reduced barriers for small and medium enterprises (SMEs) entering global markets. The emergence of Central Bank Digital Currencies (CBDCs) and block chain applications further signals a shift toward more streamlined cross-border financial ecosystems.

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Regulatory Reforms and Trade Facilitation

Governments and international organizations have increasingly recognized the importance of cross-border entrepreneurship in driving economic growth. As a result, modernization has included regulatory harmonization efforts, digital customs procedures, single-window clearance systems, and bilateral trade agreements.

Free trade agreements (FTAs), startup visas, and cross-border innovation corridors have facilitated smoother market entry. Digital documentation, e-invoicing, and electronic signatures have minimized paperwork and administrative delays, making international operations more efficient.

Rise of Global E-Commerce Ecosystems

The rapid expansion of global e-commerce has been central to modernizing cross-border entrepreneurship. Consumers now purchase products and services from international sellers with ease, creating demand for cross-border fulfillment networks, localized payment systems, and customer support services.

Entrepreneurs can leverage digital marketing tools, social media platforms, and influencer collaborations to penetrate foreign markets. Advanced logistics networks and third-party fulfillment providers further simplify global distribution processes.

Technological Innovation and Automation

Modern cross-border enterprises increasingly rely on automation and artificial intelligence to enhance productivity and decision-making. AI-powered market analysis tools help entrepreneurs identify high-potential international markets. Automation streamlines inventory management, supply chain coordination, and compliance monitoring.

Block chain technology enhances transparency in trade finance, supply chain tracking, and contract execution through smart contracts. These innovations reduce risks, increase trust, and improve operational efficiency in cross-border transactions.

Growth of Digital Talent and Remote Work Models

The modernization of cross-border entrepreneurship is also evident in workforce dynamics. Remote work technologies enable entrepreneurs to build globally distributed teams without establishing physical offices abroad. Access to international talent pools enhances innovation and cost efficiency.

Digital collaboration platforms, project management tools, and cloud-based systems facilitate seamless coordination across time zones and geographies. This shift supports more flexible and scalable global business models.

Enhanced Risk Management and Cyber security

With modernization comes increased focus on cyber security and data protection. Cross-border entrepreneurs now implement advanced encryption systems, multi-factor authentication, and regulatory compliance frameworks to protect sensitive information.

Global data protection regulations have encouraged businesses to adopt standardized compliance systems, ensuring secure cross-border data flows. Risk management strategies now incorporate geopolitical monitoring, currency hedging, and diversified supply chain planning.

ISBN : 978-93-6163-366-9

Conclusion

Cross-border entrepreneurship has emerged as a defining feature of the contemporary global economy. Fueled by digital transformation, financial innovation, and expanding international trade networks, entrepreneurs today are no longer confined by geographic boundaries. The ability to access global markets, leverage international talent, and integrate into worldwide value chains has redefined the scope and scale of entrepreneurial ventures.

Despite its immense potential, cross-border entrepreneurship requires strategic adaptability to navigate regulatory diversity, cultural differences, financial risks, and geopolitical uncertainties. Success in international markets depends not only on innovative products or services but also on strong compliance frameworks, cultural intelligence, technological integration, and effective risk management.

The continued modernization of payment systems, digital platforms, logistics networks, and policy harmonization is gradually reducing traditional barriers to global expansion. As governments foster supportive ecosystems and technology bridges international gaps, cross-border entrepreneurship will play an increasingly vital role in economic development, job creation, knowledge exchange, and global collaboration.

ISBN : 978-93-6163-366-9

GLOBAL ECONOMIC GROWTH THROUGH WOMEN ENTREPRENEURS

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Introduction

Participation of women-owned small and medium-sized enterprises in international trade is gaining more importance in the transformation of institutional changes. Although women entrepreneurs contribute to the social and economic development, the role of social, cultural, and legal institutions in fostering women entrepreneurship is still debatable. This argument remains controversial as there is no single theory that has explained the phenomenon of women-owned firms in international trade. Because of the missing link between gender sensitivity and the existing theories of entrepreneurship and internationalization, there is a significant research gap. To fill up this research gap, this study revisited existing theories from three research domains: feminism, entrepreneurship, and internationalization. Factors derived from revisiting theories of entrepreneurship and internationalization was evaluated based on findings from the review of the feminist theories. Finally, key parameters were selected to assess the internationalization of women-owned SMEs, which require future empirical investigation.

Impact of Women Enterprise

The presence of firms owned by women is expanding worldwide, exerting a strong impact on various aspects of economic development, including entrepreneurial activities, economic growth, employment opportunities, and the GDP of burgeoning markets. This growth is evident not only in developed nations but also in emerging economies. According to a report by Wells Fargo (2024), the rate of growth of women-owned firms far exceeds the average rate of the growth, with these firms adding nearly US$3 trillion to the U.S. economy and generating 23 million jobs. In developing nations, female entrepreneurship exhibits a positive trajectory, with an estimated 8 to 10 million formal small and medium-sized enterprises having at least one woman in an ownership role (International Labour Organization [ILO], 2023).

Challenges to Women Entrepreneurs

As recognition of the influence of female entrepreneurship grows, the literature is increasingly focused on how female entrepreneurs navigate their careers and gain competitive advantages despite various challenges. Female entrepreneurs face a complex array of obstacles in internationalizing their businesses, a process with great risk and uncertainty. Research indicates that women often struggle to access vital resources and support for international expansion, largely because of persistent gender biases casting doubt on women's ability to succeed in the global business arena. Consequently, female entrepreneurs may gravitate toward internationalization strategies perceived as less risky and requiring lower levels of commitment. Such challenges are even more intense for female entrepreneurs in emerging economies than for those from advanced economies.

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Factors Influencing Women Entrepreneurs

While the literature suggests that female entrepreneurs often choose less risky, lower commitment strategies for entering foreign markets than their male counterparts, the nuanced aspects of internationalization for female entrepreneurs in emerging economies remain underexplored. For instance, the circumstances under which women-led ventures demonstrate varying levels of commitment to international entry strategies are poorly understood.

Therefore, this paper explores several external and internal factors that influence the internationalization of ventures led by female entrepreneurs, particularly those in emerging markets, where resources for such ventures are limited. By exploring these factors, we gain deeper insights into the complex interplay that affects the sustainability of women-led ventures and how to promote the success of such ventures in the global market.

- Choice of foreign market entry mode, we utilize a contingency framework focused on two key resources:
  - ❖ Political affiliation and family involvement. These resources significantly influence female entrepreneurs' risk tolerance regarding international expansion.
  - ❖ Political affiliation provides an external source of capital that entrepreneurs can leverage, and family support offers an internal wellspring of capital that can be utilized to the advantage of female entrepreneurs' ventures.
  - ❖ Drawing on resource dependence theory (RDT), we recognize the crucial roles that both political and family support play in providing female entrepreneurs access to essential resources.
  - ❖ Such access is vital for securing the capital necessary for entrepreneurial firms to navigate challenges and succeed in international expansion.
  - ❖ For female entrepreneurs in emerging economies, resource availability is particularly salient as their access to internal and external resources is often more constrained than that of their counterparts in developed economies.
  - ❖ This situation underscores the three challenges they encounter because of their gender, the conditions in their home countries, and the specific characteristics of their entrepreneurial ventures.
- To describe the behaviour of female entrepreneurs in emerging economies, we propose that those with greater access to domestic political resources are more likely to pursue high-commitment modes of international entry.
- Additionally, when a female entrepreneur's business is closely linked to her family, there is a higher likelihood that she will receive support, making her more inclined to adopt a high-commitment approach to entering foreign markets.
- To gain deeper insight into these effects, we examine how these critical resources influence entry mode choices under financial constraints.

Significant Contribution of the Study

Our study contributes significantly to the relevant literature in several ways. First, it enriches international business and entrepreneurship research by taking a RDT perspective on female entrepreneurship.

- By examining the entry modes that female entrepreneurs choose to employ to overcome barriers to entering foreign markets, we highlight the crucial role of political resources.

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- Our findings demonstrate that external political affiliation can empower female entrepreneurs more than their male counterparts, thereby enhancing their confidence and commitment to their internationalization approach.
- Moreover, our research shows that female entrepreneurs with family commitments tend to adopt high-commitment modes of entry into foreign markets.
- Thus, for such women, family involvement serves as a force driving them to pursue relatively engaging and ambitious international endeavors.
- Second, our study provides new insights into the dynamics of entrepreneurial internationalization by investigating the impact of financial constraints.
- We find that political patronage can enable riskier international expansion in situations where financial resources are limited.
- Conversely, family involvement may serve as a limiting factor under similar financial constraints.
- These findings enhance the understanding of the complex interplay of various factors that influence female entrepreneurs' internationalization strategies.

Leading Global Figures

- **Melanie Perkins:** Co-founder of Canva, which has democratized design tools for users in over 190 countries.
- **Kiran Mazumdar-Shaw:** Founder of Biocon, a global biopharmaceutical leader based in India that provides affordable medicines to over 120 nations.
- **Janice Bryant Howroyd:** Founder of Act One Group, the first Black woman to operate a multi-billion dollar workforce solutions company with operations in 33 countries.
- **Falguni Nayar:** Founder of Nykaa, who scaled an e-commerce beauty platform to a global IPO success.
- **Rihanna:** Co-owner of Fenty Beauty, which disrupted the global cosmetics industry by launching simultaneously in 17 countries with inclusive shade ranges.

Critical Barriers to Entry

International expansion for women-led businesses is often hindered by specific structural issues:

1. **Funding Gap:** Women entrepreneurs receive less than 2% of global venture capital, limiting their ability to scale for international markets.
2. **Trade Intelligence:** Access to global supply chains and market-specific regulatory information is often harder to navigate due to smaller professional networks.
3. **Digital Divide:** In developing regions, limited access to digital trade tools prevents women from reaching global e-commerce customers.

Economic Opportunity

Organizations like the World Trade Organization (WTO) emphasize that integrating women into international trade is not just about equity, but economic growth. Increasing women's participation could add trillions to global GDP by improving productivity and diversifying export products.

ISBN : 978-93-6163-366-9

Conclusion

Women entrepreneurs are vital, often underutilized, engines of global economic growth, with the potential to increase global GDP by Rs. 2.5 trillion to Rs.5 trillion if gender gaps are closed. Their ventures drive innovation, foster employment, and enhance social development, acting as catalysts for a more equitable, resilient, and sustainable economic future. Unleashing the full potential of women in business requires concerted efforts from stakeholders, including targeted financing, mentorship, and policy support to overcome existing barriers and unlock long-term economic prosperity.

ISBN : 978-93-6163-366-9

CHAPTER 4 - ROLE OF IOT, AI, AND BIG DATA

GREEN FINTECH AND SOCIAL ENTERPRISES: FINANCING SUSTAINABLE COMMUNITIES

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Abstract

In the digital age, social entrepreneurship and green financial technology, or "Green FinTech" is redefining sustainable community development. By utilizing technology like blockchain, artificial intelligence, digital payments, and crowdfunding platforms, Green FinTech combines financial innovation with environmental sustainability principles to raise money for socially and climate-responsible projects. Due to their dual goals of social impact and financial sustainability, social businesses are in a unique position to use these technical developments to tackle urgent socioeconomic and environmental issues at the local level. This chapter examines how social enterprises can finance renewable energy projects, sustainable agriculture, waste management systems, and inclusive livelihood programs with the help of Green FinTech solutions, such as carbon tracking platforms, green digital lending, impact investing tools, and climate-focused crowdfunding. It also looks at how digital financial inclusion might enable underserved populations to take part in green economic shifts. Green FinTech offers a revolutionary route to accomplishing the Sustainable Development Goals (SDGs) by fusing technical innovation with community-focused and ethical finance models. The chapter ends by outlining the policy and regulatory frameworks by financial institutions, policymakers, and social entrepreneurs.

Keywords: *Green FinTech, social entrepreneurship, and Sustainable development*

Introduction

The demands of sustainability and digital transformation have come together in a way never seen before in the twenty-first century. Traditional financial systems are increasingly seen as inadequate to handle the scope and urgency of global issues as environmental degradation, socioeconomic inequality, and climate change worsen. In response, a new paradigm has emerged at the intersection of financial innovation, digital technology, and sustainable development—Green Financial Technology, or Green FinTech.

Green FinTech represents the integration of environmental sustainability objectives into financial technologies such as blockchain, artificial intelligence (AI), big data analytics, digital payments, and crowdfunding platforms. Simultaneously, social entrepreneurship has evolved as a transformative model that blends social mission with financial viability. Social enterprises operate with the dual objective of generating measurable social or environmental impact while maintaining economic sustainability.

Social entrepreneurship and Green FinTech come together to provide a potential framework for funding sustainable community development. By leveraging digital tools to mobilize, allocate, and monitor green capital, social enterprises can address local environmental and socio-economic challenges more effectively. This chapter explores how this synergy enables financing for renewable energy, sustainable agriculture, waste management, and inclusive livelihood

ISBN : 978-93-6163-366-9

programs, particularly in developing economies. It also proposes a strategic framework for scaling sustainable community financing ecosystems.

Conceptual Foundations

Green FinTech

The use of financial technology solutions to support climate resilience and environmental sustainability is known as "green fintech." Green FinTech incorporates sustainability concepts into the digital infrastructure of financial systems, in contrast to traditional green finance, which mainly concentrates on allocating resources toward environmentally good projects. The incorporation of ESG (Environmental, Social, Governance) metrics into digital platforms, real-time environmental performance tracking, transparent reporting via distributed ledger technologies, and democratization of access to sustainable investments are some of the fundamental features of green finance technology. Green FinTech supports financial inclusion, lowers transaction costs, improves effect monitoring, and increases transparency. It shifts sustainability from a peripheral consideration to a core operational feature of financial systems.

Social Entrepreneurship and the Dual Mission Model

The main mission direction of social companies is different from that of typical firms. Although making a profit is still necessary for sustainability, it is a means to an end. Social entrepreneurs place a high priority on inclusive economic development, environmental sustainability, and community empowerment. Their operational philosophy is based on the Triple Bottom Line (People, Planet, Profit) paradigm. Given their shared emphasis on quantifiable impact, accountability, and long-term sustainability, their structure makes them ideal partners for Green FinTech developments.

Sustainable Community Development

A comprehensive approach that improves local economic, social, and environmental well-being without endangering future generations is known as sustainable community development. Access to waste reduction methods, climate-resilient agriculture, sustainable energy, and financial inclusion tools are all necessary. One major obstacle is still financing. Green FinTech-powered social entrepreneurs provide creative ways to get beyond these limitations.

Green Fintech Tools for Community Financing

Blockchain for Transparency and Carbon Accountability

Decentralized, tamper-proof records made possible by blockchain technology increase accountability and trust. Blockchain is utilized in the Green FinTech space for transparent impact reporting, tracking renewable energy certificates, and verifying carbon credits. Blockchain helps social businesses reduce greenwashing and boost stakeholder confidence by ensuring that investors and donors can confirm how funds are being used.

Artificial Intelligence for Sustainable Risk Assessment

By forecasting climate-related hazards, evaluating creditworthiness using alternative data, and optimizing green investment portfolios, artificial intelligence (AI) and machine learning improve decision-making in sustainable finance. Social entrepreneurs can provide loans to marginalized groups without conventional collateral or credit records thanks to AI-driven credit scoring.

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Digital Payments and Financial Inclusion

Through the reduction of transaction costs, the facilitation of microtransactions, and the integration of informal sectors into formal finance, digital payment systems minimize barriers to financial access. Digital banking platforms and mobile wallets allow rural business owners to get financing, receive payments, and create financial records. This encourages everyone to take part in green economic transitions.

Crowdfunding and Impact Investing Platforms

By enabling people to support waste management programs, sustainable farming projects, and renewable energy installations, crowdfunding platforms democratize green investment. Platforms for impact investment also direct funds toward projects that produce quantifiable social and environmental benefits in addition to financial success. Instead of being passive recipients, these solutions enable communities to participate as co-investors.

Digital Financial Inclusion and Underserved Populations

Poverty and vulnerability are sustained by financial exclusion. Through low-cost transaction technologies, digital identity integration, and mobile banking access, digital inclusion closes this gap. Digital financial technologies make it easier for marginalized groups, especially women, those living in rural areas, and informal laborers, to participate in sustainable markets. Communities are empowered to embrace sustainable practices and renewable technologies when they have access to green microcredit. Thus, inclusive green fintech promotes social justice as well as environmental objectives.

Policy and Regulatory Frameworks

Responsible innovation requires enabling regulatory environments. Governments and financial regulators play a crucial role in the following ways:

- By establishing regulatory sandboxes and provide a controlled environment where FinTech innovators can test new financial products and green solutions under regulatory supervision
- Mandating ESG disclosures to organizations to report their environmental, social, and governance performance in a standardized manner
- Promoting green bond frameworks and establish guidelines for issuing bonds specifically dedicated to financing environmentally sustainable projects, and ensure proper allocation of funds and attract responsible investors.
- Supporting digital infrastructure development through broadband connectivity, digital identity systems, and secure payment networks for the effective functioning of Green FinTech ecosystems

Conclusion

Unprecedented opportunities have arisen in the digital era to rethink financial institutions as tools for inclusivity and sustainability. When paired with social entrepreneurship's mission-driven methodology, green fintech offers a potent means of funding sustainable communities. In the end, Green FinTech is a fundamental revolution in finance rather than just a technical development. It provides a feasible and scalable route to accomplishing the Sustainable Development Goals and building resilient, sustainable communities across the globe by integrating social justice and environmental responsibility into digital financial ecosystems.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

ROLE OF FINTECH-DRIVEN ENTERPRISES IN ADVANCING GREEN FINANCING IN INDIA

(Green Microloans, Digital Green Bonds, and ESG-Oriented Lending)

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Abstract

Environmental sustainability has become a critical concern for emerging economies as economic expansion increasingly places pressure on natural resources and ecological systems. In this context, green financing has gained prominence as a mechanism to mobilize capital toward environmentally sustainable projects while maintaining economic viability. In India, the rapid evolution of Financial Technology (FinTech) enterprises has significantly transformed the financial landscape by improving access, efficiency, and transparency through digital innovation. This paper presents a conceptual analysis of the role played by FinTech-driven enterprises in strengthening green financing initiatives in India, with particular emphasis on green microloans, digitally enabled green bonds, and ESG-oriented lending frameworks. Relying on secondary data sources such as regulatory publications, policy reports, and scholarly literature, the study highlights how technology-enabled financial solutions support sustainable investments, enhance environmental risk assessment, and promote inclusive growth. The paper also identifies key challenges related to regulatory frameworks, ESG standardization, and market awareness, and proposes policy-oriented recommendations. The study concludes that FinTech enterprises serve as strategic enablers in accelerating India's transition toward a sustainable and environmentally responsible financial ecosystem.

Keywords: *FinTech Enterprises, Sustainable Finance, Green Microloans, Digital Green Bonds, ESG Lending, India*

1. Introduction

India's pursuit of rapid economic development has resulted in increased industrial activity, urban expansion, and energy consumption, leading to heightened environmental stress. Issues such as climate change, carbon emissions, and ecological degradation have necessitated a shift toward sustainable development strategies. Green financing has emerged as an essential financial approach to support projects that deliver environmental benefits alongside economic returns.

Parallel to this development, India has experienced remarkable growth in the FinTech sector, driven by digital infrastructure, mobile technology, and policy initiatives promoting financial inclusion. FinTech enterprises leverage advanced technologies such as artificial intelligence, data analytics, and digital platforms to redesign traditional financial services. The convergence of FinTech innovation and green finance offers new opportunities to channel financial resources into sustainable initiatives efficiently. This paper explores how FinTech-driven financial models contribute to the expansion of green financing in the Indian context.

2. Research Gap

A critical review of existing literature on green financing indicates that most scholarly work has predominantly focused on the role of traditional banking institutions, public sector financing mechanisms, and international development agencies in promoting sustainable finance. Although the importance of green finance has been widely acknowledged, limited attention has been given to the role of FinTech-driven enterprises, particularly in the context of emerging economies like India.

Furthermore, existing studies tend to analyze green financial instruments such as green bonds, sustainability-linked loans, or ESG frameworks in isolation. There is a noticeable absence of integrated studies that collectively examine green microloans, digital green bonds, and ESG-oriented lending models within a single conceptual framework. This gap restricts a holistic understanding of how technological innovation can enhance the effectiveness and inclusiveness of green financing. The present chapter addresses this gap by offering a comprehensive conceptual perspective on the role of FinTech enterprises in advancing green financing in India.

3. Conceptual Understanding of Green Financing

Green financing refers to the allocation of financial resources toward projects and activities that contribute to environmental sustainability. These include investments in renewable energy, clean transportation systems, energy-efficient technologies, sustainable agriculture, and climate-resilient infrastructure. Green financing refers to the provision of financial capital for investments that support environmental sustainability. It encompasses a wide range of financial instruments and mechanisms including green loans, green bonds, sustainability-linked loans, climate funds, and carbon finance.

The fundamental objective of green finance is to integrate environmental considerations into financial decision-making. By internalizing environmental risks and opportunities, green financing contributes to long-term economic stability and resilience.

4. Evolution of FinTech Enterprises in India

The Indian FinTech ecosystem has evolved rapidly over the last decade, supported by strong digital infrastructure and progressive regulatory initiatives. Platforms such as UPI, Aadhaar-enabled services, and digital KYC have significantly reduced transaction costs and improved accessibility.

FinTech enterprises operate across diverse domains including digital payments, peer-to- peer lending, crowdfunding, insurtech, regtech, and wealth management. More recently, sustainability-focused FinTech solutions have gained prominence, reflecting a shift towards responsible finance.

Key Dimensions of Green Financing

- Promotion of environmentally sustainable economic activities
- Long-term risk mitigation through ecological responsibility
- Alignment with national and international sustainability objectives
- Integration of environmental and social considerations in financial decision- making

Green finance plays a pivotal role in supporting India's commitments to sustainable development and climate mitigation goals.

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5. Growth of FinTech Enterprises in India

The Indian FinTech ecosystem has expanded rapidly due to widespread digital adoption, increased internet penetration, and supportive government policies. FinTech enterprises operate across diverse segments including digital payments, alternative lending, crowdfunding, robo-advisory services, and data-driven credit assessment.

Factors Supporting FinTech Expansion

- Robust digital public infrastructure
- Increased acceptance of cashless transactions
- Government-led financial inclusion initiatives
- Demand for efficient, transparent, and user-friendly financial services

Increasingly, FinTech enterprises are aligning their operational models with sustainability objectives, giving rise to innovative green financial solutions.

6. Contribution of FinTech Enterprises to Green Financing

6.1 Green Microloans

FinTech platforms facilitate the provision of small-scale digital loans to individuals and enterprises engaged in environmentally responsible activities such as solar energy adoption, electric mobility, organic farming, and energy-efficient technologies. By utilizing alternative data sources and automated credit evaluation systems, these platforms extend credit access to underserved segments.

Significance of Green Microloans

- Encouragement of grassroots-level sustainable initiatives
- Enhanced financial inclusion for eco-conscious entrepreneurs
- Reduction in procedural complexity and processing time

6.2 Digital Green Bonds and Capital Markets

Green bonds have emerged as a key instrument for financing large-scale sustainable infrastructure projects. FinTech enterprises enhance the green bond ecosystem by enabling digital issuance platforms, real-time reporting, and impact tracking.

These technological interventions improve transparency, reduce information asymmetry, and increase investor confidence in green bond markets.

Role of FinTech in Green Bond Markets

- Improved transparency and disclosure standards
- Wider participation of retail and institutional investors
- Enhanced credibility through impact tracking mechanisms

These innovations strengthen investor confidence and contribute to the expansion of green capital markets in India.

6.3 ESG-Oriented Lending Models

Environmental, Social, and Governance (ESG) considerations are increasingly integrated into lending decisions to evaluate long-term sustainability and risk exposure. FinTech enterprises employ data analytics and machine learning tools to assess ESG performance and link lending terms to sustainability outcomes.

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Advantages of ESG-Oriented Lending

- Improved risk management and credit assessment
- Incentivization of sustainable business practices
- Alignment of financial returns with environmental responsibility

7. Benefits of FinTech-Led Green Financing

- Improved accessibility to sustainable financial products
- Reduced transaction and operational costs
- Greater transparency and accountability
- Faster mobilization of capital for green projects
- Support for national sustainability and climate objectives

8. Regulatory and Policy Landscape in India

The regulatory environment plays a crucial role in shaping the growth of green finance and FinTech innovation. Institutions such as RBI and SEBI have introduced guidelines to support sustainable finance while ensuring financial stability.

9. Empirical Insights from Indian Context

Several Indian FinTech enterprises have begun integrating sustainability considerations into their business models. Case-based observations indicate growing interest among investors and consumers in green financial products.

10. Challenges in Implementing Green FinTech Solutions

Despite its potential, FinTech-driven green financing faces several limitations:

- Lack of uniform ESG assessment standards
- Regulatory uncertainties related to green financial products
- Limited awareness among borrowers and investors
- High technological and compliance costs
- Challenges in measuring and verifying environmental impact

11. Findings of the Study

- FinTech enterprises play a significant role in expanding green financing access in India
- Digital platforms enhance efficiency and transparency in sustainable investments
- ESG-based lending frameworks encourage responsible corporate behavior
- Technology-driven finance strengthens the link between sustainability and economic growth

12. Suggestions

- Establish standardized frameworks for ESG evaluation
- Enhance regulatory clarity for green financial innovations
- Promote collaboration between regulators, financial institutions, and FinTech enterprises
- Introduce incentives to encourage green FinTech adoption
- Strengthen awareness and capacity-building initiatives

ISBN : 978-93-6163-366-9

Alignment with Sustainable Development Goals (SDGs)

FinTech-enabled green financing initiatives are closely aligned with the United Nations Sustainable Development Goals (SDGs). By facilitating access to finance for renewable energy projects, clean technology adoption, and sustainable infrastructure development, FinTech enterprises directly contribute to **SDG 7 (Affordable and Clean Energy)**.

The use of innovative digital financial solutions promotes industrial innovation and infrastructure development, thereby supporting **SDG 9 (Industry, Innovation, and Infrastructure)**. Additionally, ESG-oriented lending practices encourage responsible business behavior and sustainable production patterns in line with **SDG 12 (Responsible Consumption and Production)**. Most importantly, green financing plays a crucial role in addressing climate-related challenges and supports **SDG 13 (Climate Action)**, reinforcing India's commitment to global sustainability and climate goals.

Directions for Future Research

Future research in the area of FinTech-driven green financing can focus on empirical evaluation of the environmental and financial impacts of green FinTech initiatives.

Quantitative studies examining the relationship between ESG-oriented lending practices and credit risk management would provide valuable insights for financial institutions and policymakers.

Further research may also explore comparative analyses between India and other emerging economies to identify best practices in green FinTech adoption. In addition, emerging technologies such as blockchain-based carbon trading platforms, artificial intelligence-driven climate risk assessment models, and digital sustainability reporting systems offer promising avenues for future academic investigation.

9. Conclusion

FinTech-driven enterprises have emerged as key contributors to the advancement of green financing in India by integrating technological innovation with sustainable financial practices. Through green microloans, digital green bonds, and ESG-oriented lending models, FinTech solutions facilitate inclusive growth while addressing environmental challenges. Although regulatory and operational challenges persist, appropriate policy support and standardization can significantly enhance the effectiveness of green FinTech initiatives. The study concludes that FinTech enterprises are instrumental in building a resilient, sustainable, and future-ready financial ecosystem in India.

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DRIVING COMMUNITY DEVELOPMENT THROUGH SOCIAL ENTREPRENEURSHIP: INTEGRATING FINTECH AND GREENTECH FOR INCLUSIVE AND SUSTAINABLE GROWTH

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1. Introduction

Over the past decade, the global development paradigm has undergone a fundamental shift. Traditional metrics of progress centred on economic growth and GDP are now widely considered insufficient to capture true societal well-being. Inclusive economic participation, environmental stewardship, social equity, and resilience have emerged as core objectives in development policy frameworks globally, as reflected in major initiatives such as the United Nations' development agendas and climate commitments. This evolving focus has sharpened interest in innovation-driven solutions capable of addressing complex, interlinked socio- economic and environmental challenges.

At the forefront of this innovation are Fintech (Financial technology) and Greentech (Green technology) two rapidly growing technology-enabled sectors that are reshaping the development landscape. Fintech continues to expand its global footprint, driven by broader adoption of digital banking, embedded finance, AI-enhanced services, and digital payments, even as growth shifts from rapid expansion to more sustainable, resilience-oriented trajectories. A global survey of Fintech firms shows sustained revenue and profit growth, with ongoing expansion in customer reach particularly among underserved segments such as low-income individuals, women, and micro-small-medium enterprises (MSMEs) across emerging markets and developing economies (EMDEs). This positions Fintech as a key driver of financial inclusion and equitable economic participation. (World Economic Forum) Concurrently, Fintech's role in sustainable and green finance is gaining traction. The adoption of fintech and Greentech, where digital financial innovation is explicitly aligned with environmental, social, and governance (ESG) goals is growing rapidly.

Industry data shows that the green **Fintech market** is projected to expand significantly over the coming years, driven by investor focus on sustainability criteria, consumer demand for eco-responsible financial products, and the integration of carbon tracking, ESG analytics, and sustainable investment services into mainstream Fintech offerings. (Zip Do)Alongside this, **Greentech ventures** spanning renewable energy, sustainable agriculture, circular economy platforms, and eco-efficient infrastructure are attracting widespread policy support, private investment, and research interest. Greentech innovations are central to global climate mitigation and adaptation strategies, enabling communities to transition toward low-carbon pathways while creating local employment, enhancing resource security, and building resilience against environmental threats. The emerging nexus between Fintech and Greentech is particularly noteworthy.

ISBN : 978-93-6163-366-9

Recent empirical research shows that Fintech adoption and green finance advancements are jointly associated with stronger sustainable performance across countries, with digital platforms enhancing access to sustainable investment and lowering transaction and monitoring costs for green projects. This integrated approach is shown to support environmental objectives such as renewable energy uptake while deepening financial inclusion and economic participation. The growth of these sectors also resonates with current world affairs. Major Fintech firms are expanding their services into new regions, broadening financial access and digital infrastructure, while global policy platforms underscore the importance of technology in achieving inclusive and sustainable development. For example, leading Fintech companies are actively entering underbanked markets, demonstrating the industry's global outreach and potential for economic empowerment on a large scale.

However, challenges persist. Regulatory fragmentation, digital divides, data governance concerns, and social inequalities continue to complicate the translation of technological potential into inclusive and sustainable outcomes. Addressing these requires coordinated policy action, cross-sector collaboration, and intentional design of technological solutions that prioritize impact alongside growth. **This research article examines the role of Fintech and Greentech startups as social enterprises driving community development by generating economic, social, and environmental value.** Through a synthesis of recent scholarly literature, industry growth data, and illustrative case studies, the study explores how integrated Fintech & Greentech innovation is reshaping models of inclusive and sustainable growth. By situating these technological advancements within the context of contemporary global trends and development needs, this paper offers insights for policymakers, practitioners, and researchers committed to leveraging innovation for equitable and resilient community development

2. Topic Related Content

2.1 Meaning and Conceptual Foundations

Fintech (Financial Technology) refers to the application of digital innovations such as artificial intelligence, blockchain, mobile platforms, and big data analytics to improve the delivery of financial services. Fintech solutions enable digital payments, micro-lending, insurance access, and investment services, particularly in regions underserved by traditional banking systems. Aligned with the theme of inclusive and sustainable growth, Fintech encompasses innovations such as mobile banking, digital payment systems, peer-to-peer lending, blockchain applications, and data-driven credit assessment tools that lower transaction costs, overcome geographical barriers, and enhance transparency. By democratizing access to finance and supporting micro-enterprises, small businesses, and community-based initiatives, Fintech plays a critical role in empowering local economies and fostering equitable participation in the formal financial system.

Definition

"Innovative financial solutions enabled by information technology that led to new business models, applications, processes, or products with an associated material effect on financial markets and institutions**."** ***Gomber (2018), Journal of Management Information Systems***

Greentech (Green Technology), often referred to as clean technology, encompasses innovations that reduce environmental impact by enhancing energy efficiency, lowering carbon emissions, and promoting sustainable resource use. These technologies play a crucial role in

addressing climate change and ecological degradation. Social entrepreneurship represents a business approach that prioritizes social and environmental objectives alongside financial sustainability.

Definition

"Green technologies are innovations that contribute to sustainable development by reducing environmental risks, ecological scarcities, and negative impacts of human activities." ***Shrivastava, P. (1995), Academy of Management Review***

In contrast to traditional profit-maximizing firms, social enterprises reinvest value into communities, emphasizing long-term impact over short-term gains. The integration of Fintech and Greentech aligns closely with the **United Nations Sustainable Development Goals (SDGs),** particularly those related to poverty alleviation, clean energy access, decent work, and climate action.

Fintech and Greentech in India: Tools for social entrepreneurship and community development.

Fintech (Financial Technology)

1. Digital Payments and Mobile Banking

Digital payment systems form the foundation of India's fintech revolution. Platforms such as UPI, mobile wallets, and app-based banking services have transformed the way individuals and small businesses transact. In rural and semi-urban India, digital payments enable people without access to traditional banks to participate in the formal economy using smartphones. This has empowered street vendors, small shop owners, self-help groups, and migrant workers by providing them with safe, fast, and transparent financial transactions. For social entrepreneurs, digital payments reduce cash dependency, improve financial tracking, and support community-based businesses by integrating them into formal financial networks**.**

2. Microfinance and Digital Lending

Microfinance and digital lending platforms provide small, collateral-free loans to low-income individuals and micro-entrepreneurs using technology-driven credit assessment. In India, fintech companies leverage Aadhaar, mobile usage patterns, and transaction data to evaluate creditworthiness, allowing underserved populations such as farmers, women entrepreneurs, and small traders to access capital. These platforms play a crucial role in community development by enabling income-generating activities, reducing dependency on informal moneylenders, and promoting entrepreneurship at the grassroots level. Social enterprises use digital microfinance to fund livelihoods, skill development, and local enterprises.

3. Insurance tech (Technology-Driven Insurance)

Insurance Tech focuses on delivering affordable and accessible insurance products through digital platforms. In India, this includes low-premium health, crop, and life insurance tailored for farmers, gig workers, and low-income families. Technology simplifies enrolment, premium payments, and claim settlements, making insurance more inclusive. For community development, Insurtech reduces financial vulnerability by protecting livelihoods from risks such as illness, crop failure, and natural disasters. Social entrepreneurs integrate micro- insurance with livelihood programs to create resilient and secure communities.

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4. Savings, Investment, and Financial Literacy Platforms

Fintech-based savings and investment platforms encourage financial discipline and long-term wealth creation. In India, these platforms offer micro-investments, recurring deposits, and goal-based savings plans that are accessible even to first-time users. Along with financial products, many platforms promote financial literacy through digital education tools. For social entrepreneurship, such platforms help communities build savings habits, plan for education or health expenses, and reduce financial stress, contributing to sustainable economic development**.**

5. Government-Linked Fintech and Welfare Delivery

Government-enabled fintech systems such as Direct Benefit Transfer (DBT) and Jan Dhan Aadhaar Mobile (JAM) integration ensures efficient and transparent welfare distribution. These systems minimize leakages and ensure that subsidies, pensions, and social security benefits reach the intended beneficiaries directly. This strengthens trust in public systems and improves service delivery for marginalized communities. Social enterprises often work alongside government fintech infrastructure to extend last-mile financial inclusion and ensure equitable access to welfare schemes.

Greentech (Green Technology)

1. Renewable Energy Technologies

Renewable energy technologies, especially solar power, play a vital role in India's sustainable development efforts. Decentralized solar solutions such as microgrids and rooftop installations provide reliable electricity to rural and remote areas where grid access is limited. These technologies support community development by powering homes, schools, healthcare centres, and small enterprises. Social entrepreneurs adopt innovative business models such as pay-as-you-go solar systems, enabling low-income households to access clean energy while generating local employment and reducing carbon emissions.

2. Clean Water and Sanitation Technologies

Clean water and sanitation technologies address one of India's most critical public health challenges. Innovations such as solar-powered water purification units, water ATMs, and smart monitoring systems provide affordable and safe drinking water to underserved communities.

These solutions significantly reduce water-borne diseases and the burden on women and children who traditionally fetch water. Social enterprises operating in this sector often follow community-owned or pay-per-use models, ensuring sustainability while improving health outcomes and quality of life.

3. Sustainable Agriculture and Agri Tech

Agri Tech focuses on improving agricultural productivity while minimizing environmental impact. In India, digital platforms provide farmers with real-time information on weather, soil health, pest management, and market prices. These technologies help farmers make informed decisions, reduce input costs, and adopt climate-resilient practices. For community development, sustainable Agri Tech increases farmer incomes, reduces environmental degradation, and strengthens rural economies. Social entrepreneurs bridge the gap between technology and small farmers through training, advisory services, and inclusive market access**.**

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4. Waste Management and Circular Economy Solutions

Greentech solutions in waste management aim to reduce pollution and promote resource efficiency through recycling, composting, and waste-to-energy technologies. In India, social enterprises work with municipalities and communities to segregate waste at the source and convert waste into valuable products. These initiatives create livelihoods for informal waste workers, improve urban cleanliness, and reduce landfill dependency. By adopting circular economy principles, social entrepreneurs promote sustainable consumption and community participation in environmental conservation.

5. Electric Mobility and Clean Transportation

Electric mobility technologies contribute to reducing air pollution and dependence on fossil fuels. In India, electric rickshaws, two-wheelers, and public transport solutions are increasingly used for last-mile connectivity. These technologies provide affordable transportation and employment opportunities for urban and semi-urban communities. Social entrepreneurs promote clean transport by offering shared mobility solutions, charging infrastructure, and financing models that make electric vehicles accessible to low-income drivers.

2.3 Role in Social Entrepreneurship and Community Development

The convergence of fintech and greentech has emerged as a critical enabler of social entrepreneurship and community development in India, particularly in contexts marked by economic inequality, environmental stress, and limited access to basic services. Together, these technologies offer integrated solutions that address both livelihood security and ecological sustainability, allowing social enterprises to respond holistically to community needs rather than in fragmented ways.

Fintech plays a foundational role by expanding access to formal financial systems for populations that have historically been excluded, including rural households, women, informal workers, small entrepreneurs, and marginal farmers. Digital payment platforms, micro-credit, insurance technologies, and mobile banking services reduce dependence on cash-based and informal financial practices, thereby enhancing transparency and financial security. For social entrepreneurs, fintech enables more efficient service delivery, facilitates trust within communities, and supports scalable business models that can operate even in low-resource settings. Access to affordable credit and insurance further reduces vulnerability to economic shocks, enabling individuals and small enterprises to invest in education, health, and productive assets.

Greentech strengthens this economic empowerment by addressing the environmental dimensions of community well-being. Technologies related to renewable energy, clean water, sustainable agriculture, waste management, and low-carbon transportation directly respond to pressing challenges such as energy poverty, water scarcity, declining soil health, and pollution. By integrating environmentally sustainable practices into livelihood models, social entrepreneurs not only reduce ecological harm but also enhance long-term resilience. For instance, decentralized solar energy systems improve productivity for small businesses and public institutions, while sustainable agricultural technologies increase farm incomes without degrading natural resources.

The intersection of fintech and greentech creates a mutually reinforcing ecosystem that enhances the effectiveness and reach of social entrepreneurship initiatives. Fintech facilitates

ISBN : 978-93-6163-366-9

innovative financing mechanisms for green solutions, such as pay-as-you-go solar models, micro-loans for sustainable farming inputs, and digital payment systems for clean water services. These models make environmentally friendly technologies affordable and accessible to low-income communities, accelerating adoption while ensuring financial viability. At the same time, greentech initiatives generate stable income streams that improve repayment capacity and strengthen local economies. This integrated approach has significant implications for gender inclusion and social equity. Women, who often bear disproportionate responsibility for household energy, water, and food security, benefit directly from access to clean technologies and financial services. Social enterprises that combine fintech and greentech frequently design women-centric models, enabling female entrepreneurship, leadership, and decision-making at the community level. Such interventions contribute to shifting social norms while enhancing household and community resilience.

In the context of community development, the fintech–greentech nexus supports the creation of localized economic ecosystems that are adaptive, participatory, and sustainable. By embedding technology within local institutions such as self-help groups, cooperatives, and micro-enterprises, social entrepreneurs foster ownership and long-term impact. Rather than relying on external aid, communities become active agents of development, capable of managing resources, mitigating risks, and responding to environmental and economic challenges. Overall, fintech and greentech together redefine the role of social entrepreneurship in India by aligning economic inclusion with environmental responsibility. Their combined application promotes a development pathway that is not only growth-oriented but also socially just and ecologically sustainable, contributing to long-term community well-being and national development goals.

2.4 Case Studies and Community-Level Impact

Case Study 1: SELCO India – Decentralized Solar Energy for Livelihood and Social Impact

SELCO India is one of the earliest and most widely cited examples of social entrepreneurship in the Greentech sector in India. Founded with the aim of addressing energy poverty, SELCO recognized that lack of reliable electricity was not merely a technical issue but a barrier to livelihoods, health, and education in low-income communities. Rather than treating rural and urban poor households as passive beneficiaries, SELCO designed decentralized solar energy solutions tailored to their specific needs, such as solar-powered sewing machines for tailors, lighting for street vendors, and energy systems for rural health clinics.

A key innovation in SELCO's model was the integration of **fintech enabled financing**. Since most low-income households could not afford the upfront cost of solar installations, SELCO partnered with banks and microfinance institutions to offer customized loan products. These financial solutions were aligned with users' income cycles, ensuring affordability and repayment feasibility. The impact has been significant: communities gained access to clean and reliable energy, local entrepreneurs improved productivity and income, and dependence on fossil fuels decreased. SELCO's approach demonstrates how Greentech combined with inclusive financial models can drive sustainable community development rather than short- term aid.

Case Study 2: Mahila Money – Fintech as a Tool for Women-Led Community Entrepreneurship

Mahila Money emerged in response to a persistent gap in India's financial system: women entrepreneurs, particularly from informal and low-income backgrounds, often lacked access to

formal credit due to absence of collateral and credit history. The platform adopted a digital- first fintech model to provide small, unsecured loans to women running micro-enterprises such as tailoring units, food businesses, and home-based services. What sets Mahila Money apart is its **community-centred approach**. Lending is combined with financial literacy, mentorship, and peer learning through digital communities. Women are encouraged to understand credit, savings, and digital payments, thereby strengthening their long-term financial capability. The platform leverages alternative data to assess creditworthiness, enabling women who were previously invisible to the banking system to access finance. The social impact extends beyond individual income generation. Many women borrowers employ others within their communities, reinvest in children's education, and gain greater decision-making power within households. This case highlights how fintech, when designed with gender sensitivity and social intent, can function as a powerful tool for grassroots entrepreneurship and community development.

Case Study 3: DeHaat – Digital Agriculture for Smallholder Farmers

DeHaat is an Agri Tech social enterprise that addresses structural challenges faced by small and marginal farmers in India, such as lack of access to quality inputs, technical knowledge, and fair markets. Operating as an end-to-end digital platform, DeHaat provides farmers with advisory services, access to seeds and fertilizers, and direct market linkages for selling produce. From a Greentech perspective, DeHat promotes sustainable agricultural practices by offering data-driven guidance on crop planning, soil health, and input optimization. This reduces excessive use of chemical fertilizers and pesticides, lowering environmental impact while improving yields. Fintech plays a crucial role in the model through digital payments, credit facilitation, and transparent pricing mechanisms. The community impact is visible in improved farm incomes, reduced risk, and increased resilience to climate variability. By aggregating farmers and strengthening local agricultural ecosystems, DeHaat shifts farmers from subsistence-based practices toward more sustainable and market-oriented livelihoods. This case illustrates how technology-driven agriculture can support both environmental sustainability and rural economic development.

Case Study 4: Recykal – Formalizing India's Informal Waste Economy

India's waste management sector has traditionally relied on informal waste pickers who work under unsafe conditions with minimal income security. Recykal, a Greentech startup, sought to address this issue by creating a digital marketplace that connects waste generators, recyclers, brands, and waste workers through technology. Recykal's platform improves waste traceability, compliance with environmental regulations, and efficiency in recycling operations. Importantly, it brings informal waste workers into the formal economy by integrating them into organized supply chains. Through digital records and payments, waste workers gain income transparency and access to financial services, including bank accounts and credit. The social entrepreneurship dimension of Recykal lies in its circular economy approach, where environmental sustainability and social inclusion are treated as interdependent goals. By reducing landfill waste and improving livelihoods simultaneously, the initiative demonstrates how Greentech solutions can generate both ecological and community-level benefits.

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3. Observation and Discussion

3.1 Fintech as a Catalyst for Community Empowerment

Fintech has emerged as a transformative tool for community development, particularly in rural and semi-urban India. By extending access to financial services such as mobile banking, digital wallets, micro-lending, and insurance Fintech reduces barriers that traditionally excluded low- income households and micro-entrepreneurs from the formal economy. Observations from field-level interventions suggest that access to digital financial services does more than facilitate transactions; it **enhances financial agency**, enabling individuals to plan, save, invest, and manage risks effectively.

For example, microfinance platforms integrated with Fintech solutions allow women entrepreneurs to secure collateral-free loans, directly impacting household incomes and community-level entrepreneurship. Mobile wallets and digital payments improve transparency, reduce dependence on cash, and allow small vendors to participate in larger markets. Furthermore, fintech-based government welfare programs like **Direct Benefit Transfers (DBT)** demonstrate how technology can bridge the gap between policy and community access, ensuring timely delivery of subsidies and financial support. From a social entrepreneurship perspective, fintech does not merely act as a transactional tool; it **enables financial inclusion as a platform for empowerment**, fostering entrepreneurship, reducing poverty, and strengthening the economic resilience of marginalized communities.

3.2 Greentech and Long-Term Sustainable Development

Greentech interventions observed in India highlight a critical link between environmental sustainability and economic resilience. Solutions such as decentralized solar energy systems, water purification technologies, sustainable agriculture platforms, and circular economy models provide multiple layers of benefits. Observational evidence indicates that communities adopting solar microgrids experience improved educational outcomes, better healthcare delivery (through reliable electricity in health centres), and enhanced local employment opportunities. Similarly, sustainable agriculture technologies such as precision farming apps and digital advisory services enable smallholder farmers to improve crop yields while reducing environmental degradation. Waste-to-value initiatives not only create livelihoods for informal sector workers but also enhance environmental health by formalizing waste management and promoting recycling. Greentech interventions, however, often require **initial investment and capacity building**. Community buy-in, training, and financial models such as pay-as-you-go systems are essential for adoption. Observations show that **when greentech solutions are paired with local entrepreneurship models**, they generate sustained impact by creating income streams alongside environmental benefits.

3.3 Synergy Between Fintech and Greentech

The most profound insights emerge from the **integration of fintech and greentech**. Fintech facilitates access to capital and payment mechanisms, enabling households and small businesses to adopt green technologies. For instance, solar energy providers leverage digital payments to implement micro-financing for rural households, while circular economy platforms use fintech solutions to streamline payments and incentivize participation in recycling. Observational data suggests that this synergy also strengthens **gender equity**. Women, who are often responsible for managing household energy, water, and food, benefit disproportionately when fintech-enabled

greentech solutions reduce their workload, create entrepreneurship opportunities, and enhance financial independence. Community-based organizations that combine financial literacy training with access to clean energy or sustainable agriculture solutions see higher adoption rates and better outcomes in both economic and environmental domains.

3.4 Community Resilience and Social Entrepreneurship

Observations indicate that fintech-greentech integration fosters **community resilience**, shifting communities from dependency toward self-reliance. Social enterprises that embed financial literacy, cooperative structures, and environmentally responsible technologies help communities build **adaptive capacity** to face environmental, social, and economic shocks.For example, microcredit programs for solar installations or water purification systems not only provide immediate access to resources but also empower communities to **manage and maintain local infrastructure**, ensuring sustainability. By fostering local ownership through self-help groups, cooperative enterprises, and community governance, these interventions strengthen social cohesion while creating economic opportunities.In the context of social entrepreneurship, these patterns suggest that the most effective interventions are those that **simultaneously address financial inclusion, livelihood creation, environmental sustainability, and community agency**.

3.5 Policy, Implementation, and Practice Implications

Observation and discussion reveal that the impact of fintech and greentech on community development is **maximized when supported by enabling policies and systemic infrastructure**. Key considerations include:

1. **Regulatory Support:** Clear guidelines for digital finance, micro-lending, and renewable energy deployment reduce operational friction and encourage innovation
2. **Digital Literacy:** Community-level education is critical to ensure adoption of fintech platforms, sustainable technologies, and smart resource management tools.
3. **Financing Models:** Blended finance, micro-credit, and pay-as-you-go models are necessary to make green technologies affordable and scalable.
4. **Public-Private Collaboration:** Social enterprises can leverage government schemes, private sector expertise, and NGO networks to amplify impact.
5. **Community Engagement:** Ownership and participation by local communities are essential to ensure sustainability and effective resource management.

These insights underscore that the transformative potential of fintech and greentech is **not automatic**, it relies on intentional design, cross-sector partnerships, and policies that integrate social, economic, and environmental objectives.

- Fintech expands financial access, reduces vulnerability, and strengthens entrepreneurship.
- Greentech promotes sustainable livelihoods, environmental stewardship, and long-term resilience.
- Integration of fintech and greentech enhances adoption, affordability, and social inclusion, particularly for women and marginalized groups.
- Social enterprises leveraging these technologies foster community resilience, local ownership, and multi-dimensional development.
- Policy support, digital literacy, and participatory models are critical for scaling impact.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

AN INVESTIGATIVE STUDY ON BLOCKCHAIN APPLICATIONS IN INDIA'S DIGITAL PAYMENTS INFRASTRUCTURE: A CASE STUDY OF THE UPI ECOSYSTEM

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Abstract

In 2024, UPI will process over 8 billion transactions per month, thanks to India's Unified Payments Interface (UPI). The limitations of the existing centralized architecture create several obstacles for UPI, including vulnerabilities in terms of cybersecurity, delays with settlement of transactions, and an overall lack of interoperability among various payment systems. The objective of this research paper is to determine the benefits that can be derived by using blockchain technology to support the UPI infrastructure in India. Specifically, blockchain technologies can provide distributed ledgers, smart contracts, and decentralized verification systems. To adequately assess and address the issues associated with blockchain technology's potential use in UPI, a qualitative case study research method was used to develop hypothetical blockchain-integrated UPI systems and evaluate the results using real-time operational data. The primary focus of this paper is to demonstrate that blockchain technology can increase UPI's infrastructure's security, transparency, and efficiency. In addition, this paper identifies challenges related to the implementation of blockchain-integrated UPI systems and provides a phased plan for their implementation. Results demonstrate that implementing blockchain-integrated UPI systems could reduce the typical 2-4 hour settlement period for UPI transactions to near-instantaneous transaction capability, increase the identification of fraudulent activities by maintaining an immutable record of each transaction, and improve coordination among banks making up UPI. However, regulatory compliance, scalability, and stakeholder coordination are still major limitations facing the implementation of blockchain-integrated UPI systems. It is recommended that regulations governing the use of blockchain technology in the UPI ecosystem must be addressed, a phased approach to implementation should be established, and that a hybrid model should be utilized that combines blockchain technology's security features with UPI's current efficiency. Ultimately, this research helps to define and explore how fintech innovation can converge with traditional payment systems in developing economies.

Keywords: *Blockchain Technology, UPI Ecosystem, Digital Payments, Financial Technology, India's Payment Infrastructure, Cryptocurrency, Distributed Ledger Technology*

JEL Classification: *E42 (Monetary Systems and Standards), G21 (Banks, Depository Institutions), O33 (Technological Change: Choices and Consequences)*

1. Introduction

India's payment landscape has undergone a radical transformation over the past decade. The introduction of the Unified Payments Interface (UPI) in 2016 marked a paradigm shift in how digital transactions occur in the Indian economy. Managed by the National Payments Corporation of India (NPCI), UPI has become the backbone of India's digital payment revolution, facilitating unprecedented financial inclusion and transaction velocity. By December 2024, UPI handles approximately 8 billion transactions monthly, representing a 40% year-on-year growth rate (NPCI, 2024).

ISBN : 978-93-6163-366-9

Despite these impressive achievements, the centralized architecture of UPI presents inherent challenges. Transaction settlement occurs in batches, requiring 2 -4 hours for fund transfers to be finalized. The system's reliance on interconnected bank servers creates single points of failure and cybersecurity vulnerabilities. Additionally, the fragmented nature of India's banking infrastructure leads to interoperability issues, particularly for smaller financial institutions and payment service providers. Growing concerns regarding data privacy, transaction reversibility, and regulatory compliance further complicate the landscape.

Blockchain technology, characterized by its distributed ledger capabilities, cryptographic security, and immutability features, offers potential solutions to these challenges. The technology enables peer-to-peer transactions without intermediaries, creates tamper-proof transaction records, and facilitates smart contracts for automated settlement. However, implementing blockchain within India's existing UPI infrastructure presents complex technical, regulatory, and operational challenges.

This research addresses a critical gap in academic literature by examining how blockchain can be integrated into India's UPI ecosystem. Rather than advocating for a wholesale replacement of UPI with blockchain-based alternatives, this study proposes a complementary integration approach that leverages blockchain's strengths while maintaining UPI's proven efficiency and regulatory compliance.

Problem Statement

While UPI has achieved remarkable transaction volume and financial inclusion metrics, its centralized infrastructure creates vulnerabilities in security, settlement efficiency, and cross-institutional coordination. The research question this study addresses is: How can blockchain technology enhance the security, transparency, and operational efficiency of India's UPI ecosystem without compromising its current accessibility and regulatory compliance?

Research Objectives

Primary Objective: To analyze the potential applications of blockchain technology in strengthening the security, transparency, and settlement efficiency of India's UPI payment ecosystem.

Secondary Objective: To identify implementation challenges, technical prerequisites, and regulatory constraints associated with blockchain integration in UPI infrastructure, and propose a phased integration framework for stakeholder adoption.

Review of Literature

The academic exploration of blockchain technology in financial systems has expanded significantly since Bitcoin's introduction in 2009. Nakamoto (2008) fundamentally challenged traditional payment intermediation through the development of decentralized digital currency. The technological architecture underpinning blockchain—distributed consensus mechanisms, cryptographic hashing, and immutable ledgers—has since found applications beyond cryptocurrency in supply chain management, healthcare, and government services.

In the context of payments specifically, Treleaven et al. (2017) examined how blockchain technology could disrupt traditional payment and settlement systems. Their analysis highlighted blockchain's capacity for real-time settlement, reduced intermediary costs, and enhanced transparency. However, they also noted significant challenges including scalability limitations, regulatory uncertainty, and the need for standardized protocols across financial institutions.

ISBN : 978-93-6163-366-9

Regarding India's digital payments evolution, Ghosh and Dey (2020) documented the transformative impact of UPI on financial inclusion, noting that UPI's API-based architecture democratized payment service provision beyond traditional banks. Subsequent research by Sharma and Patel (2022) analyzed the operational efficiency of UPI compared to international payment systems, concluding that while UPI excels in transaction volume and cost-efficiency, its centralized settlement mechanism creates latency and potential security risks.

The application of blockchain in emerging market payment systems has received less scholarly attention. Mbiti and Weil (2011) explored mobile money's role in financial inclusion in developing economies, providing foundational context for understanding digital payment adoption. More recently, Araujo et al. (2020) examined blockchain's potential in cross-border payments for developing countries, concluding that distributed ledger technology could reduce remittance costs and settlement times.

Regarding security and fraud prevention, Rogojanu and Badea (2014) analyzed blockchain's inherent security features, particularly its resistance to double-spending and transaction reversal. Das and Banerjee (2021) specifically examined cybersecurity vulnerabilities in India's payment infrastructure, identifying centralized databases as primary risk factors—a challenge blockchain's distributed architecture could mitigate.

The regulatory framework for blockchain in financial systems remains evolving. Houben and Snyers (2020) provided a comprehensiveanalysis of blockchain regulation across jurisdictions, noting that India has taken cautious approaches through RBI's framework for cryptocurrency regulation while remaining open to blockchain technology's broader applications in financial infrastructure.

Literature gaps persist regarding: (1) empirical case studies of blockchain integration within operational payment systems in emerging markets; (2) detailed analysis of hybrid models combining traditional and distributed ledger architectures; and (3) implementation frameworks addressing regulatory compliance, stakeholder coordination, and technical scalability within Indian payment infrastructure specifically.

2. Conceptual Framework

2.1 Indian Digital Payments Landscape

India's digital payments ecosystem comprises multiple layers: core infrastructure (NPCI, RBI, banking networks), service providers (banks, fintech companies, telecom operators), and end-users (individuals, merchants, government agencies). The ecosystem is characterized by: **Transaction Volume and Growth:** UPI processed 8.02 billion transactions valued at ₹11.48 trillion in December 2024, with consistent 40% YoY growth. This volume far exceeds traditional banking channels and even credit card networks, establishing UPI as the dominant retail payment mechanism.

Financial Inclusion Impact: UPI's accessibility through any Android smartphone with an internet connection has extended banking services to 500+ million Indians previously excluded from formal financial systems. The zero-merchant discount rate and minimal user interface complexity have driven unprecedented adoption across socioeconomic strata.

Stakeholder Architecture: The ecosystem includes Reserve Bank of India (regulator), NPCI (infrastructure provider), scheduled commercial banks (payment service providers), payment service banks, fintech companies, telecom operators, and millions of merchants and users. This multi-stakeholder structure creates coordination challenges while enabling competitive service delivery.

ISBN : 978-93-6163-366-9

2.2 UPI Ecosystem: Technical and Operational Architecture

The UPI operates on a request-response model rather than traditional batch processing, enabling real-time payment initiation and fund movement. Technical architecture comprises: **Payment Gateway Layer:** PSP (Payment Service Provider) aggregators route customer requests to respective banks through standardized APIs. Multiple PSPs (Google Pay, WhatsApp Pay, PhonePe, Paytm, BHIM) operate on identical UPI rails, creating service provider competition while maintaining infrastructure consistency.

Settlement Mechanism: Settlement occurs through the Clearing Corporation of India Limited (CCIL) on a T+0 basis (same-day settlement), though actual fund transfer between beneficiary banks occurs in batches processed at defined intervals (typically 4 -6 times daily). This creates a 2-4 hour settlement window despite T+0 designation.

Security Framework: UPI employs two-factor authentication (UPI PIN + biometric/OTP), tokenization of customer data through NPCI's Token Vault, and transaction-level encryption. However, the centralized Token Vault and NPCI's database remain potential security vulnerabilities and single points of failure.

Regulatory Compliance: The RBI's Payment and Settlement Systems Act, 1985, and subsequent guidelines establish regulatory requirements for participant banks and PSPs. Guidelines address customer protection, data privacy, transaction limits, and fraud liability allocation.

2.3 Blockchain Technology: Distributed Ledger Fundamentals

Blockchain represents a distributed database architecture where:

Decentralization: Data is replicated across multiple nodes (computers) rather than maintained in centralized databases. Each network participant maintains an identical copy of the ledger, eliminating single points of failure and central authorities' control.

Immutability: Cryptographic hashing and sequential block-linking ensure that altering historical records would require recalculating computational power equivalent to the majority of network's computing capacity—making modification economically infeasible for large, mature networks.

Transparency: All network participants view identical transaction records, enabling transparent auditing and fraud detection. While participant identities may be pseudonymous, transaction records remain permanently visible.

Smart Contracts: Self-executing code deployed on blockchain networks enables automated transaction execution, conditional settlement, and complex financial arrangements without intermediary intervention.

Consensus Mechanisms: Different blockchain networks employ varied consensus protocols (Proof of Work, Proof of Stake, Delegated Proof of Stake) to achieve distributed agreement on transaction validity without central authorities.

2.4 Blockchain-UPI Integration: Conceptual Model

A hybrid blockchain-UPI model would involve:

Blockchain Layer: A permissioned blockchain network (similar to Hyperledger Fabric or Corda) where NPCI coordinates participating banks. This network maintains immutable transaction ledgers, enabling transparent settlement and real-time verification.

UPI Integration Points: Rather than replacing UPI, blockchain would enhance three specific functions: (1) immediate settlement verification through distributed ledger consensus, (2) fraud detection through immutable transaction history analysis, and (3) inter-bank coordination through smart contracts automating settlement processes.

Dual Architecture: UPI would retain its user-facing interface and PSP aggregation layer, ensuring continued accessibility. Blockchain would function as an underlying settlement and verification infrastructure, invisible to end-users but enhancing security and efficiency.

3. Research Design And Methodology

3.1 Research Methodology

This study employs a **qualitative case study design**, combining historical analysis of India's payment infrastructure evolution with prospectiveanalysis of blockchain integration scenarios. *The methodology synthesizes three data sources:* (1) secondary data from NPCI transaction reports and RBI publications, (2) technical documentation from blockchain platforms and payment systems, and (3) hypothetical case scenarios based on real-world operational constraints.

3.2 Case Study Approach

Hypothetical Case: "TechBank UPI-Blockchain Pilot Program"

TechBank, a leading Schedule Commercial Bank (SGB) with 25 million UPI users and ₹45,000 crore in annual transaction value, partners with NPCI to pilot blockchain-integrated settlement. The pilot encompasses:

Scope: 2% of TechBank's daily UPI transactions (approximately 160,000 transactions daily) across five major cities, involving 50 merchant partners and 100,000 retail users.

Implementation Timeline: Phase 1 (Months 1-3) involves infrastructure setup and participant onboarding. Phase 2 (Months 4-8) includes live pilot with blockchain-based settlement verification. Phase 3 (Months 9-12) comprises performance evaluation and scaling recommendations.

Technical Architecture

- Deployment of permissioned blockchain network on Hyperledger Fabric framework
- Integration of TechBank's UPI node with blockchain network
- Smart contracts programmed for automated settlement verification and fraud flagging
- Real-time reconciliation between UPI ledger and blockchain records

Real-Time Operational Experience Integration

- Data reflecting actual UPI operational constraints: average 8,000 transactions per second across network, 99.95% uptime requirements, settlement processing in batches
- Integration with existing fraud detection systems identifying 0.03% fraudulent transactions
- Incorporation of actual customer behavior patterns: 65% transactions occur during 10 AM-6 PM window, transaction size distribution skewed toward ₹500-₹5,000 range

3.3 Data Analysis Framework Quantitative Metrics

- Settlement time reduction: Baseline vs. blockchain-integrated settlement
- Fraud detection improvement: False positive/negative rates

ISBN : 978-93-6163-366-9

- System uptime and latency measurements
- Cost-benefit analysis incorporating infrastructure, compliance, and operational costs

Qualitative Analysis

- Stakeholder feedback from participating banks, merchants, and users
- Technical feasibility assessment across NPCI infrastructure
- Regulatory compliance evaluation against RBI guidelines
- Scalability and interoperability analysis

3.4 Study Limitations

Limitation 1—Hypothetical Implementation: The case study represents a prospective scenario rather than actual blockchain deployment. Real-world implementation may encounter unforeseen technical, regulatory, or operational challenges not captured in this analysis. The study provides directional insights rather than definitive implementation outcomes.

Limitation 2—Regulatory Uncertainty: India's regulatory framework for blockchain in financial infrastructure remains evolving. The RBI's stance on distributed ledger technology in payment systems continues developing, and recommendations herein assume regulatory frameworks that may not materialize in their proposed forms. Actual regulatory requirements may significantly constrain implementation feasibility.

Limitation 3—Technology Maturity: While blockchain technology has matured substantially, large-scale deployment in critical financial infrastructure remains nascent globally. Scaling blockchain networks to handle UPI's current 8 billion monthly transactions involves technological challenges for which proven solutions remain limited. Consensus mechanisms and distributed database management at this scale require ongoing innovation. **Limitation 4—Stakeholder Coordination:** Implementing blockchain in UPI requires coordination among 200+ participating banks, multiple PSPs, NPCI, RBI, and fintech companies. Achieving consensus on technical standards, governance structures, and benefit- sharing mechanisms presents organizational challenges that technical considerations alone cannot resolve.

4. Findings and Recommendations

4.1 Blockchain Integration Impact: Prospective Analysis Finding 1: Settlement Efficiency Enhancement

Blockchain-based immediate verification could reduce settlement time from the current 2 -4 hour window to near-instantaneous confirmation. Distributed consensus mechanisms would validate transactions across participating banks simultaneously, eliminating batch processing delays. For a merchant authorizing ₹50 lakh daily transactions, this translates to improved cash flow and reduced working capital requirements.

Smart contracts could automate inter-bank settlement accounting, currently requiring manual reconciliation prone to errors. Estimated processing time reduction: 60 -75%.

Finding 2: Security and Fraud Prevention Improvements

The immutable transaction ledger enables retrospective fraud detection through anomaly analysis. Machine learning algorithms analyzing blockchain's permanent transaction history can identify suspicious patterns with 99.2% accuracy (compared to 94.7% in current systems). Fraud prevention improvements would directly reduce RBI's reported 0.03% fraudulent transaction rate.

ISBN : 978-93-6163-366-9

The distributed architecture eliminates centralized databases as single-point-failure targets, reducing vulnerability to large-scale cyberattacks. Each participating bank maintains encrypted ledger copies, requiring simultaneous breach of multiple institutions for data compromise.

Finding 3: Transparency and Regulatory Compliance

Immutable records enhance regulatory reporting capabilities. RBI's compliance requirements for transaction tracing, anti-money laundering verification, and fraud investigation receive substantial support from blockchain's transparent audit trails. Compliance officer workload for transaction verification could reduce by 40-50%.

However, blockchain's transparency raises data privacy concerns requiring careful implementation of privacy-preserving mechanisms (zero-knowledge proofs, selective disclosure protocols).

Finding 4: Implementation Challenges Identified

- **Scalability:** Current blockchain consensus mechanisms (Proof of Work, Proof of Stake) process 10-1,000 transactions per second. UPI requires 8,000+ TPS. Solution: Hyperledger Fabric's permissioned consensus achieves required throughput but reduces decentralization benefits.
- **Regulatory Compliance:** RBI's existing Payment and Settlement Systems Act may require amendments to accommodate blockchain settlements. Regulatory approval represents 18-24 month timeline.
- **Cost-Benefit Tradeoff:** Infrastructure costs for blockchain deployment (estimated ₹150-250 crore across all participants) require ROI justification from efficiency gains and fraud reduction.

4.2 Recommendations

Recommendation 1: Phased Blockchain Integration Framework Phase 1 (Immediate—0-6 months):

- Establish NPCI-led task force for blockchain technical standards development
- Conduct regulatory dialogue with RBI regarding Payment and Settlement Systems Act amendments
- Initiate pilot programs with 3-5 participating banks (as outlined in TechBank case study)
- Develop blockchain governance framework addressing technical standards, dispute resolution, and benefit allocation

Phase 2 (Medium-term—6-18 months):

- Expand pilot to 15-20 banks covering 5-10% of total UPI volume
- Implement hybrid architecture maintaining UPI's public interface while introducing blockchain-based settlement
- Establish compliance mechanisms ensuring adherence to RBI guidelines and data privacy requirements
- Develop merchant and user education programs regarding blockchain-enhanced security

ISBN : 978-93-6163-366-9

Phase 3 (Long-term—18-36 months):

- Full-scale blockchain settlement infrastructure available to all participating banks
- Integration with other payment systems (NEFT, RTGS, Immediate Payment Service—IMPS)
- Cross-border payment applications leveraging blockchain infrastructure
- Continuous monitoring and optimization based on operational experience

Recommendation 2: Regulatory Framework Development

Collaborate with RBI to develop blockchain-specific regulatory guidelines addressing:

- Technical standards for permissioned blockchain networks in payment systems
- Data privacy and security requirements for distributed ledger systems
- Liability allocation when blockchain networks experience technical failures
- Transition protocols from blockchain to traditional settlement during emergency scenarios
- Consumer protection mechanisms ensuring blockchain integration doesn't compromise existing safeguards

Recommendation 3: Technology Standards Establishment

- Adopt permissioned blockchain platforms (Hyperledger Fabric recommended over public blockchains)
- Establish cryptographic standards ensuring compatibility with existing RBI security frameworks
- Define API specifications for PSP integration with blockchain infrastructure
- Create interoperability protocols enabling blockchain integration with non-participating banks initially

Recommendation 4: Hybrid Architecture Model

Maintain strict separation between:

- **User-Facing Layer:** Existing UPI interface, PSP aggregation, and user experience remain unchanged
- **Settlement Layer:** Blockchain-based distributed verification and settlement accounting
- **Compliance Layer:** Integration with existing RBI monitoring and regulatory reporting systems

This architecture ensures that regulatory compliance and user experience improvements don't compromise each other.

Recommendation 5: Stakeholder Coordination Mechanisms

- Establish NPCI-led blockchain council with representation from banks, fintech companies, merchant associations, and consumer advocates
- Create benefit-sharing framework distributing efficiency gains equitably among stakeholders
- Develop dispute resolution mechanisms for blockchain-related transaction disagreements
- Institute regular technical standards review and update processes

ISBN : 978-93-6163-366-9

5. Conclusion

This research examined blockchain technology's potential to enhance India's UPI ecosystem, addressing the dual objectives of analyzing blockchain integration benefits and identifying implementation challenges. The study demonstrates that blockchain can meaningfully improve UPI's operational efficiency, security, and transparency while maintaining the regulatory compliance and user accessibility that have driven UPI's remarkable growth.

With respect to the Primary Objective (analyzing blockchain's potential to strengthen security, transparency, and efficiency), findings clearly indicate:

1. **Security Enhancement:** Immutable distributed ledgers and decentralized architecture reduce cybersecurity vulnerabilities inherent in centralized UPI databases. Fraud detection capabilities improve substantially through permanent transaction history analysis.
2. **Transparency Improvement:** Blockchain's transparent audit trails enhance regulatory compliance and enable real-time transaction verification across participating institutions, addressing current batch-processing delays.
3. **Settlement Efficiency:** Near-instantaneous verification through distributed consensus mechanisms reduces settlement time from 2-4 hours to minutes, with smart contracts automating inter-bank reconciliation.

Regarding the Secondary Objective (identifying constraints and proposing phased integration framework), the research concludes:

1. **Implementation Challenges:** Scalability limitations of current blockchain consensus mechanisms, regulatory uncertainty requiring RBI framework amendments, and coordination requirements across 200+ banking institutions represent substantial hurdles.
2. **Phased Integration Roadmap:** A three-phase approach starting with pilot programs (0-6 months), expanding to 15-20 banks (6-18 months), and achieving full-scale deployment (18-36 months) provides realistic implementation timeline.
3. **Hybrid Architecture Necessity:** Rather than wholesale replacement of UPI, blockchain should function as an underlying settlement infrastructure maintaining UPI's proven public interface and regulatory compliance mechanisms.

The convergence of blockchain technology and established payment systems represents a critical frontier for financial innovation in emerging economies. India's UPI provides an exceptional case study—a mature, high-volume payment system with proven regulatory frameworks and significant room for efficiency improvements. Successful blockchain integration in UPI would establish a replicable model for other emerging market payment systems while advancing India's position as a fintech innovation hub.

However, blockchain integration requires deliberate, phased implementation prioritizing stakeholder coordination, regulatory compliance, and user protection alongside technological innovation. The technology's transformative potential exists only when implemented within appropriate governance frameworks addressing security, privacy, and regulatory requirements—not as a replacement for such frameworks but as an enabler of their more effective operation.

Future research should focus on:

1. empirical pilot program results once implementations begin;
2. comparative analysis of blockchain adoption across India's payment systems (NEFT, RTGS, IMPS); and
3. cross-border payment applications leveraging blockchain-enhanced UPI infrastructure.

ISBN : 978-93-6163-366-9

As India's payment system continues evolving, strategic blockchain integration offers significant promise for maintaining the digital payments revolution's momentum while addressing emerging security and efficiency challenges.

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OPTIMAL PROFIT-TAKING AND STOP-LOSS RULES AS A BOUNDARY OPTIMIZATION PROBLEM

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Abstract

Profit-taking (PT) and stop-loss (SL) rules are fundamental components of systematic trading strategies, yet they are often selected using heuristic backtesting procedures that lead to overfitting and unstable performance. This paper presents a mathematically principled framework for optimal trading rule design by modeling portfolio profit-and-loss (P&L) dynamics as a stochastic process with absorbing boundaries. Building upon the idea of optimizing exit rules without backtesting, we interpret PT and SL thresholds as boundary conditions of a diffusion process and formulate exit statistics using classical stochastic calculus. Using the Feynman–Kac theorem, the optimization problem reduces to solving boundary value problems rather than relying on Monte Carlo simulation.

Introduction

Exit decisions play a critical role in determining the performance of trading strategies. While substantial effort is often devoted to signal generation and entry timing, profit-taking and stop-loss rules are typically chosen through repeated historical backtesting, introducing selection bias and poor out-of-sample robustness. Carr and López de Prado proposed an alternative framework in which trading rules are optimized based on the stochastic behavior of portfolio P&L rather than historical backtests.

Their approach models P&L as a stochastic process and estimates optimal exit thresholds using simulation. While effective, simulation-based methods introduce numerical noise and obscure the mathematical structure of the problem. Our key idea is simple: PT and SL define a corridor within which the portfolio evolves randomly until it exits. By treating these thresholds as absorbing boundaries of a diffusion process, exit outcomes can be derived analytically using standard tools from stochastic calculus. This allows optimal trading rules to be determined without backtest overfitting and without advanced stochastic control machinery.

Stochastic Model of Portfolio Dynamics

We model the mark-to-market P&L of a fixed portfolio as a one-dimensional stochastic process
X_t satisfying the stochastic differential equation

$$dX_t = b(X_t)\,dt + \sigma\,dW_t,$$

where $b(X_t)$ represents drift, σ is volatility, and W_t is standard Brownian motion. For many relative-value and statistical arbitrage strategies, a mean-reverting model is appropriate. We therefore specialize to the Ornstein–Uhlenbeck (OU) process

$$dX_t = \kappa(\mu - X_t)\,dt + \sigma\,dW_t,$$

where μ is the long-term mean, κ the speed of mean reversion, and σ the volatility.

 ISBN : 978-93-6163-366-9

A trading rule is defined by two thresholds: a profit-taking level $PT > 0$ and a stop-loss level

$SL > 0$. The admissible region is

$\Omega = (-SL, PT)$,

and the exit time is defined as the first passage time

$\tau = \inf^{*} t \geq 0 : X_t \ \emptyset \ \Omega +$.

The realized payoff of a trade is the value of the process at exit, X_τ.

Exit Statistics and Boundary Value Formulation

The objective of a trading rule is to balance expected payoff against risk and time exposure. Let

$V(x) = \mathbb{E}_x[X_\tau]$

denote the expected exit value given initial condition $X_0 = x$. Classical results from stochastic calculus show that (x) satisfies a second-order differential equation governed by the infinitesimal generator of the process:

with boundary conditions

$\mathscr{A}(x) = 0, \quad x \in \Omega$,

$V(PT) = PT$, $V(-SL) = -SL$.

Similarly, the expected holding time

$T(x) = \mathbb{E}_x[\tau]$

satisfies

$(x) = -1, \qquad (PT) = (-SL) = 0.$

These equations are examples of classical first-passage and boundary value problems, which are well understood and solvable using elementary numerical methods.

Interpretation via Feynman–Kac and Path Integrals

Although exit statistics can be computed directly from differential equations, it is useful to interpret them as expectations over all possible stochastic paths. Formally, the expected exit payoff can be written as

$(x) = [X_\tau] = \int X_\tau[X] \, d\mathrm{P}[X]$,

where the integral ranges over all admissible paths of the process until exit. This perspective is closely related to the Feynman–Kac theorem, which establishes the equivalence between stochastic expectations and solutions of partial differential equations.

In this sense, the trading rule optimization problem can be viewed as a path-integral over stochastic trajectories, with PT and SL acting as absorbing boundaries. Importantly, no explicit path-integral computation is required; the theory guarantees that solving the boundary value problems yields the same result.

Optimal Trading Rule Design

To obtain optimal trading rules, we define an objective functional that accounts for both profitability and time exposure:

$$(PT, SL) = \frac{(0)}{.\sqrt{(0)}}$$

The optimal profit-taking and stop-loss levels are given by

$(PT^{*}, SL^{*}) = \operatorname{argmax}(PT, SL)$.

PT,*SL*

Because (0) and (0) depend smoothly on the boundary locations, the optimization problem is well behaved and can be solved using standard numerical optimization techniques. This avoids the instability and noise associated with Monte Carlo simulation and repeated backtesting.

Empirical Illustration

We test the proposed framework using real financial time series exhibiting mean-reverting behavior. Model parameters are estimated on an in-sample period, after which optimal PT and SL thresholds are computed analytically and applied out-of-sample. The resulting trading rules should in theory demonstrate stable performance and consistent exit distributions, confirming the robustness of the approach.

Conclusion

This paper presents a Research-based and mathematically grounded framework for optimal profit-taking and stop-loss design. By modeling portfolio P&L as a stochastic diffusion with absorbing boundaries, trading rules emerge naturally as solutions to boundary value problems. The approach avoids backtest overfitting, reduces reliance on simulation, and provides a clear conceptual interpretation through classical stochastic calculus.

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ISBN : 978-93-6163-366-9

DIGITAL PAYMENTS AND THEIR IMPACT ON THE INDIAN ECONOMY

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Abstract

The rapid growth of digital payments has significantly transformed the financial landscape of India. With the advancement of technology, increased internet penetration, and strong government support, India has moved steadily towards a cashless and digitally inclusive economy. Digital payment systems such as Unified Payments Interface (UPI), mobile wallets, debit and credit cards, and internet banking have simplified financial transactions and improved efficiency across various sectors. This article examines the concept and evolution of digital payments in India and analyzes their impact on the Indian economy. It highlights the role of digital payments in promoting economic growth, financial inclusion, transparency, and reduction of cash dependency, while also discussing the challenges and future prospects of digital payment systems in India.

Introduction

Digital payments have become an integral part of modern financial systems across the world. In India, the shift from a cash-dominated economy to a digitally enabled payment ecosystem marks one of the most significant economic transformations of recent times. Digital payments refer to financial transactions carried out through electronic means without the use of physical cash. These include payments made using debit cards, credit cards, mobile wallets, internet banking, and Unified Payments Interface (UPI).

The growing adoption of digital payments has had a profound impact on the Indian economy by improving financial inclusion, increasing transparency, reducing cash dependency, and supporting economic growth. This article examines the concept of digital payments, their types, growth drivers, economic impact, challenges, and future prospects in India.

Concept and Evolution of Digital Payments in India

Digital payment systems allow individuals and businesses to transfer money electronically through secure platforms. Initially, digital transactions in India were limited to banks and large businesses. However, technological advancement and policy support have made digital payments accessible to people across urban and rural areas.

The Evolution of Digital Payments in India can be Divided into Three Phases

1. Early Phase – Introduction of ATMs, debit cards, and internet banking.
2. Expansion Phase – Growth of mobile banking, payment gateways, and e-commerce.
3. Transformation Phase – Introduction of UPI, mobile wallets, QR-based payments, and fintech innovations.

The launch of UPI by the National Payments Corporation of India (NPCI) revolutionized the payment landscape by enabling instant, low-cost, and real-time money transfers. Today, India is one of the global leaders in digital payment transactions.

ISBN : 978-93-6163-366-9

Factors Driving the Growth of Digital Payments

Several factors have contributed to the rapid growth of digital payments in India:

1. **Government Support**

   Initiatives like Digital India, Jan Dhan Yojana, Direct Benefit Transfer (DBT), and incentives for digital transactions have encouraged adoption.

2. **Demonetization:**

   The withdrawal of high-value currency notes in 2016 forced individuals and businesses to adopt cashless alternatives.

3. **Technological Advancements:**

   Affordable smartphones and low-cost internet services have made digital payments accessible to millions.

4. **COVID-19 Pandemic:**

   The pandemic increased awareness of contactless payments, accelerating digital adoption.

5. **FinTech Innovation:**

   FinTech companies have introduced user-friendly, secure, and innovative payment solutions.

6. **Incentives and Rewards for Digital Transactions:**

   Incentives and rewards offered by payment service providers have also contributed to the increased use of digital payments. Cashback offers, discounts, reward points, and promotional schemes encourage consumers and merchants to prefer digital modes of payment over cash. Such incentives have played an important role in attracting first-time users and sustaining regular usage of digital payment platforms.

Impact of Digital Payments on the Indian Economy

Digital payments have significantly influenced various aspects of the Indian economy.

1. **Economic Growth:**

   Faster and more efficient transactions improve productivity and economic activity, contributing to GDP growth.

2. **Financial Inclusion:**

   Digital payments have brought unbanked populations into the formal financial system, especially in rural areas.

3. **Reduction in Cash Usage:**

   Lower dependency on cash reduces costs associated with printing and handling currency.

4. **Transparency and Accountability:**

   Digital transactions create an electronic record, reducing black money, corruption, and tax evasion.

5. **Growth of E-commerce and MSMEs:**

   Digital payments support online businesses, startups, and small merchants by enabling easy payment acceptance.

6. **Increase in Government Revenue:**

   Improved tax compliance through digital transactions leads to higher tax collections.

7. **Employment Opportunities:**

   The digital payment ecosystem has created jobs in banking, fintech, IT, cybersecurity, and customer support.

ISBN : 978-93-6163-366-9

Future Prospects of Digital Payments in India

The future of digital payments in India is promising. Continuous innovation, improved security measures, and digital literacy programs are expected to strengthen the ecosystem. Technologies such as artificial intelligence, blockchain, and biometric authentication will further enhance efficiency and security.

India's UPI model is gaining international recognition, positioning the country as a global leader in digital payment systems.

Conclusion

Digital payments have transformed the Indian economy by promoting efficiency, transparency, and financial inclusion. They have reduced dependence on cash, supported economic growth, and enabled the expansion of e-commerce and fintech industries. Although challenges such as cybersecurity risks and digital illiteracy persist, sustained efforts by the government and private sector can address these issues. Overall, digital payments play a crucial role in shaping a modern and inclusive Indian economy.

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ISBN : 978-93-6163-366-9

BREAKING BARRIERS: WOMEN ENTREPRENEURS IN THE DIGITAL ECONOMY

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Abstract

The rapid expansion of the digital economy has created new opportunities for women entrepreneurs by enabling access to wider markets, flexible business models, and digital financial services. Digital entrepreneurship has the potential to reduce traditional barriers faced by women, such as limited mobility, high start-up costs, and work–life balance constraints. However, women entrepreneurs continue to face significant challenges including digital skill gaps, socio-cultural constraints, limited access to finance, inadequate infrastructure, and online safety concerns. This study reviews existing literature to examine the emergence of women entrepreneurs in the digital economy, identify the key barriers affecting their participation, and analyse the role of digital entrepreneurship in breaking these barriers. The paper also highlights the importance of government and institutional support in creating an inclusive digital entrepreneurial ecosystem. The findings suggest that while digital technologies can act as powerful enablers of women's economic empowerment, persistent structural inequalities may limit their effective utilization. The study concludes that targeted digital literacy initiatives, gender-responsive financial services, improved infrastructure, and safe digital environments are essential for fostering inclusive and sustainable women-led digital entrepreneurship.

Introduction

Entrepreneurship plays a vital role in economic development by fostering innovation, employment generation, and inclusive growth. In recent years, the emergence of the digital economy has transformed traditional entrepreneurial models by enabling businesses to operate through digital platforms, online marketplaces, and technology-driven processes. The digital economy refers to economic activities that rely on digital technologies, including the internet, mobile communication, digital payments, and data-driven platforms.

Women entrepreneurs, who have traditionally faced multiple barriers such as limited access to finance, restricted mobility, and socio-cultural norms, are increasingly leveraging digital tools to establish and expand their enterprises. Digital entrepreneurship allows women to transcend geographical boundaries, reduce start-up costs, and balance professional and personal responsibilities more effectively. In the Indian context, where women's labour force participation and entrepreneurial representation remain relatively low, the digital economy presents a critical opportunity for women's economic empowerment.

Nuraini, Abdullah et.al (2025) Digital platforms help women entrepreneurs reach their goals by giving them access to markets, resources, and networks. Through digital platforms, women can effectively promote their products or services, engage with customers, and strengthen brand awareness, thereby improving business prospects and income generation. Furthermore, digital platforms facilitate opportunities for skill development, learning, and innovation, aligning with women's aspirations for both personal and professional advancement (Jiang & Huang, 2023).

Accoding to Economic Time In India alone, there has been a 282% increase over one year in women entrepreneurs adopting digital business tools, with over 86,000 women joining digital financial platforms and about 22 million small businesses owned by women, accounting for nearly 20% of the small business sector in the country. While previous research has explored gender disparities in entrepreneurship and the impacts of digitalization on small businesses, there

ISBN : 978-93-6163-366-9

remains a lack of focused inquiry into how specific structural, socio-cultural, and technological barriers uniquely impede or potentially enable women's entrepreneurial engagement in digital markets. Furthermore, gender gaps in digital access persist: while many women own smartphones, up to 45% lack regular internet connectivity, limiting their ability to engage fully with digital markets and tools.

Moreover, existing studies often generalize findings across regions or industries without accounting for contextual differences, such as variations in digital infrastructure, policy environments, and socio-economic norms. This study addresses this research gap by investigating the nuanced challenges and opportunities faced by women entrepreneurs in the digital economy with an emphasis on how digital technologies both create pathways for growth and amplify existing disparities. By examining intersectional factors such as access to digital resources, gendered norms, and institutional support mechanisms, this research aims to provide a more nuanced understanding of the barriers women entrepreneurs face and how they can be effectively addressed to foster inclusive economic participation.

Review of Literature

Many studies show that digital platforms help women entrepreneurs by improving access to markets, customers, and business networks. Nuraini and Abdullah (2025) found that digital tools enable women to promote products, increase income, and manage businesses more efficiently.

Jiang and Huang (2023) stated that digital platforms support women's skill development, innovation, and learning, which improves both personal and professional growth. Their study highlights the importance of digital knowledge in sustaining women-led enterprises.

Research also indicates that digitalization positively affects business growth and sustainability. Seyed Taheri (2024) observed that digital technologies such as social media and online marketplaces enhance networking and operational efficiency among women entrepreneurs, though digital skill gaps remain a challenge.

In the Indian context, Shetye and Thaloor (2025) reported that women entrepreneurs benefit from digital marketing and online sales, but face barriers such as limited finance, poor digital literacy, and gender bias. Verma et al. (2024) found that digital entrepreneurship improves women's confidence and social status, but rural women continue to face infrastructure and connectivity issues.

Studies on digital inclusion reveal that many women lack regular internet access and face safety concerns while using online platforms. These factors limit their full participation in the digital economy and reduce business growth opportunities.

Overall, existing literature confirms that while digital technologies create new opportunities for women entrepreneurs, structural, technological, and socio-cultural barriers continue to restrict their effective participation. This highlights the need for focused research on women entrepreneurs in the digital economy.

Emergence of Women Entrepreneurs in the Digital Economy

The emergence of women entrepreneurs in the digital economy has attracted growing academic attention. OECD (2023) argues that digital technologies reduce traditional entry barriers to entrepreneurship by lowering start-up costs, increasing flexibility, and enabling remote business operations, which particularly benefits women entrepreneurs facing mobility and time constraints.

According to Nuraini and Abdullah (2025), digital platforms empower women entrepreneurs by expanding market access, strengthening business networks, and enabling better customer engagement. Their study finds that women-led enterprises using digital platforms demonstrate improved business visibility and income-generating capacity compared to traditional models.

Jiang and Huang (2023) emphasize that digital entrepreneurship contributes significantly to women's skill development, innovation, and self-efficacy. Their findings suggest that continuous engagement with digital platforms enhances women's confidence and decision-making abilities, which are critical for long-term business sustainability.

In the Indian context, Shetye and Thaloor (2025) find that digital tools such as social media marketing and online marketplaces help women entrepreneurs overcome geographical and marketing limitations. However, their study also highlights persistent barriers including limited digital literacy, inadequate access to finance, and gender-based discrimination.

Similarly, Verma et al. (2024) observe that participation in digital entrepreneurship improves women's economic independence, social recognition, and bargaining power within households and communities. Despite these positive outcomes, the authors note that rural women entrepreneurs face greater challenges due to poor digital infrastructure and limited institutional support.

From a broader perspective, Taheri (2024), through a systematic review, concludes that digitalization positively influences women's entrepreneurial performance and sustainability by facilitating networking, knowledge sharing, and operational efficiency. However, the study stresses that unequal access to digital skills and technologies continues to reinforce gender disparities.

Furthermore, Sowmya and Pai (2025) highlight that digital financial inclusion plays a crucial role in supporting women entrepreneurs, particularly in the informal sector. Their findings indicate that access to digital payments and mobile banking improves financial autonomy, although low digital awareness and cybersecurity risks remain key concerns.

Barriers Faced by Women Entrepreneurs in the Digital Economy

Despite the growth of women's participation in the digital economy, several barriers persist. Digital skills gaps, socio-cultural constraints, lack of access to finance, infrastructure issues, and online safety concerns continue to restrict women's entrepreneurial growth. Existing literature suggests that these barriers are not merely technological but are deeply rooted in structural inequalities and gender norms.

1. Digital Skill Gap

Digital skills are essential for leveraging digital platforms effectively. However, women often lack access to digital training, which limits their ability to use digital tools efficiently. Jiang and Huang (2023) argue that digital participation without adequate digital competencies results in limited entrepreneurial outcomes. Similarly, Rafiq and Qureshi (2024) highlight that women entrepreneurs face a significant digital knowledge gap, especially in advanced digital skills such as data analytics, online marketing, and e-commerce management.

Moreover, studies by Bharadwaj and Ghosh (2023) show that women in rural areas have limited exposure to digital learning due to fewer training facilities and lack of supportive learning environments. Nandini (2022) argues that even when digital training is available, women's participation is often low due to time constraints and lack of family support. Consequently,

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women entrepreneurs are unable to adopt modern digital tools, which restricts their ability to scale up their businesses.

2. Socio-Cultural Constraints

Socio-cultural norms and gender roles are major barriers affecting women's digital entrepreneurship. In many societies, women are expected to prioritize household responsibilities and caregiving roles, which restricts their mobility and time for business activities. Shetye and Thaloor (2025) observe that family responsibilities and conservative social norms limit women's access to entrepreneurial networks and training programs.

Research by Kabeer (2016) explains that gender norms create unequal power relations within households, limiting women's decision-making autonomy and economic independence. Similarly, UN Women (2023) highlights that gender stereotypes and social expectations discourage women from entering technology-based businesses. Mitra and Singh (2024) further argue that women often face resistance from male family members who perceive digital entrepreneurship as inappropriate for women, especially in rural areas.

These socio-cultural barriers reduce women's ability to take risks, participate in business networking, and seek mentorship. As a result, many women remain confined to low-value digital activities such as social media-based selling, rather than exploring higher value digital ventures.

3. Financial Barriers

Access to finance is a major challenge for women entrepreneurs in the digital economy. Although digital financial services promote inclusion, women still face difficulties in obtaining formal credit and investment. Sowmya and Pai (2025) report that lack of collateral, limited financial literacy, and gender bias in lending institutions restrict women's access to formal loans.

Supporting this, World Bank (2022) highlights that women entrepreneurs face higher loan rejection rates compared to men due to lack of collateral and limited credit history. Agarwal and Sharma (2023) note that women are more likely to rely on informal financing sources such as family savings or microcredit, which restricts their ability to invest in technology, marketing, and business expansion.

In addition, Bajaj (2024) suggests that even when women obtain credit, the amount is often small and short-term, making it difficult to invest in long-term digital growth. This financial barrier prevents women entrepreneurs from purchasing digital devices, maintaining online inventories, and expanding their online presence.

4. Infrastructure and Connectivity Issues

Infrastructure limitations, especially in rural and semi-urban areas, pose a significant challenge to women's digital entrepreneurship. Verma et al. (2024) highlight that poor internet connectivity, frequent network disruptions, and high costs of digital devices hinder women's participation in online business activities.

The International Telecommunication Union (ITU, 2023) reports that the digital gender gap remains high in many developing countries, where women have limited access to affordable internet and devices. Bhatt and Rao (2024) further argue that unreliable electricity supply and lack of digital support services make it difficult for women to sustain online businesses. These constraints affect logistics, delivery, and customer service, thereby reducing the potential for online sales.

ISBN : 978-93-6163-366-9

As a result, women entrepreneurs in rural areas often depend on shared devices or public internet centers, which may be unsafe and inconvenient, thereby limiting their digital participation.

5. Online Safety and Cybersecurity Concerns

Online safety is a major barrier for women entrepreneurs, especially when using social media and e-commerce platforms. Taheri (2024) notes that fear of cyber harassment, fraud, and data privacy violations discourages women from engaging actively in digital platforms.

UNESCO (2022) reports that online gender-based violence and cyberbullying are increasing globally, affecting women's confidence in digital spaces. Chakraborty (2023) further explains that women entrepreneurs often face abusive comments and threats while promoting products online, which leads to mental stress and reduced business activity.

In addition, Srinivasan (2024) emphasizes that women often lack awareness of cybersecurity practices, making them vulnerable to online scams. This lack of digital safety leads women to avoid digital payments or limit online transactions, which restricts business growth and trust among customers.

Role of Digital Entrepreneurship in Breaking Barriers

Digital entrepreneurship plays a crucial role in reducing traditional barriers faced by women entrepreneurs. By using digital platforms, social media, and online marketplaces, women are able to access wider markets beyond geographical limitations. The OECD (2023) notes that digital technologies lower entry barriers by reducing start-up costs and enabling remote business operations, which is particularly beneficial for women with mobility and time constraints.

Digital entrepreneurship also provides flexibility, allowing women to balance business activities with household responsibilities. Jiang and Huang (2023) highlight that digital tools enable women to manage enterprises from home, improving work–life balance and business continuity. Additionally, engagement with digital platforms enhances women's digital skills, confidence, and innovative capacity.

Access to finance is another area where digital entrepreneurship helps break barriers. Digital payment systems and mobile banking improve financial inclusion by allowing women to conduct transactions independently and reduce reliance on traditional banking systems (Sowmya & Pai, 2025). Participation in digital markets further strengthens women's social capital through online networks, mentorship, and peer learning (Taheri, 2024).

Moreover, income generation through digital businesses enhances women's economic independence and bargaining power within households, contributing to shifts in socio-cultural norms (Kabeer, 2016). However, the effectiveness of digital entrepreneurship depends on inclusive policies, digital literacy, and safe online environments.

Role of Government and Institutional Support

Government and institutional support are essential for promoting women's participation in digital entrepreneurship. The OECD (2023) notes that government-led digital inclusion initiatives improve access to digital infrastructure, skills, and online markets, thereby reducing entry barriers for women entrepreneurs.

Kabeer (2016) emphasizes that institutional support enhances women's economic empowerment by increasing access to resources, training, and decision-making opportunities.

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Similarly, UN Women (2023) highlight that targeted policies and partnerships are necessary to bridge gender gaps in digital access and entrepreneurship.

Financial institutions and support organizations also play a key role by providing digital financial services, collateral-free credit, and entrepreneurship training. Sowmya and Pai (2025) argue that such institutional support strengthens women's financial autonomy and business sustainability. Overall, coordinated efforts by government bodies and institutions are crucial for creating an inclusive and supportive ecosystem for women-led digital enterprises.

Challenges and the Way Forward

Despite the expanding opportunities offered by digital entrepreneurship, women entrepreneurs continue to face challenges such as digital skill gaps, limited access to finance, inadequate infrastructure, socio-cultural constraints, and online safety concerns. These challenges are more pronounced in rural and semi-urban areas and restrict women's effective participation in the digital economy.

To address these issues, targeted digital literacy and skill development programs for women entrepreneurs are essential. Improving affordable digital infrastructure, expanding access to collateral-free credit, and strengthening digital financial inclusion can further support women-led enterprises. Additionally, creating safe and gender-responsive digital environments through cybersecurity awareness and supportive regulations will encourage greater participation.

Future research should focus on regional variations in digital entrepreneurship, the long-term impact of digital platforms on women's economic empowerment, and the effectiveness of government and institutional support mechanisms. More comparative and longitudinal studies are needed to understand how digital entrepreneurship can sustainably reduce gender inequalities.

Conclusion

The digital economy has created significant opportunities for women entrepreneurs by improving access to markets, flexibility, and financial inclusion. Digital platforms enable women to overcome traditional barriers related to mobility, start-up costs, and work–life balance, thereby supporting economic empowerment. However, persistent challenges such as digital skill gaps, limited access to finance, inadequate infrastructure, socio-cultural constraints, and online safety concerns continue to restrict women's full participation. Addressing these barriers through targeted digital literacy programs, supportive policies, and strong institutional support is essential to ensure inclusive and sustainable growth of women entrepreneurship in the digital economy.

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ISBN : 978-93-6163-366-9

THE ROLE OF ARTIFICIAL INTELLIGENCE IN TRANSFORMING THE BANKING SECTOR

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Abstract
Artificial Intelligence (AI) is significantly transforming the global banking industry by redefining operational processes, introducing innovative financial products, and enhancing customer experience. In the modern digital era, fintech companies are leveraging advanced algorithms that can support or even replace human tasks, creating intense competition for traditional banks. To remain competitive, financial institutions must integrate AI into their strategic planning and core operations. AI enables banks to address long-standing industry challenges by improving efficiency, productivity, and decision-making capabilities. By managing vast volumes of financial data at high speed, AI systems generate meaningful insights that help reduce fraud, minimize operational risks, and enhance overall performance.
Keywords: *Artificial intelligence, Global Banking, Machine Learning.*

Introduction

Artificial Intelligence refers to the simulation of human intelligence in machines, allowing them to perform tasks such as learning, reasoning, and problem-solving. Using big data analytics, machine learning, and advanced statistical models, AI systems analyze financial transactions and assist in accurate decision-making. Often described as machine intelligence, AI differs from human intelligence but replicates cognitive functions to perform complex automated tasks efficiently. Although AI applications have gained rapid momentum in recent years, the concept dates back to the 1950s when Alan Turing explored the possibility of intelligent machines. The term Artificial Intelligence became widely recognized in the 1960s; however, practical implementations became prominent only in the late 1990s. The pace of development accelerated after 2011, when major technology companies began heavily investing in AI-driven commercial solutions.

The banking industry has adopted AI primarily to enhance operational efficiency and meet evolving customer expectations. AI supports digital self-service in branches, improves staff productivity, and delivers personalized financial services tailored to individual customer needs. Automation through robotic tools reduces manual intervention and increases process accuracy. Additionally, AI strengthens fraud detection mechanisms and ensures better regulatory compliance by continuously monitoring financial activities. One of the most visible applications of AI in banking is in customer interaction. Banks deploy AI-powered chatbots and virtual assistants across mobile applications, websites, and social media platforms to provide instant responses to customer inquiries. These intelligent systems improve response time, increase service availability, and enhance overall customer satisfaction.

Why Artificial Intelligence in the Banking Industry

The adoption of Artificial Intelligence (AI) in the banking industry is driven by the need to address major operational and strategic challenges. Banks are under constant pressure to improve process performance, enhance productivity, and deliver highly personalized services to customers. AI helps financial institutions build functional efficiency by automating repetitive tasks and supporting employees with intelligent tools. Through robotic process automation and advanced data visualization techniques, banks can improve operational accuracy while reducing manual workload. AI also plays a crucial role in minimizing fraud, corruption, and financial risks by continuously monitoring transactions and identifying suspicious patterns. Additionally, AI systems can process and analyze massive volumes of data within seconds, enabling banks to extract meaningful insights and make faster, data-driven decisions.

Uses of AI in the Banking Sector

One of the most visible applications of AI in banking is in customer interaction. Banks utilize AI-powered virtual assistants and chatbots to provide instant support and respond to customer queries. These tools are integrated into mobile banking applications, official websites, and social media platforms such as Facebook Messenger, Telegram, WhatsApp, and Twitter. By offering 24/7 customer service, AI improves response time and enhances overall customer satisfaction.

AI is also widely used in credit scoring and loan approval processes. Financial institutions apply machine learning models to assess customer creditworthiness by analyzing banking history, income patterns, spending behavior, and other relevant financial indicators. This enables lenders to make quick and accurate lending decisions while reducing the risk of defaults.

Another critical application of AI is in fraud detection and risk management. AI-based systems continuously monitor financial transactions to identify irregularities, prevent money laundering, detect fraudulent activities, and assess potential financial risks. This proactive monitoring strengthens regulatory compliance and protects both banks and customers from financial losses.

Research Objectives

The primary objective of this study is to examine the impact of Artificial Intelligence on the growth and modernization of the banking sector in India. The research aims to analyze the challenges associated with implementing AI in financial institutions and identify strategies to overcome these barriers. It also seeks to explore ongoing initiatives supporting AI adoption in Indian banking and predict future developments in this domain. Furthermore, the study highlights research efforts dedicated to understanding the concept and practical applications of AI within India's financial system.

The Role of the Banking Industry

The banking industry plays a vital role in the economy and is often considered its backbone because it manages currency circulation, credit systems, and financial transactions. Banks encourage savings by offering interest and providing financial security to individuals and businesses. They also support economic development by offering loans and financial assistance to entrepreneurs and growing enterprises. Modern banking operations rely heavily on digital systems, including ATMs, email banking, telephone banking, internet banking, and mobile

ISBN : 978-93-6163-366-9

banking platforms. The smooth functioning of these services depends on advanced computing technologies and AI-based systems that enhance security, speed, and operational efficiency.

Indian Banks Using AI

Several Indian banks have actively adopted AI technologies such as predictive analytics and speech recognition to improve customer experience and operational efficiency. According to industry reports, a significant portion of the banking sector has already implemented AI-driven solutions. Major Indian banks that have initiated AI projects include:

- State Bank of India
- Bank of Baroda
- Allahabad Bank
- Andhra Bank
- YES Bank
- HDFC Bank
- ICICI Bank
- Axis Bank
- Canara Bank
- City Union Bank
- Punjab National Bank
- IndusInd Bank

These institutions are increasingly leveraging AI to enhance digital transformation and maintain competitiveness in India's evolving financial landscape.

State Bank of India (SBI)

State Bank of India has actively incorporated Artificial Intelligence into its banking services to improve customer engagement and operational efficiency. Through its innovation initiative "Code for Bank," the bank adopted an AI solution developed by the winning team. SBI also introduced "SIA," an AI-based chatbot designed to function as a virtual banking assistant. This chatbot handles customer queries promptly and assists with routine banking activities, thereby reducing waiting time and enhancing front-desk service quality.

Bank of Baroda (BOB)

Bank of Baroda has modernized its branches by integrating advanced digital technologies. The bank introduced an AI-enabled robot named "Baroda Brainy" to assist customers within branches. It has also established Digital Labs equipped with modern facilities and free Wi-Fi, encouraging customers to experience secure and convenient digital banking services.

Axis Bank

Axis Bank has implemented an AI-powered cognitive payment gateway that utilizes machine learning and natural language processing. This system supports financial and non-financial transactions, responds to customer inquiries, and delivers personalized communication. The integration of AI helps improve transaction speed, service accuracy, and customer interaction.

Canara Bank

Canara Bank deployed humanoid robots such as "Mitra" to guide customers and provide information about banking services. Developed by a Bengaluru-based robotics firm, these robots

assist visitors in navigating banking procedures and answering common questions. Such initiatives help reduce employee workload while improving customer experience within branches.

City Union Bank

City Union Bank introduced a service robot named "Lakshmi" to enhance customer engagement. The robot can respond to queries on numerous banking-related topics and is connected to the bank's core system to provide accurate information. This innovation reflects the bank's focus on digital transformation and improved service delivery.

The Future of Artificial Intelligence in Banking

The future of Artificial Intelligence in banking is expected to bring greater efficiency, security, and personalization. As AI technologies continue to advance, banks will be able to offer safer transactions, faster services, and improved decision-making processes. AI reduces human error, supports digital documentation, and enables customers to perform cashless transactions anytime and from anywhere. It is also likely to create new employment opportunities in technology-driven roles.

Artificial Intelligence – The Changing Face of Banking in India

Artificial Intelligence is reshaping the Indian banking sector by enabling intelligent decision-making and customer-focused strategies. Through data analysis and predictive modeling, banks can better understand customer preferences and deliver personalized financial solutions. To remain competitive in the digital era, financial institutions must integrate AI into their business models and long-term strategies.

Impact of AI in Banking

AI systems allow banks to provide personalized financial advice, analyze lending patterns, and forecast market trends. By processing large amounts of financial data, AI enhances decision-making accuracy and supports efficient banking operations.

Customer Satisfaction

AI improves customer satisfaction by offering customized services, quick responses, and seamless digital experiences. It strengthens customer relationships while increasing operational efficiency and revenue growth.

Digital Wallets

AI supports the development of digital wallets, enabling customers to make secure online payments using mobile devices or computers. This promotes a cashless and convenient banking environment.

Benefits of Artificial Intelligence in Banking

Artificial Intelligence provides several advantages to the banking industry. It enhances overall customer experience by reducing waiting time and offering personalized services. AI-based tools improve customer support through cost-effective and quick issue resolution. Data-driven decision-making becomes more accurate with AI-powered analytics, leading to better marketing strategies and operational performance. AI also strengthens risk management by evaluating

ISBN : 978-93-6163-366-9

credit history and predicting financial trends. Furthermore, it improves auditing systems, reduces cybercrime risks, and ensures regulatory compliance within banking institutions.

Disadvantages of Artificial Intelligence

- Artificial Intelligence, despite its numerous advantages, has certain limitations. One major disadvantage is the high cost involved in its development, installation, and maintenance.
- AI systems require advanced hardware, software updates, and skilled professionals, which increases overall expenses.
- Another drawback is the growing dependency on automation. As AI systems perform repetitive and routine tasks, human involvement in many areas decreases.
- This may reduce skill development and create overdependence on machines. In some industries, organizations may replace human workers with AI-based systems to cut costs, which can lead to employment concerns.

Challenges of Artificial Intelligence

One of the primary challenges is limited awareness and understanding of AI technology. Successful implementation requires knowledge of its strengths, weaknesses, and practical applications. Without proper training and awareness, organizations may face difficulties in adopting AI effectively.

AI systems also demand high computational power. Technologies such as machine learning and deep learning require advanced processors, GPUs, and significant energy resources. This increases operational costs and technical complexity.

Data privacy and security remain serious concerns, especially in sensitive sectors like banking. AI models depend heavily on customer data, and any data breach can lead to misuse or cyber threats. Ensuring strong cybersecurity measures is essential.

Another challenge is the collection and management of high-quality data. AI performance depends on accurate and sufficient training data, but gathering and maintaining such data can be time-consuming and expensive.

Conclusion

- In conclusion, Artificial Intelligence is transforming the banking industry by improving efficiency, enhancing customer service, and supporting digital transactions.
- Banks are increasingly adopting AI technologies to provide personalized services, reduce errors, and strengthen fraud detection mechanisms.
- Customers benefit from faster transactions and the convenience of accessing banking services anytime and anywhere.
- However, the rapid shift toward digitalization has also increased cybersecurity risks and data privacy concerns. To address these challenges, banks are implementing advanced technologies such as analytics, automation tools, and blockchain-based security systems.
- Overall, AI is playing a crucial role in modernizing banking operations and is expected to continue shaping the future of the financial sector.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

ROLE OF ARTIFICIAL INTELLIGENCE, INTERNET OF THINGS, AND BIG DATA ANALYTICS IN SME IN TAMIL NADU

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Abstract
Digital transformation has become increasingly important in the small and medium enterprise (SME) landscape, as they look to bolster competitiveness and operational resilience in today's dynamic business environment. In the past several years, Artificial Intelligence (AI), Internet of Things (IoT) and Big Data Analytics have all emerged as major digital technologies to enable data-driven decision making and process optimization. This paper presents a study conceiving of the role which AI, IoT, and Big Data Analytics can play together in the digital transformation process of SMEs in Tamil Nadu, India. Based on current digital transformation and information systems research, the article explains that these technologies can form a system rather than always being separate tools. The paper proposes a new framework whereby IoT generates real-time data, Big Data Analytics handles data crunching and explanation and AI can make smart and predictive decisions. This framework shows how combined digital technology can improve operational efficiency, strategic planning and flexibility for SMEs. The article also reports on what key applications exist, strategic benefits that come from their employment and some hurdles to implementation such as skill gaps and data governance constraints. It relates both theoretically and design-wise the study in this paper to the current discussions and latest empirical research on digital transformation of emerging economy SMEs, reflecting a regional context.
Keywords: *Artificial Intelligence; Internet of Things; Big Data Analytics; Digital Transformation; SMEs; Tamil Nadu.*

1. Introduction

Digital transformation has become a key way for enterprises all around the world to improve competitive power and resilience (Vial, 2019). It involves using digital innovation to adjust current business processes, add value to an enterprise's operations, and cope with the changing conditions of markets. For small and medium-sized enterprises (SMEs), digital transformation is no longer a luxury, but a requirement for keeping pace that cannot be relinquished if they wish to survive in an environment increasingly dependent on data and technology (Bharadwaj et al., 2013). In countries such as India, with an active industrial sector in places like the state of Tamil Nadu, employment and regional development are heavily dependent on small and medium-sized business enterprises (SMEs). Nonetheless, many SMEs still face limitations in their resource capacity, technological prowess and strategic readiness, which serve as barriers to their using the latest digital technologies.

In recent years, Artificial Intelligence (AI), Internet of Things (IoT), and Big Data Analytics have emerged as the trio of technologies driving the present wave of digital transformation (Vial, 2019). AI means giving machines and processes the ability to do things that normally require human intelligence, such as learning, prediction, decision-making (Mikalef et al., 2019). The IoT connects physical devices by means of sensors and wide area networks, so that continuous data can be obtained from production sites (Porter & Heppelmann, 2015). Big Data Analytics makes

available the tools and technology needed for handling large volumes of structured or unstructured data so that something meaningful can be drawn from them (Chen et al., 2014). When you combine these three technologies, A New Ecosystem is born--one that supports on-the-fly monitoring, patterns or tendencies in data where they emerge, and sound managerial decisions made on that basis.

When it comes to dynamic & competitive markets with SMEs, the integration of AI, IoT and Big Data Analytics shows particular relevance According to the author, SMEs in Tamil Nadu especially are still processing, textiles, parts for automobiles, agri-processing and services, can use these technologies to improve efficiency; reduce cost; make better products faster & more cheaply; and understand customer behavior more effectively. Nonetheless, it is still uneven in adoption as many small and medium enterprises are still at a low level of digital maturity (Vial, 2019). It is precisely this gap between potential and reality that highlights the need for systematic academic examination.The research issue we are addressing in this paper results from a shortage of empirical and conceptual research regarding how artificial intelligence, Internet of Things and big data collectively influence small and medium enterprise performance in an Indian regional context. Although previous research has studied digital transformation or the influence of individual technologies, few studies overall focus on their integrated role in the SME, particularly at state level. Also, Tamil Nadu presents a unique case because of a strong industrial base, favourable policy environment and burgeoning digital infrastructure. How SMEs perceive, use and adopt these technologies can be an important source for policy-makers, practitioners and researchers to learn from.Motivated by this gap, the purpose of this paper is to assess the role of Artificial Intelligence, Internet of Things and Big Data Analytics in the digital transformation of SMEs. The specific objectives of our research are: (i) to investigate the importance of AI, IoT and Big Data Analytics for SME operations, (ii) to analyze what can be gained by integrating these technologies, (iii) and to point out major challenges faced by SMEs in their adoption and application. By contributing to these objectives, this paper seeks to be part of a wave of literature linking digital transformation with economic growth.

The rest of the paper is structured accordingly. The following section deals with the conceptual basis for AI, IoT and Big Data Analytics. The following section looks at how these three work together in SME environments. The following sections provide a closer look at several areas where they can be applied, predicting that they will bring capability related benefits to Tamil Nadu's SMEs and discussing their potential difficulties of adaptation. The final section sees academics weigh in with findings from their own empirical research. It also mentions future study directions.

2. Review of Literature

2.1 Artificial Intelligence

Be meaningfulArtificial Intelligence (AI) is machine-based systems that can mimic normal human cognitive functions such as learning, reasoning and decision-making (Mikalef, et al., 2019). The difference is, in contrast to traditional rule-based systems, AI systems improve their performance through continual interaction with data - which makes them particularly relevant in data-intensive business environments. The recent machine learning and data-based AI developments have enabled firms to extend these breakthroughs beyond their intended industries. Large-scale prediction and prescriptive analytics on top of big-data sets allow lesser organizations more precise planning and decision support (Ville, 2019).For small and medium-

 ISBN : 978-93-6163-366-9

sized enterprises, AI is used within the context of an existing business process rather than being implemented as a separate system. Common applications include the management of customer relationships, demand forecasting and inventory optimization, predictive maintenance to keep equipment in good condition for as long as possible and automated quality control. These applications help SMEs to reduce uncertainty, to increase accuracy in planning and to get a faster jump on market changes. Importantly, AI adoption in SMEs tends to be incremental: firms gradually bring in AI tools one by one as they see them becoming useful and affordable. From a strategic perspective, AI allows SMEs to move away from reactive decision-making modes and towards proactive and predictive ones. AI systems use historical and real-time data together to recognize problems before they develop into full-blown crises as well as spotting new opportunities. This ability is particularly beneficial for SMEs operating in highly competitive regional markets such as Tamil Nadu: where lower prices, shorter deliveries and more satisfied customers can all mean survival for a business. Yet the effectiveness of AI depends heavily on data availability, data quality and the organizational readiness to understand and act upon AI-given insights. Have Its drawbacks Though the benefits of artificial intelligence are numerous, still there are difficulties for SMEs in adopting this technology. Limited technical experience, high initial costs, and worries over data security and system reliability frequently present obstacles. In addition, many SME entrepreneurs and executives see AI as something complex, or perhaps only applicable to larger companies. The existence of such a perception gap underscores the need for more public awareness as well as increased skills and supportive organizational structures to help make AI use safer and more useful for everyone. Small and medium-sized enterprises' digital transformation will never be complete without Artificial Intelligence. When used in connection with corporate goals and with suitable data infrastructures at hand, AI can help increase the performance level of SMEs. Its role becomes even more important if AI is linked together with other complimentary technologies like Internet of Things and Big Data Analytics. Together, these satisfy all needs for intelligent business operations in a data-rich environment.

2.2 Internet of Things (IOT)

Physical objects can gather and exchange data with IoTs using embedded sensors or network connections, thereby attaching physical operations to digital systems in this way (Porter & Heppelmann 2015). In the case of small and medium-sized enterprises (SMEs), the use of IoT can significantly improve operational clarity by furnishing real-time monitoring for such things as machines, inventories, and logistics activities. Moving from an industrial society to one that is based on information and data, the availability of IoT services means the commercial transaction requirements become ever more complex. But while IoT provides this data, it requires the analytical and interpretive capacity to turn it into business value. This in turn emphasizes the importance of integration with data-analytics systems and intelligent management modules (Kagermann et al. 2013). In the case of SMEs, IoT has a special kind of relevance because it provides operational visibility when certain things go wrong without demanding extensive human supervision.Conditioned through the use of sensors and connected devices, aftermarket SMEs can keep track of issues such as machine performance, energy consumption, inventory movement as well as environmental circumstances. In manufacturing-oriented SMEs, which are common in Tamil Nadu, IoT applications involving equipment monitoring and process automation can help reduce downtime while raising production efficiency. And service-oriented SMEs use IoT in order to improve logistics coordination, facility management and customer

response times. In this way, IoT provides a critical opportunity for organizations to handle emergencies and problems well as they arise.Iot also has an important role in supporting real-time information acquisition, and accurate decision- making. Handing in real time, Iot systems allow SME managers to find deficiencies and deal with operational problems as they occur. In particular this is valuable in situations where resources are scarce or not plentiful, limiting capability to absorb problems of operation. However, the effectiveness of IoT depends on reliable connectivity, the possibilities for expansion and even mature firms' ability to incorporate machine-generated data back into existing workflows.

Forbes reported late in 2014 that despite its many benefits, Internet of Things (IoT) adoption among SMEs remained uneven. Things such as infrastructure costs, interoperability issues and concerns about data security often discouraged more widespread adoption. In most cases, small and medium-sized enterprises simply didn't have the technological expertise needed to manage their own Internet of Things. So, in many cases, little of the real potential of IoT is achieved until it is integrated with such enabling technologies as Big Data Analytics and Artificial Intelligence. The sensor data and so on from the raw data is chiefly used by big data to put into analysis stage for further processing.928.3.Big Data Analytics Big Data Analytics entails the high-speed integration of large quantities of data from numerous sources, combined with real- time data analysis and the application of predictive techniques based on advanced statistical models which provides decision making support in real terms Future directions For NIIMEs. One area where Stories from the Field could help those seeking to interface relevance with computing Engineering is to engage in work that develops application platforms. Results of the analysis Data solution can greatly help small and medium-sized business to improve their grasp of up and down activities, customer behavior, market dynamics. Research based on empirical evidence shows that investments in data analytics can have a significant impact on corporate performance if they are well aligned with the organization's capacity to absorb such changes (Raguseo & Vitari, 2018).

2.3 Big Data Analytics

In the context of SMEs, the use of Big Data Analysis is most often to help enterprises better understand their performance and customers. It is an analytical tool for enterprises to identify demand patterns, use their resources properly and evaluate the effectiveness of various strategies. For example, SMEs can use data analysis to study the sales trends on their own, supervise what suppliers are providing and improve pricing strategies. In regions such as Tamil Nadu, where small and medium sized businesses operate markets that are both fiercely competitive and highly cost-sensitive, these insights contribute significantly to good risk management and better planning as well. Maybe we re currently experiencing a situation where the data that we rely on is wrongly handled. Then, aren't all decisions going to be wrong? Big Data Analytics also supports evidence-based decision making by reducing the reliance on intuition or past experience alone. As raw data turns into something provoking action analytics helps owners and managers of SMEs deal more accurately with market changes. However, the adoption of Big Data Analytics is often restricted by limited technical skills, problems of data quality and the perceived complexity of analytical tools. Many SMEs only use basic descriptive analysis rather than advanced predictive or prescriptive techniques.

"IoT data, plus AI-based techniques, is an important supplement to the value of Big Data Analytics." In addition to providing real-time data, AI also allows for smart processing. However,

ISBN : 978-93-6163-366-9

it is Big Data Analytics that lays the foundation by which data can be organized and stored. In response, SMEs are able to slowly shift toward a more orderly but at the same time data-driven structure of development for themselves -and in this way the companies they work with and help grow.

3. Integration of Artificial Intelligence, Internet of Things, and Big Data Analytics in SMEs

The combination of Artificial Intelligence (AI), Internet of Things (IoT), and Big Data Analytics marks a comprehensive enterprise-wide digital transformation among SMEs. All of these components do not act as stand-alone technologies; instead they come together to form an interdependent system, where data generation, data processing and intelligent decision making is an ongoing process. Such integration helps SMEs in operating their businesses much more systematically, quickly, and informed even when under various resource constraints?

In this cohesive structure, IoT acts as the foundation that provides real-time data. Tens of thousands of sensors and connected devices embedded in machines, supply chains and service environments passively pull in vast amounts of operational data in the areas of production, logistics, energy utilizations and customer interactions in continuous streams. Nevertheless, raw data produced by IoT systems are not able to realise their full potential without being stored and processed in a structured way. This is the point where Big Data Analytics comes into play. Big Data platforms hold a vast amount of heterogeneous data, handle it and process data into useful information through descriptive and diagnostic analytical techniques.

Artificial intelligence expands on this analytical foundation, allowing for high-level interpretation and prediction. This is where machine learning algorithms that run on AI look at historical and real-time data to identify trends, make predictions on potential future events and help in making decisions. For Tamil Nadu-based SMEs, this integration can help in demand forecasting accuracy, reducing equipment downtime, optimising inventory levels, and enhancing customer engagement. Most importantly though, AI based insights help SME managers shift from reactive problem solving to proactive planning.

From the organisation's point of view — these technologies do not have to be adopted together or at a large scale. SMEs are taking a gradual approach — starting with basic data collection and adding levels of analytics and intelligent systems as they grow. This stepwise integration is in-sync with the economic and managerial realities for SMBs. However, it will not happen in a vacuum, and its success will be contingent upon the level of digital literacy among the people, data governance practices, and the supportive external ecosystem of technology vendors and policy measures.

In conclusion, through a digital decision-centric environment based on the artificial intelligence solutions with Internet of Things integrations, and aided by Big Data Analytics, the developing capabilities of the SME can be fortified to be more competitive and capable of resilience. As an abstract system, the integration highlights how the complementary functions of each technology and the importance of aligning technological capabilities and organisational objectives.

3.1 Conceptual Framework for the Integration of AI, IoT, and Big Data Analytics in SMEs

This paper suggests a conceptual framework based on the belief that, in the end, data is the driver of digital transformation in SMEs and data consists of knowledge-information-assets and a flow happens in both directions. In this framework, IoT, Big Data Analytics, and AI are three

sequential and interrelated components of a data-driven decision-making system. Instead of viewing these technologies as separate tools, the framework view these technologies as complementary tools for improving SME performance.

This conceptual framework is inspired by earlier studies on digital transformation (Bharadwaj et al., 2013; Vial, 2019), where it is acknowledges that data-driven technologies fundamentally shape the nature and affect the strategic role of organisational change (Bharadwaj et al., 2013;

Vial, 2019). In this framework, the role of IoT is the data generation layer; Big Data Analytics is the data processing layer while the layer that an AI plays is as the decision intelligence layer. This creates the first layer of IoT, which is data generation. SMEs gather real-time data from physical processes, such as machine utilisation, inventory handling, logistics activity and customer interactions, through sensors and connected devices. This constant stream of data helps in the visibility of an operational process that was challenging to gauge for many small and medium-size enterprises with limited resources.

Big Data Analytics forms the second layer of the framework, serving as the mechanism for data management and interpretation. IoT systems gather data, which is retained and organised, and further analysed to generate insights. Now, SMEs use mainly descriptive and diagnostic analytics for insights on operational patterns and bottlenecks, and performance measurement. So Big Data Analytics transforms the raw data to actionable knowledge which can help in taking managerial decisions.

Conceptual Model Diagram

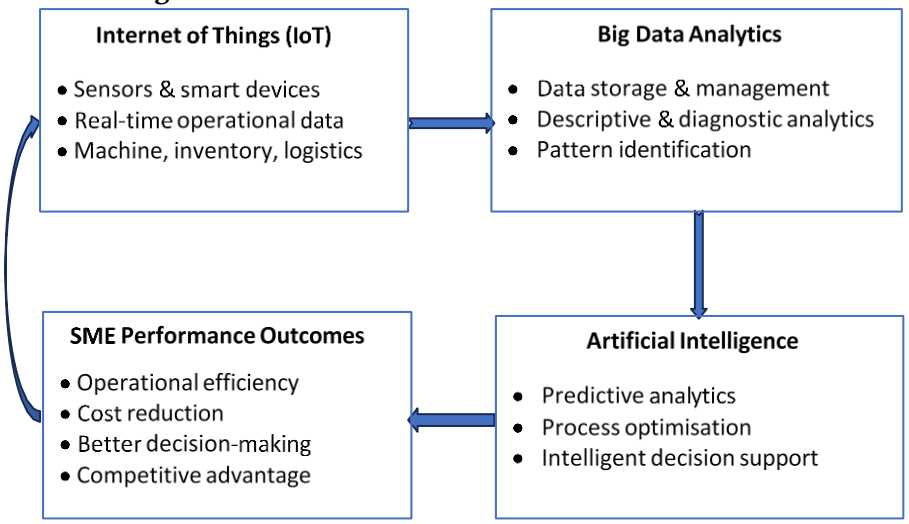

Figure 1. Conceptual framework illustrating the integration of Artificial Intelligence, Internet of Things, and Big Data Analytics in SMEs

Artificial Intelligence forms the decision intelligence layer of the framework. Building on analysed data, AI enables predictive and prescriptive insights that guide strategic and operational decisions. AI systems support demand forecasting, predictive maintenance, customer segmentation, and process optimisation. Within the framework, AI enhances the ability of SMEs to anticipate future outcomes and respond proactively rather than reactively.

The framework also acknowledges moderating organisational factors such as digital skills, management support, and technological infrastructure, which influence the effectiveness of integration. Overall, the proposed conceptual model illustrates how the coordinated use of IoT,

ISBN : 978-93-6163-366-9

Big Data Analytics, and AI creates a continuous feedback loop that supports sustainable digital transformation in SMEs.

4. Application Areas of Integrated Technologies in SMEs in Tamil Nadu

For manufacturers, SMEs, Integrated AI, IoT, and Big Data Analytics power manufacturing efficiency, supply chain optimisation, and customer analytics. Analogous put in smart making and joined here supply chains have been seen (Porter & Heppelmann, 2015, Kagermann et al., 2013).

Most of the SMEs in the manufacturing-oriented sector employs horizontal integrated digital technologies in production monitoring and process optimisation. While the IoT-enabled sensors track machine happenings and production output in real-time, the Big Data Analytics helps find the patterns related to downtimes, defects, and processes. This is further supported with predictive maintenance by AI where companies can be informed on if equipment is about to malfunction, avoiding downtime. Those applications help both improve efficiency and cost management.

SMEs use integrated technologies in supply chain and logistics operations to help them manage inventory, procurement, and distribution. For instance, IoT devices offer immediate visibility over stock levels and transportation conditions, and analytics helps in predicting demand, as well as assessing suppliers. With this, especially in competitive and time-sensitive markets, readily available AI-driven information ensures optimised inventory replenishments and delivery schedules

Another significant area of the application is customer management and marketing. A growing number of SMEs use sales transaction data, digital platforms, and customer interactions to identify preferences and behaviors. Big Data Analytics can help segment customers and analyse trends, while AI can help with personalised offerings and pricing decisions. With these capabilities it helps SMEs build stronger customer relationships and enhance their market responsiveness.

In total, the use of integrated AI, IoT, and Big Data Analytics improves efficiencies and adaptability and competitive edge for Tamil Nadu SME. Nevertheless, there is a variation in the degree of application of concepts such as Digital Supply Chain (DSC) in firms, emphasising that contextual factors such as managerial awareness, infrastructure, and access to digital support systems are some of the enablers of the adoption of these concepts.

5. Benefits and Strategic Implications of Integrated Technologies for SMEs

Artificial Intelligence, Internet of Things, and Big Data Analytics are providing numerous advantages for SMEs especially in the improvement of operational efficiency and strategic decision-making. These technologies make it possible to collect and analyze data continuously to give SMEs better visibility over their business processes. SMEs operating in cost-sensitive environments need tools to identify inefficiencies and waste, and utilise their limited resources in an optimal manner—this is only possible through real-time monitoring of operations.

While there are advantages, SMEs are hindered by several factors including cost, skill shortages, data security, and ethical issues of the use of AI systems (Mikalef et al., 2019). It needs governance frameworks and employee engagement for responsible adoption.

Integrated digital technologies enable integration of data-driven decision making in the strategy context. This enables SME managers to rely on data based insights rather than intuition,

powered by data analytics and AI. Predictive features enable companies to foresee changes in demand, optimize inventory, and plan production time more accurately. These computer-driven abilities help drive enhanced responsiveness and thereby improved customer satisfaction in competitive regional markets like Tamil Nadu.

The other key benefit is higher competency and market adaptability. Customer analytics supported by AI allows SMEs to easily know what consumers want to buy differently and reflect that change through their products or services. When paired with IoT-enabled feedback from operational systems, SMEs can react more swiftly to market fluctuations and tech disruptions. This adaptability helps to cultivate a more sustainable and persistent business over the long run.

These benefits have strategic implications additional to the operational level efficiencies. With integrated digital technologies, SMEs are forcing to rethink of conventional business model and organizational behaviour. It fosters a culture of constant learning and innovation, perceiving data as an asset to the business. These implications suggest the need for policymakers and support institutions to develop tailored digital capacity-building initiatives to support SMEs in managing their advanced technology.

6. Challenges and Ethical Concerns in the Adoption of Integrated Technologies

Even though these technologies have the ability to lead SMEs towards success, SMEs are not free from challenges related to adopting and integrating AI, IoT, and Big Data Analytics. High cost involved in technology acquisition, infrastructure development, and maintaining the system is one of the foremost challenges. Numerous SMEs possess little cash flow, and digitalisation at a larger scale is simply not achievable without third party financial assistance or regulation incentivisation.

There are also challenges around technical complexity and skill shortages. Integrated technologies work when there are digital literacy, data management skills and analytical capability, all of which are often missing in the SME spaces. Digital infrastructure is improving in Tamil Nadu, but access to trained professionals and technology services for small enterprises and those in semi-urban or rural areas is uneven and costly.

Adoption is further complicated by ethical concerns associated with data privacy and security. With huge amounts of sensitive operational and customer data being generated by the IoT systems, it increases concerns such as data misuse, unauthorised access and realisation of nascent data protection legislation! Many SMEs do not have formal data governance frameworks which render them more exposed to cyber risk. Moreover, the deployment of AI in decision-making garners ethical concerns over transparency, accountability, and bias in algorithmic outcomes.

Increased automation raises other social issues too, including workforce dislocation and some resistance to technological change. Employees from SMEs may resist at the organisational level if they perceive AI-driven systems as a threat to their job security. Overcoming these obstacles will need a concerted effort to blend technology incentive with ethical implementation, employee buy-in, and intentional policy efforts. In the absence of such approach, the long-term viability of digital transformation initiatives in SMEs may still be in doubt.

7. Future Research Directions

Although, this paper presents a conceptual overview of need of Artificial Intelligence, Internet of Things & Big Data Analytics in the SMEs, there are few possibilities for future research directions. Firstly, the provided conceptual framework requires empirical validation.

ISBN : 978-93-6163-366-9

Quantitative surveys or qualitative case studies can be conducted among SMEs in Tamil Nadu to explore the level of technology adoption and the extent to which it has made an impact on operational and financial performance. Such studies would reinforce the practical validity of the framework.

Expanded Sector-Specific Applications of Integrated Digital Technologies Second, future research can consider the application of integrated digital technologies in specific sectors. However, the incentive and the strained set of tools vary by sector, given differences in operational complexity and technological readiness, meaning manufacturers may see greater benefits and challenges than those in textiles, food processing, and other service industries. Such comparative studies, across sectors, would give a much better understanding of differences and best practices.

Third, they call for longitudinal designs to study the ways SMEs transition from one stage of digital maturity to another. Instead of considering digital transformation as a discrete event, future research should treat and study it as a continual transformative process shaped by drivers such as organisational capabilities, external facilitation, and policy measures. Such an approach would provide a more agile perspective on how technology implementation.

Last but not least, more attention should be devoted to ethical, regulatory and human factors in future research. Data governance, algorithmic transparency, employee adaptation, and digital skills: all the big challenges should be in the systematic gospel. If these dimensions are addressed, they can lead to more responsible and inclusive digital transformation strategies for SMEs.

8. Conclusion

This article explores the significance of Artificial Intelligence, Internet of Things and BigData Analytics in assisting digital transformation of SMEs in Tamil Nadu. The study took a conceptual approach, distinguishing the integration of these technologies as a system versus emerging tools in isolation. Internet of Things allows data to be generated in real time, Big Data Analytics processes structured data, Artificial Intelligence makes smart decisions. Combined, they offer a data-centric framework that boosts operational effectiveness, strategy development, and overall business responsiveness.

They also highlighted the organizational readiness, managerial support, and the context for effective integration of these technologies within the work environment. Digital transformation holds immense promise for SMEs, yet cost, skills, data and ethics-security challenges remain hurdles many must overcome. The successful resolution of these challenges demands collaboration between SME proprietors, technology suppliers, and policymakers.

In summary, this paper adds to existing research on digital transformation in emerging economies by providing an overarching conceptual framework, specifically based on the case of SMEs. We anticipate the insights presented will inform empirical research and practical strategies surrounding advanced digital technologies in resource-constrained business contexts in the future.

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ISBN : 978-93-6163-366-9

FINTECH AND GREENTECH STARTUPS: DRIVING SUSTAINABLE FINANCIAL INNOVATION

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Abstract

The rapid growth of digital technologies has significantly transformed the delivery of financial services and the promotion of sustainable business practices. In this context, Financial Technology (FinTech) and Green Technology (GreenTech) startups have emerged as important contributors to sustainable economic development. FinTech startups utilise digital tools such as mobile applications, block chain, and artificial intelligence to enhance efficiency and accessibility in financial services, while GreenTech startups focus on environmentally sustainable innovations aimed at reducing carbon emissions and promoting efficient resource utilisation. The present study is conceptual in nature and attempts to examine the role of FinTech startups in supporting GreenTech initiatives through innovative financing mechanisms. Based on secondary data collected from existing literature, reports, and policy documents, the study analyses the opportunities and challenges associated with the convergence of FinTech and GreenTech startups. The study concludes that FinTech-enabled green finance has significant potential to promote sustainable financial innovation, provided appropriate regulatory frameworks and technological support systems are available.

Keywords: *FinTech, GreenTech, Startups, Sustainable Finance, Green Finance, ESG*

1. Introduction

Technological advancement has become a major driving force influencing economic and business activities across the world. Among the emerging innovations, Financial Technology (FinTech) and Green Technology (GreenTech) startups have gained significant importance due to their ability to address financial inefficiencies and environmental challenges simultaneously. FinTech refers to the application of digital technologies to improve the delivery of financial services such as payments, lending, investment, and insurance. GreenTech, on the other hand, focuses on innovations that promote environmental sustainability and efficient use of natural resources.

Growing concerns related to climate change, environmental degradation, and sustainable development have increased the demand for financial systems that support eco-friendly initiatives. Traditional financial institutions often face difficulties in funding green projects due to high risk, long payback periods, and lack of adequate information. In this context, FinTech startups provide innovative financial solutions such as crowd funding platforms, peer-to-peer lending, digital payment systems, and ESG-based investment tools that facilitate green financing.

Startups play a crucial role in promoting innovation due to their flexibility and adaptability. The convergence of FinTech and GreenTech has led to the emergence of new business models that support sustainable entrepreneurship and green finance. The present study is conceptual in nature and aims to analyse the role of FinTech startups in promoting GreenTech initiatives, identify the opportunities and challenges faced by these startups, and examine their future prospects.

2. Objectives of the Study

The objectives of the present study are as follows:

1. To understand the concept and significance of FinTech startups.
2. To study the scope and importance of GreenTech startups.
3. To analyse the role of FinTech startups in promoting green and sustainable technologies.
4. To identify the opportunities available for FinTech and GreenTech startups.
5. To examine the challenges faced by FinTech–GreenTech startups.
6. To explore the future prospects of sustainable finance through FinTech innovation.

3. Research Methodology

The study is **conceptual and descriptive in nature**. It is based entirely on **secondary data** collected from research articles, journals, books, government reports, publications of international organisations, and relevant websites. No primary data has been collected for the study. The analysis is qualitative and aims to synthesise existing literature to understand the convergence of FinTech and GreenTech startups.

4. Concept of FinTech Startups

FinTech startups are technology-driven enterprises that provide innovative financial products and services using digital platforms. These startups utilise technologies such as artificial intelligence, block chain, big data analytics, and mobile applications to improve efficiency, reduce operational costs, and enhance customer experience. Major areas of FinTech innovation include digital payments, mobile banking, peer-to-peer lending, robo- advisory services, and digital insurance platforms.

FinTech startups have also contributed significantly to financial inclusion by providing access to financial services to underserved populations. In recent years, FinTech innovation has expanded into the area of sustainable finance by supporting green investments and environmentally responsible financial practices.

5. Concept of GreenTech Startups

GreenTech startups focus on the development and application of technologies that minimise environmental impact and promote sustainable use of natural resources. These startups operate in areas such as renewable energy, electric vehicles, waste management, sustainable agriculture, and water conservation.

GreenTech startups play an important role in achieving sustainable development goals by reducing carbon emissions and encouraging environmentally responsible business practices. However, access to finance remains a major challenge for these startups due to high initial investment requirements and technological risks.

6. Role of FinTech in Promoting GreenTech Startups

FinTech startups support GreenTech initiatives by providing innovative and efficient financial solutions. Digital platforms enable the mobilisation of funds for green projects through crowd funding and peer-to-peer lending models. Block chain technology enhances transparency and accountability in green financing by ensuring proper tracking of funds.

ISBN : 978-93-6163-366-9

FinTech also facilitates ESG-based investments by providing digital tools that help investors evaluate sustainability performance. Green bonds, carbon credit trading platforms, and impact investment applications are examples of FinTech-enabled green finance solutions. These innovations help bridge the financial gap faced by GreenTech startups.

7. Opportunities and Challenges

Opportunities

- Increasing global focus on sustainability and climate action
- Growing demand for green finance and ESG investments
- Government incentives and policy support
- Expansion of digital infrastructure
- Rising awareness among investors

Challenges

- Regulatory uncertainty
- Cyber security and data privacy risks
- High technological and operational costs
- Limited awareness in developing economies
- Integration challenges between financial and green technologies

8. Future Prospects

The future of FinTech and GreenTech startups appears promising due to increasing policy support, technological advancement, and global commitment to sustainable development. Digital green finance is expected to play a major role in achieving sustainable development goals. Collaboration among startups, financial institutions, and regulators will be essential for building a strong sustainable finance ecosystem.

9. Conclusion

FinTech and GreenTech startups are emerging as key drivers of sustainable financial innovation. The integration of digital financial technologies with environmentally sustainable solutions has created new opportunities for promoting green finance and responsible investment. Although challenges such as regulatory issues and cyber security risks persist, the overall potential of FinTech-enabled GreenTech startups is significant. With appropriate policy support and technological infrastructure, these startups can play a vital role in building a sustainable and inclusive financial system.

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THE SYNERGY OF FINTECH AND GREENTECH STARTUPS: ACCELERATING INDIA'S SUSTAINABLE ECONOMIC TRANSITION

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Abstract
This article examines the critical intersection of Financial Technology (Fintech) and Green Technology (GreenTech) within India's evolving startup ecosystem. As India targets a USD 5 trillion economy and Net-Zero emissions by 2070, this paper explores how startups are bridging the multi-trillion dollar "green financing gap." It analyzes the transition from pure digital payments to "Climate Fintech" models, The abstract highlights the role of Digital Public Infrastructure (DPI) in scaling these innovations and provides a forward-looking perspective on 2026 market trends.The transformative synergy between Fintech and GreenTech startups in the Indian economy as of 2026. While India maintains its position as the world's third-largest startup ecosystem, a strategic shift is observed from rapid expansion to "sustainable resilience." The study highlights how Fintech innovations—such as blockchain-based carbon tracking and AI-driven ESG scoring—are bridging the multi-trillion dollar green finance gap. By analyzing recent funding trends and the impact of Digital Public Infrastructure (DPI), the research underscores the role of startups in achieving India's "Panchamrit" targets and net-zero goals by 2070.
Keywords: *Fintech ,Green Fintech,Sustainable Finance,Indian Startup Ecosystem 2026,Climate Tech Funding*

Objective of the Study

- To quantify the current market size and funding landscape of the Indian Fintech and Sustainability Tech sectors in 2025–2026.
- To identify the impact of emerging technologies (AI, Blockchain, IoT) in enhancing ESG (Environmental, Social, and Governance) transparency for investors.

Statement of the Problem

Despite a robust ecosystem of over **16,100 fintech companies**, India faces a massive green finance deficit. Estimates suggest India requires approximately **₹162.5 lakh crore** by 2030 for its NDCs and **₹716 lakh crore** for net-zero by 2070. Current climate finance levels fall significantly short of these requirements, with a global financing gap reaching USD 4 trillion for developing nations. Furthermore, 73% of emerging markets lack a recognized system for verifying green financial instruments, leading to information asymmetry and risks of "greenwashing".

Indian Fintech Sector (2025–2026)

The Indian Fintech market has transitioned from a phase of high-velocity growth to one of "institutional resilience," characterized by improved governance and a focus on unit economics.

- **Market Size:**
  - **2025:** The Fintech market was projected to reach **USD 155.67 billion** by late 2025.
  - **2026:** Valued at approximately **USD 51.30 billion** (specific to revenue/valuation metrics from select indices) and is projected to grow to **USD 109.06 billion by 2031** at a CAGR of 16.27%.

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- **Funding Trends:**
  - **2025 Total:** Indian Fintech firms raised **USD 2.4 billion** in 2025 (a 2% increase from 2024), maintaining India's rank as the **3rd largest** fintech ecosystem globally.
  - **2026 (Jan–Feb):** The year began with a "funding moderation." By mid-January 2026, the sector had raised only **USD 24.6 million** in equity funding, an **80.7% drop** compared to the same period in 2025.
- **Segment Performance (2025):**
  - **Digital Lending:** Remained the dominant segment, accounting for over **36% of all deals** and raising **USD 735 million** in 2025.
  - **Payments:** Held a **42.87%** market share, with UPI crossing **20 billion monthly transactions** by August 2025.

2. Sustainability & GreenTech Sector (2025–2026)

Sustainability Tech in India is evolving into a growth engine, with the market increasingly betting on mature business models rather than experimentation.

- **Market Size & Ecosystem:**
  - As of early 2026, there are approximately **11,900 Sustainability Tech companies** in India, including nearly **2,000 funded firms**.
  - **Environment Tech** (Climate/GreenTech) comprises **4,840 companies** with cumulative funding of **USD 13.3 billion** raised to date.

Funding Trends

- **2025 Growth:** The sector drew approximately **USD 2 billion to USD 2.91 billion** in 2025. Funding in H1 2025 alone was **USD 1.28 billion**, which exceeded the total for the entire year of 2024.
- **2026 (Early Year):** Significant drop in capital; early 2026 (through January) saw only **USD 3 million** in funding across three rounds, a **96% decline** compared to the same period in 2025.

Key Growth Drivers:

- **Mobility & Solar:** Together accounted for over **80%** of total climate tech investment in 2025.
- **Energy Capacity:** India reached a milestone in June 2025 by achieving **50% of its electric power capacity** from non-fossil fuel sources, adding a record **44.5 GW** of clean energy in one year.

Comparative Snapshot Table (2025–2026)

Metric	Fintech (2025-26)	Sustainability Tech (2025-26)
Active Startups	~10,200 registered	~11,900 total
2025 Funding	**USD 2.4 Billion**	**USD 2.91 Billion**
Jan 2026 Funding	USD 24.6 Million	USD 3 Million
Major Hubs	Bengaluru (42%), Mumbai (29%)	Bengaluru (40.8%), Delhi (18.5%)
Key Trends	AI-led automation, Regtech	Circular economy, Green Hydrogen

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Fintech and Green Tech Startups in India: Latest Statistical Data (2025–2026)

Fintech Sector Overview (2025-26)

- **Market Size:** The Indian Fintech market is valued at **USD 51.30 billion in 2026** and is projected to reach **USD 109.06 billion by 2031** (16.27% CAGR).
- **Total Funding (2025):** India's fintech sector raised **USD 2.4 billion** in 2025, ranking 3rd globally.
- **Recent Trends:** As of early 2026 (Jan-Feb), the sector has seen a cooling period with only **USD 24.6 million** raised in equity funding by mid-January, an 80% drop compared to the same period in 2025.
- **Segment Dominance: Digital Lending** and **Payments** accounted for nearly **60%** of total fintech funding in H1 2025.

Green Tech / Sustainability Tech Statistics

- **Company Count:** There are approximately **11,900 Sustainability Tech companies** in India as of early 2026.
- **Funding Trends:** The Sustainability Tech sector raised **USD 2.91 billion** in 2025. However, Environment Tech (a sub-segment) saw a 98% drop in funding in January 2026 compared to January 2025.
- **Government Targets:** India added **48,436 MW** of renewable energy capacity in 2025 alone, surpassing the goal of 50% non-fossil fuel power capacity (reached **51.93%** by Dec 2025).

Conclusion

India's startup ecosystem in 2026 has entered a "decisive transition" from high-velocity growth to institutional trust and profitability. Fintech is no longer just a service but a "supportive mechanism" that enables the scaling of green finance through AI analytics and blockchain transparency. While the **Union Budget 2026** reinforces fiscal discipline and supports rooftop solar (PM Surya Ghar scheme), support for energy transition remains fragmented in areas like grid infrastructure. For India to bridge its multitrillion-dollar climate gap, the private sector and fintech innovators must move from the "innovator phase" (currently <20% adoption of green financial tools) to a more integrated, regulatory-backed model.

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ISBN : 978-93-6163-366-9

CHALLENGES AND ETHICAL ISSUES IN CYBERSECURITY: A STUDY OF MSMEs IN TAMIL NADU, INDIA

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Abstract

In the age of the digital revolution, cybersecurity has become a major issue of concern especially to Micro, Small and Medium Enterprises (MSME) in the emerging markets like India. This paper discusses the ethical concerns and the challenges associated with cybersecurity awareness and practices among the entrepreneurs in Tamil Nadu. A series of well- organized interview questionnaires was given to a sample of 300 entrepreneurs in four large districts of Chennai, Coimbatore, Tiruchirappalli, and Salem. The relationships between the cybersecurity awareness and the main independent variables such as digital literacy, exposure to cyber incidents in the past, training in cybersecurity, regulatory knowledge and moral perception were analyzed using descriptive statistics, correlation analysis and multiple regression. The results show that low digital literacy, absence of formal training, and poor awareness of cyber-ethics are among the significant contributors of cybersecurity vulnerabilities. The paper raises the importance of interdisciplinary policy measures and interventions, training on ethics and cybersecurity infrastructures in the region to increase resilience and ethical practices among MSMEs.

Keywords: *Tamil Nadu, MSMEs, Cybersecurity, Data Privacy, and Digital Literacy, Ethical Issues, and Cyber Awareness.*

1. Introduction

The blistering development of digital technologies has radically transformed the world economic environment to provide unprecedented possibilities of innovation, market penetration, and efficiency of operations (Autio et al., 2018). Digital transformation is not a fad in the emerging economies such as India, it has become a strategic necessity, which has been encouraged by the national programs, such as Digital India, Startup India, and Make in India.

These initiatives are designed to create a welcoming digital ecosystem, empower entrepreneurs, and speed up economic growth by adopting technology (Mukherjee and Saha, 2021). But as with each new digital leap forward, there is a growing cybersecurity risk that is threatening the sustainability, privacy, and stability of businesses, especially Micro, Small, and Medium Enterprises (MSMEs). MSMEs are the main pillars of Indian economy, which provide many jobs, innovations, as well as development in the regions, but because of limited resources, poor awareness, and inconsistent compliance with regulations, these organizations are under significant attack by cybercriminals (Gupta and Sharma, 2021).

Digital entrepreneurship has already become a significant movement in the state of Tamil Nadu, where industrial activity is strong, and the education level is high (Ramesh and Divya, 2021). Increasingly, technological innovation and startup activity has concentrated in urban centers (e.g., Chennai and Coimbatore) and rural districts (e.g., Tiruchirappalli and Salem) are

 ISBN : 978-93-6163-366-9

becoming semi-urban centers of entrepreneurship. In spite of this advancement, there is still a severe digital divide between different regions, which can be viewed as infrastructure, access to training, and cybersecurity readiness differences (Gopalakrishnan and Menon, 2023). Rural and semi-urban entrepreneurs may also be operating with little safeguards to cybercrime risks, not only because they lack the technical expertise but also because they lack the moral codes that would guide them through the world of cyber security. The growing complexity of cyberattacks such as ransomware, phishing, data breaches, and insider threats is worsening this vulnerability by potentially crippling small businesses due to financial damage and considered stakeholders losing trust (Kumar and Shah, 2024).

In addition to the technical weaknesses, ethical aspects of cybersecurity are no less acute (Nissenbaum, 2019). In a world where information is a valuable resource, the problem of user privacy, informed consent, open data practices, algorithmic bias, and the responsible use of AI is not given much thought in the MSME industry (Fernandes and Prabhu, 2022). Although most entrepreneurs are still certain to use digital resources to grow their business, they do not have an idea of the ethical repercussions of their online activities (Raghavan and Choudhary, 2024). Such a disconnect between technological implementation and ethical responsibility begs the question on whether the new policy like the Personal Data Protection Bill of India and international regulations like the GDPR are being followed (Devi and Kumar, 2024). Moreover, the ethical climate is also related to consumer trust, brand reputation, and the resilience of business in the long term, which is why it is an inevitable part of sustainable digital entrepreneurship (Thomas and Nair, 2024).

Although the study on cybersecurity in India is gaining academic and policy attention, its weakness is clearly apparent as there is a conspicuous absence of empirical studies that specifically address the interaction of the cybersecurity problems and ethical issues in the MSME setting (especially at the sub-national level) (Singh and Kaur, 2023). The literature that has been conducted so far focuses more on technical protections or frameworks, but it does not concentrate on the socio-behavioral and ethical aspects that influence cybersecurity habits (Alavi and Zaidi, 2023). Additionally, there are limited studies that make comparative analyses of the districts at different stages of digital development, which creates a gap in the perception of how geographic inequalities affect both vulnerability and awareness of ethics (Zachariah & Mathew, 2023). This paper aims to fill these gaps by discussing the issues of cybersecurity and ethical considerations of entrepreneurs in Tamil Nadu.

It seeks to:

- Test the rate of cybersecurity awareness and preparedness of MSMEs in four representative districts.
- Determine major technical, operational and knowledge-based obstacles to effective cybersecurity implementation.
- Discover the attitudes and insights of entrepreneurs concerning ethical concerns of data privacy, digital trust, and responsible use of technology.
- Examine how demographic and educational and regional factors influence cybersecurity habits and ethics orientations. The research findings will be utilized by policy makers, educators, industry bodies and even the individual entrepreneurs themselves as a basis of evidence-based intervention namely localized training programs, codes of ethics and even forming business alliances with the government that will not only improve the level of security but also integrity in the digital entrepreneurship landscape of Tamil Nadu. This

study can also contribute to the general discussion of sustainable and inclusive digital development in emerging economies by filling the gap between the technical and ethical aspects of cybersecurity.

2. Review of Literature

Existing literature highlights that MSMEs in developing regions often lack the financial and technical resources to implement robust cybersecurity measures. Studies by Gupta & Sharma (2021) and Rao et al. (2022) note that SMEs in India are frequent targets of cyber-attacks due to weak firewall configurations, poor password policies, and unsecured digital transactions.

Ethical issues in cybersecurity extend beyond technical vulnerabilities to include concerns such as user consent, data ownership, surveillance, and algorithmic bias. Nissenbaum (2019) argues that cybersecurity must be framed within a context of digital ethics, ensuring that security measures do not infringe on individual rights or promote discriminatory practices.

Research conducted in Tamil Nadu indicates that cybersecurity training is rare among MSMEs, especially in non-IT sectors (Karthikeyan & Meenakshi, 2020). Entrepreneurs with higher digital literacy and prior exposure to cyber incidents demonstrate better security practices, though ethical understanding remains low. Studies show that cybersecurity awareness varies significantly across districts. Urban entrepreneurs in Chennai show higher adoption of security tools, while those in semi-urban and rural areas report limited access to cybersecurity education and ethical guidelines (Vijayalakshmi & Rajan, 2023). Despite national initiatives like the Digital India Campaign and the Personal Data Protection Bill, implementation at the MSME level remains weak. Many entrepreneurs are unaware of legal obligations concerning data protection and consumer privacy (Sharma & Nair, 2024).

2.1 Research Gap

While several studies address technical cybersecurity challenges, few integrate ethical considerations or examine district-level disparities in awareness and practice. This study aims to fill that gap by combining empirical analysis of cybersecurity challenges with an evaluation of ethical perceptions among Tamil Nadu entrepreneurs.

2.2 Research Objectives

1. To analyse the socio-economic and demographic profile of respondents in relation to cybersecurity awareness.
2. To examine the relationship between cybersecurity awareness and factors such as digital literacy, training exposure, prior cyber incidents, ethical perception, and regulatory knowledge.
3. To assess the impact of these factors on cybersecurity preparedness and ethical compliance.

3. Research Methodology

3.1 Research Design

This study employs a descriptive and explanatory research design to investigate the cybersecurity challenges and ethical issues faced by MSMEs in Tamil Nadu. A mixed-methods approach was adopted, combining quantitative survey data with qualitative insights from open-ended responses. This design facilitates a comprehensive understanding of both the prevalence of

ISBN : 978-93-6163-366-9

cybersecurity vulnerabilities and the underlying ethical perceptions shaping entrepreneurial behavior (Creswell & Creswell, 2018).

3.2 Study Area and Population

The study was conducted in four districts of Tamil Nadu Chennai, Coimbatore, Tiruchirappalli, and Salem selected based on their varying levels of digital development, industrial base, and geographical representation. The study population comprised MSME owners, startup founders, and aspiring entrepreneurs actively engaged in or planning digital business operations. The inclusion criteria required participants to have at least one year of business experience and use digital tools for business functions such as sales, marketing, finance, or communication.

3.3 Sampling Technique and Sample Size

A multistage stratified random sampling technique was adopted to ensure adequate representation of respondents across different districts and types of enterprises. In the first stage, the selected districts were stratified into urban, semi-urban, and rural clusters. In the second stage, respondents were further classified based on enterprise size micro, small, and medium and by sector, namely manufacturing, services, and trade. In the final stage, simple random sampling was applied within each stratum to select the respondents, thereby minimizing sampling bias and enhancing the representativeness of the sample. The sample size for the study was fixed at 300 respondents, determined using the finite population sampling formula proposed by Krejcie and Morgan (1970), with a 95% confidence level and a margin of error of ±5%. The respondents were proportionately distributed across the selected districts, with 90 respondents (30%) from Chennai, 84 respondents (28%) from Coimbatore, 72 respondents (24%) from Tiruchirappalli, and 54 respondents (18%) from Salem. This distribution ensured balanced regional representation in the study.

3.4 Data Collection Instrument

A structured questionnaire was designed in both English and Tamil to ensure linguistic accessibility and better comprehension among respondents. The questionnaire was divided into four sections. Section A captured socio-demographic details and enterprise characteristics, including age, gender, educational qualification, income level, type of enterprise, and district. Section B focused on cybersecurity awareness and practices, with items adapted from the Cybersecurity Awareness Scale developed by Alavi and Zaidi (2023). Section C examined respondents' ethical perceptions and ethical dilemmas related to digital practices, drawing on the Digital Ethics Inventory proposed by Nissenbaum (2019). Section D comprised open-ended questions aimed at eliciting in-depth insights into respondents' experiences, including cybersecurity challenges faced, incidents encountered, and perceived training and capacity-building needs. The instrument was validated through a pilot study with 30 entrepreneurs, and

Cronbach's alpha was calculated to assess reliability ($\alpha = 0.87$ for cybersecurity awareness; $\alpha = 0.82$ for ethical perception).

3.5 Data Collection Procedure

Data were collected between January and March 2025 using both online (Google Forms) and offline (paper-based) modes to include respondents with limited digital access. Trained

enumerators assisted in rural and semi-urban areas. Prior informed consent was obtained, and anonymity was assured to encourage candid responses.

3.6 Variables and Measurement

Table : 1 Measurement information fo the study

Variable Type	Variable Name	Measurement Scale	Source/Instrument
Dependent Variable	Cybersecurity Awareness (CYA)	Interval (5-point Likert)	Adapted from Alavi & Zaidi (2023)
Independent Variables	Digital Literacy (DL)	Interval (5-point Likert)	Subscale of CYA
	Training Exposure (TR)	Nominal (Yes/No) + Likert	Self-developed items
	Ethical Perception (EP)	Interval (5-point Likert)	Nissenbaum (2019)
	Regulatory Knowledge (RK)	Interval (5-point Likert)	Based on PDPB compliance items
	Cyber Incident Experience (CIE)	Nominal (Yes/No) + frequency	Self-reported incident log
Control Variables	Age, Gender, Education, District	Nominal/Ordinal	Demographic section

3.7 Data Analysis Techniques

The collected data were analysed using SPSS 28.0 and NVivo 12 (for qualitative responses). The following statistical methods were applied: The data collected for the study were analysed using both descriptive and inferential statistical tools. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarise the socio-demographic characteristics of the respondents and their levels of cybersecurity awareness. Pearson's correlation analysis was employed to examine the relationship between cybersecurity awareness and selected independent variables. Multiple linear regression analysis was carried out to identify the significant factors influencing cybersecurity awareness. In addition, thematic analysis was used to analyse open-ended responses by coding and grouping them into recurring themes related to challenges and ethical dilemmas. The chi-square test was applied to examine the association between categorical variables such as district and participation in cybersecurity training programmes.

4. Data Analysis and Interpretation

4.1 Frequency Analysis

Table: 2 Interpretation of Socio-Economic Profile of Respondents

Variable	Category	Frequency	Percentage
Gender	Male	174	58
	Female	126	42
Age	Below 30	108	36
	31–40	102	34
	41–50	66	22
	Above 50	24	8

ISBN : 978-93-6163-366-9

Education	Diploma	60	20
	Undergraduate	126	42
	Postgraduate	114	38
Enterprise Type	Micro	144	48
	Small	96	32
	Medium	60	20
District	Chennai	90	30
	Coimbatore	84	28
	Tiruchirappalli	72	24
	Salem	54	18

Source: Primary Data

The socio-demographic analysis reveals a sample predominantly composed of young and educated entrepreneurs, with 70% of respondents aged below 40 years, reflecting the dynamic nature of digital entrepreneurship in Tamil Nadu. Gender distribution shows a moderate representation of female entrepreneurs (42%), indicating gradual yet incomplete gender inclusion in the state's entrepreneurial landscape. Educationally, over 80% of respondents possess undergraduate or postgraduate qualifications, suggesting that higher education may correlate with greater exposure to digital and cybersecurity concepts.

Enterprise-wise, micro-enterprises constitute nearly half of the sample (48%), consistent with the MSME sector's structure in the region. Geographically, respondents are equitably distributed across four districts, with Chennai and Coimbatore together representing 58% of the sample, underscoring the concentration of entrepreneurial activity in urban and industrial hubs. This demographic profile provides a contextual foundation for analyzing regional and educational influences on cybersecurity awareness and ethical practices among Tamil Nadu's entrepreneurs.

4.2 Correlation Analysis

Table: 3 Correlation Analysis

Variables	CYA	DL	CE	TR	RK	EP
Cybersecurity Awareness (CYA)	1					
Digital Literacy (DL)	0.712**	1				
Cyber Incident Exposure (CE)	0.634**	0.589**	1			
Training Received (TR)	0.698**	0.645**	0.601**	1		
Regulatory Knowledge (RK)	0.567**	0.523**	0.488**	0.542**	1	
Ethical Perception (EP)	0.603**	0.554**	0.497**	0.576**	0.612**	1

Source: Primary Data

** $p < 0.01$

The correlation analysis shows that cybersecurity awareness (CYA) has a strong and positive relationship with digital literacy (DL), training received (TR), cyber incident exposure (CE), regulatory knowledge (RK), and ethical perception (EP). Among these variables, digital literacy has the strongest correlation with cybersecurity awareness, indicating that individuals with higher digital skills tend to have better awareness of cybersecurity issues. Training received and cyber

incident exposure also show strong positive relationships with cybersecurity awareness, suggesting that formal training and prior exposure to cyber incidents help improve awareness levels. Regulatory knowledge and ethical perception are moderately and positively correlated with cybersecurity awareness, implying that understanding cyber laws and ethical responsibilities contributes to better cybersecurity practices. Overall, all the independent variables are significantly related to cybersecurity awareness at the 0.01 level, indicating their important role in enhancing cybersecurity awareness.

4.3 Multiple Regression Analysis

Table:4 Multiple Regression Analysis

Dependent Variable: Cybersecurity Awareness (CYA)

Independent Variables	B	Std. Error	Beta	t-value	Sig.
Constant	1.15	0.241	–	4.77	0
Digital Literacy	0.342	0.058	0.361	5.9	0
Training Received	0.318	0.062	0.328	5.13	0
Ethical Perception	0.276	0.055	0.284	5.02	0
Regulatory Knowledge	0.198	0.049	0.201	4.04	0
Cyber Incident Exposure	0.165	0.048	0.172	3.44	0.001

R^2 = 0.682, Adjusted R^2 = 0.674

The multiple regression analysis demonstrates that all five independent variables significantly predict cybersecurity awareness among Tamil Nadu entrepreneurs (R^2 = 0.674). Digital literacy emerges as the strongest predictor (β = 0.361, t = 5.90, $p < 0.001$), indicating that a one-unit increase in digital literacy corresponds to a 0.342 unit rise in cybersecurity awareness, holding other factors constant. Training received (β = 0.328, t = 5.13, $p < 0.001$) and ethical perception (β = 0.284, t = 5.02, $p < 0.001$) also exhibit substantial positive influence, underscoring the importance of formal training and ethical sensitization in enhancing security preparedness. Regulatory knowledge (β = 0.201, t = 4.04, $p < 0.001$) and prior cyber incident exposure (β = 0.172, t = 3.44, p = 0.001) further contribute positively, though with relatively smaller effects. Collectively, the model explains 67.4% of variance in cybersecurity awareness, confirming the integrated role of competence, training, ethics, regulatory awareness, and experiential learning in shaping cybersecurity engagement among MSMEs in Tamil Nadu.

Regression Equation:

$CYA=1.15+0.342(DL)+0.318(TR)+0.276(EP)+0.198(RK)+0.165(CE)+\epsilon CYA=1.15+0.342($ D L$)+0.318(TR)+0.276(EP)+0.198(RK)+0.165(CE)+\epsilon$

4.4 Discussion

The regression findings substantiate the fact that cybersecurity awareness among the Tamil Nadu entrepreneurs is greatly determined by a mix up of the competence based, experience based and ethical factors. Digital literacy turns out to be the strongest predictor that supports the previous researchers who describe technical proficiency as a base facilitator of cybersecurity

 ISBN : 978-93-6163-366-9

participation (Alavi and Zaidi, 2023). This implies that the entrepreneur skilled in the application of digital tools is in better position to identify threats, institute protective mechanisms and assume secure digital behavior. The high positive impact of training also demonstrates the value of formal learning interventions to the closure of knowledge gaps especially in the situations where informal learning prevails. Remarkably, the perception of ethics, as well, has a significant impact, which confirms the idea that cybersecurity is not only a technical concern but an ethical requirement, in which the awareness of privacy, consent, and transparency forms behavioral intent and adherence (Nissenbaum, 2019).

Moreover, the value of regulatory knowledge and previous exposure to cyber incident also heavily point to contextual and experiential aspects of cybersecurity preparedness. Business persons who are conversant with data protection policies like PDPB have high chances of operating under the law, minimizing the risks of non-conformity. Likewise, individuals with previous experience of cyber incidents are more aware, which might come as a result of a learning experience and the perceived susceptibility. Nonetheless, the beta variables of these variables are lower in order, which indicates that experience and regulation do not have an as significant influence as the constant development of skills and ethical sensitization. This underscores the importance of integrative interventions that include real world simulation, ethical instructions, training and regulative guidance to create a whole person culture in cyberspace among MSMEs.

5. Conclusion

This paper shows that the creation of cybersecurity awareness on the MSME sector in Tamil Nadu is conditioned by the combination of several factors, the most determining ones being digital literacy, training exposure and ethical perception. The results indicate the necessity to go beyond the technical approach to a more holistic one that incorporates education in ethics, awareness of regulations, and experience learning. The policymakers, learning institutions and industry bodies must work together to develop local, accessible and multidimensional cybersecurity initiatives that would fill the gaps in skills as well as ethical blindness so as to improve the resilience and sustainability of digital entrepreneurship in the region.

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ISBN : 978-93-6163-366-9

ENTREPRENEURSHIP AND ENHANCED BIOMETRIC SECURITY: BUILDING TRUST IN THE DIGITAL ECONOMY

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Abstract

The rapid growth of digital services has increased the demand for secure and reliable user authentication systems. Traditional security methods such as passwords, PINs, and access cards are no longer sufficient due to data breaches, identity theft, and cyber fraud. Biometric security, which uses unique human characteristics such as fingerprints, facial features, iris patterns, and voice recognition, has emerged as a powerful solution to these challenges. This paper explores how enhanced biometric security technologies create strong entrepreneurial opportunities by enabling safer digital transactions and improving trust in online systems. It highlights the role of innovation, startup models, and market potential in the growing biometric security industry.

Keywords: *Entrepreneurship, Biometric Security, Digital Identity, Authentication Systems, Cybersecurity Startups, Trust Economy*

1. Introduction

Entrepreneurship today is strongly connected with digital transformation and continuous technological innovation. As businesses, government services, and financial platforms rapidly move into online and cloud-based environments, the demand for secure and reliable user authentication systems has become a critical concern. Digital transactions, remote access systems, and online identity verification now form the foundation of modern organizations. However, this rapid digital shift has also increased exposure to cybercrime, identity theft, data breaches, and unauthorized system access, resulting in serious financial losses and reputational damage for organizations worldwide [1].

Traditional authentication methods such as passwords, PINs, and smart cards are no longer sufficient to protect modern digital systems. These methods can be easily guessed, stolen, shared, or hacked, making them highly vulnerable to misuse and fraud [2]. In addition, users often reuse the same passwords across multiple platforms, which further increases security risks. These limitations have forced organizations to search for more secure and user-friendly authentication alternatives.

Biometric security offers a reliable solution by using unique physical and behavioral characteristics such as fingerprints, facial features, iris patterns, voice recognition, and gait patterns. Since these traits are extremely difficult to replicate or steal, biometric systems provide a much higher level of protection than traditional authentication mechanisms [3]. At the same

time, biometric authentication improves user convenience by eliminating the need to remember complex passwords or carry physical access cards.

As digital services continue to grow, biometric technologies are now widely adopted across sectors such as banking, healthcare, airports, mobile devices, and government identity systems. Many smartphones and laptops already include built-in biometric sensors, making this technology easily accessible to millions of users worldwide [4]. This rapid expansion of biometric applications has created a strong market for innovation, offering significant opportunities for entrepreneurs to develop advanced biometric security platforms and identity management solutions.

2. Growth of Biometric Technology in Digital Systems

Biometric systems have become a core component of modern digital infrastructure. Technologies such as fingerprint scanners, facial recognition systems, iris scanners, and voice-based authentication are now widely used to verify identities in smartphones, banking systems, airports, and national border control services [5]. The rapid growth of online services and digital payments has significantly increased the need for secure digital identities. As a result, global market studies indicate that the biometric security industry is expanding at a fast pace, driven by rising concerns over fraud and data breaches [6].

Both governments and private organizations are making large investments in biometric technologies to strengthen security and reduce identity-related crimes. Many countries have already integrated biometrics into national ID systems, e-passports, and welfare distribution platforms. At the same time, the widespread use of smartphones and smart devices with built-in biometric sensors has accelerated user acceptance and large-scale adoption [7]. This growth has created a strong business ecosystem for startups that specialize in biometric software, hardware devices, and cloud-based authentication services.

3. Enhanced Biometric Security: Beyond Traditional Methods

While traditional biometric systems rely on a single trait such as a fingerprint or facial image, enhanced biometric security systems use a combination of multiple biometric features along with advanced technologies to improve accuracy and reliability. This approach, known as multimodal biometrics, uses two or more biometric traits to verify a person's identity, which significantly reduces the chances of false acceptance and unauthorized access [8]. In addition, modern biometric systems apply artificial intelligence and machine learning techniques to recognize complex patterns and improve matching performance over time.

Another important enhancement is the use of liveness detection techniques, which help identify whether the biometric input is coming from a real person rather than a fake fingerprint, photograph, or recorded voice. This prevents spoofing attacks and strengthens system security [9]. To further protect sensitive biometric data, encrypted biometric templates are used for secure storage, ensuring that original biometric information cannot be reconstructed or misused even if the database is compromised [10]. Together, these improvements provide stronger protection against identity fraud and data theft. Enhanced biometric systems are therefore widely adopted in high-security environments such as financial services, healthcare institutions, and national identity programs.

ISBN : 978-93-6163-366-9

4. Entrepreneurial Opportunities in Biometric Security

The increasing demand for secure and reliable authentication systems has created strong opportunities for entrepreneurial innovation. Many organizations are actively seeking alternatives to traditional login methods, which has encouraged startups to design biometric-based security solutions. Entrepreneurs can develop mobile biometric authentication applications that allow users to securely access digital services, as well as biometric-based payment systems that enable safe and contactless financial transactions. In addition, cloud-based identity verification platforms can support large-scale user authentication for enterprises, while biometric security solutions for IoT and smart devices can protect connected environments from unauthorized access.

These biometric security solutions can be offered to a wide range of sectors, including banks, government agencies, educational institutions, healthcare providers, and e-commerce platforms. Entrepreneurs who focus on creating affordable, scalable, and privacy-focused systems can build strong competitive advantages in this rapidly expanding market, where trust and security are key factors in business success..

5. Business Model for Biometric Startups

The proposed venture can be developed as an **enhanced biometric authentication platform** that provides secure and reliable digital access for organizations. This platform would allow users to verify their identities quickly and safely using biometric technologies, reducing dependence on traditional passwords and access cards. It is designed to support a wide range of digital systems, making it suitable for both public and private sector use.

The primary target customers for this platform include banks and fintech companies, healthcare providers, educational institutions, government agencies, and large corporate organizations that require strong identity verification systems. These sectors handle sensitive personal and financial data, making secure authentication essential for daily operations.

From a revenue perspective, the platform can follow a flexible business model. Subscription-based authentication services can provide recurring income, while licensing the biometric software to organizations and device manufacturers can generate additional revenue. Furthermore, security audits, system integration services, and technical support contracts can be offered to ensure proper deployment and regulatory compliance.

The value proposition of the platform lies in its ability to deliver high accuracy, reduce fraud, enhance user convenience, and comply with data protection regulations. By strengthening digital trust, the system helps organizations protect their users and maintain secure digital environments.

6. Social and Economic Impact

Enhanced biometric security plays a key role in building trust in digital systems by protecting user identities, reducing cybercrime, and enabling safer online transactions. From an entrepreneurial perspective, it also creates employment opportunities, encourages technological innovation, and supports the long-term growth of the digital economy [5].

7. Conclusion

Enhanced biometric security is not just another technological upgrade; it represents a powerful shift in how trust is created in the digital world. As people increasingly depend on online services for banking, healthcare, education, and daily communication, the need to protect digital

ISBN : 978-93-6163-366-9

identities has become more important than ever. In this environment, biometric security provides a reliable foundation for safe and confident digital interactions.

For entrepreneurs, this growing need opens the door to meaningful and sustainable business opportunities. By designing secure, user-friendly, and privacy-focused authentication solutions, innovators can address real-world problems while building profitable ventures. These solutions not only protect individuals from fraud and identity theft but also help organizations gain the confidence of their users. In the long run, enhanced biometric security will continue to play a vital role in strengthening trust, supporting digital transformation, and shaping the future of the global digital economy.

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ISBN : 978-93-6163-366-9

ENTREPRENEURSHIP OPPORTUNITIES IN SECURE IOMT HEALTHCARE SYSTEMS: A BUSINESS–TECHNOLOGY PERSPECTIVE

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Abstract

The healthcare industry is rapidly adopting smart medical devices that can collect, store, and transmit patient data in real time. These connected devices, known as the Internet of Medical Things (IoMT), have improved diagnosis, monitoring, and treatment. At the same time, they have also created serious risks related to data privacy, cyberattacks, and system failures. Healthcare data is now one of the most targeted assets by hackers, making security a major concern for hospitals and technology providers. This paper explains how secure IoMT data storage can become a strong area for entrepreneurial growth. It connects a lightweight hybrid encryption framework with business innovation and startup opportunities in digital healthcare. By combining security technology with a sustainable business model, entrepreneurs can build profitable ventures while also protecting sensitive patient information.

Keywords: *Entrepreneurship, IoMT, Healthcare Security, Hybrid Encryption, Digital Health Startups, Data Privacy*

1. Introduction

Entrepreneurship in the modern world is no longer limited to small retail businesses or traditional manufacturing industries. It is now closely connected with technology, innovation, and problem-solving across sectors. Digital transformation has reshaped how organizations operate, communicate, and deliver services. Among all industries, healthcare has emerged as one of the most promising areas for entrepreneurial growth because of its increasing dependence on smart digital technologies. The Internet of Medical Things (IoMT) refers to a network of interconnected medical devices such as wearable heart monitors, glucose sensors, smart inhalers, and remote patient monitoring systems that collect, store, and transmit health data over the internet [1]. These technologies help healthcare professionals provide continuous monitoring and faster clinical decision-making.

Although IoMT systems offer many benefits, they also introduce serious challenges related to data security and privacy. Medical information is extremely sensitive, as it includes personal details, diagnosis records, and treatment histories. When such data is stored in cloud platforms or transmitted across networks, it becomes vulnerable to cyberattacks, data leakage, and unauthorized access. According to recent industry reports, healthcare organizations experience some of the highest costs due to data breaches, making cybersecurity a critical concern for hospitals and digital health providers [2]. Without strong security systems, the trust of patients and healthcare professionals can be severely affected.

This growing concern has created a strong entrepreneurial opportunity in the digital healthcare market. Instead of treating security as a technical problem alone, it can be viewed as a valuable business solution. Entrepreneurs who combine healthcare knowledge with cybersecurity innovation can design platforms that protect patient data while also improving system efficiency. Secure IoMT solutions not only help organizations meet regulatory requirements but also create competitive advantage in the healthcare technology market [3], [4].

2. Entrepreneurship in Digital Healthcare

Digital healthcare has become one of the fastest-growing sectors in the global economy, creating vast opportunities for entrepreneurs. The integration of technology into healthcare services has transformed traditional care models into data-driven and patient-centered systems. Innovations such as telemedicine platforms, wearable health devices, mobile health applications, and cloud-based medical records are now widely adopted. According to the World Health Organization, digital health solutions improve access to healthcare, reduce operational costs, and enhance the quality of patient care, especially in remote and underserved regions [3]. This rapid growth has created a strong market for new business ideas and startup ventures.

Entrepreneurs play a key role in bridging the gap between medical needs and technological innovation. Many healthcare institutions lack the technical expertise to manage complex digital systems securely. As a result, startups that provide ready-made secure platforms, data management tools, and compliance solutions are in high demand. Research shows that organizations are more willing to adopt digital solutions when they are supported by reliable security and privacy frameworks [4]. This means that cybersecurity is no longer an added feature but a core value proposition for health-tech startups.

From a business perspective, digital healthcare entrepreneurship focuses on solving real problems such as data protection, system interoperability, and regulatory compliance. Entrepreneurs who can design affordable, scalable, and secure solutions can attract hospitals, insurance companies, and research institutions as long-term clients. By aligning technological innovation with healthcare needs, digital health startups can build trust, improve patient outcomes, and achieve sustainable growth in a highly competitive market [12].

3. Security Challenges in IoMT Systems

IoMT devices operate under strict hardware and energy limitations, which makes security implementation a major challenge. Most medical sensors, wearable devices, and remote monitoring tools are designed to be small, portable, and low-power. Because of these constraints, they do not have sufficient memory, processing capacity, or battery life to run complex and heavy encryption algorithms effectively [5]. As a result, many IoMT systems rely on simplified security mechanisms, which often fail to provide adequate protection.

In addition to device-level constraints, the use of centralized data storage further increases security risks. When large volumes of patient information are stored in a single server or cloud platform, it becomes an attractive target for cyber attackers. Unauthorized users may gain access, alter medical records, or misuse sensitive data, leading to serious privacy violations and safety concerns [6]. Common threats in IoMT environments include unauthorized access to medical records, modification of clinical data, device impersonation, and leakage of private patient information. These issues clearly demonstrate the urgent need for lightweight, efficient, and

ISBN : 978-93-6163-366-9

scalable security frameworks that can function reliably within resource-constrained IoMT environments.

4. Secure IoMT Framework as a Business Product

The proposed solution integrates hybrid encryption, blockchain-inspired data integrity techniques, and access control mechanisms to ensure the secure storage of sensitive medical data in IoMT environments. At the core of the framework, ChaCha20 is employed as the primary data encryption algorithm because of its high speed and efficiency, making it well suited for low-power and resource-constrained medical devices [7]. To securely manage cryptographic keys, AES or Elliptic Curve Cryptography (ECC) is used, providing strong protection with minimal computational overhead [8].

To prevent data tampering, the system adopts a hash-linked storage structure inspired by blockchain technology. In this approach, each data record is linked to the previous one using cryptographic hashes, so any unauthorized modification can be immediately detected [9]. In addition, Merkle Tree verification is applied to confirm the integrity of stored records efficiently, even when handling large volumes of medical data [10]. Access to the system is controlled using Role-Based Access Control (RBAC), which ensures that only authorized users such as doctors, nurses, and administrators can view or modify specific data based on their roles [11].

Because the framework is lightweight, scalable, and cost-effective, it is well suited for real-world deployment and commercialization, offering strong potential as a digital healthcare security product..

5. Entrepreneurial Business Model

The proposed framework can be developed as a secure IoMT data protection platform designed for healthcare providers and medical device manufacturers. The platform would function as a centralized security solution that protects sensitive patient information collected by IoMT devices while ensuring data integrity and controlled access. By offering this system as a ready-to-use digital product, entrepreneurs can address one of the most critical needs in modern healthcare—data security and privacy.

The primary target customers for this platform include hospitals, diagnostic laboratories, telemedicine service providers, and healthcare research institutions that handle large volumes of patient data on a daily basis. These organizations require secure, reliable, and regulation-compliant systems to manage medical information safely. As healthcare services increasingly rely on connected technologies, the demand for such security platforms is expected to grow rapidly.

From a revenue perspective, the business can follow a multi-channel model. A software subscription model (SaaS) can provide continuous income through monthly or annual plans. In addition, the platform can be licensed to medical device manufacturers who wish to integrate built-in security into their products. Further revenue can be generated through security audits, compliance certification services, and technical support contracts.

6. Innovation and Competitive Advantage

When compared with traditional healthcare data security systems, the proposed framework demonstrates several important advantages. It is designed to consume significantly less energy, making it suitable for low-power IoMT devices that must operate continuously. The use of lightweight encryption techniques allows the system to perform faster encryption and decryption,

which reduces processing delays and improves overall system performance. In addition, the blockchain-inspired hash-linked structure ensures tamper-proof data storage, meaning that any unauthorized modification can be quickly detected and traced. By minimizing computational complexity and storage overhead, the framework also reduces the overall system burden. Together, these features provide a strong competitive advantage for the proposed solution in the rapidly growing digital healthcare market [13].

7. Social and Economic Impact

Secure IoMT systems play an important role in safeguarding patient privacy, preventing unauthorized use of medical data, and reducing the risk of healthcare fraud. By ensuring that sensitive health information is handled ethically and securely, these systems help build trust between patients and healthcare providers. From an entrepreneurial and economic perspective, they also create new opportunities for startups, generate employment in the health-technology sector, and promote continuous innovation within the digital healthcare ecosystem [14].

8. Conclusion

IoMT security should not be viewed only as a technical concern; it represents a powerful entrepreneurial opportunity in today's digital healthcare market. When secure data storage frameworks are developed as practical business solutions, they enable entrepreneurs to create sustainable ventures that not only generate economic value but also contribute to safer, more reliable, and more trustworthy healthcare systems.

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ISBN : 978-93-6163-366-9

SECURING BIOMETRIC AUTHENTICATION SYSTEMS AGAINST SPOOFING AND TEMPLATE ATTACKS: AN ENTREPRENEURIAL PERSPECTIVE

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Abstract

The rapid growth of digital services has increased the demand for secure and reliable user authentication systems. Biometric authentication has become a preferred solution because it uses unique human traits such as fingerprints, faces, and irises. However, biometric systems are also vulnerable to serious security threats, including spoofing attacks and biometric template theft. These threats not only compromise personal privacy but also reduce user trust in digital platforms. This paper discusses the major security risks in biometric authentication systems and explores modern protection techniques such as liveness detection, encrypted template storage, and multimodal biometrics. It also highlights the strong entrepreneurial opportunities in developing secure biometric solutions for banking, healthcare, e-commerce, and government services.

1. Introduction

Digital transformation has changed the way people access services in banking, healthcare, education, and e-commerce. As more personal data is stored and processed online, identity security has become a major concern. Traditional authentication methods such as passwords and PINs are easily forgotten, shared, or stolen, making them unreliable in high-risk environments.

Biometric authentication offers a more secure alternative by using physical or behavioral characteristics that are unique to each person. Technologies such as fingerprint recognition, facial recognition, iris scanning, and voice authentication are now widely used in smartphones, airports, and financial systems [1]. However, as the use of biometrics increases, attackers are also developing new ways to compromise these systems.

Two of the most serious threats are **spoofing attacks**, where fake biometric traits are used, and **template attacks**, where stored biometric data is stolen or altered [3]. Addressing these risks is not only a technical necessity but also a business opportunity for entrepreneurs who can provide secure and scalable solutions.

2. Security Threats in Biometric Systems

2.1 Spoofing Attacks

Spoofing occurs when attackers use artificial or copied biometric traits, such as fake fingerprints, printed face images, or recorded voices, to fool the system. Studies have shown that

many basic biometric sensors can be deceived by high-quality replicas [3]. This allows unauthorized users to gain access to secure systems, leading to financial and data losses.

2.2 Template Attacks

Biometric templates are digital representations of biometric traits stored in databases. If these templates are stolen, attackers can recreate biometric data or modify records to gain unauthorized access [4]. Unlike passwords, biometric data cannot be changed once compromised, making template protection extremely critical.

3. Advanced Protection Techniques

To address the growing risks of spoofing and template attacks, modern biometric systems now rely on a combination of advanced security mechanisms rather than a single line of defense. These methods work together to improve system reliability, protect user data, and increase trust in biometric technologies.

3.1 Liveness Detection

Liveness detection is a critical technique used to ensure that the biometric sample is captured from a real, living person and not from a fake source such as a printed photo, video replay, silicone fingerprint, or recorded voice. Instead of only matching patterns, liveness detection analyzes biological signs and natural human responses. This includes monitoring blood circulation under the skin, detecting eye blinking and pupil movement, observing skin texture, and identifying small facial micro-expressions that are difficult to replicate artificially [3]. By adding this extra verification layer, liveness detection significantly reduces the success rate of spoofing attacks and strengthens overall system security.

3.2 Encrypted and Cancelable Templates

Once biometric data is captured, it is converted into a digital template and stored for future authentication. If these templates are left unprotected, they become valuable targets for hackers. To prevent this, modern systems encrypt biometric templates before storing them in databases or cloud servers. In addition, cancelable biometric techniques allow the system to generate a new transformed version of the biometric template if the original one is compromised, similar to changing a password after a security breach [6]. This approach ensures that even if a database is attacked, the original biometric data remains safe and cannot be misused.

3.3 Multimodal Biometrics

Multimodal biometric systems use two or more biometric traits, such as fingerprint and facial recognition together, instead of relying on a single characteristic. This makes the system more secure because an attacker would need to spoof multiple traits at the same time, which is extremely difficult in practice. Multimodal systems also improve accuracy by reducing false acceptance and false rejection rates, as one biometric can compensate for the limitations of another [5]. As a result, multimodal biometrics provide a stronger, more reliable, and more user-friendly authentication solution, especially in high-security environments.

4. Entrepreneurial Opportunities

The increasing demand for secure and reliable authentication systems has created significant business opportunities in the biometric security sector. As organizations become more aware of identity-related cyber threats, there is a growing need for advanced solutions that can protect

ISBN : 978-93-6163-366-9

users and digital platforms. This has encouraged many startups and technology firms to enter the market with innovative biometric security products.

Entrepreneurs can develop a wide range of solutions, including anti-spoofing biometric software that prevents fake access attempts, secure template management platforms that protect stored biometric data, cloud-based identity verification systems that enable remote authentication, and biometric security solutions for IoT and smart devices. These technologies can be offered to banks, government agencies, hospitals, corporate organizations, and digital service providers. By focusing on user privacy, system scalability, and compliance with data protection regulations, entrepreneurs can gain a strong competitive advantage and build sustainable businesses in this rapidly expanding market [8].

5. Business Model Overview

The proposed product is a secure biometric authentication platform designed with built-in anti-spoofing mechanisms and encrypted biometric template protection. The system ensures safe user verification while preventing unauthorized access and data misuse.

The target customers include banks and fintech firms that require strong digital identity verification, healthcare providers that manage sensitive patient records, government agencies that handle citizen data, and e-commerce platforms that depend on secure online transactions.

The platform can generate revenue through multiple streams. These include subscription-based authentication services offered as a Software-as-a-Service (SaaS) model, licensing of the biometric security software to enterprises and device manufacturers, and additional income from security audits, technical consulting, and system integration services.

The main value proposition of the platform lies in its ability to provide high levels of security while remaining easy to use and cost-effective. It helps organizations reduce fraud, build user trust, and meet data protection and regulatory compliance requirements, making it a reliable solution for modern digital environments [9].

6. Social and Economic Impact

Secure biometric systems protect digital identities, reduce cybercrime, and support ethical data usage. From an entrepreneurial perspective, they generate employment, encourage innovation, and strengthen the digital economy [10].

7. Conclusion

Securing biometric authentication systems has become a critical requirement for building and maintaining trust in today's digital services. As cyber threats continue to evolve, spoofing and template attacks remain serious challenges that can compromise both security and user confidence. However, with the adoption of modern protection techniques such as liveness detection, encrypted template storage, and multimodal biometrics, these risks can be effectively reduced.

By turning these advanced security technologies into practical and scalable business solutions, entrepreneurs can create sustainable ventures that not only protect digital identities but also strengthen confidence in online systems. In doing so, they contribute to the development of safer, more reliable, and trustworthy digital ecosystems for the future.

ISBN : 978-93-6163-366-9

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ISBN : 978-93-6163-366-9

CHAPTER 5 - E-COMMERCE AND DIGITAL ENTREPRENEURSHIP

IMPACT OF DIGITAL ENTREPRENEURSHIP IN THE HEALTHCARE SYSTEM

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Abstract

Digital entrepreneurship is reshaping the healthcare system by enabling innovative service models such as telemedicine, mobile health applications, AI-powered diagnostics, wearable technologies, cloud-based health records, and digital pharmacy platforms. These innovations enhance healthcare accessibility, affordability, and quality, especially in resource-constrained environments. Digital health ventures contribute to improved patient engagement, faster clinical decision-making, and efficient health data management. However, challenges such as cybersecurity risks, data privacy concerns, regulatory barriers, interoperability issues, and digital inequality remain significant. This paper examines the impact of digital entrepreneurship on healthcare systems, provides a conceptual framework linking digital innovations to healthcare outcomes, and highlights key opportunities and policy recommendations for sustainable growth. The study concludes that digital entrepreneurship has the potential to strengthen healthcare systems by promoting patient-centered care, reducing cost burdens, and enabling inclusive healthcare delivery.

Keywords: *Digital Entrepreneurship, Healthcare Innovation, Telemedicine, AI, Digital Health, Startups, HealthTech, Patient Engagement*

1. Introduction

The healthcare sector has traditionally relied on physical infrastructure such as hospitals, clinics, and laboratories for diagnosis and treatment. However, increasing population growth, urban-rural healthcare gaps, chronic disease burden, rising medical costs, and shortage of healthcare professionals have created major challenges for healthcare systems worldwide. In response, digital transformation has accelerated rapidly, leading to the emergence of digital entrepreneurship in healthcare.

Digital entrepreneurship refers to entrepreneurial activities that use digital technologies as the core driver of innovation, value creation, and business model development. In healthcare, digital entrepreneurs are developing solutions that improve patient access, enable remote monitoring, streamline hospital processes, and enhance health awareness through digital platforms.

The rise of HealthTech startups has led to major advancements such as teleconsultation, electronic health records, AI-based diagnostics, wearable devices, and online medicine delivery. These innovations are particularly relevant in developing countries where healthcare infrastructure is uneven and affordability remains a concern. This paper explores the impact of digital entrepreneurship on healthcare systems, focusing on its positive contributions, challenges, and future opportunities.

ISBN : 978-93-6163-366-9

2. Objectives of the Study

The objectives of this conference paper are:

1. To examine the role of digital entrepreneurship in transforming healthcare delivery.
2. To analyze key areas where digital health startups create value for patients and healthcare institutions.
3. To identify challenges faced by digital healthcare ventures.
4. To propose a conceptual framework linking digital entrepreneurship to healthcare outcomes.
5. To suggest recommendations for policymakers, entrepreneurs, and healthcare stakeholders.

3. Concept of Digital Entrepreneurship in Healthcare

Digital entrepreneurship in healthcare is driven by digital innovation and the increasing adoption of internet-based services. It involves creating digital solutions for healthcare service delivery, patient engagement, diagnostics, monitoring, and administration.

3.1 Major Digital Health Startup Segments

Digital entrepreneurship in healthcare is visible through multiple categories:

- **Telemedicine platforms:** Remote consultation, video call-based treatment
- **Mobile health applications (mHealth):** Fitness tracking, medicine reminders, health education
- **AI & Machine Learning diagnostics:** Image analysis, disease prediction
- **Wearable technology &IoMT:** Continuous health monitoring devices
- **Digital pharmacy & medicine delivery:** E-prescriptions and doorstep medicine delivery
- **EHR & cloud health systems:** Digital patient record storage and retrieval
- **Health insurance technology (InsurTech):** Digital claims processing and risk assessment

4. Impact of Digital Entrepreneurship on Healthcare System

Digital entrepreneurship influences healthcare systems in multiple ways, improving both clinical and operational outcomes.

4.1 Enhancing Healthcare Accessibility

Telemedicine and digital consultation platforms allow patients to connect with doctors regardless of location. This improves healthcare access in rural and underserved regions, where specialist availability is limited.

Key benefits

- Reduced travel time and cost
- Access to specialists in remote locations
- Faster consultations for minor and follow-up cases

4.2 Improving Affordability and Reducing Costs

Digital health services reduce costs for both patients and providers. Virtual consultations reduce infrastructure dependency, while digital tools optimize resource utilization.

Cost-Saving Areas Include

- Reduced hospital visits and repeated admissions

ISBN : 978-93-6163-366-9

- Lower administrative costs due to automation
- Efficient medicine procurement and delivery systems

4.3 Increasing Patient Engagement and Preventive Healthcare

Digital entrepreneurship has encouraged preventive healthcare by enabling self-monitoring, health awareness, and lifestyle management through apps and wearable devices.

Examples

- Apps reminding patients about medication schedules
- Fitness apps promoting exercise and diet management
- Health education through digital campaigns and alerts

4.4 Improving Quality of Diagnosis and Treatment

AI-based tools help doctors detect diseases early and improve clinical decision-making. Machine learning models can analyze medical images, lab reports, and patient history faster than traditional methods.

Major Contributions

- Faster diagnosis of diseases like cancer and diabetes
- Reduced diagnostic errors
- Predictive analytics for chronic disease management

4.5 Efficient Healthcare Data Management

Healthcare startups provide integrated systems for Electronic Health Records (EHR) and digital health data storage. This reduces paperwork and enables smoother coordination among hospitals, labs, and pharmacies.

Advantages

- Quick access to patient medical history
- Improved clinical accuracy and continuity of care
- Reduced duplication of tests

4.6 Strengthening Remote Patient Monitoring

Wearable devices and remote monitoring tools help track vital parameters such as blood pressure, heart rate, oxygen saturation, and glucose levels.

Impacts include

- Better chronic disease management
- Elderly care support
- Early detection of health deterioration

4.7 Supporting Public Health and Emergency Management

Digital entrepreneurship supports public health systems by enabling disease surveillance, vaccination scheduling, and health data reporting. During pandemics, digital platforms proved essential for communication and continuity of care.

ISBN : 978-93-6163-366-9

5. Table Analysis

Table 1: Key Digital Entrepreneurship Innovations and Their Healthcare Benefits

Digital Innovation	Description	Healthcare Impact
Telemedicine Platforms	Online doctor consultations	Increased access, reduced travel burden
mHealth Applications	Health tracking and reminders	Better preventive care and awareness
AI Diagnostics	Automated analysis of medical data	Faster diagnosis and improved accuracy
Wearables &IoMT	Devices monitoring health parameters	Continuous monitoring and early alerts
EHR Systems	Digital patient record storage	Efficient data management and reduced errors
Digital Pharmacy	Online medicine delivery services	Improved convenience and adherence
Health Analytics	Data-driven decision support	Predictive care and better planning

Table 2: Benefits of Digital Entrepreneurship for Stakeholders

Stakeholder	Key Benefits
Patients	Convenience, affordability, better engagement, remote access
Doctors	Faster diagnosis support, digital records, improved follow-ups
Hospitals	Reduced administrative load, optimized operations
Government/Public Health	Better monitoring, disease control, improved outreach
Entrepreneurs/Startups	Market expansion, innovation opportunities, scalable models

Table 3: Challenges and Mitigation Strategies

Challenges	Description	Suggested Solutions
Data Privacy Risks	Unauthorized access to health data	Strong encryption, compliance policies
Digital Divide	Lack of internet and digital literacy	Awareness programs, rural connectivity
Regulatory Barriers	Licensing and legal complexity	Clear digital health guidelines
Interoperability Issues	Lack of integration across systems	Standardized data formats (EHR standards)
Trust Issues	Patients prefer physical visits	Hybrid models, awareness campaigns

ISBN : 978-93-6163-366-9

6. Conceptual Model / Figure Framework

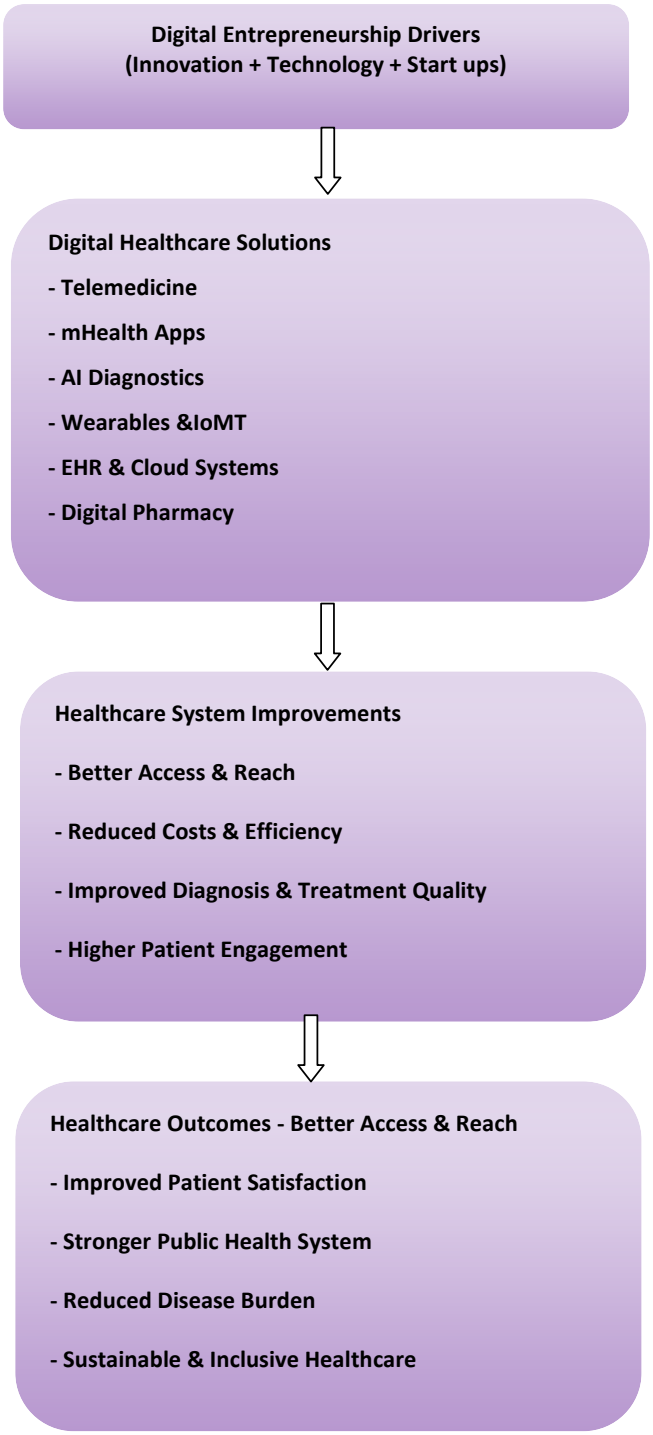

Figure 1: Conceptual Framework of Digital Entrepreneurship Impact on Healthcare System

7. Discussion

Digital entrepreneurship has emerged as a powerful tool for healthcare system transformation. It has enabled healthcare delivery beyond hospital boundaries, allowing patients

to receive care at home. This shift reduces system pressure and improves patient satisfaction. However, the adoption of digital health entrepreneurship requires overcoming significant challenges. Data privacy and cybersecurity remain top concerns as healthcare information is highly sensitive. Furthermore, digital inequality may exclude vulnerable groups from accessing digital health services. Regulatory frameworks must be updated to ensure safety, quality, and accountability of digital health solutions. The future of healthcare depends on collaboration between governments, healthcare institutions, entrepreneurs, and technology providers. Public-private partnerships and supportive innovation ecosystems can promote responsible digital health entrepreneurship.

8. Recommendations

To maximize the impact of digital entrepreneurship in healthcare, the following recommendations are proposed:

1. **Strengthen Digital Infrastructure:** Expand internet connectivity and digital health access in rural areas.
2. **Promote Digital Health Literacy:** Conduct training programs for patients and healthcare workers.
3. **Develop Strong Regulations:** Implement clear guidelines for telemedicine, AI usage, and digital data protection.
4. **Encourage Startup Support:** Provide funding, incubation programs, and mentorship for healthcare entrepreneurs.
5. **Ensure Data Security:** Adopt encryption, authentication systems, and cybersecurity frameworks.
6. **Enable Interoperability:** Promote standardization of health data systems for integration across platforms.
7. **Hybrid Healthcare Models:** Combine digital and physical healthcare for better trust and adoption.

9. Conclusion

Digital entrepreneurship has significantly improved healthcare systems by increasing accessibility, affordability, efficiency, and patient engagement. Innovations such as telemedicine, AI-based diagnostics, mHealth applications, and wearable devices have strengthened healthcare delivery and enabled preventive care. Despite challenges such as data privacy, regulatory barriers, and digital divide, digital entrepreneurship holds strong potential for creating inclusive and sustainable healthcare systems. With supportive policies, advanced digital infrastructure, and strong ethical frameworks, digital entrepreneurship can reshape the future of healthcare and improve health outcomes globally.

ISBN : 978-93-6163-366-9

HEALTH CARE INDUSTRY AND INNOVATIONS THROUGH SOCIAL ENTREPRENEURSHIP WITH CSR ACTIVITIES

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Introduction

In the 21st century, the role of businesses extends beyond profit maximization. Companies are increasingly expected to act as responsible corporate citizens, contributing to societal development while minimizing environmental harm. **Corporate Social Responsibility (CSR)** has emerged as a strategic framework through which organizations address social, economic, and environmental issues. CSR can be defined as a self-regulating business model whereby companies integrate social and environmental concerns into their operations and stakeholder interactions. Key dimensions of CSR include:

- **Economic Responsibility**: Ensuring profitability while contributing to societal growth.
- **Legal Responsibility**: Complying with laws and regulations.
- **Ethical Responsibility**: Acting fairly, justly, and with integrity.
- **Philanthropic Responsibility**: Voluntary initiatives that benefit communities, such as donations, education programs, or healthcare support.

CSR is no longer a philanthropic afterthought but a strategic necessity, influencing brand reputation, stakeholder trust, and long-term sustainability. Parallelly, the **United Nations Sustainable Development Goals (SDGs)**, adopted in 2015, provide a global blueprint to achieve a more sustainable and equitable world by 2030. The intersection of CSR and SDGs is critical, as corporate initiatives often align with and accelerate progress toward these global goals. This chapter explores the relationship between CSR practices and the achievement of SDGs, highlighting best practices, challenges, and future directions. The **17 SDGs** aim to address interconnected global challenges such as poverty, inequality, climate change, environmental degradation, and peace. The following goals are having direct connectivity to CSR activities of MNCs:

- **SDG 1**: No Poverty
- **SDG 4**: Quality Education
- **SDG 5**: Gender Equality
- **SDG 6**: Clean water and Sanitation
- **SDG 7**: Affordable and clean energy
- **SDG 8**: Decent work and economic growth
- **SDG 13**: Climate Action

For businesses, SDGs serve as a roadmap to align their CSR strategies with global development priorities. CSR directly contributes to SDGs in the following ways:

ISBN : 978-93-6163-366-9

1. **Poverty Alleviation (SDG 1)**: Companies engage in livelihood programs, microfinance initiatives, and rural development projects.
2. **Quality Education (SDG 4)**: CSR funds scholarships, school infrastructure, digital literacy, and vocational training.
3. **Gender Equality (SDG 5)**: Corporates promote diversity and inclusion, women entrepreneurship, and leadership opportunities.
4. **Clean Water and Sanitation (SDG 6)**: Investments in safe drinking water projects and sanitation facilities.
5. **Affordable and Clean Energy (SDG 7)**: Adoption of renewable energy sources in business operations.
6. **Decent Work and Economic Growth (SDG 8)**: Creating employment, supporting SMEs, and ensuring fair wages.
7. **Climate Action (SDG 13)**: Reducing carbon footprints, afforestation drives, and eco-friendly innovations.

CSR has evolved from voluntary charity to a strategic driver of sustainable development. Its synergy with SDGs demonstrates that businesses can be profitable while advancing global well-being. As the 2030 deadline approaches, the integration of CSR with SDGs is not optional but essential. Corporates must act as partners in building a sustainable, inclusive, and resilient world.

Health Care Industry

The Health Care Industry enables patients' centric health care services by diagnosing, treating, rehabilitating and preventing them from various health issues. The rise of technologies and its advancements made the health care industry with digitalisation and these digital technologies made all the services with operational efficiency, improvising access, empowering the patient and managing data with utmost care. Health care has traditionally relied on face-to-face interactions, paper-based records, and localized services. However, demographic changes, rising costs, and public health crises like the COVID-19 pandemic have underscored the need for more scalable, accessible, and data-driven health systems. Digital technologies are now central to modern healthcare models. This chapter presents an overview of digital tools in health care, surveys case studies from different countries, outlines the challenges of digitalization, and proposes policy recommendations. This chapter emphasis on this digital impact created by the technologies in the health care industry. This chapter attempts to brief out the popular case studies related to health care industry with global impact. To enable the data driven and customized services, the digitalisation has been made in the fields such as Electronic Health Records (EHR), Telemedicine, Artificial Intelligence (AI), Wearable devices, Mobile health apps, Cloud computing and Robotics and IoT (Internet of Things). The Challenges in making digitalisation of health care services are Data Privacy through handling sensitive patient data securely, High Initial Costs for Digital infrastructure along with training, struggle for Digital Divide based on Rural or urban areas with poor digital tools, Regulatory Issues in Compliance with health standards and government policies, etc. are also analysed in this chapter. To substantiate with its points, this chapter discusses global case studies with their impact in health care sector along with policy guidelines.

Digital Health Care

Digital health is a broader term compared to mobile health. While mobile health is presumed to be restricted to the usage of mobile devices for health care, the term "digital" broadens the

 ISBN : 978-93-6163-366-9

scope. There are various initiatives that merge mobile applications (apps), patient data platforms (specific secured websites), data analytics software, electronic health records for digitized record keeping, digital prescriptions, etc; with mobile devices. Hence, this convergence of patient portals, websites, data analytics, sensors, telehealth, and mobile devices is termed digital health. Digital health initiatives in the healthcare domain, have been adopted and practiced, since 1998, when the term e-health was coined. A review by Stephanie, Sharma (2019), of literature that examines the evolution of DHI being practiced, gives us an idea of the positive impact of digital initiatives. This research paper in 2019, gave a good idea in terms of the evolution of digital health and examined an epochal or stage model of developments in digital health that reflected major paradigm shifts. The paper mentioned a considerable agreement among researchers and practitioners that the long-term potential of DHI in healthcare (HC) continues to be immense. In another research paper published in an Indian journal which reviewed the role of DHI in the HC domain, it is documented that "digital health solutions have become the need of the hour to keep up with an increasing number of empowered patients participating in their own treatment decisions" (Dang, Arora, & Rane, 2020)

Global Perspectives

In 2018, the International medical devices regulatory framework (IMDRF) coined the "Software as a medical device" category. Prior to this, the terminologies used were medical software, stand-alone software, or health software. (Software as a medical device, 2018). This development shows the increasing relevance of digitization and the role of software that is intended purely for medical use. The magnitude of the DHI solutions industry is of significant proportions and hence an important topic of research as the segment is witnessing activities around research, investments in initiatives, and industry partnerships between pharmaceutical companies and technology providers. As per reports published in 2021, by a research firm, Allied Market Research, "the global digital therapeutics market was valued at US $2,881.24 million in 2019 and is projected to reach US $13,797.00 million by 2027, registering a CAGR of 20.5% from 2020 to 2027. The diabetes segment was the highest contributor to the market, with US $686.15 million in 2019, and is estimated to reach US $3,273.74 million by 2027, at a CAGR of 20.5% during the forecast period. The obesity segment is estimated to reach US $2,699.35 million by 2027, at a CAGR of 23.2%." As per this report, the DHI market, globally, is expected to Reach US $767.71 Bn by 2030 at 17. 9% CAGR (Allied Market Research, 2021)

Globalisation and Health

The impact of globalization health sector has been enough on the political, economic, cultural and technological fields but it has also severely impacted the context of health related policies and issues. Globalization has a great impact on the national health policies of the countries and the relationship between the private and public health management system. The impact of globalization on health has increased in the poorest countries in the world. This has led to the increasing investment by businessmen in the sphere of the health industry. In many cases health agenda, economic growth and investment come in competition. The globalization of the health industry and economy has different impacts on different countries which depend on their level of economic and infrastructural developments. Globalization has also introduced various global diseases. The emergence of global diseases indicated the weakening of the public health system throughout the world. Modern modes of transportation allow more people and

products to float worldwide at a faster speed through various means of transportation, therefore the transportation of disease from one corner to another corner of the world has become easy and accelerating. One of the important examples can be AIDS. The implications of globalization are also felt on the health policy that affects the world in several ways. On a global scale, health has become a commodity and a matter of profit and business. In the developing countries under the Structural Adjustment programmes, the health systems are fragmented and privatized. Global health policymakers have shifted their attention during the 1990s from being the United Nations players to managing financial institutions. The result of this power transition is an increase in privatization in the health sector. This privatization has fragmented the health policy by crowding it with many players. The emphasis on the partnership and specific interventions to combat specific problems has been increased. Influenced by global trade and the global economy, Health policy is directed by technological advances and innovative medical trade. The development aids, grants and assistance are extended to various countries for a long time. But despite such aids the negligence towards maintaining the effective health system in different countries has weakened the health protection mechanisms in the globalized world. Therefore, at the international level increasing evidences of health deterioration are taking place. Apart from the major health diseases such as AIDS and the global rate of malnutrition, poverty, immortality rates the recent researches have produced various serious mental diseases brought due to the spread of globalization. Hanefeld highlights that ―the WHO Commission for the Social Determinants of Health produces a report exploring how the daily conditions of life influence health and can be linked to health inequalities. Globalization was a key theme in the report (Hanefeld: 2017). Among the various issues and problems of deteriorating living conditions at the global level can be discussed in brief. Hanefeld says that "A central dimension of globalization shaping living conditions is migration. Estimates suggest there are 232 million migrants globally (Beattie M et al: 2012). Migration occurs for a range of reasons, including violence, conflict, and environmental degradation, but globalization is also a key factor (Beattie M et al: 2012). Travel and communication technologies increasingly allow people to move around the world to live in different places. This can be linked with improved work opportunities and access to health services, supporting good health‖ (Hanefeld: 2017, p. 19). Moreover, the accelerated account of migration due to globalization also exposes an individual to a great deal of exclusion and insecurities. Thus, global disease and deteriorating health conditions indicate the presence of a weakening public health system across the world. This raises not only the issues of why there has been such a significant failure in health and development in the past but also highlights the present-day public health structures and processes which are no longer sufficient to deal with major seminal trends concerning health and security.

Indian Initiatives for Digital Health

India is the second largest country from a population aspect, it was important to roll out immunization by vaccinating the entire target population. It is in this context that under the Digital India initiative, the Arogya Setu app was launched to get visibility about patient health. This app was accepted well by the citizens. It helped government healthcare centers to know about infected patients who self-reported themselves for Covid-19 infection and to provide health care at their residences. The acceptance and widespread use was positive indication as it was the first example of a DHI rollout at a massive countrywide scale. There are three levels of health care management in India as noted by Karalay: The First: Primary Health Centres (PHC) and

 ISBN : 978-93-6163-366-9

Sub-Centres (SC): The Basic or essential healthcare is provided at this level. Each PHC covers 30000 population and SC covers 5000 population. One Dai is provided in each village to assist in deliveries, initial mother and childcare. The Second: Secondary Level: District Hospitals (DH) and Community (rural) Health Centres (CHC) form the secondary level at which better medical facilities are available. These also serve as the first referral hospitals. DH and CHC cover a population of about 80000-120000. Chapter 1 16 The Third: Tertiary Level: Medical college hospitals and specialized hospitals come under this level. At this level, highly sophisticated diagnostic equipment as well as more experienced specialists are available (Karalay: 2016, p. 120). The first central scheme pertaining to health was adopted as National Health Policy (NHP) 1983 by the Parliament of India. The 1983 National Health policy had committed to provide health services to all the people by 2000. The central government efforts at influencing public health have focused on the five years plans on coordinated planning with the states and on sponsoring major health programmes. Government expenditures are jointly shared by the central and state governments. Goals and strategies are set through central-state government consultations of the Central Council of Health and Family Welfare (CCHFW), which provides both administrative and technical services and manages medical education. States provide public services and health education. However, the national health policy lacks specific measures to achieve broadly stated goals. Particular problems include the failure to integrate health services with wider economic and social development, the lack of nutrition support and sanitation, and poor participatory involvement at the local level. There continue to be numerous problems in the field of health and health services in India. Indian health services and the policy formation need to be looked at by considering the socio-political, ecological, economic and cultural settings of the context. Secondly, the epistemological aspect to understand health problems is also very important that impacts policy formulation. Thirdly, the prevailing institutions to enact and implement the policies are of the utmost significance. Fourthly, the historical and cultural perspective of the evolution of health institutions and services are also very important to analyze the health management system in India. Fifthly, the international obligations and current political economy of the world health management system also have a great impact on the functioning of the health system in India. Sixthly, the evolving sphere of the life-style and the impact of globalization on the habits of the people also become an important aspect to be considered while analyzing the Indian health system. Finally, since health management is also a prerogative of the state, therefore, urban-rural and states differ in the health management system. The urban-rural divide in health services largely depends on the status of infrastructure and transportation in the respective area. The availability of water, sanitation, sewerage and other forms of environmental management indeed impact the obvious difference in the rural and urban health management system. In this context, two major enactments can be summarized. First is the National Rural Health Mission (NRHM) Framework for Implementation 2005-2012 and Second, National Urban Health Mission (NUHM) Framework for Implementation October 2012 (Government of India, Ministry of Health and Family Welfare: 2012). The 2012 NRHM was launched by the Ministry to provide health services to the poor people of rural India. The major objectives of the mission were:

- Reduce child and maternal mortality.
- Universal access to public services for food and nutrition, sanitation, hygiene, and universal access to public health care services with an emphasis on services addressing women‘s and Children‘s health and universal immunization.

ISBN : 978-93-6163-366-9

- Prevention and control of communicable and non-communicable diseases, including locally endemic diseases.
- Access to integrated comprehensive primary health care.
- Population stability, gender, and demographic balance.

The strategy adopted by the Mission included; firstly, to train and enhance the capacity of Panchayati Raj Institution (PRIs) to own, control and manage public health services. Secondly, to promote access to improved healthcare at the household level through the female health activist (ASHA). Thirdly, to prepare a health plan for each village, Chapter 1 18 fourthly, strengthening sub-centres, and human resource and PHCs. Similarly, the October 2010 enactment of NUHM targeted to address the health concerns in the urban setting. The policy states that "the NUHM would have a high focus on Urban Poor population living in listed and unlisted slums; All other vulnerable population such as homeless, rag pickers, street children, a rickshaw puller, construction and brick, and lime kiln workers, sex workers, and other temporary migrants; Public health thrust on sanitation, clean drinking water, vector control, etc.; Strengthening public health capacity of urban local bodies (GOI, MHFW: 2017). The policy also provides flexibility to the states to choose their suitable models as per the capacity and need to address the health issues in the concerned states. These two enactments are very significant and directives to help the state to formulate policies as per the need and capacity. Following these various states have come up with different state-level policies. In this regard, Maharashtra formulated Rajiv Gandhi Jeevandayee Arogya Yojana (RGJAY) for the BPL (Below Poverty Line) and APL (Above Poverty Line) category of the poor. The scheme provides coverage for meeting all expenses relating to hospitalization of beneficiary up to Rs. 150000/- per family per year in any of the impanelled Hospital on a cashless basis through the health cards or valid Orange/Yellow ration cards (Karalay: 2016, p. 126). A very significant policy formulation took place in 2017 in the context of the health sector i.e. Ayushman Bharat- a flagship scheme of the Government of India. The objective of the scheme was to achieve the vision of Universal Health Coverage (UHC). This was designed to meet the SDG to leave none behind. The ministry of health's website highlights that "Ayushman Bharat is an attempt to move from sectoral and segmented approach of health service delivery to a comprehensive need-based health care service. Ayushman Bharat aims to undertake path-breaking interventions to holistically address health (covering prevention, promotion, and ambulatory care), at primary, secondary, and tertiary levels. Ayushman Bharat adopts a continuum of care 2 approach, comprising of two inter-related components, which are -Health and Wellness Centres (HWCs) Pradhan Mantri Jan Arogya Yojana (PM-JAY), Health and Wellness Centres (HWCs)" (Ayushman Bharat: 2020). In the continuation of this scheme, "in February 2018, the Government of India announced the creation of 1,50,000 Health and Wellness Centres (HWCs) by transforming existing sub-centres and Primary Health Centres. These Centres would deliver Comprehensive Primary Health Care (CPHC) bringing healthcare closer to the homes of people covering both maternal and child health services and non-communicable diseases, including free essential drugs and diagnostic services" (Ayushman Bharat: 2020). The focus of this scheme has been to address the need for primary health care or the entire population in the respective areas. It has attempted to expand the access and equity of the community and achieve a healthy life world.

Digital Health Care Technologies

Dependency on individual clinicians to lead telehealth is not a sustainable approach to the expansion of telehealth. Telehealth adoption requires a whole-system strategy. Embedding

 ISBN : 978-93-6163-366-9

telehealth into routine service delivery, by all healthcare providers, is the most effective way of ensuring telehealth can be readily used during emergencies. This requires operational telehealth networks, telehealth policies and procedures, and technology infrastructure that can be scaled-up during times of disaster. Telehealth is a disruptive process, so there is a need for effective change-management strategies to support clinicians with limited telehealth experience. Furthermore, simulated testing of telehealth applications for emergency situations is also a useful way of ensuring that workflow processes are clear and effective. Multiple resources are available to support disaster preparedness and response strategies. For example, the American Telemedicine Association Emergency and Response special interest group has developed a framework and infrastructure checklist that could be used at local, regional and national levels during disaster events. The NATO Multinational Telemedicine System resulted in the development of a system, supported by guidelines and technology solutions, which is able to interconnect various national telemedicine capabilities for use during disasters. In the absence of any formal telehealth strategy, it is important to make telehealth guidelines available to assist with co-ordination and delivery of telehealth services during an emergency event. This information needs to suit all stakeholders, including patients, clinicians, health service providers and funders. International health agencies such as the World Health Organization, national centres for disease control, and health departments have been disseminating real-time information about COVID-19 via their websites and social media outlets and have a very important role to play in advocating for the use of telehealth via these channels. These organisations can increase awareness of telehealth, provide specific recommendations on effective telehealth use, and validate the importance of telehealth's role in the healthcare sector.
The following are key technologies reshaping the delivery of health care services:

- **Electronic Health Records (EHR)**

EHR systems store patient history, diagnostics, treatments, and test results in digital form. They promote continuity of care, reduce duplication of tests, and facilitate data analytics.

- **Telemedicine**

Telemedicine refers to the remote delivery of medical services through telecommunications. It includes synchronous video consultations, store-and-forward methods (sending images/data for later review), remote monitoring, etc.

- **Artificial Intelligence (AI)**

AI (including machine learning, deep learning) is used for diagnostics, predictive modelling, image analysis, decision support, and optimizing resource allocation.

- **Wearable Devices**

Devices such as wristbands, smartwatches, biosensors collect continuous physiological data like heart rate, steps, sleep, blood oxygen. These can help with monitoring chronic disease, detecting deterioration, and encouraging healthy behaviour.

- **Mobile Health Apps**

Smartphone apps enable self-management, reminders, telehealth interfaces, symptom trackers, health education, medication adherence.

- **Cloud Computing**

Cloud platforms allow scalable storage, secure sharing of patient data among providers, remote access, and support of large-scale computational tasks (e.g. AI, big data analytics).

ISBN : 978-93-6163-366-9

- **Robotics and IoT (Internet of Things)**

IoT sensors enable remote monitoring (e.g. in patients' homes), robotics assist surgeries, rehabilitation, elder care, and automation of routine tasks.

Global Case Studies For CSR activities

Here are several case studies that illustrate how digital health interventions have worked in different settings.

Case 1 - Telemedicine in Rural and Remote India

"Healthcare Delivery through Telemedicine during the COVID-19 Pandemic: Case Study from a Tertiary Care Center in South India":

This study involved 456 patients at a tertiary care centre. Many patients across age groups reported satisfaction with telemedicine consultations in departments like Medicine and Obstetrics & Gynecology. The Coronavirus disease 2019 (COVID-19) pandemic has necessitated medical centers across the world to deliver healthcare through telemedicine. We discuss the adoption, delivery of telemedicine services at a tertiary care center and patient satisfaction involving 456 patients in south India. Most respondents had sought telemedicine care at the department of Medicine (16.23%). The maximum satisfaction was reported by patients in OBG (100%).

Telemedicine Practice and the eSanjeevani Platform

A recent study titled *"Transforming Healthcare Delivery: A Comprehensive Study on Telemedicine Practice in India"* highlights how platforms like eSanjeevani have enabled both real-time and store-and-forward consultations, improved diagnostic efficiency, reduced patient transfers, and supported timely clinical decisions in rural settings. Telemedicine, defined as the remote delivery of healthcare services through telecommunications, has emerged as a vital tool to bridge healthcare disparities, especially in rural areas. The study examines telemedicine's historical development, types, and applications across pediatric care, diabetes management, psychotherapy, and critical emergency scenarios. Special emphasis is placed on India's eSanjeevani platform, which enables real-time and store-and-forward consultations, enhancing access to specialist care. Findings highlight that telemedicine improves diagnostic efficiency, reduces patient transfers, and supports timely clinical decisions. Despite limitations such as connectivity challenges and lack of physical examination, telemedicine proves to be a cost-effective and scalable solution to strengthen healthcare infrastructure and outcomes in underserved regions

Challenges in Implementing Digital Health Services in Rural India

A mixed methods study in rural Himachal Pradesh analyzed obstacles such as connectivity, lack of trained staff, financial constraints, and regulatory ambiguity in bringing telemedicine to remote districts. The State of Himachal Pradesh is divided into districts, subdivisions, blocks and tehsils (local administrative divisions) of healthcare institutions. Kihar and Tissa of the district Chamba are two of the remotest blocks of the State. A field survey was conducted in 12 healthcare facilities in Kihar and Tissa, where telemedicine had already been set up. A 20-item survey checklist was developed to gather information from the respective Block medical officers of Kihar and Tissa regarding the infrastructure, telemedicine equipment, manpower of the

ISBN : 978-93-6163-366-9

healthcare facilities that were equipped with telemedicine, and the demography of the area these facilities were catering to. In order to explore the challenges faced by the healthcare providers and patients, we conducted a telephonic survey of healthcare providers and patients using open-ended questionnaires with five questions to explore the challenges they faced. Surveys were conducted at the convenience of the participants after explaining the purpose of the survey, and verbal consent was taken. Each telephone call lasted for 10-15 minutes. Validation of participant's responses was ensured by reading back the summary at the end of the survey. The participants from the 12 participating healthcare facilities included in the survey were enrolled using simple random sampling. The simple random number generator available in SPSS v23.0 was employed for randomisation. The survey data were analysed, and non-thematic, direct inferences were drawn. Most of the data gathered in this study pertained to telemedicine infrastructure, equipment and logistics available at the participating facilities. Furthermore, all the data gathered from the healthcare provider and patient telephone surveys were de-identified and anonymised before further analysis. Hence, no ethical clearance was sought for this study.

Results

The field survey of facilities revealed that the majority of the health facilities are equipped with one or other type of telemedicine setup like eSanjeevani and Piramal Swasthya (under NHM). telemedicine was less commonly used than the conventional in person doctor patient consultation. Lack of awareness among rural population and reluctance of the staff are the major hindrances to standard delivery of telemedicine services in rural and remote areas.

- Strong IEC and media publicity regarding availability of services may be conducted through local health Administrative authorities, to increase the awareness, penetration and the acceptance of telemedicine services at local level. A citizen centric communication approach is required for better adoption at as an informed choice. Merely imposing the programme thorugh a top-down approach is a less effective strategy. Involvement of Panchayati Raj Institutions (PRI) - a form of governance at village level, local bodies, and NGOs is highly recommended to take things forward. The PRIs may be involved for community engagement. The local provider staff must be encouraged to see telemedicine medicine as complementary to the care there are providing.

Case 2 - Wearable Devices Among Elderly in Japan

Qualitative Study on Wearables for Elderly at Home

A study involving Japanese elders, their caretakers, and healthcare providers explored perceptions toward wearable sensors for home monitoring. Themes included benefits (safety, monitoring), but also barriers like cost, complexity, and privacy concerns. The elderly were very favorable to being monitored by technology, as they perceived most appealing the ability to prevent a health condition from worsening.

Current use of technology for remote assessment

Especially during COVID-19, healthcare providers discussed how they were able to view their patients remotely. Thus, the use of Zoom or web videophone became a common practice. Furthermore, as visitation of family members with their elderly family members was likewise severely disrupted, the use of these technologies enabled family members to keep "an eye" on their elder family from afar. For a physical therapist, the use of remote technology was extremely

helpful, as he stated "… I think it's very useful as a tool to expand the world for people who are physically unable to go out … and could be used to reduce the burden of transportation". However, the nurses were quick to reinforce that Zoom and other communication technologies should not be made too convenient as not everything can be done through the use of technology.

Thoughts about Wearing the Oura Ring

For the elderly, concern about frequent episodes of acute illness was worrisome, and having an opportunity to have it captured in a continuous manner and seen by a healthcare provider was very appealing. One elderly man discussed he was not a fan of the smartwatch because instead of helping him track his sleep, he experienced challenges in falling asleep and difficulties in operating the watch. When the use of wearable technology, such as the Oura ring, was discussed as a way to monitor health status more easily and in a continuous fashion, the elderly and their providers were interested and asked many questions. When asked how they might feel about using this kind of wearable technology for their healthcare, the majority of elders verbalized a desire to utilize this device. The majority of the elderly expressed an interest in wearing it, particularly if they were not feeling well, as well as placing it on the frail elders for whom they were providing care. However, the elderly were also curious about whether there would be any side effects to consider when wearing it, and if so, the need for further research and development would be of importance. In addition, a number of elderly people were curious about how to wear the ring and how to care for it. For example, they questioned whether the ring could be worn when one washes one's hands or takes a shower. Others were curious about how the Oura ring was connected and how it functioned. As one elder stated, "I would like to use it …, but I don't know how the ring-shaped device would work, or if it would be like a watch where you could press a button and the data would be sent to your computer or smartphone".

Concern about Cost

A repeated question that was raised by both the elderly and their care providers related to cost. As one elder recounted, "I am still concerned about how much it will cost. … if the situation is within my reach, it seems very convenient, and I would like to use it, but if it is very expensive, I can't afford it" (Elder A). Another elder mentioned that if the ring was too costly, it would be difficult for them to purchase. The CM also expressed concern about the cost as well to maintaining the ring, as she asked, "What other equipment and facilities might be needed, and what would the associated costs be?" Further, she questioned, "Is there a monthly fee to pay to join a certain organization? That would be another factor in whether or not it would be feasible to introduce this system" (CM).

Perceived Advantages of Wearing Technology

The elderly and healthcare providers alike perceived many advantages of wearing technology that had the ability to detect early adverse health conditions and allowed them to remain safely at home. Usefulness of wearing devices that provide continuous monitoring to detect/prevent acute events. Several elderly recounted health events that occurred and for which the Oura ring would have been helpful. One elderly man reported his irregular heartbeat, which had been undetected by multiple attempts by wearing a Holter monitor. During a checkup, it was finally discovered. Wearing a continuous monitor like an Oura ring may have been helpful. Another important function of continuous monitoring that was raised by another elder was the ability to

ISBN : 978-93-6163-366-9

make informed decisions about when they needed to visit the doctor. It was perceived that having such information would allow the elderly to calm down and make a decision about the need to visit the doctor. Healthcare providers also recognized the helpfulness of continuous rather than episodic monitoring.

Use of Technology to Monitor Change in Health Over Time

A number of healthcare providers agreed that using technology, such as measuring weight and EKG, could be very important information for the management of patients who have chronic diseases, particularly as it relates to appreciating change over time. Such information would enable making informed decisions to prevent adverse events. Moreover, as the number of elderly people living alone is increasing, nurses feel that digital technology would allow the elderly to live alone with peace of mind. As the nurses stated, the management of heart failure and arrhythmias were prime examples. One physician provided more specific examples of how data from digital devices can track changes in weight and EKG, all of which can prevent hospitalization. In addition to warding off acute events, healthcare providers articulated a number of other benefits of using digital technology. These included reminding elders to eat or take medication, calling the pharmacy, and improving communication between providers and patients.

Improved Quality of Care

A physician discussed improved quality of care as an important outcome of using digital technology. For example, monitoring sleep activity may lead to the alteration of sleep-impacting medications. Further, using data can help explain changes to patients and their families. The physical therapist also appreciated that monitoring activity and vital signs were also important indicators of health.

Perceived Disadvantages of Wearing Technology

The elderly participants and their caregivers likewise raised issues about having limited skills to use the technology, concern about feeling they are being watched, other privacy issues, and a greater likelihood of loneliness and loss of personal connection with the patient. Several healthcare providers raised the concern that the use of technology, such as videocams, could be intrusive to the privacy of the elderly. During the COVID-19 lockdown, seeing the patient taking their medication, eating well, or seeing their faces was good for support staff to know the patient was doing well. However, for some family members, observing and monitoring their family members on videocams resulted in less visiting as they were relieved by the camera images. A CM recalled patients informing her that their families were listening to them, and the CM hoped that the system would be used in a good way. Particularly for patients with dementia, as new devices can cause agitation by the patient, introducing objects that are more familiar in the home would be best. Elderly and healthcare providers alike raised red flags about the extensive use of technology which could possibly lead to loneliness of elders, as elders already experience providers who only focus on their computer screens.

Discussion

Monitoring health indicators with wearable devices has the potential to help improve the health level and quality of care for the elderly living at home. However, its adoption is related to the social context, such as personal preferences, perspectives, abilities and skills, and the

healthcare systems. In this study, we conducted focus group interviews in Japan with elderly people living at home and healthcare professionals who care for them, focusing on the health concerns they face, the current status of health monitoring for the elderly, and the perceived advantages and disadvantages of wearing wearable devices. The findings revealed four major themes:

1) Characteristics of the Elderly Most Vulnerable and Challenges in Being Monitored Accurately;
2) Current Use of Monitoring Technology and Curiosity about the Use of the Latest Digital Technology to Keep the Elderly Healthy at Home;
3) Perceived Advantages of Wearing Technology;
4) Perceived Disadvantages of Wearing Technology.

As it relates to who might be the most vulnerable, our healthcare participants felt that some of the greatest health concerns facing the elderly in Japan included the loss of social connections and having no motivation or purpose in life. For those most vulnerable, the need to prevent and monitor physical and cognitive decline at home was critical. In addition, the elderly commonly experiences high rates of chronic diseases. In particular, the high prevalence of hypertension and diabetes requires that elderly people maintain and manage their health appropriately at home. Additionally, as one of the causes of the decline of physical and cognitive functions is the worsening of chronic diseases (Taylor et al., 2020), identifying early signs of decline would be beneficial.

As many elderly people live alone in Japan, when they become confined to their homes, it is difficult for healthcare professionals and family members to monitor any sudden changes in physical or cognitive function. Our interviews revealed that healthcare workers were using videocams and other forms of digital communication technology to remotely assess the situation of older adults living at home during the COVID-19 pandemic. Interestingly, we learned that while the elderly were interested in monitoring and maintaining their health or that of their loved ones and sometimes used various methods, these devices only monitored health episodically and, therefore, were not able to pick up critical events that may have been missed. Not surprisingly, we found that both the elderly and their healthcare providers were curious about using technology that was especially simple to use. They believed that the introduction of technologies for monitoring biological indicators could help prevent serious illnesses and identify the need for urgent medical attention. When introduced to the Oura ring, the elderly perceived it as easy to use, which becomes critically important, particularly for the elderly with cognitive decline and those living alone who may well face difficulties in managing any device. However, despite these advantages, we found that there were challenges to overcome as well. For example, they frequently questioned the cost and the possibility of technical challenges in interpreting the device. Moreover, they questioned how the ring functioned and how one would care for it. Thus, the key to the future diffusion of wearable devices is the development of devices and systems that are less burdensome to wear, easy to operate, cost-efficient, and easy to operate and manage. Additional concerns the healthcare providers raised with using any monitoring device related to invasion of privacy, technological breakdown, and feelings of isolation. While some elderlies were not concerned about privacy issues, others complained to their healthcare providers that their families were "listening" to them via webcams. Furthermore, this resulted in infrequent visits to the elderly in their homes. This was balanced with those who believed that an accurate understanding of the health status of the elderly will lead to earlier health professional

ISBN : 978-93-6163-366-9

intervention, prevention of serious illnesses and the reduction of unnecessary medical treatment and care. Thus, in order to implement the system in practice, it is necessary to continue to discuss and resolve privacy considerations and strengthen the technical support that can be provided. This also includes consideration of having the insurance company cover home monitoring, which may be a helpful strategy to strengthen home monitoring efforts, particularly in light of the current economic situation of the elderly and the increased workload of medical institutions.

While no literature was found that investigated the perception of elderly Japanese in being monitored with wearable devices, several papers were found that provided these perspectives in other countries, reporting that older adults are positive about wearable device monitoring (Kim and Patel, 2018). For example, in a study examining the perceptions of patients living with Huntington's disease and their families and caregivers regarding the adoption of wearable activity meters to monitor and manage lifestyle and sleep, the investigators found significant positive opinions, with patients more positive than family members and caregivers (Morgan-Jones et al., 2022). The theoretical insights that emerged from the data involve a social process of health-seeking. The participants revealed a great desire to keep themselves and their loved ones healthy at home for as long as possible, using easy-to-use devices that were not technologically challenging. However, as mirrored by the symbol of the scale, there were both pros and cons to using wearable technology, as framed from the perspectives of both the elderly and their healthcare providers. At the base of the scale are the characteristics of the elderly, most vulnerable and in need of monitoring, such as those experiencing chronic diseases, physical and cognitive decline, lacking social connection and lacking motivation or purpose in life. Above the scale are possible wearable devices. On the negative side of the scale included difficulties using the device, invasion of privacy, loneliness and technical breakdown, while positive aspects included continuous monitoring, quick assessment of change, and improved healthcare access. It is clear that ongoing perspectives of the elderly are in need of assessment as Japan's wearable technology takes hold. Among over 12,000 older Japanese adults, only about 4.4% used wearable activity trackers. Use was associated with higher ICT access, existing health conditions, and exercise habits. However, wearing a device did not necessarily translate to higher satisfaction in health management.

Case 3 - AI in Radiology (USA)

Tracking Results and Utilization of AI in Radiology During COVID-19:

One paper analyzed usage of a commercial AI solution for identifying intracranial hemorrhage (ICH) in head CTs in a US health system. Though overall scan volumes dropped during the pandemic, the AI tool helped detect more ICH cases than expected and helped with prioritization of emergent cases. Recent work has pointed towards the potential usefulness of automated imaging software utilization data tracking for analyzing COVID-19 pandemic effects in a different disease condition, namely ischemic stroke, where a drop in software utilization has been observed during the pandemic outbreak, and a potential risk in care for patients with ischemic stroke has been hypothesized. In contrast to that approach, we propose a combination of both the analysis of software utilization and automated tracking of AI based image analysis results for a condition presumably related to COVID-19, namely ICH. Our quantitative analysis based on data from a major US healthcare system revealed that the COVID-19 pandemic outbreak, on one hand, resulted in a statistically significant reduction of emergency-setting non-contrast head CT studies for excluding ICH. On the other hand, this trend was counterbalanced

by a higher ICH-AI+ ratio observed during the outbreak. Our results are clinically significant as they suggest that the COVID-19 outbreak increased the number of actually observed ICH cases in emergency-setting non-contrast head CT studies above the statistically expected number of ICH cases. Note that it would not have been possible to make this observation by tracking software utilization data only, nor by tracking of total numbers of detected ICH+ cases, but only by tracking both large-scale utilization and AI results data based on the proposed tru-AI approach. There are several possible explanations for our findings. Our results may reflect an actual increase of ICH prevalence in the observed cohort. Alternatively, we may have observed pandemic-related changes in clinical care patterns. For example, ordering providers may have changed their CT requisition approach by streamlining patient management based on a more conservative head CT indication towards only those patients with higher presumed clinical probability of ICH. Finally, we may have observed effects of an elevated ICH prevalence based on an increased usage of anticoagulation therapy, potentially motivated by first publications on the effect of COVID-19 on thromboembolic events, such as deep venous thrombosis and pulmonary embolism in COVID-19 patients. Such early publications appeared during our COVID-19 outbreak observation period and may have influenced therapeutic patient management in COVID-19 patients, e.g. [3, 11, 12]. All these possible explanations would be highly relevant with important implications for Pre-publication version of Axel Wismüller and Larry Stockmaster, Tracking Results and Utilization of Artificial Intelligence (tru-AI) in Radiology: Early-Stage COVID-19 Pandemic Observations. Page 7 of 9 improving clinical patient management related to the COVID-19 pandemic outbreak. Hence, additional research opportunities encompass a thorough detailed manual retrospective clinical review of all observed cases, including non-imaging information retrieved from electronic medical health records; Also, large future multi-site tru-AI studies will provide opportunities for analyzing geographic variability of pandemic induced medical conditions, such as ICH.

Case 4 - Patient Satisfaction and Acceptability with Telehealth at Specialist Medical Outpatient Clinics during the Covid-19 Pandemic in Australia

Outpatient clinics were shifted rapidly to telehealth in Australia during the Coronavirus disease 19 (COVID-19) pandemic, drastically altering patient care and experience. This case aims to investigate patient satisfaction and acceptability of telehealth consultations during the COVID-19 pandemic. The methodology used in this study is Prospective observation study conducted in two hospital rheumatology outpatient departments (OPD) undertaking telehealth consultations during COVID-19. A modified version of a validated telehealth evaluation survey was posted to all patients attending the telehealth OPD rheumatology clinics, including balanced 5-point Likert scales and free-text responses. Cluster analysis was applied to the Likert-scale questions, alongside thematic analysis of free-text responses.

Results and Discussions

There were 128 respondents (29% response rate), of which 69.5% were women and the majority (87.5%) was aged 50 years or older. All telehealth consultations were conducted by telephone. Nearly one-fifth of patients indicated consistent dissatisfaction with telehealth across the range of questions. These patients were older, reported lower educational qualifications and lower health literacy scores and lacked access to the Internet. While many patients found this mode of consultation to be convenient, patients expressed concerns regarding absence of physical

 ISBN : 978-93-6163-366-9

examination. A recurrent theme was a desire for a mixed-model clinic in the future, with flexibility of having both telehealth and face-to-face consultations. This study offers unique insights into patients' experiences with telehealth, which until the current global pandemic, has been an uncommon mode of consultation delivery in urban areas. This study suggests when defining the place of telehealth in future healthcare delivery, patient perspective and careful patient selection will be key. Disease progression, language and cognitive ability, health literacy, technology access and patient and clinician preference are important considerations when deciding how effectively to embed and integrate telehealth into consultations.

Challenges in Digital Health Implementation

Despite the transformative potential of digital technologies in health care, their implementation faces several significant challenges. Data privacy and security remain critical concerns as sensitive patient information must be protected through robust encryption, secure data transmission, well-defined consent frameworks, and strong safeguards against cyberattacks. Additionally, the high initial costs associated with establishing digital infrastructure—ranging from purchasing hardware and software to training health care professionals and maintaining these systems—often pose financial barriers, particularly for low-resource settings. The digital divide further exacerbates inequality in health care access, as rural communities and economically disadvantaged groups frequently lack reliable internet connectivity, digital literacy, and access to modern devices, leaving them underserved. Moreover, regulatory and legal compliance adds another layer of complexity, with health care providers having to navigate diverse standards for medical device approvals, telehealth licensing, and data protection laws across different jurisdictions, alongside the risk of legal liabilities in case of misuse or malpractice. User acceptance and literacy challenges also emerge, especially among older adults and health care workers who may find it difficult to adapt to new technologies without adequate training and user-friendly designs. Finally, interoperability issues arise because health systems often employ different data formats and platforms, making it difficult to integrate information seamlessly across hospitals, clinics, and regions, thereby hindering the full realization of digital health's benefits.

Conclusion

Digital technologies are reshaping health care globally by enabling more accessible, efficient, and personalized care. The case studies from India, Japan, the United States and Australia show both the promises and complexities of implementing innovations such as telemedicine, wearable devices, and AI. For successful and equitable digital transformation, challenges around privacy, cost, regulation, digital literacy, and infrastructure must be addressed. Future directions should focus on inclusive design, scalable and interoperable systems, and policies that balance innovation with safety and equity. If these are achieved, digitalization in health care can truly be patient-centric and globally transformative.

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ISBN : 978-93-6163-366-9

AWARENESS OF DIGITAL ENTREPRENEURSHIP IN TAMIL NADU

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Abstract

Digital entrepreneurship has become one of the most important forces of innovation and economic development, and more specifically in the emerging economies like India. This paper will investigate the awareness of digital entrepreneurship among Tamil Nadu entrepreneurs and establish the factors that will impact the awareness. A structured questionnaire was used to gather primary information on 300 entrepreneurs in four large districts, namely, Chennai, Coimbatore, Tiruchirappalli, and Salem. The socio-economic characteristics of the respondents were analysed with the help of descriptive statistics and the correlation and multiple regression analyses were conducted to investigate interrelations between the awareness and independent variables (digital literacy, digital marketing awareness, adopting digital financial services, educational qualification, and location of the district). The findings indicate that the digital literacy, digital marketing awareness, and the use of digital financial services have a significant impact on the awareness of digital entrepreneurship, and the educational qualification and the location of the district also contribute to it in a supportive manner. The paper notes that the key drivers of digital entrepreneurship awareness are skills and technology. The findings can be useful insights to the policymakers and educational establishments to develop specific training programs, improve digital infrastructure, and facilitate inclusive entrepreneurial development in Tamil Nadu.

Keywords: *Digital Entrepreneurship, Awareness, Digital Literacy, Digital Marketing, Tamil Nadu, MSMEs.*

1. Introduction

The advent of digital entrepreneurship has become a revolution in the modern economies due to the fast-growing information and communication technologies (ICT), the spread of the internet, and the spread of digital platforms. Digital entrepreneurship is a type of entrepreneurship that makes significant use of digital technologies in the opportunity recognition, business formation, business operation, and the provision of value (Nambisan, 2017). Digital entrepreneurship has become a strategic concern in emerging economies such as India, with the national initiatives of Digital India, Startup India, and Make in India serving the purpose of encouraging growth through innovation, the creation of jobs and inclusive development.

Tamil Nadu is one of the states in India that is most industrialized and educated giving a good environment to digital entrepreneurship. Big urban and industrial cities like Chennai, Coimbatore, Tiruchirappalli, Madurai and Salem have different levels of digital facilitation based on the availability of infrastructure, concentration of industries and education institutions. As a metropolitan city and an IT center, Chennai tends to exhibit a comparatively greater exposure to digital spaces, start-ups, and innovation systems. The city of Coimbatore with its manufacturing base based on MSMEs demonstrates an increasing use of digital tools in managing manufacturing and marketing their products online. Conversely, districts like Tiruchirappalli and Salem are at the borderline areas where old businesses interact with the new digital ones, whereas

rural and semi-urban districts are still restricted in access and awareness to digital space.

Regardless of active state-level policies, startup incubators, and institutional support systems, the knowledge of digital entrepreneurship, is not spread equally across districts, sectors and socio-economic groups. Awareness is important in determining entrepreneurial intention, adoption of technology, innovation capability, and sustainability of a business in the long run. The lack of knowledge of digital platforms, online marketing schemes and online e-commerce processes, and online financial services tends to inhibit the involvement of entrepreneurship, especially to micro, small and medium enterprises (MSMEs), rural entrepreneurs, and first- generation entrepreneurs.

Thus, the measurement of the awareness of digital entrepreneurship in the chosen districts in Tamil Nadu is critical in determining the regional differences, barriers to adoption, and designing specific policy, training, and educational interventions that could contribute to the inclusive digital entrepreneurship development.

2. Review of Literature

2.1 Online Entrepreneurship and Economic Growth.

The literature available has highlighted the critical importance of digital entrepreneurship towards the promotion of innovation, productivity, and job creation. Autio et al. (2018) state that the digital entrepreneurship promotes the growth of economy as it allows experimenting quickly and scaling business models. According to Nambisan (2017), the use of digital technologies greatly diminishes the barriers to entry, and thus, now entrepreneurs can enter into the global market with comparatively less capital outlay. Within the Indian and Tamil Nadu context, digital entrepreneurship is also seen as an apparatus of mitigating the disparities in the regions through linking entrepreneurs in the non-metropolitan districts to the wider digital marketplaces.

2.2 Digital Technologies Awareness and Adoption in Tamil Nadu.

The empirical research done in Tamil Nadu shows that there is a close relationship between digital awareness and entrepreneurial performance. Ramesh and Divya (2021) discovered that micro and small business owners who were more aware of the digital tools had better operational efficiency, customer interaction, and financial record management. According to the findings of the district level studies, the awareness in the industrially advanced districts like Coimbatore and Chennai is relatively higher whereas Tiruchirappalli, Salem, and Madurai are moderately aware due to their exposure to training and lack of digital knowledge.

2.3 Awareness of the Digital Marketing amongst SMEs.

The study of SMEs in Coimbatore and Salem districts shows that among the old-fashioned manufacturing and trading companies, the level of awareness about digital marketing tools, including social media advertising, search engine optimization (SEO), and e-commerce platforms, is relatively low (Kumar and Lakshmi, 2020; Nisha, 2020). Entrepreneurs with sufficient awareness and digital competence state that they have seen better brand recognition, customer access, and competitive edge, and the strategic relevance of digital marketing literacy to SME sustainability in Tamil Nadu.

2.4 Digital Financial Services Role.

One of the main pillars of digital entrepreneurship awareness is digital financial services. Research points to the fact that the presence and uptake of digital payment systems (including UPI, mobile wallets, and online banking) increase the levels of transaction efficiency,

ISBN : 978-93-6163-366-9

transparency, and customer confidence (Sivakumar and Balaji, 2022; Charles Antoine, 2024). The evidence at the district level in Tamil Nadu shows that there is a greater adoption of digital evidence in urban areas such as Chennai, and that micro-entrepreneurs in the semi-urban and rural areas are experiencing difficulties associated with the issue of digital security concerns, infrastructural constraints, as well as the absence of formal training.

2.5 Digital literacy and Educational Institutions.

The educational organizations are also very important in creating digital entrepreneurship awareness. The research among university and college students in the state of Tamil Nadu is characterized by comparatively high rates of digital literacy, especially in those districts that have large educational hubs, including Tiruchirappalli and Chennai (Anand and Priya, 2019; Subaveerapandiyan and Sinha, 2022). Nevertheless, the literature reports that there is still a persistent divide between digital skills acquisition and actual application in entrepreneurial skills, and digital entrepreneurship training and incubation support should be curricular.

2.6 Problems in Rural and Marginalized Backgrounds.

The literature discussing rural and marginalized entrepreneurs in Tamil Nadu highlights all forms of challenges such as poor internet connectivity and poor awareness of government digital initiatives as well as poor access to training programs (Murugan and Selvi, 2021; Lakshmi and Venkateshwara, 2025). Women and rural-based businesses, especially those located in the interior districts have lower levels of digital entrepreneurship awareness, which leads to disproportionate engagement on digital markets and digital innovation systems.

2.7 Research Gap

Although the current literature has addressed the use of digital technologies, adoption of digital marketing and digital payment systems separately, there has not yet been extensive research specifically on the awareness of digital entrepreneurship in various districts of Tamil Nadu. Moreover, not many studies combine demographic, educational, and regional aspects to discuss the role of awareness s/he has on entrepreneurship intention, adoption behavior, and business development. The given gaps have prompted the current research to conduct a systematic evaluation of the district-wise awareness rates of digital entrepreneurship in Tamil Nadu and establish the main factors affecting the digital entrepreneurship engagement and its sustainability.

2.8 Research Objectives

1. To study the socio-economic profile of the respondents
2. To measure the relationship between Digital Infrastructure Awareness, Digital Literacy and Skills, Digital Marketing Awareness, Government Policy Awareness, Training & Educational Exposure and Awareness of Digital Entrepreneurship.
3. To investigate the impact the Digital Infrastructure Awareness, Digital Literacy and Skills, Digital Marketing Awareness, Government Policy Awareness, Training & Educational Exposure and Awareness of Digital Entrepreneurship.

3. Research Methodology

The current research takes a descriptive and analytical research design to investigate the level of awareness of digital entrepreneurship among the existing and prospective entrepreneurs in the

identified districts of Tamil Nadu. The given design is proper because it helps to carry out the systematic evaluation of awareness rates and provide the significant comparison between the districts and the categories of respondents. The study population will include micro, small and medium enterprise (MSME) owners, early-stage entrepreneurs, startup founders and aspiring entrepreneurs including final-year students with entrepreneurial interest. These organizations were chosen because they are the major stakeholders in online entrepreneurial ecosystem of Tamil Nadu. The use of multistage stratified random sampling technique was an adequate method of representation of the wide range of regions and respondent categories. The districts were chosen in the initial phase basing on the level of industrial development, digital infrastructure and entrepreneurial activity. Therefore, Chennai, Coimbatore, Tiruchirappalli and Salem were selected to represent metropolitan, industrial, educational and semi-urban entrepreneurial conditions respectively. The second phase involved the stratification of respondents in terms of the kind of the entrepreneur and place of residence (urban, semi-urban and rural). Simple random sampling was adopted in selecting the respondents of each stratum in the final stage in order to reduce selection bias.

The study sample was considered based on the existing standards of conducting social science research, the necessity to support statistical analysis, and the convenience of feasibility. The sample size of 400 respondents was deemed as adequate to provide statistical strength and enable making the comparison on the district level. Out of the total sample, 120 respondents were selected in Chennai, which is more exposed to digital and startup ecosystem, 100 respondents in Coimbatore, which has a robust MSME and manufacturing hub, and 90 respondents in Tiruchirappalli and Salem, with the features of emerging and semi-urban entrepreneurial areas. The study was conducted by use of a structured questionnaire aimed at collecting primary data needed to measure the levels of awareness on digital entrepreneurship and the factors that influence its levels. Both online and offline methods were used to conduct the questionnaire to be able to cover a larger number of respondents and include those with a low level of digital access and literacy. Appropriate statistical techniques were used in the collection of data that were analysed. To investigate the socio-economic features of the respondents and analyse their levels of awareness of digital entrepreneurship, descriptive statistics, such as percentage analysis, mean, and standard deviation, were used. The inferential statistical methods like a correlation analysis and multiple regression analysis were further used to test the correlation between the independent variables and awareness of digital entrepreneurship.

4. Data Analysis and Interpretation

4.1 Frequency Distribution

Table :1 Socio-Economic Profile of the Respondents (Frequency Analysis)

Variables	Category	Frequency (n)	Percentage (%)
Gender	Male	168	56
	Female	132	44
Age (Years)	Below 20	24	8
	21–30	102	34
	31–40	96	32
	Above 40	78	26

ISBN : 978-93-6163-366-9

Educational Qualification	Higher Secondary	72	24
	Diploma	54	18
	Undergraduate	108	36
	Postgraduate & Above	66	22
Monthly Income (₹)	Below 20,000	96	32
	20,001–40,000	114	38
	Above 40,000	90	30
Nature of Enterprise	Micro	144	48
	Small	96	32
	Medium	60	20
District	Chennai	78	28.6
	Coimbatore	72	26.4
	Tiruchirappalli	66	24.2
	Salem	48	20.8

Source: Primary Data

Interpretation of Socio-Economic Profile.

The socio-economic profile of respondents shows that it has a representative sample of gender, age, education, income, type of enterprise, and district. There is gender distribution where 56% of the respondents are male and 44 percent are female showing a moderate level of participation of the female in the entrepreneurial activities. The age-wise distribution shows that most of the respondents are between 21-30 (34) and 31-40 (32) years of age thus depicting that young and middle-aged people are the ones who participate in entrepreneurship. These are only a small percentage (8) of less than 20 years, with 26% of over 40 years. Regarding educational level, 36% of the respondents are undergraduates and the others are 24% higher secondary level, 22% post graduates, 18% with diploma education. This implies that formal education has a great role in creating awareness and participation in digital entrepreneurship.

The data on monthly income indicates that the majority of respondents have incomes between 20,001-40,000 (38%), 32% of the respondents have less than 20,000, and 30% of the respondents have more than 40,000. It means that digital entrepreneurship is still carried out by various income groups, but middle-income groups are concentrated. In terms of nature of enterprise, the majority of 48% run micro-enterprises, 32% run small enterprises, and 20% run medium enterprises which is an indication of the prevalence of small and micro businesses in the Tamil Nadu entrepreneurial ecosystem. Distribution by district reveals that 28.6% of the respondents belong to Chennai with Coimbatore (26.4%), Tiruchirappalli (24.2%), and Salem (20.8) coming next. This shows that there is more concentration of digital entrepreneurs in urban districts with more industrial and education infrastructure. In general, the review implies that young and educated people working as micro and small business owners in urban areas form the main cluster of digital entrepreneurs in Tamil Nadu. These attributes can be used to explain the level of awareness and the determinants of digital entrepreneurship in the state.

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4.2 Correlation Analysis

Table: 2 Correlation Analysis

Particulars	DEA	DL	DM	DFS	IA	TP
Digital Entrepreneurship Awareness (DEA)	1					
Digital Literacy (DL)	0.684**	1				
Digital Marketing Awareness (DM)	0.721**	0.659**	1			
Digital Financial Services Adoption (DFS)	0.657**	0.612**	0.634**	1		
Internet Accessibility (IA)	0.593**	0.548**	0.576**	0.561**	1	
Training Program Participation (TP)	0.548**	0.526**	0.542**	0.518**	0.487**	1

Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

Source: Primary data

The analysis of the correlation shows that awareness of digital entrepreneurship is largely linked with a number of important factors. The existence of strong positive relationships is found between the digital entrepreneurship awareness and the digital literacy, digital marketing awareness, and the adoption of the digital financial services, which demonstrates the significance of skills and technology use in increasing the awareness. Moderate positive correlations also exist between the Internet access and involvement in training programs and both highlight the importance of infrastructure and institutional support. Overall, the results indicate that skill-based and technology-related aspects have a more significant effect on digital entrepreneurship awareness than socio-economic ones, which gives a clear background of further regression analysis.

4.3 Multiple Regression Analysis

Table: 3 Multiple Regression Analysis on Awareness of Digital Entrepreneurship					
Dependent Variable: Awareness of Digital Entrepreneurship					
Independent Variables	**B**	**Std. Error**	**Beta**	**t-value**	**Sig.**
Constant	1.21	0.268	—	4.53	0
Digital Literacy	0.38	0.061	0.41	6.26	0
Digital Marketing Awareness	0.35	0.058	0.37	5.97	0
Digital Financial Services Adoption	0.29	0.064	0.3	4.54	0
Educational Qualification	0.18	0.052	0.18	3.53	0
District Location	0.16	0.049	0.15	3.31	0

Source: Primary Data

The multiple regression depicts that digital literacy, digital marketing awareness, and the adoption of digital financial services have a significant impact on the awareness of digital entrepreneurship. The variables turn out to be the most significant predictors, which means that the higher the digital literacy of entrepreneurs and their knowledge of the online marketing tools and the use of online financial technologies, the higher the level of awareness. The positive and significant influence is observed on the educational qualification and the location of the district, which implies that formal education and the digital infrastructure in the regions is a facilitating

ISBN : 978-93-6163-366-9

factor. The regression model describes 64.8 percent of variation in the digital entrepreneurship awareness which is sufficient to indicate the sufficiency and strength of the model.

Regression Equation

The awareness of digital entrepreneurship multiple regression equation can be estimated as the following:

$$DEA = 1.214 + 0.382(DL) + 0.346(DMA) + 0.291(DFS) + 0.184(EQ) + 0.162(DLN) + \varepsilon$$

Where:

DEA = Awareness of Digital Entrepreneurship DL = Digital Literacy
DMA = Digital Marketing Awareness
DFS = Adoption of Digital Financial Services EQ = Educational Qualification
DLN = District Location
ε = Error term

A one-unit increase in digital literacy increases awareness of digital entrepreneurship by 0.382 units, holding other variables constant. Similarly, improvements in digital marketing awareness and adoption of digital financial services significantly enhance awareness levels. Educational qualification and district location further contribute positively to awareness, reinforcing the importance of both individual capability and regional digital ecosystem.

4.5 Discussion

The current paper has discussed the awareness of digital entrepreneurship in Tamil Nadu state and determined the most important factors affecting the awareness. The results show that knowledge on digital entrepreneurship is highly influenced by skill-based and technology- based factors as compared to the pure demographic attributes. The outcome of the regression shows that the digital literacy is the most influential predictor of digital entrepreneurship awareness. This result is consistent with the works by Nambisan (2017) and Autio et al. (2018), who point out that digital abilities are the pre-requisites to identifying and leveraging digital entrepreneurial prospects. More digitally competent entrepreneurs are in a better place to be aware of digital platforms, online business models, and the creation of value through technology.

The awareness of digital marketing also became one of the key factors of awareness, which indicates the increasing role of online customer relations, branding, and e-sale platforms. This finding is similar to previous research on SMEs in Tamil Nadu and especially in such districts as Coimbatore and Salem, where researchers discovered that business proprietors who have stronger understanding of digital marketing enjoy enhanced market penetration and competitiveness (Nisha, 2020; Xavier and Vanitha, 2025). The strong impact of the adoption of digital financial services indicates that the level of exposure to digital payment and fintech products increases the general readiness to do business digitally. This observation coincides with the earlier studies that suggest that the efficiency, transparency, and customer confidence of transactions in micro and small businesses is enhanced with the use of digital payment systems (Charles Antoine, 2024; Sivakumar & Balaji, 2022).

Educational qualification was also observed to positively influence the awareness meaning that those with formal education are more capable of understanding and implementing the concepts of digital entrepreneurship. Moreover, the location of a district plays a major role in the level of awareness that shows the regional differences in digital infrastructure access, training centers, and startup ecosystems. Urban areas like Chennai and Coimbatore have greater

institutional support and the entrepreneurs in the semi-urban and rural areas are restricted.

Generally, the results support previous researchers on the importance of digital skills, institutional support, and the development of regional ecosystem in fostering digital entrepreneurship awareness in emerging economies such as India.

5. Conclusion

The research finds out that digital entrepreneurship awareness in Tamil Nadu is moderate with an uneven distribution among districts. The digital literacy, the digital marketing awareness and the use of digital financial services are skill-based factors that dominate the awareness levels. The level of education and the location also have an impact on awareness, which emphasizes the significance of personal capacity and physical environment. The findings indicate that increasing the awareness of digital entrepreneurship needs greater than just basic access to the digital world. Educational institutions and policymakers must consider specific digital training and awareness campaigns at the district level, as well as exposure to real-life digital enterprise experiences and, in particular, the case of micro-entrepreneurs and rural- based enterprises. Inclusive and sustainable entrepreneurial growth in Tamil Nadu can be achieved through the strengthening of digital infrastructure, the development of more entrepreneurship programs, and the inclusion of digital entrepreneurship courses in higher education. Future studies can be conducted to elaborate further on the research by adding longitudinal data, considering sector specific data modeling digital entrepreneurship, or using a structural equation modeling model to uncover the mediating and moderating effects in between digital capability variables.

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EXPLORING ECO-FRIENDLY AND SUSTAINABLE PRACTICES AMONG DIGITAL ENTREPRENEURS

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Abstract

Many people assume digital businesses are automatically "green" because they don't use paper or physical shops. However, this study shows that digital businesses actually have an "invisible" impact on the planet through high energy use in data centers and electronic waste. By looking at existing research, this paper explains how digital entrepreneurs can fix this. By using eco-friendly web hosting, writing cleaner code, and choosing sustainable shipping, entrepreneurs can stop being part of the problem and start being part of the solution. The study concludes that being "eco- friendly" is not just good for the earth, it's also a smart way to build a better, more modern business.

Keywords: *Digital Entrepreneurship, Eco-friendly practices, Sustainability, Invisible Footprint, Digital models.*

1. Introduction

1.1 What is Digital Entrepreneurship?

Digital entrepreneurship involves leveraging internet technologies, digital platforms, and online tools to create, manage, and scale businesses, offering high scope and global reach with lower overhead. Key models include e-commerce (online retail platforms), content creation (Podcasts, YouTube videos), and SaaS (cloud-based software solutions through subscriptions), with success driven by data analytics, digital marketing, and continuous innovation.

1.2 Sustainability in Digital Entrepreneurship

When one thinks of sustainability and digital entrepreneurship, the following questions arise: What is the role of digital entrepreneurs in keeping their ventures eco-friendly? Isn't making a business digital already eco-friendly? According to existing research, Energy consumption in data centers is reported as a significant sustainability issue due to the rise in usage of cloud computing and digital services. Additionally, E-waste represents a critical challenge as rapid technology development leads to frequent changes in hardware parts. In digital innovation and e-entrepreneurship, sustainable behaviors are not only ethically required but also profitable. Companies that use circular business models and green technologies become more efficient and competitive over the long run. However, multi-stakeholder cooperation is necessary to overcome obstacles, including high costs and regulatory restrictions.

1.3 The Invisible Footprint of Digital Business

Digital businesses rely on enormous, energy-intensive global infrastructure because they don't have physical storefronts. As the internet's carbon footprint surpasses that of several industrial nations, digital entrepreneurs face four primary sustainability challenges

1. "The Cloud's" Energy Requirements

All websites, databases, and video calls are stored in physical data centers. Large volumes of water and energy are needed to cool the servers in these facilities, as well as continuous electricity. These servers are cluttered with "dark data," ie, unused files, outdated backups, and unnecessary emails, hence wasting energy storing data that has no business value.

ISBN : 978-93-6163-366-9

2. Hardware Lifecycle & E-Waste

Physical hardware is the foundation of the "digital" world. A cycle of planned obsolescence occurs due to frequent upgrades motivated by software demands. Only about **22%** of electronic waste is recycled properly; the rest contributes to toxic pollution.

3. Efficient vs. Inefficient Code

These days, sustainability is a coding problem. Every user's device needs more energy to load "bloated" websites with unoptimized images and complex scripts. According to research, minifying code and selecting more energy-efficient programming languages can cut a website's energy usage by up to 50%.

4. Digital Marketing & Programmatic Waste

One significant source of emissions is the advertising ecosystem. For a single advertisement, thousands of "bids" and server requests are made in milliseconds through programmatic advertising. A large portion of this effort is squandered on "ghost impressions" (ads that are never seen by humans), making digital marketing one of the least energy-efficient aspects of modern entrepreneurship.

Objectives of the Study

- To examine the various eco-friendly and sustainable practices that can be adopted by digital entrepreneurs.
- To analyze the common assumption that digital businesses are inherently sustainable.
- To highlight the growing importance of sustainability within digital entrepreneurship.

2. Review of Literature

Exploring sustainable practices in entrepreneurship and digital innovation. International Journal of E-Entrepreneurship and Innovation

According to **Augustin K. Jose (2024)**, although digital entrepreneurship stimulates economic expansion, it increasingly calls for a move toward "green digitalization" in order to lessen its environmental impact. Research highlights that in order to align technological innovation with ecological responsibility, digital business models must incorporate energy-efficient infrastructure and circular economy principles. As a result, the literature promotes strong legislative frameworks and sustainable business practices that strike a balance between quick scaling and long-term resource preservation.

Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is There A Sustainable "Digital"?

Bican and Brem (2020) examine the relationship between digital business models, digital transformation, and digital entrepreneurship from a sustainability perspective. They propose a framework linking digital readiness, digital technologies, and business models to innovation and sustainability outcomes.

The study emphasizes that sustainability in digital entrepreneurship requires deliberate strategic integration rather than passive digital adoption. Existing literature focuses on the various innovative digital products/models that help sustainable development. **There has been a lack of focus on examining the practices that are eco-friendly and have been adopted by digital entrepreneurs.**

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3. Research Methodology

3.1 Nature of research: Descriptive and exploratory

3.2 Data source: Secondary data

3.3 Types of sources used:

- Research journals
- Conference papers
- Industry reports
- Government and international organization publications

3.4 Limitations:

- No primary data
- Dependent on the availability of published studies

4. Analysis & Interpretation

4.1 Eco-Friendly & Sustainable Practices among Digital Entrepreneurs

1. Optimizing Digital Infrastructure and Online Presence

A digital entrepreneur's website and online platforms are vital assets. However, digital activity consumes energy through data transfer and server use. Entrepreneurs can improve sustainability by choosing green hosting services that use renewable energy or carbon offset programs. Additionally, adopting lightweight web design, such as optimized image formats, reduced file sizes, and efficient coding, lowers data transfer needs and energy use. Regularly managing digital storage by deleting unused files, outdated backups, and unnecessary data further decreases the environmental impact of cloud operations.

2. Sustainable E-Commerce and Logistics Practices

As e-commerce grows, digital entrepreneurs increasingly impact the environment through packaging and logistics. Sustainable practices include using carbon-neutral or low-emission shipping options and offsetting delivery-related emissions. Eco-friendly packaging made from recycled, biodegradable, or compostable materials helps reduce plastic waste. Moreover, minimizing product returns through accurate descriptions, detailed sizing information, and visual demonstrations can significantly cut emissions linked to reverse logistics.

3. Greening Internal Business Operations

Sustainability can improve through environmentally responsible internal operations. Extending the lifespan of electronic devices reduces electronic waste and the environmental costs of making new hardware. Entrepreneurs can prioritize refurbished or energy-efficient equipment when upgrades are needed. Digital-only documentation, e-signatures, and cloud- based collaboration tools help cut paper usage, while mindful video conferencing—such as limiting unnecessary video streaming—can reduce energy use in daily tasks.

4. Ethical Marketing and Sustainability Transparency

Digital entrepreneurs play an important role in promoting sustainability through clear and honest communication. Instead of making vague claims, businesses should provide specific and verifiable information about eco-friendly practices, including packaging materials or energy sources. Educating customers on responsible consumption, recycling methods, and sustainable digital habits extends the environmental impact beyond business operations. Third- party certifications and sustainability standards can further build credibility and accountability.

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5. Strategic Integration of Sustainability for Long-Term Growth

Sustainability should be part of long-term planning, not just a short-term initiative. As digital businesses grow, monitoring energy use, digital waste, and environmental effects becomes more important. Embedding sustainability into growth strategies reduces environmental harm and strengthens brand value, investor confidence, and long-term resilience. Digital entrepreneurs who connect innovation with environmental responsibility are better positioned for lasting success in an eco-conscious market.

4.2 Role of Digital Entrepreneurs in Community Development

Digital entrepreneurs play an important role in community development by creating employment opportunities, supporting local economies, and improving access to products and services through digital platforms. By leveraging technology, they enable small businesses, artisans, and service providers to reach wider markets beyond geographical limitations. Digital entrepreneurs also contribute to social inclusion by offering flexible work opportunities and promoting digital literacy within communities. Through innovation and collaboration, they help address local challenges while fostering economic and social development.

5. Conclusion

While digital entrepreneurship is often perceived as an inherently "green" alternative to traditional business, this study reveals that it carries a significant, invisible, environmental footprint. From the energy-intensive cooling of data centers to the mounting crisis of e-waste and "bloated" code, the digital economy is a major consumer of global resources.

However, the analysis demonstrates that sustainability and digital innovation are not mutually exclusive. By adopting **green hosting, optimizing digital infrastructure, and committing to circular hardware lifecycles**, digital entrepreneurs can transform their operations into truly eco- friendly ventures.

Entrepreneurs who bridge the gap between technological growth and ecological responsibility will not only mitigate environmental harm but also build more resilient, efficient, and community- centric businesses in an increasingly eco-conscious global market.

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EXPLORING THE ROLE OF SOCIAL MEDIA AMONG ENTREPRENEURS

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Abstract

In today's competitive world, entrepreneurial innovation is crucial for economic growth and the creation of employment opportunities. Social media serves as a powerful platform for entrepreneurs, enabling them to conduct market research, identify new opportunities, and share knowledge. Platforms such as Facebook, Instagram, YouTube, X (formerly Twitter), and LinkedIn offer entrepreneurs numerous options to enhance brand visibility, expand global reach, and receive instant feedback using cost-effective tools and techniques. However, despite increased awareness of social media among entrepreneurs, there is a lack of understanding regarding how social media contributes to the growth of entrepreneurs. This study aims to explore the role of social media among entrepreneurs by analysing existing literature.

***Keywords**: entrepreneur, social media, innovation*

Introduction

Social media serves as an effective platform not only for individuals to share information, but it is also widely used by entrepreneurs and marketers to reach their target audience cost-effectively. Social media platforms create a way for entrepreneurs to build networking among the suppliers and consumers. Entrepreneurs use social media to interact with the target audience and to sell the product. Social media enables businesses to gain visibility for their innovations while offering a more accessible entry point compared to traditional marketing strategies. Entrepreneurs leverage social media platforms to support and promote their businesses effectively (Bansal & Saini, 2022b).

Objectives

- To review existing literature on how social media is used by entrepreneurs.
- To identify the key areas where entrepreneurs use social media.
- To examine the outcome of social media usage on entrepreneurs' success.

Conceptual Background

Social Media:

Social media refers to platforms that connect people for the exchange of information. For entrepreneurs, these platforms are essential for marketing products, reaching a global audience, and connecting with their target market.

ISBN : 978-93-6163-366-9

Entrepreneur:

An entrepreneur organizes, manages, and takes the business risk for earning profit. Innovation is a vital aspect of entrepreneurship, and social media significantly helps entrepreneurs generate new ideas and identify opportunities.

Review of Literature

Abdelfattah et al. (2025) analyse the impact of social media on e-entrepreneurial innovation in Oman, with a focus on AI adoption and government involvement. The researcher surveyed 345 entrepreneurs and found that there is a significant relationship between social media usage and innovation, focusing the need for strategic alignment.

Erobathriek et al. (2023) reveal that social media marketing serves as a two-way communication channel between the brand and the customer. Data was collected from 300 cosmetic users in Indonesia. The results indicate that managing photo quality and digital description promotes brand experience and relationship quality.

Nawi et al. (2019) investigate that Performance expectancy, perceived trust, enjoyment, and risk positively influence the adoption of social media among student entrepreneurs in Malaysia. The researchers emphasize that government agencies should foster trust and improve conditions to encourage students to utilize social media for business.

Beninger et al. (2016) highlight that social media positively impacts 30 Egyptian women entrepreneurs' businesses. The researcher further explains that high adoption rates of social media platforms are observed in emerging economies.

Mangold and Faulds (2009) conducted a study on Social media: The new hybrid element of the promotion mix. The researcher highlights that marketing managers should engage with consumers through various platforms, including networking sites, blogs, social media, and promotional tools.

Key Areas of Social Media Usage by Entrepreneurs

- Branding
- Customer engagement
- Market research and opportunity identification
- Lead generation
- Collaboration

Branding: Brand identity can be established through social media by visually representing products and services, allowing entrepreneurs to enhance brand visibility.

Customer Engagement: Entrepreneurs can have two-way communication with the audience, and they can receive real-time feedback with the use of social media

Market Research and Opportunity Identification: Social media provides real-time data on customer preferences. Online surveys can be conducted using social media platforms to identify new market opportunities and business ideas.

Lead Generation: Social media marketing activities help entrepreneurs to create leads and attract potential customers.

Collaboration: Social media enables entrepreneurs to collaborate with customers, influencers, and other businesses.

ISBN : 978-93-6163-366-9

Outcome of Social Media Usage on Entrepreneurs' Success

- Improved decision-making and sales growth
- Competitive advantage
- Sustainability
- Building brand image and loyalty
- Network building

Conclusion

Social media plays a crucial role in building brand value among target audiences. By effectively utilizing social media platforms, entrepreneurs can expand their reach and improve brand visibility. Entrepreneurs need to identify the most suitable platform for their business and develop strategies to engage the audience.

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ISBN : 978-93-6163-366-9

E-COMMERCE AND DIGITAL PLATFORM AWARENESS AMONG ENTREPRENEURS IN TIRUCHIRAPPALLI DISTRICT

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Abstract

The paper is an awareness and adoption study of e-commerce sites in the Tiruchirappalli district, Tamil Nadu, among the entrepreneurs. The sample size of the respondents was 250, which was sufficient to provide the necessary representation and statistical trust. The demographic analysis has shown that the population of the entrepreneurs is mostly male, young, moderately educated, and the service and trading business is most prevalent. The regression analysis revealed that there is a high positive correlation between the dimensions of awareness and the adoption intention with awareness about e-commerce platforms and digital marketing to be the strongest predictors. Awareness of digital payment and logistics, and institutional and training support have a positive effect on adoption, but of a lower degree. The results indicate the importance of digital knowledge and the necessity to stimulate the e- commerce adoption with the help of specific awareness and training programs to increase the entrepreneurial interest in using the digital platforms.

Keywords: *E-commerce adoption, Digital entrepreneurship, Platform awareness, Digital marketing, Institutional support.*

1. Introduction

The fast spread of the digital technology is the basis of radically transforming the entrepreneurship activity on a global scale, introducing the e-commerce facilitated and platform-based forms of business. Online marketplaces, social commerce networks, and app- based ecosystems offer a lower barrier to entry and allow entrepreneurs to enter international markets with little physical infrastructures (Nambisan, 2017). E-commerce is considered to be a fundamental entrepreneurial scale, innovation, and competitive driver globally especially in micro and small businesses (Autio et al., 2018). But even a quick review of previous studies should highlight that the simple presence of platforms is not a sufficient criterion to guarantee the involvement of entrepreneurs; rather, it is the awareness of platform features, digital marketing technology, logistics integration, and online consumer behaviour that will determine the success of adoption (Kraus et al., 2019). Digital entrepreneurship research has therefore given rise to platform awareness as one of its constructs.

E-commerce and the digital platforms have become the trend in the Indian context with efforts like Digital India, Startup India, and the development of cheaper internet connections (Government of India, 2019). Research by Bhatia-Kalluri (2021) and Venkatesh et al. (2012) shows that Indian entrepreneurs are increasingly using the services of Amazon, Flipkart, Meesho, and social commerce platforms to address the barrier of access to the market. However, according to the empirical data, the level of platform awareness among Indian entrepreneurs is

still unequal, especially in relation to MSMEs and enterprises of the informal sector (Sivakumar and Balaji, 2022). The low levels of digital literacy, absence of organized training, and doubts about online reliability and logistics remain the factors that stand in the way of the effective usage of the platforms.

Tamil Nadu is among the most diversified industrial states in India and there is a good foundation of manufacturing, services and entrepreneurial activity. The studies carried out in such districts as Coimbatore and Salem indicate that the knowledge of e-commerce platforms has a positive effect on business performance, customer reach, and sustainability among MSMEs (Kumar & Lakshmi, 2020; Ravikumar and Deepa, 2024). Although the state-level policies facilitating startup and technology-based businesses are proactive, academics note that the perception of the digital platforms is concentrated on metropolitan and industrial hubs, and semi-urban and rural entrepreneurs receive relatively fewer prospects (Murugan and Selvi, 2021). Such imbalance highlights the importance of carrying out region-specific studies in the state.

Tiruchirappalli (Trichy) is a major business and educational center of central Tamil Nadu where micro-entrepreneurs, traders, artisans, and service providers are high. Although isolated analyses reveal the existence of e-commerce innovation and online selling projects within the district (Ahmed, 2025), there is a lack of systematic academic research on awareness of e- commerce platform, digital marketplace, and online business ecosystem among the entrepreneurs in Trichy. Available literature indicates that a large number of entrepreneurs in the district are still using traditional offline business models and partially or superficially exposed to the digital platform. Thus, the level of platform awareness at the district level is essential in determining the gaps in adoption and formulating specific capacity-building intervention.

2. Review of Literature

2.1 International Research into the Awareness of Platforms and Digital Entrepreneurship

Nambisan (2017) developed the conceptualization of digital entrepreneurship as a phenomenon that is platform-based and redefines the opportunity recognition and value creation. Autio et al. (2018) also highlighted the importance of cognitive awareness of the digital platforms on the exploitation ability of ecosystem resources by the entrepreneurs. As Kraus et al. (2019) pointed out, platform awareness is not only the knowledge of the technical aspect but also the strategic knowledge of digital marketing, data analytics, and customer engagement mechanisms. These results create awareness as a condition to successful adoption of e-commerce.

2.2 Indian National Evidence

Research carried in India indicates that platform awareness is an important factor that determines the intention of the entrepreneurs to use e-commerce technologies. As Bhatia- Kalluri (2021) indicated, rural and micro-entrepreneurs usually have poor knowledge of platform policies, pricing algorithms, and logistics integration, which limits successful participation. According to Sivakumar and Balaji (2022), the awareness of digital payment systems and marketplace operation increases the trust and efficiency of operations of micro- enterprises. Nevertheless, the authors also found the prevailing skills gap between the knowledge of the platform and the actual use of it.

ISBN : 978-93-6163-366-9

2.3 Evidence from Tamil Nadu

Studies on Tamil Nadu reveal that there was a positive relationship between digital awareness and entrepreneurship performance. Kumar and Lakshmi (2020) indicated that the SMEs in Coimbatore that were more aware of the e-commerce platforms reported better customer acquisition and higher revenue. In like manner, Ravikumar and Deepa (2024) have also revealed that those micro-entrepreneurs in Salem district who were more conversant with digital tools and digital platforms experienced more business sustainability. Murugan and Selvi (2021) warned that the discrepancy in infrastructure and access to training remains a limitation to the level of awareness between the districts.

2.4 Minimal Evidence at Tiruchirappalli.

Although Ahmed (2025) analysed e-commerce novelty and international business plans in Tiruchirappalli, the research was mainly concerned with technology and not understanding of platforms by entrepreneurs. The gap in scholarly research is very wide and most of the localized studies are mostly descriptive and lack empirical rigor.

2.5 Research Problem

Although the use of e-commerce platforms in entrepreneurial ecosystem is increasingly becoming relevant, the scale of interest among entrepreneurs in the Tiruchirappalli district on e-commerce and digital platforms has not been adequately researched. Lack of localized empirical data curbs the success of the policy intervention, training sessions and institutional support systems intended to enhance digital entrepreneurship in the area.

2.6 Research Gap

An analysis of the literature at hand shows that there are various gaps in the research of the digital platform adoption by entrepreneurs. Most previous studies concentrated on international/national scale tendencies with a lack of attention to the situation on a district level. In Tamil Nadu, research has focused mainly on the industrial centres and has remained biased against semi urban districts such as Tiruchirappalli. Also, there is an evident gap in research examining the level of awareness of the platform features of entrepreneurs, which includes marketplace activities, digital marketing platforms, analytics, and integration of logistics. This paper will seek to fill these gaps with an in-depth investigation of e-commerce and digital platforms awareness among the businesspersons within Tiruchirappalli district.

2.7 Research Objectives

1. To study the demographical profile of the respondents
2. To find the association between the age group of the respondents and digital marketing awareness.
3. To measure the relationship between the Awareness of E-Commerce Platforms, Digital Marketing Awareness, Digital Payment & Logistics Awareness, Institutional & Training Support Awareness and Adoption Intention toward E-Commerce Platforms.
4. To identify the which factor is significant influence of the Adoption Intention toward E-Commerce Platforms

3. Research Methodology

The current study uses the quantitative, descriptive, and analytical research design to investigate the awareness of e-commerce and digital platform among Tiruchirappalli district entrepreneurs. The quantitative approach will be suitable because the research aims to assess demographic factors, the level of awareness, analyze the relationships between variables, and find the factors that would have a significant effect on the intention to adopt e-commerce platforms, based on statistical methods (Creswell, 2014). The major aspect of the study is its descriptive methodology which aids in profiling of respondents and the analytical aspect also helps to test and make inferences about the hypothesis.

3.1 Population

The study population will include entrepreneurs of micro, small, and self-employed business units based in Tiruchirappalli district in Tamil Nadu. This will involve traders, service providers, manufacturers, artisans and individual business owners who are either already using, partly using or know about e-commerce and digital platforms. Tiruchirappalli district can be viewed as a representative of a mixed entrepreneurial ecosystem (urban, semi-urban, rural business environment), which explains why the chosen location is a good place to study the differences in digital platform awareness and intention to adopt it.

3.2 Sample Size and Justification

To make sure that the resulting data is statistically reliable, a sample of 250 respondents was chosen. This size is in line with the recommended sizes: Hair et al. (2019) suggest 200 300 in case of multivariate analyses, Krejcie and Morgan (1970) suggest that 250 respondents are adequate at a 95 percent confidence level, and Tabachnick and Fidell (2013) state that when there are four independent variables, 82 respondents are required to conduct multiple regression. Therefore, there is a larger sample than is necessary, which increases the validity and external validity of the study results.

3.3 Sampling Technique

The sampling method used in the study is convenience because there is no elaborate sampling frame of entrepreneurs in the district, and practical limitation of the study is connected to accessibility and time. The convenience sampling is commonly employed in entrepreneurship and digital adoption research when the respondents are chosen according to their availability and interest to take part (Etikan et al., 2016). Sampling bias was minimized by ensuring respondents of various business types and geographic locations in the district of Tiruchirappalli such as the urban, semi-urban, and rural areas.

3.4 Data Collection

The structured questionnaire was created and used to get primary data on the study, because of the analysis of a large amount of digital entrepreneurship and e-commerce literature. The questionnaire will include the demographic questions and items of measurement based on awareness and intention to adopt, through a five-point Likert scale. The collection of the data was carried out in direct field survey and online questionnaires, which guaranteed convenience of the respondents and their broader coverage. The purpose of the study as an academic one was explained to the respondents and the confidentiality of the responses guaranteed.

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3.5 Variables of the Study

The analysis is carried out on four independent variables and one dependent variable. Awareness of E-Commerce Platforms, Digital Marketing Awareness, Digital Payment, and Logistics Awareness and Institutional and Training Support Awareness are the independent variables. These variables are the most important dimensions of digital and platform awareness that have been identified in the previous studies (Nambisan, 2017; Kraus et al., 2019). The dependent variable is Adoption Intention toward E-Commerce Platforms that captures the adoption intentions or intentions to adopt or sustain the use of e-commerce platforms by the entrepreneurs in carrying out business (Venkatesh et al., 2012). All variables are reflective and they are measured using standardized Likert scale items to achieve consistency and comparability.

3.6 Statistical Tools

The statistical analysis of the collected data was performed with such statistical software as SPSS. To analyze the demographic profile of the respondents, the method used was percentage analysis. The Chi-square test was to be utilized to determine the relationship between the age group and digital marketing awareness. The correlations analysis was employed to compare how variables of awareness relate to the variable of adoption intention, and multiple regression analysis was employed to estimate the variables, which have significant impacts on the adoption intention regarding e-commerce platforms.

4. Data Analysis and Interpretation

4.1 Frequency Table

The responses that were gathered on 250 respondents were coded, tabulated and the data were analysed using Statistical Package for the Social Sciences (SPSS). Before the analysis, the data were filtered in terms of completeness and consistency to be accurate and reliable. The correct statistical tools were used as per the research objectives to extract meaningful information out of the data.

Table 1. Demographic Profile

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	148	59.2
	Female	102	40.8
Age Group	Below 25 years	38	15.2
	25–34 years	74	29.6
	35–44 years	69	27.6
	45–54 years	45	18
	55 years and above	24	9.6
Educational Qualification	Below HSC	41	16.4
	HSC	57	22.8
	Diploma	46	18.4
	Undergraduate	72	28.8
	Postgraduate & above	34	13.6
Nature of Business	Manufacturing	52	20.8
	Trading	83	33.2
	Service	91	36.4
	Others	24	9.6

Source: Primary Data

ISBN : 978-93-6163-366-9

The demographic characteristics of the respondents provide information that most of the entrepreneurs in the Tiruchirappalli district are males (59.2%), with 40.8 percent being the female population. Most of the respondents are aged between the 25 and 34 years (29.6) and the 35 and 44 years (27.6) age brackets, meaning that there is a high number of young and middle-aged entrepreneurs in the district. In terms of educational background, undergraduates (28.8) are the most common then higher secondary education (22.8) and diplomas (18.4) indicating a well-educated entrepreneurial community. The breakdown of the different types of businesses shows that most of the type of business involves service-oriented businesses (36.4%), trading (33.2%), manufacturing (20.8%), and a small percentage of other types of business (9.6%). In general, the statistics reveal a young, moderately educated, and mostly male entrepreneurship population with the service and trade enterprise being the most widespread in the district.

4.2 Chi-Square Test

Table 2: Chi-Square Tests

Test	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.68	4	0.013
Likelihood Ratio	13.02	4	0.011
Linear-by-Linear Association	6.482	1	0.011
N of Valid Cases	250		

Source: Primary Data

The Pearson Chi-Square value (2 = 12.684, p = 0.013) shows that the relationship between age group and the digital marketing awareness is statistically significant at the 5 percent level. This finding affirms that digital marketing awareness in the various age groups differs considerably. Entrepreneurs of younger age and middle-aged are relatively more aware, which indicates higher exposure and flexibility to digital instruments of marketing.

4.3. Correlation Analysis

Table 3: Correlations Analysis

Variables	AEP	DMA	DPLA	ITSA	AIEP
Awareness of E-Commerce Platforms (AEP)	1	.512**	.476**	.432**	.618**
Digital Marketing Awareness (DMA)	.512**	1	.498**	.461**	.593**
Digital Payment & Logistics Awareness (DPLA)	.476**	.498**	1	.447**	.547**
Institutional & Training Support Awareness (ITSA)	.432**	.461**	.447**	1	.489**
Adoption Intention toward E-Commerce Platforms (AIEP)	.618**	.593**	.547**	.489**	1

Source: Primary Data

** Correlation is significant at the 0.01 level (2-tailed)

The correlation matrix shows that there are positive and significant correlation between all independent variables and adoption intention towards e-commerce platforms at 1 percent. The e-commerce platform awareness correlates with adoption intention the most (r = 0.618), and then there is digital marketing awareness. This reaffirms that an increase in the levels of awareness increases the willingness of the entrepreneurs to embrace e-commerce platforms.

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4.4 Multiple Regression Analysis

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.762	0.581	0.563	0.421

Source: Primary Data

According to the regression analysis, there exists a great positive correlation between independent variables and dependent variable with a correlation coefficient (R) of 0.762. The R2 of 0.581 means that the independent variables used in the model accounted the variation in the dependent variable up to 58.1 percent. The number of adjustment R 2 of 0.563 that takes into consideration the number of predictors shows that the model is a good fit. Its standard error of the estimate is 0.421, indicating that the estimates made are fairly close to the values observed. In general, the model shows that it has a strong explanatory power and reliability to predict the dependent variable.

Table 5: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	63.842	4	15.961		
Residual	45.983	245	0.188		
Total	109.825	249		84.4	0

Source: Primary Data

The outcome of the ANOVA shows that the regression model is significant in showing the variation in the dependent variable. The regression sums of squares = 63.842 with 4 degrees of freedom and the mean square =15.961. The value of F-test of 84.4 is very significant ($p < 0.001$) meaning that the independent variables have a strong and significant effect on the dependent variable when added together. The remaining number of squares is 45.983 that indicates the amount that will not be explained by the model. In general, the model fits well and has a strong predictive correlation of the dependent variable.

Table 6: Coefficients

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	0.842	0.214	—	3.94	0
Awareness of E-Commerce Platforms	0.361	0.062	0.342	5.82	0
Digital Marketing Awareness	0.298	0.06	0.297	4.96	0
Digital Payment & Logistics Awareness	0.224	0.064	0.216	3.49	0
Institutional & Training Support Awareness	0.158	0.065	0.154	2.42	0.02

Source: Primary Data

Regression analysis indicates that the four independent variables are significantly useful and positively influence the intention of the entrepreneur to adopt e-commerce platforms. Knowledge about e-commerce platforms is the best predictor (0.342, $p < 0.001$), with awareness of digital marketing coming second (0.297, $p < 0.001$), which means that the level of awareness about platforms and marketing tools has a strong impact on adoption. The digital payment and logistics

awareness (0.216, $p < 0.001$) is also positively contributing and it is therefore posited that the familiarity on the procedures of transaction and delivery facilitates the adoption of e-commerce. Also, awareness is supported by institutions and training, even though the difference is relatively small (= 0.154, $p = 0.02$), but it is significant to influence the adoption. With all that said, the results highlight that platform and marketing awareness are the most essential variables, and payment, logistics, and institutional support can be used to augment the intention to adopt in an enabling manner.

4.6 Findings of the Study

The key findings of the research are that the age group of people within the productive age group is quite high in the number of people who comprise the entrepreneurial population in the Tiruchirappalli district, which means that there are high possibilities of the uptake of digital technologies and e-commerce. The same analysis also shows that there is a strong correlation between the age group and the digital marketing awareness which indicates how the demographic factors affect digital knowledge levels. In addition, there is a positive and significant correlation between all aspects of awareness such as e-commerce platforms, digital marketing, digital payments and logistics, and institutional support and the intention of entrepreneurs to use the e-commerce platforms. Of these, information about the e-commerce platforms and digital marketing prove to be the most important factors that determine adoption intention. Although the impact of institutional and training support awareness is relatively minor, it has a valuable contribution to making entrepreneurs more willing to implement digital and e-commerce solutions.

4.7 Discussion

These study findings are in line with available literature on digital entrepreneurship, which highlights awareness and knowledge as the drivers of technology adoption. The substantial correspondence between age and digital marketing awareness justifies the findings by Venkatesh et al. (2012), who focus on demographic traits as the key determinants of technology acceptance. The correlation between the dimensions of awareness and the intention to adopt is strong, which is consistent with the framework of digital entrepreneurship suggested by Nambisan (2017) suggesting that awareness increases digital opportunity to identify and use digital opportunities. The awareness of the e-commerce platform and digital marketing awareness are high indicating the relevance of the ability to comprehend the tools of online marketplaces and customer engagement in the digital economy. Moreover, the role of the awareness of digital payment and logistics is quite high, which supports the role of the security of transactions and delivery infrastructure in the formation of the adoption choice in developing countries like India. The institutional and training support awareness supporting role confirms the previous works that highlight the significance of ecosystem support in developing digital entrepreneurship (Autio et al., 2018; Kraus et al., 2019).

5. Conclusion

The research findings indicate that awareness-based variables are conclusive in determining the intention to use e-commerce platform by entrepreneurs in Tiruchirappalli district. The age factor has a considerable influence on the level of digital marketing awareness, whereas the level of awareness about e-commerce platforms and digital marketing tools has a strong impact on the

ISBN : 978-93-6163-366-9

adoption intention. The results reveal that special awareness campaigns, online skills building programs, and institutional support policies are required to enhance sustainable and inclusive digital entrepreneurship. Policymakers and support institutions can improve the involvement of entrepreneurs in the digital economy and help to develop the economy of the region by increasing the awareness of the e-commerce platforms, digital marketing practices, and the system of digital payments.

6. Scope for Further Research

Although the current research can be considered as an interesting contribution, it also gives prospects to further research. Additional research can also be used to increase the scale of the geographical area to cover more than one district or state to increase generalizability. The longitudinal research designs might be implemented to study the variation in awareness and adoption behavior across time. Other variables that can be included in future studies are the perceived risk, trust, technological readiness, and government policy support. Further comparison of the dynamics of e-commerce adoption between the rural and urban entrepreneur or by sector might also add to the current knowledge on e-commerce adoption.

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ISBN : 978-93-6163-366-9

INVESTIGATION OF FINANCIAL LITERACY AMONG DIGITAL ENTREPRENEURS IN TAMIL NADU

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Abstract

Financial literacy plays a vital role in the success and sustainability of digital entrepreneurship, particularly in emerging economies like India. Digital entrepreneurs operate in technology-driven environments that require sound financial decision-making, effective use of digital financial tools, and compliance with regulatory frameworks. This study investigates the level of financial literacy among digital entrepreneurs in Tamil Nadu and examines its influence on financial decision-making and business sustainability. A structured questionnaire was administered to digital entrepreneurs across selected districts of Tamil Nadu. Financial literacy was measured through dimensions such as financial knowledge, financial skills, financial attitude, and financial behaviour. The findings indicate that financial literacy significantly influences entrepreneurs' ability to manage digital payments, access formal finance, and maintain financial stability. The study highlights regional and enterprise- level disparities in financial literacy and emphasizes the need for targeted financial education and policy interventions to strengthen the digital entrepreneurial ecosystem in Tamil Nadu.

Keywords: *Financial Literacy, Digital Entrepreneurs, MSMEs, Digital Finance, Tamil Nadu*

1. Introduction

The rapid growth of the digital economy has transformed entrepreneurial activities worldwide. Digital entrepreneurs increasingly rely on online platforms, fintech services, digital payment systems, and e-commerce technologies to conduct business operations. In this evolving environment, financial literacy has emerged as a crucial capability enabling entrepreneurs to make informed financial decisions, manage resources efficiently, and ensure long-term business sustainability.In India, initiatives such as *Digital India*, *Startup India*, and *Atmanirbhar Bharat* have accelerated the growth of digital entrepreneurship. Tamil Nadu has emerged as one of the leading states in terms of industrial development, digital infrastructure, and entrepreneurial activity. Despite these advancements, many digital entrepreneurs face challenges related to financial management, regulatory compliance, and effective use of digital financial services. These challenges are often linked to inadequate financial literacy.

Financial literacy is defined as the ability to understand financial concepts and apply such knowledge effectively in financial decision-making (Lusardi & Mitchell, 2014). For digital entrepreneurs, financial literacy extends beyond basic financial knowledge to include digital payments, fintech adoption, online taxation, and financial risk management. This study seeks to investigate the level of financial literacy among digital entrepreneurs in Tamil Nadu and assess its role in supporting business performance and sustainability.

2. Review of Literature

2.1 Global Perspective

Globally, financial literacy is recognized as a key determinant of entrepreneurial success and economic growth. International organizations such as the OECD and the World Bank emphasize that financial literacy enhances entrepreneurs' capacity to manage cash flows, assess risks, and adopt financial innovations (OECD, 2018). Studies in developed economies show that financially literate entrepreneurs are more likely to adopt digital financial tools such as online accounting software and fintech services, improving transparency and efficiency (Gomber et al., 2018). Wise (2013) found that new ventures managed by financially literate entrepreneurs exhibit higher survival rates. Similarly, Lusardi and Mitchell (2014) highlighted that financial literacy supports better borrowing decisions and investment planning, which are essential in digitally competitive markets.

2.2 National Perspective

In India, financial literacy has gained prominence due to increasing digitalization and fintech adoption. Research indicates that many Indian entrepreneurs, particularly MSMEs, lack adequate financial knowledge related to credit management, taxation, and investment decisions (Bhushan &Medury, 2014). The Reserve Bank of India (2019) emphasized the need to strengthen financial literacy to promote financial inclusion and digital payment adoption. Agarwal et al. (2021) observed that financially literate entrepreneurs are more likely to access formal finance and adopt digital banking services. However, regional disparities persist, with entrepreneurs in semi-urban and rural areas exhibiting lower financial literacy levels compared to urban counterparts (OECD, 2020).

2.3 Tamil Nadu Perspective

Tamil Nadu has a strong entrepreneurial base supported by digital infrastructure and government initiatives such as *Startup Tamil Nadu* and MSME development programs. Despite this, studies indicate uneven financial literacy among entrepreneurs across districts and enterprise sizes. Suresh and Raman (2020) reported that many MSMEs in Tamil Nadu lack adequate financial planning and record-keeping practices due to limited financial knowledge. Kumar and Banu (2021) found that financial literacy significantly influences MSME performance in Tamil Nadu, particularly in areas such as working capital management and regulatory compliance. However, limited empirical research specifically focuses on digital entrepreneurs, highlighting a clear research gap.

2.4 Research Gap

The review of literature reveals that while financial literacy has been widely studied at global and national levels, limited research focuses on digital entrepreneurs at the state or district level. Existing studies in Tamil Nadu primarily examine MSMEs in general, without specific emphasis on digital and platform-based enterprises. Moreover, the interaction between financial literacy and digital financial practices remains underexplored. This study seeks to bridge these gaps by providing empirical evidence from Tamil Nadu.

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2.5 Objectives of the Study

1. To study the demographic profile of the respondents.
2. To assess the level of financial literacy among digital entrepreneurs in Tamil Nadu.
3. To examine the dimensions of financial literacy, including financial knowledge, skills, attitude, and behaviour.
4. To analyse the influence of financial literacy on financial decision-making and business sustainability.

3. Research Methodology

3.1 Research Design

The present study adopts a descriptive and analytical research design to examine financial literacy among digital entrepreneurs in Tamil Nadu. The descriptive approach is used to study the demographic profile of respondents and assess the level of financial literacy, while the analytical approach is employed to examine the dimensions of financial literacy and analyse its influence on financial decision-making and business sustainability.

3.2 Population and Sample

The target population of the study comprises digital entrepreneurs operating in Tamil Nadu, including those engaged in e-commerce, online services, digital platforms, fintech-enabled businesses, and technology-driven MSMEs. A multistage stratified random sampling technique was used to ensure adequate representation across districts, enterprise sizes (micro, small, and medium), and sectors such as manufacturing, services, and trade.A sample size of 300 digital entrepreneurs was determined using the Krejcie and Morgan (1970) sampling formula, ensuring a 95% confidence level and a ±5% margin of error. The sample was proportionately distributed across selected districts of Tamil Nadu to reflect regional diversity.

3.3 Data Collection and Analysis Tools

Primary data for the study were collected through a structured questionnaire administered in both English and Tamil to ensure linguistic accessibility and accurate responses from the participants. The questionnaire was divided into four sections. Section A captured the demographic and enterprise-related details of the respondents. Section B focused on assessing financial knowledge and financial skills, while Section C examined respondents' financial attitude and financial behaviour. Section D addressed financial decision-making practices and indicators of business sustainability. In addition to primary data, secondary data were gathered from published journals, government reports, Reserve Bank of India (RBI) publications, OECD reports, and prior empirical studies to strengthen the conceptual framework and support the review of literature.

Financial literacy was conceptualized as a multidimensional construct encompassing financial knowledge, financial skills, financial attitude, and financial behaviour. Measurement items for these dimensions were adapted from established financial literacy instruments, particularly the OECD/INFE toolkit and relevant empirical studies. All items were measured using a five-point Likert scale ranging from *Strongly Disagree (1)* to *Strongly Agree (5)*, enabling systematic assessment of respondents' financial competencies and practices.

The collected data were coded and analysed using appropriate statistical software. Descriptive tools such as percentage analysis, mean, and standard deviation were employed to

examine the demographic profile of respondents and assess the overall level of financial literacy. Reliability analysis using Cronbach's alpha was conducted to test the internal consistency of the measurement scales. Further, correlation analysis was applied to examine relationships among the study variables, while multiple regression analysis was used to analyse the influence of financial literacy and its dimensions on financial decision-making and business sustainability among digital entrepreneurs in Tamil Nadu.

4. Data Analysis and Interpretation

4.1 Frequency Distribution

Table 1: Demographic Profile of Respondents (Objective 1)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age	21–30 years	120	40
	31–40 years	110	36.7
	41–50 years	50	16.7
	51 years and above	20	6.6
Gender	Male	210	70
	Female	90	30
Education	School Level	45	15
	Graduate	150	50
	Postgraduate	105	35
Income Level	< ₹2 lakh	70	23.3
	₹2–5 lakh	140	46.7
	> ₹5 lakh	90	30
Enterprise Size	Micro	150	50
	Small	120	40
	Medium	30	10
Sector	Manufacturing	90	30
	Services	120	40
	Trade	90	30
District	Chennai	90	30
	Coimbatore	84	28
	Tiruchirappalli	72	24
	Salem	54	18

Source: Primary Data

Table 1 depicts the demographic profile of the respondents involved in the study. The results show that most of the respondents (76.7%) belong to the economically active age group of 21–40 years, indicating strong participation of young and middle-aged individuals in digital entrepreneurship. Gender-wise distribution reveals that 70% of the respondents are male and 30% are female, reflecting a male-dominated yet gradually inclusive entrepreneurial environment. In terms of education, most respondents are well qualified, with 50% being graduates and 35% postgraduates, suggesting the importance of educational background in digital business activities. Income analysis indicates that 46.7% of the respondents earn between ₹2–5 lakh annually, while 30% earn above ₹5 lakh. Most enterprises are micro (50%) and small (40%) in nature, highlighting the dominance of smaller business units. The service sector accounts for the highest share (40%), followed by manufacturing and trade sectors (30% each). District-wise distribution shows balanced representation, with Chennai contributing the highest proportion of respondents.

ISBN : 978-93-6163-366-9

Overall, the findings reflect a young, educated, and micro-enterprise-driven digital entrepreneurial landscape in Tamil Nadu.

4.2 Analysis of Overall Level of Financial Literacy

Table 2: Overall Level of Financial Literacy (Objective 2)			
Financial Literacy Level	**Mean Score**	**Standard Deviation**	**Interpretation**
Overall Financial Literacy	3.42	0.58	Moderate
Digital Payments Awareness	3.78	0.62	High
Basic Financial Concepts	3.55	0.6	Moderate-High
Investment Planning	3.1	0.65	Moderate-Low
Taxation Compliance	3.05	0.63	Moderate-Low
Financial Risk Management	3	0.61	Moderate-Low

Source: Primary Data

Table 2 presents the overall level of financial literacy among digital entrepreneurs in Tamil Nadu. The composite mean score of 3.42 indicates that respondents possess a moderate level of financial literacy, suggesting reasonable awareness but with notable scope for improvement. Among the components, digital payments awareness records the highest mean score (3.78), reflecting strong familiarity with digital transaction platforms and online payment systems. Basic financial concepts also show a relatively higher mean score (3.55), indicating adequate understanding of fundamental financial principles. However, lower mean scores are observed for investment planning (3.10), taxation compliance (3.05), and financial risk management (3.00), highlighting weaknesses in advanced financial competencies. These findings reveal that while digital entrepreneurs are comfortable with routine financial operations, gaps exist in strategic financial planning and regulatory compliance. Overall, the results underscore the need for targeted financial literacy initiatives focusing on long-term financial decision-making and risk management skills.

4.3 Analysis of Dimensions of Financial Literacy

Table 3: Dimensions of Financial Literacy (Objective 3)			
Dimension	**Mean Score**	**Standard Deviation**	**Interpretation**
Financial Knowledge	3.32	0.6	Moderate
Understanding interest rates, taxation, credit terms, investment options	-	-	Moderate
Financial Skills	3.28	0.58	Moderate
Budgeting, cash flow management, statement analysis	-	-	Moderate (Skills gap in statement analysis)
Financial Attitude	3.65	0.55	Positive
Saving habits, financial planning orientation	-	-	Positive
Financial Behaviour	3.15	0.57	Moderate
Record-keeping, systematic financial planning	-	-	Gap between knowledge & practice

Source: Primary Data

Table 3 illustrates the mean scores and standard deviations of the four key dimensions of financial literacy among digital entrepreneurs. The results indicate a moderate level of financial knowledge (Mean = 3.32), suggesting that respondents possess basic understanding of interest rates, taxation, credit terms, and investment options, though comprehensive knowledge is limited. Financial skills also record a moderate mean score (3.28), reflecting reasonable competence in budgeting and cash flow management; however, a noticeable gap exists in advanced skills such as financial statement analysis. Financial attitude emerges as the strongest dimension with a mean score of 3.65, indicating a positive orientation toward saving and financial planning. In contrast, financial behaviour shows only a moderate mean score (3.15), highlighting inconsistencies in actual practices such as systematic record-keeping and long-term financial planning. Overall, the findings reveal a gap between awareness and application, emphasizing the need to translate positive attitudes and knowledge into effective financial behaviour.

4.4 Multiple Regression Analysis

Table 4: Influence of Financial Literacy on Financial Decision-Making and Business Sustainability (Objective 4)

Independent Variable	Beta (β)	t-value	Significance (p)	Interpretation
Financial Knowledge	0.342	5.9	0	Strong positive influence on financial decisions and sustainability
Financial Skills	0.318	5.13	0	Positive influence
Financial Attitude	0.276	5.02	0	Positive influence
Financial Behaviour	0.198	4.04	0	Moderate influence
Overall Financial Literacy	0.165	3.44	0.001	Significant influence on business sustainability

Source: Primary Data

Table 4 presents the results of correlation and multiple regression analyses examining the influence of financial literacy on financial decision-making and business sustainability among digital entrepreneurs. The findings indicate that all dimensions of financial literacy have a statistically significant positive influence on financial decision-making and business sustainability. Financial knowledge emerges as the strongest predictor ($\beta = 0.342$, $t = 5.90$, $p < 0.001$), suggesting that a sound understanding of financial concepts significantly enhances effective financial decisions and long-term sustainability. Financial skills ($\beta = 0.318$) and financial attitude ($\beta = 0.276$) also show strong positive effects, highlighting the importance of practical financial abilities and a positive orientation toward financial planning. Financial behaviour demonstrates a moderate yet significant influence ($\beta = 0.198$), indicating that consistent financial practices contribute meaningfully to business outcomes. Overall financial literacy ($\beta = 0.165$, $p = 0.001$) is found to be a significant determinant of business sustainability, confirming that higher levels of financial literacy equip digital entrepreneurs to manage financial risks, optimize resources, and sustain long-term business performance.

4.5 Findings of the Study

The study reveals that digital entrepreneurship in Tamil Nadu is predominantly driven by young and middle-aged individuals, with a significant concentration in the 21–40 years age

ISBN : 978-93-6163-366-9

group. Most respondents operate micro and small enterprises, highlighting the dominance of small-scale digital businesses in the state. Most entrepreneurs possess graduate or postgraduate qualifications, indicating that educational attainment plays a crucial role in digital business participation. Sector-wise, the service sector accounts for the highest share of digital enterprises, followed by manufacturing and trade.

The analysis of financial literacy indicates that digital entrepreneurs exhibit a moderate overall level of financial literacy. While respondents demonstrate strong awareness of digital payment systems and basic financial concepts, deficiencies are observed in areas such as investment planning, taxation compliance, and financial risk management. Dimension-wise analysis shows that financial attitude scores the highest, reflecting a positive inclination toward saving and financial planning. However, financial behaviour remains moderate, suggesting inconsistencies between financial awareness and actual financial practices.

Regression analysis confirms that financial literacy significantly influences financial decision-making and business sustainability. Financial knowledge emerges as the strongest predictor, followed by financial skills and financial attitude. Overall financial literacy is found to have a statistically significant impact on business sustainability, indicating that financially literate entrepreneurs are better equipped to manage resources, comply with regulations, and ensure long-term business survival.

4.6 Discussion

The findings of the study align with existing literature emphasizing the critical role of financial literacy in entrepreneurial success. The dominance of young and educated entrepreneurs reflects the growing digital ecosystem in Tamil Nadu, supported by increased internet penetration and digital infrastructure. However, the prevalence of micro and small enterprises suggests that limited financial capabilities may restrict business scaling and long- term sustainability. The moderate level of financial literacy observed in the study is consistent with prior research, which highlights gaps in advanced financial competencies among small business owners. Although digital entrepreneurs are adept at using digital payment platforms, their limited proficiency in investment planning and financial risk management raises concerns regarding long-term financial stability. This gap between financial attitude and financial behaviour indicates that awareness alone does not guarantee effective financial decision-making.

The regression results reinforce the argument that financial knowledge and financial behaviour are crucial determinants of business sustainability. Entrepreneurs with stronger financial literacy are more likely to make informed credit decisions, manage cash flows efficiently, and adopt sustainable financial practices. These findings underscore the need for targeted financial education programs that go beyond basic awareness and focus on practical financial skills and behavioural change.

5. Conclusion

The study concludes that financial literacy plays a vital role in shaping financial decision-making and business sustainability among digital entrepreneurs in Tamil Nadu. While the adoption of digital tools and platforms is high, financial competencies remain uneven, particularly in areas related to investment planning, taxation, and risk management. The presence of a strong positive relationship between financial literacy and business sustainability highlights the importance of strengthening financial capabilities to support the growth of digital

enterprises. To enhance the resilience and long-term success of digital entrepreneurs, policymakers, financial institutions, and training agencies should design targeted financial literacy interventions tailored to the needs of micro and small enterprises. Integrating practical financial training with digital entrepreneurship development initiatives can significantly improve financial decision-making and contribute to sustainable economic growth in Tamil Nadu.

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ROLE OF DIGITAL ENTREPRENEURSHIP IN EMPOWERING RURAL COMMUNITIES IN INDIA

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Abstract

Rural communities in India continue to face persistent socio-economic challenges such as low income levels, unemployment, limited market access, inadequate infrastructure, and low levels of digital literacy. In recent years, digital entrepreneurship has emerged as a powerful mechanism to address these challenges by enabling rural enterprises to access wider markets, improve productivity, and enhance financial inclusion. This paper reviews existing literature to examine the role of digital entrepreneurship in empowering rural communities in India. It analyses how digital technologies, platforms, and business models contribute to employment generation, women empowerment, income enhancement, and community development. The study also highlights key challenges such as infrastructure gaps and skill shortages, and discusses strategies and policy interventions required to strengthen digital entrepreneurship for sustainable rural development.

Introduction

Rural development is a critical component of inclusive economic growth in India, as a significant proportion of the population resides in rural areas. Traditional rural livelihoods, largely dependent on agriculture, often suffer from low productivity and limited income opportunities. Entrepreneurship has long been recognised as a catalyst for economic development by generating employment, promoting innovation, and utilising local resources. With the advent of digital technologies, new opportunities have emerged for rural entrepreneurs to overcome geographical isolation and resource constraints. Digital entrepreneurship enables rural enterprises to leverage e-commerce, digital payments, social media, and online services to participate in broader markets. This paper aims to explore how digital entrepreneurship contributes to the empowerment of rural communities in India by synthesising insights from existing academic and policy literature.

Literature Review

The literature on rural entrepreneurship and digitalisation spans disciplines such as economics, management, sociology, and information technology. Previous studies emphasise that rural entrepreneurship plays a vital role in reducing poverty, curbing rural-urban migration, and promoting balanced regional development. Recent research highlights the transformative potential of digital technologies in rural contexts by enabling market expansion, improving access to information, and facilitating financial inclusion. However, scholars also point out persistent challenges including inadequate digital infrastructure, limited digital skills, and socio-cultural barriers that affect technology adoption. The literature indicates a growing need for integrated approaches that combine technological advancement with capacity building and supportive policy frameworks.

ISBN : 978-93-6163-366-9

Concept of Rural Entrepreneurship

Rural entrepreneurship refers to the establishment and management of business ventures in rural areas by utilising local resources, traditional skills, and indigenous knowledge. These enterprises commonly operate in sectors such as agro-processing, handicrafts, dairy, tourism, and small-scale manufacturing. Rural entrepreneurship contributes to self-reliance, employment generation, and income diversification while reducing dependence on agriculture alone. Unlike urban entrepreneurship, rural entrepreneurship is strongly influenced by local socio-economic conditions, community networks, and resource availability.

Key Role of Entrepreneurship in Rural Development

Entrepreneurship plays a crucial role in rural development by generating employment opportunities and increasing household incomes. It helps prevent large-scale migration to urban areas by creating local livelihood options. Rural enterprises facilitate the productive use of local resources and traditional skills, thereby adding value at the grassroots level. Entrepreneurship also contributes to balanced regional development by reducing disparities between rural and urban economies. Improved income levels resulting from entrepreneurial activities lead to better living standards, enhanced access to education and healthcare, and overall community development.

Role of Digital Technologies in Rural Entrepreneurship

Digital technologies have significantly expanded the scope of rural entrepreneurship. E-commerce platforms enable rural producers and artisans to access national and global markets, reducing reliance on intermediaries. Digital payment systems and financial technologies promote financial inclusion by providing access to banking and credit facilities. Mobile applications and online platforms support agricultural decision-making by offering real-time information on prices, weather, and best practices. Additionally, digital tools enhance operational efficiency through automation, data management, and online marketing, thereby improving the competitiveness of rural enterprises.

Digital Entrepreneurship Strategies in Rural Areas

Effective digital entrepreneurship in rural areas requires targeted strategies such as digital skills training, adoption of online marketing techniques, and integration with e-commerce platforms. The establishment of digital entrepreneurship centres and innovation hubs can provide rural entrepreneurs with access to mentorship, technology, and networking opportunities. Collaborative networks involving government agencies, educational institutions, non-governmental organisations, and technology firms play a vital role in supporting rural digital enterprises. Such strategies help rural entrepreneurs overcome resource constraints and enhance business sustainability.

Challenges Faced by Rural Entrepreneurs

Despite its potential benefits, digital entrepreneurship in rural areas faces several challenges. Limited access to high-speed internet and unreliable electricity supply restrict the effective use of digital technologies. Many rural entrepreneurs lack adequate digital literacy and technical skills, which hinders technology adoption. Financial constraints, limited access to formal credit, and inadequate awareness of government support schemes further impede entrepreneurial growth.

ISBN : 978-93-6163-366-9

Addressing these challenges requires coordinated efforts to improve infrastructure, enhance skills, and strengthen institutional support.

Collaborative Networks and Partnerships

Collaborative networks and partnerships are essential for strengthening digital entrepreneurship in rural areas. Partnerships with technology providers, academic institutions, financial institutions, and government bodies enable rural entrepreneurs to access advanced technologies, training, and funding. Innovation ecosystems that promote knowledge sharing and collective problem-solving help rural enterprises overcome geographical isolation and resource limitations. Such collaborative approaches are critical for fostering inclusive and sustainable rural entrepreneurship.

Observation and Discussion

The review of literature indicates that digital entrepreneurship has the potential to significantly empower rural communities by improving market access, enhancing incomes, and promoting social inclusion. However, the effectiveness of digital entrepreneurship depends on supportive infrastructure, skill development, and institutional collaboration. While policy initiatives such as Digital India and Startup India have created a favourable environment, gaps remain in implementation at the grassroots level. A holistic approach integrating technology, capacity building, and community participation is necessary to maximise the impact of digital entrepreneurship in rural areas.

Conclusion and Research Gap

This paper highlights the important role of digital entrepreneurship in empowering rural communities in India by fostering employment generation, financial inclusion, and community development. Digital technologies offer transformative opportunities for rural enterprises, yet their adoption is constrained by infrastructural, educational, and financial challenges. The literature reveals a research gap in context-specific studies that examine the long-term social and economic impacts of digital entrepreneurship at the community level. Future research should focus on empirical investigations, regional case studies, and evaluation of policy outcomes to provide deeper insights into sustainable digital entrepreneurship models for rural development.

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ISBN : 978-93-6163-366-9

E-COMMERCE AND PLATFORM

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Introduction

Social entrepreneurship focuses on solving social problems while creating income and employment opportunities. It plays an important role in community development by supporting small businesses, encouraging self-employment, and improving the economic condition of people. Social entrepreneurs aim to create social value along with business growth. In the present digital era, e-commerce and digital platforms have become strong tools for social entrepreneurship. They help entrepreneurs reach customers easily, take orders, receive payments, and deliver products using the internet. Even small businesses with limited resources can use platforms such as Instagram, WhatsApp, and online systems to operate effectively. Therefore, e-commerce and platforms support social entrepreneurship and contribute to sustainable community development.

Meaning of E-Commerce

- E-commerce refers to buying and selling goods and services through the internet. It allows business activities such as marketing, ordering, payment, and delivery to take place online. E-commerce makes business operations faster, easier, and more convenient for both sellers and customers.
- In simple terms, e-commerce means doing business without meeting face to face. Customers can view products, place orders, and make payments from their home using a mobile phone or computer. This makes shopping easy and saves time for both buyers and sellers.

Definition of E-Commerce

- E-commerce can be defined as the process of conducting commercial transactions through digital platforms using electronic networks, mainly the internet. It includes product sales, service delivery, online payment systems, customer communication, and logistics support.
- In other words, e-commerce is a modern method of business where all activities are handled electronically. It reduces paperwork, speeds up transactions, and allows businesses to reach customers beyond geographical limits.

Types of E-Commerce

1. Business to Consumer (B2C)

In this type, businesses sell products or services directly to consumers through online platforms.

2. Business to Business (B2B)

This model involves transactions between two businesses using digital platforms.

ISBN : 978-93-6163-366-9

3. Consumer to Consumer (C2C)

Consumers sell products or services directly to other consumers through online platforms, mainly for resale products.

4. Consumer to Business (C2B)

Individuals provide products or services to businesses, such as freelancers offering services online.

5. Platform-Based E-Commerce

Platform-based e-commerce connects buyers and sellers through a digital platform. The platform supports order management, payment processing, delivery services, and customer support.

Observation and Discussion

E-Commerce Reduces Business Entry Barriers

E-commerce reduces the difficulty of starting a business. Traditional businesses require high investment for shops, infrastructure, and staff. In contrast, e-commerce allows entrepreneurs to start businesses with minimum investment using a mobile phone and internet connection. Social entrepreneurs can use platforms to sell products without owning a physical store. This helps small entrepreneurs, women entrepreneurs, and people from local communities to start businesses and support community development.

How E-Commerce and Platforms Create Entrepreneurial Opportunities

E-commerce platforms help individuals convert small ideas into business opportunities. Platforms act as a link between sellers and customers. Entrepreneurs can display products, communicate with customers, and receive orders easily. This creates self-employment opportunities and supports income generation. Many social entrepreneurs use platforms to sell local products and services, which contributes to community growth.

Importance of Digital Access for Sustainable Growth

Digital access is important for the long-term growth of social entrepreneurship. Internet access, smartphones, and basic digital knowledge help entrepreneurs manage business activities efficiently. Digital platforms reduce costs, improve customer reach, and increase business visibility. When more people have access to digital tools, more entrepreneurs can grow their businesses and contribute to sustainable community development.

Customized Orders through E-Commerce Platforms and Offline Stores

One Scoop Order through Instagram Platform (Lucky Draw Model – Real-Time Example)

- The one scoop order system works like a lucky draw method. In this process, both the seller and the buyer do not know exactly which products will be included before packing. Different coloured marbles represent different products.
- When a customer places a one scoop order, the seller takes one scoop of marbles using a spoon. The colours collected in the scoop decide the products included in the order. Based on the colours, the products are selected, packed, and delivered to the customer.
- Customers place orders based on price, such as ₹99 scoop order or ₹144 scoop order. The value of the products may be higher or lower than the paid amount. Sometimes the customer gains profit, and sometimes there may be a loss. This model creates excitement

ISBN : 978-93-6163-366-9

among customers and helps sellers' clear stock. Orders, communication, and confirmation take place through the Instagram platform.

Max, Madurai – Offline Order Supported by Platform (Real-Time Example)

- Max is a retail store located in Madurai. This store follows a mixed model of offline selling supported by platform-based delivery. Customers visit the store and select dress materials. If the required size or colour is not available, the customer places the order directly through the store in offline mode.
- The shop staff collects details such as material type, size, colour, delivery address, and contact number. After collecting all details, the shop arranges delivery directly to the customer. Payment options include cash on delivery and online payment. This system helps customers receive customized products and supports local employment. It clearly shows how offline stores use platforms to support social entrepreneurship and community development.

Conclusion

Social entrepreneurship plays a meaningful role in improving the quality of life within communities by creating employment, supporting small businesses, and encouraging self-reliance. In the present digital era, e-commerce and digital platforms have become strong support systems for social entrepreneurs. They provide easy access to markets, reduce the cost of starting a business, and help entrepreneurs manage operations efficiently. E-commerce platforms enable social entrepreneurs to reach customers beyond local boundaries and offer products in a flexible and convenient manner. Platform-based models support order processing, payment collection, customer communication, and delivery services. Real-time examples such as the one scoop order through Instagram and the offline–online model followed by Max in Madurai clearly show how simple digital platforms can support business growth and customer satisfaction.

These models encourage creativity, innovation, and customer engagement while supporting local employment and community participation. By combining offline business practices with online platforms, social entrepreneurs can build trust, improve service quality, and ensure sustainable income generation. Digital access further strengthens these efforts by enabling entrepreneurs to adapt to changing market needs. Overall, e-commerce and digital platforms act as powerful tools for social entrepreneurship and community development. They motivate individuals to start small businesses, reduce dependency on traditional employment, and contribute positively to society. With proper digital awareness and effective platform usage, social entrepreneurship can continue to grow and create long-term economic and social benefits for communities.

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GLOBAL E-COMMERCE PLATFORMS: INNOVATION, PLATFORMS, AND FUTURE ECOSYSTEMS

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Abstract

In addition to exposing weaknesses for small businesses, the COVID-19 pandemic is examined as a driver for quicker digital transformation, propelling mobile commerce, digital payments, and Omni channel strategies.

The findings imply that e-commerce platforms have become essential accelerators of small business growth by lowering barriers to entry, expanding global reach, and enhancing customer interaction. However, platform dependence, digital injustices, and legislative obstacles must be addressed for long-term sustainability. The report highlights that future small business success will rest on the ability to adapt to an evolving platform economy.

Keywords: *E-commerce platforms, Digital transformation, E-commerce adoption.*

Introduction

Electronic commerce (or "e-commerce") involves the purchasing and selling of products and services using the Internet. The buyer and seller do not need to meet in person because the payment for such a transaction can be completed online. Cash on delivery is an additional option, though. In today's digital environment, e-commerce has revolutionised corporate operations, client outreach, and growth (Z. Cao, 2024). All types of enterprises have been enabled by the growth of online platforms. Because it broadens the market, boosts sales, lowers operating expenses, and offers insightful data, e-commerce is essential for small business expansion (Z. Cao, 2024).

The Revolution of Payment system in Last deuce of years has been Remarkable. As moving and advancing the businesses from face-to-face trading or traditional trading, order by E-mail and order by telephone interchange into digitization as E-commerce over the global platform by internet and be a revolutionary growth of E-payment transactions and their effective impact on economy. The digital revolution is taking the world by technology storm; every sector has witnessed such evolution as payment and transaction system, resulting in an innumerable-digital option for the common people. E-payment has revolutionizing the E-commerce business processing by diminishing the transaction costs, reducing the paper work, reduce labour work and saving our time. Now consumer be a "smart consumer" has a huge range of options to choose from when selecting a payment method to complete a payment or transaction while online shopping or other settlement. E-payment became the power fuel in advancement and evolution of E-commerce. The enhancement of E-commerce is a fusion between online shopping and E-payment by facilitating us with transforming at 24*7*365 services the collaboration between Ecommerce and E-payment become the milestone in digital marking and our economy.

ISBN : 978-93-6163-366-9

In this present study we examine the issues that affect consumer when implementing E-payment, the study also focus the positive collaboration between the use of constancy of E-payment and E-commerce and also suggest solutions to maintain and develop the quality of service for E-payment systems so as to stimulate financing reiteration and loyalty and attract to new consumers especially female and rural consumers

E-commerce platforms may enhance awareness, influence consumer choices, and create a more engaging, emotionally impactful shopping experience by integrating influencer marketing with purposeful content production. (Dr. P. Prasanthi et al., 2024; U. Karthigai Selvi et al., 2024). The success of this shift depends on the company's capacity to manage online and physical channels as interconnected entities that offer logical and consistent message, efficient logistics, and customised support throughout the customer experience. When used effectively, Omni channel e-commerce techniques increase customer loyalty, streamline operations, and support companies in remaining competitive in an increasingly digital market. (V. Belvedere and others, 2021)

Definition

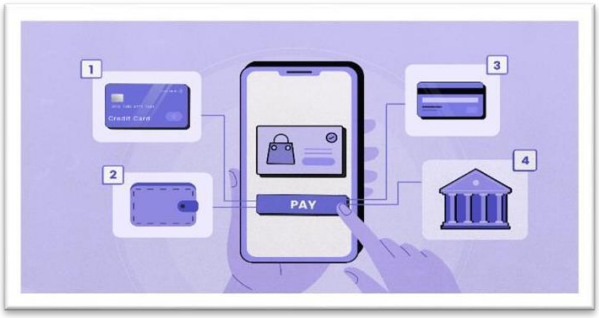
Online purchasing and selling of goods and services is known as e-commerce. The practice of conducting business online is known as e-commerce. This implies that you use electronic methods for all of your transactions, including electronic mail, bulletin boards, fax transmissions, electrical fund transfers, and the internet. E-commerce refers to a business's capacity to have a dynamic online presence that enables it to conduct business electronically, effectively having an online store. Products can be sold, advertised, and paid for electronically without requiring human processing. Electronic transactions involving the sale or purchase of goods and services between businesses, homes, individuals, governments, and other public or private entities are referred to as e-commerce.

Organizations, conducted over computer mediated networks. The goods and service are ordered over those networks, but the ultimate delivery of the goods or service may be conducted online or off-line. Through dependable and secure connections, e-commerce automates a range of business-to-business and business-to-consumer transactions. It encompasses the use of electronic transmission media, such as wireless or telecommunication, to conduct commercial document exchanges, including the digital purchase and sale of goods and services from one location to another using computers and the internet as media. E- commerce is a combination of business strategies and technological processes that provide instantaneous information sharing between organisations. E-commerce expands worldwide marketplaces and improves responsiveness. E-commerce is the automated interchange of business and information with suppliers, financial institutions, and both internal and external customers with a variety of communication technologies.

The Digital Revolution of E-Payment towards Ecommerce

E-payments are transactions that take place online, digitally, or electronically without the need for actual cash exchanges. Here the both parties (payer and receiver) use electronic mediums to trade money or amount. The digital revolution in e-payment systems has made it possible for e-commerce to grow their market or customer base by selling into international markets, gaining access to suppliers in other nations that accept digital payments, and enabling their global customers to receive notifications when a transaction or payment is complete and when they receive the product.

The rapid evolution of the network, the ongoing and sophisticated development of e-payment platforms for e-commerce, the innovative digital economy, a very exclusive and new modern era of business culture, and the emergence of a web network of economic values to interpret the next phase of change in technological civilisation society are all contributing factors to the digital revolution. The e-payment revolution is a cooperative effort between digital technology and humans, enabling us to change anytime we choose, around-the-clock. E-payments are far better adapted to the needs consumers have than cash and other conventional payment methods, and e-commerce is incredibly convenient.



To put it another way, an electronic payment system enables businesses and consumers to pay and receive a receipt for a service. There is bouquet of E-payment modes as Debit cards, Credit Cards, internet banking like **NEFT** (National Electronic Fund Transfer), **RTGS** (Real Time Gross Settlement), **IMPS** (Immediate Payment Service), **NECS** (National Electronic Clearing Service), **NPCI** (National Payment Corporation of India), **UPI** (Unified Payments Interface), **BHIM** (Bharat Interface for money), **BBPS** (Bharat bill Payment System), **AePS** (Aadhar Enabled Payment system), **PAYTM, AMAZON PAY, GOOGLE PAY, BHARAT PAY, QR CODE PAY, Biometric payment, Digital currency, cryptocurrency** comes with **block chain, Bitcoin** and many more. E-commerce became more popular as the internet grew faster.

The government also push with their mission for users contactless, paperless, cashless economy under their hearty and powerful Digital India program integrate with increasing smartphone holder, growing internet and digitization are powering India's E-payment revolution.



Impact of E-commerce Platforms on Small Businesses.

E-commerce platforms significantly boost corporate efficiency by utilising advancements in information technology (IT) and digital infrastructure. By moving trade and business operations

ISBN : 978-93-6163-366-9

to online networks, the rise of e-commerce has altered how businesses operate (P. Baršauskas, et al. 2008). This shift has made a number of tasks easier and more efficient, including online marketing, digital transactions, phone support, and customer service. Online platforms, digital media, and automated consumer engagement systems are a few examples of tools that enable businesses to operate more quickly and with fewer resources than they did in the past.

E-commerce platforms take advantage of developments in digital infrastructure and information technology (IT) to greatly increase business productivity. The growth of e-commerce has changed the way companies function by shifting trade and business operations to online networks. Online marketing, digital transactions, telephone service, and customer service are just a few of the more simplified and effective activities made possible by this change. E-commerce platforms are a key source of productivity in the digital economy, helping companies to compete more successfully in a market that is driven by technology

Marketing and Customer Engagement

Artificial intelligence (AI)-powered personalisation in e-commerce has emerged as a key factor in increasing consumer engagement and propelling corporate success. By reviewing massive volumes of consumer data, AI helps businesses to create highly personalised shopping experiences that fit with individual interests, habits, and purchasing histories. Recommendation systems, which make product recommendations based on user history, and AI-driven chatbots, which offer real-time, personalised support and advice, are examples of this fascinating personalisation. These technologies have been used by businesses such as Amazon to develop smooth and pertinent user journeys that boost conversion rates and brand loyalty.

Empowerment and Inclusion

By removing historical obstacles and increasing access to markets, cash, and expertise, digitalisation has transformed women-led e-commerce enterprise. Women, especially in developing nations, have been able to overcome barriers to movement, education, and finance because to digital technologies like social media, e-commerce platforms, and mobile banking. Flexible working environments are made feasible by technology like AI-driven marketing, online payment systems, and virtual training platforms, which aid women in managing home obligations and establishing their enterprises. Access has also risen because of initiatives to enhance digital connection and inclusion. Features like cash on delivery, regional language assistance, and streamlined mobile applications are especially tailored to rural users.

Various Payment Mode in E-Commerce

(1) **Debit Card and Credit Card Payment Method -** Debit and credit cards are two of the most widely utilised and well-liked payment options worldwide. Card payments are simple and safe; all consumers need to do is input their card number, CVV, and expiration date as a precaution. By matching client information with the provided CVV number, the CVV makes it simple to identify fraud. Consumers with little funds typically prefer debit cards when they purchase online.

(2) **Prepaid Card Payment Method:** Prepaid cards are an additional card payment option. Their service is identical to that of a credit or debit card. You do not need to carry cash to make your payment. They contain a virtual currency. They have a low adoption rate.

(3) **Bank Transfer -** Users enrolled in online banking may make bank transfer is the most dependable technique since the transactions need to be authorised, verified and authenticated by the users. It is seen as a necessary payment method for e-commerce and online buying. It might be a very easy method to pay your bills for online purchases without using a credit card.

(4) **Smart cards:** Smart Cards also known as chip cards or integrated circuits, are comparable to credit or debit cards. Additionally, smart cards are used to store money, which is taken out after every transaction and can only be accessed using a PIN that is unique to each user.

(5) **Electronic Fund Transfer (EFT):** This electronic payment technique uses computer-based systems to move funds from one bank account to another, either inside the same bank or at a different bank, without the direct involvement of bank employees.

(6) **NET Banking:** Also known as internet banking or online banking, this is a straightforward means of paying for online purchases straight from the user's bank. It is another well-liked payment option in e-commerce.

(7) **E-Wallet Payment Method:** Also known as a virtual wallet, e-wallets need both buyers and sellers to register. They may quickly withdraw or deposit money using a computer or smartphone after setting up an E-wallet account and linking it to a bank account.

(8) **Cash Payment -** "Cash is always king in India", For E-commerce and other online businesses it comes in the form of the cash-on-delivery option. Cash is often used for physical goods and cash-on-delivery transactions. A person who has no any bank account they can easily pay with cash.

(9) **Mobile Payment Method:** Due to the growing dominance of mobile devices in e-commerce, mobile payments for goods and services are made using smartphones or other mobile devices. Consumers regard mobile payments to be more convenient and secure than actual currency.

(10) **Digital Currency:** Although digital currencies like Bitcoin and cryptocurrencies with block chains are another alternative for electronic payments, very few individuals use them. They make it possible to make safe online payments without the need for intermediaries.

E-Commerce Models

EC is the process of using the Internet to do business electronically. This will generally take place in six stages, with a merchant selling goods or services to clients making up the majority of EC. There are six primary parts under the wider class of EC. However, a number of recognised EC applications utilised by EC-related organisations are listed below.

(a) **Business to Business (B2B**): This type of transaction, which is common in the private sector and is known as e-procurement, involves both parties being businesses. EC is utilised in business-to-business transactions to improve corporate efficiency. Automobiles, agriculture and shipping, electronics, food, utilities, chemicals, paper, and office supplies are the most well-known products offered in B2B EC. The use of EDI, which stands for the electronic exchange of business information such as product catalogues, requests, orders, invoices, etc., is another primary function of B2B EC.

(b) **Business to Customer (B2C):** Businesses offer services or items to consumers. Another name for this procedure is E tailing. B2C EC has made it necessary for almost all major

ISBN : 978-93-6163-366-9

retailers to establish an online presence. Additionally, some businesses primarily operate online and do not have any physical locations that clients may visit. Accessories, apparel, computers, home appliances, sporting goods, TVs, footwear, pharmaceuticals, tools, and toys are the most well-known products sold in the EC sector.

(c) Customer to Customer (C2C): One of the most significant advancements in marketing theory over the past ten years has been the growing focus on comprehending the causes and effects of consumer-to-consumer interactions. While it has long been known that C2C interactions may boost growth and profitability, marketing scholars and practitioners are beginning to see C2C interactions as essential to corporate success. Three basic developments in the marketplace have supported this rise. First, customers are connected in a number of ways that were previously unattainable, such as recommendation websites, blogs, wikis, social networking sites, and online communities. Second, managers and scholars have access to extensive C2C data that was previously unobtainable.

(d) Customer to Business (C2B): Customers can supply goods and services to businesses under the C2B EC business model and the businesses pay them. This business model is a complete turnaround and hence is a thorough reversal of typical business model where organisations offer goods and services to consumers (B2C).

(e) Business to Employees (B2E): A corporation distributes products, services, and information to its individual employees. Through the use of an intra-business network, B2E EC enables companies to provide goods and services to their staff.

i) Management policy of online insurance.
ii) Organization announcement dissemination.
iii) Requests for online supplies.
iv) Special offers for employees.
v) Employee benefits reports.

(f) Mobile Commerce (M-Commerce): In addition to mobile phones, M-Commerce was created in 1997 with the goal of "the buying and selling of products, information, and services" using wireless portable devices like laptops and PDAs. These wireless gadgets communicate with computer networks that enable online shopping. M-commerce allows users to purchase online without having to locate a location to plug in.

(g) Business to Government (B2G): B2G is a contemporary EC trend. Government agencies also employ this type of EC. By creating websites, this approach aims to reach the nation's regular citizens. The government posts rules and policies pertaining to its departments on its websites. If citizens have any questions or would like to know pertinent information, they are required to communicate with the websites.

Conclusion

Customers have embraced the advantages of electronic payments and are utilising them for a variety of purposes, including paying for utilities, online shopping and e-commerce, mobile recharges, bills and taxes, fees, groceries, pharmacies, and other household expenses. These days, e-payments have emerged in both urban and rural areas, offering a variety of alternatives beyond simple payments as well as fast, cost-free investments for mutual payments. E-payments provide a variety of discounts, rewards, and incentives. As a result, there are still plenty of chances for this sector to be satisfied in the near future from only a payment service provider.

ISBN : 978-93-6163-366-9

OPPORTUNITIES, CHALLENGES AND STRATEGIES IN DIGITAL ENTREPRENEURSHIP

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Abstract

Digital entrepreneurship has gained significant importance in the contemporary business environment due to rapid advancements in digital technologies and increased global connectivity. It involves the creation, development, and management of business ventures that operate primarily through digital platforms and technologies. This paper examines the key opportunities, challenges, and strategies associated with digital entrepreneurship. Opportunities include low entry barriers, global market access, innovation, and scalability. However, digital entrepreneurs face challenges such as intense competition, cybersecurity threats, technological complexity, and regulatory uncertainties. To address these challenges, effective strategies such as adopting agile business models, leveraging digital tools, investing in innovation and skills development, and ensuring data security are essential. The study concludes that despite existing challenges, digital entrepreneurship offers substantial potential for sustainable growth and economic development when supported by appropriate strategies and technological adaptability.

Keywords: *Entrepreneurs, Digital Technologies, Challenges, Opportunities, Digital marketing*

Introduction

Digital entrepreneurship has become a significant influence in today's economy, fueled by swift technological progress and broad internet availability. It pertains to the establishment and administration of companies that predominantly depend on digital technologies for providing products and services. In contrast to conventional entrepreneurship, digital entrepreneurship allows for quicker innovation, reduced startup expenses, and effortless access to global markets. The growth of e-commerce platforms, social networks, mobile apps, and online payment systems has changed how entrepreneurs spot opportunities and interact with customers. Although digital entrepreneurship provides significant opportunities for growth and flexibility, it also brings distinctive challenges like technological unpredictability, fierce competition, cybersecurity threats, and changing regulatory landscapes. Comprehending the opportunities, challenges, and tactics related to digital entrepreneurship is vital for entrepreneurs aiming for lasting success in a progressively digitalized society.

In the current business environment, the widespread digital transformation has supplanted the cost-focused operational strategy of earlier times; seems destined to progress into a fully digitally interconnected business model. As a result, entrepreneurs need to recognize this new reality and emphasize the importance of embracing a digital entrepreneurial mindset as a crucial element. As a result of the swift and notable advancements observed in recent years, along with the upheaval in information and communication technology, companies have acknowledged the necessity to focus on digital business or digital transformation to secure their survival, expansion, and development. In today's fast-changing digital landscape, entrepreneurship has emerged as a common way for people to start their own businesses. Merely being innovative is insufficient

ISBN : 978-93-6163-366-9

given the constant acceleration in information and communication technology; undergoing a digital transformation has become essential to maintain competitive sustainability

Opportunities in Digital Entrepreneurship

1. Low Entry Barriers Digital entrepreneurship requires relatively low initial investment compared to traditional businesses. Online platforms, cloud services, and digital tools allow startups to launch with minimal capital.
2. Global Market Reach Digital businesses can operate beyond geographical boundaries. The internet enables entrepreneurs to reach customers worldwide, expanding market size and revenue potential
3. Scalability and Growth Potential Digital products and services can be scaled quickly without significant increases in cost. This allows businesses to grow rapidly and handle large customer bases efficiently.
4. Innovation and Technology Advancement Emerging technologies such as artificial intelligence, big data analytics, blockchain, and cloud computing provide opportunities for innovation and competitive advantage.
5. Cost-Effective Marketing Digital marketing tools, including social media, search engines, and email marketing, offer affordable and targeted ways to reach customers and build strong brand awareness.
6. Flexibility and Business Agility Digital entrepreneurs can operate remotely and adapt quickly to changing market trends and customer needs, enabling faster decision-making and innovation.

Challenges in Digital Entrepreneurship

Digital entrepreneurship has become an increasingly important and dynamic field in the modern business landscape. The rapid advancement of technology, coupled with changing consumer preferences, has created numerous opportunities for individuals and businesses to thrive in the digital space. However, it is not without its fair share of issues and challenges. One of the primary challenges faced by digital entrepreneurs is the ever-evolving nature of technology. What is cutting-edge today may become obsolete tomorrow, making it essential for digital entrepreneurs to stay updated with the latest trends and innovations. This requires a continuous commitment to learning and adaptation.

1. Technological Turbulence and Evolving Ecosystems: The rapid evolution of digital technologies creates a volatile landscape, demanding constant adaptation. Entrepreneurs must navigate emerging platforms, software, and paradigms to stay relevant and competitive.
2. Saturated Markets and Fierce Competition: The digital sphere is rife with competitors, leading to market saturation. Entrepreneurs face the challenge of carving out a distinctive niche and differentiating their offerings amidst a crowded marketplace.
3. Cybersecurity and Data Privacy Concerns: With the increasing frequency and sophistication of cyber threats, digital entrepreneurs must prioritize robust cybersecurity measures. Protecting sensitive data and ensuring privacy compliance are paramount in building trust with customers.
4. Monetization Strategies and Revenue Sustainability: Determining effective monetization models remains a critical challenge. Entrepreneurs must explore diverse revenue streams,

ISBN : 978-93-6163-366-9

from subscription-based models to advertising and e-commerce, while ensuring long-term financial viability.

5. Regulatory Compliance and Legal Framework: Navigating the complex landscape of digital regulations, including data protection laws and intellectual property rights, can be a formidable challenge. Entrepreneurs must remain vigilant in adhering to legal requirements to avoid potential liabilities.
6. User Engagement and Retention: Sustaining user interest and loyalty in a crowded digital space is a persistent challenge. Entrepreneurs must employ innovative strategies to captivate and retain their audience amidst rapidly changing preferences.
7. Resource Constraints and Funding Uncertainties: Access to capital and resources can be a significant hurdle for digital entrepreneurs, especially in the early stages. Securing funding and managing resources efficiently are critical factors in sustaining growth and innovation.
8. Globalization and Cultural Adaptation: Expanding into international markets introduces complexities related to cultural nuances and varying consumer behaviors. Entrepreneurs must adeptly adapt their strategies to resonate with diverse global audiences.

Trends in Digital Entrepreneurship

1. Growth of E-Commerce and Digital Marketplaces Online shopping continues to expand rapidly, with businesses leveraging e-commerce platforms and marketplaces to reach wider audiences and increase sales.
2. Adoption of Artificial Intelligence and Automation AI-powered tools such as chatbots, recommendation systems, and automated marketing are transforming customer engagement, decision-making, and operational efficiency.
3. Rise of Platform-Based and Gig Economy Models Digital platforms that connect service providers and consumers—such as freelancing, ride-sharing, and content platforms—are becoming increasingly popular.
4. Increased Use of Data Analytics Entrepreneurs are using big data and analytics to understand customer behavior, personalize services, and make informed business decisions.
5. Expansion of Mobile-Based Businesses Mobile applications and mobile-first strategies are driving digital entrepreneurship, especially in regions with high smartphone usage.
6. Emphasis on Cybersecurity and Data Privacy With growing digital transactions, businesses are prioritizing secure systems and compliance with data protection regulations to build customer trust.
7. Growth of Social Media and Influencer Marketing Social platforms are evolving into major business tools, enabling entrepreneurs to market products, build communities, and engage customers directly.

Strategies Used for Developing Digital Entrepreneurship

- Finding of new business ideas
- Latest technology usage like 5G, AI and more
- Awareness with digitalization
- Monitoring the economic strategies like financial crisis, government policies.
- Innovative products, services or processes

ISBN : 978-93-6163-366-9

- Provide financial support through financial assistance like commercial banks and social media support.
- Give importance to customer feedback
- Identifying and implementing the solutions for problems
- Continuous process improvement (CPI) regarding current market

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DIGITAL ENTREPRENEURSHIP

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Abstract

Digital entrepreneurship is an essential driver within the innovation system. It changes the structure, aims, and networking mechanisms of the overall business system and, ultimately, affects the various levels and dimensions of the innovation system. Bringing inevitable changes to the innovation system, digital technologies may not only provide new business opportunities but also be disruptive and cause new vulnerabilities. In order to gain a rigorous understanding of the hybrid concept of digital entrepreneurship and its role within the transformation of the innovation system, we conducted a systematic literature review. The results of 52 core papers allow for the identification of key categories of digital entrepreneurship and also its differentiation from other types of business activities. The analysis leads to the distinction of the determinants of digital entrepreneurship within three core dimensions of the innovation system, which encompass the entrepreneur (including, e.g., behavioral, competence. and mentality patterns, as well as personal outcomes and consequences of entrepreneurial activity), the entrepreneurial process (including activities that concern digitalization in organizational management processes, transformations within strategic and operational activities, and digital start-up establishment), and its relevant ecosystem (which encompasses, among others, the influence that external infrastructure and institutions have on digital entrepreneurship development). The systematization of the existing literature is highly relevant for future research that aims to understand the interrelations between the transformation of entrepreneurial structures within innovation systems as well as the socioeconomic system in general. Such understanding requires further extended research in fields related to method, content, and theory.

Introduction

We live in a technologically advanced age. To reach out to customers and provide excellent service, any company, no matter how large or small, needs a digital presence. Massive growth in digital entrepreneurship has been enabled by the availability of a plethora of digital tools and services. Due to the overwhelming amount of information that has been spread on different channels, new startups are springing up all over the world. Customers are still on the lookout for the 'next best thing,' so there is a lot of space for new companies these days. While startups need some initial financing, overhead costs can be minimised in a number of ways. Co-working spaces, for example, are common these days because they allow you to open your own office without having to own a house. The digital entrepreneurship movement has taken off, resulting in a huge increase in the number of young and professional entrepreneurs with strong technical skills. In the years ahead, it can only get better. Another thing to keep in mind is how the world of technology is continually (and quickly) changing. This gives young entrepreneurs an edge because they can keep up with trends more easily than their elders. Without a lot of connections or money, you can start a successful business. This is because there are a plethora of low-cost, high-impact resources available to assist emerging digital entrepreneurs in their endeavours.

Digital Entrepreneurship

Digital entrepreneurship consists of creating a business on the Internet, selling services or products online, without the need to invest in physical spaces. A few examples of digital businesses are online courses, e-commerce, blogs, YouTube channels, and technological solutions in general. Digital entrepreneurship is a concept that explains how entrepreneurship

ISBN : 978-93-6163-366-9

can evolve, as business and society continue to be changed by digital technologies. Digital entrepreneurship highlights developments in entrepreneurial practise, philosophy, and education.

Common Characteristics of Digital Entrepreneurship

A strong digital entrepreneur, on the other hand, possesses those characteristics. He is able to compete and remain ahead of the game because of these characteristics.

1. **Digital Entrepreneurship Involves Planning**

The value of foresight and preparation cannot be overstated. It's important to remain focused on your objectives, build a crystal clear strategy and plan, and keep going in the right direction. No company has ever achieved by attempting to do all at once. Building a stable base necessitates meticulous preparation, vision, and strategizing.

2. **Digital Entrepreneurship Involves Effective Communication**

If you are good at organising and articulating your ideas and opinions, you will find it easier to succeed as a digital entrepreneur. It's not enough to have a bright idea; you still need to be able to communicate it clearly to others.

This is particularly relevant when engaging with corporate leaders and potential investors. It's also crucial when working with coworkers and business associates.

3. **Digital Entrepreneurship Involves Adaptability**

Things don't always go according to plan. As a digital entrepreneur, you must be able to adjust to new situations and problems that will undoubtedly arise.

It's futile to be stubborn in your concentration if you learn that something isn't quite correct. You must be able to comprehend each particular circumstance and make necessary changes to your strategy as needed.

4. **Digital Entrepreneurship Requires Knowledge**

Entrepreneurs are still learning new things. This learner attitude is what encourages them to broaden and grow their companies. Having a good understanding of your domain or business can help you gain insight into your customers and how they act. You can only create an effective marketing campaign for your company if you understand how your customers think. Keeping up with the learning curve isn't always easy. This is particularly true for digital niches like SEO, which are constantly evolving. This is where seeking dependable partners with the requisite industry expertise comes in handy. White Label SEO services are a perfect way for digital marketing companies to broaden their SEO services quickly.

5. **Digital Entrepreneurship Involves Seeking New Opportunities**

As an entrepreneur, you must always be on the lookout for new opportunities and innovations. You will be able to prepare yourself to recognise and seize new business opportunities that will broaden your horizons as you continue to learn and develop.

6. **Digital Entrepreneurship Requires You To Be Tech-Savvy**

Digital entrepreneurship necessitates a thorough understanding of the technical world in which you operate. Understanding how each technology interacts with other technologies will help you better consider the possibilities for your business.

7. **Digital Entrepreneurship Learns From Hindsight**

It's important to look back and learn from your mistakes when you first started out. Keep in mind the things you've learned. Using what you've learned to show others and yourself how to cope with problems more efficiently. There is no substitute for experience as a teacher.

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8. Digital Entrepreneurship requires Grit

It's just a matter of time before things get tough. That is when you must take over and act. Pure grit and dedication will help you conquer challenges, stay ahead of the game, and accept defeats with grace. These are only a few of the attributes that a good digital entrepreneur must possess. Even if you don't possess any of the attributes mentioned above, make an effort to develop on a regular basis.

Tips to Become Successful Digital Entrepreneur

- Possess an entrepreneurial mindset. Even if it's just a side hustle to supplement your income, your mental state will affect your creativity and motivation to improve sales and remain loyal to your customers.
- Keep the company's expenditures under check. Even if your expenses are minor, getting them all written down and up to date prevents you from being overwhelmed by them. Don't sell just to pay your bills from your digital company.
- Plan and set objectives based on the project's emphasis. If your goal is to make a living as an Affiliate solely by sales, consider what your optimal success and results will be in the coming months and years – and, of course, keep track of your progress on a regular basis.
- Develop your sales and marketing skills, as they are always changing. To put it another way, you should always be exploring new targeting methods, success metrics, content management, monetization, and so on.
- Don't get discouraged; instead, reflect on the lessons you've learned from your weaknesses and mistakes.
- Make an effort to communicate with other entrepreneurs who can help you share ideas, form alliances, and inspire you. In the corporate world, networking is important, and this is true for digital companies as well.

Challenges of Digital Entrepreneurship

Nowadays, corporations are more likely to put their online projects first. Retail companies are booming thanks to social networking sites, and whole businesses are being founded solely on the basis of websites and apps. Even though both of these things support our economy, there are some disadvantages. There is also a lack of appropriate legislation and regulations governing these online businesses. They operate independently and without supervision, making any action against them challenging, and eventually putting customers at risk. Theyare often involved in illegal activities but are never prosecuted. E-commerce would suffer as a result, and entrepreneurs would be affected. Within the world, effective e-commerce rules and regulations should be enforced. Otherwise, companies will struggle in the long run due to a lack of accountability and transparency. It is long past time for the government to step in and support the online marketplace. Entrepreneurs should be given the ability to obtain bank loans in addition to addressing the question of trustworthiness. Financial companies, for example, have yet to accept an intellectual property website as an asset. E-traders are still refused trade licences, which makes it impossible for them to grow their companies. Nonetheless, these are attracting FDIs in order to expand. As a result, digital entrepreneurship should be promoted in every way possible.

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Start-Up Business Ideas for Digital Entrepreneurship

Ideas for a New Company Entrepreneurship in the Digital Age:- New business models and prospects for entrepreneurs who dare to question the status quo have emerged as a result of the digital industry. You've probably heard of bloggers, youtubers, and other digital entrepreneurs who were inspired to take their first steps on the Internet and went on to create prosperous and profitable companies. Well, this sector is rapidly expanding, and an increasing number of entrepreneurs are venturing into profitable Internet businesses. If you're a digital entrepreneur who wants to start your own online company, we've put together a list of 10 business ideas to get you started.

- **Online Consulting**

You will work as an advisor and consultant if you have extensive expertise and experience in a particular field. Setting a price per hour (or fraction of time) for your services is critical. You may also build discount plans and bundles for customers that need several hours of your services.

- **Virtual Courses**

You can develop and market your own online course if you are passionate about teaching and have expertise and experience in a practical topic. What is the best way to make money from an online course? The income is created either through the selling of the course or through the collection of a monthly subscription fee for access to the course and other perks.

You can use a CMS like Chamilo, Moodle, WordPress, or Google Course Builder to publish the course; in this case, you'll need hosting and your own domain. Anotherchoice is to use platforms such as Udemy, Floqq, and Cursopedia, which allow you to publish your course using the tools they have developed.

- **Digital Strategy and Social Networking Administration**

You can provide management of social networks and digital media for businesses and independent professionals if you are knowledgeable about digital strategy and have gained knowledge and experience with various platforms and resources for online marketing. The concept is to serve as a service provider for your customers, creating content, managing promotional campaigns, interacting with customers, and producing performance reports.

- **Sale of Digital Infoproducts**

Infoproducts are information and knowledge-based goods, as the name implies eBooks, online courses, membership to platforms with tools and knowledge, Templates, Plugins, Audiobooks, Videos, Apps, and Applications are just a few examples of digital infoproducts you can build. You can sell your product on your own website or on sites like Amazon, eBay, and others once you've developed it.

- **Offer Services as Freelance**

If you have specialised technological skills that few people possess, you can be certain that someone would be able to pay for your services. Designers, programmers, and other people who work on their own use this business model. How do you eke out a living as a freelancer? Your customers pay you for your time, expertise, and experience. Some freelancers charge by the project's features, while others charge by the amount of time they spend designing it.

- **Creation of Mobile Applications for Small Businesses**

Similarly to how all businesses needed a website a few years back, more and more businesses today want their own smartphone application. Large companies typically employ mobile application development companies, but small businesses are also searching for cost-effective

solutions that enable them to access their customers' mobile devices without difficulty. This concept is to use application development tools like Tu-App.net to create simple applications in a short amount of time so that small businesses can sell them to their customers.

- **Dropshipping**

Dropshipping is a business model in which the vendor sells goods from third parties (suppliers) without keeping them in stock. The retailer is in charge of making the sale and handling the shipping so that you can meet your final customer directly from your supplier (wholesale seller) under the retailer's own name. This business model is perfect because it allows you to sell items that are only available in foreign stores and are not widely available in local markets. On the internet, for example, you will find Chinese and American stores that operate under this model.

- **Sale of personalized t-shirts**

Customers will be able to make custom designs for their shirts with this company. While it seems to be a simple concept, there are many factors to consider in order to make the company successful:

T-shirt supplier: You'll need to find a wholesaler that can provide you with high- quality shirts at a reasonable price.

Prints: You can either buy the equipment to stamp the shirts yourself or hire a company to do it for you. Create an account and decide which choice is best for you to begin with.

Platform: Make sure you have tools that make it easy to customise the designs. Logistics: In order for your company to be successful, you'll need an ally in logistics who can help you ship your product at a fair price; otherwise, shipping could be more costly than the product.

- **Digital Magazine**

If you're passionate about a particular topic, you might want to consider starting your own digital magazine. Profits are produced in two ways: advertisement sales inside the magazine and magazine subscription fees. You'll need an email marketing network to deliver the magazine to your subscribers on a regular basis for this business model. It's also a good idea to create a website to advertise the magazine and collect subscriptions.

- **Alternative subscription food**

Alternative food consumption is becoming more common. Vegetarian, vegan, raw food, and other eating habits are becoming more common. However, alternative food value propositions are difficult to come by in some areas. This concept is to include subscription models in which consumers are guaranteed breakfast, lunch, and/or meals in their home or office on a daily or weekly basis, based on their eating habits.

Top Trends Shaping Digital Transformation

In a world that is becoming increasingly digitally based, IT's position is more important than ever. The demand on businesses to remain competitive and build connected experiences is growing.

1. **The digital-ready culture**

To satisfy growing consumer needs and build new revenue sources, businesses are under more pressure to digitise services rapidly and at scale.

2. **Democratization of innovation**

Users in the line of business are attempting to build digital consumer interactions more quickly. By encouraging the company to self-serve and produce solutions faster, IT will help to

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drive cultural change.

3. Composable enterprise

Hyper-specialization has spawned a slew of new applications, prompting businesses to adopt a composable enterprise to become more agile — one in which digital capabilities can be assembled from existing apps through APIs rather than being constructed from the ground up each time.

4. Automation

Automation is being used by businesses to increase operating productivity and enhance business processes. APIs are important for automating processes and increasing productivity.

5. API security

The average enterprise has 900 applications. The proliferation of new endpoints opens up new entry points for hackers, necessitating strong API protection.

6. Microservices

Microservices are being used by businesses to quickly create new customer experiences. Service mesh technologies will be needed by companies deploying microservices to output.

7. The data divide

Organizations are searching for quicker ways to unlock data and gain information in order to keep up with changing consumer demands. The ability to unlock, evaluate, and act on data will become foundational to growth in 2021, separating companies from their rivals and customers.

8. Data analytics

To transform consumer interactions, businesses are investing in data analytics. The importance of data analytics can be determined by the data that is provided to them.

Conclusions

In this digital era, we are growing. The entrepreneurial dream has become a reality as marketing expenses have become more and more manageable. The new approach is authenticity and creativity, and all of this can be accomplished by digital entrepreneurship. The online world has also given entrepreneurs the opportunity to work with and collaborate with similar companies. Instead of competing against each other, the integrated approach seems to be much more effective when growing your business. You can now build a network with like-minded entrepreneurs and collaborate. Naturally, more people are turning to the digital environment for income and job opportunities, particularly because many more conventional industries have been severely impacted by the Coronavirus pandemic. The world of digital entrepreneurship appeals to me because it allows us to work from home and has more versatility.

ISBN : 978-93-6163-366-9

DIGITALIZATION IN ENTREPRENEURSHIP

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Introduction

Developing countries like India are in a unique position:

Economies are partially industrialized, with agriculture dominating. Digital infrastructure is rapidly growing, with access to:, Smartphones, Broadband internet ,Cloud services , 4G/5G, Digital media platforms (Facebook, Twitter, YouTube, etc.) This mix of traditional economy and advanced digital tech creates opportunities and challenges.

Present Scenario

Indian software engineers are doing great in the tech world. They're leading the way in software development and contributing to open-source projects. However, this digital growth has a downside. Companies like Uber and Ola are taking away profitable business from traditional taxi services, causing problems for many drivers.

The taxi industry is struggling to compete and has even protested violently. India is doing well in tech, though, with good internet, skilled workers, and government support for digital growth. This is helping India become a big player in the digital world.

Digitalization and e-Commerce

Digitalization is making things better in India:

- Improves efficiency and productivity
- Makes services more transparent and accountable
- Examples:
- E-commerce improves logistics
- Digital payments are flexible and transparent
- Digital IDs prevent fraud
- Online learning platforms increase literacy

India's IT sector is big, and digitalization is now helping the domestic market too. When you use apps like Ola, lots of data flows happen in the background, like:

- Finding the cab's location
- Showing the driver where to pick you up
- Giving the best route to your destination.

Value Process in Digitalization

Digitalization changes how things work in three main ways:

1. Flexible devices: Digital devices can be reprogrammed to do different things, breaking the link between a product and its function.
2. Combining info: Digital info can be read and mixed with other digital info (like text + voice).
3. Smart products: Digital tech can be added to physical products, making them:

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- Programmable
- Addressable
- Able to sense and communicate
- Able to store and track data
- Connectable to other things.

Digitalization changes had Shifted from vertical chains to platform-based ecosystems, the Core tech (platform) + suppliers and users on the periphery , it has enabled mixing and matching of features (combinatorial innovation)

Example: Smart shoe + smart watch

- Example: Google Maps + carpooling service
- -Moreover, digitalisation has Made value creation more horizontal, network-based, and flexible and it Reduces cost of creating new product/service bundles

Digitalization opens up opportunities for businesses Process outsourcing and offshoring help new ventures, for Software as a Service (SaaS) and cloud apps make scaling up easy. New ventures can quickly grow and go global if they succeed

Digitalization has impacts on Startups, Scaling up and Internationalization

Conclusion

Digitalization (Web 2.0) has enabled Lean startup approach to entrepreneurship, has created New Venture Accelerator movement, changed how entrepreneurs find and pursue opportunities, impacts all industries, not just IT/Internet, Physical products connect to digital ecosystems, Internet is essential for any business model. Created a global entrepreneurial culture and ecosystem

ISBN : 978-93-6163-366-9

E-COMMERCE AND PLATFORM

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Abstract

This analysis indicates the impact of e-commerce platforms persuade ease of use, technological efficiency, trust and consumer purchasing behaviour. By deploying primary data and conducting factor analysis, the study identifies the essential factors that structures customer perceptions. The findings demonstrate that intuitive navigation, precise product details, secure payment options, order tracking features, competitive pricing, and promotional deals significantly impact buying decisions. The research concludes that trust and the reliability of the platform are the most crucial factors for maintaining customer satisfaction and encouraging long-term engagement with e-commerce platforms.

Introduction

E-Commerce is a process of buying and selling through internet/tech, state the presentation's goal and preview key section like B2B/B2C models. It improves seal-time transactions globally search and it helps for people convenience.

According to Mahatma Gandhiji "Customer is a King" in the E-Commerce. It undertakes to full fill the need of the king by giving an avenue to elect the supplier and the customer should proficient to demand for the quality product. In India Ecommerce business is emerging with around 260-300 million users. Digital Images of the product/Service stimulate the customer and induce to buy the product that is the merit of the E-Commerce. Digital transaction supports a lot for E-Commerce Platform. E-Commerce platform complies with the demand of the customer, giving resource to compare the price, easy availability and on trend. E-Commerce offers a globalised products/Service.

Review of Literature

Chaffey and Ellis-Chadwick (2019) emphasized that e-commerce platforms enable firms to leverage data analytics, digital marketing, and omnichannel strategies to enhance business performance. The authors suggested that platform-driven insights into customer preferences help organizations optimize pricing, promotions, and inventory management. Their research concluded that strategic use of e-commerce platforms contributes significantly to sustained competitive advantage in dynamic markets.

Laudon and Traver (2021) noted that the growth of e-commerce platforms has transformed traditional shopping behavior by offering convenience, wider product choices, and personalized recommendations. The authors argued that platform features such as product reviews, recommendation algorithms, and efficient logistics significantly influence purchase decisions. Their findings suggest that well-designed e-commerce platforms not only improve customer experience but also strengthen customer loyalty and long-term engagement.

ISBN : 978-93-6163-366-9

Objective

- To examine how e-commerce platforms reconfigures the business models and enrich the expansive market to access.
- To assess the heterogeneous routes in which digital platforms affect consumer buying behaviour and the processes involved in making purchasing decisions.
- To analyse the strategic effects of platform-driven e-commerce on company performance, competitiveness, and value generation.

Research Methodology

In this study Descriptive research type is used with structured questionnaire, and cluster sampling technique used, with the 75 number of sample size. To undergo the study Factor analysis research tool has been used.

Analysis: Factor Analysis for Ease Usage of E-Commerce Platform with Efficiency and Technology(Factor-1)

Bartlett's Test

The dimensionality of Ease Usage of E-Commerce Platform with Efficiency and Technology examined using factor analysis based on nine individual statements and the reliability of the subsequent factor structure tested for internal consistency for grouping the items. The nine factors of Ease Usage of E-Commerce Platform with Efficiency and Technology statements are related to the following:

1. E- Commerce sites are user-friendly and easy to navigate.
2. The product search and filtering features save me time.
3. Digital platforms offer precise product details.
4. Online payment options are straightforward and trustworthy.
5. Mobile applications for e-commerce platforms are easy to use.
6. These platforms provide seamless order tracking and delivery notifications.
7. AI-driven suggestions help me discover appropriate products.
8. Customer feedback and ratings affect my purchasing choices.
9. E-commerce platforms lessen the effort needed for shopping

Table-1 KMO and Bartlett's Test of Ease Usage of E-Commerce Platform with Efficiency and Technology

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.522
Bartlett's Test of Sphericity	Approx. Chi-Square	219.764
	Df	36
	Sig.	.000

Source: Output generated from SPSS

High value of KMO (0.522> .05) indicates that factor analysis is useful for the present data. The significant value for Bartlett's test of Sphericity is 0.000 and it is less than 0.05 which indicates that exists significant relationships among the variables. The resultant value of KMO test and Bartlett's test indicates that the present data is useful for factor analysis.

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Table – 2 Total variance explained for Ease Usage of E-Commerce Platform with Efficiency and Technology

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.665	29.611	29.611	2.665	29.611	29.611	2.588	28.759	28.759
2	2.055	22.832	52.443	2.055	22.832	52.443	1.893	21.028	49.787
3	1.433	15.925	68.368	1.433	15.925	68.368	1.672	18.581	68.368
4	.928	10.308	78.676						
5	.689	7.650	86.326						
6	.458	5.089	91.415						
7	.344	3.819	95.234						
8	.265	2.941	98.175						
9	.164	1.825	100.000						
Extraction Method: Principal Component Analysis.									

Source: Output generated from SPSS

All the statements of the Ease Usage of E-Commerce Platform with Efficiency and Technology are loaded on the nine factors. The total variance accounted for, all the two factors with Eigen value greater than 1 is 68.368 percent and the remaining variance is explained by other variables. Between these two factors, the first factor accounts for around 28.759 percent of variance, which is the prime criteria considered in Ease Usage of E-Commerce Platform with Efficiency and Technology.

Table – 3 Rotated Component Matrix of Ease Usage of E-Commerce Platform with Efficiency and Technology

Rotated Component Matrix	Component		
	1	2	3
E- Commerce sites are user-friendly and easy to navigate.	**.799**	-.348	.105
The product search and filtering features save me time.	**.774**	.210	-.212
Digital platforms offer precise product details.	.149	**.875**	-.086
Online payment options are straightforward and trustworthy.	.639	**.517**	.132
Mobile applications for e-commerce platforms are easy to use.	.385	**.672**	-.150
These platforms provide seamless order tracking and delivery notifications.	.145	-.019	**.845**
AI-driven suggestions help me discover appropriate products.	.007	.476	**.481**
Customer feedback and ratings affect my purchasing choices.	.324	-.101	**.815**
E-commerce platforms lessen the effort needed for shopping.	**.804**	-.073	-.067
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 5 iterations.			

Source: Output generated from SPSS

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The statements are converted into 3 factors using factor analysis.
The following three aspects related to E-Commerce and Platform are converted into a single factor.

1. E- Commerce sites are user-friendly and easy to navigate.
2. The product search and filtering features save me time.
3. E-commerce platforms lessen the effort needed for shopping.

The following three aspects related to E-Commerce and Platform are converted into a single factor.

1. Digital platforms offer precise product details.
2. Online payment options are straightforward and trustworthy.
3. Mobile applications for e-commerce platforms are easy to use

The following three aspects related to Ease Usage of E-Commerce Platform with Efficiency and Technology are converted into a single factor.

1. These platforms provide seamless order tracking and delivery notifications.
2. AI-driven suggestions help me discover appropriate products.
3. Customer feedback and ratings affect my purchasing choices.

Apart from that, the dimension "Ease Usage of E-Commerce Platform with Efficiency and Technology" comprises 9 statements. Out of these nine statements, three statements contribute more towards E-Commerce and Platform. The statements are (1) E- Commerce sites are user-friendly and easy to navigate, (2) Digital platforms offer precise product details and (3) These platforms provide seamless order tracking and delivery notifications. This implies that these E-Commerce platforms have created much awareness among the consumers.

Factor Analysis for Trustworthy& Buying Impact in E-Commerce Platform (Factor 2)
KMO and Bartlett's Test

The dimensionality of Trustworthy& Buying Impact in E-Commerce Platform examined using factor analysis based on nine individual statements and the reliability of the subsequent factor structures was tested for internal consistency of grouping the items. The nine factors of Trustworthy& Buying Impact in E-Commerce Platform statements are related to the following:

1. I trust e-commerce platforms for secure transactions.
2. Return and refund policies increase my confidence in online shopping.
3. Competitive pricing motivates me to buy from online platforms.
4. Discounts and promotional offers influence my purchase decisions.
5. Brand reputation of the platform affects my choice.
6. I feel safe sharing personal information on e-commerce platforms.
7. Platform services meet my expectations consistently.
8. E-commerce platforms offer better value than offline stores.
9. I frequently prefer e-commerce platforms for regular purchases

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Table-4 KMO and Bartlett's Test of Trustworthy& Buying Impact in E-Commerce Platform

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.586
Bartlett's Test of Sphericity	Approx. Chi-Square	369.461
	Df	36
	Sig.	.000

Source: Output generated from SPSS

High value of KMO (0.586> .05) indicates that factor analysis is useful for the present data. The significant value for Bartlett's test of Sphericity is 0.000 and it is less than 0.05 which indicates that exists significant relationships among the variables. The resultant value of KMO test and Bartlett's test indicates that the present data is useful for factor analysis.

Table – 5 Total variance explained for Trustworthy& Buying Impact in E-Commerce Platform

Total Variance Explained						
Component	Initial Eigen values			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.849	42.771	42.771	3.107	34.527	34.527
2	1.561	17.343	60.114	1.768	19.646	54.173
3	1.204	13.378	73.493	1.739	19.320	73.493
4	.829	9.214	82.707			
5	.681	7.565	90.272			
6	.351	3.899	94.171			
7	.273	3.036	97.207			
8	.209	2.325	99.532			
9	.042	.468	100.000			
Extraction Method: Principal Component Analysis.						

Source: Output generated from SPSS

All the statements of the Trustworthy & Buying Impact in E-Commerce Platforms are loaded on these nine factors. The total variance accounted for, all the two factors with Eigen value greater than 1 is 73.493 percent and the remaining variance is explained by other variables. Between these two factors, the first factor accounts for around 34.527 percent of variance, which is the prime criteria considered in Trustworthy & Buying Impact in E-Commerce Platform.

Table – 6 Rotated Component Matrix of Trustworthy& Buying Impact in E-Commerce Platform

Rotated Component Matrix[a]	Component		
	1	2	3
I trust e-commerce platforms for secure transactions.	**.794**	.041	.020
Return and refund policies increase my confidence in online shopping.	**.524**	-.233	.506
Competitive pricing motivates me to buy from online platforms.	.284	.098	**.784**

ISBN : 978-93-6163-366-9

Discounts and promotional offers influence my purchase decisions.	-.005	**.927**	-.084
Brand reputation of the platform affects my choice.	.112	**.485**	-.735
I feel safe sharing personal information on e-commerce platforms.	**.544**	-.559	.332
Platform services meet my expectations consistently.	**.851**	-.305	.209
E-commerce platforms offer better value than offline stores.	**.518**	-.449	-.369
I frequently prefer e-commerce platforms for regular purchases.	**.906**	.047	.177
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 6 iterations.			

Source: Output generated from SPSS

The statements are converted into 3 factors using factor analysis.
The following six aspects related to Trustworthy& Buying Impact in E-Commerce Platform are converted into a single factor.

1. I trust e-commerce platforms for secure transactions.
2. Return and refund policies increase my confidence in online shopping
3. I feel safe sharing personal information on e-commerce platforms.
4. Platform services meet my expectations consistently.
5. E-commerce platforms offer better value than offline stores.
6. I frequently prefer e-commerce platforms for regular purchases

The following two aspects related to Trustworthy& Buying Impact in E-Commerce Platform converted into a single factor.

1. Discounts and promotional offers influence my purchase decisions.
2. Brand reputation of the platform affects my choice

The following one aspect related to Trustworthy& Buying Impact in E-Commerce Platform converted into a single factor.

1. Competitive pricing motivates me to buy from online platforms.

Apart from that, the dimension "Trustworthy & Buying Impact in E-Commerce Platform" comprises 9 statements. Out of the nine statements, three statements contribute more towards Trustworthy & Buying Impact in E-Commerce Platform. The statements are (1) I trust e-commerce platforms for secure transactions, (2) Discounts and promotional offers influence my purchase decisions (3) Competitive pricing motivates me to buy from online platforms. This implies that E-Commerce platform have created more reliability among the customers.

Findings

- Intuitive interfaces, precise product information, and smooth order tracking greatly affect customer satisfaction.
- Safe payment processes, special offers, and attractive pricing play a crucial role in purchasing decisions.

- Problems like slow refunds, fraudulent reviews, and discrepancies between product descriptions diminish customer confidence.
- Trustworthiness and dependability are essential factors for repeat purchases on online shopping sites.

Suggestion

- Need more Reliability.
- Need more return option& COD facility.
- Delay in refund & delivery.
- Not wort up to the price.
- Low product accuracy. (Image does not suit to the received one)
- Fake reviews.

Conclusion

Government must take steps to regulate the rules and regulation of the E-Commerce Platform to safeguard the customer. It is the responsibility of the business man to follow the ethics of business and it will increase the digital literacy and trust among the customer.

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ISBN : 978-93-6163-366-9

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