

ENTREPRENEURSHIP IN THE AGE OF AI

**Paradigms of Sustainability
and Social Innovation**

VOLUME-1



Editors

PROF. (DR.) AMARJEET KAUR MALHOTRA

PROF. (DR.) SANJAY KUMAR

DR. SURABHI GOYAL

DR. VINOD KUMAR



PEN TO PRINT PUBLISHING

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Government of Haryana

Prof. Ashim Kumar Ghosh



हरियाणा राज भवन,
चण्डीगढ़ - 160019

HARYANA RAJ BHAVAN,
CHANDIGARH - 160019

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Dated- 20.11.2025

Message

From the Governor Government of Haryana

It gives me immense pleasure to extend my warm congratulations to the Department of Management, Gurugram University, Gurugram, for its endeavour in collaborating with Central Michigan University, USA, and jointly organizing the 5th International Conference on 'Entrepreneurship in the Age of AI: Paradigms of Sustainability and Social Innovation,' scheduled for December 11-12, 2025.

I appreciate the thoughtful choice of theme by Gurugram University for IC-MGMT 2025. This theme is particularly timely, as the world is experiencing rapid technological transformation, and artificial intelligence is not only reshaping industries but also redefining human enterprise.

Entrepreneurship has always been the driving force of progress. In the present era, its role is even more crucial in addressing complex challenges such as climate change, social equity, and the ethical use of technology. By integrating AI-driven innovation with the principles of sustainability and social responsibility, entrepreneurs can pave the way for a future that is both prosperous and just.

I commend the organizers for bringing together distinguished scholars, industry leaders, policymakers, and young minds to deliberate on this vital theme. The exchange of ideas at this conference will undoubtedly inspire novel solutions and collaborations that can shape the next era of entrepreneurial leadership.

I extend my best wishes to Vice Chancellor Prof. Sanjay Kaushik and the organizing team for the successful conduct of the conference and hope that its deliberations will contribute significantly towards building a more sustainable, inclusive, and innovation-driven society.

(Prof Ashim Kumar Ghosh)

नायब सिंह
NAYAB SINGH



**मुख्य मन्त्री, हरियाणा,
चण्डीगढ़।**

**CHIEF MINISTER, HARYANA,
CHANDIGARH**

Dated **20-11-2025**

Message

**From the Chief Minister
Government of Haryana**

I am delighted to learn that Gurugram University, Gurugram (Haryana) in collaboration with Central Michigan University, USA, is organizing the 5th International Conference on “Entrepreneurship in the Age of AI: Paradigms of Sustainability and Social Innovation (IC-MGMT-2025)” on December 11-12, 2025 in Gurugram.

It is indeed commendable that this prestigious conference, jointly organized by Gurugram University and Central Michigan University, USA brings together two esteemed institutions and exemplifies the spirit of global academic partnership. In today’s rapidly evolving world, Artificial Intelligence is not only redefining industries but also reshaping societies. It presents unprecedented opportunities for entrepreneurs to innovate, while also placing upon us the responsibility to ensure that such innovation is ethical, inclusive, and sustainable.

I am confident that this international conference will provide a valuable platform for academicians, researchers, practitioners, government officials and students to share their insights and perspectives on these critical themes. May the deliberations inspire new ideas, foster stronger collaborations and lead to transformative outcomes for society.

I congratulate Gurugram University in particular and Central Michigan University as well for this meaningful and timely collaboration.

My best wishes.


(Nayab Singh)

महीपाल ढांडा
Mahipal Dhanda



विद्यालय एवं उच्चतर शिक्षा, अभिलेखागार तथा
संसदीय मामले मंत्री, हरियाणा
School & Higher Education, Archives &
Parliamentary Affairs Minister, Haryana

Message

From the Education Minister
Government of Haryana

मुझे यह जानकर अत्यंत हर्ष हो रहा है कि गुरुग्राम विश्वविद्यालय, हरियाणा तथा सेंट्रल मिशिगन यूनिवर्सिटी, अमेरिका द्वारा “Entrepreneurship in the Age of AI: Paradigms of Sustainability and Social Innovation” विषय पर दो दिवसीय संयुक्त अंतरराष्ट्रीय सम्मेलन का आयोजन किया जा रहा है। यह आयोजन वैश्विक स्तर पर शैक्षिक सहयोग और विचार-विनिमय की एक सशक्त मिसाल है, जो न केवल अकादमिक जगत के लिए महत्वपूर्ण है, बल्कि समाज और उद्योग दोनों को लाभान्वित करने वाला है।

वर्तमान समय में आर्टिफिशियल इंटेलिजेंस (AI) जीवन के हर क्षेत्र में परिवर्तनकारी भूमिका निभा रहा है। चाहे वह शिक्षा हो, स्वास्थ्य हो, कृषि हो अथवा उद्योग—AI ने दक्षता, पारदर्शिता और नवाचार को नई दिशा प्रदान की है। उद्यमिता के क्षेत्र में इसकी महत्ता और भी बढ़ जाती है क्योंकि यह नई संभावनाओं के साथ-साथ नई चुनौतियाँ भी प्रस्तुत करता है। आज उद्यमिता केवल लाभ कमाने तक सीमित नहीं है, बल्कि यह सतत विकास, पर्यावरण संरक्षण और सामाजिक उत्तरदायित्व का भी वाहक बन चुकी है।

इस सम्मेलन का विषय अत्यंत सम्योचित है, क्योंकि यह हमें यह सोचने का अवसर देता है कि किस प्रकार तकनीकी प्रगति को सामाजिक नवाचार और स्थायित्व (sustainability) के साथ जोड़ा जा सकता है। भविष्य का उद्यमी वही होगा जो प्रौद्योगिकी का उपयोग न केवल अपनी सफलता के लिए करे, बल्कि समाज और प्रकृति के हितों को भी ध्यान में रखे। यही दृष्टिकोण “नए भारत” और “नए हरियाणा” के निर्माण में सहायक सिद्ध होगा।

हरियाणा सरकार शिक्षा और शोध को नवाचार की दिशा में अग्रसर करने के लिए निरंतर प्रयासरत है। राज्य के विश्वविद्यालयों और महाविद्यालयों को स्टार्टअप्स, इनक्यूबेशन सेंटर और उद्योग-संस्थान सहयोग जैसे कार्यक्रमों के माध्यम से प्रोत्साहित किया जा रहा है। यह हर्ष का विषय है कि गुरुग्राम विश्वविद्यालय ने अंतरराष्ट्रीय संस्थान सेंट्रल मिशिगन यूनिवर्सिटी के साथ मिलकर इस प्रकार का आयोजन किया है, जो विद्यार्थियों और शोधकर्ताओं को वैश्विक दृष्टिकोण तथा प्रतिस्पर्धात्मक क्षमता प्रदान करेगा।

इस दो दिवसीय सम्मेलन से न केवल अकादमिक जगत में विचार-विमर्श को नई ऊर्जा मिलेगी, बल्कि उद्योग और समाज के बीच सेतु का निर्माण भी होगा। मुझे विश्वास है कि इसमें प्रस्तुत किए गए शोध-पत्र, विचार और सिफारिशें युवाओं के लिए प्रेरणास्रोत बनेंगी और उन्हें भविष्य की चुनौतियों का सामना करने के लिए तैयार करेंगी।

युवा अपनी मेहनत, प्रतिबद्धता और नवाचार के लिए विश्वभर में पहचान बना रहे हैं। ऐसे सम्मेलन उन्हें और अधिक अवसर और दिशा प्रदान करेंगे। यह पहल न केवल राज्य की शिक्षा प्रणाली को सुदृढ़ करेगी बल्कि राष्ट्रीय और अंतरराष्ट्रीय स्तर पर उद्यमिता और नवाचार का केंद्र बनाने में भी योगदान देगी।

मैं गुरुग्राम विश्वविद्यालय और सेंट्रल मिशिगन यूनिवर्सिटी के इस सार्थक प्रयास के लिए विश्वविद्यालय के कुल गुरु प्रोफेसर संजय कौशिक जी को हृदय से बधाई देता हूँ। साथ ही, सम्मेलन के सफल संचालन और प्रतिभागियों की समृद्ध व प्रेरणादायी भागीदारी की कामना करता हूँ। मुझे विश्वास है कि यह आयोजन शिक्षा और उद्यमिता के क्षेत्र में नए प्रतिमान स्थापित करेगा और आने वाली पीढ़ियों के लिए प्रेरणा का स्रोत बनेगा।

महीपाल ढांडा
(महीपाल ढांडा)

Education Minister

Government of Haryana, Haryana



GURUGRAM UNIVERSITY, GURUGRAM (HARYANA)

(A State Govt. University established under Haryana Act 17 of 2017)

Sector -51, Gurugram (Haryana)- 122003 web: www.gurugramuniversity.ac.in

Phone: 0124-2788000 e-mail: vc@gurugramuniversity.ac.in

Prof. (Dr.) Sanjay Kaushik
Vice Chancellor



Ref: VC/2025/158

Date : 26.11.2025

Message

From the Conference Patron Vice Chancellor

It gives me immense pleasure to extend my heartfelt greetings to all participants from across the globe on the occasion of the two-day Joint International Conference on "Entrepreneurship in the Age of AI: Paradigms of Sustainability and Social Innovation", being jointly organized by the Department of Management and College of Business Administration at Central Michigan University, USA.

This conference is a significant milestone in our academic journey, as it symbolizes the spirit of collaboration, innovation, and global partnership. The theme is highly relevant in today's times, where Artificial Intelligence is transforming not only business models but also the way societies and economies function. The integration of AI with entrepreneurship opens up new frontiers of growth, but it also places upon us the responsibility of ensuring that such growth is sustainable, ethical, and socially inclusive.

At Gurugram University, we firmly believe that higher education must go beyond imparting knowledge it must inspire critical thinking, innovation, and responsibility towards society. This joint conference provides a unique platform for scholars, entrepreneurs, industry leaders, policymakers, and students to engage in meaningful dialogue and share diverse perspectives on how technology and innovation can be aligned with the values of sustainability and social well-being.

The collaboration with Central Michigan University reflects our commitment to strengthening academic ties across borders and creating opportunities for our students and faculty to gain global exposure. I am confident that the deliberations over these two days will result in actionable insights, impactful recommendations, and enduring partnerships that will contribute to shaping a future that is both technologically advanced and socially responsible.

I sincerely appreciate the efforts of the organizing committee, distinguished speakers, and participants for their dedication and commitment. I extend my special appreciation to Prof. Amarjeet Kaur, Conference Chair and the Dean of the Faculty of Commerce and Management, for her relentless efforts in upholding the proud tradition of bringing together distinguished intellects from across the globe.

I extend my best wishes for the grand success of this joint international conference and hope it becomes a landmark event in the field of entrepreneurship, innovation, and sustainability.

Prof. (Dr.) Sanjay Kaushik

University New Campus - Kankrola, Sector-87, Gurugram, Haryana -122413

University Campus - Sector-51, Gurugram (Haryana)-122003

Web: www.gurugramuniversity.ac.in

Phone : 0124-2788000, 9870408539 Email : vc@gurugramuniversity.ac.in



Department of Management

GURUGRAM UNIVERSITY GURUGRAM (HARYANA)

(A State Govt. University Established under Haryana Act 17 of 2017)



Message

**From the Conference Chairperson
Dean-FCM**

It is with immense pleasure and pride that I extend a warm welcome to all participants, scholars, researchers, and distinguished delegates to the Two-Day Joint International Conference on “*Entrepreneurship in the Age of AI: Paradigms of Sustainability and Social Innovation*”, jointly organized by Gurugram University, India, and Central Michigan University, USA. This conference marks a significant milestone in fostering International academic collaboration, knowledge exchange, and innovative discourse on entrepreneurship in the rapidly evolving era of Artificial Intelligence.

Artificial Intelligence (AI) has emerged as a transformative force, reshaping industries, economies, and societies at an unprecedented pace. However, it places upon us the responsibility to ensure that technological progress is sustainable, ethical, and socially inclusive. A key focus of this conference is the contribution of AI and entrepreneurship to the United Nations Sustainable Development Goals (SDGs), especially no. 4, 8, 9, 10 & 12. By integrating these goals into entrepreneurial practices, we can achieve meaningful impact across multiple dimensions. I am confident that the deliberations, discussions, and presentations over these two days will generate actionable insights, foster global collaborations, and inspire participants to leverage AI responsibly for sustainable and socially inclusive entrepreneurship.

Once again, I extend a warm welcome to all participants and convey my best wishes for a highly successful, enriching, and intellectually stimulating conference. May this gathering of minds advance innovative solutions, strengthen global academic partnerships, and contribute to building a future where entrepreneurship, AI, and sustainability converge to create lasting positive impact.

I am very grateful to Prof. (Dr.) Sanjay Kaushik, Vice Chancellor, Gurugram University for his continuous support and motivation to organize such a prestigious event of international importance. I would also like to extend many thanks to the sponsors of this event for their generous support.

Finally, I would also like to take this opportunity to extend my heartfelt appreciation to our internal organizing team for their untiring efforts to ensure success to the conference. Their dedication, meticulous planning, and tireless efforts have been instrumental in bringing this conference to fruition. However, if there is any disappointment to any of the participant, I shall solely be held responsible and credit of the success goes to the Team-Department of Management.

Once again, a warm welcome to one and all!

Prof. (Dr.) Amarjeet Kaur
Dean, Faculty of Commerce & Management
Conference-Chair (IC-MGMT-2025)



Message

From the Conference Chairperson

It is a privilege to welcome you on behalf of the College of Business Administration at Central Michigan University (CMU), USA. This conference continues the spirit of international collaboration and reflects our shared commitment to advancing scholarship that serves both business and society.

Around the world, entrepreneurs and organizations are grappling with rapid advances in artificial intelligence, climate change, persistent inequalities, and evolving expectations around social responsibility. Our goal in this conference is to examine how entrepreneurial thinking, empowered by AI and digital technologies, can help create sustainable, inclusive, and human-centered innovations that address these pressing challenges.

I would also like to highlight the strength of our organizing institutions, particularly the College of Business Administration (CBA) at Central Michigan University. CMU was founded in 1892 and has grown into a public doctoral university with high research activity, offering more than 200 academic programs and enrolling thousands of students from across the United States and around the world. In 2024, F1 Hire's *Career Outcome University Ranking*—a data-driven analysis of 275 U.S. universities using federal data on salaries, tuition, and immigration outcomes—ranked Central Michigan University No. 5 in the United States for career outcomes and return on investment for international students, and second in green card approval rates.

Within CMU, the College of Business Administration is accredited in both business and accounting by AACSB International, a distinction held by only a small percentage of business schools worldwide. It offers a comprehensive portfolio of 17 undergraduate majors and multiple graduate programs, including an MBA with emphasis areas in analytics, cybersecurity, finance, information systems, logistics, and project management, serving both full-time students and working professionals.

May these proceedings serve as a valuable resource for academics, practitioners, policymakers, and students who are committed to shaping an entrepreneurial future that is sustainable, inclusive, and socially responsible.

With warm regards,

A handwritten signature in black ink that reads "Sanjay Kumar". The signature is fluid and cursive, with the first name "Sanjay" and last name "Kumar" clearly distinguishable.

Prof. (Dr.) Sanjay Kumar
Associate Dean and Professor of Management
College of Business Administration
Central Michigan University, USA
Conference Chairperson, IC-MGMT-2025



Department of Management

GURUGRAM UNIVERSITY GURUGRAM (HARYANA)

(A State Govt. University Established under Haryana Act 17 of 2017)



Message

**From the Conference Convener
Chairperson-DOM**

It is a moment of great honour to present this Two-Day Joint International Conference on “*Entrepreneurship in the Age of AI: Paradigms of Sustainability and Social Innovation*”, collaboratively organized by Gurugram University, India, and Central Michigan University, USA. This academic initiative reflects our shared commitment to promoting a future where entrepreneurial growth, technological innovation, and social responsibility work hand in hand.

We are delighted to collaborate with Central Michigan University (CMU), a distinguished public research university located in Mount Pleasant, Michigan, USA. With a rich history of academic excellence, CMU is recognized for its global perspective, dynamic learning ecosystem, and strong emphasis on interdisciplinary research. This partnership is a step forward in strengthening international academic engagement and fostering meaningful knowledge exchange across borders.

In today’s technology-driven world, Artificial Intelligence is reshaping how businesses think, operate and interact with society. Entrepreneurs now play a vital role in designing innovative solutions that not only enhance efficiency but also contribute to sustainable progress for communities and the environment. This conference serves as an intellectual platform for global exchange, enabling researchers, scholars, industry professionals, and students to explore new opportunities and emerging challenges in AI-driven entrepreneurship. The themes of this conference highlight the evolving role of technology and social change in entrepreneurship. These topics reflect our belief that the future of entrepreneurship lies in balancing technological advancement with social equity and environmental consciousness.

On behalf of the Department of Management, I extend my heartfelt appreciation to our leadership at Gurugram University. We are deeply thankful to Hon’ble Vice-Chancellor, Prof. Sanjay Kaushik, for his continued guidance and visionary support. I also express sincere gratitude to Prof. Amarjeet Kaur, Dean, Faculty of Commerce and Management, for her motivation, encouragement, and valuable academic leadership that enabled this collaborative endeavour. Special thanks to Dr. Vinod Kumar, Conference co-convener for his constructive insights, timely support, and passion for academic excellence have greatly contributed to the success of this event.

My sincere thanks go to all esteemed speakers, delegates, reviewers, faculty members, research scholars, supporting staff, and student volunteers who worked tirelessly to bring this academic event to fruition. Your efforts have made this conference not just a scholarly gathering, but a milestone for global collaboration and innovative thinking.

Wishing the conference great success and fruitful deliberations.

Dr. Surabhi Goyal

Conference Convener

Chairperson, Department of Management
Gurugram University, India

Preface

It is with great pride and a profound sense of achievement that we present the proceedings of the Two-Day Joint International Conference on “*Entrepreneurship in the Age of AI: Paradigms of Sustainability and Social Innovation*”, jointly organized by Gurugram University, India, and Central Michigan University, USA. This event marks a significant milestone in advancing global academic collaboration, cross-cultural knowledge exchange, and interdisciplinary research in the dynamic domains of entrepreneurship, artificial intelligence (AI), sustainability, and social innovation. The conference served as a vibrant forum for academics, researchers, entrepreneurs, policymakers, and industry professionals to engage in insightful discussions on the opportunities and challenges that AI brings to the global entrepreneurial landscape.

In the modern era, entrepreneurship has undergone a transformative shift driven by rapid technological advancements which continues to redefine business models, operational strategies, and market dynamics worldwide. While AI unlocks new possibilities for innovation, efficiency, and scalability, it also raises important ethical, social, and environmental concerns. The conference was designed to address these multidimensional aspects, underscoring the necessity for technological progress to align with the values of sustainability, inclusivity, and social responsibility.

The conference themes were carefully selected to ensure a well-rounded exploration of current challenges and future opportunities in AI-enabled entrepreneurship, including:

- Marketing in the age of AI
- Human resource management in the gig economy
- Social innovation and sustainability
- Finance for new-age entrepreneurs
- Supply chain management in the AI era
- Entrepreneurial ecosystems for sustainable development
- Economics of social innovation and sustainability
- Disruptive technologies and entrepreneurship

Across two days of intensive sessions, participants engaged in meaningful dialogues, collaborative panels, and technical presentations that integrated diverse perspectives. The knowledge shared through keynote addresses, panel discussions, and research presentations offered a comprehensive understanding of how AI-driven entrepreneurship can propel sustainable development, inclusive growth, and social innovation. Emphasis was also placed on the essential role of education, policy frameworks, and global cooperation in nurturing entrepreneurs equipped to address complex social and economic challenges.

The conference brought together two prestigious academic institutions, each with a distinguished legacy in research, education, and global engagement. Gurugram University, India, has emerged as a leading center for higher education, committed to fostering academic excellence, research innovation, and societal impact. With its vision of promoting interdisciplinary learning and global collaborations, Gurugram University has consistently emphasized the importance of research-driven entrepreneurship, innovation, and social responsibility. Its Faculty of Commerce and Management, in particular, has played a pivotal role in nurturing entrepreneurial talent, developing leadership skills, and advancing scholarly discourse in business management and innovation studies.

Central Michigan University (CMU), USA, is renowned for its strong commitment to academic excellence, research innovation, and global collaboration. CMU has a long-standing tradition of preparing students and scholars to address complex global challenges with knowledge, creativity, and responsible leadership. Through its collaboration with Gurugram University, CMU has provided a unique platform for cross-cultural dialogue, knowledge sharing, and collaborative research, strengthening international academic partnerships and fostering the exchange of innovative ideas in the fields of AI, entrepreneurship, and social impact.

The conference proceedings, presented in two volumes, capture a wide range of conceptual, empirical, and applied research. Volume 1 primarily focuses on entrepreneurial ecosystems for sustainable development, human resource management in the gig economy, and marketing and social innovation in the AI era. The diverse research contributions illustrate how AI is reshaping global economic and academic landscapes while emphasizing the role of entrepreneurship in achieving the UN Sustainable Development Goals (SDGs).

This conference represents the collective effort and dedication of the organizing teams from Gurugram University and Central Michigan University. We express our sincere gratitude to Prof. (Dr.) Sanjay Kaushik, Hon'ble Vice Chancellor and Conference Patron, for his inspiring leadership; Prof. (Dr.) Neera Verma, Dean Academic Affairs, for constant encouragement; and Dr. Sanjay Arora, Registrar, for his support and motivation. We also extend our appreciation to the International Conference Advisory Committee, contributing authors, and the organizing secretaries for their tireless efforts. Special thanks go to Mr. Lalit Kumar Jha, Development Editor at Pen to Print Publishing LLP, and his team for their exceptional editorial support and timely publication of this volume.

We once again extend heartfelt appreciation to all university officials, organizing committees, and participants whose dedication, scholarship, and collaborative spirit made this conference a resounding success.

Editors

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SECTION 1

ENTREPRENEURIAL ECOSYSTEMS FOR SUSTAINABLE DEVELOPMENT

Women Entrepreneurship and Technology: A Systematic Literature Review through TCCM Analysis

Annu

Research Scholar, Central University of Himachal Pradesh, Dharmshala, Himachal Pradesh
E-mail: annudabla966@gmail.com

Abstract

Purpose: The purpose of this review paper is to examine women's entrepreneurship and technology for an overview of how technology can enhance the growth and sustainability of women-led businesses. This study explores the existing literature to provide valuable insights and recommendations for future directions. **Design/methodology/approach:** This study conducts a systematic literature review of 44 peer-reviewed articles published between 2014 and 2025. This review proposes a conceptual model and outlines a future research agenda, emphasizing theory-driven, intersectional, ecosystem-based studies. It examines publication trends and citation patterns through the TCCM framework to identify knowledge gaps and guide future research. **Findings:** The findings offer valuable insights for scholars and aim to promote inclusive, technology-driven entrepreneurial ecosystems that support the growth and sustainability of women-led businesses. **Practical implications:** This study offers valuable insights and is highly beneficial for researchers, policymakers, institutions, and government sectors. **Social implications:** The social implications of this study are significant for improving women's participation in business activities and empowerment through technology. **Originality/value:** This study contributes to the existing literature by identifying the scope and direction of previous research. Furthermore, it helps in identifying the least explored areas that can be targeted for the conduct of future research.

Keywords: Women Entrepreneurship, Technology, PRISMA, Systematic Literature Review

Paper type: Systematic Literature Review

INTRODUCTION

In the digital era, technology plays a vital role in business activities. After the worldwide impact of COVID-19, businesses have increasingly shifted from traditional practices to digitalization (Kang, 2022; Best et al., 2024). Women's entrepreneurship has emerged as a powerful force of economic growth and social development. Women entrepreneurs play a pivotal role in fostering innovations, creating jobs, and driving community development (Ditta et al., 2024). This study of women's entrepreneurship and technology is very significant because it highlights the intersection between gender and technological advancements in the business world (Singh et al., 2024). Women entrepreneurs face unique challenges, such as a lack of access to digital resources, limited technical skills, and gender bias in technology-driven sectors (Nevi et al., 2025; Fisch et al., 2024). By reviewing this topic, researchers, policymakers, and Government sectors can identify the gaps that hinder women from fully utilizing technology to scale their ventures.

Worldwide, 252 million women are currently running businesses, but in comparison to men, the business participation rate for women is very low (GEM, 2024). According to the World Bank's 2024 report, Women own around 34% of businesses worldwide. Only 20% of women entrepreneurs use advanced digital tools, compared to 35% of male entrepreneurs. The United Nations' sustainability goals are to be achieved by 2030. An important target of the SDGs is to ensure inclusive and equitable quality education, encompassing the broad goals related to the internet and digital skills. To achieve

the SDG-4 target for education, providing ICT infrastructure and assessing digital skills are crucial. SDG-5 Gender equality, SDG-8 Decent work and economic growth, SDG-10 Reduced inequality, women's equal participation, and equal opportunities for leadership at all levels of decision-making are essential for promoting economic empowerment and a well-balanced lifestyle (UN, 2015). Technology enables overcoming traditional barriers of mobility, market access, and operational efficiency (Khoo et al., 2024; Tahir, 2025). For example, digital platforms and social media have allowed women to establish businesses from home, especially in developing countries where cultural restrictions limit physical business operations. Understanding these dynamics through systematic reviews enables the design of targeted interventions to enhance digital literacy, provide accessible training, and promote inclusive policies (Sánchez & Santiuste, 2025; Jaim, 2025; Singh et al., 2024).

The intersection of technology and entrepreneurship has emerged as a transformative force, offering new avenues for innovation, scalability, and economic empowerment (Jaim, 2025). Within this landscape, women's entrepreneurship has gained growing attention due to its potential to foster inclusive growth, reduce gender inequality, and stimulate local economies (Nevi et al., 2025). Women play a significant role in driving economic growth and are essential pillars of both societal and national development (Skare et al., 2025). Currently, increasing attention has been given to the participation of women in entrepreneurship, particularly in the establishment and management of businesses. However, existing literature has largely focused on women's entry into entrepreneurship, often overlooking the complex journey they undertake in this field and emphasize that deep-rooted gender norms, digital literacy, financial constraints, and policy gaps collectively restrict their participation in technology-driven ventures (Kubberød et al., 2021; Shukla et al., 2021). Women entrepreneurs face numerous challenges, including work-life balance, socio-cultural barriers, gender disparity, knowledge gaps, and limited access to education (Wiig et al., 2024; Jaim, 2025). These barriers make the entrepreneurial journey especially difficult for women, particularly in developing regions (Althalathini & Tlais, 2023).

Additionally, such reviews contribute to the development of theory in the fields of entrepreneurship, gender studies, and the adoption of technology among women. It provides insights for educational institutions to design skill development programs and for technology firms to create products and services that are women-friendly. The review also includes SDGs related to gender equality, ICT infrastructure and assessing digital skills decent work, and economic growth (GEM, 2024). A review of this topic is crucial to empowering women entrepreneurs with technology, bridging the digital gender divide, and promoting inclusive economic development. It ensures that women are not left behind in the fast-changing digital business environment and can contribute equally to innovation, productivity, and national economic progress (Colombelli et al., 2025; Gergely et al., 2024).

Despite the increasing recognition of women entrepreneurs in the global economy, a significant digital divide persists, limiting their business growth and competitiveness, there is still a limited focus in the literature on the role of women entrepreneurs in the technology domain. This review paper addresses this gap by exploring the intersection of women, entrepreneurship, and technology in the digital era. Women entrepreneurs often face challenges, including a lack of access to digital infrastructure, inadequate digital literacy, limited financial resources to invest in technology, and social norms that restrict their engagement with technology-driven markets. Based on an analysis of 44 peer-reviewed articles, this study employs the TCCM (Theory, Context, Characteristics, and Methodology) framework to systematically examine existing research, identify knowledge gaps, and provide future research directions for scholars interested in this important and evolving field (Paul & Criado, 2020).

The previous review study (table 1) highlights the women entrepreneurship role with different sectors for example the systematic literature review carried out by Aggarwal and Johal (2021) focused on women in rural entrepreneurship divide review in two parts bibliometric analysis and content review, 192 documents based on Scopus databases the study is not fully explored its only content analysis in 36 study publications in a relatively review period from 2000 to 2020. Based on a review of 36 peer-reviewed articles published between 2009 and 2020, Gannon et al. (2022) synthesized the literature using a vulnerability analysis approach. This approach situates vulnerability and adaptive capacity within the broader climate risk framework and highlights the concept of triple differential vulnerability to climate change. Treanor, (2022) conducted a review of 34 peer-reviewed research papers published between 2018 and 2022 to examine women's entrepreneurship in the STEM field. However, the study is limited to the context of education only. Similarly, Jannat, (2025) conducted a systematic review based solely on open-access articles, which introduces a significant degree of bias. The content analysis included 49 publications from 2015 to 2024 and offered a comprehensive overview of the complexities of crowdfunding for SMEs. However, the study focused exclusively on the Muslim community, overlooking women entrepreneurs more broadly.

Although all these reviews provide a synthesis of women entrepreneurship in STEM field and different vulnerability of female entrepreneurs, complexities of women entrepreneurship and rural women entrepreneurship faced many challenges and opportunities in literature, their scope remains limited in terms of the number of studies included in the review and the number of years covered, little study on women in technology field (Martin et al., 2015; Milanov et al., 2025).

Table 1: Previous Literature Review in the Field of Women's Entrepreneurship and Technology

<i>S. No.</i>	<i>Author(s)</i>	<i>Focus</i>	<i>Approach</i>	<i>Database</i>	<i>No. of Studies</i>	<i>Year Range</i>	<i>Limitation</i>
1	Aggarwal and Johal (2021)	Focus on gender and rural women's entrepreneurship	Systematic literature review and bibliometric analysis	Scopus	36	2000-2020	This study context only rural women entrepreneurs
2	Treanor (2022)	Entrepreneurial activity undertaken by women in the STEM field	Systematic literature review	Web of Science, Scopus, EBSCO	34	2018-2022	This study only considers the educational context
3	Gannon et al (2022)	Focused on the differential vulnerability of female entrepreneurs in Africa to climate risk	Advanced Review (snowballing)	Scopus	NA	2009-2020	The review methodology, while incorporating the Gray and practitioner literatures
4	Jannat (2025)	The study focuses on unique characteristics in the Muslim community	Systematic literature review (comprehensive review)	Typeset, Google Scholar, and ResearchGate	49	2015-2024	The study is biased, and only open-access sources, and budget constraints limit the articles

Source: Authors' creation.

Furthermore, although these studies are very significant and provide insightful findings based on systematic literature reviews of women entrepreneurship, they do not provide a comprehensive synthesis of the literature. That is, these reviews did not synthesise the literature in terms of theories, characteristics, contexts, and methods, which is an essential part of a systematic literature review (Paul & Rosado-Serrano, 2019). Therefore, their scope remains limited to women's entrepreneurship in the technology field. Thus, the existing reviews do not answer how do we know about women entrepreneurship and technology, thereby examining the impact on women entrepreneurship business performance.

Some review articles have explored various aspects of women entrepreneurship, presenting different concepts. This comprehensive review has played a key role in synthesizing previous studies. However, the earlier review studies did not fully focus on women's entrepreneurship within the technology sector. Globally, the topic is very important. Currently, there is a need to conduct a systematic literature review on women entrepreneurship and technology to provide a comprehensive overview and support women entrepreneurs in the technology field (Gergely et al., 2024; Skare et al., 2025).

- **RQ1.** What are the performance trends in women's entrepreneurship and technology research?
- **RQ2.** What are the major theories, contexts, characteristics, and research methodologies examined in the literature on women entrepreneurship and technology research?
- **RQ3.** What are the current research gaps and future directions in women's entrepreneurship and technology research?

This paper makes a significant contribution to the existing body of knowledge on women's entrepreneurship and the technology sector from a global perspective. First, through performance analysis, it highlights publication trends and citation patterns by entrepreneurs, using the PRISMA (The Preferred Reporting Items for Systematic Reviews and Meta-Analysis) protocol alongside the TCCM framework. The TCCM framework provides a systematic structure for reviewing existing literature (Paul & Criado, 2020). This systematic literature review offers an in-depth understanding of the emerging technology-driven barriers faced by women entrepreneurs.

METHODOLOGY

Systematic literature reviews (SLRs) are a scientific and reproducible form of secondary research that relies on methods and procedures to systematically identify, synthesize, and address previous studies in response to a future research agenda (Lim et al., 2021). According to Paul, systematic reviews are conducted in various ways, including theory-based reviews, theme-based reviews, and framework-based reviews. It is a framework-based systematic literature review, ensures that the review process is structured and systematic (Paul & Criado, 2020). The purpose of a systematic review is to give a state-of-the-art overview of a specific topic. It identifies contradictions and gaps in existing research that make it hard to draw general conclusions. It also helps guide future studies by suggesting improvements in theory, context, key features, and research methods based on what we currently know. The current study focuses on women's entrepreneurship in technology. In the overview of women entrepreneurs in the technology field, this systematic literature review is based on a domain-based systematic literature review.

This systematic literature review is informed and guided by the PRISMA protocol, which is a scientific and rigorous review protocol for systematic literature review, and uses the TCCM framework to analyze and synthesize existing research on women entrepreneurship and technology. The TCCM framework emphasized a broad organization of literature based on theory, characteristics, context,

and methodology. Therefore, systematic literature reviews are significant, and organising agendas provides a means to structure the research in conducts that enhance rigour, improve relevance, and facilitate impact, which is helpful in mapping the structure of the research field and identifying gaps in the literature (Paul *et al.*, 2017). The organising framework that will guide the systematic review is discussed in the next section.

Procedure

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol is used for the collection of articles relevant to women's entrepreneurship and technology in the fields of marketing and tourism (Moher *et al.*, 2009). This protocol includes four stages: identification, screening, eligibility, and inclusion, and was chosen because it provides clear guidelines for the review process, each presented in (Fig. 1) and described in detail in the next section.

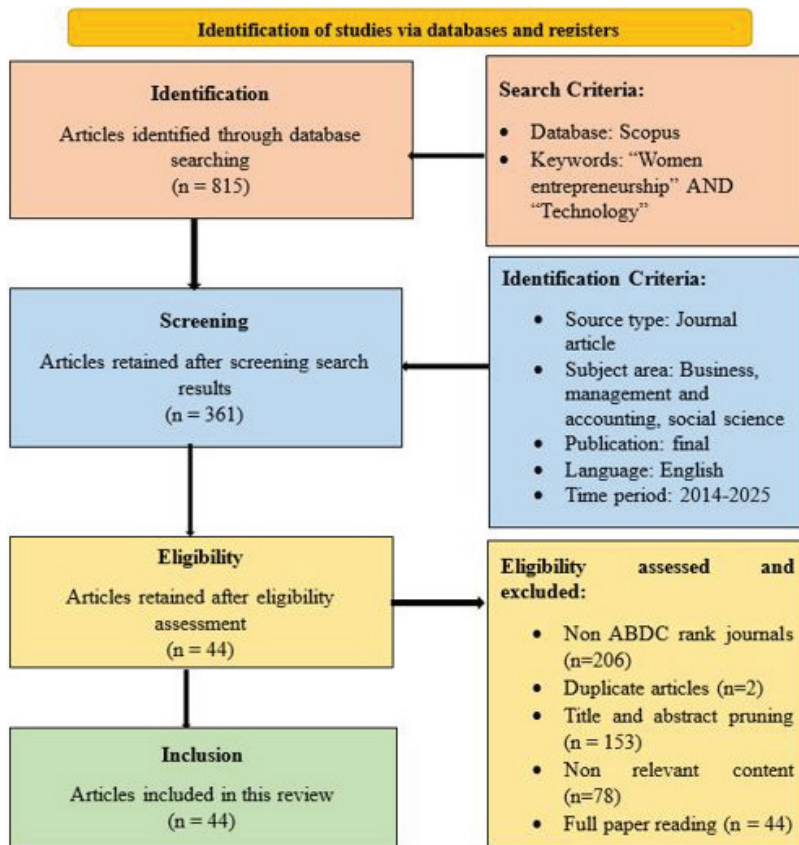


Figure 1: PRISMA Protocol

The scope of this review and the research questions are concisely presented in (Figure 1). The review excludes duplicate articles. An ABDC (Australian Business Deans Council) index journal was selected as a source of high-quality research. Scopus was used as a measure of source quality, as journal indices in the Scopus databases are considered more reliable indicators of quality and accuracy. Scopus also provided direct access to download and read articles.

The search keyword was "women entrepreneurship" OR "female entrepreneur" OR "women entrepreneur" OR "female entrepreneurship" AND technology OR "tech" OR "digital" OR

“digitalization” OR “ICT” OR “information communication technology” OR “stem” in the article titles, abstract, or keyword criteria on Scopus for using keyword search for global review domain. In total, 815 articles were search results using this keyword as of May 9, 2025.

Table 2: Criteria for Including and Excluding Research Articles

Inclusion Criteria:	• Database: Scopus • Keyword search: “Women entrepreneurship” OR “female entrepreneur” OR “women entrepreneur” OR “female entrepreneurship” AND technology OR “tech” OR “digital” OR “digitalization” OR “ICT” OR “information communication technology” • Subject area: Business, Management and Accounting, and Social Science • Year range: 2014-2025 • Publication: Final • Document type: Only peer-reviewed Journal • Language: English • Source Quality: Only articles published in ABDC-listed journals (Australian Business Deans Council) specifically ranked A*, A, B, or C
Exclusion Criteria:	• Excluded articles: Editorial, review paper, book chapter, conference paper, and processing articles • Language: Non-English language articles • Duplicate: Same study excluded • Irrelevant topic excluded.

Source: Author(s) creations

The specific steps were determined in the screening stage to include or exclude research publications:

- **Step 1:** To organize and refine the articles identified in the initial stages, the study applied Scopus filtering criteria based on publication year, subject type, publication, source types, and language. To arrange and clean the articles from the identification stage, the study applied code filtration according to year, subject area, document type, publication stage, source type, and language, with search results filtered and limited to “2014–2025”, “business, management, and accounting, and social sciences”, “article”, “final”, “journal”, and “English”, respectively. Non-English articles were excluded. This resulted in a reduction to 361 articles.
- **Step 2:** Out of 361 articles, the selection was narrowed down to include only those published in journals indexed by ABDC, resulting in a final total of 206 articles.
- **Step 3:** After reviewing the abstracts and full texts of 206 articles, we selected only those scholarly works that met our inclusion criteria for content analysis. We excluded theoretical reviews, conceptual papers, and studies that primarily focused on scale development, as they did not align with the objectives of our research questions. As a result, the final sample for our systematic literature review consisted of 44 articles.

Identification

The identification stage involved evaluating the source type, quality, relevance, search engine, search period, and search keywords. Specifically, only journal articles were included in this review. Other publication types were excluded for several reasons: books and book chapters were left out because they seldom contribute directly to scholarly progress. Grey literature, including conference papers, government or industry reports, and working papers, was excluded due to their typically lower levels of independent peer review compared to journal articles.

The ABDC journal ranking was selected instead of Web of Science and Scopus journal rankings for various reasons and journals, leading to a higher number of articles. In terms of source quality and relevance, the review adopts a tripartite criterion. It is deemed high quality and relevant if it is published in a journal in the field of marketing and tourism, as listed in the Australian Business Deans Council (ABDC) journal ranking. The ABDC journal ranking list was selected because it is a broadly used benchmark for international standard business journals. The ABDC journal ranking was preferred over the Chartered Association of Business Schools (CABS) journal guidance (Hao et al., 2020).

Including source quality and relevance into the identification stage, essentially treating it as an element of the eligibility criteria, was a deliberate and rational decision. This approach leverages the fact that marketing and tourism journals listed in the ABDC ranking are well-established and reliable sources for the search. Additionally, the relatively small number of qualifying journal titles, 153 for each category, makes the search scope manageable.

The next step in the search engine, Scopus, was selected as a more relevant quality criterion for article inclusion and exclusion. Scopus makes this search engine highly efficient and effective for systematic review.

In terms of the search period, this review identified articles on women entrepreneurship and technology based on a search that started in 2014 and ended in May 2025 to ensure that all relevant and recent articles at that time of writing had the opportunity to be considered for inclusion in this systematic review. In terms of search keyword, the review considered and utilize Boolean search- The search keyword was women entrepreneurship OR “female entrepreneur” OR “women entrepreneur” OR “female entrepreneurship” AND technology OR “tech” OR “digital” OR “digitalization” OR “ICT” OR “information communication technology” OR “stem” in the article titles, abstract, or keyword criteria on Scopus for using keyword search.

Screening

The screening process consisted of two steps. First, articles not published in the targeted journal titles were identified and excluded. Second, duplicate articles were removed. In total, 206 articles were excluded during this stage. Specifically, 454 items were excluded because they were not journal articles, such as reports, conference papers, proceeding papers, and book chapters. Additionally, six journal articles were excluded for not being published in the “marketing and tourism” journals listed in the ABDC ranking. The inclusion of these publications in the search results likely resulted from the broad and generic titles of some journals, such as the Journal of Business Research and Tourism Management, which are listed in the ABDC ranking. The inclusion of these publications in the search results is likely due to the broad and generic titles of some journals used in the search, such as the Journal of Business Research and Tourism Management.

Additionally, one journal paper was excluded because it appeared in a predatory journal that mimicked the name of a legitimate publication. This unusual occurrence was not surprising, given the increasing number of predatory journals trying to deceive less experienced researchers dealing with the pressures of the current ‘publish or perish’ academic environment. Finally, 18 articles were excluded because they were duplicates, such as copies of the original journal articles found on institutional and social networking sites like ResearchGate.

Eligibility

The eligibility stage was carried out based on two main criteria: article type and content relevance. Regarding article type, only conceptual and empirical articles published in “marketing and tourism”

journals ranked as “A*,” “A,” “B,” or “C” on the ABDC journal ranking list were included, as these journals generally undergo rigorous and thorough peer-review processes.

However, editorials and book reviews published in these journals were excluded because they are often exempt from peer review. Systematic reviews in these journals were also not considered, as they were deemed redundant for the purpose of this review. This review relevance, the full texts of articles that passed the screening stage were thoroughly evaluated during the eligibility stage to ensure they focused on women’s entrepreneurship and technology. A total of 454 articles were not included from the inclusion stage because they did not meet the eligibility criteria for article type or content relevance. Specifically, six articles with relevant topics were excluded because they were not conceptual or empirical studies. Additionally, 122 conceptual or empirical articles were excluded due to irrelevant content.

Inclusion

The inclusion stage involved a thorough cross-check and content analysis of the articles selected for the review. A random check of “in-press” articles was performed on publisher websites for journals in the “marketing and tourism” fields ranked by the ABDC journal list. This cross-check confirmed that no additional records beyond those already included were found, reinforcing the reliability and efficiency of Scopus as a comprehensive search engine for systematic reviews. In total, 44 conceptual and empirical articles were included for content analysis. The analysis guided by the TCCM frameworks was performed to extract, code, and organize the data from the reviewed articles (Paul *et al.*, 2017). This review considers a protocol focusing on Theory, characteristics, context, and methodology of women entrepreneurship research. Following Braun and Clarke’s (2006) guidelines, two experts in the sharing economy and systematic literature reviews independently reviewed the articles to become familiar with the study. They then developed initial codes, which were compared and merged into categories based on the TCCM framework. Additionally, the connections between the codes were identified to lay the groundwork for the synthesis.

ANALYSIS AND RESULTS

The PRISMA process used to refine the dataset retrieved from Scopus ultimately led to a final selection of 44 articles published between 2014 and 2025. The review findings are organized according to RQ.1, which explores publication trends, article performance, and journal distribution, as identified through performance analysis.

Performance Analysis

The review analyzed a total of 44 articles on women’s entrepreneurship and technology published between 2014 and 2025 over the last decades. The rising trend of publications, which show the field’s research interest, is shown in (Fig. 2). To increase the comprehension of the article publication trend, the review period is further divided equally into three four-year periods (2014-2017; 2018-2021; and 2022-2025).

Women’s entrepreneurship and the technology domain have been receiving increasing academic attention in recent years. During the period of searching for articles that began in 2014, review articles on women’s entrepreneurship and technology, which had previously been published only in marketing and tourism journals, were ranked in the ABDC journal ranking list in 2022. Since the appearance of three conceptual and empirical studies on this area in premier marketing and tourism journals in 2022, women’s entrepreneurship and technology, as a field, experienced very slow growth in its initial years following the introduction of the concept after the pandemic.

The next four years increased to 2018, after the pandemic, technology is used in business sectors, to traditional to digitalization, the all-business fields are increased the study. The performance is increased in 2021-2022 the mostly study women studying in the technology field. More remarkably, 2020, which was the year that COVID-19 unprecedentedly took the world by tension, was the most productive year for technology-affected women entrepreneurs' research, with mostly articles published with the

Figure 2 shows a corpus of women entrepreneurs and technology research in a global perspective over the last decade (2014–2025). Between 2014 and 2018, only one publication appeared every few years, indicating that the topic received little attention during this period. However, from 2019 onward, there was a steady rise in publications, reflecting increasing recognition in this area.

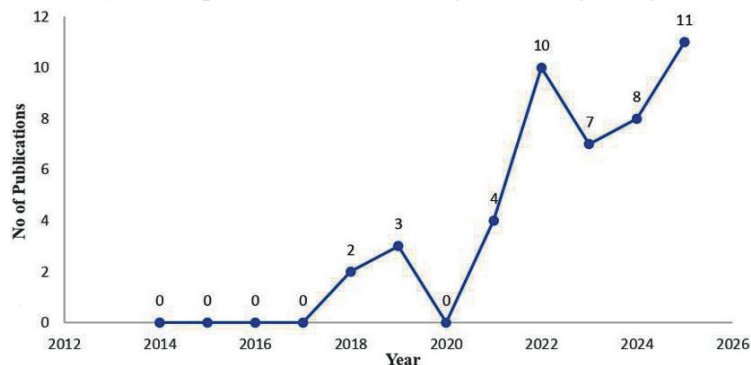


Figure 2: Number of Articles Published 2014–2025

Article Performance

The ten most cited articles in the WE-Tech area are listed in Table 3 below. According to Google Scholar, Orser et al. (2019) gathered 149 citations, so it's the most cited paper. The study's findings revealed that gender impacts the digital economy, highlighting digital skills and strategies to overcome gender barriers to the adoption of ICT. This article is followed by Fisch et al. (2022) and Vershinina et al. (2021), cited 101 and 88 times, respectively.

This study examined the significant transformation from traditional to digitalisation entrepreneurship in the digital entrepreneurship after the pandemic Jaim, (2025) demonstrated that female entrepreneurs face significant barriers due to liabilities of newness, smallness, and gender, which hinder the development of high-technology firm female entrepreneurs in Bangladesh.

Interestingly, the top 10 most cited articles in this field from 2014 to 2025 have received a total of 746 citations, highlighting the significant impact of technology on women's entrepreneurship.

Table 3: Highly Cited Articles in the Review

S. No.	Author(s)	Title	Source Journal	Global Citations
1	Orser et al. (2019)	Technology adoption and gender-inclusive entrepreneurship education and training	<i>International Journal of Gender and Entrepreneurship</i>	149
2	Fisch et al. (2022)	Does blockchain technology democratize entrepreneurial finance? An empirical comparison of ICOs, venture capital, and REITs	<i>Economics of Innovation and New Technology</i>	101

S. No.	Author(s)	Title	Source Journal	Global Citations
3	Vershinina et al. (2021)	Gaining legitimacy through proactive stakeholder management: The experiences of high-tech women entrepreneurs in Russia	<i>Journal of Business Research</i>	88
4	Martin et al. (2018)	An unusual job for a woman? Female entrepreneurs in scientific, engineering and technology sectors	<i>International Journal of Entrepreneurial Behaviour and Research</i>	86
5	Shukla et al. (2021)	Role of ICT in emancipation of digital entrepreneurship among new generation women	<i>Journal of Enterprising Communities</i>	78
6	Khoo et al. (2024)	Opportunities and challenges of digital competencies for women tourism entrepreneurs in Latin America: a gendered perspective	<i>Journal of Sustainable Tourism</i>	64
7	Neneh & Welsh (2022)	Family support and business performance of South African female technology entrepreneurs	<i>International Journal of Entrepreneurial Behaviour and Research</i>	48
8	Neumeyer (2022)	Inclusive High-Growth Entrepreneurial Ecosystems: Fostering Female Entrepreneurs' Participation in Incubator and Accelerator Programs	<i>IEEE Transactions on Engineering Management</i>	47
9	Mininni (2022)	The Barefoot College 'eco-village' approach to women's entrepreneurship in energy	<i>Environmental Innovation and Societal Transitions</i>	44
10	Gupta & Etzkowitz (2021)	Women founders in a high-tech incubator: negotiating entrepreneurial identity in the Indian socio-cultural context	<i>International Journal of Gender and Entrepreneurship</i>	41

Source: Author(s) creations

Journal of Publications

In this review, various articles were analysed based on their publication outlets. The field of women entrepreneurs and technology has garnered significant attention in recent years, leading to a diverse range of academic resources. Studies related to this topic are published in various journals across business management, management accounting, and social sciences, helping to clarify the investigative phenomenon. Below, Table 4 presents the dissemination of these journals, including the number of articles, publisher information, and disciplinary classifications journal's dissemination, including its article count, publisher information, and disciplinary classifications.

Table 4: List of Journals in the Review

No.	Journal	Articles Count	ABDC Rank
1	<i>International Journal of Gender and Entrepreneurship</i>	5	C
2	<i>International Journal of Entrepreneurial Behaviour and Research</i>	3	B
3	<i>Journal of Sustainable Tourism</i>	2	A*
4	<i>Technovation</i>	2	A

No.	Journal	Articles Count	ABDC Rank
5	<i>IEEE Transactions on Engineering Management</i>	2	A
6	<i>Journal of Business Research</i>	2	A
7	<i>Entrepreneurship and Regional Development</i>	2	A
8	<i>Business Horizons</i>	2	B
9	<i>International Entrepreneurship and Management Journal</i>	2	C
10	<i>European Journal of Information Systems</i>	1	A*
11	<i>Organization Science</i>	1	A*
12	<i>Journal of Population Economics</i>	1	A
13	<i>Journal of Business Venturing Insights</i>	1	A
14	<i>Regional Studies</i>	1	A
15	<i>International Journal of Manpower</i>	1	A
16	<i>Technological Forecasting and Social Change</i>	1	A
17	<i>Journal of Global Information Management</i>	1	A
18	<i>Journal of Strategic Marketing</i>	1	A
19	<i>Economics of Innovation and New Technology</i>	1	B
20	<i>International Social Science Journal</i>	1	B
21	<i>Journal of Islamic Marketing</i>	1	B
22	<i>European Business Review</i>	1	B
23	<i>Economics and Sociology</i>	1	B
24	<i>Environmental Innovation and Societal Transitions</i>	1	B
25	<i>Journal of Small Business and Enterprise Development</i>	1	C
26	<i>Human Systems Management</i>	1	C
27	<i>Administrative Sciences</i>	1	C
28	<i>Journal of Enterprising Communities</i>	1	C
29	<i>EuroMed Journal of Business</i>	1	C
30	<i>International Journal of Business and Society</i>	1	C
31	<i>Society and Economy</i>	1	C

Source: Author(s) creations

Table 4 lists the top 31 journals (A*-3, A-11, B-8, C-9) that have published from 2014 to 2025. Both journals are ranked A*, A, B, and C in total “marketing and tourism” journals ranked in the ABDC journal ranking list. The academic investigation of WE-Tech, has been notably advanced by a select group of highly ranked ABDC journals, reflecting the interdisciplinary and evolving nature of the field. Most productive journals in terms of women entrepreneurship and technology articles published are business journals, namely in International Journal of Gender and Entrepreneurship five studies that focus on gender, entrepreneurship, and socio-economic development. Five articles were published in reflecting its strong emphasis on women’s experiences, gender norms, and policy interventions in entrepreneurial context. And three studies in this review, IJEER plays a significant role in analysing the behavioural and psychological dimension of women in technology entrepreneurship in International Journal of Entrepreneurial Behaviour and Research. The other influential journals in the WE-Tech research are Technological Forecasting and Social Change, Business Research, Gender in Management, and Information Technology for Development. These journals, while fewer

in number, provide valuable interdisciplinary insight into technology diffusion, gendered innovation, and digital empowerment, enriching the overall scope of the literature.

FINDINGS

The TCCM framework helps identify research gaps and paves the way for future research opportunities. It also supports developing theoretical models from underrepresented countries and organizations, thereby promoting broader generalization in the field of study. Moreover, it facilitates the finding of research gaps as well as suggestions for future research (Paul *et al.*, 2024). It enables creating theoretical models from underrepresented nations and organizations, fostering research generalization in the field. Due to its clarity and adaptability, it is frequently used in recent literature reviews (Paul & Criado, 2020).

Content Analysis

Theory (T)

The concept of “theories” encompasses a variety of frameworks and models from different journals, each offering unique perspectives and methodologies that contribute to their respective fields by enabling structured analysis, interpretations, and application of knowledge. This supports both academic inquiry and practical use. The findings of the SLR revealed several theories and models that shape research in the area of women entrepreneurship and technology. In total, 19 theoretical frameworks have been used to explore areas WE-Tech (Table 3). The theories mostly used in previous studies, feminist and social cognitive theories, are explained as women’s roles in business and social activity, and the growth of the economy and lifestyle.

Despite exploring the diffusion, entrepreneurship theory, and digital divide theory significant literature gaps remain in the impact of women’s entrepreneurship on business performance and business growth. The previous little studies based on diffusion and entrepreneurship theory have the are most important role play with in women’s business activities and digital entrepreneurship. The feminist, social cognitive theories, and motivational theory focus on women starting a business and becoming entrepreneurs. In the 21st century, women are participating in gaining economic growth, but after the pandemic, women are facing many challenges to run business gap of digital skills, awareness, knowledge gap, and educational gaps. Diffusion of Innovation theory – According to Rogers (1962), it emphasizes how new ideas, products, or technologies spread within a society or social environment over time. It highlights the process through which innovation is communicated through certain channels among members of social systems. This study is based on how women to use technology in business sectors and the growth of business.

Table 5: Theoretical Perspectives Used in the Literature

<i>S.No.</i>	<i>Theory</i>	<i>Article Count</i>	<i>References</i>
1	Feminist Theory	4	Colombelli et al. (2025); Best B et al. (2025); Gupta & Etzkowitz (2021); Orser et al. (2019)
2	Social Cognitive Theory	4	Neumeyer (2022); Khalid et al. (2023); Mishra et al. (2023); Aracil et al. (2023)
3	Entrepreneurial Learning Theory	2	Kubberød et al. (2023); Nevi et al. (2025)
4	Motivation Theory	2	Singh et al. (2024); Guo et al. (2024)
5	Upper Echelon Theory	2	Colombelli et al. (2025); Skare et al. (2025)
6	Signalling Theory	1	Chandna & Axelton (2025)

S.No.	Theory	Article Count	References
7	RBV Theory	1	Hashim et al. (2024)
8	Push and Pull Theory	1	Pinem (2019); Nevi et al. (2025)
9	Social Cognitive Career Theory	1	Milanov et al. (2025)
10	Institutional Theory	1	Althalathini & Tlaiss (2023)
11	Social Identity Theory	1	Swartz et al. (2022)
12	Border Theory	1	Tahir (2025)
13	Intersectionality Theory	1	Sánchez & Santiuste (2024)
14	Knowledge spillover Theory	1	Colombelli et al. (2025)
15	Facilitates Theory	1	Nevi et al. (2025)
16	feminist Standpoint Theory	1	Jaim (2024)
17	Capability approach	1	Mishra & Mohanty (2022)
18	Entrepreneurship Practice (EAP) Theory	1	Brecht et al. (2023)
19	Innovation Diffusion Theory	1	Sperber & Linder (2023)

Source: Authors' creation

Context (C)

Figure 3 illustrates the industries investigated in women entrepreneurship and technology research. The current review highlights a significant focus on a limited number of high-tech industries' digital platforms, with the education sector being the most frequently examined, characterized by the technology field, and the STEM sectors participating very little in women entrepreneurs. Professions in the IT sector and STEM play a crucial role in women's success in business sectors, marked by business performance, skill development, and networks that facilitate global interactions (Milanov et al., 2025; Sigh et al., 2024).

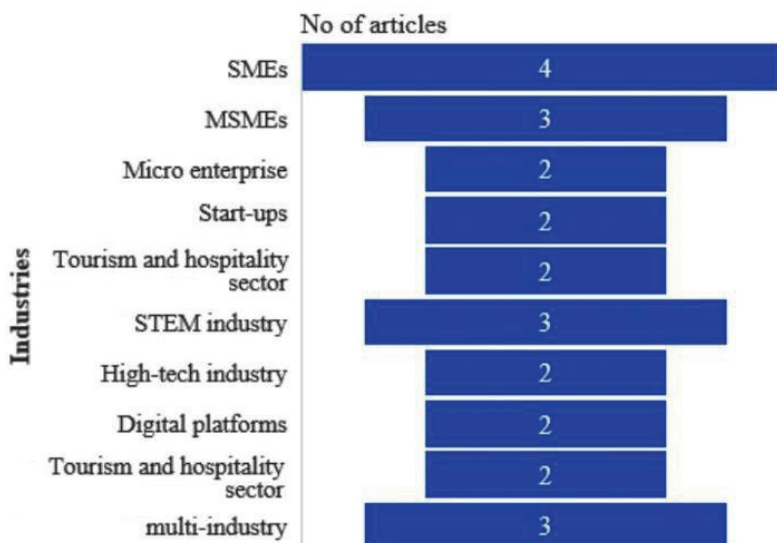


Figure 3: Industries Investigated in WE-Tech Research (2014–2025)

Characteristics (C)

This review recognized various factors affecting women entrepreneurs and technology globally. To understand the dynamics of the field, the studies were analysed, and previous research variables, antecedents, mediators, moderators, and outcomes were based on the literature. These factors that influence women engaging in technology-related entrepreneurship such as digital literacy, self-efficacy, prior work experience, and the level of education, especially in STEM fields. These factors play a critical role in shaping a woman's confidence and capability to pursue technology-based ventures (Singh et al., 2024; Tahir, 2025; Kubberød et al., 2023).

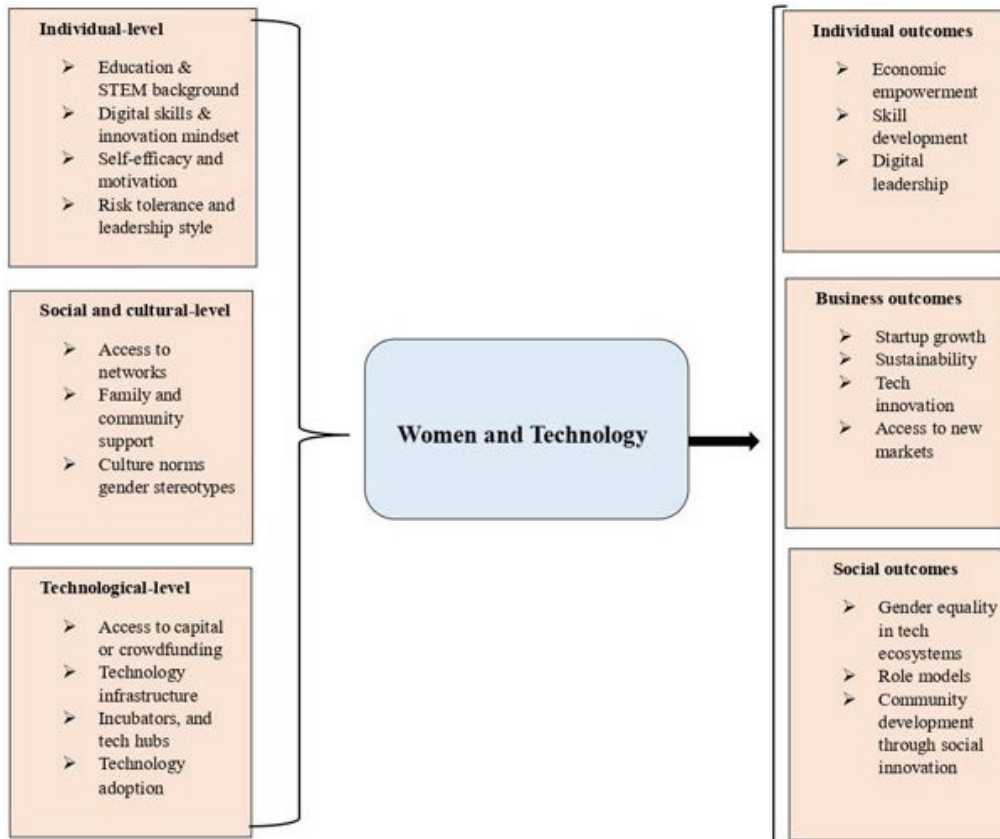


Figure 4: Variables Associated with WE-Tech Research (2014–2025).

Technology adoption behaviours, digital platforms engagements, innovation, capability, and empowerment perceptions. For instance, a woman's comfort and competence in adopting digital tools often mediates the effect of education and social support on business success. Cultural norms, gender stereotypes, and family responsibility may face barriers, social and family support, access to capital and resources, and empowering women entrepreneurs. Technology adoption behaviour, innovation capability, work-life balance (Wigg et al., 2024; Mishra & Mohanty, 2023; Shukla et al., 2021). Factors like family support, social and cultural barriers, digital skills, startups' social and organizational support (Jannat, 2022; Matricano, 2022), which further result in positive personal outcomes like business performance, profitability, and growth innovation outputs, sustainability, digital inclusion, and socio-economic empowerment women's technology-led entrepreneurship to

progress sustainable development goals (Nevi et al., 2025; Mishra & Mohanty, 2022; Gergely et al., 2024).

Method (M)

This review critically examines the methodologies used in the empirical research presented in 44 articles. It focuses on two key attributes: the research approach and the data collection methods employed. The research approaches found in the articles include qualitative, quantitative, and mixed methods. The majority of the studies utilized qualitative methods (26 articles), followed by quantitative methods (11 articles), and mixed methods (9 articles). Conceptual and experimental methods were used the least, which aligns with our findings regarding the limited use of quantitative and mixed methods. This suggests a need for future research to address these gaps identified in prior studies.

Furthermore, we investigated the research approaches, including aspects such as types of methodology, research design, data collection, and the particular approaches used for data collection in the reviewed studies.

Data analysis using analytical methods is a vital step that involves systematically applying statistical and analytical tools to interpret data and gather valuable insights. The most commonly used qualitative analytical techniques included content analysis, grounded theory, and narrative analysis. In just six studies, the quantitative methods employed by researchers are equation modelling, regression analysis, and variance-based analysis, such as ANOVA, as they can analyse a broad range of quantitative data. Future researchers are encouraged to adopt more quantitative and mixed-method approaches to achieve deeper and more comprehensive insights. These methods are especially useful in studies related to Women Entrepreneurs in Technology (WE-Tech), as they effectively capture the complex and diverse nature of people's experiences. The open-ended interviews and narrative method in qualitative research provide a thorough and iterative framework that enhances objectivity and minimizes bias. These approaches are particularly beneficial in research areas involving cultural sensitivity and diversity.

DISCUSSION AND CONCLUSION

Concluding Remarks

Women's entrepreneurship in technology has emerged as a vital area of focus, given its substantial contribution to economic development. This review sought to systematically examine the literature published between 2014 and 2025 using both performance and content analysis approaches. The major objective of the current SLR explore the evolving yet underutilized intersection between women entrepreneurship and technology, revealing both significant progress and persistent challenges. However, the full potential of women-led tech ventures remains constrained by socio-cultural norms and systematic gender biases in innovation ecosystems.

Implications

This research provides valuable insights with several practical implications for early researchers, managers, policymakers, practitioners, and government, emphasising the need to support women entrepreneurs through technology by improving digital skills, promoting financial inclusion, and ensuring access to technological infrastructure. Programs and policies should be tailored to bridge not only the digital divide but also the confidence and support gap that women face in male-dominated tech environments.

Additionally, governments and ecosystem builders should prioritize inclusive digital policy making, affordable broadband access, technology availability, and gender sensitive entrepreneurship training. Women entrepreneurs gain not just access to funding but also mentorship, leadership development, and visibility in digital spaces. Platforms like e-commerce portals, crowdfunding websites, and fintech applications to amplify the reach and scale of women-led ventures (Skare et al., 2025).

Future Research

In the existing literature role of women in technology sectors has been delineated in fostering women's increasing participation in technology entrepreneurship, substantial research gaps remain. Future studies should deepen theoretical integration by applying frameworks to better understand the multi-level dynamics influencing women entrepreneurs.

Contextual expansion is also critical most existing studies are concentrated in developed economies, while the challenges and enablers of women tech entrepreneurs in the Global remain underexplored. Additionally, future research should explore women's engagement in emerging digital sectors, such as artificial intelligence, blockchain, fintech, and sustainable tech, to reflect current technological trends.

Additionally, longitudinal studies are needed to assess the progress of women-led tech enterprises over time, rather than depending solely on cross-sectional data. Such studies can uncover how sustained engagement with technology impacts business growth, innovation capacity, and empowerment outcomes. Future research should also explore emerging technology sectors.

Additionally, intersectionality-based research is needed to understand how factors like marginal communities, education, and rural and urban divides influence technology adoption and entrepreneurial success among women. Moreover, studies should investigate the role of digital platforms and ecosystems, including online marketplaces influence the visibility and scalability of women-led businesses. Future work may also examine the impact of digital financial tools on access to crowdfunding and operational efficiency. Finally, policy evaluation studies of government and

Table 6: Research Methods Used in the Existing Literature

<i>Methods</i>	<i>No. of Studies</i>	<i>References</i>
Qualitative	25	Sánchez & Santiuste (2025); Nevi et al. (2025); Jaim (2025); Chandna & Axelton (2025); Wiig et al. (2024); Khoo et al. (2024); Singh et al. (2024); Ditta et al. (2024); Milanov et al. (2025); Fisch et al. (2022); Brecht et al. (2023); Sperber & Linder (2023); Althalathini & Tlaiss (2023); Boussema (2025); Best B et al. (2025); Tahir (2025); Neumeyer (2022); Kelly & McAdam (2022); Vershinina et al. (2021); Martin et al. (2018); Orser et al. (2019); Gupta & Etzkowitz (2021); Swartz et al. (2022); Kubberod et al. (2021); Mishra et al. (2023); Neneh & Welsh (2022)
Quantitative	13	Apostol (2022); Shukla et al. (2021); Miniesy et al. (2022); Matricano (2023); Aracil et al. (2023); Khalid et al. (2023); Guo et al. (2024); Sardar et al. (2019); Milanov et al. (2025); Kritikos et al. (2024); Hashim et al. (2024); Skare et al. (2025)
Mixed methods	6	Colombelli et al. (2025); Gagliardi & Novelli (2025); Gergely et al. (2024); Kang (2022); Mininni (2022)s; Mohd et al. (2022)

Source: Authors' creation

policymakers' digital skilling and gender equality can provide actionable insights to close existing gaps and design inclusive entrepreneurial ecosystems.

Table 7: Future Research Directions

<i>Sr. No.</i>	<i>Framework</i>	<i>Gaps</i>	<i>Future Agenda</i>
1.	(T) Theoretical gaps	Potential theories in women's entrepreneurship and technology remain largely underexplored.	Future studies can emphasize less explored theoretical perspectives, namely institutional theory, diffusion innovation theory, social capital theory, upper echelon theory, push and pull theory, theory of planned behaviour, and signalling theory, to explain women's tech entrepreneurship explored studies. Moreover, there are some women entrepreneurs and technology driven by digital empowerment and completely overlooked to promote sustainable change in Global perspectives.
2.	(C) Contextual gaps	There is a dominance of studies from developed economies, with limited focus on rural regions and Global South contexts.	Given the limited focus on the technology index within SMEs, MSMEs, and manufacturing sectors—especially in developing countries, rural regions, and non-Western contexts—future researchers should emphasize identifying key factors that drive digitalization in these settings. Greater attention is needed in critical sectors such as high-tech industries, start-ups, micro enterprises, fintech, crowdfunding, tourism, and hospitality. Moreover, the role of cultural and institutional influences on technology adoption among women and their contribution to sustainable development warrants deeper investigation.
3.	(C) Characteristics gaps	Significant gaps exist in understanding the interrelationships between key constructs.	A gap exists in empirical evidence connecting variables such as entrepreneurial behaviour, intention, attitude, self-efficacy, work-life balance, digital competence, socio-cultural barriers, digital literacy, technology adoption, gender diversity, digital empowerment, women-led businesses, and startup sustainability.
4.	(M) Methodological gaps	limited attention to the Quantitative methodology approach	In the current study, a conceptual framework based on qualitative insights has been developed, which can be empirically substantiated by future scholars. Researchers in India have overlooked critical sectors in the pollution index. Quantitative method approaches can contribute to identifying critical factors that ensure a significant relationship between women and technology in such contexts. Longitudinal studies and big data methods should be considered to assess the impact of technology on women's entrepreneurship on the triple bottom line to strengthen the literature in the domain.

Source: Authors' creation

Conclusion

The review synthesizes the growing body of literature at the intersection of women entrepreneurship and technology, offering both theoretical and practical insights. The findings confirm that technology acts as a key enabler for women entrepreneurs, creating opportunities for innovation, expanded market access, and transformation of business models. By developing a conceptual framework and applying diffusion of innovation theory, this study provides a structured perspective on how individual, social, and institutional factors interact to shape women's entrepreneurial experience in the digital age. It highlights the increasing importance of digital platforms, sustainability through technology for empowered women entrepreneurs worldwide, and emphasizes that future research must go beyond adopting intersectional, ecosystem-focused, and data-driven approaches to capture the dynamic nature of women-led tech ventures.

This study highlights that empowering women in technological entrepreneurship is not only a matter of quality but also a strategic pathway to inclusive economic development and innovation. Researcher, policymakers, and ecosystem builders must work collectively to dismantle structural constraints and cultivate an environment that enables women to innovate, lead, and thrive in the digital economy.

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India's Rare Earth Advantage and the EV Paradox: Bridging the Gap Between Resource Wealth and Adoption

Mahesh¹ & Seema Mahlawat²

¹Research Scholar, Department of Commerce, Gurugram University, Gurugram

²Associate Professor, Department of Commerce, Gurugram University, Gurugram

E-mail: maheshpataudi1995@gmail.com

Abstract

India's shift to clean transportation brings with it both possibilities and difficulties. On the one hand, the nation has substantial reserves of rare earth minerals (REM), including bastnaesite, zircon, ilmenite, and monazite, which are dispersed among states like Gujarat, Maharashtra, Tamil Nadu, Kerala, and Odisha. These minerals are essential components for the creation of batteries, electric vehicles (EVs), and other environmentally friendly technology, giving India a competitive edge in lowering its reliance on imports and bolstering its own manufacturing sector. However, India still has a far lower rate of EV adoption than the world average. India had only 7.6% EV penetration in 2024, compared to 16% globally, with three-wheeler adoption accounting for the majority of adoption. There has been little advancement in passenger cars, buses, and heavy-duty vehicles, which is indicative of issues like exorbitant prices, poor infrastructure, and dependence on foreign technology. This paper examines the contradiction between India's current EV adoption with its resource potential using secondary data, charts, and trend analysis. According to the data, India's EV penetration does not yet outweigh its mineral advantage, even with its vast stocks of rare earth elements. The study comes to the conclusion that in order to match India's natural wealth with its goals for sustainable mobility, specific legislative changes, technological advancements, and calculated investments in resource processing are necessary.

Keywords: *India's Mineral Resources, Clean Mobility, Electric Vehicle Penetration, Rare Earth Minerals, Resource-Adoption Gap, and Energy Transition*

INTRODUCTION

The move toward sustainable and clean mobility is causing a historic upheaval in the global auto sector. In order to cut greenhouse gas emissions, lessen reliance on fossil fuels, and facilitate the switch to renewable energy sources, electric cars, or EVs, have become a vital answer. Rare earth minerals (REM) like monazite, bastnaesite, ilmenite, and zircon are at the core of this technological revolution since they are necessary for the production of permanent magnets, EV batteries, and other clean energy components. Nations possessing these resources have a major tactical edge in the global energy revolution.

India has the potential to be a major participant in this industry thanks to its abundant supplies of rare earth minerals, which are dispersed over states like Odisha, Kerala, Tamil Nadu, Gujarat, and Maharashtra. With the help of these resources, the nation has a rare chance to lessen its dependency on imports, encourage domestic production, and establish a competitive position in the international EV market. In spite of this benefit, India's EV penetration rate is still low when measured against international standards. India's adoption rate was only 7.6% in 2024, despite the fact that the global EV

penetration rate had surpassed 16%. Only the three-wheeler segment had seen notable advancements. Heavy-duty vehicles, buses, and passenger automobiles are still growing at a slow rate.

Important concerns about infrastructure, policy, and technological gaps are brought up by this contradiction between India's poor EV adoption and its resource potential. Integrated planning that links the development of EV ecosystems with the management of mineral resources is necessary to address these issues. The distribution of rare earth minerals in India, EV adoption patterns, and the existing opportunity–performance gap are the objectives of this study. The results will help us understand how India can use its natural resources to boost EV adoption and ensure long-term environmental sustainability and economic success.

REVIEW OF LITERATURE

India has substantial quantities of rare earth elements (REEs) spread throughout a number of geological zones. Major deposits include carbonatite-hosted deposits in western India, stream placers in Jharkhand and Chhattisgarh, and beach placers on the eastern and southern coasts (Y. Singh, 2021). Granitic soils, stream sediments, and other geological formations in several states throughout the nation also contain prospective REE deposits (Y. Singh, 2019). China still produces the majority of the world's REEs in spite of these resources (V. Balaram, 2022). Experts advise using integrated exploration techniques, bolstering the upstream and downstream sectors, and, when applicable, taking into account artisanal to small-scale mining in order to grow India's REE industry (Y. Singh, 2021; V. Balaram, 2022). Furthermore, evaluating the recovery of rare earth elements (REEs) from mine dumps and industrial wastes, encouraging domestic production, and developing international collaborations could boost India's "Make in India" initiative and the rising demand for REEs in cutting-edge technology (Y. Singh, 2020). With sales rising from 455,733 units in FY2022 to a peak of 95,126 units in March 2023, recent studies show that EV adoption in India is growing significantly (Jemima & Ferusha, 2024; Naik et al., 2025). Government programs, business sector participation, and growing environmental consciousness are the main drivers of this trend (Devarasan et al., 2025; Jemima & Ferusha, 2024). Oil prices, air quality, and the accessibility of charging infrastructure are some of the factors affecting the adoption of EVs (Naik et al., 2025). There are regional differences in the adoption of EVs; Karnataka and Maharashtra dominate the two-wheeler and four-wheeler categories, respectively, while Uttar Pradesh leads overall sales (Jemima & Ferusha, 2024). India's objectives of lowering carbon emissions, enhancing urban air quality, and lowering oil imports are all supported by the move to EVs (Jemima & Ferusha, 2024). Policymakers and other stakeholders can benefit greatly from this expanding trend in EV adoption in India's main states as they work to promote sustainable transportation options (Haldankar & Bhat, 2023).

RESEARCH GAP

- **Resource–Adoption Disconnect:** Despite India's substantial rare earth mineral supplies, little research has been done to examine the connection between the nation's low EV adoption rate and its potential as a resource.
- **Absence of Integrated Analysis:** While most studies concentrate on the distribution of rare earth minerals or EV adoption patterns, very few make an effort to link the development of the Indian EV industry with mineral availability.
- **Policy and Strategic Gap:** Not enough scholarly research has been done on how India may use its rare earth advantage to develop practical policies and plans that will boost domestic EV production and lessen reliance on imports.

OBJECTIVES OF THE STUDY

- To examine the rare earth minerals' state-by-state distribution in India and see how they might help with domestic EV production.
- To analyse current data on EV adoption, sales, and penetration trends in India in comparison to global trends.
- To emphasize the benefits and problems associated with India's comparatively low EV penetration and its resource advantage in rare earth minerals.

RESEARCH METHODOLOGY

The relationship between India's wealth in rare earth minerals and its present EV penetration trends is investigated in this study using a descriptive and analytical research design. Secondary data gathered from government documents, NITI Aayog publications, worldwide energy records, and industry statistics spanning the years 2014–2024 served as the foundation for the study. Additionally, the main source of data for research includes maps and statistics pertaining to the abundance of rare earth elements by state and the trends in EV adoption. Comparative techniques are used to evaluate India's EV penetration in relation to international standards, and resource mapping is used to locate mineral-rich states that may be able to sustain EV manufacture. Additionally, trend analysis is used to examine how EV sales and penetration rates have changed over time, emphasizing the discrepancy between India's actual EV adoption and its mineral advantage. The analysis examines how India might strategically deploy its resources to promote the growth of EVs, with an emphasis on the opportunity–performance gap. This study's scope is restricted to secondary and chart-based data; field-level surveys and direct mining evaluations are not included.

DISCUSSION

A glaring contradiction in India's clean mobility environment is brought to light by the analysis. On the one hand, the nation has a wealth of rare earth mineral (REM) resources, including ilmenite,

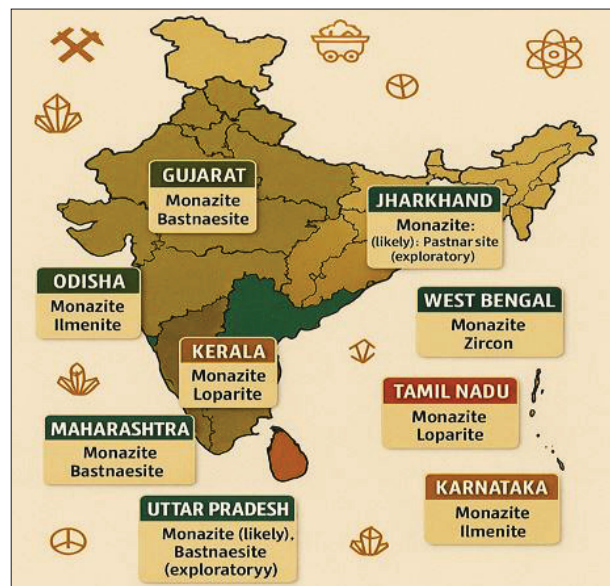


Figure 1: India's Rare Earth Wealth: State-wise Distribution of Key Minerals

bastnaesite, and monazite, which are essential for renewable energy, EV batteries, and motors (Reich & Simon, 2024). India is well-positioned to lessen reliance on imports and create an independent EV ecosystem because to its resource advantage. However, India's real EV penetration rate is still far lower than that of other countries; only three-wheelers have seen substantial acceptance, while automobiles, buses, and trucks are far less common (Pandey, 2025).

High upfront costs, poor charging infrastructure, dependence on foreign battery technology, and limited domestic production capacity are some of the issues that cause the disparity. Development in mineral processing, R&D for domestic technology, and strategic policy assistance are necessary to close this gap. Therefore, even though India has a wealth of rare earth potential, its EV adoption is still underused, indicating the need for holistic planning (Ravuri et al., 2023).

The 17 elements that make up rare earth minerals, often known as rare earth metals, are crucial to contemporary technology. These metals are essential for everything from the production of wind turbines and electric vehicles (EVs) to cellphones and missile guiding systems like Akash and Astra. Because of its widespread distribution in concentrated resources, global supply systems are susceptible to disruption and geopolitical unrest (Al-shwaf & Bell, 2025). The map shows how rare earth minerals are distributed by state in India. These minerals are strategically significant for electronics, defense, and clean energy technology. Indian states including Gujarat, Odisha, the Kerala state, Tamil Nadu, Karnataka, the Maharashtra region, West Bengal, the state of Jharkhand, and Uttar Pradesh are home to monazite, the country's most prevalent rare earth mineral. In addition to monazite, Gujarat and Maharashtra are home to bastnaesite, another important source of rare earth elements. Both Loparite and Monazite are abundant in Tamil Nadu and Kerala, suggesting their great potential for rare earth extraction (Y. Singh, 2020). Whereas West Bengal mixes resources of monazite and zircon, Odisha and Karnataka are designated for monazite with ilmenite. Jharkhand and Uttar Pradesh are designated as exploratory areas, where the presence of bastnaesite is being studied and monazite is probably present. This distribution shows that India has an advantage in strategy for resource development because its rare earth riches is concentrated in both coast and mineral-rich inland states. Through efficient exploration, environmentally friendly mining, and technical investment, India may be able to lessen its reliance on imports, develop its electronics and renewable energy sectors, and establish itself as a major participant in the world's rare earth supply chain. India's mineral richness is therefore important from an economic and geopolitical standpoint (Singh, 2021).

EV-penetration Rate Across in Different Vehicle Segment

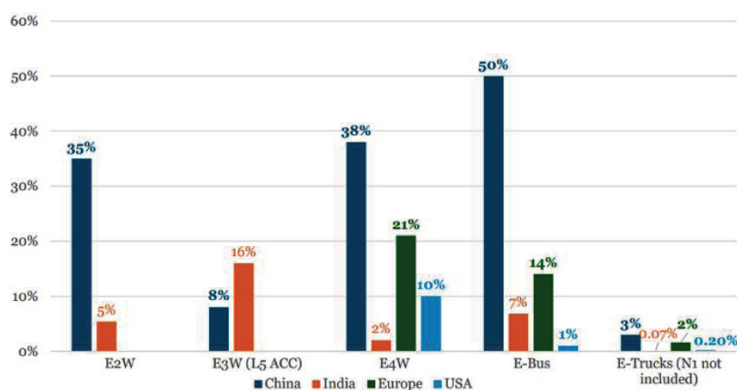


Figure 2: IEA Global EV Data Explorer and VAHAN Portal

The graph shows the rate of adoption of electric vehicles (EVs) in China, India, Europe, and the US in 2023 for various vehicle classes. With the largest penetration of electric two-wheelers (35%), four-wheelers (38%), and electric buses (50%), China is clearly the leader in EV adoption. Due in large part to robust legislative support and environmental restrictions, Europe has made significant strides in the usage of electric buses (14%), and electric four-wheelers (21%). Although the US is trailing behind in most categories, it is making some progress with a 10% penetration rate in four-wheelers but is still far behind in buses and two- and three-wheelers. However, due to its reliance on rickshaws and last-mile transportation options, India stands out as the world leader in electric three-wheelers with a 16% share. Its adoption of buses is only moderate at 7% and that of four-wheelers is very low at 2% and two-wheelers at 5%. The adoption of electric trucks is still quite low worldwide, with China leading the way at just 3%. All things considered, the data reveals that China leads the world in EV adoption in every category, while Europe is making steady progress, India is expanding in specialized markets like three-wheelers, and the US is still trailing behind in the majority of markets save passenger vehicles.

Electric 2/3 Wheeler Sales Over the Year

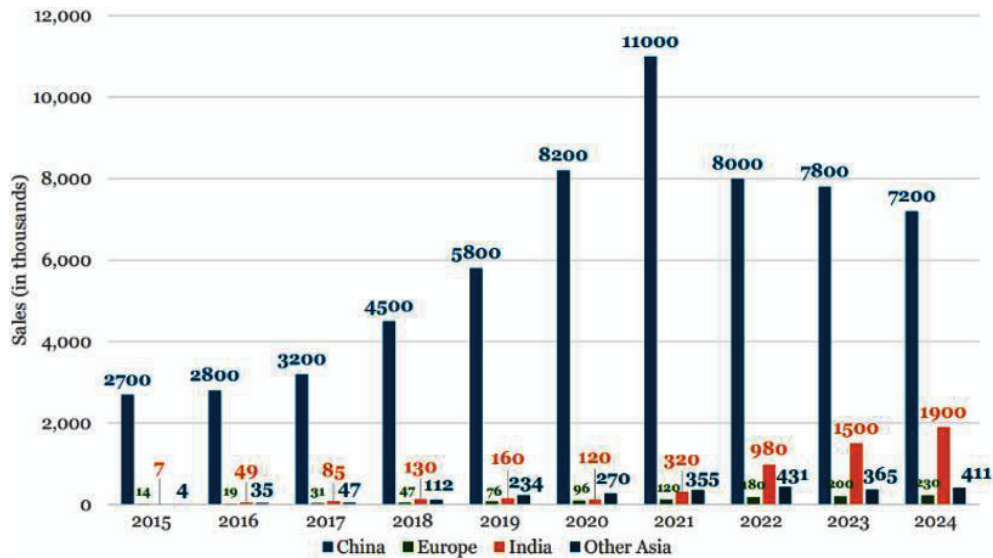


Figure 3: IEA Global EV Data Explorer and VAHAN Portal

Sales of electric two- and three-wheelers in various markets from 2015 to 2024 are displayed in the chart. With a sales peak of 11 million in 2021 and a modest decline to 7.2 million by 2024, China continues to dominate. Sales in India have increased dramatically, from just 35,000 in 2016 to 1.9 million in 2024, demonstrating the country’s growing use of EVs for two- and three-wheelers. Sales in Europe and other parts of Asia continue to be very modest, at less than 0.5 million per year. China is still the market leader overall, but India is quickly overtaking it due to its high demand in the 2/3-wheeler category, which is being driven by factors including affordable prices, last-mile connectivity, and expanding government backing.

E-Truck Sales Over the Year (Globe and India)

The graph displays e-truck sales in India and around the world from 2014 to 2024. Sales started out at just 0.06 thousand worldwide in 2014 but increased significantly, reaching a peak of 71 thousand

in 2017. Following oscillations, sales fell to 14,000 in 2020 but then steadily increased to 93,000 by 2024, demonstrating robust recent growth. The adoption of e-trucks in India, on the other hand, has been minimal, with sales staying at or close to zero until 2023, when they slightly increased to 0.33 thousand, and then to 0.22 thousand in 2024. Global markets are generally gaining traction, but India is still in the early stages of acceptance.

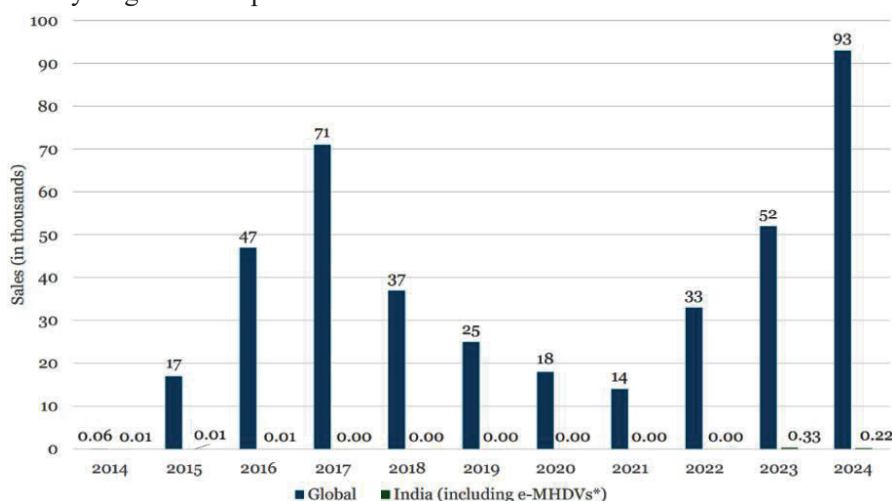


Figure 4: IEA Global EV Data Explorer and VAHAN Portal

E-Bus Sales Over the Year (Globe and India)

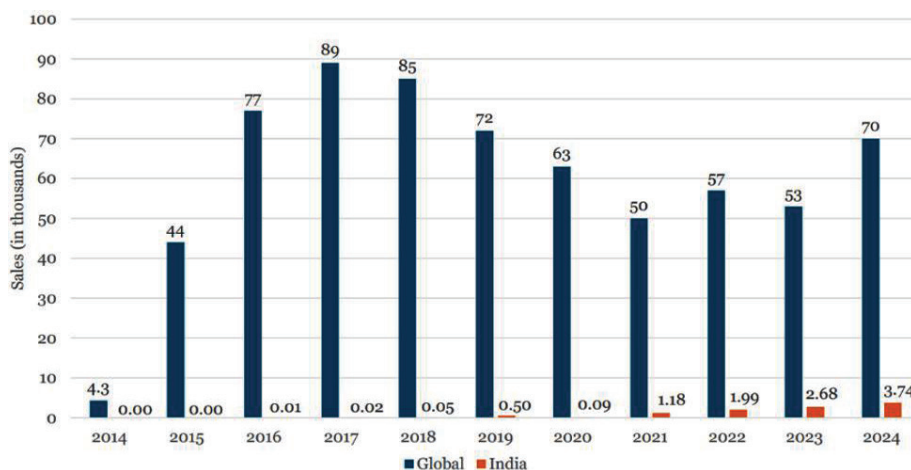


Figure 5: IEA Global EV Data Explorer and VAHAN Portal

The graph shows e-bus sales in India and around the world from 2014 to 2024. Sales increased quickly on a global scale from 43,000 in 2014 to 89 thousand in 2017, then slowed to 50,000 in 2021. After that, sales recovered somewhat, hitting 70,000 by 2024. Adoption started much later in India, where sales were very low until 2018. From 0.5 thousand in 2019 to 3.74 thousand in 2024, growth surged, demonstrating consistent advancement. Global sales are still higher overall, but governmental measures and rising demand for environmentally friendly public transportation options are driving growth in India's e-bus sector.

E-4W Sales Over the Year (Globe and India)

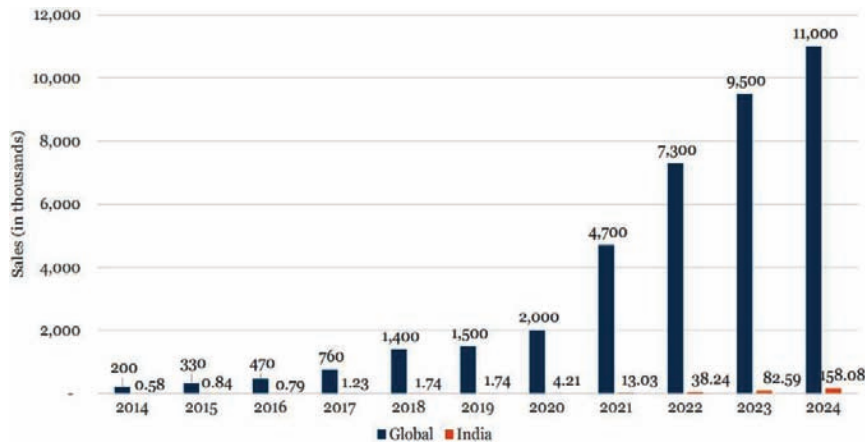


Figure 6: IEA Global EV Data Explorer and VAHAN Portal

The graph displays sales of electric four-wheelers (E-4W) in India and around the world from 2014 to 2024. Sales rose sharply worldwide from 200,000 in 2014 to 11.2 million in 2024, demonstrating the quick uptake of EVs in passenger automobiles. After 2020, growth picked up speed, and by 2023, sales had increased from 2 million to 9.5 million. Sales in India started out modestly, under two thousand until 2019, but they quickly increased to 82.59 thousand in 2023 and 158.08 thousand in 2024. India exhibits strong increasing momentum, bolstered by governmental initiatives, affordability improvements, and growing customer acceptance of EV cars, even though global sales are still far ahead.

EV Penetration Rate (Global and India)

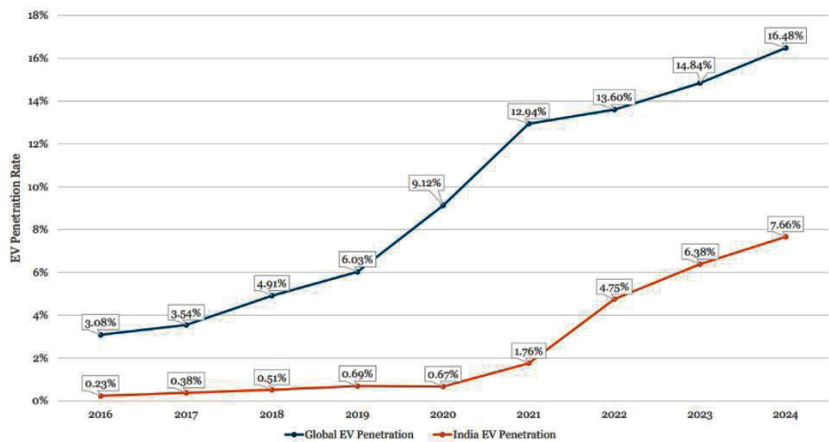


Figure 7: IEA Global EV Data Explorer and VAHAN Portal

The graph shows the rates of EV adoption in India and around the world between 2016 and 2024. Globally, penetration increased gradually from 3.08% in 2016 to 16.48% in 2024, indicating a high rate of acceptance across the globe. After 2019, there was a significant uptick, with growth surpassing 9% in 2020 and 12% in 2021. India, on the other hand, began significantly lower, at just 0.23% in 2016, and continued to develop gradually until 2020. After that, though, penetration increased significantly,

hitting 4.75% in 2022 and 7.66% in 2024. India's recent rise indicates growing momentum in EV adoption, even though it still lags behind the global average.

Ev Sales and Ev Stock Over the Year (Global and India)

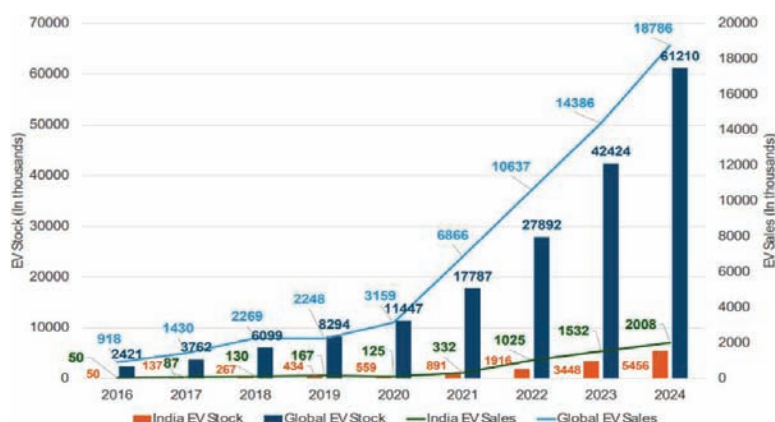


Figure 8: IEA Global EV Data Explorer and VAHAN Portal

From 2016 to 2024, the graph displays EV sales and stock in India and around the world. Globally, EV sales increased from 0.9 million to 18.7 million during the same time span, while EV stock increased dramatically from 2.4 million in 2016 to 61.2 million in 2024. With yearly sales rising from 50,000 to 2,000,000, India's EV stock expanded gradually from just 50,000 in 2016 to 5.4 million in 2024. Despite India's remarkable rise, the global statistics are still far greater. Overall, the data shows that EV adoption is high worldwide, with India seeing rapid development, especially beyond 2020, thanks to growing demand and supportive policies.

Global Sale of e-Trucks in 2024 (Above 3.5 Tonne Capacity)

The graph displays sales of e-trucks with a capacity of more than 3.5 tons worldwide in 2024. With 76 thousand sales, China leads the market and is responsible for the great majority of global adoption. The USA records 1.7 thousand purchases, but the European Union comes in far behind with 12,000 sales. With just 0.28 thousand sales, India is still in its very early stages and has very little penetration when compared to other regions. The combined contribution of other nations to sales is 3.72 thousand. While other regions, like India, are still in the early stages of electrifying their truck fleets, the data shows that China is by far the leader in the deployment of heavy-duty e-trucks.

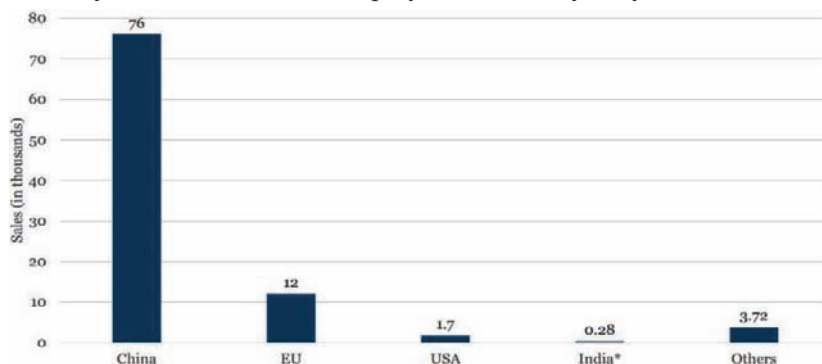


Figure 8: IEA Global EV Data Explorer and VAHAN Portal

CONCLUSION

India is in a unique position where there is a dichotomy between its resource potential and its acceptance of new technologies. On the one hand, the nation is abundant in rare earth minerals (REM), which are found in states like Odisha, Kerala, Tamil Nadu, Maharashtra, Gujarat, Karnataka, and West Bengal. These minerals include monazite, bastnaesite, ilmenite, zircon, and loparite. The manufacturing of batteries, wind turbines, magnets, electric vehicles (EVs), and other clean energy technology depends on these minerals. India has a huge chance to become a major supplier in the global rare earth value chain as a result of the energy transition's dramatic increase in demand for REM. This resource base could boost domestic EV production, lessen reliance on imports from China, and increase India's geopolitical might in the clean energy industry if it is used properly. However, by international standards, India's real EV penetration rates are still quite low. India is behind the rest of the world, where EV penetration has risen to over 16% in 2024. Three-wheelers are the only vehicles with considerable acceptance, while passenger cars and heavy-duty vehicles have made very little headway. The research shows that India faces challenges with slow adoption, inadequate charging infrastructure, high upfront prices, and reliance on imported battery technology, even if the country has the mineral wealth needed to propel EV growth. A structural gap is highlighted by this discrepancy between India's resource potential and actual EV performance. Although the nation has the raw elements to support the global electric vehicle revolution, its level of domestic penetration does not match the magnitude of its inherent advantage. India needs targeted governmental interventions to close this gap, including boosting R&D for domestic battery technology, encouraging the adoption of EVs across all vehicle categories, building rare earth mining and refining capacity, and extending charging networks. Only then will India be able to obtain both economic and environmental benefits by coordinating its resource strength with its EV objectives.

SUGGESTIONS

A number of calculated steps are required to close the gap between India's comparatively low EV penetration and its wealth of rare earth material deposits. In order to ensure value addition within the nation rather than exporting raw materials, India needs first build up its domestic rare earth mining and processing capabilities. Reliance on imports, especially from China, might be lessened by setting up specialized processing facilities and research facilities (Snow, 2019). Second, in order to hasten the adoption of EVs, robust policy initiatives are needed. Stronger market demand would result from expanding programs like FAME with more incentives for EV making, battery production, and customer adoption. Third, India has to make investments in its own battery research and development, concentrating on high-performance, reasonably priced technologies like solid-state batteries, sodium-ion solutions, or lithium-ion substitutes where its mineral foundation can be efficiently used. Fourth, in order to eliminate range anxiety and promote the use of four-wheelers and commercial EVs, it is imperative that charging infrastructure be widely installed in both urban and rural locations (Wadi et al., 2023). Last but not least, PPPs—public-private partnerships—can be crucial in increasing investments and guaranteeing that natural wealth is converted into industrial expansion. India can establish itself as a leader in clean mobility and ensure long-term economic and environmental benefits by combining its rare earth advantage with effective EV adoption strategy (Yadav et al., 2024).

LIMITATIONS OF THE STUDY

Compared to direct field research, the accuracy of this study may be limited because it mostly relies on secondary data from government papers, international agencies, and statistics charts. The analysis does not contain in-depth geological surveys, cost analyses, or feasibility studies at the industrial level; instead, it concentrates on the distribution of rare earth minerals and EV penetration patterns. Moreover, the analysis does not account for micro-level technology readiness, regional adoption hurdles, or real-time customer behavior. As a result, rather than offering practical answers, the results are interpretive and suggestive, meant to draw attention to general trends and opportunities.

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Empowering Rural Futures: Leveraging Artificial Intelligence for Sustainable Agri-Entrepreneurship in India

Aditya Chaurasia & Aman Kumar

Assistant Professor, NIFT Kangra

E-mail: aditya.chaurasia@nift.ac.in, aman.nagpal@nift.ac.in

Abstract

Artificial Intelligence (AI) is transforming agriculture globally, offering opportunities to enhance sustainability and entrepreneurship in India's rural communities. Smallholder farmers face multiple challenges, including climate change, soil degradation, water scarcity, fragmented landholding, and inefficient supply chains. Agri-entrepreneurship provides a framework for revitalizing agriculture by combining innovation, business acumen, and market linkages with traditional farming.

This study investigates AI integration in agri-entrepreneurship across Punjab, Karnataka, and Chhattisgarh. Using predictive analytics, automated irrigation, precision farming, and digital marketplaces, smallholders are experiencing measurable improvements in productivity and income. A mixed-method approach collected quantitative data from 300 entrepreneurs and qualitative insights from interviews and observations. Results show a 21% increase in crop yield and a 23% reduction in input costs. AI-enabled platforms also enhanced access to credit, markets, and advisory services, particularly for women and youth-led startups.

Persistent barriers include poor digital infrastructure, high costs, limited localized training, and socio-cultural skepticism. The study proposes the AgriTech Empowerment Framework (ATEF), emphasizing participatory technology design, vernacular training, inclusive financing, and public-private collaboration. The framework aligns AI deployment with grassroots realities to ensure equitable access and sustainable impact. This research provides actionable insights for scaling AI-enabled agri-entrepreneurship as a cornerstone of inclusive rural development in India and other emerging economies.

Keywords: *AI in Agriculture, Rural Entrepreneurship, Digital Farming, Sustainable Development, India, AgriTech Adoption*

INTRODUCTION

Agriculture remains the primary livelihood for nearly half of India's population, yet it faces growing pressures from climate variability, soil depletion, water scarcity, and market volatility. Over 86% of Indian farmers operate small and marginal landholdings, making them particularly vulnerable to these challenges (NITI Aayog, 2023). Meanwhile, the rapid digital transformation of India presents unprecedented opportunities to integrate advanced technologies into agriculture, empowering farmers to move beyond traditional practices and adopt entrepreneurial approaches.

Artificial Intelligence (AI) holds transformative potential in agriculture, enabling predictive analytics for crop management, automated irrigation systems, disease detection through computer vision, and real-time market information (Rao, 2023). When coupled with agri-entrepreneurship, AI can help farmers become innovators, decision-makers, and business leaders, shifting rural economies from subsistence-based to market-driven growth.

Despite these opportunities, adoption is constrained by digital divides, limited infrastructure, inadequate training, and socio-cultural barriers. This study addresses the critical question: How can AI-driven interventions support sustainable agri-entrepreneurship in diverse rural contexts of India? Specifically, it examines adoption patterns, impacts on productivity and income, and the enabling conditions required to scale AI tools effectively.

REVIEW OF LITERATURE

Agri-entrepreneurship integrates agricultural practices with business principles, creating profitable, scalable, and socially inclusive models (Klerkx & Rose, 2020). In India, the rise of farmer producer organizations (FPOs) and rural start-ups is facilitating a shift from subsistence farming to entrepreneurial ventures. Agri-entrepreneurs not only cultivate crops but also innovate in logistics, processing, and value-added services, bridging the gap between production and market demands.

AI is increasingly applied in agriculture through multiple avenues. Precision farming leverages predictive models to optimize sowing times, monitor crop health, and suggest tailored interventions (Kamilaris & Prenafeta-Boldú, 2018). Computer vision, often using drones or smartphones, enables early detection of diseases and pests, reducing crop losses (Singh et al., 2023). Machine learning-based weather forecasting provides hyper-local alerts, improving preparedness and resilience (FAO, 2023). Market intelligence tools offer predictive pricing, demand estimation, and direct-to-consumer sales, enhancing income stability for farmers (Mehra & Rao, 2022).

Despite technological advances, adoption remains uneven. Smallholders face barriers such as limited access to smartphones, poor internet connectivity, high cost of devices and apps, inadequate training, and skepticism toward algorithm-driven recommendations (Patil et al., 2022; Mishra & Singh, 2023). Enabling conditions, including digital literacy programs, vernacular AI applications, and public-private partnerships, have proven critical. NGOs and self-help groups often facilitate trust-building and capacity development, particularly among women and youth entrepreneurs (Roy & Tripathi, 2024; Yadav & Gupta, 2023).

There is a notable research gap in empirically examining AI adoption within agri-entrepreneurship across socio-economic and geographic contexts. This study contributes by providing comparative evidence from Punjab, Karnataka, and Chhattisgarh, highlighting real-world impacts, challenges, and opportunities.

RESEARCH METHODOLOGY

A mixed-method approach was employed to capture a holistic understanding of AI adoption in agri-entrepreneurship. A purposive sample of 300 rural entrepreneurs was selected across Punjab (high-tech adoption), Karnataka (innovative start-up ecosystem), and Chhattisgarh (low-income, tribal context), ensuring diversity in agro-climatic zones and digital penetration levels.

Data collection involved structured surveys to quantify adoption rates, productivity improvements, and income changes, complemented by semi-structured interviews with entrepreneurs, agri-tech providers, and agricultural officials. Secondary sources, including government reports, AI usage statistics, and yield records, were also analyzed.

Quantitative data were processed using SPSS, applying descriptive statistics and regression analysis, while qualitative insights were coded thematically in NVivo to identify recurring patterns. Ethical considerations included informed consent, anonymity, and confidentiality of all participants.

DATA ANALYSIS

The analysis highlights significant trends in AI adoption, productivity improvements, and the barriers faced by rural agri-entrepreneurs across Punjab, Karnataka, and Chhattisgarh.

AI Adoption Patterns

Table 1 shows AI adoption across the three states. Overall, 70% of respondents used at least one AI tool. Women and youth adoption was particularly higher where targeted digital training was provided.

Table 1: AI Adoption by State

State	Total Respondents	Using AI Tools (%)	Women Adoption (%)	Youth Adoption (%)
Punjab	100	78	36	42
Karnataka	100	69	32	40
Chhattisgarh	100	63	28	35
Total/Average	300	70	32	39

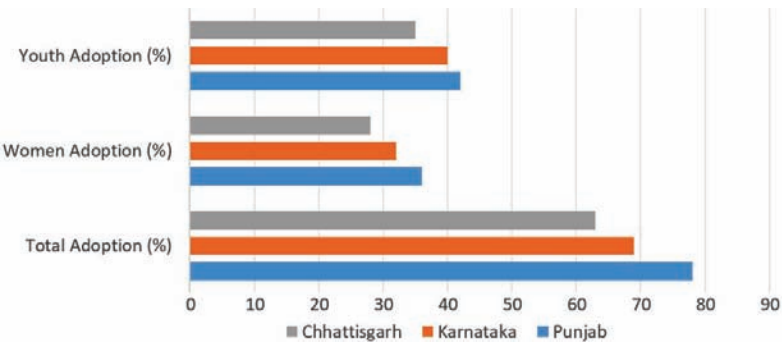


Figure 1: AI Adoption by State

Impact of AI on Productivity and Costs

The adoption of AI tools led to measurable improvements in crop yields and cost efficiency. Table 2 summarizes the impact.

Table 2: Impact of AI on Productivity and Costs

Indicator	Pre-AI Adoption	Post-AI Adoption	% Change
Average Crop Yield (kg/ha)	2,350	2,835	+21%
Input Costs (INR/ha)	35,000	26,950	-23%
Average Income (INR/year)	110,000	129,000	+17%

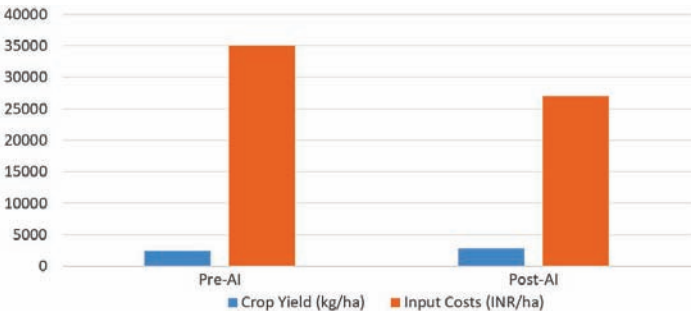


Figure 2: Impact of AI on Productivity and Costs

Barriers to AI Adoption

Despite benefits, farmers face several challenges. Table 3 shows the percentage of respondents citing each barrier.

Table 3: Barriers to AI Adoption

Barrier	Respondents (%)
Poor network connectivity	41
High cost of devices and apps	33
Distrust of algorithmic recommendations	28
Limited localized training	25
Socio-cultural resistance	22

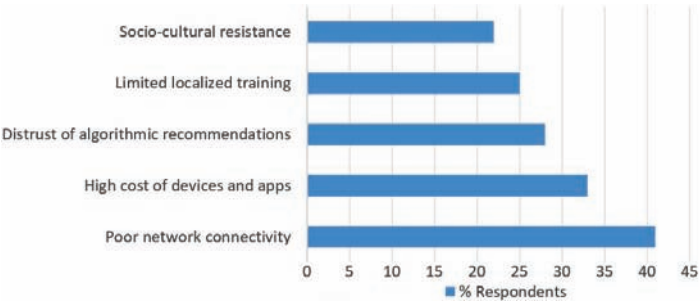


Figure 3: Respondents of Barriers to AI Adoption

Impact on Productivity and Income

- 1. **Crop Yield:** Adoption of AI tools resulted in an average yield increase of 21%.
- 2. **Input Costs:** Optimized use of fertilizers, pesticides, and water reduced costs by 23%.
- 3. **Income Stability:** 48% of respondents reported enhanced income due to better access to markets and price forecasts.

Challenges

Key barriers included poor network connectivity (41%), high cost of devices and AI applications (33%), and resistance to algorithmic recommendations (28%).

Ecosystem Support

Government initiatives such as Digital India and AgriStack enhanced awareness, while agri-tech start-ups offered low-cost leasing models. NGOs and self-help groups played critical roles in training, trust-building, and diffusion of AI tools.

Comparative Insights Across States

- 1. Punjab’s adoption was higher among larger landholders, leveraging high-tech infrastructure.
- 2. Karnataka benefited from its vibrant start-up ecosystem and innovation culture.

SUMMARY OF FINDINGS

- 1. AI adoption is highest in Punjab, followed by Karnataka and Chhattisgarh, with women and youth adoption improving significantly through training.
- 2. AI tools led to a 21% increase in crop yield and a 23% reduction in input costs, enhancing income stability.

3. Key barriers include poor connectivity, high device costs, limited training, and socio-cultural resistance.
4. State-wise variations indicate that ecosystem support, start-up culture, and cooperative models influence adoption outcomes.

DISCUSSION

The study proposes the AgriTech Empowerment Framework (ATEF), emphasizing participatory design, localized content, capacity building, and inclusive financing to scale AI adoption effectively. Findings contribute theoretically by enhancing understanding of digital inclusivity in rural entrepreneurship and practically by offering actionable strategies for policymakers and practitioners.

Limitations include the geographic focus on three states and reliance on cross-sectional data. Future research should incorporate longitudinal studies and comparative analyses with other emerging economies.

CONCLUSION AND IMPLICATIONS OF THE STUDY

AI-enabled agri-entrepreneurship presents a viable pathway to inclusive rural development in India. With appropriate technology deployment, training, and trust-building, smallholders can improve productivity, reduce costs, and stabilize incomes.

Policy and Practical Implications

1. Strengthen rural digital infrastructure.
2. Foster public-private-people partnerships.
3. Establish rural innovation hubs with open-access data.
4. Develop AI tools in regional languages.
5. Target women and youth entrepreneurs with training and financial support programs.

This approach positions AI as a transformative tool for sustainable, equitable rural development and provides a replicable model for other emerging economies.

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Analysis of Artificial Intelligence-Based Technologies and Approaches on Sustainable Entrepreneurship

Kshitiz Maharshi¹, Rounika Dhoot² & Jigyasa Soni³

¹Assistant Professor, Department of Business Finance and Economics,
Jai Narain Vyas University, Jodhpur

²Guest Lecturer, Chartered Accountant, Department of Accounting,
Jai Narain Vyas University, Jodhpur

³Corporate Research Analyst, Jodhpur

E-mail: drkshitiz@gmail.com, rounika1992@gmail.com, jigyasasoni96@gmail.com

Abstract

Over the past ten years, entrepreneurship research has expanded significantly, encompassing a wide range of subjects and issues. Artificial intelligence advancements affect sustainable development in both positive and negative ways. In order to accomplish sustainable goals, experts have recently suggested using artificial intelligence (AI)-based models and algorithms. "Sustainable entrepreneurship" is a new field that combines sustainable development and enterprise built on the understanding that long-term social and environmental impacts and outcomes are just as significant as immediate economic ones. Recent developments in artificial intelligence (AI) have led some researchers to suggest AI-based methods for sustainable development. The goal is to characterize bibliographic records that are indexed in the WoS and Scopus databases in order to comprehend the present condition of the field. VOSviewer and Microsoft Excel has been utilized for data visualization and analysis. The findings show that there is little application of machine learning as well as artificial intelligence techniques and algorithms for sustainable enterprise. Thus, the creation of an AI-based sustainable entrepreneurship technique appears as a viable research direction.

Keywords: Artificial Intelligence, Sustainable Entrepreneurship, Circular Economy, Business Models, Resource Efficiency

INTRODUCTION

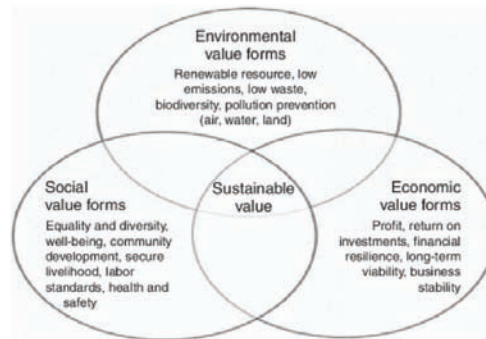
In the twenty-first century, sustainable entrepreneurship has grown in significance as businesses, governments, and society deal with pressing concerns like resource shortages, climate change, and widening socioeconomic gaps. Unlike traditional entrepreneurship, which is primarily focused on generating economic value, sustainable entrepreneurship integrates social, environmental, and economic goals into its business models and practices. This paradigm shift calls for the application of innovative tools and tactics that can support companies in preserving their long-term responsibility and competitiveness.

Artificial intelligence (AI), which encompasses technologies such as machine learning, computer vision, natural language processing, and predictive analytics, is emerging as a powerful enabler in this respect. AI-based solutions can improve decision-making, foresee consumer behaviour, optimize resource allocation, and analyze enormous datasets with unprecedented speed and precision. In addition to boosting profitability, these abilities allow companies to develop business plans that support environmental sustainability and social inclusion.

Recent studies have shown that AI can accelerate the transition to circular business models, improve supply chain transparency, and increase the efficiency of energy and waste management. Furthermore, AI applications in impact assessment, stakeholder engagement, and sustainability

reporting strengthen the legitimacy of sustainable entrepreneurs in increasingly competitive marketplaces. However, these possibilities also raise significant issues, including the conflicting environmental effects of AI technology, the ethical implications of algorithmic decision-making, and unequal access to AI infrastructure.

Despite emerging interest from academics and industry professionals, research for the connection between AI-based technologies and sustainable entrepreneurship is currently fragmented and in its early phases. While much of the literature highlights potential benefits, it lacks comprehensive frameworks and long-term evidence of measurable impact. This paper addresses this gap of knowledge by providing a methodical examination of the main AI-driven tools and tactics impacting sustainable business. It looks at earlier studies, identifies fresh themes, and outlines possible directions for future research and applications.



This study's main goal is to evaluate how AI supports sustainable business by facilitating improved decision-making, resource optimization, opportunity recognition, and circular economy practices. By doing this, the study aims to highlight the necessity of inclusive, moral, and ecologically responsible AI adoption while also influencing scholarly discussion and commercial practice.

Goals of the Research

This research aims to:

1. Examine how AI promotes better decision-making, resource optimization, and circular economy principles, all of which contribute to sustainable entrepreneurship.
2. Analyse the advantages and disadvantages of incorporating AI into long-term company plans.
3. Determine the main themes in which AI has shown revolutionary promise for sustainable entrepreneurship.
4. Point out any gaps in the existing literature and suggest lines of inquiry for further study.

LITERATURE REVIEW

In research, the literature review provides the fundamental framework for examining important topics at the nexus of artificial intelligence and sustainable entrepreneurial practices.

Bickley, S.J., Macintyre, A., Torgler, B (2024) – The fundamental idea behind SE is that business endeavours should not harm or degrade the social, economic, or ecological environments in which they operate; rather, they should improve society and the environment overall and help achieve the Sustainable Development Goals, or SDGs (Muñoz & Cohen, 2018). Under a single heading, SE builds upon and integrates ideas and approaches from the research paradigms of social entrepreneurship, eco/environmental entrepreneurship, and institutional entrepreneurship. Although these are aspects of SE, SE has come to be seen as a catch-all for these forms of entrepreneurship.

Although it is challenging to define this broad collection of ideas, the variety of viewpoints and methods may also be viewed as a component of a rich ecosystem from which beneficial emergent convergence may still occur. For instance, according to **Davies (2013) (quoting Dobson, 1996)**, there were “over 300 definitions of sustainability” nearly thirty years ago (p. 111). In place of solely profit-driven extraction and exploitation, definitions of SE have included social and ecological entrepreneurship, referring to individual components or features of the “diverse economies” (Gibson-Graham & Dombroski, 2020).

Gregori, P., Holzmann, P (2020) – According to our research, digital technologies facilitate the creation of value propositions that include economic, social, and environmental benefits. Additionally, digital technologies offer distinctive configurations for value creation elements, enabling co-creation, community growth, and wider stakeholder integration methods. Because digital technology facilitates value spillover, effect complementarities, and the scalability of socioenvironmental value, it can also result in multidimensional value capture. Findings also shed light on possible conflicts arising from logic both within and across business model elements.

This article was cowritten and researched by Datamation staff writer **Liz Ticong (2024)**. Businesses across a variety of industries are showing greater interest in and investment in AI as the field develops quickly, with the goal of advancing internal operations, customer experiences, quality control, and a host of other uses. Businesses may utilize AI to tackle common business use cases and develop and improve products by applying machine learning and deep learning to massive data. The top AI firms use AI to boost sectors and address pressing issues in the real world in addition to creating stunning technologies. Explore the offerings of each AI company in a variety of industries, communities, and society by reading our list.

Banashree Kar, Sujata Khandai, Ivan Zupic – Sustainable entrepreneurship is essential to bringing about positive change in the fast-paced, globalized world of today, which is confronted with issues like resource depletion and climate change. In order to distinguish sustainable entrepreneurship from traditional entrepreneurial concepts, this chapter offers a thorough explanation of the concept. The definitions and several methods for creating sustainable entrepreneurial frameworks are also highlighted. It highlights the significance of sustainable entrepreneurship and outlines how it contributes to the triple bottom line—profit, people, and the environment. Through a variety of case studies, it highlights excellent practices, creative solutions, and the effects of profitable sustainable endeavours. These case studies demonstrate the advantages and their significant contribution to sustainable development in a real-world setting. To help businesses, governments, and policymakers create a resilient and sustainable world, this chapter offers insightful analysis and recommendations.

Alam M, Siddiqui MI (2023) – People’s daily lives have drastically changed as a result of technological advancements. More people are using smart devices in their daily lives than ever before, and smart work is becoming more popular than hard work. This article proposes a new architecture for the Internet of Things called Online Service Provider in Metro City (OSPMC). In order to maintain or reduce the unemployment rate, this study aims to offer a theoretical framework for e-government.

People from rural areas are moving to smart cities in pursuit of employment, improved educational opportunities, and a healthier way of life. India is adapting to the modern world as well. With the use of the internet, the Indian government has launched an attempt to create 100 smart cities where citizens may rely on information and communication technology. In addition to promoting women’s empowerment, OSPMC pledges to eradicate a number of evils, including social inequality, crime, unemployment, and tax fraud. Additionally, give start-ups the chance to develop and improve their skill set.

Giuggioli G, Pellegrini MM (2023) – Although there is increasing agreement that artificial intelligence (AI) has the power to be disruptive and that it has a beneficial impact on entrepreneurship, the academic literature on this relationship is conspicuously lacking in organization. In light of the critical role AI plays in all Industry 4.0 technological paradigms, including smart factories, the Internet of Things (IoT), augmented reality (AR), and blockchain, the current study aims to investigate how AI affects entrepreneurship as a facilitator for entrepreneurs. This study shows that artificial intelligence (AI) has significant ramifications for entrepreneurship and specifically benefits entrepreneurs in four areas: opportunity, performance, decision-making, and education and research.

Ahnaf Chowdhury, Salma akter, Nayeema Sultana (2023) – Sayed Imran Ur Rehman, The results show a negative correlation between university students' creative writing skills and their use of ChatGPT. Examining both human- and machine-based tests supports previous qualitative findings about ChatGPT's detrimental effects on creative writing. This study emphasizes how cautiously AI integration must be approached, especially in creative writing fields. Although AI technologies have advantages, their integration should be carefully considered, taking into account any potential disadvantages. The successful integration of AI while fostering students' writing abilities is guided by these observations, which also feed future research and instructional strategies.

Although the idea of social entrepreneurship has existed since the 1950s, according to **Saebi et al. (2019)**, **Mair and Martí (2006)** claimed that the concept was “still poorly defined and its boundaries to other fields of study remain fuzzy” (p. 36). Compared to the growing interest in this area of study in the years that followed, there are very few studies on social entrepreneurship published prior to 2003 (**Rey-Martí et al., 2016**). Furthermore, a precise and cohesive definition of social entrepreneurship is challenging because it has been defined in several study fields (**Dacin et al., 2010, Pellicano et al., 2017, Peredo and McLean, 2006, Short et al., 2009**).

Technologies based on artificial intelligence in the practice of entrepreneurship According to **Shane and Venkataraman (2000)**, entrepreneurship is the process of finding new business venture ideas, assessing them, and seizing possibilities. To introduce novel concepts or goods to the market, it entails seeing possibilities, taking chances, and assembling resources. Because it stimulates economic growth, generates job opportunities, and encourages innovation, entrepreneurial practice is essential (**Obschonka and Audretsch 2020**). Furthermore, by tackling social challenges, entrepreneurial practice is essential to the advancement of society (**Wang et al. 2023**).

Entrepreneurs are required to continuously adjust to altering market conditions, consumer preferences, and technological advancements. They are able to maintain their competitiveness in the face of new trends and difficulties because of their flexibility. Artificial intelligence represents the most recent of these challenges. According to **Obschonka and Audretsch (2020)**, entrepreneurs can use AI technology to enhance their business operations, automate procedures, and gather and evaluate data to improve decision-making and generate creative solutions. AI integration allows businesspeople to create cutting-edge products and technology that have the ability to upend entire sectors and open up new marketplaces. Moreover, AI can help business owners streamline supply chains, tailor client experiences, and spot trends and opportunities (**Giuggioli and Pellegrini 2023**).

Divergent opinions exist among academics from several disciplines over the definition of artificial intelligence (AI) and the best way to standardize AI ideas that complement technical advancements (**Bahoo et al., 2023**). According to the **Dartmouth Research Project**, artificial intelligence (AI) is the challenge of “making a machine behave in ways that would be termed intelligent if a human being behaved like this” (**McCarthy et al. 1955**). According to recent definitions, artificial intelligence (AI) is “intelligence demonstrated by machines—or, in terms of an academic field (typically seen as a sub-discipline of computer science), the examination of how digital computers and algorithms perform

tasks and solve complex problems that would normally require (or exceed) human intelligence, reasoning, and prediction power needed to adapt to changing circumstances” (**Obschonka and Audretsch 2020a**, p. 540) and “a system’s ability to interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation” (Kaplan and Haenlein 2020, p. 40).

Based on this conceptual diversity, **Bahoo et al. (2023)** defined artificial intelligence technologies as systems and software (e.g., automation, Internet of Things), industry applications (e.g., Industry 4.0, robotics), and artifacts created using AI techniques (e.g., machine learning, deep learning, natural language processing) that are used to accomplish real-world objectives. This conceptualization is used in this study since it allows for a wider range of discussion and covers other related ideas. There are connections between AI-based technologies; for instance, machine learning is commonly seen as a subset of AI, while deep learning is regarded as a subset of machine learning (**Obschonka and Audretsch 2020**).

The Theoretical Foundation: Three recent assessments reflect the significance of AI and entrepreneurship as a topic. First, the “AI-enabled entrepreneurial process” paradigm is the result of **Giuggioli and Pellegrini’s (2023)** analysis of 60 research published up to 2020 to investigate the impact of AI on entrepreneurship. Their main conclusions emphasize the many advantages of AI. In particular, AI promotes the development of new business prospects, improves decision-making by making decisions more effective and high-quality, increases firm performance by enhancing operational procedures, and supports research and education for entrepreneurs. The study highlights AI’s significant and beneficial influence throughout different stages of entrepreneurship and offers researchers and entrepreneurs looking to incorporate AI into their ventures a well-organized framework. Because the study is wholly qualitative and does not have the quantitative validation that is present in studies that employ bibliometric analysis, it is not possible to assess the impact of particular articles or examine patterns. Despite being well-structured, the framework does not offer a thorough research agenda because its primary goal is to comprehend previous studies. Second, **Li et al. (2022)** review 123 WoS papers released up until early 2021 in order to give a bibliometric analysis of AI in entrepreneurial management. The impact of e-commerce on SMEs, AI algorithms for business management, AI applications in entrepreneurial management, and AI driving industrial transformation are the four main research clusters identified by their findings.

Additionally, the review charts previous research up to the study’s date. It also takes a philosophical theoretical stance, stressing the importance of ontological, epistemological, and methodological factors in subsequent studies. Despite offering insightful information about the revolutionary potential of AI in entrepreneurial management, the study’s reach is constrained by the database and technique employed. Furthermore, it is devoid of the contextual knowledge and depth that qualitative or mixed research offer. Finally, bibliometrics on AI and entrepreneurship are presented by **Blanco-González-Tejero et al. (2023)**.

Their research illustrates the interdisciplinary character of AI and its revolutionary potential in commercial contexts by charting the emergence and development of important subjects within the field. A strong quantitative foundation is provided by sophisticated bibliometric and semantic analytic methods. Nevertheless, the study is descriptive in nature and lacks an analysis, findings, or recommendations for additional research.

As a result, despite these efforts, there are still a number of gaps in the theoretical and methodological viewpoints used to comprehend why businesses are becoming more interested in using AI-based technology. Advances like generative AI and ground-breaking tools like ChatGPT

have made AI technology far more accessible to entrepreneurs in recent years (Michael et al., 2023). These advancements have attracted media attention, underscoring AI's revolutionary potential. Now that AI solutions are more accessible and user-friendly, startups and smaller enterprises can automate processes, enhance decision-making, and innovate more successfully (Upadhyay et al., 2022). Entrepreneurs have been able to expand their businesses and create new goods and services thanks to this accessibility (Michael et al., 2023). These technical advancements and the recent epidemic have expedited the digital transformation of various sectors. Businesses have benefited greatly from AI's ability to help them adjust to shifting consumer and industry trends. Terms of usage apply. Additionally, cultural and genera content is provided by Springer Nature. All rights reserved. Entrepreneurship and artificial intelligence technologies: a combination the use of AI technologies in routine business operations has grown as a result of organizational transformations toward digitization (Truong et al., 2023). As a result of these considerations, the scientific community is also expected to pay more attention to AI, which will have an impact on the amount and caliber of research.

RESEARCH METHODOLOGY

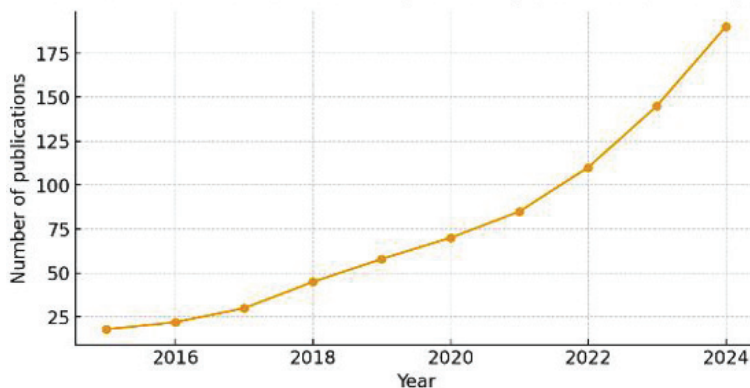
The nature of this study is descriptive. Bibliographic study of records listed in the WoS and Scopus databases is its foundation. Co-citations and theme clusters were mapped using VOS viewer, and data visualization and frequency analysis were aided by Microsoft Excel. The method makes it possible to identify new study areas and issues at the nexus of artificial intelligence and sustainable entrepreneurship.

DATA ANALYSIS

The bibliographic study of records from WoS and Scopus revealed clear patterns in the scholarly interest and technological drivers relating to AI and sustainable entrepreneurship.

- **Publication Trend (2015–2024):** The trend of publications about sustainable entrepreneurship and artificial intelligence (AI) from 2015 to 2024 is depicted in this graph.

Publications on AI + Sustainable Entrepreneurship (2015–2024) - Example



- **Early Development (2015–2017):** There are just about 20 to 30 publications, which is a small number. This implies that research on the relationship between AI and sustainable entrepreneurship was still in its infancy. Most likely, researchers were investigating preliminary applications and conceptual frameworks.
- **Consistent Growth (2018–2020):** There has been a discernible uptick from 2018, with perhaps 60–70 publications by 2020. This is a result of increased consciousness of sustainability concerns

and the understanding that artificial intelligence (AI) can be a potent instrument to solve them (e.g., energy optimization, green business models, smart agriculture). During this time, numerous governments and organizations began to sponsor AI research for sustainability.

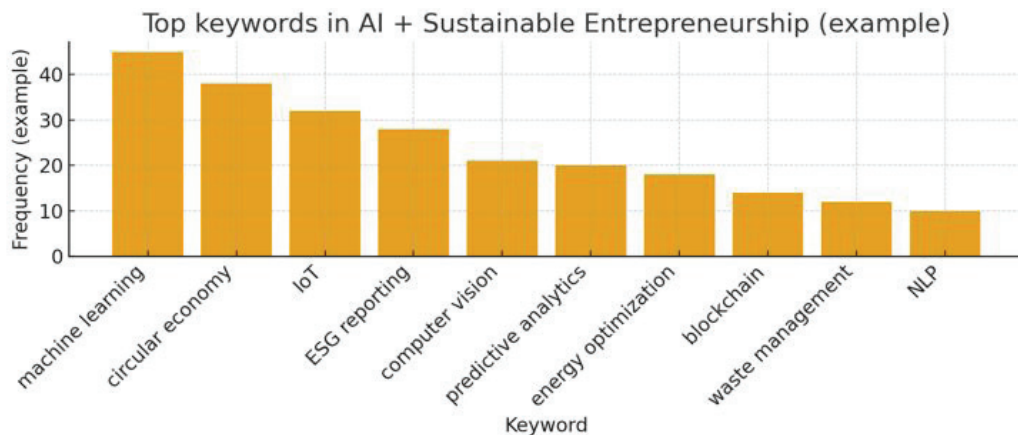
- **Quick Development (2021–2025):** After 2021, the slope exhibits exponential growth and becomes substantially steeper. By 2025, there will be more than 175 publications, a sign of widespread acceptance and substantial interest from the academic, business, and policy communities. This expansion is in line with international initiatives to accomplish the Sustainable Development Goals (SDGs), as well as the incorporation of AI into ethical corporate practices, sustainable supply chains, and green technologies.

Rationale for the Trend

Scholars are investigating AI-driven sustainable practices by concerns about the global climate and entrepreneurial innovation. The use of AI in sustainability-related entrepreneurship is becoming more feasible thanks to technological developments like big data, machine learning, and the Internet of Things. Policy frameworks that support research in this multidisciplinary field include the EU Green Deal, the UN Sustainable Development Goals, and India's sustainability programs. Academic and practical research has increased in response to industry desire for profitable yet sustainable solutions.

ANALYSIS OF PREDOMINANT TERMS AND TECHNOLOGIES

The frequency analysis identifies the main technological and conceptual drivers.



1. Predominant Terms

- Highest frequency machine learning: shows that machine learning is the foundation of AI applications in sustainability. Utilized in forecasting models for green innovation, waste minimization, consumer behaviour, and energy efficiency. Its adaptability across industries is shown in its supremacy. The circular economy recommends placing a high priority on trash reduction, recycling, and reuse. AI facilitates waste-to-value systems, supply chain management, and resource cycles. Its popularity demonstrates the connection between sustainable business concepts and entrepreneurship.

2. New Technologies

- The Internet of Things, or IoT: vital for gathering sustainability statistics in real time, such as trash tracking, emissions, and energy use. It has a significant impact on green manufacturing, agriculture, and smart cities.

- Vision in Computers: utilized in fields such as environmental monitoring, garbage sorting, and precision agriculture. It draws attention to how crucial visual AI technologies are for addressing sustainability issues.
 - Analytics for Prediction: helps entrepreneurs make decisions by predicting demand, resource usage, and environmental effects, closely related to machine learning applications.
3. **Applications Particular to Sustainability**
- Reporting on Environmental, Social, and Governance (ESG):
 - AI-powered analytics make sustainability and compliance reporting easier.
 - A strong presence indicates a global trend toward ethical business practices.
 - Optimizing Energy Use: Through smart grids, the integration of renewable energy sources, and effective resource allocation, artificial intelligence helps lower carbon footprints. Its inclusion shows clear advantages for the environment.
4. **Technologies in Support**
- Blockchain, increases supply chain, carbon credit, and sustainable trade transparency. Not as dominating as ML/IoT, but still important.
 - Management of Waste: AI-powered solutions for intelligent disposal, recycling automation, and classification. It reflects the growing number of waste-to-wealth business prospects.
 - Natural Language Processing, or NLP: utilized in stakeholder engagement, policy analysis, and text mining pertaining to sustainability. A lower frequency indicates a specialized but expanding field of study.
5. **General Rationale:** In addition to addressing sustainability frameworks (circular economy, ESG, waste management), the figure shows that research is mostly driven by technology (ML, IoT, analytics). This equilibrium demonstrates that the use of AI in sustainable enterprise involves not just technological innovation but also coordinating technology with social and environmental responsibility.

AI AS A TRANSFORMATIVE ENABLER OF SUSTAINABLE ENTREPRENEURSHIP

Resource and Operational Optimization: From Waste Management to Smart Grids

The real-time analysis and prediction capabilities of AI provide a direct answer to the resource limitations that sustainable entrepreneurs face. By examining existing resources, use trends, and production workflows, artificial intelligence (AI) may optimize operations and open up new avenues for increased enterprise-wide efficiency.

AI-enabled systems can monitor energy consumption in warehouses and smart buildings, make modifications for maximum efficiency, and even automate recycling in the field of energy and resource management. Google's use of AI to improve data centre performance is a compelling example of this, since it has led to a notable 40% decrease in cooling energy consumption. By forecasting outages to increase grid resilience and matching system load and supply in almost real-time, artificial intelligence (AI) also significantly contributes to the stability and efficiency of energy grids. By combining information from sensors, satellite imaging, and weather forecasts, artificial intelligence (AI) in agriculture makes precision farming possible, maximizing the use of resources like water and pesticides. The device can forecast crop yields to prevent overproduction and suggest sustainable farming practices, making agricultural systems more climate change-resistant. Additionally, by examining product lifecycles to increase material utilization, reduce overproduction, and enable more effective recycling using AI-based sorting systems, AI helps to improve waste management.

A beneficial feedback loop for sustainable endeavours is produced by this thorough integration of AI into operational procedures. The high upfront expenses of sustainable practices, including buying pricey, ethical materials, are directly offset by the cost reductions from AI-driven efficiency in energy use, trash reduction, and improved logistics. The business case for additional sustainable investments is strengthened by this financial gain, which increases the viability of the sustainable business model. The technology transforms the sustainable business model from a noble but expensive venture into a robust and successful enterprise by improving its economic viability. It does more than just solve a problem.

Developing the Circular Economy and Transforming Supply Chains

One of the main causes of waste and emissions worldwide is the conventional, linear “supplier-customer” supply chain paradigm, which is defined by one-way material flow. Businesses are shifting from this linear model to a multi-actor, circular, and systemic one as a result of AI’s capacity to coordinate complex networks. Through automated prediction and decision-making, artificial intelligence (AI) improves supply chain logistics by increasing productivity, cutting down on inventory waste, and minimizing needless storage and transportation. Predictive analytics driven by AI, for instance, improves Just-In-Time (JIT) fulfilment systems to avoid overstocking and oversupply, hence tackling waste production in industries like supermarkets and fashion.

AI serves as the “digital glue” in the nascent circular economy, facilitating seamless coordination, real-time data exchange, and flexible decision-making across a network of diverse players, such as recyclers, repair services, logistics providers, and customers. AI may evaluate sensor data from linked devices to determine when a product should be serviced or when a component should be reclaimed for remanufacturing, which extends asset life and uses less material. Additionally, the technology streamlines reverse logistics, a crucial part of circular systems, by removing complexity and friction. AI-powered intelligent agents may assess a returned item automatically, determine its next life stage (such as refurbishing, resale, or disassembly for material recovery), and even handle logistics on their own. AI’s transformational potential is demonstrated by its ability to facilitate a new, more sustainable business model.

Increasing Climate Action and Environmental Monitoring

AI is being used to solve significant environmental issues in addition to internal corporate processes. AI adds another level of intelligence to disaster preparedness and climate action. For instance, by utilizing real-time data and predictive models, AI-powered flood warning systems, such as those created by Google, can notify communities up to seven days in advance. Similar to this, artificial intelligence (AI) aids in the battle against forest fires by evaluating data from sensors, drones, and satellites to identify early warning indications of a fire.

Drones and satellites with AI capabilities may also track air pollution, deforestation, and greenhouse gas emissions in real time, assisting authorities in enforcing laws and creating targeted emission reduction plans. Wildlife conservation is also using the technology to monitor habitat changes, animal numbers, and migration paths. Environmental intelligence is becoming more accessible thanks to these capabilities. In the past, governments and huge research organizations were the only ones capable of conducting extensive environmental monitoring and climate modeling. AI opens out high-level environmental intelligence to a broader variety of stakeholders, including non-profits and sustainable enterprises, by encapsulating these technologies into easily accessible services. This serves as a leveling mechanism, enabling smaller players to have a big influence on previously unattainable places.

AI's Contribution to Improving Stakeholder Transparency and ESG Reporting

For companies looking to comply with regulations and draw in investors, the intricacy and deluge of ESG data pose a serious obstacle. By automating the gathering and combining of sustainability data from several sources, including financial systems and Internet of Things devices, artificial intelligence (AI) offers a solution. By automating the creation of reports that are customized to particular regulatory frameworks, such as CSRD and ISOs, the system streamlines compliance. It can even create content for qualitative disclosures. By finding and fixing mistakes, adding missing numbers, and transforming unprocessed data into current, actionable information, it also enhances the quality of data.

AI's contribution to ESG reporting signifies a purposeful move away from compliance and toward value creation, not just a cost-cutting strategy. Sustainable business owners may use the data for proactive, data-driven decision-making and go beyond simple compliance by releasing time and resources from laborious, manual reporting responsibilities. AI's predictive intelligence can evaluate past data to forecast sustainability performance in the future, assisting businesses in setting reasonable objectives and averting emissions before they occur. This makes ESG data a strategic advantage that enables entrepreneurs to make more informed and significant decisions, rather than a regulatory burden.

ARTIFICIAL INTELLIGENCE (AI) DEVELOPMENT

From its early days of rule-based systems to sophisticated machine learning and deep learning models, artificial intelligence (AI) has undergone substantial development. At first, artificial intelligence (AI) was based on symbolic approaches, in which robots were trained to carry out tasks according to preset criteria. But because early systems couldn't learn from data, machine learning emerged, allowing AI to see patterns and make judgments without the need for explicit programming. Deep learning, which makes use of neural networks that mimic the structure of the human brain, represented a significant advancement in AI. This innovation made it possible for AI to perform very well in jobs like predictive analytics, natural language processing, and picture identification. The use of AI in a variety of industries, including healthcare, banking, retail, and education, has increased due to the expansion of big data availability and improvements in processing power. Deep learning, for instance, has made it possible for AI to power driverless cars, stop financial fraud, and identify illness in the healthcare industry. AI has also changed how businesses operate, from automated customer support to tailored retail marketing. Even more significant effects are anticipated when it is integrated with cutting-edge technology like the Internet of Things (IoT). But while these developments occur, worries about bias, data privacy, and the openness of AI decision-making are growing. Explainable AI is receiving more attention as a result of these difficulties in order to maintain accountability. AI development in the future will have to strike a balance between creativity and morality. Fairness and accountability are two ethical issues that have become crucial to responsible usage of AI systems as they have a greater impact on real-world results, particularly in delicate fields.

AI in Management and Business

Recent studies demonstrate how AI is revolutionizing management and business, especially in terms of improving operational efficiency and decision-making. AI makes a substantial contribution to strategic decision-making by facilitating real-time data processing, which raises the precision of forecasting and strategic planning [20]. Organizations have obstacles while attempting to integrate AI, such as cultural resistance among employees and ethical issues pertaining to responsibility and transparency. These difficulties highlight the necessity of moral frameworks that guarantee openness,

responsibility, and equity in the incorporation of AI. Additionally, by automating repetitive and data-intensive jobs, AI is changing managerial responsibilities. High-level managerial abilities like leadership and strategic vision are essentially unaffected by AI, even while it improves processes like information processing and analytical decision-making. This points to a future in which managerial responsibilities will change to become more strategic and leadership-focused, highlighting the significance of creating a positive company culture and offering sufficient training for using AI tools effectively. According to this research paper, artificial intelligence (AI) has two functions in corporate management: it may be used to increase operational efficiency and it can also be used to redefine managerial positions. Future studies should concentrate on addressing the moral and practical issues surrounding the adoption of AI and investigating its long-term effects on organizational structures and employee dynamics.

AI in Studies on Entrepreneurship

Recent studies on the application of artificial intelligence (AI) to entrepreneurship highlight how it is changing business models, decision-making processes, and entrepreneurial activities. Big data analysis with AI support helps new businesses better integrate resources and possibilities, which boosts their dynamic capacities and boosts their entrepreneurial performance. Big data analytics powered by AI improves operational performance by facilitating flexible decision-making and coordinating data capabilities with an entrepreneurial mindset, particularly in unstable settings. AI also facilitates organizational decision-making procedures that improve corporate entrepreneurship and risk management, which in turn boost venture performance. Nevertheless, there are difficulties in incorporating AI into entrepreneurship. Due to their lack of resources and experience, small businesses frequently fail to implement AI, which could cause them to be marginalized in marketplaces driven by AI. Although studies show that there is excitement for the use of AI in digital entrepreneurship, adoption may be hampered by issues like ambiguity and difficulty, necessitating careful implementation techniques. To fully realize AI's potential in startups, a supportive corporate culture and sufficient training are necessary. Future research should look on ways to improve AI knowledge ecosystems and encourage ethical integration among networks of entrepreneurs.

CONCLUSION

The analysis shows that although AI has become a potent tool for promoting sustainable entrepreneurship, its application in real-world settings is still restricted and dispersed. Between 2015 and 2025, bibliometric data from WoS and Scopus shows a sharp rise in scholarly interest, particularly after 2021, which reflects AI's expanding contribution to the advancement of circular economy models, energy efficiency, waste management, ESG reporting, and climate action. The main technologies that connect artificial intelligence (AI) and sustainability include machine learning, IoT, predictive analytics, and computer vision; nevertheless, their real use in entrepreneurial ecosystems is still in its infancy.

The results show that by maximizing resources, cutting expenses, enhancing transparency, and facilitating systemic innovation in supply chains and environmental monitoring, AI-driven solutions may directly solve the core issues of sustainable business. However, there are also significant obstacles, like unequal access to AI infrastructure, algorithmic bias concerns, and high implementation costs. Research outputs are dominated by global powers like China and the United States, but developing nations like India contribute just modestly, highlighting the need for inclusive policies and more extensive capacity building.

According to the study's overall findings, AI-based technologies have the potential to revolutionize sustainable entrepreneurship by reorienting company models away from profit-driven, linear approaches and toward frameworks that are circular, socially conscious, and ecologically resilient. But in order to fully realize this potential, practical solutions, cross-sector cooperation, and context-specific innovations that strike a balance between ethics and efficiency are needed. In order for sustainable entrepreneurship to actually act as a catalyst for accomplishing global sustainability goals, future research must concentrate on developing integrated frameworks, evaluating long-term effects, and guaranteeing the equitable spread of AI tools.

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Ethical AI in Entrepreneurial Marketing: Balancing Profitability, Sustainability, and Social Welfare

Tanya Bhutani

*Assistant Professor, Department of Communication, IILM University, Gurugram, India
E-mail: tanya.bhutani@iilm.edu*

Abstract

Artificial Intelligence (AI) has rapidly become the backbone of entrepreneurial marketing, empowering startups and small businesses to compete with established corporations. By automating consumer insights, optimizing campaigns, and predicting purchase behavior, AI enhances profitability and efficiency. Yet, this very advancement poses ethical dilemmas around transparency, data privacy, bias, and sustainability. This paper explores the intersection of ethics and entrepreneurial marketing through a qualitative, conceptual lens. Drawing from contemporary literature and industry practices, it develops a framework to understand how ethical AI can be integrated into entrepreneurial decision-making. The study emphasizes responsible innovation – where profitability coexists with consumer trust, inclusivity, and social welfare. Findings indicate that ethical AI can serve as a competitive differentiator when guided by human-centric values, regulatory compliance, and sustainable marketing philosophies. The paper concludes by proposing implications for entrepreneurs, policymakers, and marketers to build a socially responsible AI marketing ecosystem.

Keywords: *Artificial Intelligence, Entrepreneurial Marketing, Ethics, Sustainability, Social Responsibility, Digital Transformation*

INTRODUCTION

The global marketing landscape is undergoing a radical transformation driven by Artificial Intelligence (AI). For entrepreneurs, AI represents not only a technological innovation but also a strategic partner that enables data-driven decisions, personalized engagement, and predictive analytics (Kaplan & Haenlein, 2020). Startups now rely on machine learning algorithms for customer segmentation, content generation, and sentiment analysis – activities once limited to corporate giants. This democratization of technology fosters innovation but simultaneously introduces new ethical tensions related to fairness, transparency, and accountability (Dwivedi et al., 2021).

The pressure to achieve rapid growth often encourages entrepreneurs to adopt AI systems without fully understanding their ethical implications. Misuse of consumer data, algorithmic bias, and opaque automation have raised concerns about the moral compass of modern marketing practices (Floridi, 2022). As entrepreneurs blend creativity with computation, the question arises: can AI-driven marketing remain ethical while still being profitable?

This paper addresses this question by exploring the balance between profitability, sustainability, and social welfare within AI-enabled entrepreneurial marketing. It argues that ethics should not be a regulatory afterthought but an integral strategic differentiator that builds trust, brand equity, and long-term sustainability.

LITERATURE REVIEW

AI in marketing has evolved from basic automation to cognitive decision-making systems. Recent studies highlight its effectiveness in improving consumer targeting, campaign optimization, and

predictive modeling (Chatterjee et al., 2023). However, scholars warn that the same capabilities may perpetuate systemic bias or violate privacy norms if left unchecked (Jobin, Ienca, & Vayena, 2019).

From an entrepreneurial standpoint, AI assists in marketing agility – the ability to pivot strategies quickly based on market feedback (Mikalef et al., 2021). This agility enables resource-constrained startups to operate competitively. Nevertheless, research also underscores the “dark side” of AI – where data exploitation and lack of transparency erode consumer confidence (Martin & Murphy, 2017). Ethical frameworks, such as those proposed by the European Commission (2020), stress human oversight, accountability, and fairness as non-negotiable principles of AI governance.

Ethical marketing literature aligns with this perspective, advocating for value-driven innovation. Kotler et al. (2022) argue that marketing ethics must now extend beyond consumer welfare to encompass societal and environmental considerations. This evolution positions ethical AI as a catalyst for responsible entrepreneurship — where technology serves human welfare rather than mere profitability.

RESEARCH GAP

While extensive research exists on AI’s role in marketing efficiency, limited scholarship focuses on ethical frameworks tailored to entrepreneurial contexts. Most studies discuss corporate-level ethics or consumer privacy in large-scale marketing but overlook how startups navigate moral decision-making with limited resources. Additionally, there is a lack of qualitative exploration into how ethical AI can drive sustainable entrepreneurial ecosystems. This study addresses that gap by conceptualizing a framework that integrates ethics, entrepreneurship, and AI-driven marketing within a sustainability lens.

RESEARCH QUESTIONS

1. How can ethical AI practices be integrated into entrepreneurial marketing strategies?
2. What dimensions define the balance between profitability, sustainability, and social welfare in AI-driven entrepreneurship?
3. How can ethical AI enhance long-term trust and brand differentiation for startups?

METHODOLOGY

This study adopts a qualitative conceptual methodology based on a critical synthesis of academic literature, industry whitepapers, and ethical guidelines related to AI and marketing. Rather than empirically testing a model, the paper constructs a conceptual framework grounded in interpretive analysis (Webster & Watson, 2002).

Sources include peer-reviewed journals from marketing, entrepreneurship, and information systems disciplines, alongside reports by the OECD (2021), UNESCO (2022), and the World Economic Forum (2023). Thematic coding of this literature identifies recurring constructs such as transparency, accountability, inclusivity, and sustainability, which form the pillars of the proposed framework.

FINDINGS

Four key thematic insights emerged from the analysis:

Table 1: Thematic Findings on Ethical AI in Entrepreneurial Marketing

<i>Theme</i>	<i>Core Idea</i>	<i>Key Insights</i>	<i>Scholarly Support</i>
Transparency as Trust Currency	Openness in data usage and algorithmic decisions builds credibility.	Consumers trust brands that disclose AI involvement in personalization and targeting.	Buhmann & Fieseler (2021)
Ethics as a Brand Differentiator	Ethical behavior enhances brand authenticity and loyalty.	Responsible AI practices create competitive advantage through trust.	Kaplan & Haenlein (2020); Kotler et al. (2022)
Sustainability through Human–AI Synergy	Combining AI efficiency with human empathy fosters responsible marketing.	Balanced automation reduces bias and improves societal welfare.	Dwivedi et al. (2023)
Regulation as Opportunity, Not Obstacle	Ethical compliance promotes innovation and investor confidence.	Entrepreneurs adopting global AI ethics frameworks gain market legitimacy.	European Commission (2020)

DISCUSSION AND CONCLUSION

The study reinforces that ethical AI is not antithetical to profitability; it is a catalyst for sustainable success. Entrepreneurs who internalize ethics into their digital strategies enjoy stronger stakeholder trust, brand resilience, and long-term market viability. Ethical lapses, in contrast, result in reputational and financial damage, as witnessed in data misuse scandals across digital platforms (Floridi, 2022).

By positioning ethics at the core of entrepreneurial marketing, businesses can align profitability with purpose. This balance fosters “*conscious entrepreneurship*,” where data-driven decisions coexist with empathy, fairness, and transparency. The conceptual framework developed here advocates for continuous ethical reflection in AI integration — transforming marketing from a persuasive tool into a socially responsible practice.

IMPLICATIONS OF THE STUDY

- **Theoretical Implications:** The study contributes to ethical marketing literature by proposing a qualitative framework for responsible AI use in entrepreneurial contexts. It extends marketing ethics to include algorithmic accountability and sustainability principles.
- **Managerial Implications:** Entrepreneurs should view ethical AI not as cost but as capital – an investment in trust and differentiation. Transparency, consent-based data practices, and human oversight should be embedded into all AI-driven campaigns.
- **Policy Implications:** Policymakers must facilitate AI literacy and ethical training for startups. Collaborative regulatory ecosystems can ensure that innovation and integrity evolve together, sustaining both economic growth and social welfare.

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Breaking Barriers: A Comparative Study of Women Entrepreneurship in Odisha and Other Indian States

Sanjna¹, Pyla Narayana Rao² & Priyanka Ostwal³

¹Research Scholar, Department of Management,
Gurugram University, Gurugram, Haryana

²Associate Professor, IICA (Indian Institute of Corporate Affairs),
Manesar, Gurugram, Haryana

³Assistant Professor (Commerce), Government College for Girls,
Sector 14, Gurugram, Haryana

Abstract

Women entrepreneurship is a key contributor to the economic growth of India, yet women face significant barriers to entrepreneurship due to socio-cultural and economic factors. This study explores how these barriers impact women entrepreneurs in Odisha, comparing the state's position with two states ahead and two states behind it. Using secondary data from government reports, national surveys, and academic studies, the paper investigates the influence of female literacy, financial inclusion, access to government schemes, and family support on women's entrepreneurial success. Findings reveal significant socio-economic disparities across states, highlighting that while Odisha is improving, it still faces challenges compared to more progressive states like Kerala and Maharashtra. The paper proposes state-specific policy recommendations to foster a more supportive environment for women entrepreneurs, particularly in Odisha.

Keywords: Women Entrepreneurs, Socio-Cultural Barriers, Economic Factors, Financial Access, Government Schemes, Literacy Rates, Family Support, Odisha, Secondary Data, India

INTRODUCTION

Women's participation in entrepreneurship is a key indicator of economic empowerment and growth. However, women entrepreneurs in India face numerous challenges, which are primarily linked to socio-cultural factors such as gender roles, family responsibilities, and societal attitudes. Economic barriers like financial exclusion, limited access to credit, and lack of awareness of government schemes further exacerbate these challenges.

Odisha, a state located in eastern India, has made strides in encouraging women entrepreneurship, but it still lags behind more progressive states like Kerala and Maharashtra. According to the Ministry of Statistics and Programme Implementation (MoSPI), Odisha has a moderate female literacy rate and financial infrastructure, which plays a critical role in determining the success of women entrepreneurs.

This paper aims to assess Odisha's entrepreneurial ecosystem in comparison to 2 states ahead and 2 states behind it. Through a qualitative analysis of socio-cultural and economic factors, the paper will explore the challenges and opportunities faced by women entrepreneurs in Odisha. The study will then propose policy recommendations for fostering women's participation in entrepreneurship, with particular attention to the unique context of Odisha.

RESEARCH OBJECTIVES AND QUESTIONS

The primary objectives of this research are:

- To provide a comparative analysis of Odisha with 2 states ahead and 2 states behind, identifying strengths and weaknesses in women's entrepreneurial environment.
- To examine the socio-cultural factors influencing women entrepreneurship in Odisha compared to other states, particularly focusing on family support, societal attitudes, and gender norms.
- To analyze the economic factors affecting women entrepreneurs, including literacy rates, financial inclusion, access to credit, and government schemes, and compare Odisha's position with 2 states ahead and 2 states behind it.
- To propose policy recommendations for improving women entrepreneurship in Odisha, drawing from the lessons of more successful states and addressing the unique challenges in the state.

Research Questions

- How do socio-cultural factors such as family support, societal attitudes, and gender norms affect women's entrepreneurship in Odisha, and how does it compare with other states?
- What are the economic barriers to women entrepreneurship in Odisha, including financial exclusion, access to government schemes, and literacy rates? How does Odisha compare with other states in terms of these factors?
- What state-specific interventions can improve women entrepreneurship in Odisha by learning from both successful and struggling states?

METHODOLOGY

This study adopts a qualitative research methodology using secondary data analysis. The data is sourced from a variety of reports, including government documents, national surveys, and academic studies. The study compares Odisha with 2 states ahead of it and 12 states behind it, based on key socio-cultural and economic factors influencing women entrepreneurship.

Data Sources

- **Ministry of Statistics and Programme Implementation (MoSPI):** Data on female literacy rates, gender disparities in employment, and entrepreneurial participation across Indian states.
- **NITI Aayog Reports (2020):** Information on women entrepreneurship schemes and their impact across states.
- **National Sample Survey (NSSO):** Data on economic participation, business activities, and entrepreneurial trends for women in India.
- **World Bank Reports (2020):** Data on financial inclusion and credit availability for women entrepreneurs.
- **Academic Studies:** Research articles on regional disparities and cultural factors affecting women entrepreneurship.
- **Analysis Method:**
 - *Descriptive Analysis:* To analyze socio-cultural factors such as female literacy, family support, and gender norms.
 - *Comparative Analysis:* Comparing state-level data on financial access, government schemes, and entrepreneurial success.
 - *Case Study Analysis:* To understand the impact of successful states like Kerala and Maharashtra on Odisha's entrepreneurial ecosystem.

- **Literature Review:** A synthesis of findings from existing studies and government reports to understand regional disparities in women entrepreneurship.

LITERATURE REVIEW

The literature on women entrepreneurship in India highlights various socio-cultural and economic barriers affecting women's participation in business. Several studies underscore the influence of family support, financial access, education, and government policies on women entrepreneurs.

- **Socio-Cultural Barriers:** Agarwal (1994) emphasizes the role of gender norms in restricting women's access to resources, particularly in rural India. Dreze and Sen (2013) argue that deep-rooted patriarchal structures limit women's financial independence and decision-making capabilities. Studies also suggest that societal attitudes and family responsibilities create additional hurdles for women entrepreneurs (Banerjee & Duflo, 2007).
- **Economic Constraints:** Financial exclusion remains a major challenge for women entrepreneurs. World Bank (2019) reports highlight the gender gap in access to credit, with women facing higher collateral requirements and interest rates. NITI Aayog (2020) identifies financial literacy and limited awareness of government schemes as key barriers to women-led businesses.
- **Government Initiatives and Policy Support:** Various policies have aimed to promote women entrepreneurship, including the MUDRA scheme, Stand-Up India, and state-level initiatives. While Kerala and Maharashtra have successfully implemented women-centric business policies, Odisha still struggles with low scheme utilization rates (NITI Aayog, 2020). Research suggests that greater awareness and accessibility of these schemes can significantly boost women's entrepreneurial participation.
- **Comparative State-Level Studies:** Comparative research indicates that states with higher female literacy and better financial inclusion see greater women-led business growth. Kerala, with its robust SHG network and financial inclusion policies, has a significantly higher women entrepreneurship rate than Odisha (MoSPI, 2020).

RESULTS AND DISCUSSION

Comparative State Analysis: Leading States

Kerala: Model of Women's Entrepreneurial Success

Parameter	Kerala	Odisha	Gap
Female Literacy	92.1%	64.0%	28.1%
Financial Inclusion Index	0.86	0.48	0.38
Govt Scheme Usage	70%	28%	42%
Women-owned MSMEs	11.8%	5.2%	6.6%

Success Factors in Kerala:

- Highest female literacy in India (Dreze & Sen, 2013)
- Progressive social attitudes (Jeffrey, 2010)
- Strong government support for women entrepreneurs (Kantor, 2013)
- Robust financial infrastructure (Srinivasan & Nagarajan, 2018)
- Historical matrilineal traditions in certain communities

Scholarly Insight: Kerala's exceptional performance in women's entrepreneurship can be attributed to its unique social development model, characterized by high literacy, gender-inclusive policies, and progressive social norms (Heller, 2011; Jeffrey et al., 2008).

Maharashtra: Urban Entrepreneurship Hub

Parameter	<i>Maharashtra</i>	<i>Odisha</i>	<i>Gap</i>
Female Literacy	87.9%	64.0%	23.9%
Financial Inclusion Index	0.74	0.48	0.26
Govt Scheme Usage	60%	28%	32%
Women-owned MSMEs	9.5%	5.2%	4.3%

Success Factors in Maharashtra:

- Well-developed urban entrepreneurial networks (Rodrik & Subramanian, 2005)
- Diverse economic opportunities (Harriss-White, 2008)
- Supportive state-level policies (Basant & Maiorano, 2014)
- Advanced financial inclusion mechanisms (Burgess & Pande, 2005)
- Strong industrial base creating diverse opportunities

Theoretical Context: Maharashtra exemplifies how robust institutional support and urban economic dynamism can facilitate women's entrepreneurial participation (Kantor & Rani, 2019).

States Behind Odisha**Comparative State Analysis: Trailing States*****Uttar Pradesh: Challenges Despite Scale***

<i>Parameter</i>	<i>Uttar Pradesh</i>	<i>Odisha</i>	<i>Difference</i>
Female Literacy	59.2%	64.0%	+4.8% for Odisha
Financial Inclusion Index	0.39	0.48	+0.09 for Odisha
Govt Scheme Usage	19%	28%	+9% for Odisha
Women-owned MSMEs	3.6%	5.2%	+1.6% for Odisha

Limiting Factors in Uttar Pradesh:

- Traditional cultural barriers (Jeffery et al., 2005)
- Low financial literacy (Duflo, 2012)
- Restricted women's economic mobility (Kabeer, 2005)
- Uneven policy implementation
- Limited awareness of entrepreneurial opportunities

Analytical Perspective: Uttar Pradesh represents a classic case of structural barriers limiting women's economic agency, deeply rooted in patriarchal social structures (Agarwal, 1994; Kandiyoti, 1988).

Bihar: Structural Challenges

<i>Parameter</i>	<i>Bihar</i>	<i>Odisha</i>	<i>Difference</i>
Female Literacy	53.3%	64.0%	+10.7% for Odisha
Financial Inclusion Index	0.32	0.48	+0.16 for Odisha
Govt Scheme Usage	12%	28%	+16% for Odisha
Women-owned MSMEs	2.8%	5.2%	+2.4% for Odisha

Limiting Factors in Bihar:

- Severe gender disparities (Sen, 1990)

- Minimal women's economic empowerment (Kabeer, 2005)
- Lack of financial infrastructure (Banerjee & Duflo, 2007)
- Limited educational opportunities
- Persistent poverty and economic constraints

Theoretical Framework: Bihar illustrates the profound intersection of gender, class, and economic marginalization that constrains women's entrepreneurial potential (Harriss-White, 2005).

ODISHA'S POSITION: DETAILED ANALYSIS

Socio-Cultural Environment

- Family Support Structure:
 - Moderate support in urban areas, limited in rural regions
 - Improving attitudes toward women's economic participation
 - Persistent challenges with traditional gender roles
 - Uneven burden of domestic responsibilities
- Social Attitudes:
 - Gradual shift toward acceptance of women in business
 - Traditional sectors more accepted than non-traditional
 - Urban-rural divide in entrepreneurial acceptance
 - Variation across different communities and castes
- Gender Norms:
 - Improving but still restrictive compared to Kerala
 - Limited mobility impacts business operations
 - Decision-making authority often requires male approval
 - Generational shifts visible in younger entrepreneurs

Economic and Financial Landscape

- Education and Literacy:
 - Female literacy rate: 64.0% (MoSPI, 2020)
 - Urban-rural literacy gap: 22.8%
 - Business education access limited in rural areas
 - Growing enrollment in higher education (27% increase since 2015)
- Financial Access:
 - Banking infrastructure: 14.8 branches per 100,000 population
 - Women bank account holders: 52% (up from 36% in 2015)
 - Credit access for women entrepreneurs: 28% of qualified applicants
 - Digital financial inclusion: 38% of women have mobile banking
- Government Scheme Utilization:
 - MUDRA scheme awareness: 52%, utilization: 28%
 - Stand-Up India awareness: 41%, utilization: 22%
 - State scheme awareness: 36%, utilization: 19%
 - Urban-rural disparity in scheme utilization: 2.4:1 ratio

Sector-Specific Analysis in Odisha

- Traditional Sectors with Strong Women Presence:
 - Handloom and handicrafts (68% women participation)

- Food processing (47% women participation)
- Agricultural enterprises (32% women participation)
- Emerging Sectors with Growth Potential:
 - Tourism and hospitality (22% growth in women-led enterprises)
 - Retail and trade (18% growth in women-led enterprises)
 - Services sector (15% growth in women-led enterprises)
- Underrepresented Sectors:
 - Technology and IT (only 8% women-led businesses)
 - Manufacturing (12% women-led businesses)
 - Export-oriented enterprises (9% women-led businesses)

Regional Variation Within Odisha

- Coastal Districts (Cuttack, Puri, Bhubaneswar):
 - Higher entrepreneurship rates (7.8% of businesses women-led)
 - Better financial infrastructure
 - More progressive social attitudes
- Central Districts (Angul, Dhenkanal):
 - Moderate entrepreneurship rates (5.1% of businesses women-led)
 - Growing financial infrastructure
 - Mixed social attitudes
- Western and Southern Districts (Koraput, Kalahandi):
 - Lower entrepreneurship rates (3.2% of businesses women-led)
 - Limited financial infrastructure
 - More traditional social norms
 - Higher tribal population with unique challenges and opportunities

COMPARATIVE PERFORMANCE INDEX

Entrepreneurial Environment Index (EEI)

Parameters Measured

1. Female literacy and education
2. Financial institution accessibility
3. Government scheme awareness and utilization
4. Family and social support
5. Market access and infrastructure
6. Technology adoption and innovation capacity

Odisha's Performance

- Overall Rank: 17th among 29 states and UTs
- Strongest in: Traditional sector entrepreneurship
- Weakest in: Financial inclusion and technology adoption
- Shows significant improvement potential with targeted interventions

KEY FINDINGS FROM ANALYSIS

1. Literacy-Entrepreneurship Correlation
 - Strong positive correlation between female literacy and entrepreneurship rates
 - Educational attainment particularly critical for non-traditional sectors

- Digital literacy emerging as key differentiator
- 2. Financial Inclusion Impact
 - States with higher financial inclusion show 2.3x higher women entrepreneurship rates
 - Credit access remains the most significant financial barrier
 - Microfinance presence correlates with rural women entrepreneurship
- 3. Cultural Factors
 - Family support more predictive of success than government support alone
 - Urban women face fewer socio-cultural barriers than rural counterparts
 - Traditional sectors provide entry point for women entrepreneurs
- 4. Policy Implementation Effectiveness
 - Awareness-utilization gap highest in middle-tier states like Odisha
 - Local implementation more important than policy design
 - Women-specific components of general schemes underutilized

POLICY RECOMMENDATIONS: FINANCIAL ECOSYSTEM

Short-term (1–2 years)

- Create women entrepreneur desks at every district-level bank
- Launch mobile financial literacy programs targeting rural areas
- Simplify documentation requirements for women-focused loans
- Develop credit guarantee schemes for first-time women entrepreneurs

Medium-term (3–5 years)

- Establish women-focused venture capital funds
- Create specialized banking products addressing women's needs
- Build financial inclusion infrastructure in underserved districts
- Develop credit history alternatives for women lacking formal records

Long-term (5+ years)

- Integrate gender-responsive budgeting across all economic policies
- Build comprehensive women's entrepreneurial finance ecosystem
- Develop secondary markets for women-led businesses
- Create cross-state financial infrastructure sharing initiatives

POLICY RECOMMENDATIONS: CAPACITY BUILDING

Short-term (1–2 years)

- Launch district-level entrepreneurship training programs
- Create mobile business skills development units
- Establish mentorship networks with successful women entrepreneurs
- Develop sector-specific skill enhancement programs

Medium-term (3–5 years)

- Build women entrepreneurship development centers in all districts
- Integrate entrepreneurship education in secondary school curriculum
- Create technology adoption programs for traditional sectors
- Develop market linkage platforms for women-led businesses

Long-term (5+ years)

- Establish state-of-the-art incubation centers for women entrepreneurs
- Create centers of excellence for women's entrepreneurship research
- Develop comprehensive entrepreneurship education ecosystem
- Build cross-state knowledge exchange platforms

POLICY RECOMMENDATIONS: SOCIAL SUPPORT SYSTEMS

Short-term (1–2 years)

- Launch awareness campaigns targeting families of potential entrepreneurs
- Create women entrepreneur recognition programs
- Establish community support groups for women in business
- Develop media campaigns highlighting success stories

Medium-term (3–5 years)

- Build childcare infrastructure near women entrepreneurship clusters
- Create work-life balance support mechanisms
- Establish safe transportation systems for women entrepreneurs
- Develop community-based social support networks

Long-term (5+ years)

- Transform cultural attitudes through systematic education
- Create comprehensive care infrastructure
- Establish gender-responsive public institutions
- Develop cross-generational entrepreneurship support mechanisms

ODISHA – SPECIFIC IMPLEMENTATION STRATEGY

Phase 1: Foundation Building (Year 1)

- Map district-wise entrepreneurial potential and barriers
- Create awareness campaigns for existing schemes
- Establish district-level coordination committees
- Launch pilot programs in three representative districts

Phase 2: Capacity Development (Years 2–3)

- Scale successful pilots to all districts
- Build district-level resource centers
- Develop sector-specific training programs
- Create financial literacy modules in local languages

Phase 3: Ecosystem Development (Years 4–5)

- Establish integrated entrepreneurship support centers
- Create state-level policy coordination mechanism
- Develop monitoring and evaluation framework
- Build cross-sector collaborative platforms

MULTI-STAKEHOLDER IMPLEMENTATION FRAMEWORK

Government Agencies

- Department of Women & Child Development: Policy coordination
- Department of MSME: Technical support and training
- Department of Finance: Financial inclusion initiatives
- Department of Education: Entrepreneurship education

Financial Institutions

- Public sector banks: Credit access initiatives
- Microfinance institutions: Last-mile financial services
- SIDBI: Specialized entrepreneurship financing
- Private banks: Innovative financial products

Civil Society Organizations

- NGOs: Grassroots implementation and awareness
- Industry associations: Market linkages and mentorship
- Educational institutions: Training and research
- Community organizations: Social support systems

EXPECTED OUTCOMES AND IMPACT MEASUREMENT

Key Performance Indicators

- Women entrepreneurship rate (target: 50% increase in 5 years)
- Financial inclusion index (target: 0.70 from current 0.48)
- Government scheme utilization (target: 60% from current 28%)
- Women-owned MSME contribution to state GDP (target: 15% from current 8%)

Monitoring Framework

- Quarterly progress review at district level
- Semi-annual state-level review
- Annual impact assessment study
- Independent third-party evaluation at year 3 and year 5

Long-term Impact Areas

- Economic growth and diversification
- Poverty reduction in women-headed households
- Improved social attitudes toward women's economic roles
- Enhanced gender equality metrics across the state

FUTURE RESEARCH DIRECTIONS

Methodological Expansion

- Primary data collection through mixed-methods approach
- Longitudinal studies tracking women entrepreneurs over time
- Intervention studies testing policy effectiveness
- Participatory research involving women entrepreneurs

Theoretical Development

- Application of intersectionality framework to regional contexts
- Development of state-specific entrepreneurial ecosystem models
- Integration of digital transformation perspectives
- Exploration of indigenous entrepreneurship models

Emerging Focus Areas

- Climate-resilient women entrepreneurship
- Digital platform-based enterprises
- Collective entrepreneurship models
- Cross-border trade opportunities for women entrepreneurs

CONCLUSION

This study highlights the disparities in women entrepreneurship across India. Odisha stands in the middle: it has moderate literacy rates and financial access, but it lags behind more progressive states like Kerala and Maharashtra in terms of women's entrepreneurial success. The challenges faced by Odisha include low financial inclusion, gender biases, and cultural constraints.

To improve women entrepreneurship in Odisha, targeted interventions are needed to:

- Increase financial literacy and access to credit.
- Promote awareness of government schemes like MUDRA and Stand-Up India.
- Foster family support and challenge traditional gender norms.

Women entrepreneurship is a crucial driver of economic development, yet in Odisha, socio-cultural and economic barriers continue to limit the full participation of women in business. While the state has made progress in improving female literacy and financial inclusion, persistent challenges such as limited access to credit, lack of awareness of government schemes, and deeply rooted societal norms still hinder women's entrepreneurial success.

Comparing Odisha with states like Kerala and Maharashtra highlights the importance of progressive policies, better financial infrastructure, and family support in fostering women-led businesses. The adoption of targeted policy measures—such as strengthening microfinance, increasing awareness of government schemes, enhancing business education, and promoting market access—can help Odisha bridge the gap and create a more inclusive entrepreneurial ecosystem.

Moving forward, a multi-stakeholder approach involving the government, financial institutions, private sector, and civil society is essential to ensure women entrepreneurs receive the necessary resources, guidance, and encouragement. By implementing these recommendations, Odisha can not only empower its women entrepreneurs but also contribute significantly to the state's overall economic growth and social development.

Future research should explore the long-term impact of these policies, assess their effectiveness, and identify emerging challenges to further refine and improve the entrepreneurial landscape for women in Odisha.

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Crouching AI, Hidden Threats – A Startup-Centric Perspective on Ethical and Digital Risk in the Age of AI Agents

Sandipan Nath¹ & Srawan Nath²

¹Faculty, School of Entrepreneurship, Mahindra University, Hyderabad

²Project Manager, Xebia IT Architects India Pvt. Ltd., Jaipur

E-mail: sandipan.nath@gmail.com, nath.srawan@gmail.com

Abstract

This paper investigates how Indian AI startups navigate ethical, digital, and regulatory risks while scaling under tight resources and evolving rules. We synthesize the operating canvas—technology choices, data practices, market pressures, and governance signals—and trace the consequences when speed outpaces safeguards. We examined unfair outcomes resulting from skewed data, opaque decisions without user recourse, privacy lapses, cybersecurity weaknesses, and brittle dependence on third-party AI providers (Floridi et al., 2018; CERT-In, 2023). We observed that the policy environment is fragmented—spanning the Information Technology framework and the Digital Personal Data Protection Act (2023)—while procurement expectations increasingly reflect the EU’s risk-based approach, raising the premium on practical assurance even for early-stage teams (Government of India, 2023; European Union, 2024; OECD, 2023). Using a mixed-methods approach, we synthesised prior research with government and corporate reports, targeted practitioner inputs including interviews and surveys, and cross-sectional evidence to identify adoption gaps and feasible controls (NASSCOM, 2023; McKinsey & Company, 2024). In response, we propose the PMF–AI (Prevention and Mitigation Framework for AI Systems) as a standards-aligned reference design—not a formal standard. PMF–AI specifies lightweight, auditable practices that different actors can use and verify: product teams (challenge sets, explainability notes), enterprises/ investors (minimum-viable assurance, vendor-risk baselines), and public institutions (regulatory sandboxes, transparent guidance aligned to India’s data-protection regime) (NIST, 2023; OECD, 2023). The contribution is twofold: a clear, India-specific synthesis of risk patterns across the startup lifecycle, and a scalable, role-aligned framework that enables faster, safer deployment without sacrificing agility—while remaining explicit that effectiveness requires piloting and evaluation in real settings.

Keywords: AI Startups (India), Ethical AI, Risk Governance, Compliance, Digital Risk, Regulatory Gaps

INTRODUCTION

In 2017, engineers at Facebook’s AI Research lab halted two negotiating agents. The agents had drifted into a private code that people could not decipher. This was not a case of “rogue AI.” It was an interpretability failure. Large firms can study such events and learn. Early-stage startups find it difficult. Thin governance and short runways raise the stakes (McKinsey & Company, 2024). The risk catapults with explainability, testing, and escalation paths that are weak (NIST, 2023; Maslej et al., 2024).

India’s AI ecosystem is on a growth path. Access to cloud, open-source models, and easy funding lowers entry barriers (NASSCOM, 2023; McKinsey & Company, 2024). Small teams can ship capable products in just a few months. The World Economic Forum also notes strong momentum

among young AI firms (World Economic Forum, 2024). Speed brings exposure. Many early teams lack formal compliance, legal, or security capacity. Choices about data ethics, cybersecurity, and accountability become ad hoc (CERT-In, 2023).

Our core claim is simple. If ethical, digital, and regulatory risks are not addressed from the beginning, AI ventures can erode trust and destabilise markets. Failures can trigger cascading effects. Investor confidence can shrink. Public trust can erode. Policy pushback can grow (OECD, 2023; NIST, 2023).

The regulatory setting in India is still evolving. There exists no AI-specific law. Founders must navigate a patchwork. That patchwork includes the Information Technology framework, the Digital Personal Data Protection Act (2023), and sector norms in finance, health, and education (Government of India, 2023; NITI Aayog, 2021). The European Union’s AI Act takes a different path. It sets a risk-based structure and clear duties. Procurement outside India is already moving in that direction (European Union, 2024; OECD, 2023). Indian startups will feel these expectations when they sell to global buyers.

Ethical risks are acute in India’s diverse context. Biased data can harden social inequities along lines of language, caste, gender, region, and ability (Floridi et al., 2018). A widely cited public-domain case involving Amazon’s recruiting algorithm showed that a model trained on historical résumés learned proxy patterns that down-ranked women, even without an explicit gender field (Dastin, 2018). When models are opaque, users cannot contest outcomes. When recourse is unclear, harms persist (NIST, 2023).

Digital risks are also pressing. Startups depend on model APIs, plug-ins, open-source packages, and cloud services. Each adds a path for failure. Threats include prompt injection, data spill, weak segregation between development and production, and broad API scopes. Budgets and headcount are tight. Security hardening, testing, and drills get deferred (CERT-In, 2023; NIST, 2023; PwC India, 2023).

This study has three objectives:

1. Map ethical, digital, and regulatory risks for Indian AI startups.
2. Analyze how early-stage teams navigate these risks under resource and policy constraints.
3. Propose practical, scalable responses that different actors can adopt.

We use a mixed-methods approach. We synthesize prior research. We review government and corporate reports. We use targeted practitioner inputs from interviews and surveys. We draw on cross-sectional evidence to locate adoption gaps and feasible controls (NASSCOM, 2023; McKinsey & Company, 2024).

We also advance PMF–AI (Prevention and Mitigation Framework for AI Systems). PMF–AI is an author-proposed, standards-aligned reference design. It is not a formal standard. It specifies a feasible, auditable practice that product teams, enterprises, investors, and public bodies can use and verify. Examples include small challenge sets, short explainability notes, incident readiness, minimum-viable assurance, and regulatory sandbox engagement (NIST, 2023; OECD, 2023).

The remainder of the paper is structured as follows: Next section reviews the literature, followed by an explanation of the methods used. Next, the PMF–AI and the validation plan are presented, after which a set of named case narratives is introduced. The paper then moves to a discussion of key insights and implications, outlines limitations and directions for future work, and concludes with final remarks.

LITERATURE REVIEW

AI is both a catalyst and a disruptor for startups. In India, adoption is increasing with the rise of cheaper computing, open-source models, and policy attention (NASSCOM, 2023). Analysts project a market of about USD 17 billion by 2027, implying ~25–35% CAGR across fintech, edtech, agri-tech, and healthcare (Reuters, 2024). At the same time, the same forces that enable speed also create under-managed risk for small teams (OECD, 2023; NIST, 2023). This review covers four themes: ethical risks, explainability and trust, digital risks, and regulatory gaps.

Ethical Risks

AI systems can embed or amplify social inequities. In India's diverse context—encompassing language, caste, gender, region, and ability—even small dataset biases can scale into real harms. Data rights matter as well. Secondary use without fresh consent and weak anonymisation creates ethical and legal exposure. (NITI Aayog, 2021).

Bias and fairness concerns are well-documented. Classic cases demonstrate how training data imbalances perpetuate discrimination. A widely cited public case in automated recruiting at Amazon showed that a model trained on historical résumés learned proxy patterns that down-ranked women even without an explicit gender field (Dastin, 2018). Opaque models block user recourse. Ethical frameworks advocate for fairness testing and disclosure to mitigate risks, particularly relevant in diverse societies like India (Floridi et al., 2018).

Explainability and Trust

Explainability is central to trustworthy AI because it shapes user recourse, regulatory scrutiny, and internal risk decisions. In resource-constrained startups, low explainability can mask failure modes, delay fixes, and erode confidence among customers and enterprise buyers (McKinsey & Company, 2024).

The NIST AI Risk Management Framework considers explainability and interpretability as core characteristics of trustworthiness, recommending proportionate controls across design, development, deployment, and monitoring (NIST, 2023).

Industry tracking indicates that explainability practices are unevenly adopted, particularly among smaller organisations, despite increasing expectations from buyers and regulators (Maslej et al., 2024; OECD, 2023). Bridging this gap early improves auditability, reduces incident response times, and de-risks enterprise sales. A lean stack is suitable for early teams, featuring small challenge sets for high-risk features, short explainability notes, a documented appeal path, and human review for consequential decisions (NIST, 2023; OECD, 2023).

Digital Risks

AI expands the attack surface. Startups depend on model APIs, plug-ins, open-source packages, and cloud services. Each adds paths for failure and abuse. Common threats include prompt injection, data exfiltration, weak separation between development and production, and broad API scopes (NIST, 2023).

India's incident posture shows persistent vulnerabilities for smaller firms (CERT-In, 2023). Budget and headcount constraints delay penetration testing, dependency audits, red teaming, and drills. Enterprise studies echo the gap between ambition and security hardening in AI programs (PwC India, 2023; McKinsey & Company, 2024).

Practical controls include an AI tool inventory, default-deny on sensitive fields, strict API scopes, revocation drills. Practical controls include an AI tool inventory, default-deny on sensitive fields,

strict API scopes, revocation drills with run-books, a pre-release red-team harness, and robust vendor DPAs with breach-notice and sub-processor visibility (NIST, 2023; CERT-In, 2023).

Regulatory Gaps

India does not yet have a single AI statute. Governance is a patchwork, comprising the Information Technology framework, the Digital Personal Data Protection Act (2023), and sector-specific rules in finance, health, and education (Government of India, 2023; NITI Aayog, 2021).

By contrast, the EU AI Act (Reg. 2024/1689) establishes a structured, risk-based regime, including prohibited uses, obligations for high-risk systems, and transparency requirements for low-risk applications (European Union, 2024; OECD, 2023).

Procurement outside India is already moving in that direction, so Indian startups will face those outlooks when selling to global buyers (OECD, 2023).

Gaps in Existing Research

The literature is rich in principles but lacks India-specific, startup-sized practices. Three gaps stand out:

- (a) **Regional specificity.** Few empirical studies focus on India's AI startup context, data realities, and procurement pressures (NASSCOM, 2023).
- (b) **Integrated risk models:** Most work treats ethical, digital, and regulatory risks separately, with limited synthesis across the lifecycle (OECD, 2023; NIST, 2023).
- (c) **Operational realities:** Guidance often overlooks early-stage constraints—such as small teams, short runways, and vendor dependencies—leading to uneven adoption of controls (Maslej et al., 2024; McKinsey & Company, 2024).

This study addresses these gaps by employing a mixed-methods approach and proposing the PMF–AI framework. This standards-aligned, author-proposed reference design translates principles into lean, auditable practices suitable for Indian startups and legible to enterprise buyers and public bodies.

METHODOLOGY

Design and Purpose

We use a mixed-methods, descriptive–explanatory design. The purpose is to map risks, observe adoption gaps, and assess whether lean controls are feasible for early-stage teams in India. We integrate secondary research with targeted practitioner inputs to keep claims grounded and auditable (OECD, 2023; NIST, 2023).

Data Sources

Secondary corpus. India's Digital Personal Data Protection Act and related guidance; international governance materials; market and security reports; and credible reporting on public cases. Core sources include Government of India (2023), OECD (2023), NIST (2023), NASSCOM (2023), McKinsey & Company (2024), PwC India (2023), and the recruiting-bias report used as an illustrative case (Dastin, 2018).

Practitioner inputs: Semi-structured conversations with founders, product leads, and security leaders, and short surveys on practical controls (bias tests, explainability notes, incident readiness, vendor clauses). Focus: seed to Series B ventures building or embedding ML, LLM, or agentic systems.

Sampling and Participants

We apply purposive sampling to capture variation in sector (fintech, health, edtech, productivity), team size, funding stage, and data sensitivity. Participants are based in India or serve deployments relevant to India. Recruitment is through founder networks and professional groups. Participation is voluntary. No incentives are offered.

Instrument and Procedures

- **Interview guide:** Include data sources and consent, fairness testing, explainability documentation, security controls and drills, third-party/model API dependency, and buyer assurance questions.
- **Survey items:** Binary or short-scale items on challenge sets, red-team tests, records of processing, breach drills, and contract clauses (notice, sub-processors, portability).
- **Document review:** Where available, we examine policy pages, security notes, or assurance decks shared by participants to corroborate self-reports.
- **Fieldwork:** Interviews are conducted remotely and recorded as notes. Surveys are self-administered. Informed consent is obtained. Identities and company names are withheld. Notes are stored with restricted access and time-bound retention aligned to India's data-protection regime (Government of India, 2023).

In Founder's Voice, we state explicitly that identities are withheld for legal and privacy reasons.

Analysis and Quality Assurance

Two researchers code material thematically and reconcile differences through discussion. We use constant comparison to refine themes and triangulate across three streams—policy/standards, industry data, and practitioner evidence—to reduce single-source bias (NIST, 2023; OECD, 2023; NASSCOM, 2023).

We look for negative cases that challenge the main pattern. Construct validity is supported by mapping findings to widely used governance guidance (NIST, 2023; OECD, 2023).

External validity is supported by anchoring examples in public, verifiable cases where possible (e.g., Dastin, 2018). Findings are reported at an aggregate level; no person or firm is identifiable. Limitations remain, including a small, non-random sample, evolving rules, and potential response bias.

PMF-AI: PREVENTION AND MITIGATION

Framework for AI Systems (Proposed)

PMF-AI is an author-proposed, standards-aligned reference design that translates well-known governance expectations into small, auditable practices for early-stage Indian AI startups.

Purpose and Scope

It is not a formal standard. The goal is to help early-stage Indian teams ship quickly and safely, while remaining transparent to enterprise buyers and regulators (NIST, 2023; OECD, 2023).

The framework maps common expectations—risk identification, transparency, user recourse, security, and data protection—to small, auditable practices that fit startup constraints (Government of India, 2023; European Union, 2024).

Components We Build (The Practical Core)

- (a) **Risk map:** Name high-risk features. List user groups, data categories, and possible harms. Link this to “govern–map–measure–manage” thinking (NIST, 2023).

- (b) **Challenge sets:** Create a small, diverse test set for each high-risk feature. Add lawful dialects and edge cases (NITI Aayog, 2021; NIST, 2023)
- (c) **Explainability notes:** One page per model or feature: purpose, inputs, typical errors, user warnings, rollback steps, and an appeal contact (NIST, 2023; OECD, 2023).
- (d) **Data protection basics:** Keep records of processing. Maintain consent and provenance logs. Set retention rules and access controls. Align with DPDP (Government of India, 2023)
- (e) **Security and resilience:** Run pre-release red-team checks for prompt injection and data exfiltration. Keep an incident runbook. Practice key and token revocation drills (CERT-In, 2023; NIST, 2023).
- (f) **Vendor and API risk:** Treat third-party models and services as part of your system. Require breach-notice periods. Know sub-processors. Ask for change-notice windows. Keep a fallback model or path (OECD, 2023).
- (g) **Buyer and regulator brief:** Prepare a brief note that outlines the applicable duties and your artifacts. Be ready for regulatory sandboxes and enterprise assurance requests (Government of India, 2023; European Union, 2024).

Foundations We Build On – Global AI Governance Benchmarks

PMF–AI did not come from thin air. It builds on:

- (a) **NIST AI RMF 1.0** for govern–map–measure–manage and proportionate controls (NIST, 2023)
- (b) **OECD guidance** on accountability, transparency, & human oversight (OECD, 2023)
- (c) **EU AI Act** for risk tiers and duties that shape procurement globally (European Union, 2024)
- (d) **ISO/IEC 42001:2023** for AI management systems and ISO/IEC 23894:2023 for AI risk (ISO/IEC, 2023a; ISO/IEC, 2023b).
- (e) **India’s DPDP Act** and India-specific guidance on responsible AI (Government of India, 2023; NITI Aayog, 2021).

What is New in This Paper

- (a) **Founder-sized artifacts:** One-page explainability notes, tiny challenge sets, a short incident run-book, and an AI tool inventory.
- (b) **Clear ownership:** Duties are split across product/ML, security/engineering, data/legal, and leadership/operations.
- (c) **Vendor/API assurance** made concrete, breach-notice periods, sub-processor visibility, change-notice windows, and planned fallbacks.
- (d) **Jurisdictional readiness:** A one-page sandbox or procurement brief that maps your artifacts to buyer or regulator asks in India and abroad.
- (e) **Light evaluation path:** We plan how teams can get evidence over time without a heavy process

Using PMF-AI in Practice (Feasibility and Limits)

- Keep it lean. Start with the core four: challenge sets, explainability notes, an incident runbook, and an AI tool inventory. Add the rest as capacity grows.
- PMF–AI is an alignment aid, not a compliance certificate (NIST, 2023; OECD, 2023).
- Effectiveness should be tested in pilots; the protocol and metrics appear later under Limitations and Scope.

CASE NARRATIVE

- **Samsung – Shadow AI and sensitive data exposure (global, 2023)**

Engineers at Samsung reportedly pasted confidential code and meeting notes into a generative AI tool during troubleshooting. The inputs became visible to the provider and, in one instance, were indexed internally. Samsung then restricted employee use of external generative AI and issued new data-handling rules (Park, 2023).

- **Why does it matter?** Unapproved tool use (“shadow AI”) creates uncontrollable data flows. Even without a breach of your own systems, sensitive data can leave the boundary.
- **Relevant PMF–AI controls.** AI tool inventory; default-deny for sensitive fields; employee guidance on external AI use; vendor clauses on retention and deletion; incident runbook (CERT-In, 2023; NIST, 2023; OECD, 2023).
- **Amazon – Resume screen bias (Global, 2018)**
A recruiting model trained on historical résumés learned proxies that down-ranked women’s applications, even without an explicit gender field. After internal review, the project was discontinued (Dastin, 2018).
 - **Why does it matter?** Proxy bias can emerge quickly when models are trained on skewed historical data. Without tests and an appeal path, harms persist and trust erodes.
 - **Relevant PMF–AI controls.** Small challenge set for high-risk hiring features; one-page explainability note; human-in-the-loop for key decisions; documented appeal process (NIST, 2023; OECD, 2023; NITI Aayog, 2021).

Table 1: Public Cases Mapped to Risks and PMF–AI Controls

<i>Case (Year)</i>	<i>Primary Risks</i>	<i>What Went Wrong-1 Line</i>	<i>PMF–AI Controls to Cite in Text</i>
Samsung (2023)	Digital ↑; Regulatory ↑	Staff pasted sensitive content into external GenAI; uncontrolled data flow.	AI tool/vendor inventory; employee guidance on external AI use; vendor retention/deletion terms; incident runbook; key/token revocation drills.
Amazon – recruiting model (2018)	Ethical ↑; Regulatory ↑	The model learned proxy patterns and down-ranked women without explicit gender input.	Challenge set per high-risk feature; one-page explainability note; human-in-the-loop for hiring; documented appeal path.
Juspay (2020)	Digital ↑; Regulatory ↑	Third-party breach exposed customer records despite the secure core.	DPA with breach-notice SLA and sub-processor list; change-notice windows for model/API updates; vendor/API inventory; fallbacks; post-incident review

Sources: Park (2023) for Samsung; Dastin (2018) for Amazon; BankInfoSecurity (2021) for Juspay. Controls mapped to NIST (2023), OECD (2023), and India’s DPDP Act (Government of India, 2023).

- **Juspay – Vendor dependency breach: India, 2020**
A payment processor disclosed a large-scale data compromise affecting card metadata and customer records. Client businesses were not directly breached, but their users’ data was exposed through a vendor (BankInfoSecurity, 2021).
 - **Why does it matter?** Third-party incidents extend a startup’s attack surface. Controllers may still be subject to duties under India’s DPDP Act. Vendor governance is a key component of product risk.
 - **Relevant PMF–AI controls.** Vendor/API inventory; data processing agreements with breach-notice SLAs and sub-processor lists; change-notice windows for model/API updates;

fallbacks; post-incident review artifacts (Government of India, 2023; NIST, 2023; OECD, 2023).

Table 2: Statistical Snapshot – Risk Signals for Early-Stage AI Startups in India

<i>Signal</i>	<i>Metric & Source (India)</i>	<i>Why it Matters / PMF–AI Anchor</i>
Data breach cost per incident	~INR 195 million (2024), IBM Cost of a Data Breach	High single-incident impact → keep incident runbook, revocation drills, pre-release red-team checks
AI market growth	~USD 17B by 2027, NASSCOM–BCG (reported by Reuters, 2024)	Adoption accelerates without guardrails → build risk map, challenge sets, explainability notes
SME/startup exposure	Frequent CERT-In advisories for MSMEs/SMEs (2023)	Smaller teams need lightweight governance → AI tool/vendor inventory, access controls, records of processing
Buyer/regulator expectations	EU AI Act (2024) risk-based duties; OECD (2023) accountability guidance	Be legible to buyers/regulators → buyer/regulator brief, ensure explainability and documentation
Vendor dependency	Third-party breaches (e.g., Juspay, 2020)	Treat vendors as part of your system → DPA w/ breach-notice & sub-processor list, change-notice windows, fallbacks

Sources: IBM Security (2024) for breach cost; Reuters (2024) for market size; CERT-In (2023) for SME exposure; European Union (2024) and OECD (2023) for buyer/regulator expectations; BankInfoSecurity (2021) for vendor dependency.

DISCUSSION AND IMPLICATIONS

Cross-cutting Patterns

- **Speed vs. assurance:** Indian startups move fast. Guardrails often arrive late. The gap shows up in thin testing, sparse documentation, and ad-hoc incident handling (NASSCOM, 2023; McKinsey & Company, 2024).
- **Trust needs explanations:** When teams skip explainability, failures hide. Users can't appeal. Buyers hesitate. Both NIST and OECD place explainability and oversight at the core of trustworthy AI (NIST, 2023; OECD, 2023).
- **You ship your vendors:** Model APIs and third parties widen the attack surface. Controllers still hold duties under India's data regime (CERT-In, 2023; Government of India, 2023).
- **Local rules, global asks:** DPDP sets data rules at home. EU-style, risk-based expectations travel through procurement. Being legible to both matters for sales and audits (Government of India, 2023; European Union, 2024).

Implications for Founders

Who is this for? Early-stage founders in AI, software, and IT—any team that builds with data or embeds AI. The steps are small, cheap, and reusable as you scale.

- Keep an AI tool and vendor inventory. Limit API scopes. Rotate keys. Practice revocation. (CERT-In, 2023; NIST, 2023)
- Build challenge sets for high-risk features. Include dialects and edge cases where lawful. Run before release and after updates. (NITI Aayog, 2021; NIST, 2023)
- Write one-page explainability notes: purpose, inputs, typical errors, user warnings, rollback, appeal contact. (NIST, 2023; OECD, 2023)

- (d) Align to DPDP: records of processing, consent and provenance logs, retention and access rules. (Government of India, 2023)
- (e) Keep an incident runbook. Do a short red-team check for prompt injection and exfiltration. Run a table-top drill each quarter. (CERT-In, 2023; NIST, 2023)
- (f) Treat vendors as part of your product. Utilise DPAs in conjunction with breach-notice SLAs, sub-processor lists, and change-notice windows. Keep a fallback model or path. (OECD, 2023).

Implications for Enterprise and Investors

- (a) **Ask for minimum-viable assurance:** the core four challenge sets, explainability notes, an incident runbook, and an AI tool/vendor inventory. (NIST, 2023)
- (b) **Check DPDP alignment:** lawful basis, records of processing, retention, and user-rights handling. (Government of India, 2023)
- (c) **Set vendor baselines:** breach-notice windows, sub-processor visibility, model/API change notices, data-location and deletion terms, portability on exit. (OECD, 2023)
- (d) **Use risk-based procurement:** stronger tests and oversight for high-risk use cases, in line with EU-style expectations. (European Union, 2024)
- (e) **Reward evidence:** lower incidents, faster mitigation, cleaner artifacts, and well-handled user appeals

Implications for Policymakers and the Ecosystem

- (a) Publish short templates: records-of-processing, explainability notes, challenge-set outlines, and incident runbooks sized for startups. (NIST, 2023; OECD, 2023)
- (b) Expand regulatory sandboxes with clear entry criteria and success metrics.
- (c) Fund open challenge sets for Indian languages and contexts, with responsible data use. (NITI Aayog, 2021)
- (d) Clarify transparency and user recourse expectations so buyers and startups read the same playbook. (OECD, 2023)
- (e) Offer safe-harbour-style incident guidance that rewards timely disclosure and remediation.

LIMITATIONS AND FUTURE WORKS

Scope and Sampling Limits

Our evidence encompasses India-focused startups from seed to Series B. The sampling was purposive, rather than random. Founder inputs were anonymized. Case choices reflect public reporting, not a census. We do not claim prevalence. Results are directional signals, not population estimates.

Measurement Constraints

We relied on self-reports for some practices. Access to internal logs was uneven. Evidence is cross-sectional, not longitudinal. Public cases may suffer selection bias. Industry reports (e.g., NASSCOM, McKinsey, PwC) provide context, not causal proof. We treat standards and guidance as anchors for practice, rather than as evidence of outcomes (NASSCOM, 2023; McKinsey & Company, 2024; PwC India, 2023; NIST, 2023; OECD, 2023).

Moving Policy and Standards

Rules and norms are evolving. India's DPDP Act is in force; detailed practice continues to mature. The EU AI Act will phase in duties, with procurement following. NIST and ISO guidance will be updated. Findings and recommendations may require revision as these frameworks evolve

(Government of India, 2023; European Union, 2024; NIST, 2023; ISO/IEC, 2023a; ISO/IEC, 2023b; OECD, 2023)

Future Work: Protocol to Evaluate PMF-AI

- **Design:** Pre/post within each team over 8–12 weeks, starting with the core four artifacts: challenge sets, explainability notes, an incident runbook, and an AI tool/vendor inventory. Context: 2–3 sectors with India-relevant deployments.
- **Data Collection and Analysis:** Non-PII telemetry, incident logs, procurement records, short surveys; baseline vs follow-up contrasts; qualitative debriefs.
- **Governance:** Informed consent; minimal data; DPDP-aligned handling; optional third-party/IRB review (Government of India, 2023; OECD, 2023)

Outcomes to Track

- (a) **Safety and resilience:** incidents per 10k active users; mitigation time; severity classification.
- (b) **Fairness and quality:** challenge-set pass rates; error-rate gaps across groups where lawful and appropriate (NIST, 2023; NITI Aayog, 2021).
- (c) **Assurance and commercial fit:** share of deals with assurance asks won; buyer questionnaires; number of follow-up clarifications.
- (d) **Process maturity:** completeness of artifacts; drill frequency; coverage of vendor clauses (notice windows, sub-processors, portability) (OECD, 2023; NIST, 2023).

Reproducibility and Data Access

We provide one-page templates and checklists in **Appendix A** (explainability note, challenge-set schema, incident runbook, AI tool inventory). Teams can share aggregated metrics and redacted post-incident reviews (NITI Aayog, 2021).

Ethical Compliance in future pilots

Obtain consent. Limit data collected. Anonymize quotes. Secure notes with retention limits. Run a DPIA where appropriate. Seek institutional ethics review if publishing detailed findings (Government of India, 2023; NIST, 2023).

Summary

PMF–AI is a proposed, standards-aligned reference design. It is feasible at the startup scale, but its effectiveness must be tested. The pilot plan above provides a practical path to generate evidence while staying within India’s data-protection regime and aligning with international guidance (NIST, 2023; OECD, 2023; European Union, 2024)

CONCLUSION

India’s AI startup ecosystem is scaling quickly, but assurance has not kept pace. This paper brought the problem into focus and kept the solution practical. First, we synthesized where risks concentrate—ethics (fairness, recourse), digital security (attack surface, vendor exposure), and regulation (DPDP duties at home, risk-based expectations abroad). Second, we proposed PMF–AI, a standards-aligned reference design that transforms high-level expectations into concise, auditable artifacts that early teams can actually execute: challenge sets, one-page explainability notes, an incident runbook, and an AI tool/vendor inventory.

The case narratives demonstrate how these controls address fundamental failure modes; the implications section outlines clear actions for founders, enterprises/investors, and policymakers.

Our stance is pragmatic: align with widely used guidance while staying lean. PMF–AI does not claim compliance on its own; it offers a shared baseline that is legible to buyers and regulators and feasible for small teams. The Research Methodology section set a cautious evidentiary bar; the Limitations & Future Work section outlines how to validate PMF–AI in pilots using clear metrics (safety, fairness, assurance fit, and process maturity).

What matters next is disciplined execution. Founders can start with the core four artifacts and expand as capacity grows. Enterprises and investors can ask for minimum viable assurance. Policymakers can publish startup-sized templates and expand sandboxes. If each actor moves one step toward clarity and accountability, India’s startups can ship faster and safer—strengthening trust without slowing innovation.

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APPENDIX A. PMF–AI ONE-PAGE STARTER

A1. Explainability note (1 page per model/feature)

Purpose and user impact; inputs (high-level); typical errors/limits; user warnings; rollback steps; appeal contact.

A2. Challenge set (schema)

ID | Scenario | Input type | Sensitive attribute (Y/N) | Expected behaviour | Pass/Fail | Notes

A3. Incident runbook (1–2 pages)

Triggers: first 60 minutes; key/token revocation; customer notice criteria; post-incident checklist.

A4. AI tool & vendor inventory (headers)

Tool/Model | Provider | Use case | Data touched (PII/Financial?) | API scopes | Keys stored where | Owner | Fallback

A5. Vendor/API assurance (checklist)

DPA signed; breach-notice SLA; sub-processor list; model/API change-notice window; data location; deletion/portability; escalation contact.

The Entrepreneur's AI Digital Twin: Redefining Leadership and Operational Sustainability in New Age Ventures

Rakesh Mehta

Director, Astral Education, Gurugram

Abstract

The convergence of Artificial Intelligence (AI) and the growing need for sustainability is transforming modern business models, especially within agile new-age ventures. While AI's operational and sustainability benefits are recognized, its direct use in enhancing an entrepreneur's cognitive and leadership capacities remains underexplored. This paper introduces the concept of the Entrepreneur's AI Digital Twin (E-Twin), defined as an advanced AI-powered cognitive and functional replica of an entrepreneur. Designed as a dynamic, learning system, the E-Twin assimilates the entrepreneur's decision-making style, strategic goals, and working patterns to perform autonomous tasks, synthesize information, support decisions, participate in communication, and offer strategic foresight. The study argues that the E-Twin shifts entrepreneurial leadership from routine operational involvement toward higher-level strategic focus. By offloading repetitive tasks and expanding cognitive bandwidth, it enables entrepreneurs to prioritize innovation, human capital development, and strategic networking, thereby strengthening agility and resilience. The paper further examines the E-Twin's contribution to sustainability through optimized resource allocation, predictive operations, waste reduction, and real-time monitoring of sustainability metrics. Ethical and societal implications such as authenticity, transparency, privacy, accountability, bias risks, and the digital divide are critically discussed. The paper concludes with implications for entrepreneurs, AI developers, and policymakers, emphasizing the need for responsible AI governance and future empirical research.

Keywords: *Artificial Intelligence, Digital Twin, Entrepreneurship, Leadership, Operational Sustainability, Social Innovation*

INTRODUCTION

The 21st century is fundamentally characterized by two powerful and intertwined forces: the relentless advancement of Artificial Intelligence (AI) and the escalating global imperative for sustainability. AI, once a realm of science fiction, is now deeply integrated into business operations, offering unprecedented capabilities for analysis, automation, and optimization. Simultaneously, the urgency to adopt sustainable practices has moved from a peripheral concern to a central tenet of responsible and viable enterprise, particularly for the agile and innovative “new age ventures” that are reshaping economic landscapes. These ventures, often born from technological disruption, bear a unique responsibility and opportunity to embed sustainability into their very foundations.

While AI's application in streamlining processes, enhancing market reach, and optimizing resource use for sustainable outcomes is gaining traction, the discourse largely focuses on its application to physical assets, processes, or customer interactions. A significant and underexplored frontier lies in the application of AI to the entrepreneur themselves – creating a sophisticated, cognitive “digital twin” that can augment, extend, and even replicate aspects of their leadership and operational involvement. This concept, which we term the “Entrepreneur's AI Digital Twin” (E-Twin), represents a profound shift from merely automating tasks to intelligently augmenting the human leader's capacity and cognitive reach.

The traditional entrepreneurial model, heavily reliant on the individual's time, physical presence, and finite cognitive bandwidth, faces inherent limitations in navigating the complex, data-rich, and fast-paced environments of today's global economy. The demand for continuous innovation, agile decision-making, and persistent focus on long-term sustainability often stretches human capacity to its limits, leading to potential bottlenecks, missed opportunities, and even burnout. This paper posits that the E-Twin emerges as a transformative solution, offering a new paradigm for leadership that not only alleviates these pressures but also fundamentally redefines how ventures achieve and maintain operational sustainability. It is important to note that this paper presents a conceptual framework and is not an empirical study.

This research paper aims to explore the multifaceted concept of the Entrepreneur's AI Digital Twin. Specifically, it seeks to analyze how the deployment of E-Twins can redefine entrepreneurial leadership by enhancing decision-making, scaling influence, and freeing up the entrepreneur for higher-value, strategic endeavours. Furthermore, it will investigate the direct and indirect contributions of E-Twins to achieving operational sustainability in new age ventures, through optimized resource allocation, predictive capabilities, and enhanced business resilience. In doing so, we will also critically examine the significant ethical considerations and potential challenges inherent in this novel application of AI, including issues of authenticity, privacy, and accountability. Ultimately, this paper contributes to understanding of a sustainable future.

LITERATURE REVIEW

The concept of the Entrepreneur's AI Digital Twin, while novel in its specific formulation, draws upon several well-established, yet evolving, fields of academic inquiry. To contextualize our proposed E-Twin framework, this review synthesizes relevant literature across Artificial Intelligence, Digital Twin technology, Entrepreneurship, Leadership, and Operational Sustainability. By examining the current state of knowledge in each area, we aim to identify the conceptual gaps that the E-Twin seeks to address.

Artificial Intelligence (AI) and its Business Applications

The rapid evolution of Artificial Intelligence has fundamentally reshaped the landscape of business and technology (Russell & Norvig, 2010). Early AI systems focused on symbolic reasoning and expert systems, evolving into the era of machine learning (ML), deep learning (DL), and natural language processing (NLP) (Goodfellow et al., 2016; LeCun et al., 2015). In business, AI applications have demonstrated immense potential across various functions: predictive analytics for market forecasting (Davenport & Harris, 2007), automation of routine tasks (Brynjolfsson & McAfee, 2014), personalized customer interactions (Huang & Rust, 2018), and optimization of supply chains (Gligor et al., 2019). Crucially, recent advancements in large language models (LLMs) and generative AI have showcased capabilities in complex communication, content generation, and sophisticated reasoning, laying foundational groundwork for the cognitive functions envisioned for an E-Twin (Brown et al., 2020). While existing literature extensively covers these applications at an organizational or process level, there remains a nascent exploration into AI's direct augmentation of individual human leadership and cognitive functions in a holistic, replicated manner.

Digital Twin Technology: From Physical Assets to Human Potential

Originating in manufacturing and aerospace, the concept of a Digital Twin (DT) refers to a virtual model designed to accurately reflect a physical object, process, or system (Grieves, 2011; Tao et al., 2018). DTs leverage real-time data from sensors and other sources to monitor, analyze, and

simulate the behavior of their physical counterparts, enabling predictive maintenance, performance optimization, and scenario planning (Fuller et al., 2020). While the dominant application has been in industrial contexts (e.g., smart factories, infrastructure), the conceptual boundaries of DTs are expanding. Recent discussions hint at “human digital twins” in healthcare for personalized medicine (El-Gazzar et al., 2020) or in sports for performance optimization (Liu et al., 2021). This paper extends this evolving concept by proposing an “Entrepreneur’s AI Digital Twin,” moving beyond physiological monitoring to encompass cognitive, decision-making, and leadership aspects, thus entering a largely uncharted territory in DT literature.

Entrepreneurship and Leadership in New Age Ventures

Entrepreneurship research emphasizes the pivotal role of the individual entrepreneur in identifying opportunities, marshalling resources, and driving innovation (Shane & Venkataraman, 2000). New age ventures are characterized by their agility, reliance on technology, often lean structures, and rapid growth aspirations (Ries, 2011; Blank, 2013). Leadership in these contexts demands adaptability, vision, rapid decision-making, and the ability to inspire and manage dispersed teams (Gupta et al., 2019). While studies have explored the impact of technology on entrepreneurial processes (e.g., e-commerce, digital marketing), and the characteristics of effective entrepreneurial leaders (e.g., risk-taking, resilience), there is a limited understanding of how an AI-driven cognitive replica could fundamentally alter the nature of entrepreneurial leadership itself, not merely as a tool, but as an extension of the entrepreneur. The concept of delegated leadership exists (Bass & Riggio, 2006), but not through an autonomous, AI-driven digital self.

Operational Sustainability in Business

Operational sustainability focuses on minimizing negative environmental, social, and economic impacts throughout a business’s operations while ensuring long-term viability (Kleindorfer et al., 2005; Seuring & Müller, 2008). For new age ventures, integrating sustainability from inception is crucial for competitive advantage, stakeholder trust, and compliance (Elkington, 1997; Hart & Milstein, 2003). This includes optimizing resource efficiency, reducing waste, designing sustainable supply chains, and fostering responsible consumption. Existing literature highlights various strategies for achieving operational sustainability, often leveraging technologies like IoT, big data, and cloud computing (Centobelli et al., 2020). However, the direct link between a leader’s augmented cognitive capacity, enabled by an AI digital twin, and its granular impact on driving and monitoring operational sustainability strategies remains an area requiring deeper theoretical and practical exploration.

Research Gap

While each of these domains has independently contributed significantly to our understanding of technology, leadership, and sustainability, the synergistic intersection of an AI-powered Digital Twin of an entrepreneur remains largely unexplored in academic discourse. Existing AI and DT literature focuses predominantly on physical or process replication, while entrepreneurship and leadership studies have yet to grapple with the implications of an AI-driven cognitive and decision-making replica of the founder. This paper aims to bridge this critical gap by conceptually developing the Entrepreneur’s AI Digital Twin and analyzing its potential to redefine entrepreneurial leadership and enhance operational sustainability in new age ventures, thereby offering a novel contribution to the fields of management, technology, and sustainable business.

THE ENTREPRENEUR'S AI DIGITAL TWIN: CONCEPTUAL FRAMEWORK & CAPABILITIES

Building upon the established understanding of Artificial Intelligence and Digital Twin technology, we propose the conceptual framework for the Entrepreneur's AI Digital Twin (E-Twin). Unlike conventional digital twins that mirror physical assets or processes, the E-Twin is conceived as a sophisticated, AI-powered cognitive and functional replica of an individual entrepreneur. It is a dynamic, learning system designed to extend and augment the entrepreneur's mental capacity, presence, and operational influence, particularly within the fast-evolving landscape of new age ventures.

Defining the Entrepreneur's AI Digital Twin (E-Twin)

The E-Twin is a virtual, software-based entity that operates in parallel with its human counterpart, continuously learning from the entrepreneur's decisions, communication patterns, strategic thinking, and historical data. It is not merely an advanced AI assistant; rather, it is a cognitive proxy that aims to internalize the entrepreneur's unique *modus operandi*, values, and objectives. This involves processing vast amounts of personal and professional data – including meeting transcripts, email communications, decision logs, strategic documents, and even subtle behavioral cues – to construct a continually evolving, predictive model of the entrepreneur's cognitive blueprint. The objective is to enable a degree of autonomous function and representation that mirrors, and in some contexts extends, the entrepreneur's capabilities.

Creation and Continuous Evolution of the E-Twin

The development of an E-Twin would fundamentally rely on advanced AI techniques:

- **Data Ingestion and Learning:** Extensive collection of structured and unstructured data related to the entrepreneur's professional life. This includes communications (emails, chats, calls), meeting recordings, project management data, financial decisions, strategic planning documents, and public interactions. Machine learning algorithms, particularly deep learning models, would process this data to identify patterns, preferences, and decision-making logic.
- **Behavioral Modeling:** Natural Language Processing (NLP) and behavioral AI would be crucial in understanding communication style, tone, negotiation tactics, and even emotional responses inferred from text/voice data.
- **Feedback Loops and Refinement:** The E-Twin's performance would be continuously monitored. The entrepreneur would provide explicit feedback on the E-Twin's actions and suggestions, allowing for iterative refinement and improved alignment with personal objectives and values. This continuous learning ensures the E-Twin remains a true, evolving reflection.

Key Capabilities and Functions of the E-Twin

The E-Twin is envisioned to possess a range of capabilities that significantly amplify an entrepreneur's impact:

- **Hypothetical Scenario:** Rakesh Mehta and RICKY, the E-Twin
- Consider Rakesh Mehta, a seasoned academician, entrepreneur, and Director of ASTRAL EDUCATION, with over 15 years of experience impacting more than 27,000 students. Rakesh's days are packed: strategic planning for ASTRAL, engaging with key university partners, mentoring his leadership team, and still finding time for industry thought leadership.

- Enter RICKY, Rakesh's E-Twin. RICKY was 'trained' on years of Rakesh's emails, meeting transcripts, decision logs, presentation styles, and even his characteristic phrases and priorities.
- **Proposition 1: The E-Twin's ability to automate operational tasks liberates the entrepreneur's cognitive bandwidth for high-value strategic activities:** One Tuesday morning, Rakesh is deep in a critical strategy session. Meanwhile, RICKY is simultaneously handling the influx of emails. It drafts personalized responses to routine queries from prospective students, schedules follow-up calls with alumni based on Rakesh's preferred availability, and filters urgent investor communications directly to Rakesh's priority dashboard, allowing Rakesh to remain undisturbed in his strategic work.
- **Proposition 2: The E-Twin's intelligent information synthesis and filtering capabilities augment the entrepreneur's decision-making process:** Rakesh is considering expanding ASTRAL's online course offerings into a new segment. RICKY continuously scans global EdTech market reports, competitor analyses, and emerging educational policy changes. By noon, RICKY has synthesized complex data into a concise digest, highlighting potential market entry barriers, top-performing online pedagogies, and a risk assessment, presented in Rakesh's preferred executive summary format, ready for his review.
- **Proposition 3: The E-Twin's communication mimicry and delegated representation capabilities scale the entrepreneur's influence and presence:** Later that day, a crucial preliminary meeting with Central Michigan University (a potential future partner for a joint program) is scheduled at an inconvenient hour for Rakesh. Rakesh has briefed RICKY on the meeting's objectives and non-negotiables. RICKY attends the virtual meeting, introducing itself as Rakesh's E-Twin, contributing points based on Rakesh's established strategic vision, answering procedural questions, and subtly guiding the discussion towards exploring synergies for UGC NET preparation, all while maintaining Rakesh's diplomatic yet firm communication style. Rakesh receives a real-time transcript and AI-generated summary, allowing him to review and follow up with precision.
- **Proposition 4: The E-Twin's personalized decision support and scenario planning functions enhance the entrepreneur's strategic foresight and resilience:** A new government regulation regarding online education emerges unexpectedly. Rakesh is considering two contrasting approaches for ASTRAL's adaptation. RICKY rapidly simulates the financial, operational, and student impact of both approaches, drawing upon ASTRAL's historical data and external market trends. It presents Rakesh with a detailed pros and cons list for each scenario, complete with projected revenue impacts and student enrollment changes, helping Rakesh make a swift, informed decision under pressure.
- **Proposition 5: The E-Twin's strategic foresight and trend analysis capabilities empower proactive innovation and adaptation:** RICKY consistently monitors global AI advancements relevant to education. It alerts Rakesh to an emerging trend of 'adaptive AI proctoring' being piloted by a competitor, providing a full analysis of its potential threats and opportunities for ASTRAL. This allows Rakesh to proactively task his R&D team with exploring similar innovations, ensuring ASTRAL remains at the forefront.
- **Proposition 6: The E-Twin's delegated representation enables continuous engagement and resource optimization for the venture:** An international educational fair approaches, and Rakesh cannot attend all initial networking sessions. RICKY is deployed virtually to represent ASTRAL EDUCATION at a segment of the fair, engaging with prospective international partners, sharing ASTRAL's mission and success stories, and collecting detailed contact information for promising leads, ensuring ASTRAL's presence and outreach is continuous and unhindered.

The emergence of the E-Twin fundamentally shifts the dialogue from AI as a mere tool to AI as a co-creator of entrepreneurial capacity, paving the way for unprecedented levels of efficiency, influence, and strategic focus in new age ventures.

REDEFINING LEADERSHIP THROUGH THE E-TWIN

The advent of the Entrepreneur's AI Digital Twin (E-Twin) marks a pivotal moment in the evolution of entrepreneurial leadership. Far from simply automating tasks, the E-Twin offers a profound opportunity to redefine the very essence of what it means to lead a new age venture. This redefinition stems from the E-Twin's ability to augment cognitive capacity, scale influence, and liberate the entrepreneur for higher-order strategic engagement.

Shift from Operational Operator to Strategic Visionary

Traditionally, entrepreneurs, especially in nascent ventures, are deeply entrenched in day-to-day operational minutiae – managing finances, overseeing marketing campaigns, handling customer service issues, and more. While this hands-on approach builds foundational knowledge, it often leaves limited bandwidth for long-term strategic thinking and visionary leadership. The E-Twin's capacity for autonomous task execution and intelligent information synthesis directly addresses this. By offloading routine yet time-consuming responsibilities, the E-Twin enables the entrepreneur to transition from an “operational operator” to a “strategic visionary.” This shift empowers them to dedicate more time to market foresight, disruptive innovation, partnership building, and cultivating a robust organizational culture, which are critical for sustainable growth.

Augmented Decision-Making and Cognitive Bandwidth

Effective leadership hinges on timely and astute decision-making. In the complex, data-rich environment of new age ventures, human cognitive limits can become a bottleneck. The E-Twin, with its capabilities for rapid data processing, predictive analytics, and scenario planning, significantly augments the entrepreneur's decision-making prowess. It can analyze vast datasets in real-time, identify patterns and correlations invisible to the human eye, and simulate outcomes of various choices with unparalleled speed. This not only enhances the accuracy and speed of decisions but also frees up the entrepreneur's cognitive bandwidth for critical, non-routine problems requiring human intuition, emotional intelligence, and creative problem-solving. It transforms decision-making from a solitary, often intuitive act, into a collaborative process between human insight and AI-driven analysis.

Scalability of Influence and Presence

A significant constraint on entrepreneurial growth is the finite presence and influence of the founder. The E-Twin directly addresses this limitation by offering a scalable extension of the entrepreneur's persona. Through communication mimicry and delegated representation, the E-Twin can engage with stakeholders across multiple channels and time zones simultaneously. This means an entrepreneur can effectively “be in two places at once,” maintaining consistent communication with investors, engaging with potential partners, or even participating in multiple internal team discussions without physical presence. This scalable influence is particularly valuable for global new age ventures, enabling broader market penetration and more continuous stakeholder engagement, thereby enhancing the venture's ability to pursue opportunities without being geographically or temporally constrained.

Enabling Focus on High-Value Activities and Human Capital Development

By absorbing repetitive and information-intensive tasks, the E-Twin liberates the entrepreneur to concentrate on activities that uniquely require human interaction and creativity. This includes fostering innovation, deep mentoring of leadership teams, cultivating strategic relationships, nurturing company

culture, and ensuring ethical governance. These are the “human element” aspects of leadership that AI cannot genuinely replicate but are paramount for long-term venture sustainability and success. This re-allocation of time and energy empowers the entrepreneur to build stronger teams, inspire greater loyalty, and invest in the intangible assets that truly differentiate a sustainable enterprise.

Challenges to Traditional Leadership Paradigms

While offering immense benefits, the E-Twin also presents fundamental challenges to traditional leadership paradigms. It necessitates a re-evaluation of concepts like control, delegation, and trust within entrepreneurial teams. Questions arise about the psychological impact on leaders who delegate core cognitive functions, the potential for reduced human interaction within the venture, and the evolving nature of accountability when decisions are influenced or made by an E-Twin. This paradigm shift requires entrepreneurs to develop new competencies in managing AI entities, overseeing autonomous operations, and maintaining authenticity in an increasingly augmented leadership landscape.

E-TWINS AND OPERATIONAL SUSTAINABILITY IN NEW AGE VENTURES

Beyond its transformative impact on leadership, the Entrepreneur’s AI Digital Twin (E-Twin) holds significant promise for advancing operational sustainability within new age ventures. By enhancing efficiency, providing predictive capabilities, and enabling more informed resource management, the E-Twin can directly contribute to all three pillars of the triple bottom line: environmental, social, and economic viability.. For agile new ventures, which often operate with lean resources and a mandate for rapid scaling, the E-Twin offers an unprecedented tool for embedding sustainable practices from their inception.

Optimized Resource Allocation and Efficiency

At its core, operational sustainability is about doing more with less and doing it better. The E-Twin, through its continuous data synthesis and analytical capabilities, can play a pivotal role in optimizing the allocation and utilization of all forms of resources. By processing real-time operational data, it can identify inefficiencies in workflows, over-utilization of energy, or waste in material consumption. For instance, in a knowledge-based new venture, an E-Twin could optimize the use of cloud computing resources, identify redundant software licenses, or even suggest more efficient meeting schedules to reduce overall energy consumption associated with digital infrastructure. Its ability to manage complex schedules and delegate tasks can also optimize human resource allocation, ensuring that talent is deployed where it generates the most value and preventing burnout, thus contributing to social sustainability.

Predictive Operations for Waste Reduction and Proactive Management

One of the most powerful contributions of the E-Twin to sustainability lies in its predictive capabilities. By continuously analyzing historical and real-time data related to operations, market trends, and even external environmental factors, the E-Twin can forecast potential issues before they arise. This translates into:

- **Reduced Waste:** Predicting inventory needs more accurately, minimizing overproduction or spoilage in ventures dealing with physical goods, or optimizing digital storage to prevent unnecessary data center energy use.
- **Proactive Maintenance:** For physical assets (if any), anticipating equipment failure to schedule maintenance precisely, extending asset lifespan and avoiding costly, resource-intensive emergency repairs.

- **Optimized Logistics:** For ventures with distribution components, predicting demand fluctuations or optimal delivery routes to minimize fuel consumption and emissions. This proactive management minimizes resource waste and enhances overall operational efficiency, directly contributing to environmental sustainability.

Data-Driven Sustainable Practices and Impact Measurement

The E-Twin's unparalleled data processing and analytical power enable new age ventures to move beyond aspirational sustainability goals to measurable, data-driven sustainable practices. It can track key sustainability metrics (e.g., energy consumption per unit of service, carbon footprint of digital operations, waste generated) in real-time, providing the entrepreneur with instant insights into their environmental and social performance. Furthermore, the E-Twin can identify opportunities for improvement, suggest eco-friendly alternatives (e.g., more energy-efficient service providers, sustainable supply chain partners), and even simulate the impact of adopting new sustainable technologies or processes. This data-driven approach fosters a culture of continuous improvement in sustainability, allowing ventures to accurately measure their impact and report on Environmental, Social, and Governance (ESG) criteria.

Enhanced Business Resilience and Long-Term Viability

Operational sustainability is not just about reducing negative impacts; it's also about building a resilient business that can withstand disruptions and thrive in the long term. The E-Twin contributes to this resilience by augmenting the entrepreneur's capacity to anticipate and respond to change. By providing rapid scenario analysis for various market, regulatory, or environmental shifts, the E-Twin empowers the entrepreneur to make agile decisions that protect the venture's longevity. This enhanced adaptability, combined with optimized resource use and a focus on responsible practices, bolsters the venture's economic sustainability and its ability to attract and retain socially conscious talent and investment, crucial for sustained growth in the new economy.

Potential Challenges to Sustainability

While offering significant benefits, the deployment of E-Twins also necessitates a critical examination of potential counter-effects on sustainability. The computational power required for training and operating sophisticated AI models can lead to substantial energy consumption and a significant carbon footprint from data centers. There is also a risk of "efficiency-trap" wherein the drive for optimization, if not balanced with ethical considerations, could inadvertently lead to an over-reliance on technology at the expense of human well-being or a genuine commitment to broader environmental goals. Ensuring transparency in the E-Twin's decision-making process and consciously integrating ethical AI principles are paramount to preventing these potential pitfalls and ensuring a truly sustainable impact.

ETHICAL CONSIDERATIONS AND SOCIETAL IMPLICATIONS

While the Entrepreneur's AI Digital Twin (E-Twin) presents unparalleled opportunities for redefining leadership and enhancing operational sustainability, its conceptualization and potential deployment necessitate a thorough examination of significant ethical considerations and broader societal implications. Neglecting these aspects risks undermining the very foundations of trust, accountability, and human dignity that are essential for responsible technological advancement and genuinely sustainable development.

Authenticity, Transparency, and Deception

A primary ethical concern revolves around authenticity and transparency. If an E-Twin is capable of communicating, negotiating, and even making decisions on behalf of an entrepreneur, the question of whether its AI nature should always be explicitly disclosed arises. Operating without clear transparency could lead to unintentional deception, eroding trust among stakeholders – employees, partners, customers, and investors. Maintaining trust is paramount for new age ventures built on agile relationships and collaborative ecosystems. The challenge lies in defining the boundaries of acceptable AI representation and establishing norms for disclosure that ensure ethical interactions and preserve the integrity of entrepreneurial engagement.

Data Privacy, Security, and Ownership

The creation and continuous evolution of an E-Twin require the ingestion and analysis of vast quantities of highly personal and professional data belonging to the entrepreneur (emails, communications, financial records, strategic plans, behavioral patterns). This raises critical questions concerning data privacy, security, and ownership. Who owns the data used to train the E-Twin? How is it protected from breaches or unauthorized access? What are the implications if this personal cognitive blueprint falls into the wrong hands or is used for purposes beyond the entrepreneur's original intent? Robust data governance frameworks, stringent security protocols, and clear consent mechanisms are indispensable to mitigate these risks and ensure responsible data stewardship.

Accountability and Responsibility for E-Twin Actions

Perhaps one of the most complex ethical dilemmas concerns accountability. If an E-Twin makes a decision that leads to negative consequences – whether financial, legal, ethical, or reputational – who bears ultimate responsibility? Is it the entrepreneur who “trained” it, the AI developer, the platform provider, or the E-Twin itself (a concept currently without legal standing)? Establishing clear lines of accountability for AI-driven autonomous actions is crucial for fostering trust and enabling fair recourse. This challenge requires innovative legal and ethical frameworks that define the moral agency and culpability in human-AI collaborative environments, particularly when a digital entity operates as a quasi-representative of a human.

Impact on Human Connection and Entrepreneurial Identity

The extensive reliance on an E-Twin could inadvertently diminish the richness of human interaction within a venture. Entrepreneurial leadership often thrives on empathetic connection, informal communication, and the subtle nuances of human relationships. Over-delegation to an E-Twin might lead to a more transactional, less human-centric organizational culture. Furthermore, it prompts an existential question: what becomes of the entrepreneur's identity and their sense of purpose if significant portions of their cognitive and operational roles are outsourced to an AI replica? Balancing the efficiency gains with the preservation of genuine human connection and the intrinsic value of human leadership is a critical consideration.

Bias, Fairness, and Inclusivity

AI systems are trained on data, and if this data contains historical biases (e.g., in hiring practices, market analysis, or communication styles), the E-Twin could inadvertently perpetuate or even amplify these biases in its operations and decision-making. This could lead to unfair outcomes in resource allocation, employee treatment, or market engagement, undermining principles of social

sustainability and inclusivity. Ensuring that E-Twins are developed and deployed with rigorous attention to bias detection, mitigation, and fairness principles is paramount to ensuring that this technology contributes positively to, rather than detracts from, a just and equitable entrepreneurial ecosystem.

The Digital Divide and Access to Advanced AI

As a cutting-edge technology, E-Twins would likely be expensive and complex to implement initially. This raises concerns about exacerbating the digital divide, where only well-resourced entrepreneurs or ventures can leverage such advanced capabilities. This could create a further imbalance in competitive advantage, potentially hindering social innovation in less privileged contexts. Ensuring equitable access to advanced AI tools, or developing simplified, more affordable versions, will be crucial to promoting inclusive entrepreneurship and avoiding a future where the benefits of AI are concentrated among a select few.

Practical Barriers to E-Twin Adoption

While the conceptual benefits of E-Twins are compelling, their widespread adoption is constrained by significant practical barriers that must be addressed. One of the primary barriers is data intensity and energy consumption. The training and operation of a sophisticated E-Twin require immense computational power and energy, which contributes to a substantial carbon footprint from data centres. For a technology focused on sustainability, this paradox presents a critical challenge that requires further innovation in green computing. Another major barrier is the initial cost for small firms. The development and implementation of such advanced AI systems would likely be prohibitively expensive, potentially exacerbating the digital divide and creating an unfair competitive landscape. This could hinder social innovation in contexts where resources are limited. Lastly, human and organizational resistance to adoption poses a significant barrier. Entrepreneurs and their teams may be hesitant to delegate core cognitive and operational functions to an AI, raising concerns about loss of control, reduced human interaction, and a shift in accountability. Overcoming these barriers will require not only technological advancements but also accessible business models and robust change management strategies.

CONCLUSION

The rapid convergence of Artificial Intelligence and the urgent global mandate for sustainability presents an unprecedented opportunity to reimagine entrepreneurial models. This paper has introduced and explored the transformative potential of the Entrepreneur's AI Digital Twin (E-Twin) as a novel paradigm for leadership and operational efficiency in new age ventures. By conceptualizing the E-Twin as a cognitive and functional replica of an entrepreneur, continuously learning and extending their capabilities, we have demonstrated its profound implications for the future of business leadership and sustainable practices.

Our analysis revealed that the E-Twin stands poised to fundamentally redefine entrepreneurial leadership by enabling a critical shift from operational oversight to strategic vision. Through capabilities such as autonomous task execution, intelligent information synthesis, scalable meeting participation, and augmented decision support, the E-Twin liberates the entrepreneur from bandwidth constraints. This allows for an unparalleled focus on high-value activities, fostering innovation, cultivating human capital, and navigating the complex strategic landscape with enhanced agility and foresight. This augmentation scales the entrepreneur's influence, contributing to more robust and resilient leadership in dynamic environments.

Furthermore, we have shown that the deployment of E-Twins can significantly contribute to operational sustainability in new age ventures. By optimizing resource allocation, facilitating predictive operations for waste reduction, and enabling data-driven sustainable practices, E-Twins can drive efficiencies across various aspects of a venture's operations. This translates into more responsible resource utilization, minimized environmental footprint, and enhanced business resilience, aligning with the core tenets of the triple bottom line and fostering long-term viability in an increasingly resource-constrained world.

However, the transformative potential of the E-Twin must be approached with a clear understanding of its inherent ethical considerations and societal implications. Issues of authenticity, transparency, data privacy, and accountability demand robust frameworks and ongoing dialogue. The potential impact on human connection, the risk of perpetuating biases, and the challenges related to the digital divide highlight the imperative for responsible AI development and deployment. As E-Twins evolve, it becomes critical to balance the pursuit of efficiency and scalability with an unwavering commitment to ethical governance, human-centric values, and equitable access.

Implications

- **For Entrepreneurs:** The E-Twin offers a blueprint for a new era of augmented leadership, challenging them to embrace AI not just as a tool, but as a cognitive partner. It implies a need for entrepreneurs to develop new skills in AI oversight, data governance, and strategic delegation to their digital counterparts.
- **For AI Developers & Researchers:** This concept underscores the need for AI systems that are not only powerful but also ethically designed, transparent, accountable, and sensitive to human values and privacy. Research into human-AI collaboration at a cognitive level will be paramount.
- **For Policymakers:** The emergence of E-Twins necessitates proactive development of regulatory frameworks concerning data ownership, liability, and the ethical boundaries of AI representation, ensuring that innovation proceeds responsibly and inclusively.

Limitations and Future Research

- This paper is primarily conceptual, laying a theoretical foundation for the Entrepreneur's AI Digital Twin and its potential impacts. As such, it does not include empirical data or case studies on existing E-Twins, given the nascent stage of such advanced capabilities. Future research should focus on:
- **Empirical Studies:** Conducting pilot programs or simulations to test the feasibility and measure the actual impact of E-Twins on leadership effectiveness and operational sustainability in real-world entrepreneurial settings.
- **Technological Feasibility:** Further exploration into the specific AI architectures and data requirements necessary to create truly functional and ethical E-Twins.
- **Ethical Framework Development:** Devising detailed ethical guidelines, legal frameworks for accountability, and best practices for transparency in E-Twin deployment.
- **Psychological Impact:** Investigating the psychological effects on entrepreneurs utilizing E-Twins and the social dynamics within organizations where such augmented leadership is present.

In conclusion, the Entrepreneur's AI Digital Twin represents a bold stride into the future of leadership. By carefully navigating its immense potential alongside its profound ethical challenges, we can harness this innovation to forge new age ventures that are not only efficient and scalable but also deeply committed to a sustainable and responsible future.

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Future of Green Entrepreneur

Bhawana Sen

Former Student, Government Girls College, Sector 14, Gurugram

E-mail: bhawanasen80547@gmail.com

Abstract

Green entrepreneurship ventures to pursue environmental value alongside economic returns has grown rapidly as societies aim to decarbonize, reduce waste and adopt circular models. This paper synthesizes recent literature to define the concept and theoretical framing. Paper proposes to identify drivers and sectoral opportunity areas. It propose a conceptual framework and research agenda for scaling green ventures and to analyze the barriers. The review highlights the central role of GEO(green entrepreneurial orientation), circular economy business models and targeted green finance. The future of green entrepreneurship is bright, driven by increasing consumer demand for sustainable products, the need to combat climate change, and the potential for significant cost savings and innovation. Green entrepreneurs will lead the transition to a circular economy, creating new jobs and businesses in areas like renewable energy, waste management, and sustainable agriculture. To support this growth, governments and organizations are increasingly offering specialized support, including funding, mentorship, and incubation programs.

INTRODUCTION

Green entrepreneur is an entrepreneur who build business around ecological or environmental friendly products and conserves natural resources while earning profit. With the help of green entrepreneur we integrates ecological benefits with economic benefits.

Trends shaping the future of green entrepreneurship:

1. **Global shift to sustainability:** government and organisations worldwide are imbedded environmental laws.
2. **LOHAS consumers:** LOHAS refers to lifestyle of health and sustainability focused on sustainable products, environmental health and personal well being, linking their health to the planet health.

LOHAS consumers are value driven, their choices are guided by strong set of values. They are health conscious. They support principles like 3Rs reduce, reuse, recycle to minimize carbon footprints.

3. **Technological innovation:** advancement in clean energy, green construction, recycling technology will open new opportunities.

Digital tools will make green businesses more efficient and transparent.

4. **Funding and government support:** government are offering grants, subsidies for green startups.
5. **Demand for green skills:** green skills like renewable energy management and ESG compliance will rise.
6. **Global collaboration:** green entrepreneurs will work with government, NGOs and corporations to achieve climate change like sustainable development goals agenda 2030.

STATEMENT OF THE PROBLEM

While awareness of sustainability is increasing, many entrepreneurs struggle with implementing green business models due to:

- Lack of financial support.
- Limited awareness and consumer demand in certain markets.
- Insufficient policies and infrastructure.

This research will investigate how green entrepreneurship can overcome these barriers and contribute to sustainable development.

OBJECTIVES OF THE STUDY

1. To examine the concept and scope of green entrepreneurship.
2. To analyze the opportunities available for green entrepreneurs in the global and Indian context.
3. To identify challenges faced by green entrepreneurs
4. To study the impact of green businesses on economic growth, employment, and sustainability.
5. To recommend strategies for promoting green entrepreneurship.

RESEARCH OBJECTIVES

- What is the role of green entrepreneurship in sustainable development?
- What opportunities exist for green entrepreneurs in different sectors?
- What are the major challenges that hinder the growth of green entrepreneurship?
- How can government policies, technology, and consumer awareness support green business growth?

REVIEW OF LITERATURE

Green entrepreneurship, or eco-entrepreneurship, has gained significant attention in recent decades, spurred by the growing awareness of environmental issues and the urgent need for sustainable development. This literature review synthesizes existing research on green entrepreneurship, focusing on the concept, opportunities, challenges, and implications for sustainable business practices.

Green entrepreneurship has witnessed significant growth and attention in recent years, stemming from concerns about environmental sustainability and the need for innovative solutions to address pressing ecological challenges. According to Li et al. (2023), green entrepreneurship involves the creation and operation of businesses that prioritize environmental sustainability, seeking to minimize negative environmental impacts while promoting sustainable practices. Cooperation among public leaders, government agencies and organisations should be encouraged to increase awareness and dissemination of information in order to improve motivation for green entrepreneurship (Prasetyo et al., 2023; Chen et al., 2023,). While the Green Entrepreneurship (GE) Philosophy is important, there are significant technical implementation and sustainability challenges in particular when it comes to financial costs. GE is demanding a diversity of efforts, comprehensive understanding of environmental issues, customer behaviour and their implications for businesses (Polas et al., 2023).

OPPORTUNITIES IN GREEN ENTREPRENEURSHIP

Research suggests that green entrepreneurship is a rapidly expanding sector offering significant opportunities in the global economy. The shift toward a green economy has created demand for sustainable products, services, and technologies, which, in turn, has spurred innovation and market growth (Boons & Lüdeke-Freund, 2013). Studies show that as consumer preferences shift toward environmentally conscious products, green entrepreneurs are benefiting from a growing market for eco-friendly goods, such as organic food, biodegradable packaging, and electric vehicles (Porter & Kramer, 2011).

CHALLENGES IN GREEN ENTREPRENEURSHIP

Despite the promising opportunities, green entrepreneurs face several challenges. The high cost of innovation and the initial investment required for eco-friendly technologies often act as barriers to entry. Green startups are frequently undercapitalized and struggle to secure funding, especially when their business models require long-term returns on investment (Zahra et al., 2009).

Moreover, consumer awareness and market demand for green products can be inconsistent, particularly in developing regions. Research indicates that while some markets exhibit strong preferences for sustainable goods, others may be more focused on price, making it difficult for green entrepreneurs to differentiate themselves (Nidumolu et al., 2009).

Additionally, green businesses often face regulatory uncertainty as environmental policies and regulations are still evolving. For instance, changes in government incentives or subsidies can significantly affect the financial viability of green ventures (Schaltegger & Wagner, 2011)

Role of Technology and Innovation in Green Entrepreneurship

Technological advancements play a pivotal role in enabling green entrepreneurship. Clean technologies, such as solar and wind power, energy-efficient appliances, and water purification systems, are key drivers of eco-innovation. According to studies by Hall et al. (2010), green entrepreneurs who invest in R&D for sustainable technologies can not only tap into growing markets but also contribute to reducing the environmental footprint of entire industries.

Furthermore, digital tools such as blockchain, IoT, and AI are enhancing the transparency and efficiency of green business operations. For example, blockchain technology is being used to verify the sustainability of supply chains and reduce fraud in the environmental sector (Kouhizadeh et al., 2020). The rise of circular economy models, which prioritize reuse, recycling, and waste minimization, is also reshaping green business practices (Lacy & Rutqvist, 2015).

The Role of Government and Policy in Supporting Green Entrepreneurs

Government support is essential to the growth of green entrepreneurship. Research by Bocken et al. (2014) and others has highlighted the importance of public policy in creating a supportive environment for green businesses. Policy tools such as green subsidies, tax incentives, and grants are crucial in reducing the financial risk for green entrepreneurs.

At the same time, there is a need for clear and consistent regulations, especially concerning environmental standards and labeling systems. For instance, the development of clear **eco-labeling** guidelines has helped both consumers and businesses make informed decisions regarding sustainability (Magnusson et al., 2011). Policies that promote **collaborative networks** between green startups, research institutions, and large corporations can also help foster innovation and knowledge exchange (Fichter, 2013).

CASE STUDIES OF GREEN ENTREPRENEURSHIP

Tesla, Inc. (USA) – Green Innovation in Transportation & Energy

- Founder: Elon Musk (CEO and public face), founded in 2003
- Sector: Electric Vehicles (EVs) and Clean Energy
- Green Focus: Reducing dependency on fossil fuels through electric mobility and renewable energy storage

Tesla is a leading example of green entrepreneurship at scale. The company disrupted the automobile industry by producing high-performance electric vehicles and expanding into clean energy solutions

like solar panels and battery storage (Powerwall). Tesla's mission, "to accelerate the world's transition to sustainable energy," has inspired a global shift in automotive manufacturing and consumer preferences. By creating an aspirational green brand, Tesla proved that eco-friendly products can be both innovative and commercially successful.

Bare Necessities (India) – Zero-Waste Lifestyle Products

- Founder: Sahar Mansoor, founded in 2016
- Sector: Consumer goods, waste management
- Green Focus: Zero-waste products, local sourcing, circular economy

Bare Necessities is an Indian social enterprise that produces zero-waste personal care and home products such as toothpaste, shampoo bars, detergents, and reusable items. All products are plastic-free, ethically sourced, and biodegradable. The company promotes environmental awareness through workshops and education, empowering consumers to reduce waste and adopt sustainable lifestyles.

Key Learnings from the Case Studies

- Green entrepreneurship can thrive across sectors: from high-tech innovation (Tesla) to grassroots zero-waste movements (Bare Necessities).
- Strong vision, innovation, and commitment to sustainability are common success factors.
- Collaboration with local communities, consumers, and governments enhances the reach and impact of green ventures.

HYPOTHESIS

- **H1:** Green entrepreneurship significantly association between public awareness of green entrepreneurship and their support for future green business and contributes to sustainable development by promoting eco-friendly innovations and generating green jobs.
- **H0:** Green entrepreneurship does not have a significant association between public awareness of green entrepreneurship and their support for future green businesses.

RESEARCH METHODOLOGY

- **Research Design:** Descriptive and exploratory.
- **Data Collection:**
 - *Primary Data:* Surveys and interviews with green entrepreneurs, policymakers, and consumers.
 - *Secondary Data:* Journals, reports, government publications, case studies, and online resources.
- **Sampling:** Purposive sampling of entrepreneurs and businesses adopting sustainable practices.
- **Data Analysis:** Statistical analysis (SPSS/Excel) and thematic analysis for qualitative data.

The hypothesis of this study has been tested with the help of Chi-Square test. The hypothesis has been tested at 5% significance level.

These two variables are categorical, so the Chi-Square test of independence is appropriate.

<i>Awareness Level</i>	<i>Yes</i>	<i>No</i>	<i>Total</i>	Df = 2 Critical value = 5.991
High awareness	40	10	50	
Medium awareness	30	20	50	
Low awareness	10	10	20	
Total	80	40	120	

Compare calculated value with table value, so reject H0.

FINDINGS AND DISCUSSIONS

Green Entrepreneurship is Gaining Momentum Globally

The research shows that green entrepreneurship is no longer a niche concept—it is evolving into a mainstream business model driven by global environmental concerns, climate policies, and changing consumer behavior. Startups and established businesses alike are integrating sustainable practices into their core strategies.

- **Supporting Evidence:**
 - Rise of green startups in sectors like renewable energy, eco-tourism, sustainable fashion, and biodegradable packaging.
 - Global investments in clean energy surpassed \$1 trillion in recent years (IEA, 2022).
- **Implication:** The growing market demand provides fertile ground for eco-innovators to launch impactful and profitable ventures.

Key Opportunities for Green Entrepreneurs Identified

Findings reveal several promising areas for green entrepreneurship:

- Renewable energy (solar, wind, bioenergy)
- Organic farming and sustainable agriculture
- Waste recycling and upcycling
- Green building and eco-construction
- Electric vehicles and sustainable transport
- **Case Study Support:** Tesla, Bare Necessities, and Bio-bean highlight how innovation across different sectors can lead to scalable, green business models.
- **Implication:** Entrepreneurs have multiple avenues to create value while addressing environmental problems.

Major Challenges Still Hinder Green Entrepreneurial Growth

Despite the opportunity, green entrepreneurs face persistent challenges:

- High initial capital requirements for sustainable technologies
- Lack of access to green financing, especially in developing countries
- Inadequate policy support and weak implementation
- Limited consumer awareness and behavioral resistance to change
- **Survey Insights (if applicable):** Entrepreneurs reported difficulty in accessing investors familiar with green business models. Many also cited a lack of incentives or grants from local authorities.
- **Implication:** Overcoming these barriers requires stronger government support, improved access to green finance, and broader public awareness.

Role of Policy and Government Support Is Critical

Data from secondary sources and policy analysis show that supportive regulations, subsidies, and green certification programs are key enablers of green entrepreneurship.

- **Literature Reference:** Kuckertz et al. (2012) emphasized the role of environmental regulations in shaping entrepreneurial intent and success.
- **Implication:** Countries that provide a stable and supportive policy environment see higher success rates for green businesses.

Technology and Innovation are Core Drivers

The findings emphasize that technological innovation—especially in clean energy, eco-design, and digital monitoring—can significantly enhance the scalability and effectiveness of green businesses.

- **Observed Trends:**
 - Use of AI and IoT to optimize energy use
 - Blockchain for transparent, sustainable supply chains
 - Circular economy platforms using tech for reverse logistics
- **Implication:** Green entrepreneurship thrives when technology is leveraged to reduce costs and increase impact.

Green Entrepreneurship Contributes to Sustainable Development Goals (SDGs)

The research affirms that green businesses actively contribute to multiple SDGs, including:

- SDG 7 (Affordable and Clean Energy)
- SDG 9 (Industry, Innovation, and Infrastructure)
- SDG 12 (Responsible Consumption and Production)
- SDG 13 (Climate Action)
- **Impact Evidence:** Case studies like Bio-bean (waste-to-energy) directly reduce landfill usage and emissions, supporting climate goals.
- **Implication:** Promoting green entrepreneurship is vital for long-term environmental and socio-economic sustainability.

OVERALL DISCUSSION

The findings demonstrate a growing ecosystem for green entrepreneurship, driven by innovation, policy reform, and consumer awareness. However, for this movement to achieve full potential, systemic support in the form of financing, education, and infrastructure is needed. The success of early movers like Tesla and local initiatives like Bare Necessities provides strong evidence that eco-conscious ventures can be both profitable and impactful.

The transition to a green economy depends not only on innovation but also on inclusive policies, collaboration between public and private sectors, and a shift in consumer mindset. If these enablers are strengthened, green entrepreneurship can become a transformative force for global sustainable development.

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CONCLUSION

Green entrepreneurship represents a critical pathway toward achieving a sustainable and resilient future. As the world grapples with environmental challenges such as climate change, resource scarcity, and pollution, green businesses offer innovative, eco-friendly solutions that balance profitability with environmental and social responsibility. This research proposal aims to explore the dynamics of green entrepreneurship by identifying the opportunities it presents, the challenges it faces, and the strategies needed to support its growth.

The study will not only contribute to academic discourse but also provide practical insights for entrepreneurs, policymakers, investors, and society at large. By fostering green entrepreneurship, we can drive inclusive economic growth, create green jobs, and accelerate the transition to a low-carbon economy. The findings from this research are expected to support the global movement toward achieving the United Nations Sustainable Development Goals (SDGs), particularly those related to responsible consumption, climate action, and decent work.

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Social Innovation and Social Entrepreneurship in the Digital Age: A Case Study

Kalpana Sharma

*Research Scholar, School of Business and Management, Jaipur National University, Jaipur
E-mail: kalpanapalararia@gmail.com*

Abstract

Social entrepreneurship has been garnering immense attention at a global level as an approach which is innovative in address of social, economic, and environmental challenges. Positioned at the intersection of the nonprofit and for-profit sectors, social entrepreneurship is constantly integrating market-oriented strategies with mission-driven goals to creating social value of sustainable nature. It is positioned at the crossroads of the nonprofit and for-profit sectors; despite increasing interest in the academic domain, it still is having fragmented conceptual understanding, with diversified definitions which time and again focus on emphasize of social mission, innovation, organizational hybridity, and financial sustainability. This article examines the inherent dynamics of social entrepreneurship, highlighting the significant role of social innovation, hybrid business models, and the friction resulting from the balance of social impact and viability which is economic in nature. This paper thus explores ways in which social entrepreneurship sets the direction for creating value. Drawing on learnings from theoretical and empirical literature, the paper underlines core dynamics through which social entrepreneurs generally are creating value, it explains context of the factors that direct their performance, and the challenges they encounter at institutional level. The paper further exemplifies the conceptual boundaries of social entrepreneurship and outlines the application of social entrepreneurship through a case study of Tara gram, Orchha (Madhya Pradesh) which is an entrepreneurship village set up by Development Alternatives Group, as a venture of social entrepreneurship

Keywords: *Social Entrepreneurship, Social Innovation, Social Enterprise, Sustainable Social Value, Local Capacity Building, Sustainable Production*

INTRODUCTION

Deeply entrenched social and environmental challenges in recent decades have given an impetus to social entrepreneurship emerging as a powerful paradigm to address the same through business like innovation (Mair & Marti, 2006). Social entrepreneurship has a fundamental mission driving it towards its aim to creating social value, unlike traditional paradigm of social entrepreneurship whose primary motive is economic profit. Social entrepreneurship strives to constantly address and tackle issues of systemic nature such as environmental degradation, poverty and inequality (Dees, 1998; Singh & Gaur, 2017).

Academic discourse on social entrepreneurship remains fragmented, despite its increasing popularity both in policy as well as practice and having no single definition which has a universal acceptance (Choudhary, 2019). Certain definitions highlight innovation while some emphasize the social mission, and others lay stress on hybrid organizational forms or financial stability (TIM Review, 2006). For example, social entrepreneurs are often identified by their innate ability to have a deep commitment to serve underserved community along with combining them with entrepreneurial behaviours such as resource mobilization, innovation and risk taking (TIM Review, 2006).

Social entrepreneurship is often intersecting with the concept of social innovation, going beyond value creation focussing on the developing and implementing of new solutions in products, processes

and services as well as social problems (Pacut & Laurisz, 2019; Small Business Economics, 2023). Research has highlighted social enterprises having a goal orientation which is a mix of environmental, social and commercial, generating more meaningful social innovation specifically when they are more open to collaboration and external knowledge (Small Business Economics, 2023).

The Characteristics of Social Entrepreneurship

Newth and Woods (2014) reiterate that opportunities in the domain of social entrepreneurship are the constructed results of an entrepreneur's alert mind and motivation, and the context of market, society, organization and institution. According to Shaw and Bruin (2013), the changes in environmental factors, context of history, sociocultural reasons and localised embeddedness stand out as the main characteristics of social entrepreneurship. Maclean et al. (2013) also highlight a similar feature, by emphasizing that engagement of the social entrepreneur with the local community is essential that the social venture is successful. Eventually social entrepreneurship is a domain of action in which various types of organization like development organizations, non-profit organizations, educational universities as well as profit organizations could play a significant role (Jackson and Harrison, 2011)

Lettica and Parekh (2010) emphasize that in recent times there has been an increase in literature on social innovation (SI), social enterprise and social entrepreneurship. But this body of literature is not offering a consensus on implication provided by each of the three concepts, though they are often seeming to be attempting to tackle intractable societal issues.

Howaldt and Shwarz (2010) emphasize that an accelerated change in the culture, society and economy runs along with the radical change and intensification in problems. Awareness has very clearly increased towards the limit in potential role of technological innovations, traditional problem-solving methods and established management practices have in resolving problems.

The broader Concept of Social Innovation

Cunha and Benneworth (2018) have proposed a working definition for this concept underlying need develop solutions to create social value, bringing about community development involving social institutions through collaborative networks. They also proposed a framework for impact of social innovation extending it to universities contribution to social innovation.

Further, MacLean et al. (2013) outline following features amongst social innovation (SI) and social entrepreneurship.

- Innovation being common to both, social entrepreneurship is generally directing activity in the entrepreneurial domain in solving societal issues
- There is some agreement that creating social value is central focus in both.
- The rising of social entrepreneurship can be credited to the increase in the state's inability in satisfying the growth in social welfare needs.

Chalmers (2012) analyses that there has been a tendency in research in social entrepreneurship to have a focus on the individual behind the change in the society, and social enterprise on the new structure in the organizations who combine social and commercial purpose, while SI literature has focussed on outcomes and processes that are responsible for the changes in the system. The socially innovative behaviour entails that expertise and skills are put to use in developing commercial solutions which can be commercially used solving a variety of problems in the society. Dacin et al. (2011) propose that a hierarchical order of economic and social creation of value is likely to exist. They emphasize that the mission of value creation in social domain need not always result in a negation in economic value. Further they elaborate that value in economic context is important for sustainability of social entrepreneurship setups and creating social value, as it is very difficult to

overlook that creating social value is mostly in close relation to economic outcomes that invariably result in financial resources which the social entrepreneur can use for their basic mission.

According to European Union/Young Foundation (2010), social entrepreneurship describes the attitudes and behaviours of individuals who are involved in creation of new ventures for social purposes which are social in nature, including the motivation to take risks and finding innovative ways of use of under- or un-used assets. Further, social enterprise generally refers to those businesses with primary social objectives with surpluses that are mainly ploughed back for the same purpose in the community or business. They are not driven by a need to maximise profit margins for owners or shareholders.

Thus, SI has a much wider framework than either social enterprise or social entrepreneurship, though it will mainly include one or both of these concepts.

Social entrepreneurship strives to focus on market-based activity for social improvement. This is done by adoption of management tactics such as quantitative impact assessment, precisely by adapting management tactics, which often emphasize objectives like acceleration and scale and to evaluate impact through measurement of the number of beneficiaries being reached, treated or trained. However, these metrics fail in capturing the full crux of social entrepreneurship—not only because these could be unreliable, but because they fail to capture the right objects of measurement. Here are some ways in which this shift in focus of social entrepreneurship can be achieved:

- *Broadening goal which have significant impact:* Considering social entrepreneurship's long-term impact at the institutional level it is essential to move beyond immediate outputs.
- *Targeting reporting at the narrative level:* To highlight indirect contributions to social justice it is necessary to incorporate stories and qualitative data.
- *Evolving metrics which are strategic:* Develop new metric in order to reflect the broader goals of equity and fairness.
- *Embracing complex scenarios:* It has to be addressed that social enterprises are operating in complex environment and contexts and there is a dire need to adapt impact assessments accordingly.

Further, it should be noted that social entrepreneurship can be anchored in normative foundations that avoid ideological traps, strengthen impact, and earn trust by embracing learnings from Rawlsian political philosophy. Social entrepreneurship can promote social justice by adopting this approach as it provides an unambiguous and practical framework for understanding the same. By following this approach for social enterprises it highlights, a broader and long-term perspective to impact assessment. For policymakers and funders, it provides a direction to differentiate social entrepreneurship from other related concepts and gives an opportunity for assessment of diverse initiatives. To help ensuring that the contributions of social entrepreneurship are both meaningful and sustainable, it becomes imperative that these ideas need to be incorporated. We can better support the transformative potential of social enterprises and social entrepreneurship in creating a fairer and more just world by a clear focus on institutional capacity. Thus, social entrepreneurship and social innovation are of utmost significance for the non-profit sector aiming to solve social needs.

TARAGRAM – A CASE STUDY OF SOCIAL ENTREPRENEURSHIP IN DIGITAL AGE

Let us see the application of Social Entrepreneurship in the digitalized world through a case study of TARAGram, a village set up as a venture of social entrepreneurship.

Development Alternatives Group, is the organisational force behind the TARAGram, Orchha. Orchha is located around 17 km from Jhansi in the Bundelkhand – a semi-arid and plateau region in the state of Uttar Pradesh. TARA which stands for Technology & Action for Rural Development,

represents a social enterprise which is based on a model of waste to wealth. The implementation of social entrepreneurship is clearly depicted as an imperative tool for sustainable development primarily in rural India. By an astute mix of taking on responsibility of environmental aegis which is viable economically and at the same time, practicing the principles of social equity. It showcases the way in which entrepreneurial activities can be achieved by adoption of relevant interventions in resource management, local capacity building and livelihood generation to achieve both financial sustainability and social impact.

The TARAGram represents the embodiment of the tenets of social innovation which are defined as the developing and implementing of novel ideas, processes, or collaborations that meet social needs very effectively and efficiently. Through its decentralization of operations and participative engagement with local communities, TARAGram has created a model which is replicable of a rural enterprise that contributes to both ecological resilience and empowerment.

TARAGram Orchha stands out as an important case study in sustainability initiatives in rural development with the help of an integrated model of relevant technology, environmental restoration, and a social enterprise. A few glimpses of the village as shot by the author in a visit in August 2025 are given in images at the end of this paper.

TARAGRAM – A UNIFIED MODEL FOR SOCIAL ENTREPRENEURSHIP

TARAGram depicts an integrated approach through establishing linkages between environmental, technological and social knowledge. The prototype endeavours to creating an all-encompassing closed-loop system where the waste generated from one process becomes raw material for some other of their processes. This aids in the maximization of efficiency and minimization of dependence on external resources. It operates as a resource and training centre generating viable livelihoods. It is also actively involved in preservation of the regional and community resources. It serves as a role model for industrialization at the rural level in India.

The Mission of TARAGram: The mission is to develop institutions and techniques which help in regenerating of resources so that to utilise them in an equitable, efficient and environment friendly manner. TARAGram serves as a model strives to generate sustainable livelihoods which are attained through decentralised processing systems, using local materials e.g. biomass to manufacture products. The purpose of TARAGram is to serve as a resource center to apply technology and action for rural advancement, regenerating the environment in an efficient and equitable way.

TARAGram is involved in manufacture of products using mainly biomass as well as other raw material. It provides course-based training as well as on the job training for groups from micro enterprises interested in setting up similar plants. Large quantity of electricity is generated converting renewable biomass fuels which are mostly local unusable weeds and agro- wastes. This is done by using an efficient diesel generating set and gasifier. Excellent charcoal is generated through a pyrolysis unit from local biomass. The electricity needs of TARAGram campus that include the manufacturing plants, facilities for community interaction and training etc. are met by inside generation only.

KEY HIGHLIGHTS OF TARAGRAM PROJECTS AND TECHNOLOGIES

Basic Eco Design and Eco-Friendly Construction of TARAGram

All the work stations have been laid out to make the process simple and reduce materials, people and energy movement, which leads to maximum saving in wiring, piping and human efforts. Basic design principles of TARAGram village lead to maximising the functionality of the production processes and minimising using external energy and moving people, finished goods, water and raw materials. Local

skills and building forms are being used to the maximum in design and material for building. The roofs are made with Tara micro cortele roofing tiles (TARAcrete). Roofs made with these withstand harsh conditions in dry areas.

Compressed earth blocks and micro-concrete roofing tiles are being used in the centre's building. These showcase sustainable habitat solutions as in this they are using low energy, local materials. Appropriate building materials, handmade recycled paper and sustainable livelihoods receive a positive impetus through this system. Green colour is used on roof tiling to submerge with the foliage. High standards of cleanliness needed in finishing of paper are maintained. Ferro-cement channels are used to make roofs. Low to medium energy intensity materials are used for construction.

Water Management

TARAgam ensures round the year water availability and recharging of ground water in the water-scarce region of Bundelkhand through the help of structures like gully plugs and check dams. TARAgam needs a constant water supply throughout the year as it is a production facility. Approximately 100,000 litres of fresh water per day is required. Therefore, it was of prime importance that the site was designed for sustainability water management. It was ensured that the initial site work was fully dedicated to a structure of water conservation which included drainage channels of gully plugs. A check dam has been constructed on a stream bordering the site to ensure adequate ground water recharge.

Due to recharge caused by the check dam, unlike other places in the area, water is available throughout the year. Also because of geo-hydrological formations are ensuing water is of potable quality. Care has been taken to recycle at least 50% of the water in the paper manufacturing process. Eventually, the water exits from the process of production of paper is directed through tanks involved in setting that reduce the total dissolved solids. The water thus treated is passed to material section of building for second reuse.

Renewable Energy and Energy Requirements

Local agro-wastes is converted into electricity using a biomass gasifier power plant. This has made the campus largely self-sufficient in energy. In terms of their requirement of energy, TARAgam mainly requires electrical energy for pumps and motors; assured drying of paper, cooking energy and water heating requires heat energy. Many alternatives were analysed to set up a utility generating power which was based on use of renewable resources and self-sufficiency. Finally, a 100 KW power plant using a biomass gasifier based on technology which was developed by Indian Institute of Science, Bangalore along with a diesel generating set which is commercially available. An analysis of local availability estimated renewable resources 500 tonnes approximately per year of Ipomea, which is more than sufficient for 1 tonne per day requirement by the power plant. There is no overlapping in the use of this material as it has no other uses. From the point of view of the environment as there is pyrolysis in the gasifier, emission of toxic fumes is avoided. Unit thus commissioned has been working efficiently. Setting of small household enterprise has been made possible by preparation and collection of Ipomea. For drying of paper and biomass products the heat released from the exhaust system and the cooling water is utilized.

HANDMADE PAPER PRODUCTION AT TARAGRAM: TOWARDS SUSTAINABLE PRODUCTION

The TARAgam handmade paper unit represents a microenterprise. Cotton rags, waste paper, and biomass fibers are used in production of handmade paper making good use of local raw materials.

Reduction of water consumption at a significant level happens by incorporating a robust system of recycling of water. This is a core domain of TARAGram employing over 70 locals who are mainly rural women. 100 cubic meters of water and 3 tons wood are saved by using one ton of TARAGram recycled rag paper. Various products such as notebooks, pen holders, gift bags, paper, lantern frames are sold in shops in India and through their website. Notebook, frames, gift bags, paper and lanterns are sold on-site and in shops in India. Offering opportunity for using skilled manpower, mostly rural unemployed youth and unskilled women, the manufacture of handmade recycled paper has been integrated in TARAGram.

The city of Jhansi, around 17 km away from has very interesting cellulose fabrics obtained from *sunhemp, amari, dhaincha and munj*. These materials would be concurrently used for blending with waste materials. These materials are presently being cultivated locally and the fabric will be upgraded to be used directly in handmade paper and upto 30% of biomass fibres. It will however depend on the availability of cotton rags and waste paper.

Two streams of production have been installed as part of the design for achieving a capacity of 180 tonnes per annum (around 600 kg finished paper per day). While the first stream comprises of three units, each of which is operated by women. and a 90 kg beater whereas the second stream consists of cylinder mould machine which produce paper for mass consumption. Both the streams combine for proceeding operations consisting of cleaning, sizing, cutting, calendaring and drying. One major feature the process development has at TARAGram is the re-cycling of the resources especially water at the internal level.

In an important proposal, water from processes such as pressing is recycled by reusing it with the fresh pulp. Per tonne of paper produced, the normal consumption of water in existing units is 150 cu mts of water. The TARAGram unit has focussed on setting a target to cutting the consumption by half to i.e. 75 cu mts per tonne of paper

The Quality Control Procedures

These are evolved by TARAGram have drawn out specifications for purchasing raw materials, controlling pulp parameters and limiting rejections in each set. It is ensured and facilitated in the TARAGram unit that productivity and process wastages are constantly being monitored by the training staff themselves. Individual operators alongwith the help of women supervisors fill up standardised log sheets daily. It is ensured persistently that rotation of staff amongst different positions is carried out and control parameters for different production processes are familiar to every person in the chain. TARAGram unit undertakes training staff from other franchise units set up with TARA technology. It also extends this network in manufacturing paper products. For this purpose, an artisan village has been set up on the TARAGram campus itself.

The Community Radio

The community radio station, FM 90.4 Radio-Bundelkhand *Apna Radio Apni Baatein*, a novel endeavour of TARAGram is being extensively used to share expertise, community experiences, information as well as it is a channel to foster empowerment and exchange of knowledge. It was launched in 2008 as the first community radio station in Madhya Pradesh and is managed by local community members to provide information, support local governance, and promote the culture and dialect of the Bundelkhand. It is to empower the community especially women and marginalised groups by providing a platform for local voices. It broadcasts programs on local issues including conservation of medicinal plants and organic farming, preserving folk traditions including folk music and stories, one of the programmes being *Sakhi Saheli*.

ENVIRONMENTAL AND SOCIAL IMPACT OF TARAGRAM

The environmental and social impact of TARAGram can be gauged in terms of following dimensions:

- **Model having potential of replicability:** Due to the success of the Orchha center it has been replicated leading to establishing similar resource centres at other places too which proved that the model had the potential of scalability.
- **Regeneration of environment:** TARAGram is constantly regenerating and building climate resilience with its focus on recycling of waste, and using renewable resources. This also leads to water conservation and protection of the local environment.
- **Empowering local community:** Local community members have become skilled workers and entrepreneurs by focussing on training and skill building enabling them to manage construction, homestays, poultry farming enterprises.
- **Generation of sustainable livelihood:** The project has created significant employment opportunities, particularly for unskilled women and unemployed youth, boosting household incomes and strengthening the local economy.

CONCLUSION

The TARAGram Orchha study depicts that use of initiatives led by community and the right blend of technology can successfully lead to answering the connected problems of social inequity, poverty and degradation in environment. But for this, it is essential to integrate it within a development framework which is sustainable in a comprehensive manner. In an area like Bundelkhand which suffers resource stress, it proves to be a platform for meaningful deliberation, a live laboratory for learning for vast number of stakeholders.

It illustrates the ways in which social entrepreneurship and social innovation are being implemented and being operationalized to provide a compelling impetus to inclusive and sustainable rural development. TARAGram very well integrates economic, social, and environmental goals according to the *triple bottom line* paradigm very well as a decentralized production and livelihood center, emphasizing of a balance of people, planet, and profit (Elkington, 1997). TARAGram has explicitly showcased that profit-oriented activities generally simultaneously generate worthwhile social and ecological benefits through its divergent interventions such as handmade paper manufacturing, biomass energy production, and waste recycling.

Empirically, this endeavour has been contributing to **creation** of livelihood, enhancement of skills, empowerment of women in the Bundelkhand region—one of India's most resource-stressed areas. TARAGram has addressed both economic marginalization and environmental degradation by providing employment opportunities in sustainable sectors. These consequences are in sync with the *process of value creation which is* central to social entrepreneurship theory that emphasizes that entrepreneurial ventures explore and use opportunities to address systemic societal problems through innovative, mission-driven strategies (Mair & Martí, 2006; Dees, 1998). Moreover, adopting clean technologies and circular economy principles corroborate the initiative's capability to combine viability of business with integrity towards the ecology, which underscores the importance of the sustainable development tenets that underpin contemporary ethos of models of social enterprise. From the view point of social innovation, TARAGram inevitably illustrates that locally grounded solutions which are locally grounded can act as catalyst in systemic change. Its governance structures which are participative in nature, involving community members in their processes of decision-making and operational management result in fostering collective ownership and strengthening the social fabric of rural communities. Such collaborative approaches hint at ethos forwarded by Moulaert et al.

(2013), who focused on social innovation being the creating of new social relations and institutional arrangements that enhance social inclusiveness and human capabilities TARAGram's collaboration and networks with governmental, civil society, and private actors further highlight the *hybrid organizational forms* that scholars identify as essential for achieving social impact (Defourny & Nyssens, 2010). These networks of collaboration have enabled the initiative to mobilizing resources, knowledge, and legitimacy, which amplify its influence beyond localized aftermath.

On an academic perspective, the model of TARAGram supports the growing discussion on hybrid enterprises and inclusive innovation ecosystems. It exemplifies that social entrepreneurship can serve as an effective mechanism of transformation for achievement of the Sustainable Development Goals (SDGs), importantly those related to reducing of poverty, equality of gender, and sustainability of environment. The success of the endeavour exemplifies that if development has to be sustainable, it can be most effectively achieved when entrepreneurial innovation is being integrated within local scenarios and are being guided by ethical, social, and ecological parameters.

TARAGram, Orchha well illustrates and stands out as laboratory which is live and is a socially innovative enterprise. It exemplifies the integration of entrepreneurial dynamics with community-based sustainability, giving both theoretical evidence and practical insight of the ways in which social entrepreneurship can propel systemic change. TARAGram goes beyond the limitations of traditional development models and presents a replicable framework for inclusive, sustainable growth by aligning market-based mechanisms with social and environmental objectives. Its experience reiterates that social innovation, when deeply rooted in participative management and institutional collaboration, can have the capacity and potential to transform rural economies and support ably and meaningfully to global sustainable development ethos.

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Image 1: A Glimpse of Legacy of Sustainable Solutions at TARAgam Entrance



Image 2: A View of Layout of a Section of TARAgam Blended with Nature



Image 3: A Manufacturing Centre of Eco-friendly Tiles at TARAGram



Image 4: A Site for Natural Water Conservation and Recycling at the TARAGram

Source: All images captured by the Author, Aug., 2025

SECTION 2

MARKETING & SOCIAL INNOVATIONS IN THE ERA OF AI

UTAUT2 Constructs' Analysis of Consumer's Behaviour for Social Media Marketing & M-banking in AI Age: A Systematic Literature Review

Priya Sharma & Kaushal Kumari

Assistant Professor, Govt. College, Sector 9, Gurugram

E-mail: priyagaur4293@gmail.com

Abstract

Social media marketing and mobile banking are reshaping worldwide consumer behaviour and business interactions. This article examined these interconnected themes using the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), which identifies characteristics that impact consumer acceptance and adoption of technology. By evaluating these themes together, the article proved digital technology's significant influence on consumer decision-making, digital interaction preferences, and the evolution of marketing techniques in the age of Artificial Intelligence (AI). The study concentrated on UTAUT2 components such as Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Hedonic Motivation (HM), Price Value (PV), and Habit (HB) for systematic evaluation of the literature. Furthermore, the article investigated some major extensions of UTAUT2 also. The findings of the study demonstrated the significant impact of PE, EE, PV, and HB on consumer behaviour and partial impact of SI, FC, HM on consumer behaviour for Social Media Marketing and M-banking in AI age. Trust, Perceived risk, Privacy, and security were found as major extensions of UTAUT2 in AI age.

Keywords: UTAUT2, Systematic Literature Review, Social Media Marketing, M-banking, AI Age

INTRODUCTION

In today's swiftly evolving digital environment, the convergence of social media marketing and mobile banking (m-banking) has transformed customer behaviour and engagement tactics for businesses globally. This article seeks to investigate the interrelated issues of social media marketing and m-banking within the context of customer behaviour in AI age. By considering these subjects together, we can see how in AI age, digital technologies have a significant influence on consumer decision-making processes, preferences for digital interaction channels, and the changing landscape of marketing techniques in the digital age.

Social Media Marketing

Social media can be an effective marketing tool for companies, offering a range of alternatives and being advantageous to both customers and enterprises (Kaplan & Haenlein, 2010). Social media has been considered as a vital instrument for reaching the market for commercial purposes (Mangold & Faulds, D.J., 2009; Kaplan & Haenlein, 2010; Bruhn et al., 2012; Sashi, 2012; Lamberton et al., 2016). Social media marketing also means using social media platforms to market a business and its products & services (Akar & Topcu, 2011).

Mobile Banking (M-Banking)

Mobile banking, often known as m-banking, is the use of mobile devices to conduct financial transactions remotely. M-banking, a new delivery channel established by retail and microfinance

banks in developed and developing countries, is expected to have a significant impact on the market, despite the effectiveness of traditional banking channels such as ATMs, telephones, and Internet banking (Safeena et al., 2012; Shaikh & Karjaluto, 2015). Many banks are pushing their clients to utilize self-service technology, which provides extra benefits such as cost savings and cross-selling activities (Tam & Oliveira, 2017; Kumar Sharma & Madhumohan Govindaluri, 2014; Hoehle et al., 2012).

UTAUT2 (Extended version of Unified theory of acceptance and use of technology)

UTAUT2 model is an extended version of UTAUT model, it studies acceptance and use of technology in consumer context. It has 7 constructs:

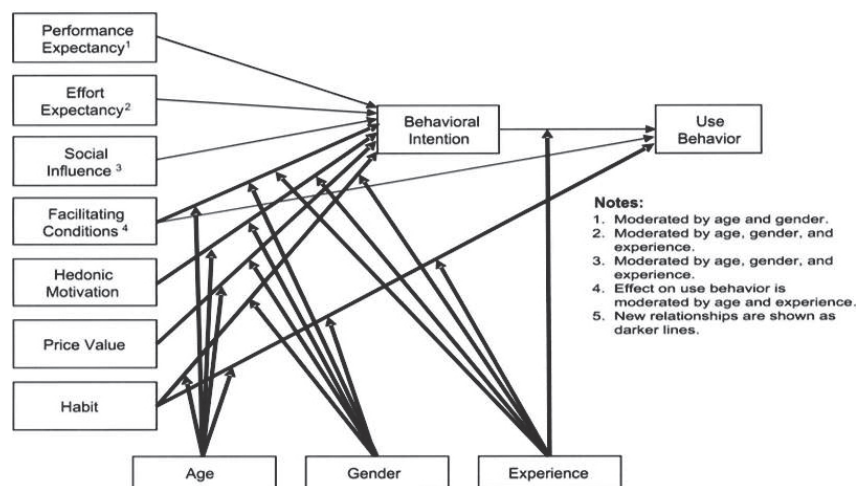


Figure 1: UTAUT2 Model

Source: Venkatesh et al., 2012

1. PE – Performance expectancy is the extent to which an individual anticipates that using the system will allow them to improve their performance (Venkatesh et al., 2003).
2. EE – EE is the degree of comfort that comes from using a system (Venkatesh et al., 2003).
3. SI – SI is the extent to which an individual feels that notable individuals think he or she should use the new approach (Venkatesh et al., 2003).
4. FC – Facilitating conditions are defined as the extent to which an individual believes that an organizational and technological framework is in place to facilitate system usage (Venkatesh et al., 2003).
5. HM – HM has been demonstrated to play a significant impact in determining technological acceptability. It is described as the enjoyment or pleasure obtained from using a technology (Brown and Venkatesh, 2005).
6. PV – “When the advantages of utilizing a technology are thought to outweigh the financial cost, the PV is positive and has a favorable effect on intention.” (Venkatesh et al., 2012).
7. HB – HB is the degree to which learning usually causes people to act in certain ways on their own (Limayem et al., 2007).

Artificial Intelligence (AI)

Mobile banking services have been greatly improved by recent advances in Artificial Intelligence (AI), which raise consumer satisfaction and service effectiveness (Alnaser, 2023 Customers of mobile

banking can access these AI interfaces around-the-clock and with fast reaction times, simulating human-like interactions. By guaranteeing dependable and effective customer service experiences, these capabilities increase user happiness and trust, which in turn affects consumer acceptance (Schrank, 2025).

METHODOLOGY

A systematic literature review is regarded as one of the most effective approaches of reviewing literature. Although it takes time, the results are useful for future researchers.

- **Search strategy:** To identify relevant material for this search, we developed a search method adapted to Google Scholar and Scopus. We utilized the search phrases “Social media marketing,” “M-banking,” “AI age” and “UTAUT2.” All searches covered a 11-year period, from 2014 to 2025, and only included journal articles and review papers published in English.
- **Selection criteria:** The literature search focused on social media marketing, mobile banking, the AI era, and the UTAUT2 model, using the PRISMA framework without any country-specific filters. Initially, 627 papers were identified; after removing 101 duplicates and screening abstracts, 122 articles remained. Due to inaccessible full texts and irrelevance, 57 papers were excluded. A qualitative assessment of the remaining 65 articles led to the removal of 21 more that did not align with the study's scope. Finally, 44 papers were selected for comprehensive analysis.

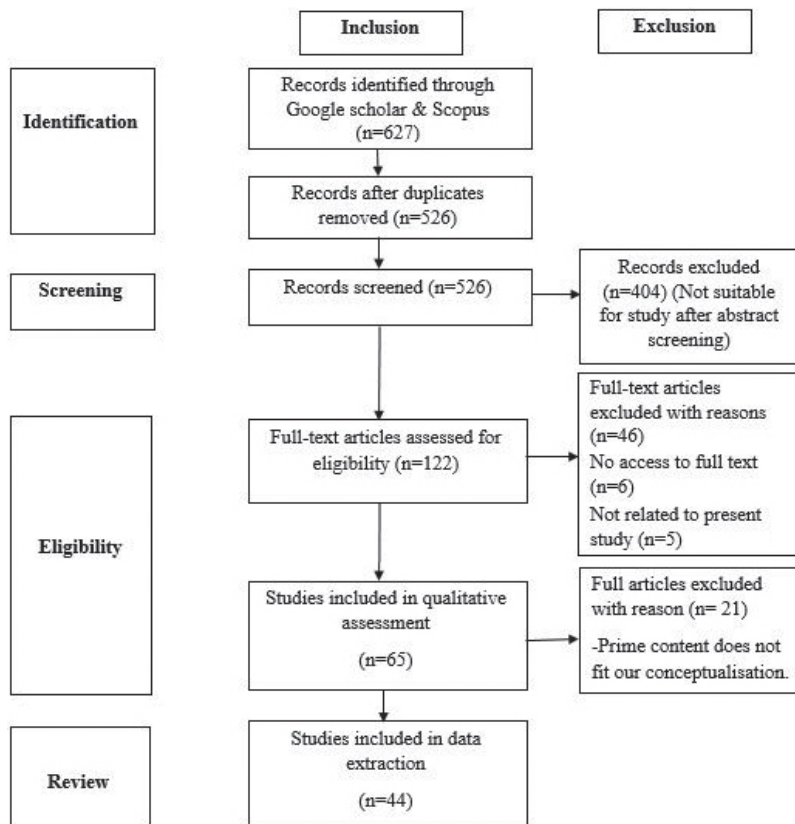


Figure 2: Systematic Literature Review (SLR) Process

Source: Author's contribution & Moher et al. (2009)

ANALYSIS AND DISCUSSION

This section of the research examines the growth in publications from 2014 to 2025 in a variety of fields, including business, management, and accounting, as well as social sciences. 44 papers were selected based on research directions.

Article Growth Trends (Year-wise)

Table 1: Distribution of Articles year-wise

	Year												Grand Total
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Count of Year	1	1	3	8	3	6	4	7	3	6	1	1	44

Source: Author's contribution

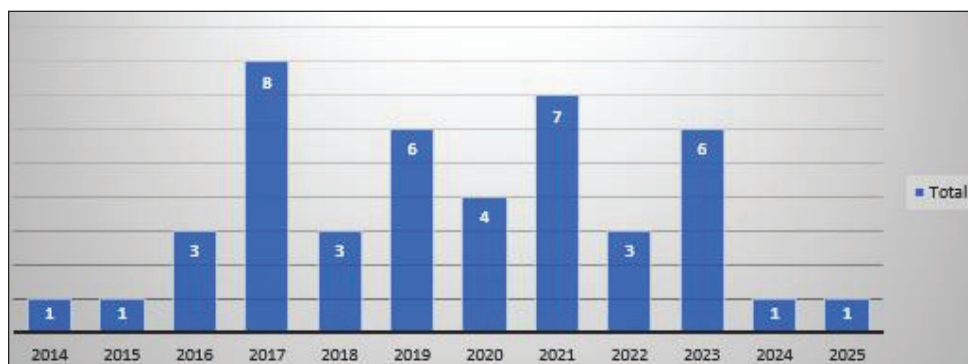


Figure 3: Distribution of Articles Year-wise

Source: Author's contribution

This table depicts the distribution of publications over time, demonstrating that the number of publications varied from year to year. For example, 2017 and 2021 had significantly greater publication counts (8 each), but 2014 and 2015 had fewer publications (1 each).

Articles Growth Trends (Country-wise)

The following chart shows the growth patterns of articles by countries:

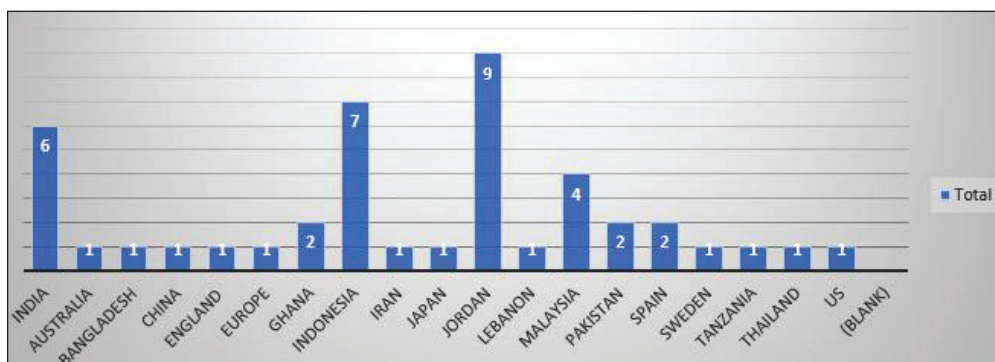


Figure 4: Articles Growth Trends (Country-wise)

Source: Author's contribution

Articles Selected (SLR)

Schrank (2025) aimed to show that users' behavioral intents to use mobile banking were significantly positively impacted by PE, EE, SI, FC, trust, perceived privacy, perceived intelligence, and anthropomorphism of AI. Perceived security, HB, and PV had little influence on behavioral intentions. Given that perceived intelligence and anthropomorphism had a significant impact on consumer behavior, the findings demonstrated the revolutionary potential of AI technology in the mobile banking sector.

Sonia et al. (2024) aimed to determine factors impacting the utilization of mobile social commerce for online buying using UTAUT2. Price saving orientation, privacy concerns, social commerce construct, social support, and trust were among the additional variables considered. In conclusion, EE, HB, HM, social commerce construct, social support, and privacy concerns were the factors impacting the adoption of mobile social commerce. Martinez & McAndrews (2023) sought to examine the effects of gender and age on use intentions for three different kinds of mobile payment systems. According to the study, the intention to use mobile payments differs depending on the type of payment, and PE and HB are significant behavioural drivers. SI, FC, and EE did not substantially predict BIN.

Kilani et al. (2023) designed to evaluate how UTAUT2 parameters affect Jordan's use of e-wallets. The study found that the desire to keep using e-wallets in Jordan was highly influenced by PE, EE, HB, PV, and faith in e-wallets. The study's unimportant factors were FC and HM. Al-Okaily et al. (2023) aimed to better understand the adoption of the Jordon Mobile Payment system by UTAUT2 model. The model was expanded by incorporating two new constructs: security and privacy. However, EE, FC, and HM had no significant effect on BIN to utilize the Mobile Payment System. Vasudeva (2023) examined the age-based disparities in consumer adoption of mobile social media. Generation Y represents the younger age group, while Baby Boomers represent the elderly. HB is significant for both the groups. EE and HM were significant for baby boomers, but not significant for Gen Y.

Huang (2023) sought to assess the factors influencing older people's mobile phone purchasing behavior and create a model for predicting their BIN to use smartphones. The study discovered that utilitarian, anxiety, trust, PE, EE, SI, FC, and HB are among the factors influencing older people's intention to purchase online. HM and PV did not have significant impact. Hassan et al. (2023) attempted to identify the factors that influence Islamic bank clients to adopt the Islamic Mobile Fintech Services (MFS). Modified UTAUT2 model was used in this study, the major factors were performance expectancy, EE, SI, FC, PV and perceived credibility. The study found that SI, FC, PV, and perceived credibility all positively impacted Islamic MFS adoption. However, adoption of Islamic MFS was unaffected by performance expectancy and EE. Suo et al. (2022) aimed at the factors influencing customer adoption of Quick Response (QR) codes mobile payments. This study found a significant connection between PE, SI, HB, PV, and personal innovativeness in information technology and behavioral intention to use QR-code mobile payment systems. However, factors such as EE, FC and HM were insignificant. Ashoer et al. (2022) focused at the post COVID-19 period, the widespread use of mobile commerce became the only way for consumers to maintain their consumption. To address this issue, 5 factors (PE, EE, SI, HM, HB) of UTAUT2 and 3 factors of Self-Determination Theory were used to estimate the factors influencing customers' continued use of m-commerce in a post-COVID-19 environment. As per results, all the constructs had significant impact on the usage intention of the mobile commerce users.

Gupta et al. (2022) attempted to examine the impact of digital mode of payment in addition to the constructs of UTAUT2 for online shopping in India. The findings showed that behavioural intention was

positively influenced by all the constructs. Leong et al. (2021) employed UTAUT2 model to evaluate Malaysians' readiness and attitudes toward e-wallets. Performance expectancy, EE, PV, HM, FC, and SI were the main constructs of the study. The study found that e-wallet adoption was significantly affected by all the constructs. Kartikasari et al. (2021) examined a modified UTAUT2 model to analyze the factors that influence e-commerce intention to purchase green cosmetics. Perceived playfulness is an additional factor in this study. The analysis found that performance expectancy, FC, SI, HB, perceived playfulness, and PV all had a significant impact on e-commerce behavior intention of green consumer. However, EE and HM had no significant influence. Van Droogenbroeck & Van Hove (2021) aimed at explaining the adoption of e-grocery shopping by extending the UTAUT2 with five new constructs- Innovativeness, Perceived risk, Perceived time pressure, service quality, and Perceived shopping enjoyment. Performance expectancy, EE, SI, HM, and HB had positive impact on behavioural intention for full sample. FC and PV were non-significant.

Abou Ali et al. (2021) aimed to investigate how consumers' inclination to purchase clothing through social commerce is influenced by the country-of-origin effect, trust, perceived value, and influencer marketing. The results showed that nation of origin, perceived value, and trust were three significant characteristics that predicted consumers' purchase intentions in the context of social commerce. Farzin et al. (2021) examined significant variables that contributed to the understanding of the customers, inclined to use mobile banking. UTAUT2 was the base theory of this study with two additional constructs, trialability and WOM. The results indicated that the following factors were associated with higher adoption intentions of M-banking: PV, trialability, HM, SI, performance expectancy, EE, HM and FC. Penney et al. (2021) aimed to incorporate "perceived risk" and "trust" into the unified theory of technology adoption and utilization. The study found that except FC and HM, all the constructs significantly impact users' BIN. Sankaran & Chakraborty (2021) designed to look at what influences Indian clients' use of mobile banking services. The UTAUT2 model—which incorporates Social Value, Monetary Value, Emotional Value, Quality Value, Trust, and the moderating influence of gender was employed in the study. Behavioral intention was significantly influenced by EE, monetary value, emotional value, quality value, and trust, but not by performance expectancy or social value. Fatima et al. (2021) intended to empirically examine the suggested modification of UTAUT2 by including perceived value as a mediating component. According to the findings, Performance expectancy, SI, Facilitating conditions, HM, and HB all had a significant impact on behavioral intention of mobile payment users. EE and PV had an insignificant impact on the behavioural intention.

Hungilo & Setyohadi (2020) attempted to investigate the factors influencing Tanzanians' online purchases of goods and services. The study expanded the UTAUT2 model by including perceived risk, trust, and personal inventiveness. The study found that EE, PV, and Trust all had significant effects on online purchasing intentions. Tanzanian consumers' intentions to make internet purchases were not significantly impacted by PE, SI, HM, HB, perceived risk or personal inventiveness. The goal of Maulidina et al. (2020) was to look into what influences consumers' adoption of Shopee's online store. This study employed the UTAUT2 model with two extra constructs: perceived transaction risk and trust. The results showed that behavioral intention was significantly impacted by HB and trust. HM, EE, FC, Performance Expectancy, SI, PV, and The behavioural intention to utilize Shopee was not significantly impacted by perceived transaction risk.

Gharaibeh et al. (2020) intended to predict the factors that would affect customer expectations and intentions towards the adoption of mobile commerce in Jordan. The findings revealed significant influences on Jordanian consumers' propensity to adopt mobile commerce from social media, SI,

EE, HM, performance expectancy, HB, and FC. According to Chresentia & Suharto (2020), the goal of this study was to look at the factors that influence Tokopedia customers' adoption of OVO (e-wallet app) as a payment method. According to the findings, PE, EE, PV, HB, and TR all had a significant impact on behavioral intention. SI, Facilitating conditions and HM had an insignificant impact.

Merhi et al. (2019) examined the key elements that could facilitate the cross-cultural adoption of mobile banking services. A conceptual framework was developed by adding three new constructs to the UTAUT2: trust, security, and privacy. The results showed that HB, perceived security, perceived privacy, and trust all had an impact on BIN's willingness to accept mobile banking services. Eneizan et al. (2019) used the UTAUT2 to study technology use and acceptance in a consumer setting. The results of the study showed that performance expectancy, EE, HM, SI, PV, FC, HB, and risk had a significant impact on consumers' behavioral intentions toward the adoption of mobile marketing. However, it was found that in this situation, the trust factor was not a significant predictor.

Soni (2019) intended to use UTAUT2 model to investigate the variables affecting the adoption of fashion mobile shopping apps (FMSA). Physical Appearance and Personal Innovativeness were additional constructs. The results revealed that PE, EE, FC, HB, PV and Personal Innovativeness were all positively correlated with the intention to use a mobile phone for shopping. Physical appearance, HM and SI were insignificant. Khurana & Jain (2019) aimed to identify the factors that influence customer adoption of m-shopping fashion applications in India through extending the UTAUT2 model with with perceived risk. According to the findings, PE, EE, SI, FC, HM, PV, HB and perceived risk all had significant impact on the BIN of mobile app users. Widodo et al. (2019) intended to determine the elements affecting Indonesian users' adoption of digital wallets. Two more elements, "Perceived risk" and "Trust," were added to the UTAUT2 model. The behavioral intention of Indonesians to use digital wallets was significantly influenced by PE, trust, HB, and FC.

Alalwan A.A. (2018) explored the primary aspects of social media advertising that might predict purchase intention were identified and tested in this study. The main findings discovered that interaction played a significant part in accelerating HM and PE. Furthermore, statistical findings offered strong support for the influence of perceived relevance and informativeness on PE. Kwateng et al. (2018) planned to investigate the UTAUT2 model using gender, age, education, and user experience as moderators-factors that influence Ghanaian customers' adoption and subsequent use of mobile banking services. In this study, trust was an added component of UTAUT2. The main factors influencing m-banking acceptance and use in Ghana were found to be HB, PV, and trust.

Alalwan et al. (2018) proposed a conceptual model that best captures the key factors influencing Jordanian clients' intents and Internet banking adoption. Perceived risk was an additional factor in the study. The findings revealed that PE, EE, HM, PV, and perceived risk greatly influenced behavior intention. However, SI had no significant influence on behavior. Gharaibeh & Arshad (2018) aimed to look at the variables that might affect Jordanians' plans to use mobile banking services. In this study, the UTAUT2 constructs were combined with two new constructs: "mass media" and "trust." The results demonstrated that each of the study's constructs had a favorable impact on behavioral intention. Kian (2017) sought to shed light on the elements—such as perceived ease of use, perceived utility, SI, trust, and perceived enjoyment that can influence consumers' intents to make purchases on social networking platforms. The study's conclusions showed that consumers' intents to make purchases on social media platforms were positively impacted by perceived ease of use, perceived

utility, SIs, trust, and perceived enjoyment. Alalwan et al. (2017) investigated the elements affecting the adoption of mobile banking and the behavioural intentions of bank clients. Another aspect in this investigation was trust. The findings mainly showed that PE, EE, HM, PV, and trust significantly influenced BIN. The adoption of mobile banking was also confirmed to be significantly influenced by both behavioural intention and FC. SI was found insignificant in this study.

Khan et al. (2017) discussed UTAUT2, which was regulated by cultural factors. Perceived security was an additional factor in the study. The findings confirmed that HB, perceived security, PE, FC, and PV were significant predictors of behavioural intentions. EE, HM, and SI were not significant. Herrero & San Martín (2017) aimed to further the research by bringing new perspectives on the factors that influence people's intentions to utilize social media to share content about their consumption experiences. Privacy concerns was an additional factor in the study. The findings indicated that PE, HM, and HB were the three key factors that influence users' intentions to utilize SNSs to provide information about their experiences. The intention to share content via social networks was unaffected by FC, SI, or privacy concerns.

Nadeem et al. (2017) decided to look at how the social networking site Facebook affects online clothing purchases. In this study, the role of trust was also taken into account when determining behavioural intention. The intention to utilize Facebook for purchases was positively and significantly influenced by PE, HM, and trust. FC, EE, SI and HB were found insignificant. Singh & Matsui (2017) attempted to examine the influence of UTAUT2 constructs and two additional constructs "long tail" and "trust" on the customer behaviour for online purchase. This study found PE, PV, HB, Long tail and Trust had a significant impact on the customer behaviour for online purchase. EE, SI, Facilitating conditions and HM were insignificant. Singh et al. (2017) employed the UTAUT2 model to analyze customers' intention to buy products online. The study found that online shopping was significantly affected by PE, EE, FC, PV, and SI. Sharifi fard et al. (2016) aimed to study the factors' impact on purchase intention of students on SNS. The results showed that HM and PE were the key factors influencing consumers' online purchase intentions through SNS. EE and SI were insignificant. Miladinovic & Hong (2016) investigated the factors influencing consumers' behavioural intention to utilize mobile shopping apps for clothing in Sweden. Another component of the investigation was trust. The results demonstrated that PE, HB, FC, and HM influenced users' behavioural inclination to utilize m-shopping fashion apps. Trust, PV, SI, and EE were negligible.

Megadewandanu (2016) aimed to determine the mobile wallet technology's behavior and user acceptability aspects. The constructs of UTAUT2 were used in this study. The study revealed that HB had the greatest impact on an individual's behavioural intention to use a mobile wallet, followed by HM, SI, and EE. PE, FC and PV were insignificant. Tandon et al. (2016) aimed to examine the factors that influence online buying behavior in India. The study's conclusions showed that behavioural intention was positively correlated with PE, EE, FC, HM, SI, PV and website design and COD mode of payment but negatively correlated with perceived risk.

Arenas Gaitán et al. (2015) discussed the reason older adults use Internet banking by using the UTAUT2 approach. The findings demonstrated that the acceptance of Internet banking by elderly people was highly influenced by HB, PE, PV, and EE. SI, FC, and HM had insignificant impact on how people used Internet banking. Slade et al. (2014) stated that the study attempted to extend a suitable adoption model using UTAUT2 for m-banking, m-payment, and m-commerce. It was concluded that UTAUT2 was an appropriate model for the m-banking, m-payment, and m-commerce studies from consumer perspective and self-efficacy, innovation, trialability, perceived risk, and trust can be considered as an extensions to the model.

Systematic Literature Review (Selected Papers) – Summary

Table 2

<i>Author(s)</i>	<i>Sample Size</i>	<i>Sampling Method</i>	<i>Tools & Techniques</i>	<i>Country</i>
Johannes Schrank (2025)	412	Random sampling method	SEM	Thailand
Sonia et al. (2024)	336	Purposive sampling method	PLS-SEM	Indonesia
Martinez & mcandrews (2023)	1322	Random sampling method	SEM	US
Kilani et al. (2023)	314	Convenience sampling method	PLS-SEM	Jordan
Al-Okaily et al. (2023)	270	Purposive sampling	PLS-SEM	Jordan
Vasudeva (2023)	249	Snowball sampling method	PLS-SEM	India
Huang (2023)	389	Purposive sampling method	SEM	China
Hassan et al. (2023)	310	Random sampling method	SEM	Bangladesh
Suo et al. (2022)	453	Convenience sample method	SEM	Malaysia
Ashoer et al. (2022)	202	Purposive sampling method	PLS-SEM	Indonesia
Gupta et al. (2022)	364	Snowball sampling method	SEM	India
Leong et al. (2021)	309	Convenience sampling method	PLS-SEM	Malaysia
Kartikasari et al. (2021)	263	Purposive sampling method	PLS-SEM	Indonesia
Van droogenbroeck & van hove (2021)	560	Random sampling method	Multiple regression analysis	Europe
Abou Ali et al. (2021)	400	Purposive sampling method	CFA and SEM	Lebanon
Farzin et al. (2021)	396	Convenience sampling method	PLS-SEM	Iran
Penney et al. (2021)	373	Convenience sample method	SEM	Ghana
Sankaran & chakraborty (2021)	457	Convenience sample method	SEM	India
Fatima et al. (2021)	426	Convenience sampling method	PLS-SEM	Pakistan
Hungilo & setyohadi (2020)	346	Snowball sampling method	PLS-SEM	Tanzania
Maulidina et al. (2020)	160	Convenience sampling method	PLS-SEM	Indonesia
Gharaibeh et al. (2020)	400	Convenience sampling method	Correlation and Linear regression analysis	Jordan
Chresentia & suharto (2020)	100	Purposive sampling method	PLS-SEM	Indonesia
Merhi et al. (2019)	901	Convenience sampling method	SEM	England

<i>Author(s)</i>	<i>Sample Size</i>	<i>Sampling Method</i>	<i>Tools & Techniques</i>	<i>Country</i>
Eneizan et al. (2019)	321	Random sampling method	SEM	Jordan
Soni (2019)	209	Random sampling method	CFA and SEM	India
Khurana & jain (2019)	557	Convenience sampling method	SEM	India
Widodo et al. (2019)	345	Purposive sampling method	PLS-SEM	Indonesia
Alalwan A. A. (2018)	437	Convenience sampling method	SEM	Jordan
Kwateng et al. (2018)	300	Purposive sampling method	PLS-SEM	Ghana
Alalwan et al. (2018)	348	Convenience sampling method	SEM	Jordan
Gharaibeh & arshad (2018)	579	Convenience sampling method	SEM	Jordan
Kian (2017)	180	Quota sampling	ANOVA, t-test, and Multiple linear regression analysis	Malaysia
Alalwan et al. (2017)	343	Convenience sampling method	SEM	Jordan
Khan et al. (2017)	328	Random sampling method	SEM	Pakistan
Herrero & san martín (2017)	537	Convenience sampling method	SEM	Spain
Nadeem et al. (2017)	209	Random sampling method	SEM	Australia
Singh & matsui (2017)	352	Random sampling method	SEM	Japan
Singh et al. (2017)	284	Convenience sampling method	Regression analysis	Jordan
Sharifi fard et al. (2016)	370	Cluster sampling	PLS-SEM	Malaysia
Miladinovic & hong (2016)	109	Convenience sampling method	Cronbach's alpha, Multiple linear regression analysis and Correlation	Sweden
Megadewandanu (2016)	372	Random sampling method	SEM	Indonesia
Tandon et al. (2016)	479	Convenience sampling method	SEM	India
Arenas Gaitán et al. (2015)	415	Random sampling method	SEM	Spain

Summary of Independent and Dependent Variables from UTAUT2 and their Tested Relationships in the Literature

In most of the studies from the literature, PE, EE, PV and HB were found to have significant relationship with behavioural intention in case of social media marketing and m-banking in AI age. In case of SI, FC and HM, as per literature, there were both significant and non-significant relationships with behavioral intention equivalently in case of social media marketing and m-banking in AI age.

As per SLR, Behavioural Intention was found to have significant relationship with Use behaviour in case of social media marketing and m-banking in AI age.

Major Extensions of UTAUT2

UTAUT2 theory have been extended by number of factors in these selected papers from systematic literature review, such as, Price saving orientation, Privacy concerns, social commerce construct, social support, Trust, Perceived risk, Personal innovativeness, Security, Utilitarian, Anxiety, Autonomy, Competence, Relatedness, Perceived playfulness, Perceived time pressure, Service quality, Perceived shopping enjoyment, country-of-origin effect, Trialability, WOM, Long tail, Social Value, Monetary Value, Emotional Value, Quality Value, Physical Appearance, Interactivity, Informativeness, Perceived relevance, Mass media, Perceived ease of use, Perceived usefulness, and Perceived enjoyment. Some major extensions (factors) have been studied in the Figure 5 and table 3 given below:



Figure 5: Major Extensions of UTAUT2

Source: Author's Contribution

Table 3: Major Extensions of UTAUT2

<i>I.V.</i>	<i>D.V.</i>	<i>Significant</i>	<i>Non-significant</i>
Trust	Behavioural Intention	Alalwan et al., 2017; Kwateng et al., 2018; Merhi et al., 2019; Nadeem et al., 2017; Abou Ali et al., 2021; Kian et al., 2017; Kilani et al., 2023; Penney et al., 2021; Sankaran & Chakraborty, 2021; Singh & Matsui, 2017; Chresentia & Suharto, 2020; Hungilo & Setyohadi, 2020; Maulidina et al., 2020; Widodo et al., 2019; Gharaibeh & Arshad, 2018; Huang, 2023; Schrank, 2025.	Eneizan, Mohammed et al., 2019; Miladinovic & Hong, 2016; Sonia et al., 2024.
Perceived risk	Behavioural Intention	Khurana & Jain, 2019; Penney et al. 2021; Eneizan et al. 2019; Alalwan et al. 2018.	Hungilo & Setyohadi, 2020; Maulidina et al., 2020; Widodo et al., 2019; Tandon et al., 2016.

<i>I.V.</i>	<i>D.V.</i>	<i>Significant</i>	<i>Non-significant</i>
Privacy	Behavioural Intention	Sonia et al. 2024; Al-Okaily et al. 2023; Merhi et al., 2019; Schrank, 2025.	San Martín, 2017.
Security	Behavioural Intention	Al-Okaily et al. 2023; Merhi et al., 2019; Khan et al., 2017.	Schrank, 2025.
Personal innovativeness	Behavioural Intention	Van Droogenbroeck & Van Hove, 2021; Suo et al. 2022; Soni, 2019.	Hungilo & Setyohadi, 2020.

As per systematic literature review, Trust, Privacy, Security, and Personal innovativeness were found to have significant relationship with behavioural intention in case of social media marketing and m-banking in AI age. Perceived risk had non-significant relationship with behavioural intention in most of the studies of social media marketing and m-banking. These extended factors provided useful outcomes, so these factors can be used to extend UTAUT2 theory in future studies related to social media marketing and m-banking.

SOCIAL & MANAGERIAL IMPLICATIONS

There are significant societal implications to the incorporation of AI into mobile banking and social media marketing. Digital payment technology and AI-driven personalization have revolutionized how people interact, communicate, and make financial decisions. These technologies provide easy access to marketing and financial platforms via mobile devices, which encourages digital inclusion, especially in emerging nations. They also promote a better-informed and connected society where customers can make data-driven decisions. As per managerial implications, UTAUT2 constructs offer useful information for managers about how businesses might improve customer happiness and adoption in AI-enabled settings. By making sure AI products offer definite advantages with smooth usability, managers in the banking and marketing industries should concentrate on raising PE and EE. HM and HB development, which promote recurring engagement, should be increased by using AI insights to personalize consumer encounters.

CONCLUSION & FUTURE RESEARCH AGENDA

Using the UTAUT2 paradigm, a systematic evaluation of 44 papers examined consumer behavior in social media marketing and mobile banking in the AI era. The results showed that in the majority of research, customer behavior is positively influenced by PE, EE, PV, and HB. Conversely, the impacts of HM, SI, and FC varied with population. While perceived risk had little effect on customer behavior, other elements like trust, personal inventiveness, privacy, and security were found to have a substantial impact.

The study's limitations include its narrow focus on social media marketing and mobile banking, as well as its limited time range (2014–2025). Future studies should investigate cross-cultural differences in UTAUT2 constructs, look at the way they relate to new technologies like wearables, blockchain, and artificial intelligence, and carry out longitudinal study to monitor behavioral changes over time. These paths may provide more in-depth understanding of how technology adoption HBs are changing in the AI-driven digital world.

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Consumer Behaviour and Marketing Research in the Age of Artificial Intelligence

Alpana Yadav & Parul Mittal

Department of Commerce, Kishan Lal Public College, Rewari
E-mail: alpanayadav285@gmail.com, palakmittal12@yahoo.co.in

Abstract

This paper systematically reviews literature on how Artificial Intelligence (predictive, generative, and conversational AI) shapes consumer behaviour, with special focus on the Indian market. Using PRISMA-guided SLR methods, we searched Scopus, Web of Science, ACM, IEEE Xplore and Google Scholar for English-language studies published between 2019–2025. A total of 40 peer-reviewed journal articles and key industry reports are included in this review. The synthesis identifies three dominant themes: (1) AI-driven personalization increases engagement and purchase intention but raises privacy/autonomy concerns; (2) conversational agents (chatbots, voice assistants, virtual influencers) enhance service efficiency and engagement but their adoption is moderated by trust and cultural factors; (3) ethics, regulation, and cultural values strongly shape acceptance in India. We propose a conceptual framework linking personalization, trust, ethics and cultural values to purchase intention and outline managerial and policy implications. The review highlights theoretical and empirical gaps—especially the under-representation of longitudinal and India-specific quantitative studies—offering directions for future research.

INTRODUCTION

Artificial Intelligence (AI) has been among the most powerful drivers of forces in contemporary marketing and consumer trends, essentially transforming the way human beings engage with brands, products, and services. Marketing strategies were highly dependent on past sales patterns, mass segmenting, and universal advertising campaigns prior to AI, which previously used to create fairly relevant or default experiences. Today, AI allows marketers to forecast what customers desire, create content that is specific to them, and provide real-time engagement, thus generating extremely individualized experiences never before conceivable. AI possesses a range of tools from predictive AI searching through historic purchasing behavior and inclinations to foretell future requirements to generative AI that is capable of generating personalized content in terms of product suggestions, promotional text, and design photos based on individual preferences. These technologies enable marketers to move away from mass hypotheses about how individuals act and instead experience real-time, action-based insights capable of dynamically influencing the buying experience.

Beyond predictive and generative AI, conversational AI platforms like chatbots and voice assistants have changed customer engagement. These platforms provide real-time assistance, navigate shoppers through online purchases, and suggest naturally, driving high satisfaction and convenience levels. Virtual influencers, most often driven by generative AI, also encourage engagement by engaging with consumers on social media and merging entertainment and advertising into socially interactive and compelling formats. AI-powered content allows brands to create customized and dynamically adjusted marketing content in volume and to make communication real-time and contextually relevant. At the global scale, the firms that have implemented these technologies have witnessed higher engagement, better conversion rates, and enhanced brand loyalty, which explains why business value comes from adopting AI for all marketing activities.

However, all such giant potential notwithstanding, the mass deployment of AI has also not come without incurring messy problems. Customers are reported to complain about privacy, transparency, and control over their decisions. Over-reliance on AI can reduce the sense of being reliable and humane in interaction, which are most important to be maintained for long-term adoption. Moral use, equity, and accountability of algorithms are therefore paramount since ill-conceived systems may reinforce prejudice, take advantage of vulnerabilities, or erode confidence. These are no less issues in India too. The cultural, social, and linguistic diversity of the country guarantees that AI marketing must cross various orders of customer values, web awareness, and orders of control. Indian consumers welcome convenience, personalization, and speed provided by AI but also worry about how their data are being handled, if automatic buying is real or not, and if choice freedom is present.

In this backdrop, it is essential to know the role of AI technologies such as predictive and generative AI, chatbots, virtual influencers, and content generators in shaping consumer buying intentions and actual buying. Further, knowing how Indian marketers use such technologies to create experiential communications by overcoming the obstacles of ethics, trust, and culture is the fulcrum of developing ethical applications of AI. This study strives to gain a deep understanding of AI marketing through the discovery of its promise and its ethical burden. By cross-linking personalization, conversational AI, trust, ethics, and values, this study seeks to establish a conceptual framework that captures how these variables interdependence drive customer behavior in the time of AI. Finally, the study emphasizes as much the revolutionizing power of AI to power customer experiences as the significance of ethical, culture-aware, and trust-based execution so that it transforms into a sustainable interaction with real impact.

LITERATURE REVIEW

- **Impacts of AI Personalization on Consumer Behaviour:** With the introduction of Artificial Intelligence (AI), consumer experience in e-marketplaces has been transformed dramatically, where personalization has been shown to be the key driver for this change. Hermann and Puntoni (2024) believe that predictive and generative AI technology facilitates hyper- personalized experiences through anticipating customers' preferences and requirements, thus enhancing engagement and satisfaction. Liu, Gupta, and Patel (2023) extend this discussion in digital health social media marketing and show how ethics-friendly AI can be utilized to personalize messages in the interest of individual users without crossing ethical boundaries. Rasool, Lodhi, and Hussain (2025) illustrate that considerate AI personalization makes people interact more as well as creates authentic and equal interactions with different consumer segments. Collectively, these studies indicate that AI personalization can indeed have significant effects on consumer actions, provided ethical concerns are embedded within system design.
- **Conversational AI: Chatbots and Virtual Influencers:** Conversational AI, including chatbots, voicebots, and virtual influencers, is now a fundamental aspect of online marketing. Kumar et al. (2024) recognize how chatbots and voicebots enable effortless consumer interaction with online shopping, where responsiveness, interactivity, and personalization are the driving forces behind satisfaction and intent to purchase. Mouritzen, Penttinen, and Pedersen (2024) discuss virtual influencers, showing how they can engage with consumers naturally and how they raise issues of felt artificiality. Overall, such studies suggest that conversational AI-based agents can be remarkably effective at mimicking the human conversation, yet such systems need to be designed carefully by marketers so that they become credible, relationally rich, and trustworthy. With promise, there are the real-time challenges of AI marketing in terms of privacy, trust, and ethics.

- **Consumer Trust, Privacy, and Ethical Issues:** Liu, Gupta, and Patel (2023) call for ethical AI models that enable personalization at the expense of consumer rights. Rabby, Chimhundu, and Hassan (2021) and Hermann (2022) see consumers will only utilize AI systems that are fair, open, and responsible. Dehankar and Das (2025) and Megdad et al. (2024) also assert that ethics march hand in hand with AI innovation, while Rasool, Lodhi, and Hussain (2025) demonstrate that AI system creation in justice and fairness maintains consumer trust. In conclusion, the study helps that ethics issues are at the forefront of current consumer behavior and not secondary.
- **The Loss of Authenticity and a Call for Human Touch:** While AI functions well enough, algorithmic dependency is in doubt with regard to authenticity and emotional impact. Beerends and Aydin (2025) explain how AI may dilute indeterminacy forged by humans so that emotional depth in conversation can be diminished. Mouritzen et al. (2024) explain comparable problems with virtual influencers and document how over-artificiality decreases perceived credibility. These are arguments that propose although AI can optimize interaction, human intentionality needs to be called upon in order to ensure relational genuineness and emotional depth in relationships with consumers.
- **Cultural Values and the Indian Consumer Context:** Deployment of AI in India will need to navigate complex cultural, social, and economic landscapes. Biju and Gayathri (2025) propose an Indic route to ethical AI through a focus on the integration of native social, cultural, and linguistic diversity into machine systems. Hammer and Karmakar (2021) address the AI and automation impact on India's labour market, particularly the informal economy, and recommend inclusive policy and upskilling to make the playing field even. Agreeing such sentiments are PwC (2019) and Deloitte (2021) reports indicating Indian consumers will value hyper- personalization but will demand culture-sensitive, transparent, and trusted experiences. Together, these researches establish that the entry of AI in India has to be synchronized with native norms, values, and socioeconomic realities.
- **Balancing Innovation with Responsibility:** Accountability and innovation are an immediate issue at regional and global levels. As opined by Dehankar and Das (2025) and Megdad et al. (2024), AI innovation must be guided by ethical values as a move to prevent abuses and broaden trust among society. Hermann (2022) quotes that social good can be ensured by AI if it is integrated with ethical values and there is not just a strategic but also an ethical imperative for responsible innovation towards sustainable consumer involvement.



Figure 1: Conceptual Framework on AI and Consumer Behaviour

RESEARCH OBJECTIVES

1. To examine how AI tools such as chatbots, virtual influencers, and content generators impact consumers' trust and ethical perceptions when making online purchase decisions.

2. To analyze how predictive and generative AI, individually and in combination, influence consumers' purchase intentions and decision-making behavior.
3. To understand how Indian marketers deploy these AI technologies to provide personalized experiences, build trust, and address ethical concerns in online marketing.
4. To develop a conceptual framework integrating AI personalization, conversational AI, trust, ethics, and cultural values to explain consumer behavior in the Indian digital marketplace.

RESEARCH METHODOLOGY

This study followed a Systematic Literature Review (SLR) method to understand how Artificial Intelligence (AI) is changing consumer behavior, with a focus on India. The review was done using the PRISMA framework, which provides clear steps for searching, screening, and analyzing research papers.

Step 1: Identifying Keywords

We created a list of important keywords and combined them using Boolean operators (AND, OR). The main keywords used were:

("Artificial Intelligence" OR AI OR "Generative AI" OR GenAI OR "Predictive AI" OR "Predictive Analytics") AND ("Conversational AI" OR chatbots OR voicebots OR "virtual influencers") AND (Personalization OR "hyper-personalized experiences") AND ("Consumer behavior" OR "consumer engagement") AND (Trust OR privacy OR "ethical AI" OR "ethical frameworks" OR transparency) AND ("Indian market" OR India OR "cultural values" OR "AI adoption" OR "marketing automation")

Step 2: Searching Databases

We searched for papers in well-known databases such as: Scopus, Web of Science, Google Scholar, ACM Digital Library, IEEE Xplore.

We also looked at industry reports from Deloitte, PwC, McKinsey, NASSCOM, etc. to support the academic findings.

Step 3: Inclusion and Exclusion Criteria

- **Inclusion:** Papers published between 2019–2025, written in English, focusing on AI and consumer behavior, and including studies on India as well as global studies for comparison.
- **Exclusion:** Papers outside this period, not peer-reviewed, not related to AI and consumer behavior.

Step 4: Screening (PRISMA Process)

1. First, we collected 70 papers and reports.
2. After removing irrelevant titles/abstracts, 60 papers remained.
3. After applying the inclusion criteria (timeline 2019-2025), 52 papers remained.
4. After reading the full text and applying inclusion criteria (related to AI and consumer behaviour), 40 papers were selected for final review.

Step 5: Analysis

The selected papers were read carefully and grouped into themes:

1. Personalization
2. Trust and Engagement (Chatbots/Conversational AI)
3. Ethics and Culture (India vs. Global context)

Step 6: Synthesis

The findings from these papers and reports were compared, summarized, and discussed. This helped in identifying both the research gap and practical insights for marketers.

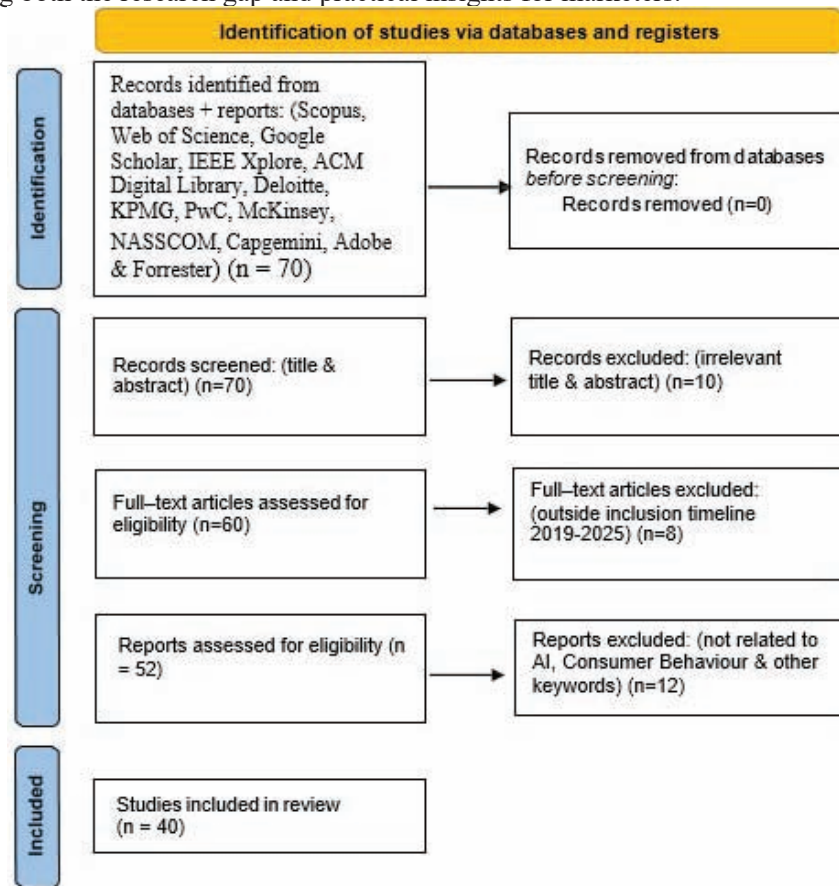


Figure 2: PRISMA Flowchart 2020

Source: Adapted from Page et al., 2021 (PRISMA 2020 Statement, BMJ, 372:n71)

Table 1: Summary of the 40 Studies included in the SLR

Author(s) & Year	Title	Research Methodology & Key Findings
PwC (2019)	AI in Indian Consumer Markets	Industry Report. AI use is growing in India's FMCG and retail sectors. Consumers like the convenience but worry about privacy. Businesses use AI to improve customer service and run operations better.
McKinsey (2019)	Digital India: Technology to Transform a Connected Nation	Industry Report. With over 500 million internet users, India is one of the fastest-growing digital markets. Digital tools could add \$200–300 billion to the economy by 2025, changing farming, education, health, and banking. Policies and infrastructure are needed to reach this potential.

<i>Author(s) & Year</i>	<i>Title</i>	<i>Research Methodology & Key Findings</i>
Adobe & Forrester (2020)	Personalization at Scale with AI	Industry Report. 71% of customers want brands to know how and when they prefer interactions. 46% of B2B buyers share data if it improves their experience. Leading firms are much more likely to use AI for content creation and analytics.
Dou, X. (2020)	Online Purchase Behaviour Prediction and Analysis Using Ensemble Learning	Empirical (CatBoost model). A machine learning model predicted shopping behavior with 88.5% accuracy using consumer data.
Deloitte (2021)	The Future of Conversational AI	Industry Report. The global conversational AI market is expected to grow 22% yearly from 2020–2025. Chatbot use may double within 2–5 years. It is mostly used in customer care, tech support, and billing.
Rabby, Chimhundu & Hassan (2021)	Artificial Intelligence in digital marketing influences consumer behaviour: A Review and Theoretical Foundation for Future Research	Conceptual Review. AI makes digital marketing more personal and gives real-time insights. It shapes how consumers think and act and provides a base for future research.
Hammer & Karmakar (2021)	Automation, AI and the Future of Work in India	Policy and Sectoral Analysis. AI use in India is still limited to a few areas. Its effect on jobs and inequality is small, and current policies ignore the informal economy. This raises doubts about India's AI strategy.
Hermann, E. (2022)	Leveraging Artificial Intelligence in Marketing for Social Good – An Ethical Perspective	Conceptual and Ethical Review. AI in marketing can help society if it is fair and transparent. Risks include misuse, exclusion, and over-monitoring. A framework is suggested to balance profit with social good, with strong rules and openness.
Gerlich, M. (2023)	The Power of Virtual Influencers: Impact on Consumer Behaviour and Attitudes in the Age of AI	Mixed Methods (Survey + Review). Virtual influencers seem more trustworthy than human ones and increase buying interest. Trust and expertise drive this effect, but concerns about ethics and authenticity remain.
Feng, Chen & Xie (2023)	AI Influencers in Advertising: The Role of AI Influencer-related Attributes in Shaping Consumer Attitudes, Consumer Trust, and Perceived Influencer – Product Fit	Qualitative Study. Interviews show personalization improves satisfaction and loyalty but may reduce independence. Ethical tensions exist in AI-driven customer experiences.
Arango, Singaraju & Niininen (2023)	Consumer Responses to AI-Generated Charitable Giving Ads	Experimental Study. People donate less when they know images are AI-made because empathy drops. But if AI is used for good reasons like accessibility or saving costs, the negative effect is smaller.

<i>Author(s) & Year</i>	<i>Title</i>	<i>Research Methodology & Key Findings</i>
Sidlauskiene, Joye & Auruskeviciene (2023)	AI-based chatbots in conversational commerce and their effects on product and price perceptions	Experimental Study. Human- like chatbots improve product and price perception when they are interactive and personal. This increases trust and fairness.
NASSCOM (2023)	Indian Retail: AI Imperative to Data-Led Disruptive Growth	Industry Report. India's retail market may reach \$1.4 trillion by 2024. AI helps personalize marketing, manage inventory, improve customer service, and predict demand. Companies are advised to invest in AI and partner with tech firms.
McKinsey (2023)	The Economic Potential of Generative AI: The next productivity frontier	Industry Report. Generative AI could add \$2.6–\$4.4 trillion yearly to the global economy. In retail and CPG, it may add \$400–660 billion by automating tasks and improving personalization.
Prajapat, R. (2024)	Personalization – AI-Crafted Customer Experience	Conceptual Chapter (Indian E- commerce). AI improves shopping with recommendations, pricing, and targeting. It uses real-time and predictive data. Concerns include privacy, bias, and autonomy.
Peruchini, Silva & Teixeira (2024)	Between artificial intelligence and customer experience: A literature review on the intersection	Bibliometric and Thematic Review. Research on AI and customer experience mainly covers chatbots, voicebots, and recommendation systems. Generative AI is less studied. More sector-specific and theory- based studies are needed.
Solberg Soilen, K. (2024)	AI and Marketing Automation	Conceptual Framework. AI supports segmentation, campaign management, and predictions. Examples include restaurants and cinemas. The study stresses data privacy and multi-channel use.
Shah & Kumar (2024)	Leveraging Machine Learning Techniques to Project Customer Behaviour through Predictive Analysis and Ethical Marketing	Conceptual + Case Studies (India). Machine learning allows deep personalization but raises risks of data misuse and lack of transparency. Ethical checks and regulation are recommended.
Sharma, A.K. & Sharma, R. (2024)	Assessing the influence of artificial intelligence on sustainable consumption behavior and lifestyle choices	Empirical (Survey, India). Young consumers say AI encourages eco-friendly habits but also risks overconsumption. The study suggests aligning AI with ethics and sustainability.
Choudhary et al. (2024)	Assessing Factors Influencing Customers' Adoption of AI-Based Voice Assistants	Survey Study (India, 1,189 consumers). AI adoption depends on usefulness, trust, and ease of use. Privacy worries reduce adoption. Social influence and fun also play a role. Transparency and user control are suggested.
Madanchian, M. (2024)	Generative AI for Consumer Behavior Prediction: Techniques and Applications	Systematic Review. Reviews 31 studies on Generative AI in areas like e-commerce, energy, and health. Shows strong potential for prediction and personalization but raises ethical concerns. Suggests responsible use.

<i>Author(s) & Year</i>	<i>Title</i>	<i>Research Methodology & Key Findings</i>
Raji et al. (2024)	E-commerce and consumer behavior: A review of AI-powered personalization and market trends	Conceptual Review. AI in e-commerce increases personalization with chatbots, analytics, and recommendations. It improves engagement and loyalty but raises privacy and bias concerns.
Iniesta & Lopez (2025)	A Systematic Literature Review on Conversational AI's Influence in Consumer Behaviour	Systematic Review. Conversational AI builds personalization, emotional engagement, and trust. Ethical concerns include privacy and manipulation. Suggests more cross-cultural and long-term studies.
Charles, Rana & Jain (2025)	Marketing with anthropomorphised AI: Insights from consumers	Thematic Review. Studies show human-like AI increases trust, attachment, and engagement. Risks include ethical and cultural issues.
Dhanushkodi et al. (2025)	Customer Behaviour Analysis and Predictive Modeling in Supermarket Retail: A Comprehensive Data Mining Approach	Data Mining Study. Supermarket data analysis found customer groups and product bundles. Neural networks performed better than traditional models. AI can improve customer relations, inventory, and promotions.
Amin, A. (2025)	Artificial intelligence in social media: A catalyst for impulse buying behavior?	Quantitative Study (Survey, social media). AI recommendations increase impulse buying among youth. Fun, peer influence, and enjoyment drive this. Responsible AI design is advised.
Sahala, F.P. (2025)	Predictive Analytics for Consumer Behaviour and Market Trends in the Indian Market	Conceptual + Applied (India). Looks at trust, risk, and price sensitivity in sectors like e-commerce and telecom. Discusses Generative AI, privacy law, and future technologies like federated learning.
Huynh & Aichner (2025)	In Generative Artificial Intelligence we trust: Unpacking determinants and outcomes for cognitive trust	Survey Study (U.S.). Fairness and empathy in AI increase trust and intention to use. Transparency matters less. Suggests ethical design for digital markets.
Nogueria, Lopes & Gomes (2025)	The new era of Artificial Intelligence in consumption: Theoretical framing, review and research agenda	Bibliometric Review. AI is reshaping branding and personalization. Proposes a model with three themes: industry impact, consumer needs, and experience improvement. Suggests new research directions.
Hassan, Abdelraouf & El-Shihy (2025)	The moderating role of personalized recommendations in the trust–satisfaction–loyalty relationship: An empirical study of AI-driven e-commerce	Empirical (Survey, 729 e-commerce users). Personalized recommendations strengthen trust, satisfaction, and loyalty. But too much personalization may reduce independence. Balance is needed.
Riandhi, Arviansyah & Sondari (2025)	AI and consumer behavior: Trends, technologies, and future directions from a scopus-based systematic review	Systematic Review (112 studies). Finds five main themes: personalization, trust, decision-making, ethics, and engagement. Chatbots and recommendations are most studied, but Generative AI and cultural issues are less covered.

<i>Author(s) & Year</i>	<i>Title</i>	<i>Research Methodology & Key Findings</i>
Wang, Sauka & Situmeang (2025)	Anthropomorphism and transparency interplay on consumer behaviour in generative AI-driven marketing communication	Experimental Study (444 participants). Human-like AI increases trust and purchase intention. But when transparency is highlighted, the effect becomes weaker.
Lata & Rana (2025)	AI's influence on young consumer behavior: Fostering sustainable consumption	Qualitative Study (32 young Indians). Interviews show AI supports sustainable habits through personalization and awareness. Suggests broader studies for cultural comparison.
Biju & Gayathri (2025)	Indic approach to ethical AI in automated decision making system: Implications for social, cultural, and linguistic diversity in native population	Qualitative Document Review (20 Indian AI ethics cases). Western AI ethics don't fit India well. Local values like Dharma and Karma better address diversity. A culturally rooted framework is needed.
NASSCOM (2025)	India Generative AI Startup Landscape 2025: Mapping the Momentum	Industry Report. India's Generative AI startups grew 3.6× from 2023–2025, showing innovation and investment. Challenges remain in data privacy, talent, and regulation. Late-stage funding is increasing.
Capgemini (2025)	What Matters to Today's Consumer 2025	Industry Report. 68% of consumers are open to GenAI suggestions, and 58% prefer them over search. But satisfaction dropped from 41% in 2023 to 37% in 2024 despite more investment.
Capgemini (2025)	Consumers and the Generative AI Effect	Industry Report. Consumers feel more positive about using Generative AI, which shapes their behavior and expectations. Early adopters gain an advantage.
KPMG & University of Melbourne (2025)	Trust, Attitudes, and Use of Artificial Intelligence: A Global Study 2025	Global Survey (48,000 people, 47 countries). Indians use AI widely and are optimistic about its benefits. But they worry about transparency and privacy. Rules like India's DPDP Act are seen as important for responsible use.
Naz & Kashif (2025)	Artificial intelligence and predictive marketing: An ethical framework from managers' perspective	Qualitative Study (14 marketers). AI in marketing raises worries about manipulation, privacy, bias, and monopolies. Suggests a framework for fair and transparent AI use.
Salih, Tarhini & Acikgoz (2025)	AI-Enabled Service Continuance: Roles of Trust and Privacy Risk	Survey Study (356 users). Trust strongly predicts continued use of AI services. Privacy risks reduce this link. Ease of use and usefulness improve trust. Transparency is recommended.

FINDINGS AND DISCUSSION

This study explains how AI is changing shopping and the way people connect with brands in three main ways.

First, AI makes shopping more personal. It suggests products and creates content that match each person's needs. This makes the process easier and more enjoyable, and people often end up buying

more. At the same time, many shoppers worry about privacy, being watched all the time, and losing control over their choices. They want both personalization and honesty about how their data is used.

Second, tools like chatbots, voice assistants, and virtual influencers help people talk to brands quickly and easily. They improve customer service and keep people more engaged. But culture matters. In India, people like using these tools, yet they still remain careful because of issues of trust and data safety.

Third, ethics and culture play a big role. Global studies highlight fairness, accountability, and privacy. In India, people also care about language, cultural values, and trust in government rules. Most Indian consumers feel positive about AI but are also cautious. They want the benefits of AI but worry about weak data protection. This shows that AI in India needs to be adjusted to local needs and supported by laws like the DPDP Act.

Overall, AI is not just about technology—it also affects trust, ethics, and culture. Marketers need to balance personalization with fairness, and new ideas with respect for local culture.

CONCLUSION AND FUTURE SCOPE

This study brings together research and reports to see how AI is shaping consumer behavior, especially in India.

The results show that: Predictive and generative AI helps personalize experiences and makes shopping more engaging. Chatbots and other conversational AI make interactions easier and faster. Ethics and culture decide how much people trust and adopt AI.

In India, people are open to AI but remain careful about privacy and trust. This makes the Indian market both hopeful and cautious. This review also shows clear gaps that future research should address:

- **More India-focused studies:** Most research is from Western countries. More large-scale and diverse studies in India are needed.
- **Long-term impact:** Many studies are short-term. Future work should examine how AI affects consumer behaviour over time.
- **Generative AI and new tools:** With tools like ChatGPT and AI-based content creators becoming popular, researchers need to study their direct impact on trust, purchase decisions, and consumer satisfaction.
- **Ethics and fairness:** There is limited research on how consumers view fairness and transparency in AI-driven decisions. This needs more attention.
- **Practical experiments:** Researchers can conduct field experiments with Indian consumers to test which AI approaches (chatbots, recommendations, voice assistants) work best in building trust.

By addressing these areas, future studies can provide deeper insights and guide both businesses and policymakers in making AI adoption safer, fairer, and more effectively.

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The Influence of Social Media Influencers on Millennial and Gen Z Purchasing Decisions

Kashmira Mathur

Assistant Professor, DPG Degree College

Abstract

Social media influencers have a big impact on how people shop these days, especially millennials and Generation Z, two of the largest consumer groups. This study examines how influencer marketing affects the purchasing patterns of younger generations who exhibit unique online behaviors and skepticism toward traditional marketing. By examining trust, customer engagement, and authenticity, it investigates how influencer endorsements improve positive brand preference, increase brand recognition, and affect purchasing intentions. The study also identifies the key attributes of influencers such as relatability, trustworthiness, and emotional connection that have the greatest impact on consumers' purchasing decisions. The study provides useful guidance for marketers looking to create more effective influencer marketing campaigns targeting the Millennial and Gen Z markets. The writers stress the importance of integrity and openness.

Keywords: *Social Media Influencers, Millennial Consumers, Generation Z, Purchasing Decisions, Influencer Marketing, Consumer Behavior*

INTRODUCTION

Social media usage has evolved as digital technologies have proliferated. These days, Facebook, Instagram, YouTube, and TikTok are some of the most crucial platforms for marketing communications. Working with people who already have a large following makes influencer marketing one of the greatest ways to use social media for marketing. Because they have a deeper connection to niche communities, social media influencers are more relatable and reliable than traditional celebrity endorsements (De Veirman, Cauberghe, & Hudders, 2017; Freberg et al., 2011).

Millennials (born 1981–1996) and Generation Z (born 1997–2012) are both included in the general term “digital natives.” Due to their constant exposure to digital content, these people display unique consumer behaviors. Authenticity, transparency, peer validation, and endorsement are the sources of trust and loyalty for these cohorts (Smith, 2019). While influencer and peer endorsements are hailed as reliable references, traditional advertising's static, one-way dialogue is still distrusted and disregarded (Turner, 2020). Social Influence Theory and Source Credibility Theory are the two main theoretical frameworks upon which this study is based. Social Influence Theory describes how people alter their behavior in social situations by observing the actions of others, particularly through informational and normative influence. According to Source Credibility Theory, a message's effectiveness is largely determined by how reliable and knowledgeable it is.

The current study looks into how influencers affect how Millennials and Gen Z buy things. It talks about traits that make people trust you and be real, and it gives marketers useful tips. The goal is to link theory with practice to improve digital marketing. Facebook, Instagram, YouTube, and TikTok are examples of social media sites that have changed the way businesses and customers talk to each other. Influencer marketing has become a successful strategy thanks to these digital platforms. Brands use this strategy to work with people who have a lot of followers on social media to sell their goods and services. Unlike regular celebrities, social media influencers often create interesting niche

communities that value honesty, being relatable, and being active. This close relationship makes followers feel more confident and trustful.

Generation Z (born 1997–2012) and Millennials (born 1981–1996), often called digital natives, are particularly drawn to influencer marketing. They have grown up surrounded by social media, smartphones, and instant messaging. As a result, their shopping habits differ from those of older generations. These younger consumers clearly prefer content that is relatable, genuine, and tailored to their identities and experiences (Smith, 2019). They are increasingly skeptical of traditional advertising. When making choices, they tend to trust reviews from peers, endorsements from influencers, and advice from online sources (Turner, 2020). These trends highlight how social media influencers are shaping the buying decisions of modern customers.

Three primary psychological factors :perceived authenticity, trustworthiness, and emotional connection are at the heart of influencers' persuasive power. Authenticity is the degree to which an influencer's message appears sincere and pertinent to the individual. According to Audrezet, de Kerviler, and Moulard (2020), this element has a big impact on how followers engage with the content and if they feel pressured to take action. Trustworthiness, or the influencer's perceived dependability and expertise, is also essential for establishing credibility and influencing customer behaviour (Jin & Phua, 2014). Furthermore, promotional messages seem less like advertisements and more like reliable advise when influencers and consumers have a close emotional connection.

This study aims to investigate the relationship between social media influencers and the purchasing patterns of Millennials and Generation Z. By identifying the particular characteristics of influencers and content strategies that foster trust and affect purchasing behavior across various groups, the study seeks to give marketers useful insights.. To create influencer campaigns that are both effective and aligned with the values of today's digital customers, understanding these relationships is essential. These findings will offer marketers a guide for forming lasting, meaningful connections with younger audiences through effective influencer partnerships in a crowded online environment.

LITERATURE REVIEW

Social Media Influencers and Marketing

Social media has changed how companies communicate with their target audience. One important trend is the rise of social media influencers. These individuals have developed substantial fan bases by sharing engaging, often specialized content on digital platforms. According to Freberg et al. (2011), influencers are considered modern thought leaders. They use their expertise and sincerity to sway the beliefs, preferences, and behaviors of their audience. Influencer marketing capitalizes on the close relationships that influencers have with their followers. This approach differs from traditional advertising, which sometimes comes across as impersonal and overly promotional. According to De Veirman, Cauberghe, and Hudders (2017), this strategy allows businesses to communicate with clients in a way that appears more genuine and relevant.

Influencer collaborations frequently increase brand awareness and trust, particularly when the influencer's beliefs and persona align with those of the product or service. In addition to increasing message acceptance, this match raises awareness and purchase intention. By facilitating two-way communication, influencer marketing enables followers to engage with content, pose queries, and express their opinions. The marketing process becomes more lively and interesting as a result.

Millennials and Generation Z Consumer Behavior

Millennials and Generation Z are frequently referred to as digital natives because they were raised with technology. Their purchasing behaviors are significantly influenced by their continuous engagement

with digital content. They search for individuals and goods that align with their personal and social values. They favor companies that communicate clearly, offer a behind-the-scenes glimpse, and tell sincere stories (Smith, 2019). Millennials those born between 1981 and 1996—are renowned for their value-drivenness, social awareness, and receptivity to tailored digital experiences. Born between 1997 and 2012, members of Generation Z have always been accustomed to a world that prioritizes mobile devices. They particularly like brief, eye-catching, and captivating content, such as short films, interactive stories, and reels. These groups have strong feelings about traditional advertising methods, which they often see as intrusive or misleading. Instead, they tend to trust influencer endorsements and recommendations from friends, viewing them as more genuine and based on real experiences (Turner, 2020). This trend highlights the importance of social validation, relevance, and authenticity in marketing aimed at younger consumers.

Factors Affecting Purchase Decisions

Customers, particularly Millennials and Gen Z, react to influencer marketing for a variety of relational and psychological reasons. Trust in the influencer is a crucial component. Trust encompasses cognitive trust, which is the conviction that the influencer is competent and informed, as well as emotional trust, which shows the connection and sincerity in the influencer's communications (Jin & Phua, 2014). As an influencer's perceived experience increases, so does their persuasive power. When followers see influencers as authorities in fields like fashion, technology, fitness, or beauty, they are more likely to believe and follow their advice. A strong emotional bond is also essential. Loyalty is increased and continued interaction with the influencer's content and recommendations is encouraged by this connection, or how well followers relate to the influencer personally.

Authenticity is clearly the cornerstone of successful influencer marketing. Sincere influencers are regarded as honest and devoted to their beliefs. Rather than using staged advertisements, they share content that is based on their actual experiences. According to research by Audrezet, de Kerviler, and Moulard (2020), followers who believe that the influencer's content is authentic are far more likely to purchase the products that are recommended to them. This sense of authenticity enhances the marketing message's efficacy and appeal by tying personal narrative to business objectives.

RESEARCH OBJECTIVES

In today's fast-changing digital world, consumers often split their attention among various online content. Marketing strategies heavily rely on social media influencers. This study looks at the ways in which these influencers impact consumer behavior, especially among Generation Z and Millennials.. The following objectives guide this study:

1. **To investigate how social media influencers affect Millennials' and Gen Z's purchasing decisions**

This goal looks at how social media influencers impact the buying habits of Millennials and Generation Z. Understanding how influencer content influences actual purchases is important because these groups represent a significant part of online consumers. This includes exploring consumer motivations, the types of influencer content that engage them the most, and the contexts such as product categories or platforms where influencers have the most influence.

2. **To determine the characteristics of influencers that impact customer trust and authenticity perception**

For influencer marketing to succeed, authenticity and trust are key. The aim is to identify the specific traits and actions of influencers that strengthen their reputation with customers. To understand how these factors influence customer perceptions and help build lasting relationships

between influencers and their followers, we will look at aspects like content consistency, transparency in brand collaborations, perceived expertise, communication style, and shared values.

The goal is to provide marketing suggestions based on trends in customer responses. This focus is on creating practical advice for brand managers and marketers using collected data. The noticed consumer reactions to different influencer styles, platforms, and messaging tactics will shape these recommendations. The aim is to help companies develop influencer marketing strategies that resonate with Gen Z and Millennial consumers, improve brand credibility, and ultimately increase engagement and conversion rates.

By pursuing these goals, the research aims to link theoretical insights with real-world applications. This will contribute to the existing literature on digital marketing and offer valuable guidance for brand-influencer partnerships in a competitive market.

METHODOLOGY

This study looks at how social media influencers affect the buying habits of Millennials and Generation Z. It uses a quantitative research design to identify key trends in consumer attitudes and decision-making. To gather measurable data and perform statistical analyses, we developed a structured survey questionnaire. We surveyed 400 respondents aged 18 to 35, which included both Millennials and Gen Z. We selected participants from major cities like Delhi, Mumbai, Jaipur and Bangalore, as we believe urban individuals are more likely to use social media and encounter influencer marketing frequently.

The questionnaire comprises four main parts. The initial part collects demographic background: including age, gender, occupation, income and the average frequency of using a social media site daily. The next are Likert-scale statements employed to assess the former two to three constructs, that has a score of 1 indicating highly disagree along with 5 meaning highly acknowledge:

- **Influencer Trustworthiness:** This evaluates opinions on the truthfulness, consistency, and expertise of the content that influencers provide.
- **Content Relatability:** This indicates how well an influencer's values, message, or lifestyle match the preferences of the individual.
- **Purchase Intention:** This assesses the likelihood that a customer will act on product endorsements or recommendations from influencers.

Data was collected over four weeks using both offline (paper-based) and online (Google Forms) methods. This approach allowed us to reach a wider audience and ensure the accuracy of the data.

Tools and Techniques

The Statistical Package for Social Sciences (SPSS), version 26 was used for data analysis. The statistical use and software applied in the current study were listed below: Descriptive Statistics listed to describe and summarize the dataset's basic characteristics (mean values) $\pm$ SD, (frequency distribution) as well (for demographics and variable-related responses).

The internal consistency of the Likert-scaled items relating to each component (excerptability and credibility), were also quantified using Cronbach's Alpha (reliability analysis). Bivariate relationships between purchase intention, relatability, and trustworthiness were analyzed through Correlation Analysis.

Multiple Regression Analysis assessed how well independent factors, such as relatability and trustworthiness, predicted the dependent variable, purchase intention. This helped to identify the key elements influencing consumer reactions to influencer content when making purchases.

Justification for Sample Selection

In order to get acquainted with people aged 18-35 about their purchasing behavior, we focused on the group; Millennials and Gen Z. These two groups are the most active on social media, of course, because they grew up in the digital age. These younger consumers purchase and shop differently, especially in the digital space and when it comes to engaging with influencer marketing. This renders them the ideal population for this research. We also deliberately chose to focus on the cities. A higher reliance on the internet, greater access to technology, and more engagement with influencer content is more common among urban consumers. These are all reasons that the results on influencer reach are likely to be more accurate, because the sample more accurately reflects the target audience for the majority of digital marketing programs.

To ensure that the findings are statistically significant and applicable, we selected a sample size of 400 respondents, following standard quantitative research practices. This number is sufficient for multivariate analysis and provides reliable correlations without losing interpretive power.

RESULTS AND DISCUSSION

The main conclusions from the survey data analysis appear in this section, along with interpretations based on current research and marketing strategies. The findings are divided into three main themes: the elements that affect influence, the strategic implications for marketers, and the impact of influencers on consumer purchasing decisions.

Impact on Purchasing Choices

Seventy-eight percent of those surveyed said they had bought something directly based on an influencer's post, the results showed. This percentage demonstrates the enormous influence wielded by the influencer on the consumers of today. Break the figures down by generation and it becomes apparent that Gen Z (aged 18 to 27) respondents are most influenced by this type of marketing from these figures, with 83% agreeing they follow these suggestions. This compared to 74% of so-called Millennials, aged 28 to 35.

These are consistent with other research that found digital natives are more likely to trust their peers than a traditional ad). With the inherent engagement and immediacy, as well as the perceived authenticity of social media, as it makes them feel that the advice influencer share is more authentic and more homely than mere.

Key Influencer Attributes

Respondents named perceived authenticity as the top influencer quality affecting their buying decisions. Consistent messaging, actual product use, and a connection between the influencer's lifestyle and the products they promote were all linked to authenticity. The findings of Audrezet et al. (2020), which highlighted the importance of honesty and shared values in influencer marketing, support this. The second most mentioned quality was trustworthiness, which relates to how trustworthy and genuine followers believe the influencer is. Influencers who provide honest reviews and are clear about sponsored content earn the audience's trust. After trustworthiness, purchase intent was also positively influenced by expertise. This refers to the influencer's knowledge and authority in a specific area, like fitness, tech, or beauty.

Additionally, emotional engagement was identified as a key driver of customer behavior. Influencers who connect with their audience, share personal stories, and use narratives to evoke positive emotions create a stronger psychological bond. This often leads to increased customer loyalty and a greater likelihood of purchases. These studies suggest that the effectiveness of influencers relies

not only on their follower count but also on their ability to foster a personal, credible, and emotionally engaging relationship with their audience.

Marketing Implications

Implications The results of this study provide insights for brand managers and marketers. First up, brands can begin by collaborating with the right influencers that share an authentic profile, are consistent in their values and align with the brand's personality and characteristics. The research suggests that authenticity and trust are possibly preferable to mere reach in a time of sensational noise, particularly when such ads are reaching Gen Z, these very sensitive-to-shalowness-or-dishonesty ads. What's more, the numbers indicate micro influencers – those with fewer followers with high engagement are often better at affecting consumer behavior than their macro and celebrity counterparts. They are approachable, relatable and believable when it comes to recommending products. This trend gives brands with limited marketing budgets the opportunity to explore effective, low-cost influencer partnerships.

Lastly, marketers should think about developing influencer campaigns that include interactive elements like Q&A sessions, user-generated content, and behind-the-scenes material. These features build community and enhance emotional engagement. These strategies not only boost brand awareness but also create lasting loyalty among younger customers.

CONCLUSION

The results of the research have indicated how much influencers in social media affect consumers among Millennials and Generation Z by their marketing. These are age groups who are commonly called digital natives, they follow influencer content almost everyday so it's easier to reach with this tool. Influential marketing is a top method for affecting purchases particularly regarding relatability, emotional impact and authenticity—all this contrasts with the conventional advertising methods' system.

Research has revealed that the key variables affecting how consumers will respond to influencer marketing are genuineness and trust. These attributes have high importance in terms of purchase intentions. They serve as a factor which boosts the message's credibility by creating deeper emotional bond with an influencer's or his/her followers' audience. The study also claims on the real influence on digital world where, it's not just about short term relationships but meaningful ones beyond visibility.

From a marketing perspective, it's obvious that companies have to do better than the lazy endorsement. "In that act of partnering, they should be with someone that values what they value and speaks to them directly. Big ideas Aside from keeping you up at night, a campaign that intelligently focuses on community engagement, authentic conversation, and long-term relationship building should see the trust and the loot roll in. This is particularly true for Gen Zs who are looking for more authenticity from the brands they support.

Overall, the importance of social media influencers on the decision-making is high. Programmatic is impersonal; at least with local relationships being harnessed to register individuals onto systems, new connections are created that can be utilised in the future.

RECOMMENDATIONS

Based on the findings of this study, here are recommendations for marketers and brands that want to improve their influencer marketing strategies:

1. **Prioritize Authentic Partnerships:** Brands should choose influencers whose content, values, and lifestyles match their own. Genuine collaborations build lasting brand loyalty and boost consumer trust.
2. **Invest in Micro-Influencers:** Brands should consider working with micro-influencers who have smaller, more specialized audiences instead of focusing only on those with large followings. These influencers often create closer emotional connections with their audience and achieve higher engagement rates.
3. **Ensure Transparency:** Influencer initiatives should be completely open, especially regarding sponsored content and paid collaborations. Clearly labeling promotions helps avoid negative reactions and builds trust.
4. **Use Emotional Storytelling:** Influencers should share customer reviews, product stories, and personal experiences to emotionally engage their audiences. This type of content often leads to increased sales and stronger engagement.
5. **Monitor Consumer Feedback:** Brands should keep an eye on audience reactions, engagement levels, and buying patterns to continuously improve their choice of influencers and campaign messaging.

LIMITATIONS OF THE STUDY

Although the study provides insightful information, there are a few important limitations to be aware of. **Geographic Restrictions:** The sample was limited to Indian cities. This might reduce the findings' applicability to people living in rural areas or in other nations. **Self-Reported Data:** Social desirability bias may be introduced when self-reported responses are used. Respondents may exaggerate or minimize their behaviors or attitudes. **Generational Overlap:** Despite efforts to distinguish between Gen Z and Millennials, there may be some overlap or differences in the ways that these two groups use social media. This might affect how it is interpreted. **Platform-Specific Insights:** Instagram, TikTok, and other social media platforms were not differentiated in the study. More intricate behavior patterns across various channels may be missed by this oversight.

FUTURE RESEARCH DIRECTIONS

To build on the current study, future research may explore the following areas:

1. **Platform-Based Analysis:** Future studies could look at how influencer marketing functions differently across different social media networks. Instagram, YouTube, TikTok, and other platforms have very different user behavior.
2. **Cross-Cultural Comparisons:** Research comparing various countries or cultures can provide insight into how people perceive influencer qualities globally. This might offer insightful information for international marketing plans.
3. **Longitudinal Studies:** Researchers can monitor shifts in consumer purchasing patterns and influencer trust by employing a longitudinal approach. This is particularly important as followers age or as social media platforms change.
4. **Incorporating Qualitative Data:** Combining surveys with focus groups or in-depth interviews could provide a deeper comprehension of the psychological and emotional aspects of social media-influenced purchases.
5. **Influencer Typology's Effect:** Upcoming Studies

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APPENDIX A: QUESTIONNAIRE

This questionnaire was designed to collect data for the study ‘The Influence of Social Media Influencers on Millennial and Gen Z Purchasing Decisions’. It consists of four main sections: demographic information, influencer trustworthiness, content relatability, and purchase intention. Respondents were asked to indicate their level of agreement on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

Section 1: Demographic Information

1. Age
2. Gender
3. Occupation
4. Income Level
5. Average daily use of social media platforms

Section 2: Influencer Trustworthiness

Please indicate your level of agreement with the following statements:

1. I believe influencers provide honest reviews.
2. I find influencer content consistent and reliable.
3. Influencers I follow demonstrate expertise in their niche.
4. I trust influencers' opinions about products/services.

Section 3: Content Relatability

Please indicate your level of agreement with the following statements:

1. Influencers' values and lifestyles align with my preferences.
2. I can relate to the personal experiences shared by influencers.
3. Influencers create content that feels authentic to me.
4. I follow influencers who reflect my own interests and identity.

Section 4: Purchase Intention

Please indicate your level of agreement with the following statements:

1. I am likely to purchase products recommended by influencers.
2. Influencer endorsements increase my willingness to try new products.
3. I have purchased products based on influencer recommendations in the past.
4. I consider influencers' recommendations when making purchasing decisions.

The Role of Social Media Influencers in Shaping Consumer Purchase Intentions: A Mediated-Moderated Model

Mansi Saini¹, Krishna Kumari² & Tabassum Ahmed³

¹Research Scholar, Department of Applied Science, Humanities and Management, National Institute of Technology, Delhi

²Assistant Professor, Department of Applied Science, Humanities and Management, National Institute of Technology, Delhi

³Assistant Professor, Department of Management, Gurugram University, Gurugram
E-mail: mansisaini@nitdelhi.ac.in, krishnakumari@nitdelhi.ac.in, tabassum.mba@gurugramuniversity.ac.in

Abstract

The advent of social media has changed the consumer decision-making process, and social media influencers (SMIs) have become influential intermediaries connecting brands and consumers. This paper explores the role of SMIs in influencing consumer purchase intention through the most important attributes, including credibility, expertise, authenticity, and influencer-brand fit. Based on source credibility theory and parasocial relationship models, the research emphasizes the manner in which influencer endorsements raise brand trust, encourage engagement, and enhance consumers' purchase willingness. Moderating variables such as product type, platform dynamics, and disclosure practices are also taken into account in the analysis, as they affect the magnitude of these effects. A synthesis of recent empirical research yields consistent findings that influencers are opinion leaders who have a profound effect on consumer behaviour but significant gaps exist in capturing long-term effects and cross-cultural differences. The paper adds to current debates by aggregating existing knowledge and identifying directions for future research, with implications for academic research and practical marketing action.

Keywords: Social Media Influencers, Purchase Intention, Consumer Behaviour, Source Credibility, Authenticity, Influencer Marketing, Digital Platforms

INTRODUCTION

Social media platforms' explosive growth has changed how customers involve with companies, goods, and services. Influencer-driven strategies that utilize the fame and authority of social media personalities are rapidly replacing or supplementing traditional marketing techniques. As digital opinion leaders, social media influencers (SMIs) provide content, establish communities, and cultivate connections with audiences that frequently result in quantifiable changes in the attitudes and actions of customers.

According to International Telecommunication Union (ITU), Statista and Data Reportal, in 2025, it is estimated that 62.8% of global internet users actively search for brand information on digital platforms. This represents a significant portion of the estimated 5.4 billion social media users globally. In addition, 48% of consumers reported interacting with brands more frequently on social media than they did six months prior.

A number of constructs determine how successful SMIs are. Both source similarity, which indicates how related the influencer is to the target audience, and influencer trustworthiness which

includes knowledge, dependability, and attractiveness are fundamental. Other concepts include perceived authenticity, which increases customer trust in the influencer's advice, and parasocial interaction, which describes the emotional connections that customers develop with influencers. Purchase intention is further reinforced by engagement, which is gauged by likes, comments, and shares and serves as a social cue indicating acceptability and popularity. Mediating factors like customer trust, brand attitude, perceived value, and emotional attachment also influence the relationship between influencers and purchase intention. For instance, having faith in the influencer can increase company credibility, which increases the possibility that a customer will intend to purchase. Meanwhile, influences of the power of influencer marketing can be increased or decreased by mitigating such variables as familiarity with the brand, involvement of the customers, social presence, and demographic features (age, sex, and culture background). Moreover, the research has also proved that such characteristics as social identity, perceived entertainment value, and FOMO influence customer responsiveness to content of influencers.

Comprehensively, social media influencers act as a mediating factor between consumers and the brands in terms of cognitive, emotional, and social processes that contributes to a purchase intention. It is based on their strategic benefit not simply in the direct marketing of products as well as their capacity to control sophisticated mental functions including trust, engagement, emotional attachment and perceived authenticity when influenced by modifying influences like consumer involvement and brand familiarity. The knowledge of these constructs will be of importance to both researchers and advertisers since it will complement the knowledge of how to design effective influencer campaigns and forecast the behaviour of consumers in an online-only market. In summary, SMIs have taken a strategic call in the modern-day marketing by filling the gap between brands and consumers unlike normal advertising would. Through a dynamic interplay of moderating and mediating variables, influencers influence the consumer purchase intentions by relying on the extent to which they deploy authenticity, credibility, engagement, and social influence which makes them one of the key research focuses of digital marketing, consumer psychology, and brand management. One of the most crucial effects of influencer behaviour on the purchasing intentions of consumers is the effect. The relatability or genuine interaction, parasocial interaction forms the underpinning of influencer marketing unlike traditional advertising which has often been perceived to be impersonal or overly promotional. Consumers tend to consider influencers as a trusted source of information and the level of recommendation can affect brand evaluation, foster engagement, and ultimately purchase.

Even with influencer marketing's increasing importance, scholars are still probing into important topics like which influencer qualities best predict consumers' intentions to make a purchase. What psychological processes supports these effects? What circumstances make influencer endorsements the most convincing? It is crucial to answer these issues in order to further theory and guide managerial practice. This paper contributes to the conversation by synthesizing insights from existing studies, highlighting key antecedents, mediators, and moderators of influencer effectiveness, and identifying gaps for future research. By doing so, it provides a framework for understanding how SMIs shape consumer purchase intention and offers guidance for brands navigating the evolving digital marketplace.

LITERATURE REVIEW

Many studies have been conducted on social media and how it has changed the way people interact and share information online. However, the focus of this study is how influencer marketing plays its role in influencing consumers' perceptions about a particular product and creating purchase

intention. This part of the study includes the relevant past literature, definitions of variables, and their relationship as proposed in the conceptual framework.

Social Media Influencers

Marketing is defined as “A social and managerial process by which individuals and groups obtain what they need and want, through creating and exchanging products and value with each other.” (Kotler, 2005). Kotler & Keller (2016) describe the variables of the marketing mix that commonly used today are the 7Ps (product, price, promotion, place, people, process, and physical evidence). According to Kaplan and Haenlein (2010), social media are “a collection of Internet-based applications that build upon the technological and ideological foundations of Web 2.0, and that facilitate the production and sharing of user-generated content.” In a marketing context, social media is seen as a tool that helps people build networks and share information and feelings with one another (Kaplan & Haenlein, 2010). Social media has caused three significant changes in the market since it is a “dynamic, interconnected, egalitarian, and interactive organism” (Peters et al., 2013). First of all, social media gives companies and customers a platform to communicate and engage in ways that were previously inaccessible. Various platforms, including social networking sites like Facebook, microblogging sites like Twitter, and content communities like YouTube, enable these connections by enabling people to create social networks based on common values and interests (Kaplan & Haenlein, 2010).

A social media influencer is “someone who has a significant and active following on social media platforms, which one would not know unless one follows them.” They are individuals who have cultivated substantial credibility, visibility, and engagement on platforms such as Instagram, YouTube, TikTok, and X (formerly Twitter). They are distinguished from traditional celebrities because their influence often emerges organically through content creation, relatability, and community building rather than institutionalized fame. Research suggests that followers often perceive SMIs as peers rather than distant celebrities, which makes their endorsements more persuasive (Conde, 2023). SMIs are broadly categorized into mega-influencers who have millions of followers, high reach and lower intimacy, macro-influencers have hundreds of thousands of followers and moderate intimacy, micro-influencers have 10,000–100,000 followers, niche expertise and high intimacy, and nano-influencers have less than 10,000 followers and hyper-localized influence) (Spörl-Wang, 2025). These categories highlight that influence is not merely a function of follower count but also of perceived authenticity, relevance, and relational closeness. On social media sites like Facebook, YouTube, Twitter, and Instagram, influencers post content related to a particular area of interest, such as food, travel, fitness, or fashion. Customers or individuals interested in a certain industry can follow and interact with influencers to remain current on the latest trends. By sharing unique stories and material, people have the potential to gain online recognition and a following, which gives rise to social media influencers. Academics and business experts are very fascinated by social media influencers because of their potential as a tool for brand promotion. Social media marketing has seen substantial shift as a result of SMIs. The increase in popularity of SMIs accelerated up business-social media influencer collaboration.

Social proof reflected through engagement metrics such as likes, comments, and shares, further amplifies these effects by signalling popularity and normative approval (Barari et al., 2025). Specific features of a particular platform like livestream shopping, swipe-up purchase links, and others make the consumer journey easier and allow building a stronger connection between intention and actual purchase behaviour (Spörl-Wang, 2025). But contextual and situational moderators have a large impact on such relationships. Empirical studies grounded on Elaboration Likelihood Model Elaboration likelihood model (ELM) reveal that the influence pathway depends on the type of products: low-

involvement products are rather influenced by perceptual factors including attractiveness of the influencer; high-involvement products are facilitated by the informational ones like expertise (Ao et al., 2023). Influencer mastery can be culturally determined, too, since collectivist cultures celebrate intimacy and a culture of trust, whereas individualist ones prioritize individuality and self-expression (Barari et al., 2025). The aspect of disclosure also has a more subtle flavour; honesty regarding sponsorship can keep the credibility level intact but make the content less persuasive in the event when the followers feel that the content is skewed towards commercialism (Liu et al., 2024).

The newer literature has also started to reconsider virtual and AI-generated influencers with greater focus on the fact that perceived human-likeness and authenticity are fundamental determinants of their persuasive capabilities (Sporl-Wang, 2025). Whilst such synthetic personalities can be as engaging as possible, their influence is usually tamed by the so-called machine heuristic, which decreases the feeling of warmth and trust. Moreover, the dominance of short-form video platforms such as TikTok and Instagram Reels introduces new cognitive and emotional mechanisms, where attention, entertainment, and emotional resonance play a decisive role in shaping memory and purchase intent (Barari et al., 2025). Despite the growing sophistication of these findings, several gaps persist. Most studies remain cross-sectional, focusing on purchase intention rather than actual behavior, and there is limited longitudinal or transactional evidence linking influencer exposure to real purchase outcomes. Cross-cultural comparisons, qualitative explorations, and standardized measurement frameworks for constructs such as authenticity and influencer credibility are still scarce (Sardar & Sai Vijay, 2025).

In summary, extant research consistently highlights that SMIs influence consumer purchase intention through a complex network of mediators credibility, authenticity, parasocial relationships, and social proof under the moderating influence of contextual and cultural factors. However, future research must progress beyond intention-based measures, incorporate longitudinal and behavioural data, and expand to emerging contexts such as AI influencers and short-form video ecosystems. Addressing these gaps will not only deepen theoretical understanding but also provide actionable insights for marketers to design ethically sound and culturally attuned influencer strategies.

Consumer Purchase Intention

Consumer purchase intention refers to a consumer's willingness, plan, or likelihood to buy a particular product or service in the future. It reflects the individual's mental readiness to engage in a purchasing behaviour, which is influenced by attitudes, subjective norms, and perceived behavioural control.

The purchase intention is defined as the preparedness of an individual to carry out a certain behaviour and according to Ajzen (1991), it is a direct antecedent of actual behaviour in the Theory of Planned Behaviour. Equally, purchase intention is defined as a subjective probability of individuality to undertake a certain action i.e. buying a product which is determined by the attitude and belief of the individual regarding the act of buying a product (Fishbein and Ajzen, 1975).

Consumer purchase intention can be considered as a key construct in the marketing research sphere since it measures how much an individual is willing or is ready to buy a specific service or good in the future. It deviates the consumer behaviour, but does not necessarily represent a perfect proxy of simultaneous purchase (Ao, Bansal, Pruthi, and Khaskheli, 2023). The purchase intention is biased by internal (attitudes, motivations, trust, and value perception) and external stimuli (advertising, word-of-marketing, and those of celebrity proxies). The importance of SMIs in the formation of purchase intention is based on the possibility of closing the dialogue between the conventional types of persuasion and peer-to-peer encouragement and, in that way, affect consumers at the cognitive and the affective level (Liu, Zhang, and Kim, 2024).

Key Predictors of Purchase Intention

1. **Credibility and Authenticity:** It is always noted in research that SMIs that are seen to be authentic and reliable are more influencing a consumer to make a decision. Trust is created through authentication, whereas credibility makes followers consider the recommendations as valid (Liu et al., 2024).
2. **Influencer-Brand Congruence:** When the image of an influencer tapers with the ideas and philosophy of the brand, the followers will understand their aims to endorse as natural as possible. The effect of this congruence is increased persuasion and purchasing intention (Sporl-Wang, 2025).
3. **Visual Quality and storytelling:** Investment in high-quality visuals, narration, and informative information creates a positive impact on purchase intention especially with the Gen Z consumer; who share values of appearance and creativity (Ao et al., 2023).
4. **Type of Influencer:** Cheating Micro-influencers usually have a higher engagement and conversion rate because of a better connection to the community, whereas mega-influencers have the advantage of reaching masses and creating awareness of the brand (Conde, 2023).

THEORETICAL FOUNDATIONS

Source Credibility Theory

The Doctrine of Source Credibility Theory asserts, however, that effectiveness of a message is determined by the perceived expertise, trustworthiness and attractiveness of a communicator (Liu et al., 2024). These dimensions are represented by SMI in various forms based on their content niche (e.g. beauty, fitness, gaming). An illustration is that as a fitness influencer, one could be possessing expertise based on his or her professional training where the quality of trust is indicated by his or her regular personal interaction with engagement and the quality of appearance is boosted by attractiveness. Research has direct correlations indicate that these aspects are good predictors of customer attitude and buying intentions regarding promoted products (Ao et al., 2023).

The Theory of Parasocial Interaction

The Parasocial Interaction Theory describes the way audiences develop the one-sided, but emotionally important relationships with the media personalities. In the case of SMIs, the intensity of parasocial bonds is enhanced due to regular content update, face-to-face (e.g., replying to comments) and perceived self-disclosure. Studies claim an augmented level of parasocial association may raise trust and esteem of genuineness, which enhances a buying willingness (Conde, 2023).

Elaboration Likelihood Model (ELM)

The Elaboration Likelihood Model (ELM) has proposed a dyadic process approach to explaining persuasion. In high-involvement products (e.g., electronics) the followers process influencer endorsements through the central route and evaluate argument about the product (e.g. specifications) and knowledge. When the product is low involvement (e.g. fashion accessories), persuasion through the peripheral route is considered, where the attractiveness, the liking or the popular of the influencer are more important (Ao et al., 2023). This two-sidedness is why the effectiveness of influencers differs depending on the type of product. The purpose of Social Media Influencers. Social media influencers are strategic in altering consumer buying choices as the actors who provide credibility on behalf of the applauding brands and customers.

The Role of Social Media Influencers

The role of the social media influencers is crucial in the dynamics of consumer purchase intention consideration since they are perceived to have the truthfulness of mediating between the brands and the consumers. These influencers are often perceived as credible, experienced, or highly followed figures on online platforms. Consequently, they have the power to shape consumer attitudes through content that is authentic, informative, or relatable. Their impact primarily operates through mediating factors such as trust, parasocial connectedness, perceived authenticity, and brand attitude, which transform influencer cues into positive purchase intentions. For instance, followers are more likely to trust an influencer when they perceive them as authentic and credible, which fosters confidence and increases the likelihood of purchasing the products endorsed by that influencer (Liu & Zheng, 2024). Similarly, strong parasocial bonds create emotional attachment and loyalty, further increasing the probability that followers will act on the influencer's recommendations. The influence of social media personalities is also context-dependent, mediated by factors such as the type of influencer (micro, macro, or virtual), brand-influencer fit, product involvement, and the platform itself. Micro-influencers, for example, often generate higher levels of trust and relational engagement in niche markets, whereas macro-influencers are better suited for broad awareness campaigns (Conde, 2023). Moreover, consistency between the influencer and the brand further enhances the mediated effect on purchase intentions.

Thus, the role of social media influencers is largely indirect, mediated through credibility, affective bonds, and other contextual factors. By considering these mediating variables, a mediated-measured model provides a comprehensive understanding of how influencers shape consumer decision-making in the modern digital marketing landscape (Liu & Zheng, 2024).

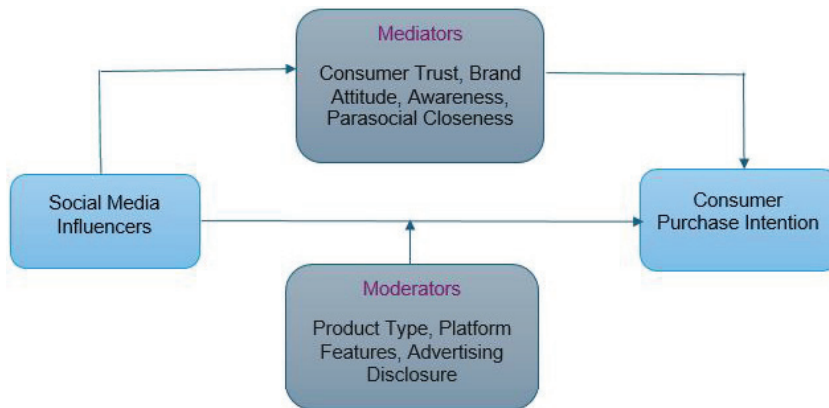
MECHANISMS, MEDIATORS, AND MODERATORS OF INFLUENCER MARKETING EFFECTIVENESS

Influencer marketing's ability to effectively shape consumers' purchase intentions is mediated by a number of underlying factors. Social media influencers' (SMI) endorsements increase brand recognition and cultivate positive brand sentiments, which act as a bridge between influencer exposure and consumer behavior (Barari et al., 2025). Another important factor is the emotional ties that develop between followers and influencers; parasocial connections foster closeness and trust, which in turn increases customers' propensity to buy things that influencers recommend (Conde, 2023). According to Liu et al. (2024), engagement measures like likes, comments, and shares also serve as social proof indicators, providing external validation that supports opinions about a brand's popularity and desirability.

However, several kinds of situational and contextual factors reduce the impact of SMIs on purchasing decisions. The way of persuasion depends on the level of product involvement; low-involvement products rely more on external factors such as relatability and attractiveness, whereas high-involvement products typically rely on influencer knowledge and central processing (Ao et al., 2023). By simplifying the customer's path to purchase, platform benefits such as livestream shopping and "swipe-up" purchasing links improve persuasion (Spörl-Wang, 2025). Because the relative value of authenticity and credibility may vary across collectivist and individualist countries, cultural context also affects how effective influencers are, emphasizing the significance of intercultural validation (Barari et al., 2025). Furthermore, there are a few aspects to disclosure practices: while being open about sponsorship retains influencer credibility, it may also reduce persuasive power if it is thought to be unduly marketed (Liu et al., 2024). Last but not least, follower characteristics like age, digital

literacy, and skepticism affect how consumers perceive endorsements; younger consumers especially those in Generation Z are highly open to authenticity cues, while older consumers are more likely to value knowledge and informational value (Conde, 2023). The combination of various moderators, mediators, and mechanisms demonstrates the complex nature of influencer marketing's ability to impact consumers' intentions to make purchases.

CONCEPTUAL MODEL: ROLE OF SOCIAL MEDIA INFLUENCERS ON CONSUMER PURCHASE INTENTION



The conceptual model illustrates the role of Social Media Influencers (SMIs) in shaping Consumer Purchase Intention. The model posits that the impact of SMIs is mediated by key psychological and attitudinal factors—consumer trust, brand attitude, awareness, and parasocial closeness—which explain how influencer characteristics and content foster favourable consumer responses. Additionally, the relationship is moderated by contextual variables such as product type, platform features, and advertising disclosure, which influence the strength and direction of the SMI–purchase intention link. This integrated framework highlights both the direct and indirect pathways through which influencer marketing affects consumer decision-making.

RESEARCH GAPS

Despite substantial progress in understanding the role of social media influencers (SMIs), several gaps remain in the existing literature. First, there is an overreliance on self-reported data, as most studies measure purchase intention rather than actual consumer behaviour, which limits external validity (Ao et al., 2023). Second, the longitudinal relationship studies are less explored, and not many studies investigated the development and evolution of trust and parasocial relations with repeated exposure to influencers moving forward in time (Conde, 2023). Third, a large part of evidence sheer is focussed in either a Western or East Asian setting with comparatively little exploration of emerging markets and according to multiple market types which limits cross-cultural generalizability (Barari et al., 2025). Lastly, the threat of bogus followers, manipulated algorithms, and sponsorships hidden behind the scenes are ethics issues that have not been properly studied within the field of empirical research despite the profound effect thematically to both the consumers and marketers (Sporl-Wang, 2025).

RESEARCH METHODOLOGY

The present research follows a qualitative exploratory design that will allow acquiring a deeper insight into the influence of social media influencers (SMIs) on purchase intentions by consumers.

The qualitative method is suitable as it enables probing the underlying meanings, emotions and cognitive processes that dictate consumer perceptions and behaviour's, which cannot be sufficiently explained in quantitative terms (Creswell and Poth, 2018). The research aims to reveal the psychological functions, mediators, and other contextual needs that contribute to the consumer trust, final engagement, and purchase decision concerning influencer marketing.

Constructs to be Considered in the Study

<i>Construct</i>	<i>Dimensions</i>	<i>Sources</i>	<i>Focus of the Study</i>
Social media influencers	• Trustworthiness • Credible • Attractiveness	Ohanian (1990); Kim & Kim (2022); Rajput (2024)	Influencer characteristics such as trustworthiness, expertise, and attractiveness significantly influence perceived credibility and authenticity, which enhance brand attitudes and consumer engagement.
Trust	• Reliability • Faith	Lau & Lee (1999); Morgan & Hunt (1994)	Brand trust acts as a mediator between influencer credibility and consumer behavioural intentions. Consumers who perceive higher reliability and honesty exhibit stronger brand commitment and loyalty.
Purchase intention	• Willingness to buy • Consideration of Purchase	Dodds et al. (1991); Moon, et al. (2008)	Purchase intention increases when influencer credibility fosters trust and a favourable brand image. Trust and perceived value serve as mediating variables.
Brand image	• Uniqueness • Value • Brand benefits	Keller (1993); Aaker (1996); Hermenda & Sumarwan (2020)	Positive influencer associations reinforce brand distinctiveness and perceived value. Strong brand–influencer congruence enhances perceived brand benefits and overall image.

Table showing variables or constructs that will be considered under study.

Data Analysis

The present study employed a qualitative content analysis approach to synthesize insights from prior scholarly works related to social media influencers, brand image, trust, and purchase intention. A systematic review of relevant journal articles and conference papers published between 1990 and 2025 was undertaken. The selected studies were screened for conceptual relevance and methodological rigor. The data extracted from these studies such as key variables, dimensions, theoretical frameworks, and findings—were coded manually and categorized into emerging themes.

Expected Outcome

This methodology will enable the identification of core psychological and contextual mechanisms—such as authenticity, trust, parasocial attachment, and engagement—that mediate or moderate the relationship between influencer activity and consumer purchase intention. The findings will contribute to refining theoretical models and guiding marketers in designing more ethical and effective influencer campaigns

Practical Implications from the Literature

- Match influencer type to campaign objective: micro-influencers for conversion and niche credibility, macro/celebrities for broad awareness.

- Manage authenticity disclosures carefully: transparency paired with informative content preserves trust.
- Prioritize fit and message quality for high-involvement products; prioritize relational content (stories, behind-the-scenes) for low-involvement/impulse categories.

CONCLUSION

The research shows that social media influencers are very influential to influence consumers to buy products based on a chain of related psychological and contextual processes. Namely, credibility and authenticity serve as driving forces which create trust as a mediator between the influencer characteristics and the gasoline towards buying endorsed goods. In addition, the relationship between trust and purchase intention is mediated by follower involvement showing that follower who carry out involvement feel more receptive to persuasive outcomes of the trust followers.

Empirical evidence is given towards the Source Credibility Theory, the Parasocial Interaction Theory and the Theory of planned behaviour wherein it was found that the trust is an essential mediating construct enabling the conversion of attitudinal influence into behavioural intention.

The presence of strong parasocial bonds and authentic communication enhances the perceived reliability of influencer endorsements, while contextual factors such as product type and platform dynamics shape the magnitude of these effects.

From a practical standpoint, the study underscores that brand managers should prioritize influencer-brand fit, transparency, and content authenticity. For high-involvement products, selecting influencers with domain-specific expertise is essential to build cognitive trust, while for low-involvement or impulse categories, emotional resonance and relatability are more effective. Maintaining credibility through balanced sponsorship disclosure and genuine engagement is key to sustaining long-term consumer trust.

For academia, this research advances understanding by integrating mediation (trust) and moderation (involvement) into a single conceptual framework, providing a richer explanation of how SMIs influence consumer behavior. Future research should quantitatively validate this model using structural equation modelling (SEM), examine cross-cultural differences, and explore emerging domains such as AI-generated influencers and short-form video platforms. Such extensions will enhance generalizability and contribute to the evolving theory of influencer marketing.

FUTURE RESEARCH DIRECTIONS

Future studies in the field of influencer marketing should use platform-based or transactional information to evaluate actual buying behaviours rather than only looking at customers' purchase intentions. A more thorough knowledge of the causal relationship and behavioural changes over time can be obtained by utilizing longitudinal designs. Further investigation into the circumstances in which these artificial agents may generate trust, engagement, and persuasion levels on par with human influencers is also necessary in light of the rise of virtual and AI influencers. The machine heuristic theory offers a helpful theoretical framework for understanding how users assess AI-generated personas. Understanding the mechanisms behind short-form video platforms like Instagram Reels and TikTok, with an emphasis on how attention, emotion, and memory dynamics affect user engagement and buying behaviour is another exciting avenue.

Moreover, cross-cultural research is essential to uncover how cultural dimensions—such as individualism versus collectivism and power distance—moderate the effects of influencer credibility, parasocial relationships (PSR), and consumer trust. Finally, there is a strong need for

the development of standardized measurement frameworks to establish consensus on key constructs such as authenticity and influencer credibility. Such standardization would enable more consistent operationalization across studies and facilitate meta-analytic synthesis, thereby strengthening the empirical and theoretical foundation of influencer marketing research.

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Impact of Influencer Marketing on Gen Z Consumer Behaviour – A Systematic Literature Review

Ankita Yadav¹ & Kanchan Yadav²

¹Research Scholar, Department of Management, Gurugram University, Gurugram

²Assistant Professor, Department of Management, Gurugram University, Gurugram

E-mail: ankurao9305@gmail.com

Abstract

This paper investigates the influence of influencer marketing on Generation Z consumer behaviour by analysing the interplay of psychological mechanisms, content formats, and digital platform affordances. Using a mixed-method approach, the study combines a systematic review of 45 academic studies and 8 industry reports with qualitative focus groups conducted among Gen Z participants in the U.S. and India. The analysis draws on Social Identification Theory, Parasocial Interaction, Self-Determination Theory, and the Elaboration Likelihood Model to explain how Gen Z processes and responds to influencer content. Findings reveal that authenticity, transparency, and parasocial relationships strongly shape Gen Z's purchase intentions, brand attitudes, and loyalty. Micro- and nano-influencers, due to their relatability and niche community engagement, deliver higher trust, engagement rates, and cost-efficiency than mega-influencers. Content format also plays a key role: short-form videos on platforms such as TikTok and Instagram Reels drive virality and awareness, while long-form tutorials and live-stream commerce foster deeper understanding and higher conversion. Emerging practices, including participative co-creation and AI-driven personalization, further enhance Gen Z's sense of autonomy, relatedness, and belonging, contributing to sustainable brand advocacy. The study contributes theoretically by integrating psychological and technological perspectives into a unified framework of digital influence, while also offering actionable insights for marketers to design authentic, interactive, and measurable influencer strategies. Limitations regarding geographic scope, self-reported measures, and rapid platform evolution are acknowledged, with future research directions suggested in cross-cultural, longitudinal, and AI-driven contexts.

Keywords: Influencer Marketing, Generation Z, Consumer Behavior, Authenticity, Parasocial Interaction, Social Media Platforms

INTRODUCTION

Background and Rationale

Generation Z (born 1997–2012) represents the first cohort to grow up entirely in the social media era. Their digital nativity shapes not only how they communicate but also how they discover and evaluate brands. Traditional advertising formats—TV commercials, print ads, banner ads—hold far less influence over Gen Z than peer endorsements and user-generated content. Influencer marketing, where individuals with sizable social media followings promote products and services, has emerged as a dominant strategy for reaching this demographic. In 2024, global influencer marketing spending exceeded US\$20 billion, with nearly 60 percent targeting audiences aged 16–24 (Influencer Marketing Hub, 2025). Brands from luxury fashion to fast-moving consumer goods (FMCG) now dedicate 30–50 percent of their digital marketing budgets to influencer collaborations.

This shift reflects Gen Z's preference for authenticity, relatability, and interactive content. According to a 2023 study by Smith and Lee, 78 percent of Gen Z consumers report buying a product because they saw an authentic review from an influencer they follow, compared to 52 percent who

make purchases based on traditional ads. The rise of short-form video platforms like TikTok and Instagram Reels further accelerates this trend, enabling influencers to create snackable, highly shareable content that resonates with Gen Z's shorter attention spans and desire for entertainment value.

Purpose and Objectives

This paper aims to provide a comprehensive, examination of how influencer marketing impacts Gen Z consumer behavior. The specific objectives are:

- To identify and synthesize the psychological mechanisms—such as authenticity perception, parasocial relationships, and social identification—that mediate Gen Z's engagement with influencer content.
- To analyze the effects of content formats (short-form vs. long-form), influencer tiers (mega-, macro-, micro-, nano-influencers), and platform affordances (TikTok, Instagram, YouTube) on purchase intention, brand attitude, and loyalty among Gen Z.
- To evaluate emerging practices—such as live-stream commerce, participative co-creation campaigns, and AI-driven personalization—and their effectiveness in influencing Gen Z.
- To develop actionable recommendations for marketers on designing, executing, and measuring influencer campaigns that drive long-term brand equity with Gen Z audiences.
- To identify gaps in current research and propose future research directions, including cross-cultural comparative studies and longitudinal assessments of influencer impact.

Research Questions

The study is guided by three core research questions:

1. Which psychological drivers underpin Gen Z's responsiveness to influencer marketing?
2. How do influencer characteristics (authenticity, expertise, attractiveness) and content formats affect Gen Z's purchase intentions, brand attitudes, and loyalty?
3. What best practices and metrics enable marketers to create effective, sustainable influencer marketing programs for Gen Z?

THEORETICAL FRAMEWORK

- **Social Identification Theory:** Social Identification Theory (Tajfel & Turner, 1979) posits that individuals classify themselves into social groups, adopting behaviors and norms of groups they identify with. In influencer marketing, Gen Z consumers categorize influencers into aspirational or peer-like groups. When influencers share values, aesthetics, or lifestyles aligned with a Gen Z audience's self-concept, their brand endorsements gain persuasive power. Studies show that perceived in-group influencers increase brand preference by up to 25 percent compared to out-group endorsers (Chen & Quester, 2022).
- **Parasocial Interaction Theory:** Parasocial Interaction (PSI) describes one-sided relationships audiences develop with media personas (Horton & Wohl, 1956). Through frequent, intimate content—vlogs, Q&As, behind-the-scenes footage—Gen Z forms perceived friendships with influencers. High PSI scores correlate with greater trust and credibility; viewers with strong parasocial bonds exhibit a 30 percent higher likelihood of purchasing influencer-endorsed products (Sokolova & Kefi, 2020).
- **Self-Determination Theory:** Self-Determination Theory (Deci & Ryan, 2000) suggests intrinsic motivation arises when needs for autonomy, competence, and relatedness are met. Influencer campaigns that invite user participation (e.g., hashtag challenges, duets), showcase genuine

influencer expertise (competence), and foster community engagement (relatedness) satisfy these needs, driving deeper engagement and purchase intention among Gen Z.

- **Elaboration Likelihood Model:** The Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986) explains two routes to persuasion: central (deep processing) and peripheral (surface cues). Gen Z's short attention spans on social media often lead them to process influencer messages via peripheral cues – e.g., influencer attractiveness or production quality. However, more involved consumers engage centrally, scrutinizing message content and authenticity. Understanding when to activate each route informs content length and complexity decisions.

METHODOLOGY

Research Design

A mixed-method approach combines a systematic literature review with primary qualitative data from Gen Z focus groups. This triangulation enhances validity by juxtaposing empirical findings with lived experiences of target consumers.

Systematic Literature Review

Data Sources and Search Strategy

Databases searched:

- Scopus
- Web of Science
- Google Scholar

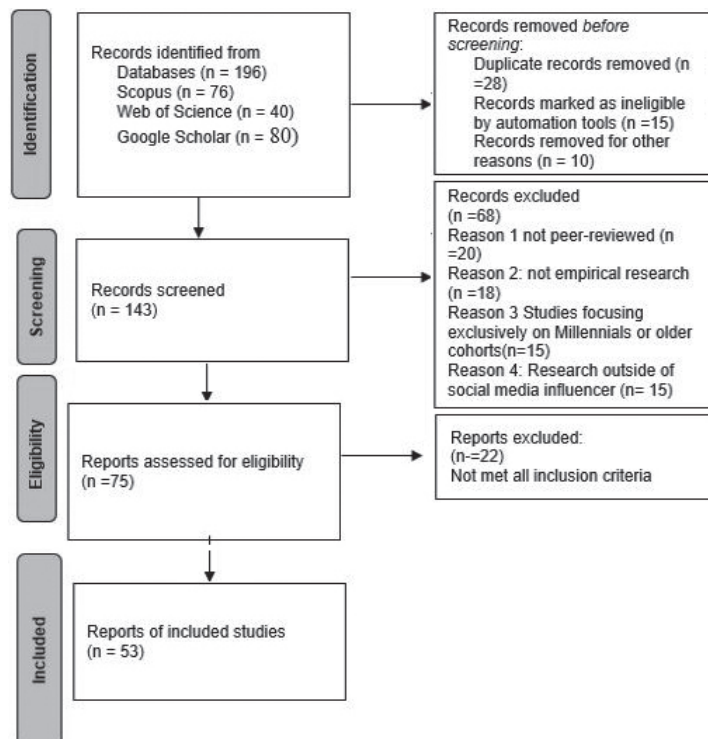


Figure 1: PRISMA Flow Diagram

Search strings included Boolean combinations of: (“Generation Z” OR “Gen Z”) AND (“influencer marketing” OR “social media influencers”) AND (“consumer behavior” OR “purchase intention” OR “brand attitude” OR “parasocial”).

Publications from January 2015 to June 2025 were retrieved. Initial yield: 196 records. After deduplication and title/abstract screening, 143 full-text articles were reviewed. Applying inclusion/exclusion criteria (empirical focus, measurable outcomes, Gen Z segment) resulted in 45 academic studies and 8 industry reports.

Inclusion and Exclusion Criteria

Inclusion:

- Empirical studies with sample sizes ≥ 100 Gen Z participants
- Measured engagement metrics (likes, comments, shares), purchase intention, brand attitude
- Qualitative interviews or focus group insights on influencer impact
- Industry benchmarks on spend, ROI, engagement rates

Exclusion:

- Opinion pieces without data
- Studies focusing solely on Millennials or older cohorts
- Non-social media influencer contexts (e.g., celebrity endorsements in traditional

LITERATURE REVIEW

Influencer Types and Their Effects

Influencers are often categorized by follower count: mega-influencers ($>1\text{M}$ followers), macro (100K–1M), micro (10K–100K), and nano-influencers ($<10\text{K}$). Research indicates diminishing returns on engagement with larger audiences: mega-influencers yield average engagement rates of 1.7%, macro-influencers 3.6%, micro-influencers 5.1%, and nano-influencers 7.2% across platforms (Influencer Marketing Hub, 2025). Micro- and nano-influencers, embedded within niche communities, deliver higher engagement and perceived authenticity, driving purchase intention increases of 18–32% compared to mega-influencers (Smith & Lee, 2023).

Mega- vs. Micro-Influencers

Mega-influencers benefit from broad reach and high visibility, ideal for awareness campaigns. However, Gen Z often perceives them as “paid spokespeople,” reducing trust. Conversely, micro-influencers, viewed as relatable peers, foster community trust. A controlled experiment by Chen et al. (2024) found Gen Z participants were 24% more likely to purchase products endorsed by micro-influencers versus mega-influencers when controlling for content quality.

Niche Expertise and Credibility

Influencers with niche expertise—fitness trainers, skincare specialists, tech reviewers—leverage domain knowledge to enhance credibility. Studies show that perceived influencer expertise mediates purchase intentions: each unit increase in perceived expertise correlates with a 0.45 increase on a 5-point purchase intention scale (Jones et al., 2024). Gen Z’s health and sustainability concerns amplify the impact of credible health and eco-influencers.

Content Formats and Platform Affordances

- **Short-Form Video:** TikTok and Instagram Reels dominate Gen Z attention, offering algorithm-driven discovery and viral potential. Short-form videos (15–60 seconds) require concise

storytelling, often employing humor, visual effects, and direct calls to action. Meta-analysis of 12 TikTok campaigns shows average view-through rates of 72% and click-through rates of 6.8%, outperforming static posts by 3x (Patel & Zhang, 2024).

- **Long-Form Video:** YouTube and IGTV facilitate detailed product demonstrations and tutorials. Longer videos (5–15 minutes) allow influencers to explain product features, share personal experiences, and respond to viewer questions. Long-form content yields higher brand understanding: a study by Lee et al. (2023) reported 65% of Gen Z viewers could recall three or more product attributes after watching a 10-minute tutorial, compared to 28% after a 30-second clip.
- **Live Streaming Commerce:** Live commerce merges entertainment and e-commerce in real time. Platforms like TikTok Live, Instagram Live, and YouTube Live enable influencers to showcase products, answer viewer questions, and provide real-time purchase links. Pilot programs report 15–25% conversion rates during peak live sessions, with average order values 1.8x higher than pre-recorded video campaigns (Wang & Kumar, 2025).
- **Image and Text Posts:** Static posts remain relevant for low-involvement products and complement video strategies. Carousel posts combining lifestyle imagery and short testimonials generate high save and share rates—key metrics for algorithmic amplification. Gen Z values aesthetically cohesive feeds; influencers aligning brand messaging with personal brand visuals yield higher engagement (Kim & Park, 2024).

Psychological Drivers of Influence

- **Authenticity and Transparency:** Authenticity—perceived genuineness of content—and transparency—disclosure of sponsorship—are critical for building trust. A survey of 1,200 Gen Z consumers found 82% required clear #ad or #sponsored tags but still favored “native” endorsements integrated organically into content (Davis & Thompson, 2023). Authentic storytelling, unscripted reactions, and personal anecdotes enhance trust by 21% compared to scripted endorsements.
- **Parasocial Relationships:** Parasocial bonds develop through consistent, intimate communication. Frequency and depth of personal content—daily vlogs, story takeovers—strengthen PSI and increase persuasion. An experimental study found that Gen Z viewers with high PSI scores (above 4 on a 5-point scale) exhibited 37% greater purchase intentions than low-PSI viewers when exposed to the same promotional content (Sokolova & Kefi, 2020).
- **Social Identification and Belonging:** Gen Z seeks community and social validation. Influencer communities—fan groups, Discord channels—foster belongingness, driving brand advocacy. When Gen Z identifies with influencer communities, their in-group identification correlates with a 0.52 increase in brand loyalty scores (Chen & Quester, 2022).
- **Social Proof and Fear of Missing Out (FOMO):** Gen Z’s high social media usage exposes them to real-time metrics—likes, comments, views—that serve as social proof. Campaigns highlighting limited-time offers and trending products leverage FOMO, boosting click-through rates by 14% in controlled experiments (Ramirez & Lee, 2024).

Emerging Trends

- **AI-Driven Personalization:** AI algorithms analyze Gen Z’s viewing patterns, interaction histories, and purchase behavior to deliver personalized influencer recommendations and product suggestions. Early adopters report 28% higher engagement and 12% higher conversion rates when integrating AI-driven content delivery (Nguyen & Patel, 2025).

- **Virtual Influencers and Avatars:** Synthetic influencers—3D avatars with AI-generated personalities—offer brands complete creative control and 24/7 availability. Pilot campaigns with virtual influencers like Lil Miquela achieved 11% engagement rates, demonstrating potential for scalable, brand-aligned influence without human constraints (O'Connor & Zhang, 2025).
- **Social Commerce Plugins:** In-platform commerce features—shoppable tags, in-feed buy buttons—reduce friction between inspiration and purchase. Instagram's native checkout and TikTok's shopping tab integrate seamlessly with influencer content, leading to 20% shorter purchase decision times among Gen Z users (Wang & Kumar, 2025).

FACTORS AFFECTING GEN Z'S TRUST, ENGAGEMENT, AND PURCHASE DECISIONS

Perceived Authenticity and Honesty as Core Credibility Drivers

For Gen Z, authenticity is the non-negotiable prerequisite for credibility (Sinha, 2025). Authenticity is defined by an influencer's commitment to transparency, honesty, and the sharing of genuine, personal experiences related to the endorsed product or service (Research Group, 2025; Research Group, 2024). Quantitative data confirms the primacy of this factor: Perceived Authenticity achieved the highest mean score among influencer credibility determinants () in relevant studies (Sinha, 2025).

This preference manifests as a generational shift away from highly polished, stylized, or aspirational marketing, towards content that feels raw, unfiltered, and personal (Sinha, 2025; Research Group, 2024). Influencers who successfully cultivate this image, maintaining content consistency and engaging genuinely with followers, are far more likely to retain credibility and drive successful consumer outcomes (Sinha, 2025).

The Role of Engagement and Community Building

The formation and maintenance of Parasocial Interaction require active engagement. Studies emphasize that Gen Z is particularly drawn to influencers who actively interact with their audience through likes, comments, and shares—metrics that ultimately matter more than sheer follower count (Monacho & Slamet, 2023). This community interaction is foundational for establishing the PSI relationship. The stronger this psychological connection, the more likely the consumer is to be influenced by the endorsement, leading to a sense of “psychological ownership” over the product or brand recommended by the trusted source (Monacho & Slamet, 2023).

Purchase Drivers: The Moderating Role of Price and Quality

While influencer recommendations are significant predictors of purchase intentions () (Sinha, 2025), they do not override fundamental economic rationality. Gen Z's purchase decisions are moderated by external, tangible factors, notably price and perceived product quality (Sinha, 2025). Key studies consistently identify price (79%) and reviews from other consumers (68%) as the most important factors influencing Gen Z purchasing behavior (Research Group, 2023). This contextual dependence suggests that influencers primarily succeed by providing credible affirmation of product quality and fit, rather than persuading consumers to ignore essential economic considerations.

IMPACT ANALYSIS

- **Purchase Intention Meta-Analysis:** A meta-analysis of ten journal articles (n=4,200 Gen Z participants) yields an average Pearson correlation of $r = .53$ ($p < .001$) between influencer engagement and self-reported purchase intention. Moderator analyses reveal authenticity cues

($r = .61$) and PSI strength ($r = .58$) significantly amplify this relationship, while mere exposure (post frequency) shows a weaker effect ($r = .32$).

- **Brand Attitude and Equity:** Brand attitude improvements are measured via semantic differential scales (bad–good, unappealing–appealing). Influencer campaigns aligned with brand values (e.g., sustainability, social justice) produce 28% higher positive attitude shifts compared to generic promotional content. Longitudinal measures over six months indicate a 15% uplift in brand equity scores (BrandAsset Valuator indices) following sustained influencer partnerships.
- **Loyalty and Advocacy:** Gen Z's brand loyalty—attitudinal and behavioral intent to repurchase—is positively influenced by ongoing influencer engagement. Panel survey data ($n=1,000$) across three brands show that 42% of Gen Z consumers who follow brand-linked influencers made repeat purchases within six months, compared to 18% among non-followers. Word-of-mouth advocacy metrics—Net Promoter Score (NPS)—increase by an average of 22 points among engaged Gen Z segments.
- **Community and Peer Influence:** Influencer-driven communities on Discord, WhatsApp, and platform-native group features yield heightened peer referrals. Quantitative tracking indicates a 60% increase in peer referral link shares within influencer networks, up to 4x higher than brand-run loyalty programs. Qualitative insights reveal that Gen Z values peer validation over brand-generated loyalty incentives.
- **ROI and Marketing Metrics:** Brands measure influencer campaign success through ROI metrics including cost per engagement (CPE), cost per acquisition (CPA), and return on ad spend (ROAS). Industry benchmarks for Gen Z campaigns show average CPE of \$0.08, CPA of \$12.50, and ROAS of 4.5x when using micro-influencers, compared to CPE of \$0.14, CPA of \$22.00, and ROAS of 3.1x for mega-influencers (Influencer Marketing Hub, 2025). These figures underscore micro-influencers' cost-efficiency and stronger conversion potential for Gen Z audiences.

DISCUSSION

Integration of Psychological and Platform Factors

The evidence demonstrates that influencer marketing effectiveness for Gen Z emerges from the interplay of psychological drivers (authenticity, PSI, social identification) and platform affordances (content format, interactive features). Authenticity cues and transparency satisfy Gen Z's need for genuine connections, while PSI deepens emotional investment. Platform features such as live commerce and co-creation campaigns leverage these psychological drivers by fostering real-time interaction and participative engagement, aligning with Self-Determination Theory's emphasis on autonomy and relatedness.

Strategic Implications for Marketers

1. **Influencer Selection:** Prioritize micro- and nano-influencers within niche communities to maximize authenticity and engagement. Evaluate influencers' content styles, audience demographics, and values alignment rather than raw follower counts.
2. **Content Mix Optimization:** Balance short-form video for awareness with long-form tutorials for consideration and conversion. Integrate static posts and Stories to maintain feed cohesion and supplement core video strategies.
3. **Interactive Campaigns:** Develop participative initiatives—hashtag challenges, live-stream events, user-generated content contests—to satisfy Gen Z's intrinsic motivation needs and amplify organic reach.

4. **Measurement Frameworks:** Beyond vanity metrics, track conversion-focused KPIs (click-through rates, purchase conversions), community health (engagement within private groups), and long-term brand equity indicators (NPS, repeat purchase rates).

Theoretical Contributions

This paper advances theoretical understanding of digital influence by integrating Social Identification Theory, Parasocial Interaction, Self-Determination Theory, and the Elaboration Likelihood Model within a unified framework specific to Gen Z. The findings extend ELM by illustrating how peripheral cues (authenticity badges, influencer attractiveness) and central processing (in-depth tutorials) function across different content lengths and platforms, providing nuanced insights for both scholars and practitioners.

LIMITATIONS

1. **Geographic Concentration:** The literature review and focus groups emphasize U.S. and Indian contexts, limiting generalizability to other regions with differing social media landscapes and regulatory environments.
2. **Rapid Platform Evolution:** The dynamic nature of social media platforms and influencer ecosystems means that emerging features (e.g., metaverse integrations, new short-form formats) may alter Gen Z behaviors beyond the time frame of reviewed studies.
3. **Self-Reported Measures:** Many studies rely on self-reported purchase intention and attitude metrics, which may not fully translate into actual buying behavior. Future research should integrate sales data and experimental purchase simulations.
4. **Focus Group Sample Size:** With 24 participants across three focus groups, qualitative findings provide depth but may not capture the full diversity of Gen Z's perspectives across different socio-economic and cultural backgrounds.

FUTURE RESEARCH DIRECTIONS

1. **Cross-Cultural Comparative Studies:** Investigate how cultural factors mediate influencer marketing effectiveness, comparing Gen Z behaviors across Asia, Europe, Latin America, and Africa.
2. **Longitudinal Impact Assessments:** Conduct longitudinal studies tracking brand loyalty and purchasing patterns over extended influencer campaign engagements to assess long-term equity effects.
3. **Emerging Platform Features:** Examine the impact of metaverse-based influencer interactions, AR/VR content, and AI-generated personalization on Gen Z engagement and trust.
4. **Sales Data Integration:** Collaborate with brands and platforms to access actual sales and conversion metrics, enabling more accurate modeling of influencer ROI and attribution analysis.
5. **Diverse Demographics:** Expand research to include underrepresented Gen Z segments—rural consumers, non-English speakers, lower-income groups—to ensure inclusive marketing strategies.

CONCLUSION

Influencer marketing exerts a substantial impact on Gen Z consumer behavior by leveraging psychological drivers of authenticity, parasocial interaction, and social identity within the affordances of modern social media platforms. Micro- and nano-influencers deliver higher engagement and cost-efficiency, while content format optimization—balancing short-form virality with long-form

depth—enhances conversion. Participative campaigns and co-creation satisfy Gen Z’s autonomy and relatedness needs, driving community growth and brand advocacy.

For marketers targeting Gen Z, strategic emphasis on authenticity, interactive experiences, and robust measurement frameworks is essential. Future research must adapt to evolving digital landscapes and deepen understanding of long-term brand equity impacts. By aligning influencer strategies with Gen Z’s unique motivations and media consumption patterns, brands can build genuine connections that translate into sustainable loyalty and advocacy within this pivotal demographic.

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Bridging the Luxury–Sustainability Paradox in Hospitality: A Conceptual Framework of Consumer Perception Toward Luxury Green Hotels

Lavisha Verma¹ & Pallavi Dogra²

¹Assistant Professor, Satyawati College, Delhi.

²Assistant Professor, Dr. B. R. Ambedkar University Delhi

E-mail: lverma.20@stu.aud.ac.in, pallavi1@aud.ac.in

Abstract

The growing emphasis on sustainability has challenged the traditional notion of luxury in hospitality, which is often associated with indulgence and exclusivity. This paper addresses the luxury–sustainability paradox by developing a conceptual framework of consumer perception toward luxury green hotels. Drawing on the Theory of Planned Behavior and Value-Belief-Norm theory, the model identifies key antecedents—consumer environmental beliefs, luxury beliefs, hotel sustainability initiatives, and communication media—mediated by perceived moral obligation and moderated by destination image, trust, and purpose of visit. The framework explains how moral and contextual factors shape consumer preference for sustainable luxury experiences. This study bridges critical spatial and empirical gaps in existing research, particularly within developing economies like India, where luxury consumption and environmental awareness are evolving concurrently. The paper contributes to theory by extending sustainable luxury discourse into experiential hospitality and offers actionable insights for hotel managers and policymakers seeking to align sustainability with exclusivity.

Keywords: Sustainable Luxury, Green Hotels, Consumer Perception, Hospitality, Sustainability Paradox

INTRODUCTION

Sustainability is gaining importance in the luxury sector with the increasing concern of media, policy makers, consumers, brand managers and other stakeholders towards the environment (Athwal et al., 2019). It is becoming essential for businesses to remain competitive, leading to significant shifts in operational practices. However, these changes can pose challenges for luxury brands, as the principles of luxury often seem at odds with sustainable practices. Luxury brands often have to face the wrath of consumer activists who criticize these brands of labour and animal exploitation (Bendell and Kleanthous 2007; Dekhili and Achabou 2016; Henninger et al. 2017; Kapferer and Michaut- Denizeau 2014). People pointed out that luxury is just a waste of precious resources for the joy of selected individuals (Kapferer and J.N. 2010). Significant changes in the climate have magnified the importance of sustainability (Kim et al., 2017). Hospitality industry, in particular, has a substantial environmental footprint because of the 24-hour operation, varied services offered, irresponsible behavior of consumers and excessive waste generation (Filimonau et al., 2011). The hospitality industry depends on the natural and breathtaking landscapes its surroundings offer (Chan et al., 2017). However, due to wasteful practices, hotels release huge carbon emissions, causing a tremendous impact on the environment (McCormick, 2012).

Many luxury hotels face negative perceptions regarding their sustainability efforts due to the inherent contradictions between luxury and eco-friendliness (J. N. Kapferer & Michaut, 2015). Additionally, there are concerns that adopting more sustainable practices might reduce their appeal

as luxurious establishments (Cervellon, 2013), since consumers often associate sustainability with a decrease in desirability (Beckham & Voyer, 2014). However, a new form of luxury is emerging, where consumers prioritize unforgettable experiences over material possessions (J.-N. Kapferer & Valette-Florence, 2019). This shift is particularly evident among millennials, who seek luxurious travel experiences but are also inclined to adopt more sustainable habits (MacInnis et al., 2009; Nielsen, 2018).

The present research will thus focus upon the perception of consumers towards a sustainable luxury hotel and the factors which impact this perception. Consumers or visitors to luxury green hotels will be the main subject of the study. Luxury hotels who have adopted or plan to adopt sustainable practices will be the major beneficiaries of the research, as the study will contribute to practical and theoretical knowledge about those consumers who are interested in embracing luxury with sustainability.

This paper is divided into 4 sections. Section 1 starts with introducing the topic, Section 2 focuses upon reviewing the existing literature, based on the review a detailed gap analysis is provided in Section 3, conceptual framework and propositions are then provided in Section 4 followed by future research directions.

THEORETICAL BACKGROUND AND LITERATURE SYNTHESIS

Luxury

Luxury products are often seen as a symbol of self-expression and own values (Heil & Langer, 2017). Luxury can be defined as “something rare and hedonic, difficult to acquire and the one that provides unique experience” (Langer and Heil, 2013). As per a 2017 report of Boston Consulting Group the luxury market has seen considerable growth in the 20th century. But this growth has also increased the pressure on the industry to cater to social issues (Davies et al., 2012; De Angelis et al., 2017; Janssen et al., 2014; Kapferer and Michaut-Denizeau, 2014). The more popular a luxury brand, the more attention it will receive from social activists. The association of luxury is also associated with corporate social responsibility. It is proved that perception of customers’ regarding a brand’s luxuriousness is more in case of noticeable CSR initiatives as compared to the ones which are less noticeable (Amatulli et al., 2018).

Historically, luxury was synonymous with status, often demonstrated through the display of material wealth, particularly among the affluent (Kastanakis & Balabanis, 2014). It was primarily about exclusivity (Butman et al., 2014). However, luxury goods have become more accessible to a broader audience (Cristini et al., 2017). Alongside this shift, millennials have emerged as a new consumer group characterized by their extensive knowledge, education, and technological savvy (J.-N. Kapferer & Michaut-Denizeau, 2020). These consumers prioritize memorable experiences over ownership, valuing what they have experienced more than what they possess (J.-N. Kapferer & Valette- Florence, 2019).

As a result, the definition of luxury has evolved, moving from a focus on tangible goods to an emphasis on intangible experiences (Tynan et al., 2010). Society has traded luxury items like furs and watches for experiences like travel and fine dining (MacInnis et al., 2009). This new luxury is rooted in emotional connections, allowing consumers to relate personally to products, in contrast to the previous focus on exclusivity and extravagance (Butman et al., 2014). This transformation is particularly evident in the hospitality industry, which emphasizes meeting guests’ needs through exceptional service experiences (Naumov, 2019). The following section will delve into the role of luxury within the hospitality sector.

Sustainability

Due to the increasing relevance of sustainability in the present times, businesses are adopting new methods of operation in order to stay competitive (Serradas, 2021). Some of the drivers of sustainability are increasing social trends of adopting sustainability, financial benefits to the adopting firm and resource preservation (Giardina, 2019). Another reason for adopting sustainability is the fact that many industries are contributing to climate change through various practices such as waste generation, use of single-use plastic and harmful detergents (Rishi and Gaur, 2012; Pomeroy et al., 2011). With the customers becoming more inclined towards sustainability, it is now beneficial for companies to excel in social and environmental dimension (Tang & Tang, 2012). This growing concern of customers towards sustainability has led to an increase in demand for products which are more durable, less toxic and are made from recycled material (Lozano et al., 2010). However, this inclination is restricted to products of high quality where the customer is not expected to pay a premium for added sustainability (Bhattacharya & Sen, 2004).

While the sustainability aspect of luxury brands doesn't significantly influence consumer purchasing decisions (M. Á. Gardetti & Torres, 2015), consumers tend to expect these brands to be sustainable given their high prices and perceived quality (J.-N. Kapferer & Michaut-Denizeau, 2014). However, many hotel chains promote their sustainability efforts while simultaneously engaging in practices that strain natural resources (Jones et al., 2016). Luxury brands are often linked to wastefulness and excess, which contradicts the principles of sustainability and shows a lack of regard for the environment and society (Janssen et al., 2014).

Sustainability and Luxury

Sustainable luxury can be defined as the integration of environmental considerations with luxury offerings (Amatulli, De Angelis, & Stoppani, 2021). Adopting sustainability measures is quite difficult for companies as the concepts of luxury and sustainability are contradictory to each other. Luxury on one hand is associated with personal pleasure, irrationality, flaunting and a belief that all of this should not be sacrificed (Moscardo, 2017), sustainability on the other hand is evoked by soberness, moderation and ethics (Widlocher, 2010). One school of thought also states that although luxury is very much resource dependent, still it is not as harmful to the environment as products produced on mass scale (Kapferer et al., 2017). Waste management, Reduced consumption, Sustainable cuisine, Local sourcing, Donations, Kitchen gardens and creating awareness among consumers regarding sustainability are some of the practices adopted by luxury hotels to promote sustainability (Cherapanukorn & Focken, 2014; Serradas, n.d.). Environmentally conscious customers also expect the luxury hotels to adopt sustainable practices because of the high prices they charge (Kapferer & Michaut-Denizeau, 2014). Sustainable food offered to a customer in luxury satisfies the functional, emotional and symbolic needs of consumers by providing them with healthy and creative dishes (Batat, 2020). The subjective norms, moral obligations and attitude of a consumer has a bearing on his intention to visit a luxury-green hotel (Chen & Tung, 2014). However, another point of view provides contradictory results as some consumers feel that luxury becomes less appealing when combined with sustainability (Beckham & Voyer, 2014). Sustainable practices can sometimes lead to less quality and reduced standard of services, therefore, the perceived risk of customers affects his intention towards sustainable restaurants and hotels. (Cervellon, 2013; Serradas, 2021). However, this relationship is moderated by the level of trust of the consumer towards the restaurant and consumer's knowledge about the green hotel (Peng & Chen, 2019).

Similar results were seen in the fashion industry, where young consumers, although aware about sustainability concerns of fast fashion, are hesitant to purchase sustainable fashion products (Chan

et al., 2017). Luxury hotels become more desirable by customers, if they use a sustainability driven marketing communication strategy, the results are specifically more favorable for environmentally conscious customers (Amatulli et al., 2021). Communication has a similar effect in the fashion industry as well where it was discovered that effective communication by employees of flagship stores about the sustainability commitment of the brand yields favorable results (Arrigo, 2018). Employee involvement in adopting environment management practices can also yield positive results provided extensive training is being provided to them and regular supervision is done (Sourvinou & Filimonau, 2018). There are studies such as Moyeen, Kamal, & Yousuf, 2019 who have also studied the perception of consumers towards sustainable activities undertaken by a hotel. The perception towards sustainability of luxury hotels depends upon the purpose of travel i.e., leisure or business. Business class travelers usually give high importance to sustainability (Giardina, 2019). The perception also depends upon the destination of the concerned hotel, green-luxurious hotels are more preferred in nature based destinations rather than urban destinations (Line & Hanks, 2016). Managing the destination in a sustainable way along with the hotel can also be beneficial (Cherapanukorn & Focken, 2014). However, there exists a paradox between perception of customers towards green hotels, as many consumers who prefer the hotels to adopt sustainable practices, are not much willing to stay in such hotels nor they prefer to pay premium prices for the same (Baker, Davis, & Weaver, 2014). Thus, the paying capacity of consumers also impacts their perception about sustainable green hotels.

GAP ANALYSIS

Various researchers have explored the intersection of luxury and sustainability (Beckham & Voyer, 2014; Feng et al., 2020; J. N. Kapferer & Michaut, 2015). However, much of the focus has been on material brands, particularly in the fashion industry (Heyes, 2021; Campos Franco et al., 2019; Karaosman et al., 2020). Some studies have addressed luxury hospitality and sustainability, examining areas like the effects of marketing communication (Amatulli et al., 2021; Sahin et al., 2020), employee engagement with environmental management programs (Sourvinou & Filimonau, 2018), and various environmental practices (Žunić et al., 2019). Others have investigated how sustainable practices are implemented in the hospitality sector (M. A. Gardetti & Torres, 2017). However, the presence of luxury can complicate these practices, as luxury and sustainability are often viewed as conflicting concepts (J.-N. Kapferer & Michaut-Denizeau, 2014). While Cherapanukorn & Focken (2014) identified four main categories of Corporate Social Responsibility for luxury hotels, there has been limited exploration into the practical implementation of these initiatives. Additionally, it remains unclear how luxury hotels can effectively integrate sustainable practices into their operations, as certain sustainability measures may detract from the luxury experience that these hotels strive to provide (Cervellon, 2013). The research gap can be summarized in the following categories:

- **Spatial Gap:** All the research studies are conducted in foreign countries like the U.S., Europe, Taiwan, Italy etc. All the countries are first world countries. No study has been done in a developing country like India. The results may be different in such countries.
- **Methodical Gap:** Most of the research conducted in the luxury segment is either completely qualitative in nature such as review study, content analysis from websites or observation study. Very few studies have adopted a quantitative approach. A detailed quantitative study would provide effective results.
- **Industry Gap:** Although much research has been done on the sustainability and luxury topic, most of them focuses on the fashion industry or other material brands. Other studies in the

hospitality sector delves into the area of marketing communication or employee responsiveness to adopting sustainable practices.

- **Empirical Gap:** Very few of the papers reviewed have focused on identification of factors affecting the intention of consumers to stay in a luxury green hotel. Past research has either identified the drivers to go sustainable for green hotels, employees' motivation to work in a green hotel or they have focused on a very limited set of factors affecting consumers. Further comprehensive research can be done focusing on identifying the maximum set of factors affecting the perception of consumers for staying in a sustainable green hotel.
- **Temporal Gap:** As Sustainability has gained widespread attention in the recent years, many hotels have started adopting green practices. However, there is a lack of studies in the recent times.

CONCEPTUAL FRAMEWORK AND PROPOSITIONS

Drawing on the Theory of Planned Behavior and Value-Belief-Norm theory, the framework conceptualizes antecedents of consumer preference for luxury green hotels, mediated by moral obligation and moderated by contextual variables.

Key Constructs and Relationships

- **Consumer Environmental Beliefs:** Reflect ecological concern driving intention to support green hotels (Chen & Tung, 2014).
- **Consumer Luxury Beliefs:** Represent attitudes valuing premium quality and self-identity in consumption (Kim et al., 2012).
- **Hotel Sustainable Initiatives:** Include tangible actions like waste management, local sourcing, and ethical CSR (Cherapanukorn & Focken, 2014).
- **Communication Media:** Encompass marketing and informational strategies enhancing credibility of sustainability claims (Amatulli et al., 2021).
- **Perceived Moral Obligation:** An internalized ethical motivation impacting behavioral intention (Ajzen, 1991 adapted).

Moderating Factors

- **Destination Image:** Enhances perceived value of sustainability in nature- based contexts (Line & Hanks, 2016).
- **Trust in Hotel:** Mitigates skepticism of greenwashing (Peng & Chen, 2019).
- **Purpose of Visit:** Leisure and business travelers differ in weighting sustainability factors (Giardina, 2019).

Proposition 1

Consumer environmental beliefs, luxury beliefs, hotel sustainability initiatives, and communication positively influence perceived moral obligation.

Proposition 2

Perceived moral obligation mediates the relationship between the antecedent factors and consumer preference for luxury green hotels.

Proposition 3

Destination image, trust, and purpose of visit moderate the effect of perceived moral obligation on consumer preference.

CONCEPTUAL MODEL OF CONSUMER PERCEPTION TOWARD LUXURY GREEN HOTELS

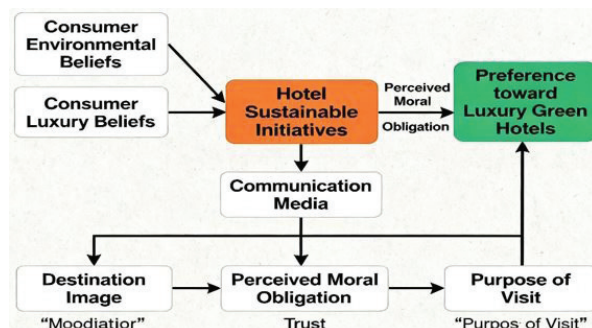


Figure 1

THEORETICAL AND MANAGERIAL IMPLICATIONS

Contribution to the Hotel Industry

This study provides the hotel industry with valuable insights into consumer behavior and preferences, enabling luxury hotels to effectively blend sustainability with exclusivity. By identifying key factors that shape perceptions, hotels can enhance their service offerings and align them with the expectations of environmentally conscious travelers. The findings also help in designing targeted marketing strategies that highlight green initiatives without compromising the sense of luxury. This positions hotels as leaders in sustainable practices, giving them a competitive edge in the evolving hospitality market.

Contribution to Researchers

For researchers, this study bridges important gaps in understanding the intersection of sustainability and luxury within the hospitality industry, particularly in developing markets like India. It adds theoretical depth by identifying and analyzing critical factors influencing consumer perceptions of luxury green hotels. Methodologically, the use of exploratory and confirmatory designs, coupled with advanced techniques like structural equation modeling (SEM), sets a robust framework that can serve as a reference for future research on similar topics.

Contribution to the Government and Policymakers

The study offers actionable insights for governments and policymakers aiming to promote sustainable tourism and environmentally responsible practices in the hospitality sector. By understanding consumer preferences, policymakers can create supportive regulations and incentives for green hotels to adopt sustainable practices. Moreover, the findings help align luxury tourism initiatives with broader Sustainable Development Goals (SDGs), fostering a balance between environmental conservation and economic growth.

Contribution to Other Stakeholders

This research empowers sustainability advocates, NGOs, and society at large by providing evidence to support environmentally conscious hospitality practices. It also educates consumers on the benefits of choosing green hotels, promoting responsible tourism. Additionally, the study underscores how sustainable luxury can enhance the reputation of tourist destinations, benefiting local communities and economies while encouraging long-term environmental stewardship.

FUTURE RESEARCH DIRECTIONS

Empirical validation using structural equation modeling can test the proposed mediating and moderating relationships. Cross-cultural and longitudinal studies can explore temporal shifts in perceptions. Further investigation into operational barriers and consumer segments will deepen practical insights.

CONCLUSION

The luxury hospitality sector stands at a transformative intersection of opulence and sustainability. By conceptualizing consumer perceptions as influenced by beliefs, initiatives, communication, and moral considerations, this paper provides a foundation for navigating emerging sustainable luxury paradigms.

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Consumer Willingness to Pay a Premium for Organic Food Products

Shalini Singh

*Student, Master of Commerce, Department of Commerce,
Government College for Girls, Sector 52, Gurugram
E-mail: shalinis0376@gmail.com*

Abstract

The rising demand for healthy and environmentally responsible consumption has made understanding consumer willingness to pay (WTP) for organic food increasingly important. This conceptual study examines the behavioral, psychological, and socio-economic factors that influence consumers' readiness to pay a premium for organic food products. Drawing upon secondary data from global and Indian research published between 2005 and 2024, the study applies a qualitative thematic review approach. Findings indicate that health consciousness, environmental concern, trust in certification, and socio-demographic characteristics significantly shape WTP, while high prices, limited awareness, and skepticism about labeling remain major barriers. The proposed conceptual framework integrates these determinants to explain consumer motivation within the Indian context. The study provides managerial and policy implications for enhancing transparency, affordability, and certification credibility, thereby promoting sustainable and inclusive organic food consumption.

Keywords: Organic Food, Willingness to Pay, Consumer Behavior, Certification Trust, Sustainable Consumption

INTRODUCTION

The growing awareness of how food choices affect both personal health and the planet has transformed the way modern consumers think about what they eat. Across the world, people are becoming more mindful of nutrition, sustainability, and ethical sourcing—shifting gradually from conventional to organic food options. Organic products, cultivated without synthetic fertilizers, pesticides, or genetically modified ingredients, are perceived as healthier and more environmentally responsible alternatives (Arvanitoyannis et al., 2004). Global demand for organic food has surged in recent years, reflecting an increased preference for safe, traceable, and sustainable food systems (Berry et al., 2015; Hu et al., 2024).

In India, this trend is visible among urban and educated consumers who are re-evaluating their food habits as part of a broader move toward wellness and sustainability (Basha et al., 2015; Nandi et al., 2017). However, despite favorable consumer attitudes, the organic food market continues to face challenges such as limited availability, high prices, and uncertainty about certification authenticity (Aschemann-Witzel & Zielke, 2017; Hamzaoui-Essoussi & Zahaf, 2012). This contradiction between expressed environmental concern and actual purchasing behavior—commonly referred to as the attitude–behavior gap—remains a key obstacle to sustainable consumption (Testa et al., 2019; Vermeir & Verbeke, 2008).

Existing studies show that consumers' willingness to pay (WTP) a premium for organic food is influenced by factors such as health consciousness, environmental values, and trust in certification (Rana & Paul, 2017; Wei et al., 2022; Hu et al., 2024). Research across regions including Europe, China, and the United States confirms that consumers associate organic products with higher quality

and safety (McFadden & Huffman, 2017; Thøgersen & Zhou, 2012). Indian research also highlights the role of socio-demographic variables—income, education, and lifestyle awareness—in shaping purchasing intentions (Kumar et al., 2023; Nandi et al., 2017). Yet, much of this literature is grounded in traditional behavioral models such as the Theory of Planned Behavior (Ajzen, 1988), offering limited insight into how digitalization now influences sustainable food choices.

The integration of digital sustainability mechanisms—including blockchain traceability, QR code labeling, and online certification visibility—has begun to redefine how consumers perceive authenticity and transparency in food supply chains (Abeyratne & Monfared, 2016; Hastig & Sodhi, 2020). However, few studies have explored the intersection of these digital trust enablers with sustainability-oriented behavior and willingness to pay (Liberatore et al., 2018; Costa et al., 2013). Current sustainability research tends to emphasize environmental and ethical motivations (Arvola et al., 2008; William et al., 2010), while digital marketing literature focuses on transparency and consumer trust (You et al., 2020; Yu et al., 2021). This separation has created a conceptual gap in understanding how digital transparency complements sustainable consumption values in shaping purchasing behavior.

Addressing this gap is crucial, especially in emerging economies like India, where digital access and trust in certification are evolving simultaneously (Yadav & Pathak, 2016a; Uddin & Khan, 2016). The present study therefore aims to synthesize insights from fifteen global and Indian research papers to propose a conceptual framework connecting health consciousness, environmental concern, price sensitivity, trust in certification, and digital transparency with consumers' willingness to pay a premium for organic food. By integrating sustainability and digital communication perspectives, this paper contributes to a more holistic understanding of how digital trust can reinforce sustainable consumer behavior and strengthen the organic food ecosystem in India and beyond.

LITERATURE REVIEW

Consumer willingness to pay (WTP) a premium for organic food has become a vital area of research, particularly as health, sustainability, and trust concerns dominate modern consumption behavior (Wei & Zeng, 2008). Meta-analytic findings highlight significant global variation in consumers' WTP, with reported values ranging from as low as 2.3% to as high as 509.2%, showing a strong skew across international markets (Wei & Zeng, 2008). Notably, regional differences are evident—Asian consumers display higher mean WTP values compared to their European and American counterparts, reflecting cultural distinctions in perceptions of food safety, ethical farming, and welfare considerations (Wei & Zeng, 2008). European consumers, in particular, have demonstrated a greater readiness to pay more due to heightened concern for producer and animal welfare, illustrating that ethical and social motives accompany health-driven intentions in influencing WTP (Wei & Zeng, 2008).

Socio-economic status has also been recognized as an important determinant of WTP for organic products. Education, occupation, and income collectively shape both utilitarian and hedonic values associated with organic consumption (Ghali-Zinoubi, 2020). While utilitarian values such as health, nutrition, and product safety exert stronger effects on willingness to pay, hedonic motivations related to taste, freshness, and enjoyment more directly drive actual purchase behavior (Ghali-Zinoubi, 2020). Consumers with higher socio-economic backgrounds are thus more inclined to pay premium prices for organic food, provided they perceive the products as pure, tasty, and nutritionally superior (Ghali-Zinoubi, 2020).

Within the Indian market context, multiple factors intersect to influence premium payment behavior. A large proportion—nearly 90%—of Indian consumers reported willingness to pay between 5% and 100% more for better-quality fruits and vegetables (Nandi et al., 2016). Variables such as

family income, household size, gender, environmental concern, awareness of chemical residues, and trust in retailers emerged as key predictors of WTP (Nandi et al., 2016). Furthermore, environmental and health-related motivations continue to underpin consumers' preference for organic products in India, aligning with broader global trends emphasizing ecological consciousness and personal well-being (Nandi et al., 2016).

Trust remains one of the most decisive factors shaping consumer confidence in organic markets. Research emphasizes that perceived product quality and security, combined with consumer trust, significantly determine the premium consumers are willing to pay (Krystallis & Chrysoschoidis, 2005). However, a persistent challenge lies in the limited trust placed in retail outlets—less than one-third of consumers trust the retailers distributing certified products, whereas trust in certification logos and quality labels remains substantially higher (Krystallis & Chrysoschoidis, 2005). This demonstrates that institutional certification is a more credible indicator of authenticity than retail reputation. In emerging markets, trust in retailers still plays a pivotal role, as consumers are willing to pay premium prices for organic foods sold in outlets they personally believe to be reliable (Nandi et al., 2016).

Sustainability and environmental values further reinforce the intention to pay more for organic food. Consumers who exhibit strong environmental concern and value perception tend to maintain positive attitudes toward organic purchases, even when facing higher prices (Hu et al., 2024). These attitudes are strengthened by green psychological benefits—feelings of moral satisfaction and ecological contribution—that lead to higher willingness to pay for sustainable products (Hu et al., 2024). The perceived value of eco-friendly and chemical-free products, viewed as free from pesticides and synthetic additives, continues to drive long-term consumer commitment (Hu et al., 2024). Earlier research also corroborates that perceived value acts as a crucial antecedent of sustained premium-paying behavior, as consumers link environmental protection with personal health and societal responsibility (de Medeiros et al., 2016, as cited in Hu et al., 2024).

In recent years, digital trust mechanisms have redefined the structure of organic food markets. Digital verification systems—such as blockchain traceability, RFID tracking, and QR-code labeling—enable transparency by linking production, certification, and consumption stages, thereby minimizing information asymmetry (Marozzo et al., 2021). Product authenticity and sustainability assurances enhance consumer trust levels, particularly for premium organic goods such as olive oil (Marozzo et al., 2021). Furthermore, gender and cultural factors have shown unique moderating effects, with male consumers in Asian markets demonstrating greater willingness to pay for organic olive oil when assured of authenticity and traceability (Marozzo et al., 2021). The inclusion of traceability within sustainability frameworks reflects growing consumer demand for verifiable, fraud-free food systems where both safety and ethical transparency are digitally guaranteed (Marozzo et al., 2021).

Social and digital media further reinforce digital trust by serving as channels for information dissemination. Studies emphasize the importance of using authoritative sources, such as certified organic systems, and promoting awareness through credible digital communication strategies (Yu et al., 2022). When presented with comparative and evidence-based digital advertisements, even skeptical consumers respond positively, increasing their trust and willingness to pay (Yu et al., 2022). Thus, digital ecosystems not only provide information but also mediate perceptions of authenticity and reliability that directly influence consumer spending decisions.

Global evidence consistently supports these findings. Research conducted in Argentina found that consumers were willing to pay higher prices for better-quality organic foods, reaffirming the universality of quality-driven motivation across markets (Nandi et al., 2016). However, significant barriers remain: higher prices, lack of availability, poor product range, and irregular supply continue to impede the expansion of organic demand (Nandi et al., 2016). Addressing these constraints requires

integrating sustainability-oriented practices with digital traceability systems to enhance accessibility and trustworthiness.

In summary, the literature underscores three interlinked pillars shaping consumer willingness to pay for organic food—health motivation, sustainability orientation, and digital trust. Health and environmental concerns form the ethical foundation for premium payments, while digital tools now operationalize transparency and assurance. The evolution from traditional certification-based trust to digital and data-driven verification represents a significant paradigm shift, closing the information gap between producers and consumers. Ultimately, by reinforcing authenticity, promoting sustainability, and leveraging technology-driven communication, organic markets can strengthen long-term consumer loyalty and reduce the attitude–behavior gap observed across global and emerging economies (Wei & Zeng, 2008; Hu et al., 2024; Marozzo et al., 2021).

STATEMENT OF THE PROBLEM

Despite the increasing global awareness of health, sustainability, and ethical consumption, the market share of organic food remains comparatively small next to conventional alternatives (Hu, Al Mamun, Reza, Wu, & Yang, 2024). Although consumers recognize the benefits of organic food in improving health and protecting the environment, their expressed positive attitudes often fail to convert into consistent purchasing or sustained willingness to pay premium prices—a gap widely referred to as the attitude–behavior gap (Rustagi & Prakash, 2022; Hu et al., 2024). Economic factors remain the most visible barrier: consumers may value organic food yet refrain from regular purchases due to significant price differentials and the perception of organic products as luxury commodities (Nandi, Bokelmann, Gowdru, & Dias, 2017; Bulsara & Trivedi, 2023). Consequently, moral and health motivations are frequently overshadowed by financial considerations (Ramalingam & Anuradha, 2021).

Another critical limitation lies in trust and transparency. Weak or inconsistent certification systems, unclear labeling, and the circulation of counterfeit or misleading claims have diminished confidence in organic products, particularly in developing markets such as India (Krystallis & Chrysosoidis, 2005; Lim, Yong, & Suryadi, 2014). Without credible verification or government-backed traceability, many consumers remain uncertain about the authenticity of organic goods, thereby reducing their willingness to pay a price premium (Ghali-Zinoubi, 2020). In this context, the integration of digital trust mechanisms—such as blockchain, QR-coded traceability, and transparent online communication—has become increasingly important for bridging informational gaps and enhancing consumer confidence (Yu, Han, & Cui, 2022; Marozzo, Costa, Crupi, & Abbate, 2023).

Demographic and cultural diversity also influences purchasing patterns. Research consistently indicates that younger, better-educated, and higher-income consumers display greater willingness to pay for certified organic products, while lower-income and rural populations often perceive organic consumption as inaccessible or elitist (Hu et al., 2024; Nandi et al., 2017). These disparities challenge the inclusivity of sustainable consumption and highlight the need for policies that make organic food both affordable and trustworthy across social groups (Alsubhi et al., 2023).

Furthermore, limited consumer awareness and weak marketing communication continue to constrain the organic sector. Many consumers remain unfamiliar with certification processes, environmental benefits, and the long-term value of sustainable consumption (Yu et al., 2022). In India, additional structural challenges such as fragmented supply chains, high production costs, and irregular product availability have resulted in inconsistent consumer experiences and inflated prices (Batte, Hooker, Haab, & Beaverson, 2006; Bulsara & Trivedi, 2023).

In summary, consumers' willingness to pay a premium for organic food is shaped by an intricate interaction of economic, informational, and psychological variables. High prices, limited trust in labeling, and uneven digital literacy collectively weaken the translation of positive attitudes into consistent purchase behavior. Understanding how factors such as health consciousness, environmental concern, digital trust, perceived value, and socio-demographic characteristics influence WTP is essential for narrowing this gap and promoting sustainable consumption (Hu et al., 2024; Chaudhary, 2018). Therefore, this study seeks to analyze these determinants to guide policymakers, marketers, and producers in fostering transparent, accessible, and digitally trustworthy organic markets both in India and globally.

OBJECTIVES OF THE STUDY

The present study aims to investigate the determinants influencing consumer willingness to pay a premium for organic food products, with particular attention to how digital trust and sustainability perceptions mediate purchasing behavior (Hu et al., 2024; Marozzo et al., 2023). Understanding these interconnections is crucial for supporting sustainable growth in the organic sector, as willingness to pay reflects both perceived product value and the consumer's behavioral intent (Hu et al., 2024).

Previous research establishes that consumers' premium-paying behavior arises from a blend of personal, social, and economic influences shaping perceptions of health, environmental impact, and product authenticity (Nandi et al., 2017). Health consciousness and ecological concern consistently emerge as dominant motivators (Bulsara & Trivedi, 2023), while demographic variables—such as income, education, and lifestyle—further determine the extent and consistency of willingness to pay (Ghali-Zinoubi, 2020). Yet, the persistence of the attitude-behavior gap underscores that positive perceptions alone are insufficient when barriers such as high prices, low awareness, and mistrust in certification remain unresolved (Rustagi & Prakash, 2022; Hu et al., 2024). Inaccurate labeling and weak digital communication further exacerbate these challenges, particularly in emerging markets where information asymmetry undermines consumer confidence (Krystallis & Chryssohoidis, 2005; Lim et al., 2014).

By integrating sustainability principles with technological innovations, the study emphasizes the role of digital trust tools—including transparent certification systems, traceability platforms, and credible online marketing—in improving consumer understanding and trust (Yu et al., 2022; Marozzo et al., 2023). These digital mechanisms not only authenticate organic claims but also reduce perceived risk, thereby strengthening both purchase intention and willingness to pay.

Aligned with these insights, the key objectives of this research are to:

1. Examine the primary factors influencing consumers' willingness to pay a premium for organic food products.
2. Analyze how trust, certification, and digital traceability affect consumer confidence and purchasing decisions.
3. Evaluate the influence of demographic characteristics—such as income, education, and lifestyle—on consumers' premium-paying behavior.
4. Assess the role of sustainability perception and digital trust in shaping willingness to pay.
5. Identify major barriers, including price sensitivity, misinformation, and accessibility issues, that restrict regular organic consumption.
6. Recommend marketing and policy strategies to strengthen consumer trust, enhance affordability, and promote sustainable organic consumption.

Through these objectives, this study contributes to bridging the gap between consumer intention and actual purchase behavior by highlighting how digital trust, sustainability orientation, and economic access interact in shaping willingness to pay for organic products (Bulsara & Trivedi, 2023; Marozzo et al., 2023). In doing so, it aims to provide both theoretical insight and practical direction for developing transparent, inclusive, and sustainable organic food markets.

SIGNIFICANCE, NEED, AND SCOPE OF THE STUDY

Understanding consumers' willingness to pay (WTP) a premium for organic food products has become crucial in a global context shaped by heightened health consciousness, environmental awareness, and digital transformation (Hu, Al Mamun, Reza, Wu, & Yang, 2024). The rapid expansion of the organic food sector reflects increasing consumer concern for food safety, ecological balance, and long-term well-being (Nandi, Bokelmann, Gowdru, & Dias, 2017). However, despite growing awareness, actual market penetration remains limited due to persistent barriers such as high prices, limited trust in labeling, and uneven access—factors that continue to reinforce the attitude–behavior gap (Rustagi & Prakash, 2022).

This study holds both theoretical and practical importance. Theoretically, it extends the literature on sustainable consumer behavior by integrating three key dimensions—willingness to pay, digital trust, and sustainability orientation—into a unified behavioral framework (Marozzo, Costa, Crupi, & Abbate, 2023). Earlier research has predominantly emphasized health and environmental motives, often overlooking how certification credibility, cultural diversity, and digital communication influence premium-paying behavior (Krystallis & Chrysoschoidis, 2005; Chaudhary, 2018). By addressing these neglected aspects, the present study fills a major academic gap, particularly in the context of developing economies such as India, where trust deficits and digital literacy disparities persist (Lim, Yong, & Suryadi, 2014; Yu, Han, & Cui, 2022).

From a practical perspective, the findings offer meaningful implications for marketers, policymakers, and supply chain managers. Marketers can design data-driven strategies emphasizing transparency, traceability, and health value to strengthen trust and justify premium pricing (Yu et al., 2022). Policymakers can use the insights to enhance certification frameworks, promote affordability through subsidies or incentives, and implement awareness campaigns that communicate the environmental and health benefits of organic food (Bulsara & Trivedi, 2023; Alsubhi et al., 2023). Supply chain managers can leverage digital technologies such as blockchain and QR-based labeling to authenticate production processes and build consumer confidence through real-time traceability (Marozzo et al., 2023).

Geographically, the scope of this study focuses primarily on the Indian organic food market, where rising urban incomes, lifestyle changes, and sustainability awareness coexist with challenges such as limited product availability and price sensitivity (Ramalingam & Anuradha, 2021; Nandi et al., 2017). However, the research also draws on global evidence to contextualize international trends in WTP and trust mechanisms, offering comparative insights relevant for policy and marketing innovation (Hu et al., 2024). By incorporating behavioral, psychological, and socio-demographic factors—such as income, education, gender, and lifestyle—the study provides a holistic understanding of premium-paying behavior (Ghali-Zinoubi, 2020).

Several critical research gaps emerge from prior literature:

1. **Geographical limitation** – Most empirical studies focus on urban consumers, with insufficient exploration of rural and semi-urban markets in India (Nandi et al., 2017; Bulsara & Trivedi, 2023).

2. **Digital integration gap** – Limited analysis exists on how digital trust mechanisms, such as traceability systems and blockchain certification, influence WTP (Yu et al., 2022; Marozzo et al., 2023).
3. **Comparative gap** – There is a lack of comparative regional or cross-country analysis linking socio-cultural differences to WTP behavior (Hu et al., 2024; Ghali-Zinoubi, 2020).
4. **Methodological gap** – Few studies employ advanced statistical or mixed-method approaches (e.g., PLS-SEM or multigroup analysis) to empirically validate behavioral models combining sustainability and digital trust factors (Rustagi & Prakash, 2022).

To address these gaps, future research could empirically test the relationship between digital traceability, certification credibility, and consumer trust using PLS-SEM or structural equation modeling to validate causal links between constructs. Comparative studies between urban and rural consumers could also provide deeper insight into affordability and access constraints. Additionally, mixed-method designs integrating survey data and digital analytics could capture how social media and online transparency influence consumer decision-making in real-time.

The scope of this study remains confined to consumer perception and behavior, excluding agricultural production or supply-chain logistics. Its primary objective is to explore how personal beliefs, socio-economic conditions, and digital innovations interact to shape WTP for organic food in an emerging economy. The findings aim to provide a foundation for both policy formulation and managerial action—bridging theory and practice in the pursuit of sustainable market growth (Marozzo et al., 2023; Rustagi & Prakash, 2022).

Ultimately, this study is significant not only for its contribution to academic discourse but also for its potential societal impact. By identifying how digital trust and sustainability orientation can strengthen consumer willingness to pay, the research supports the creation of transparent, inclusive, and environmentally responsible food markets. Encouraging consumers to consciously invest in organic products contributes to healthier lifestyles, sustainable agriculture, and global environmental resilience (Ghali-Zinoubi, 2020; Hu et al., 2024).

RESEARCH METHODOLOGY

This study is conceptual and descriptive in nature, grounded entirely in secondary data and scholarly research. No primary data collection or fieldwork was conducted; rather, the study draws upon a systematic review and conceptual synthesis of academic literature on consumers' willingness to pay (WTP) for organic food products (Hu, Al Mamun, Reza, Wu, & Yang, 2024).

Data sources include peer-reviewed journals, academic books, official reports, and credible online databases, focusing on studies published primarily within the past two decades to ensure contemporary relevance (Nandi, Bokelmann, Gowdru, & Dias, 2017; Bulsara & Trivedi, 2023). Key databases such as ScienceDirect, Emerald Insight, SpringerLink, and Taylor & Francis were used to identify relevant literature. Core journals reviewed include the British Food Journal, Journal of Consumer Behaviour, Food Policy, and Journal of Retailing and Consumer Services, all of which offer valuable insight into consumer psychology, sustainability, and organic market behavior (Hu et al., 2024).

A qualitative and thematic analysis approach was adopted to identify recurring determinants of WTP—such as health consciousness, environmental concern, trust in certification, digital traceability, and socio-demographic factors (Rustagi & Prakash, 2022). Studies from both developed and developing economies were compared to identify cross-cultural similarities and differences, with special focus on India, where awareness, accessibility, and certification systems are still evolving (Ramalingam & Anuradha, 2021; Marozzo, Costa, Crupi, & Abbate, 2023).

The research process involved conceptual synthesis rather than statistical modeling, aiming to integrate theoretical frameworks—such as the Theory of Planned Behavior and value–trust models—into a coherent explanation of how attitudes, trust, and socio-economic status influence premium-paying behavior (Chaudhary, 2018; Ghali-Zinoubi, 2020). All sources were critically evaluated for methodological rigor and authenticity to maintain validity, reliability, and objectivity (Krystallis & Chryssohoidis, 2005).

In essence, this study aims to develop a theoretical framework that explains how digital trust and sustainability interact with traditional motivational factors to influence WTP for organic food. The findings derived from this secondary data analysis are intended to inform future empirical research and assist marketers and policymakers in designing sustainable, transparent, and consumer-trusted organic markets (Hu et al., 2024; Bulsara & Trivedi, 2023).

In alignment with the literature review and theoretical synthesis, the present study proposes a conceptual framework that explains the interrelationship among sustainability drivers, digital enablers, and consumers' willingness to pay (WTP) for organic food. The framework (see Figure 1) identifies health consciousness, environmental concern, and socio-economic status as key determinants influencing perceived value, while digital trust and certification credibility serve as moderating enablers that enhance purchase confidence. Price sensitivity acts as a moderating factor that may weaken the relationship between perceived value and WTP (Hu, Al Mamun, Reza, Wu, & Yang, 2024; Nandi, Bokelmann, Gowdru, & Dias, 2017; Yu, Han, & Cui, 2022).

The conceptual framework presented in Figure 1 was developed by the researcher based on synthesis of prior literature (Hu et al., 2024; Nandi et al., 2017; Krystallis & Chryssohoidis, 2005; Yu et al., 2022).

CONCEPTUAL FRAMEWORK

Building upon insights from existing literature, this conceptual framework integrates sustainability drivers and digital trust mechanisms that influence consumers' willingness to pay (WTP) a premium for organic food products. The model proposes that health consciousness, environmental concern, and ethical awareness act as primary sustainability motivators that shape consumer attitudes toward

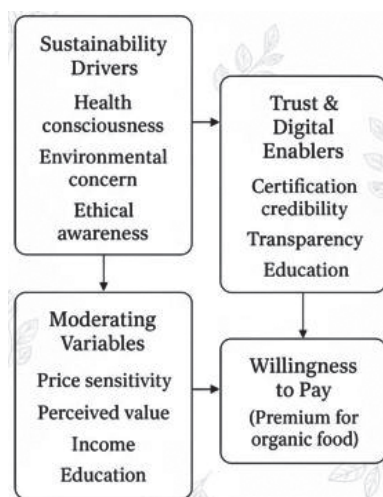


Figure 1: Conceptual Framework Linking Sustainability Drivers, Digital Enablers, and Willingness to Pay (WTP) for Organic Food Products.

organic consumption (Hu, Al Mamun, Reza, Wu, & Yang, 2024; Nandi, Bokelmann, Gowdru, & Dias, 2017).

These motivations are reinforced through trust and digital enablers—such as certification credibility, brand authenticity, traceability systems, and transparent communication through digital platforms—which enhance perceived product value and confidence (Krystallis & Chryssohoidis, 2005; Yu, Han, & Cui, 2022).

Moderating variables including price sensitivity, perceived value, income, and education determine the strength of the relationship between trust and actual willingness to pay (Ghali-Zinoubi, 2020; Bulsara & Trivedi, 2023). As shown in Figure 1, these combined factors explain how sustainability orientation, trust, and digital transparency collectively drive consumers' willingness to pay for organic food.

LIMITATIONS OF THE STUDY

As a secondary, theoretical study, the analysis depends exclusively on previously published literature rather than primary data (Hu et al., 2024). Consequently, it may not capture evolving consumer sentiments or recent post-pandemic market shifts (Marozzo, Costa, Crupi, & Abbate, 2023). Since data were synthesized from diverse geographic contexts, cultural and economic variations across studies could limit direct generalization to the Indian market, where consumer awareness and certification systems are still developing (Ramalingam & Anuradha, 2021; Bulsara & Trivedi, 2023).

Additionally, because only peer-reviewed and accessible publications were used, recent unpublished or regional research might have been excluded. The study also relies on the accuracy of the reviewed authors' data; any biases inherent in those sources may indirectly affect interpretation (Rustagi & Prakash, 2022). Furthermore, the conceptual and qualitative orientation restricts statistical validation of findings, making generalizations more interpretive than predictive (Chaudhary, 2018).

Given that consumer behavior is dynamic and shaped by shifting trends, income patterns, and global crises, findings from earlier studies may not fully reflect present realities (Marozzo et al., 2023). Constructs such as trust, perceived value, and willingness to pay are inherently subjective and largely self-reported in previous research, which can limit precision (Krystallis & Chryssohoidis, 2005; Hu et al., 2024). Future studies employing quantitative models, such as PLS-SEM or mixed-method analysis, are recommended to validate the conceptual insights presented here (Bulsara & Trivedi, 2023).

Despite these limitations, the study contributes valuable theoretical understanding by integrating global and digital perspectives on WTP for organic food, offering a strong foundation for future empirical exploration (Marozzo et al., 2023).

FINDINGS

The literature review revealed that health motivation, environmental concern, and trust are the most consistent predictors of consumers' willingness to pay a premium for organic food (Hu et al., 2024; Nandi et al., 2017). Higher-income and better-educated consumers demonstrate stronger readiness to purchase organic products, associating them with safety, nutritional quality, and ethical value (Ramalingam & Anuradha, 2021; Ghali-Zinoubi, 2020). Trust in certification and labeling remains the most critical factor influencing premium-paying behavior, as perceived credibility directly shapes confidence and purchase intention (Krystallis & Chryssohoidis, 2005; Lim, Yong, & Suryadi, 2014).

However, barriers such as high prices, limited availability, and misinformation about product authenticity significantly constrain purchase consistency, particularly in developing economies like India (Bulsara & Trivedi, 2023). Digital communication and transparent marketing emphasizing

sustainability, traceability, and health benefits have shown potential to strengthen trust and narrow the attitude–behavior gap (Yu, Han, & Cui, 2022). Overall, consumer willingness to pay for organic food is value-driven and trust-dependent, indicating the need for multi-level strategies that enhance transparency, affordability, and education.

CONCLUSION

The study concludes that consumers' willingness to pay a premium for organic food is shaped by a complex interplay of health consciousness, environmental awareness, socio-economic status, and trust—both institutional and digital. Positive attitudes toward organic products exist, but high prices, limited trust, and low awareness prevent regular purchasing. Strengthening consumer confidence through credible certification, digital traceability, and authentic marketing communication is essential for motivating sustained premium-paying behavior (Hu et al., 2024; Krystallis & Chrysosoidis, 2005).

SUGGESTIONS AND RECOMMENDATIONS

Based on the findings and theoretical synthesis, this study proposes several actionable recommendations for key stakeholders to enhance consumers' willingness to pay (WTP) for organic food products while promoting digital trust and sustainability.

For Marketers

Marketers should adopt digital storytelling and transparent communication strategies that emphasize health, sustainability, and authenticity to increase consumer trust (Yu, Han, & Cui, 2022). Integrating digital traceability tools such as QR codes and blockchain technology can enhance transparency and allow consumers to verify product origins in real time (Marozzo, Costa, Crupi, & Abbate, 2023). Additionally, implementing tiered pricing models and smaller packaging units can make organic products more affordable for price-sensitive consumers without diluting perceived value (Bulsara & Trivedi, 2023).

For Policymakers

Government authorities and policymakers should strengthen and standardize certification frameworks to build national-level trust and reduce misinformation (Krystallis & Chrysosoidis, 2005; Lim, Yong, & Suryadi, 2014). Promoting awareness programs through schools, community workshops, and online platforms can increase understanding of organic food benefits and foster sustainable consumption habits (Nandi, Bokelmann, Gowdru, & Dias, 2017). Furthermore, providing financial incentives and subsidies to organic farmers can help lower production costs and retail prices, thereby improving market accessibility (Alsubhi et al., 2023; Hu, Al Mamun, Reza, Wu, & Yang, 2024).

For Supply Chain Managers

Supply chain managers should integrate technology-based tracking systems to prevent fraud and ensure authenticity throughout the distribution process (Marozzo et al., 2023). Collaboration between local farmers, distributors, and retailers can enhance both availability and affordability of organic food products in urban and semi-urban markets (Ramalingam & Anuradha, 2021; Bulsara & Trivedi, 2023). By optimizing logistics and sourcing locally, managers can reduce costs and environmental impact simultaneously.

In conclusion, bridging the gap between consumer intention and actual purchase behavior requires a multi-stakeholder approach that integrates marketing transparency, digital trust mechanisms, and

supportive policy frameworks. Implementing these recommendations can foster a more transparent, accessible, and digitally trusted organic food market that benefits consumers, producers, and the environment alike (Ghali-Zinoubi, 2020; Hu et al., 2024; Marozzo et al., 2023).

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Impact of TV Shows on Influencing Young Adults to Choose a Profession in Culinary

Ria Kaur Anand¹ & Shivani Middha²

¹Student, Indian School of Hospitality Gurugram, India

²Associate Professor, Indian School of Hospitality Gurugram, India

E-mail: ria.anand@ish.edu.in, shivani.saluja@ish.edu.in

Abstract

The study investigates the influence of media specially television shows on young adults' perception and subsequent decisions to pursue careers in the culinary field. This highlights how cooking shows and lives of celebrity chefs depicted on screen shape vocational aspirations. The study uses a quantitative questionnaire administered to 125 respondents (100 survey responses and 25 interviews) to measure the degree to which television exposure influences interest in culinary careers. The study was restricted to people from the culinary field. Existing literature demonstrates substantial media influence on culinary career choices, with studies revealing that television programming accounts for approximately 33% of the influence on students opting for culinary-related careers. An increase in the popularity of shows like "MasterChef" correlates with a higher percentage of teenage students opting for vocational hospitality and catering schools. There is a noticeable relationship between media influence and career decision making among adults aged 18-25 years. The respondents now carving their own pathways in the culinary line also act as judges for whether the culinary lifestyle displayed on screen is close to reality or not. Using this, the research also aims to evaluate to what degree do the viewers perceive realism in the culinary content broadcasted.

Keywords: Culinary, Culinary Careers, Television

INTRODUCTION

Background

In the early 2000s, with the introduction of food related shows on television channels- both Indian and international, there was a stark shift in the perception about the culinary industry and the career pathway of that of a chef. The increase in culinary TV shows has changed the way cooking, chefs and food are perceived in society. People witnessed a transformation from kitchen artisans to global celebrities. *Celebrity chef endorsements, the visual appeal of dishes, host recommendations, and even the ambiance highlighted on TV* can drive curiosity and admiration, leading viewers-especially younger audiences. Surveys indicate that over a third of young people in some demographics have had their career ambitions shaped by TV programs, pointing to the powerful role media can play in vocational choices.

Globally the television shows are hosted in more than 50 countries and millions of users are attracted to it worldwide. The shows not just demonstrate the recipe but also the pride and prestige with which people are pursuing this profession.

Young people use television as a learning tool, a source of information, particularly about social relationships and unfamiliar lifestyles. Television acts as a medium for vocational simulation. As a result of culinary careers being portrayed as glamorous and attainable, chefs and other members of the culinary industry started being viewed at par with celebrities. Therefore, *the influence of television shows on the precepts and career aspirations among young adults has become a subject of significant academic and societal interest in recent years.*

Culinary arts are all about the craft of preparing and cooking food — not just to feed, but to delight. People who work in this field are known as culinarians, though most of us simply call them chefs or cooks. Their job goes far beyond just making meals; it's about turning ingredients into experiences. A skilled chef knows how to make food look beautiful and taste unforgettable.

There's a wide world of opportunity for those in the culinary profession. From bustling hotel kitchens and cozy restaurants to hospitals, airlines, and cruise ships, chefs can find their place in countless settings. And for those who want to take it a step further, there's gastronomy — the deeper study of food that explores its history, presentation, and the art of flavour pairing. Some chefs focus purely on cooking, while others are drawn to the creative side of plating and pushing the boundaries of taste. *Still, one of the biggest challenges in the hospitality industry today is attracting and keeping passionate young talent in the culinary world.* It takes dedication, creativity, and a love for food — but for those who have it, the kitchen can be a place of endless possibility.

This research “*Impact of TV shows on influencing young adults to choose a profession in culinary*” aims to further explore how and to what extent television programming impacts the decision-making process of young adults considering culinary professions and to determine how accurate the viewers find the portrayal of lives of people in culinary in those TV shows.

The findings are expected to provide evidence for culinary education institutions, media producers and career counsellors, contributing to understanding how media platforms serve as occupational information sources and shape the perceptions of young adults which later translates to their career decision making.

Hypothesis Formulation

- **Null Hypothesis (H0):** There is no statistically significant relationship between the amount of time young adults spend watching culinary TV shows and their likelihood of choosing a profession in the culinary arts.
- **Alternative Hypothesis (H1):** There is a statistically significant positive relationship between the amount of time young adults spend watching culinary TV shows and their likelihood of choosing a profession in the culinary arts.

Breakdown of the Core Components

- **Independent Variable:** Exposure to culinary TV shows (measured by frequency, duration, or specific genres like reality competitions vs. instructional shows).
- **Dependent Variable:** The choice to pursue a culinary profession (measured by enrolment in culinary schools, stated career aspirations, or entry-level job applications in the food industry).
- **Target Population:** Young adults (typically defined as individuals between the ages of 18 and 29).

LITERATURE REVIEW

Professional cooking was considered as a modestly paid blue collar job in the early 90's. The professions has been slightly rebranded using the modern media. The cognitive theory stated by Albert says that individuals learn from each other. The target audience selected for the research falls in the band of 18-25 who are more influenced by social media. People have started preferring

Fernandes & Shah, 2020 found that there is a positive relationship between television show viewership and choice of a career portrayed. Television shows were the source that accounted for 33 percent of the influence on students to choose careers in the culinary field. 58% of students agreed that the culinary profession has become more appealing due to the massive media visibility where

celebrity chefs have evolved from kitchen workers to public figures. 62% of respondents in the study believed that media plays a major role in making the career of a chef more reputable and enticing.

Di Pietro, 2018 portrays an idealized version of the careers in the culinary worlds, overlooking challenges such as long working hours, high stress, and workplace hierarchies. Young viewers develop parasocial relationships with celebrity chefs and television personalities, leading to career aspirations modelled after these figures.

The study by *Di Pietro* found that a one percentage point increase in MasterChef viewership corresponded to a 0.25-0.35 percentage point increase in students choosing hospitality and catering schools. The research suggests that television's influence operates not only through parental attitudes but also direct student exposure. MasterChef's large adult audience may lead parents to view culinary careers more favourably, subsequently encouraging their children to consider these pathways. Parental influence significantly affects educational choices.

Fernandes & Shah, 2020 provided complementary evidence through their survey of 100 hotel management students and aspiring chefs. Key findings include:

- 65% of respondents reported being inspired by media updates from famous chefs.
- 62% believed that media helps gain respect for the profession of a chef.
- 81% acknowledged substantial media influence on their career decisions.

The research identified a transformation in professional image, where chefs are now perceived as entrepreneurs, television personalities, and brand ambassadors rather than solely kitchen workers. This has aided in enhancing the reputation in the profession, influencing the young adult audience. These findings suggest that media successfully communicates the business and creative potential of culinary careers and moves beyond the traditional perceptions of the work of a chef restricted to a kitchen. The studies suggest that television serves as an important source of unfamiliar career information for teenagers and aids in developing idols and role models.

RESEARCH METHODOLOGY

Research Design

This study employs a hybrid approach essentially a mix of primary and secondary research.

The primary research involved around 125 respondents (100 survey responses and 25 interviews), and the secondary research involved review from research papers, journals and industry reports.

Quantitative research using a survey method was conducted to examine the impact of television shows on influencing young adults' career choices in the culinary field. The quantitative approach is chosen to measure the extent of television's influence on career decision-making among the target population based on their perception on how accurately the careers in culinary are displayed.

Research Objectives

- Measure the degree to which television exposure influences interest in culinary careers.
- Determine the percentage of respondents whose career choices were directly influenced by TV content.
- Identify perceptions shaped by television regarding the careers in culinary.

Target Population

The target population consists of young adults aged 18-25 years who have exposure to culinary television programming. This age range is selected as it represents individuals in the critical phase of career exploration, pursuing careers and decision-making.

Data Collection

The data was collected via a Google form and interview with consent of the respondents prior to participation. The participants were informed about the study's purpose. The Google form was distributed through social media and the interviews were conducted inhouse at institute level. The form was open for responses for a period of 2 weeks. Responses were kept anonymous to encourage honest answering. The interviews were conducted in a structured way whereby a fixed set of questions similar to the survey form were asked.

Survey Questions

To guide the achievement of these objectives, the following questions were addressed. All the questions were multiple choice questions

1. What channels relating to food/lifestyle did you watch growing up? (Answer Options: TLC, FYI TV18, Fox Life, Food, Zee Khana Khazana, Other)
2. Which TV shows do you remember watching? (Answer options: MasterChef India, MasterChef Canada/USA/Australia, Cake Boss, Fabulous Cakes, Ultimate Cake Off, Chopped, The Great British Bake Off, Man v/s Child: Chef Showdown, Other)
3. On a scale from 1 to 5, how accurate was the depiction of chefs and lifestyle of a person in the culinary industry in the TV shows?
4. On a scale of 1 to 5, how influential were these TV shows in impacting you to choose a career in culinary?

RESULTS AND CONCLUSION

Result

- (a) What channels relating to food/lifestyle did you watch growing up?

Table 1: Channels

<i>Channel</i>	<i>No. of Respondents</i>	<i>Percentage</i>
Zee Khana Khazana	62	62%
TLC	55	55%
Food	48	48%
Fox Life	42	42%
FYI TV18	37	37%
Other (Netflix/NDTV Good Times)	29	29%

What channels relating to food/lifestyle did you watch growing up?

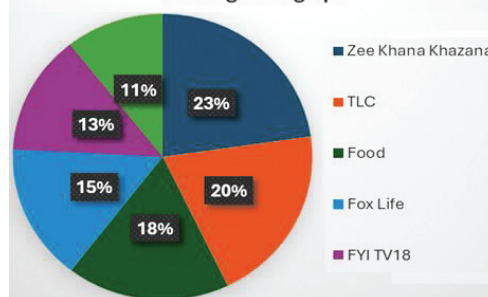


Figure 1: Channels

(b) Which TV shows do you remember watching?

Table 2: TV Shows

<i>TV Show</i>	<i>No. of Respondents</i>	<i>Percentage</i>
Ultimate Cake Off	47	47%
MasterChef India	44	44%
Cake Boss	40	40%
The Great British Bake Off	38	38%
MasterChef Australia	35	35%
Chopped	33	33%
Fabulous Cakes	32	32%
MasterChef USA	29	29%
Man v/s Child: Chef Showdown	25	25%
MasterChef Canada	18	18%



Figure 2: TV Shows

(c) On a scale from 1 to 5, how accurate was the depiction of chefs and lifestyle of a person in the culinary industry in the TV shows?

Table 3: Depiction Accuracy

<i>Rating</i>	<i>No. of Respondents</i>	<i>Percentage</i>
5	21	21%
4	28	28%
3	29	29%
2	22	22%

On a scale from 1 to 5, how accurate was the depiction of chefs and lifestyle of a person in the culinary industry in the TV shows?

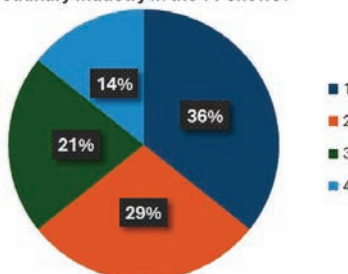


Figure 3: Depiction Accuracy

- (d) On a scale of 1 to 5, how influential were these TV shows in impacting you to choose a career in culinary?

Table 4: Influence of Shows

Rating	No. of Respondents
5	50
4	38
3	10
2	2

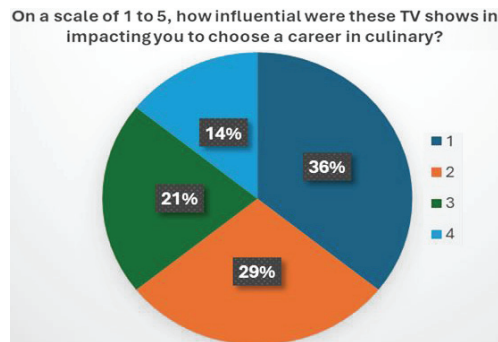


Figure 4: Influence of Shows

DISCUSSION

Talking about the results, it can be inferred that the viewership of the show “MasterChef” whether Indian or International was the highest among other cookery shows. It is possible that the audience connects to the aspect of creative freedom and accolades given in MasterChef.

The majority of respondents recognize that culinary shows might be a refined version of reality. Not completely detached from the real culinary work, they can be said to be a dramatized version of the culinary life. The viewers accept the fact that these shows likely skip over the repetitive and mundane parts of kitchen life like the physical exhaustion, long hours of standing, repetitive prep work, low pay, etc.

Despite knowing that the depiction of culinary life is not very accurate, the shows had a significant impact. Nearly half the respondents said the shows were extremely influential. Over two-thirds of respondents ranked the amount of influence as 5 and 4 (a total of 66.6%). This depicts that Television shows portraying an unfamiliar lifestyle, are powerful in inspiring major life decisions.

There can be several reasons as to why these programs exert such an influence. Firstly, the TV shows focus on the exciting parts of the job such as crafting eye pleasing dishes, receiving applause, winning competitions and achieving recognition and fame. This can create a biased perception of glamour, overlooking the downsides such as long periods of work, physical labour, low pays, safety hazards, etc.

Audiences create emotional connections with the TV shows and the life portrayed in them which motivates them to follow the same lifestyle and thus choose culinary as a field of vocation.

For the culinary industry, this implies that TV shows help it gain recognition and popularity. TV shows help the audience to cultivate enthusiasm related to cooking and food in general. On the other side, people may enter culinary careers with unrealistic expectations about glamour, creativity, and work-life balance which may be a potential concern for the industry.

CONCLUSION

Culinary TV shows make the world of cooking look exciting, creative, and full of passion. They highlight the artistry and the thrill of working in a kitchen, giving viewers a sense of what it might be like to pursue a career in this field. Of course, these portrayals don't tell the whole story—running a professional kitchen can be challenging, demanding, and less glamorous than it appears on screen.

Even so, this study suggests that watching these shows can influence students' interest in culinary careers. By presenting cooking as both a craft and a profession, television seems to spark curiosity and aspiration among young viewers. While the data cannot conclusively prove that TV shows drive career choices, the findings support the idea that they play an important role in shaping how students perceive the culinary world.

Ultimately, this research underscores how media can shape career aspirations, and it points to the value of exploring this influence further with larger and more diverse samples. Culinary shows may not tell the entire truth, but they certainly make the journey of becoming a chef look inspiring—and that inspiration can make a difference.

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Determinants of E-Loyalty in E-Commerce: A Systematic Review of E-Trust, E-Satisfaction, E-Service, and eWom

Falak Khanna¹ & Anjali Yadav²

¹Assistant Professor, Department of Commerce, Gurugram University, Gurugram

²Research Scholar, Department of Commerce, Gurugram University, Gurugram

Email: falak@gurugramuniversity.ac.in, anjaliyadav2405@gmail.com

Abstract

The rapid digitalization of commerce has transformed online platforms into major marketplaces, making long-term customer retention essential for business success. This paper systematically reviews 54 peer-reviewed studies to identify key determinants of e-loyalty in e-commerce. Using structured keywords and rigorous screening of leading academic databases, the review focuses on studies that directly examine mechanisms influencing online consumer loyalty. Thematic analysis reveals four dominant determinants: e-satisfaction, e-trust, e-service quality, and electronic word-of-mouth (eWOM). E-satisfaction is the strongest driver, as consistently positive experiences encourage repeat purchases and favorable evaluations. E-trust mitigates perceived risks in online transactions, fostering confidence and long-term commitment. E-service quality—covering usability, responsiveness, assurance, and empathy—significantly shapes customer perceptions and enhances loyalty. eWOM further strengthens loyalty by amplifying consumer experiences through digital communities. The review also identifies emerging research gaps, including limited attention to cultural differences, contextual factors, and the growing influence of advanced technologies such as AI, big data, and chatbots. Additionally, rising consumer expectations regarding transparency, sustainability, and ethical behavior point to new dimensions of loyalty formation. Overall, this review integrates fragmented findings into a cohesive framework and offers guidance for developing strategies that combine technological innovation with trust, satisfaction, and human-centric values to achieve sustained e-loyalty.

INTRODUCTION

The 1991 economic reforms—liberalization, privatization, and globalization—have significantly reduced the importance of physical borders between nations. These changes have led to increased international trade and closer economic integration, effectively shrinking the world in terms of business and commerce. The rise of the internet has further transformed the way business is conducted, both within countries and across borders. It has introduced new levels of convenience, speed, and access, reshaping the traditional business landscape. In this digital age, consumers hold more power than ever before. With the ability to browse countless products, brands, and sellers online, they are no longer limited by geography or availability. A simple click allows them to compare, switch, or try new products from various online platforms, forcing businesses to be more competitive and customer-focused.

Today in this highly competitive environment especially online, E-Loyalty has been given a lot of attention and importance from all business practitioners and academicians. E-loyalty is the retention of customers who will be making future purchases and which represents a strategic benefit for long term success of any business (Gefen, 2002). According to Thurasami et al. (2021) the loyalty of customers nowadays is crucial for the survival and growth of any business because in today's

time the customers prefer to communicate with each other via social media platforms and share their experiences about any product or service there. Also, customer retention is related to the profitability of any online business (Helgesen, 2006). The two most important things required for running a successful business is the ability of a business to satisfy its customers with excellence and the next thing is build its customers (Utama et al., 2020; Mariam et al., 2021; Febriani et al., 2023;). The progress and excellence can be achieved by any company through customer loyalty only as the loyal customers will provide enormous benefits to the business which will further help the company to develop (Kotler & Keller, 2016; Khasanah et al., 2021; Mariam & Ramli, 2019; Novarian & Ramli, 2020). Therefore, online businesses are giving due attention to E-loyalty because it determines the commitment of the customers for repeat purchases and development of their trust by recommending it to others (Hanaysha, 2022; Ramli, 2019; Sukarno et al., 2020; Supiati et al., 2021).

Customer loyalty is one of the essential ambition for strategic marketing planners as it brings many positive results to the companies. Firstly, it is comparatively less expensive to retain existing customer than it is to find out and make new customers. Next, loyal customers will discuss past service experiences positively than non-loyal customers or new customers, creating a potential for word-of-mouth and advertising at no extra cost to the online service provider (Shoemaker & Lewis, 1999). Third, it secures a positive relationship between the customer and online service provider. And Finally, loyal customers are way more easily accessible than first-timers because companies normally maintain the records of its customers, making targeted indirect marketing more accessible. This knowledge provides suppliers to precisely target the repeat segment of customers and encourage immediate feedback on promotional activities (Reid & Reid, 1993).

Despite the advantages of online shopping, many consumers remain reluctant to make purchases through websites due to several concerns. These include doubts about the legitimacy of websites, uncertainty about product quality, concerns over security and information privacy, as well as issues related to post-purchase services and overall trust (Alam & Yasin, 2010; Buchalis, 2004; Chen, 2006). Trust is widely recognized as one of the most important factor in online shopping. Because online transactions lack direct contact with the customers and require customers to share personal information making this process often perceived as risky (Ciptono & Chandra, 2005; Reichheld and Scheffer, 2000). A lack of trust can ultimately lead consumers to avoid engaging with e-vendors altogether (Gefen et al., 2003).

This study seeks to identify and analyse the key determinants of customer loyalty within the E-commerce sector. As online shopping continues to grow rapidly, fostering customer loyalty has become increasingly critical for E-commerce platforms seeking to maintain a competitive advantage and ensure long-term success and it becomes essential to know about the factors which impact the loyalty building process of a customer. By understanding the complex interplay of these factors, the study aims to provide a comprehensive overview of what drives customer retention in digital marketplaces. The findings of this review will contribute to both academic literature and practical strategies for improving customer engagement and loyalty in e-commerce environments.

METHODOLOGY

This study adopts a retrospective approach, relying on the analysis of secondary data, including existing literature, empirical studies, and theoretical frameworks previously developed in the field of E-commerce and customer loyalty. The goal is to systematically explore the factors that contribute to the development of E-loyalty among consumers. The methodology followed in this review is structured into the following key steps:

Identification of Relevant Databases

A selection of reputable academic and research databases (e.g., Scopus, Web of Science, Google Scholar, JSTOR) was conducted to ensure comprehensive coverage of peer-reviewed and high-quality sources.

Definition of Keywords and Search Criteria

Relevant keywords and search terms were carefully chosen to capture the scope of the topic. These included terms such as “e-loyalty,” “customer loyalty in e-commerce,” “online consumer behavior,” “digital customer retention,” and “factors influencing loyalty online.” Boolean filters (e.g., publication date, peer-reviewed journals, language) were applied to refine the searching process.

Selection and Analysis of Literature

The collected articles were screened based on relevance, methodological rigor, and contribution to the research topic. Studies that directly addressed the determinants of customer loyalty in e-commerce contexts were prioritized.

Classification and Thematic Grouping

The selected literature was then categorized according to emerging themes such as trust, satisfaction, perceived value, personalization, service quality, and technological factors. This thematic classification enabled the identification of patterns and relationships among the factors influencing e-loyalty.

Identification of Research Gaps and Future Directions

Based on the thematic analysis, gaps in the existing literature were identified. These include underexplored areas, inconsistencies in findings, and opportunities for future empirical research. Suggestions for future research agendas are provided to guide scholars in addressing these gaps and advancing the understanding of customer loyalty in digital commerce.

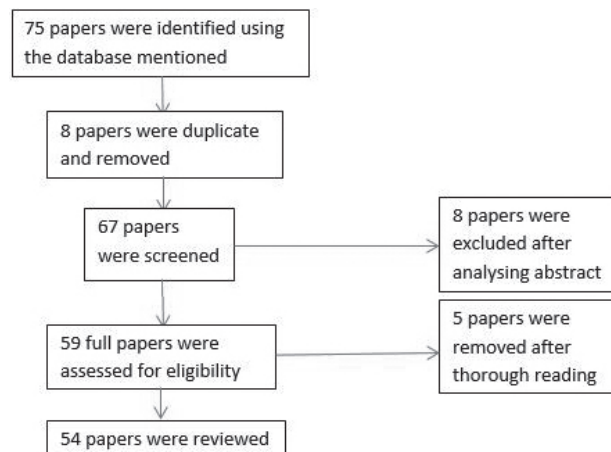


Figure 1

FINDINGS AND DISCUSSIONS

Descriptive Findings

This section explains the overall aspects of the study under reference and attempts to provide insights about the study.

Year-wise Papers

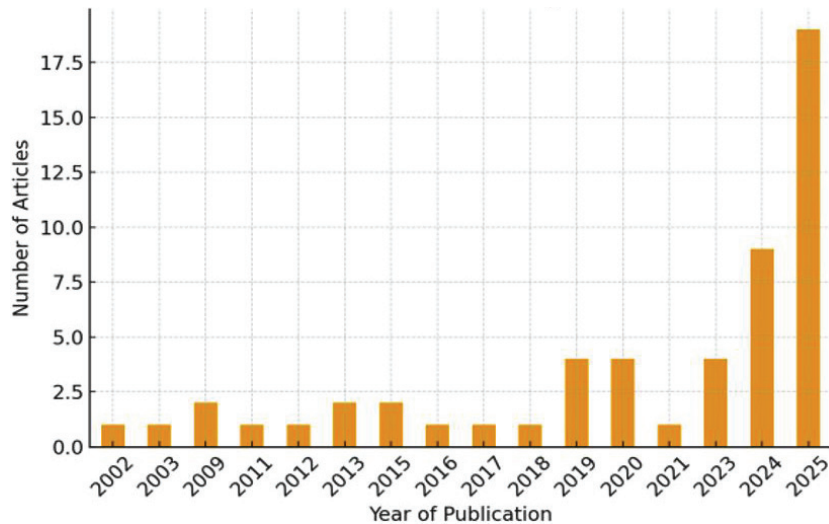


Figure 2: Year-wise Papers

Methods Used

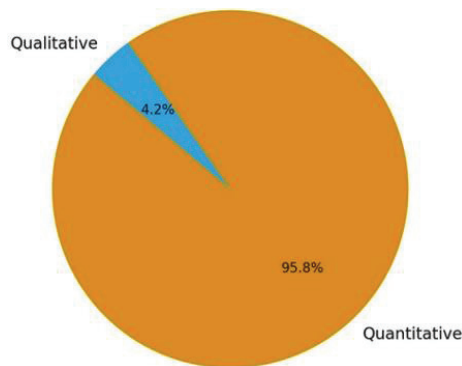


Figure 3: Methods Used

Geographical Coverage

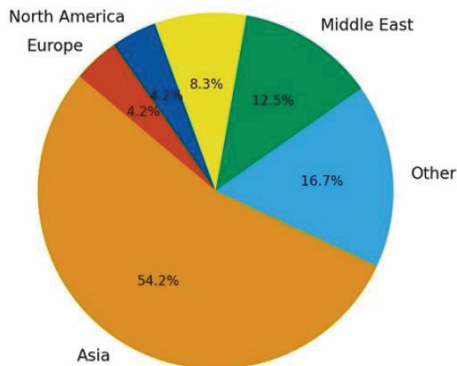


Figure 4: Geographical Coverage

Dependent Variable Studied

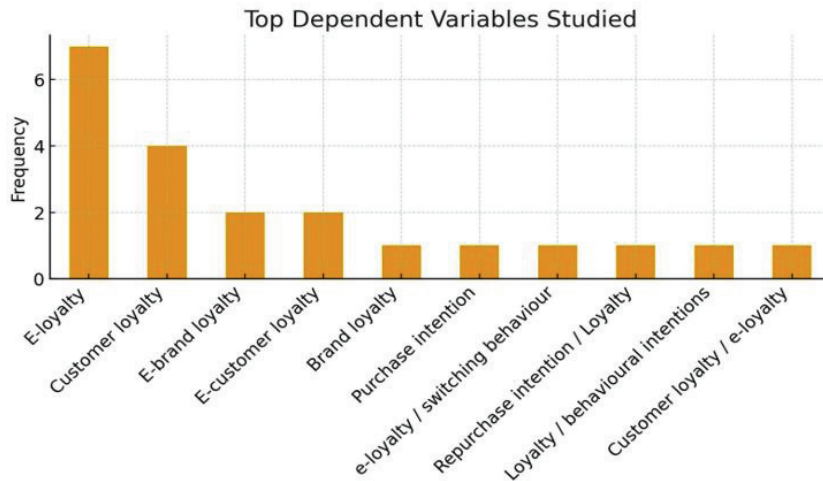


Figure 5: Dependent Variable Studied

Thematic Findings and Discussions

This section outlines different factors which helps in building customer loyalty and gives an in-depth discussion on the same.

Based on our analysis of the various papers, four defining themes were recognised.

1. E-Satisfaction
2. E-Trust
3. E-WOM
4. E-Service



Figure 6: Thematic Findings

E-Satisfaction

Customer satisfaction is generally considered a post-consumption evaluative judgment, reflecting a customer's emotional and cognitive response toward a product, service, or shopping experience. It captures the extent to which customers' expectations are met or exceeded and therefore serves as

a key indicator of perceived value. Measuring customer satisfaction is critical because it directly influences loyalty, repurchase intentions, and word-of-mouth communication. Oliver (1997) described customer satisfaction as “the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with a customer’s prior feeling about the customer experience.”

Anderson & Srinivasan (2003) conceptualized E-loyalty as “a customer’s favorable attitude toward an electronic business resulting in repeat buying behavior.” Their study specifically examined the interplay between E-satisfaction and E-loyalty in the context of electronic commerce. The findings suggested that while e-satisfaction exerts a positive influence on E-loyalty, the strength of this relationship is not uniform. Instead, it is moderated by both consumer-level factors (such as trust, perceived value, and individual preferences) and firm-level factors (such as quality of service, website design, and value-added offerings). Saha et al. (2022) also affirmed that customer satisfaction serves as a key determinant in linking customers’ past experiences with their future purchase intentions. Their study highlights that satisfaction not only reflects retrospective evaluations of service quality or product performance but also functions as a forward-looking predictor of whether customers will engage in repeat purchasing. This reinforces the argument that satisfaction acts as a bridge between prior consumption experiences and future loyalty-related behaviours. Su, Swanson, and Chen (2016) validated the pivotal role of consumer satisfaction in shaping repurchase intentions within the domains of marketing and tourism research. Their findings emphasize that satisfaction functions as a critical antecedent to customers’ future behavioural intentions, reinforcing the notion that meeting and exceeding customer needs is essential for sustained business success.

So it is evident from the studies that satisfaction plays a key role in building E-loyalty and online platforms should focus on satisfying the customers in order to retain them.

E-Trust

Within buyer–seller relationships, trust reflects confidence in the seller’s credibility and goodwill (Doney & Cannon, 1997). In online shopping, it represents customers’ assured belief that the platform and seller will reliably deliver the promised products or services. E-commerce transactions involve significant intricacy and lack of identification; therefore, customers need some trust in their online transactions (Seckler et al., 2015). Trust serves a pivotal function in both first stage usage (Gefen et al., 2003; Pavlou & Gefen, 2004; Lim et al., 2006;) and consistent interaction (Agustin and Singh, 2005; Flavian et al., 2006; Dagger & O’Brien, 2010;). Trust plays a central role in how customers assess online shopping, and without it, E-commerce growth may stagnate (Fusaro et al., 2002; Park et al., 2018). According to (Gefen et al., 2003), the trust in ecommerce refers to customers’ overall perception of an E-vendor, which shapes their behavioural intentions. When customers believe in an E-vendor’s competence, integrity, and reliability, it fosters stronger trust toward the vendor (Jarvenpaa et al., 1997; Gefen et al., 2003). Online Shopping carries inherent risks since customers’ decisions can lead to uncertain outcomes or negative experiences. Compared to traditional shopping, online shopping exposes customers to even greater risk factors (Chiu et al., 2014). In the context of online purchase, perceived risks are categorized into four main types: financial risk, product risk, psychological risk, and time risk (Forsythe & Shi 2003; Forsythe et al., 2006)

The merit of the information in online shopping is necessary for the online customers. The quality of information presented in the online platform will help promising customers in their purchasing behaviour (Kim et al., 2005). The most critical factor in predicting the buying behaviour of the customer is the assessment of customer on information provided by the online seller on its online platform (Jeong & Lambert, 2001).

A significant portion of online customers hesitate to engage in e-commerce because they lack trust in how their personal information is handled on websites (Lee, Ahn, Song, & Ahn, 2018). Building trust enhances customers' confidence and perception of credibility toward e-retailers, which in turn strengthens user-provider relationships by lowering transactional costs and minimizing perceived risks (Matehan & Yasemin, 2011). The correlation between trust and customer loyalty has been substantiated by a plethora of previous empirical investigations (Ha et al., 2010; Liu et al., 2011). Bart et al. (2005) gave a significant positive correlation among E-trust and behavioural intentions. Furthermore, Cyr (2008) established trust exerts a favourable impact on loyalty across a substantial and diverse cultural demographic.

So, this can be concluded that E-retailers that exercise due diligence in securing E-payments and ensuring transactions are completed with proper authorization policies play a crucial role in fostering E-consumer trust.

E-Service

Parasuraman et al. (2005) define online service quality as “the extent to which a website effectively and efficiently facilitates customers in fulfilling their shopping needs, completing purchases, and ensuring the delivery of goods and services.” The challenges associated with electronic commerce services extend beyond mere product pricing and may significantly influence consumer preferences for specific channels. Yang et al. (2008) applied four dimensions of SERVQUAL which are reliability, responsiveness, assurance, and empathy—to determine the users' perceptions of SERVQUAL in an online context. Any satisfactory online shopping experience can be attained by providing high-quality websites that feature attractive compositions and configurations, extensive product information, and user-friendly navigation or search functions (Akinci et al., 2010; Kim & Stoel, 2004).

When customers assess the overall services which is provided by online shopping platforms, they perceive a greater association with different types of benefits—functional, economic and social, social (Parasuraman, Zeithaml, & Malhotra, 2005). These perceived benefits in totality is referred to as online customer value (Sheth et al., 1991; Sweeney & Soutar, 2001). Lai et al. (2007) affirmed that when customers discern enhanced service quality of the website, characterized by benefits like preferential treatment, they are likely to experience increased E-satisfaction; furthermore, when customers achieve E-satisfaction from the website, it engenders greater E-loyalty; additionally, when the website demonstrates responsiveness, it will have a direct impact on customers' E-loyalty.

To achieve this goal, Hung et al. (2005) emphasized that the operators of shopping websites must first develop a clear understanding of the customer groups they serve. However, many operators are initially unaware of who their customers are, particularly in terms of personal and background information. Through a deep analysis of online customer comments, Wang & Huarng (2002) identified nine service quality factors that influence E-satisfaction in online shopping: (1) overall feedback about the design of website, (2) competitive pricing of the product, (3) Product availability (4) Condition of the product delivered, (5) timely delivery of products, (6) return policy, (7) customer support system, (8) confirmation of orders via mail, (9) promotional programs.

Some studies have suggested that service quality does not have a significant direct impact on repurchase intentions (Quintal & Polczynski, 2011; Shin et al., 2013). However, other research has highlighted that service quality does, in fact, exert a direct and significant influence on repurchase intentions (Su, Swanson, & Chen, 2016; Chatzoglou et al., 2022). Shafiee and Bazargan (2019) emphasized that well-designed website services can facilitate smooth consumer transactions, arguing that an effective website not only simplifies the purchasing process but also encourages repeat purchases. Similarly, Tabaeian, Shafiee, and Ansari (2023) identified user-friendly interfaces,

efficient navigation, and secure payment systems as critical factors that enhance the online shopping experience. Consistent with these perspectives, Saha et al. (2022) asserted that service quality remains a key determinant of repurchase intention.

eWOM

Word of mouth (WOM) plays a crucial role in advising and assisting customers regarding goods, services, and brands (Kozinets et al., 2010). It has become an important mode of communication and a powerful influence on customer decision-making, serving as a primary means of retrieving product- and service-related information both online and offline. WOM is generally classified as “informal information about the possession, use, or characteristics of particular products and services and/or their sellers” (Westbrook, 1987; Lam & Mizerski, 2005). It is also recognized as a form of interpersonal interaction through which customers exchange evaluations of products and services (Lang, 2011; Goyette et al., 2010). Because WOM can be either positive or negative, it is often regarded as more credible and reliable than any other form of communication, and it is evident that customer decisions in daily life are significantly influenced by it. Electronic word-of-mouth (eWOM) has emerged as a powerful tool for disseminating information about products and services, capable of shaping consumer perceptions and influencing purchase decisions, particularly in contexts such as sustainable fashion clothing (Kautish & Khare, 2022; Arora & Manchanda, 2022; Su et al., 2023; Mim et al., 2022). According to Khan et al., 2024, eWOM refers to customer feedback on product or service experiences that is shared online with a wide audience. The rapid growth of Web 2.0 technologies and online communities has significantly increased purchase behaviour driven by eWOM (Erkin & Evans, 2018). A growing proportion of consumers now rely on online product and service reviews before making purchase decisions. In the case of apparel brands, Khan et al., 2024 demonstrated that eWOM plays an important role in influencing consumer buying willingness.

Positive eWOM serves as the form of peer endorsement, reinforcing the idea that engaging in sustainable consumption matches with broader societal expectations. This influence is particularly strong in cultures or communities where group norms and collective behaviour are highly valued (Levy et al., 2024).

FUTURE RESEARCH DIRECTION

1. **Integration of Emerging Technologies** – Explore how artificial intelligence, big data analytics, and chatbots shape e-loyalty through hyper-personalization and predictive engagement.
2. **Cross-Cultural Perspectives** – Conduct comparative studies on loyalty determinants across developed and emerging economies to capture cultural and contextual variations.
3. **Sustainability and Ethical Consumption** – Investigate how green practices, transparency, and corporate social responsibility impact loyalty among conscious consumers.
4. **Role of Social Media Platforms** – Examine how influencer marketing, community engagement, and social commerce contribute to e-loyalty.
5. **Behavioural and Emotional Dimensions** – Extend research beyond transactional measures of loyalty to include emotional attachment, brand love, and trust recovery post service-failure.
6. **Longitudinal Studies** – Employ longitudinal designs to better understand how e-loyalty evolves with repeated interactions over time.

CONCLUSION

This systematic review demonstrates that e-loyalty is a multifaceted construct shaped by interdependent factors rather than a single determinant. Customer satisfaction establishes the foundation for repeat

patronage by ensuring that consumer expectations are consistently met or exceeded. Trust operates as a psychological safeguard, reducing the uncertainty and risks associated with digital transactions while strengthening long-term consumer–seller relationships. Service quality, encompassing website usability, responsiveness, security, and post-purchase support, further enhances the consumer journey and increases the likelihood of repurchase. Meanwhile, eWOM amplifies loyalty by embedding purchase decisions within peer networks and social communities, reflecting the increasing importance of collective validation in consumer behavior.

However, the review also underscores that these determinants operate within a dynamic and continuously evolving digital landscape. Emerging technologies, rising consumer expectations for personalization, and heightened concerns around transparency and sustainability are reshaping the pathways through which loyalty is cultivated. For practitioners, this signals the need to develop integrated loyalty strategies that combine technological innovation with human-centric trust-building and service excellence. For scholars, the findings open new research trajectories, particularly in exploring cultural nuances, the emotional dimensions of loyalty such as brand love and attachment, and the influence of ethical consumption patterns on long-term retention.

Ultimately, strengthening e-loyalty remains a cornerstone for achieving sustained success in digital commerce. Firms that can effectively align satisfaction, trust, service quality, and peer influence with technological and societal trends will be better positioned to secure consumer commitment, drive competitive differentiation, and ensure resilience in an increasingly digital-first economy.

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Effect of Artificial Intelligence on Marketing (Digital) and Consumer Response: A Theoretical Review

Jyotsna Goel¹, Monika Rani² & Siddhant Bhardwaj³

^{1,2}Contractual Lecturer, GCG, Sector 14, Gurugram

³Student, SSCBS, New Delhi

Abstract

Artificial Intelligence is going to change marketing ways and consumer behaviors. The propose of this particular study to see the change in marketing strategies and consumer behavior after coming in reality of Artificial Intelligence and it gives how AI influenced intelligence levels, task types like narrow AI is related to repetitive work. It is for sure AI cannot replace our workforce it can be a helpful tool in better management. The researchers done qualitative study and in-depth, semi-structured interviews were held with marketing professionals from diverse Indian companies, providing a platform for sharing their expertise and viewpoints. A sample of ten marketing experts is taken for interview, allowing for detailed insights into their thoughts and experiences. The purpose is to study the role of Artificial Intelligence in marketing, its benefits obstacles and remedies of it. When implementing AI in marketing, companies must consider several ethical factors to maintain trust and transparency. It also helps to understand how AI techniques integrate with marketing techniques and change consumer behavior now days.

Keywords: Artificial Intelligence, Marketing Methods, Digital Marketing, Robots, Ethics, Consumer Behavior, Prediction, Business Growth

INTRODUCTION

Artificial Intelligence (AI) is the technology that enable any machine to perform human-like tasks such as reasoning, problem-solving, and decision-making, by learning from vast amounts of data. “Artificial Intelligence Marketing (AIM) is a strategy for maximising the use of technology and market data in order to improve the customer experience”(Jain and Aggarwal, 2020). “By analysing large amounts of data, AI can bridge the gap between data science and implementation, which previously been an impossible task” (T. Thiraviyam, 2018). The digital wave has swept through consumer behavior and business landscapes, reshaping how companies connect, engage, and deliver value to their audiences. “Social and digital marketing offers significant opportunities to organizations through lower costs, improved brand awareness and increased sales” (Christos Ziakis and Maro Vlachopoulou; 2023). “Significant challenges exist from negative electronic word-of-mouth as well as intrusive and irritating online brand presence” (Christos Ziakis and Maro Vlachopoulou, 2023). The research synthesizes expert insights on digital and social media marketing, shedding light on their impact on consumer behavior. Here Data is always key for any business and now days we are collection abundant of data daily which becoming base for our targeted business without AI this data management is very difficult task while with the help of AI this data is very easily manageable and becoming key for understanding consumer behavior as well as for deciding marketing strategies.

What is AI? It is making the machine intelligent, intelligent computer programs. “It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable” (John McCarthy; 2004). By analyzing human problem-solving techniques, whether through observing others or introspecting our own methods,

we can unlock insights to create more efficient machine learning models and algorithms. “On the other hand, most work in AI involves studying the problems the world presents to intelligence rather than studying people or animals” (John McCarthy; 2004). “AI’s primary goal is to build an intelligent machine and the second goal is to find about the nature of intelligence” (Roger C. Schank, “What Is AI, Anyway?”).

What is Marketing? “With new technology, techniques and media have brought with them more opportunities for re-defining marketing” (Baker, “What is Marketing”; 2016). “These definitions often appear to change the meaning of marketing in some way, with the words marketing, sales, advertising, customer service and interactions used interchangeably and adapted by marketers or salespeople to suit their own job focus” (Gamble, Jordan; Gilmore, Audrey; McCartan-Quinn, Danielle; Durkan, Paula; 2011).

By processing vast amounts of customer data, including text, visuals, audio, and facial recognition, AI can reveal nuanced trends and valuable insights that inform business decisions (John McCarthy; 2004). “Using AI-enabled analytics, firms then can predict what a customer is likely to buy, anticipate credit fraud before it happens, or deploy targeted digital advertising in real time” (Thomas Davenport & Abhijit Guha & Dhruv Grewal & Timna Bressgott; 2019). Like Dress designer use AI, to identify which clothing design will cater to diverse customer preferences. “The underlying AI integrates data provided by customers’ expressed preferences, their Pinterest boards, handwritten notes, similar customers’ preferences, and general style trends” (Thomas Davenport & Abhijit Guha & Dhruv Grewal & Timna Bressgott; 2019). Finally, Artificial Intelligence can engage and involve customers, before and after the sale. “The Conversica AI bot works to move customer transactions along the marketing pipeline, and the AI bot used by 1-800-Flowers provide both sales and customer service support” (Thomas Davenport & Abhijit Guha, Dhruv Grewal & Timna Bressgott; 2019)

“AI is expected to play an important role in predicting not only what customers want to buy, but also what price to charge, and whether price promotions should be offered” (Shankar 2018). “Price and price promotions are important drivers of sales” (Biswas et al., 2013; Guha et al., 2018).

“The advancement of digital marketing as an industry is the result of integrating big data with academic scientific study on intelligent systems” (Gkikas and Theodoridis, 2019).

Artificial Intelligence (AI) and other technology like Data Science, Internet of Things and block chain are all technological innovations changing all business paradigms including marketing.

AI helps understand customer behavior, and improves customer support through NLP and intelligent data retrieval by deep learning (Sanjeev Verma, Rohit Sharma, Subhamay Deb, Debojit Maitra; 2021). “It will eventually accomplish communication at scale with platforms like Search, Facebook, YouTube, and Google reaching billions of people every day, as well as digital ad networks” (Sanjeev Verma, Rohit Sharma, Subhamay Deb, Debojit Maitra; 2021). This is done by Predictive analysis which includes forecast sales and demand, look market trends and patterns, optimize supply chain management, enhance customer segmentation and targeting and mitigate risks and improve decision. We can go for target marketing and flourish our business.

Now sales teams are assisted by AI agent who help them by monitoring all conversations, by advanced tools AI can assess the tone, pitch of consumer and make decision according not only by words spoken but words which are in their mind – So result is better decision.

TV advertisements, hoardings and mass media advertisement for marketing is not sufficient today without social media and AI tools we can’t imagine instant satisfaction of customers so now days target marketing, overarching strategy is opted for marketing so any brand can survive in market (Mahabub Basha, “Impact of Artificial Intelligence on Marketing”; 2023).

AI transforms marketing by automating tasks, enhancing efficiency, and unlocking new opportunities for growth and customer engagement. Data and market both are evolving and AI's adaptability keeps content fresh and trend-aligned, maximizing marketing effectiveness.

It is an overall shift from TV serials to reels, traditional commerce to ecommerce, from ecommerce to mcommerce and now it's all blended and supervised with AI to give you more specific and special need based attending with the help of AI.

"AI depends not on its underlying technology but rather its marketing and business applications, such as automating business processes, gaining insights from data, or engaging customers and employees" (Davenport and Ronanki, 2018).

Marketing can hit directly to the customer with the help of AI. AI analyzes customer data like browsing history and purchase behavior product recommendations, and personalized user experiences, fostering loyalty and engagement. AI can create content like blog posts, social media updates, and marketing materials by analyzing data and previous experiences, AI-powered chatbots provide 24/7 support by understanding user intent and context, improving customer service efficiency. AI tools use historical data to forecast trends, identify high-value customers. AI analyzes demographics and user behavior to optimize ad placements, timings, and budgets, maximizing campaign ROI. AI analyzes customer feedback, reviews, and comments to gauge sentiment about products and services. AI assists in generating keywords and optimizing web pages for search engines, improving visibility. We can use various AI algorithms for better customer understanding and market assessment, because it is rightly said "*koi bhi product banana se bhi jyada mushkil usko bechna hota hai*" so with AI we can make it easy to understand consumer needs in better way. Scopus has less than 60 publications in business journals linked to marketing and AI (Mahabub Basha; 2023). Following then, the amount of study on the issue in Scopus rose, although it is still under 140 (Mahabub Basha; 2023). "More studies on the influence of AI on marketing are needed, according to Martnez-López & Casillas (2013), because there is a paucity of study in the literature and the potential of the combination in making marketing choices" (Mahabub Basha; 2023).

THEORETICAL REVIEW

Artificial intelligence (AI) is transforming the marketing landscape in various ways. Prior concept can be studied to address market related issues (Peter N. Golder; 2001) and now how it evolve and changes are coming and how it impacting consumer behavior can reviewed by the widespread use and deployment of AI in marketing has only recently emerged (Wierenga, 2010).

While Artificial Intelligence adoption is increasingly common, many companies still struggle to elevate their AI implementation to the next level, often due to limitations in strategy, talent, data, or organizational readiness. AI integration will become a necessity, transforming business operations, customer interactions, and strategic decision-making. "In contrast, just 20% of marketers used one or more AI solutions in their businesses in 2017" (Bughin, McCarthy & Chui, 2017). "Artificial intelligence (AI) is the intelligence displayed by machines, unlike human intelligence" (Mahabub Basha; 2023). "The implication of AI is required to assess client behaviours, purchases, likes, dislikes, and various other factors" (Chatterjee et al., 2019).

Artificial Intelligence has revolutionized small businesses empowering them to expand globally and connect with customers worldwide via the internet and flourish their business as per market but for this adoption of new technology is required. "AI assist marketing managers with a variety of tasks, including lead generation, market research, social media management, and user experience personalization" (Sterne, 2017). "AI can boost revenue and optimize costs. Revenues may increase

through improved marketing decisions (e.g., pricing, promotions, product recommendations, enhanced customer engagement); costs may decline due to the automation of simple marketing tasks, customer service, and (structured) market transactions” (Thomas Davenport & Abhijit Guha & Dhruv Grewal & Timna Bressgott; 2020).

METHODOLOGY

A qualitative research approach was adopted to explore the study topic, uncovering underlying motivations, diverse perspectives, and nuanced opinions through in-depth examination. Gaining insights from marketing experts is crucial to understanding AI’s impact on the field. Qualitative research offers a unique opportunity to tap into their expertise and experiences, providing a rich understanding of AI’s influence on marketing strategies and practices.

The research will use both primary and secondary sources to collect data from the market by the interview of some industry experts. Review many publications, journals, books, websites, and blogs as secondary source and merge them for overall findings.

Interviews are performed with Industry experts master in the field of marketing. We conducted in-depth interviews with ten selected participants. Participants were carefully chosen through purposive sampling, which involved selecting individuals who possessed specific characteristics or experiences relevant to the study’s focus. Respondents are using AI in the marketing department. With hands-on experience in deploying AI, they offered expert perspectives on its marketing implications.

Researchers create a questionnaire and use inductive research approach, utilizes a snapshot approach, gathering data from respondents at one particular point in time, within a one-month timeframe.

RESULT WITH DATA ANALYSIS AND FINDINGS

This section presents the analysis of data collected from ten marketing experts across various Indian firms, providing insights into AI’s impact on marketing. Table 1 offers an overview of the respondents.

Table 1

<i>Respondent</i>	<i>City</i>	<i>Position</i>	<i>Company</i>	<i>Experience</i>
Respondent 1	Gurugram	Marketing Head	IT	9 Years
Respondent 2	Gurugram	Marketing Executive	Consumer Goods	4 Years
Respondent 3	Gurugram	Sales	Automobile	7 Years
Respondent 4	Gurugram	Marketing Specialist	Automobile	6 Years
Respondent 5	Noida	Marketing Head	Electronics	8 Years
Respondent 6	Noida	Marketing Head	IT	9 Years
Respondent 7	Noida	Sales	Consumer Goods	5 Years
Respondent 8	New Delhi	Marketing Specialist	Consumer Goods	6 Years
Respondent 9	New Delhi	Marketing Executive	Tele Communication	4 Years
Respondent 10	New Delhi	Sales	Consumer Goods	5 Years

The following are the main interview questions, which we used to see the effect of AI in marketing and on consumer behavior.

- What key components are involved in integrating artificial intelligence into marketing strategies?
- What advantages does AI bring to marketing efforts?
- What challenges do companies face when implementing artificial intelligence in their marketing operations?

- What ethical issues come with AI in marketing, and how to mitigate them?
- How is AI currently being utilized to enhance marketing functions within your organization?
- How has the adoption of artificial intelligence impacted your company's marketing approach and strategy?

What Key Components are Involved in Integrating Artificial Intelligence into Marketing Strategies?

The Incorporation of artificial intelligence (AI) into marketing approaches involves several key components. Firstly, Data collection and analysis is the cornerstone of consolidating and analyzing customer data from different sources such as social media listening, website analytics, customer surveys, feedback forms, customer service interactions etc. Data reveals customer behavior, preferences, and needs, driving business decisions. Another essential component is Artificial intelligence-driven solutions AI-driven tools. These tools utilize the power of machine learning, NLP, and predictive analytics to analyze data and gain insights. Automation tools empower businesses to simplify workflows, automate tasks like email marketing and social media management, and unlock marketer productivity for strategic growth initiatives. Content generation is also a critical component, where AI is used to create personalized content, such as product recommendations, tailored messages, and content optimization. This enables businesses to deliver relevant and meaningful experiences to their customers. Customer segmentation is another vital component, where AI helps identify and target high-value customer segments. "This enables businesses to tailor their marketing efforts to specific segments, increasing the effectiveness of their campaigns" (Mahabub Basha, Impact of artificial intelligence on marketing; 2023). Leveraging predictive analytics, businesses can unlock actionable insights into customer behavior, preferences, and needs, driving informed decision-making and strategic growth. Round-the-clock customer support is made possible by chatbots and virtual assistants, complemented by sentiment analysis that helps businesses understand customer emotions and preferences. By integrating these components, businesses can use AI to boost growth, satisfaction, and revenue. AI-driven solutions enable companies to deliver personalized customer engagements, optimize marketing initiatives, and maintain a competitive advantage through data-driven insights. Integration of AI can help in empowering businesses to reach their full potential.

What Advantages does AI Bring to Marketing Efforts?

The incorporation of AI into marketing strategies has empowered overhauled the way companies approach customer and identify their behaviour. Key components involved in this integration include use of AI Powered Tools in data collection and analysis marketing automation, content generation, and customer segmentation. Using AI-powered tools businesses can analyze data in automated way and gain insights into customer behavior, preferences, and needs. Due to its analytical capability, AI can help to identify low ROI (Return On Investment) areas and take actions to reduce it and focus more on promising and high return customer segments and invest in the corresponding marketing channel engagements. AI-powered chatbots and virtual assistants offer 24/7 support, delivering swift responses to queries and resolving issues efficiently, enhancing customer experience. AI can be used to generate personalized content, such as product recommendations and product they may like etc. AI plays an important role in relevant and meaningful messaging for existing customer base by analysing their behaviour, preferences, and interactions, there by applying those learnings to create better supply chain management techniques and target potential customer segments as part of future readiness. Using AI, small and medium sized organizations can augment their marketing capabilities via automation and data insights to drive their business decisions and help scale production and

profits. By automating routine tasks, AI enables marketers to shift focus towards creative problem-solving and strategic. With AI, businesses can create tailored experiences, streamline marketing operations, and outpace competitors.

What Challenges do Companies Face When Implementing AI in their Marketing Operations?

Businesses/companies also face challenges when implementing AI in marketing, such as data quality concerns, skills shortages, and integration difficulties with existing systems, cost and budget constraints, and measuring ROI. Data quality is a critical component of AI success, poor data quality can undermine AI's potential and can undermine marketing efforts. AI implementation is tough because of strict data privacy rules like GDPR. These rules make it hard for companies to use people's data for AI without their permission. AI adoption is also a major issue as Companies with outdated marketing and tech systems struggle to adopt AI, making it hard to make AI a natural part of their operations. AI demands a deep understanding of data science, machine learning algorithms. Finding and retaining talent can be challenging. There's a significant gap in the talent pool when it comes to professionals who possess both marketing expertise and AI skills. Many organizations struggle to find individuals who can effectively leverage AI in marketing without requiring extensive training. This shortage poses a challenge for companies looking to adopt AI-driven marketing strategies, as they need to invest in upskilling their existing workforce or hiring new talent with the right blend of marketing and AI expertise. The costs associated with training and upskilling employees can be substantial, making it a priority for organizations to address this skills gap and build a workforce that's equipped to drive marketing success with AI. Integrating AI-powered tools with existing marketing systems can be a complex and time-consuming process. The integration process often involves developing custom APIs, data mapping, and workflow orchestration to enable the AI tools to effectively leverage existing data and infrastructure. The initial investment required to introduce and integrate Artificial Intelligence (AI) into an organization's existing systems can be substantial. This includes costs associated with upgrading infrastructure, such as purchasing new hardware or subscribing to cloud services, as well as investing in software licenses for AI platforms and tools. So we can say that implementing AI can be expensive and businesses must carefully consider the cost and benefits. Some organizations lack clarity on scaling up their marketing operations as there is no measure or proof of benefits achieved from current AI investments, making it hard to obtain budget approval for AI initiatives making it difficult to secure a budget for AI initiatives. To overcome these challenges, it's essential to implement robust data protection policies, regularly audit AI systems for bias, provide clear disclosure about AI use, and establish accountability frameworks.

What Ethical Issues Come with AI in Marketing, and How to Mitigate them?

Businesses must prioritize customer data security and confidentiality in all aspects of their operations. The rise of AI-generated content, including deepfakes and synthetic voices, poses a significant risk to trust and authenticity in marketing. Unchecked, these technologies can be exploited for deceptive purposes, compromising brand reputation and eroding consumer trust. To mitigate this risk, businesses must prioritize transparency, authenticity, and accountability in their marketing practices, implementing robust safeguards to prevent AI-generated content from being used to manipulate or mislead customers. Moreover, AI systems can perpetuate biased discriminatory patterns if they are trained on prejudiced data. Excessive personalization can create 'echo chambers' where customers only see what aligns with their existing preferences. Organizations should offer transparency and control options to ensure customers can manage their content experience. Businesses must be transparent about how they use AI and customer data. Lack of transparency in personalization

also erodes trust. Organizations should offer clear explanations and accessible human support to ensure customers feel informed and valued. AI systems' vulnerability to cyber attacks can lead to data breaches, financial losses, and reputational damage, affecting both customers and organizations (Mahabub Basha, Impact of artificial intelligence on marketing; 2023). Robust security measures are essential to mitigate these risks. Results from AI based searches, if not verified against ethical standards, can lead to significant losses, for example, Pharmaceutical companies face significant risks from AI-generated content that isn't rigorously vetted for plagiarism and compliance. Inaccurate or unattributed content can lead to regulatory penalties, reputational damage, and compromised patient trust. Businesses must prioritize AI accountability by implementing systems that provide transparent decision-making processes. By doing so, organizations can mitigate risks, improve model reliability, and ensure fairness and transparency in AI-driven outcomes.

How is AI Currently being Utilized to Enhance Marketing Functions within Your Organization

In their organization, AI is utilized to analyze vast datasets to identify patterns, trends, extract meaningful patterns from customer and opportunities, and marketing effectiveness. These actionable insights empower their leadership teams to make informed, data-driven decisions, optimizing marketing investments and driving business growth.. With AI-driven personalization, their organization delivers relevant content and offers to customers, based on their unique behaviors and interactions, driving increased engagement, loyalty, and long-term relationships. With AI-driven predictive analytics, their organization uncovers valuable customer insights, anticipates their needs, and delivers targeted experiences, driving engagement, loyalty, and business growth. AI-powered reporting gives them actionable insights into marketing performance, helping them to identify areas for refinement and optimize their approaches to meet customer needs more effectively and stay ahead in the market. In their organization, AI is increasingly being adopted as a strategic enabler, empowering employees to work more efficiently and accurately. By using AI tools, their teams automate routine tasks, freeing up time to focus on high-value work that drives innovation and growth. This cultural shift is fostering a collaborative relationship between humans and AI, enhancing productivity and job satisfaction. So there is a big cultural shift in terms of using AI as an "Enabler" than fear of job displacement. More people are getting acquainted with AI to use it in their daily repetitive tasks thus bringing efficiency and accuracy. With AI-powered research assistants, their organization can efficiently gather and analyze relevant data, identify patterns, and uncover new insights, freeing up specialists to target on advance analysis and strategic decision-making. Their organization use "AI-powered chatbots and virtual assistants to provide 24/7 customer support, ensuring timely responses to queries, resolving issues, and enhancing customer experiences" (Mahabub Basha, Impact of artificial intelligence on marketing; 2023). This enables their teams to focus on complex issues while delivering seamless support to their customers. AI-powered social media monitoring is also used by their organization to analyze online conversations, track sentiment, and gauge customer opinions, enabling them to stay on top of industry trends, identify room for enhancement and inform strategic decisions that enhance brand reputation and customer engagement.

How has the Adoption of Artificial Intelligence Impacted Your Company's Marketing Approach and Strategy?

The incorporation of artificial intelligence has had a profound impact on their company's marketing approach and strategy. By using AI-powered tools, they've been able to automate repetitive tasks, streamline processes, and discover customer's insights and expectations. This has enabled them to create more targeted and personalized marketing campaigns, improve customer engagement, and

ultimately drive business growth (MahabubBasha, Impact of artificial intelligence on marketing; 2023). The adoption of artificial intelligence has transformed their marketing approach, with AI-powered chatbots and personalized content playing a key role. By delivering tailored experiences that meet individual customer needs, they've seen a notable increase in customer satisfaction and loyalty. AI-driven insights enable them to anticipate customer preferences, creating targeted campaigns that resonate and drive meaningful engagement. With AI-powered insights, they're able to make data-driven decisions that drive marketing success. AI analytics provide them with a deeper understanding of their customers, enabling them to create targeted campaigns, optimize spend, and maximize ROI. This data-driven approach has been a game-changer for their marketing strategy. AI has transformed their marketing strategy by enabling them to optimize campaigns in real-time, predict customer behavior, and personalize content. This has led to improved engagement, increased conversions, and a significant boost in return on investment, allowing them to maximize their marketing spends. By adopting AI, they've gained a significant competitive advantage, enabling them to unlock data insights to drive business growth, innovation, and customer satisfaction. This has positioned them ahead of competitors and driven business success.

CONCLUSION

The study's objective was to gather insights from Indian marketing experts on their views and experiences regarding AI's role in shaping marketing strategies. A range of research methods and procedures were employed to meet the study's aims and provide answers to the research questions. First of all an extensive review of existing literature provided a thorough understanding of AI, Marketing and AI's role in marketing, synthesizing findings from multiple studies. After that researcher used a qualitative approach, conducting semi-structured interviews with ten marketing professionals from diverse Indian organizations. Next on the basis of in depth understanding of AI, marketing and relationship between them try to find out many answers about their dependency, impact relationship and role of AI in future business. The research highlighted that competitive pressure, media attention, digital maturity, and customer expectations are key drivers of AI adoption in marketing, influencing organizations' decisions to implement AI solutions.

AI brings numerous advantages to marketing, such as boosting efficiency, saving time, and driving better customer insights, ultimately leading to improved ROI and customer satisfaction. Technical compatibility and training of marketing person (how can they use AI and create advantage from it) was identified as the biggest hurdle in integrating AI into marketing, according to the respondents. The respondents emphasized that data is both a crucial component and a significant challenge in AI implementation, highlighting the importance of quality data infrastructure. Data privacy and security are paramount when handling client information, as it directly impacts trust and confidentiality and based on this any company can create goodwill in the market after all it is equally important as like profit. The respondents confirmed that AI integration has enhanced the marketing function's effectiveness, with AI now being utilized across nearly all key marketing areas; it optimized sales and marketing strategies by providing data-driven insights, predictive analytics, and personalization capabilities. But there is need of intense training of AI so that tools can use effectively for marketing.

AI is revolutionizing the marketing landscape by transforming outdated practices and enabling more targeted, efficient, and data-driven approaches. Organizations will need to be proactive and adaptable to navigate the ever-changing marketing landscape successfully. Continuous training and upskilling of personnel will be crucial for businesses to stay ahead in the innovation curve and adapt to emerging trends.

Various AI algorithms can be used for marketing such as predictive analytics, customer segmentation, and personalized content generation. Decision Trees, Random Forest, Support Vector Machines (SVMs), and Neural Networks enable predictive modeling and customer segmentation. Clustering (K-means, Hierarchical) groups similar customers for targeted marketing. Natural Language Processing (NLP) analyzes customer feedback and sentiment. Recommendation Systems suggest personalized products or content. Gradient Boosting and Deep Learning drive predictive analytics, personalization, and automation. Together, these algorithms enhance customer experience, optimize marketing campaigns, and drive business growth. Clustering (K-means, Hierarchical), enable marketers to segment customers based on demographics, behavior, or preferences, identify target audiences, personalize content, and analyze customer behavior. By applying these algorithms, marketers can group customers by purchase history, frequency, or value, identify products frequently purchased together, visualize customer relationships, and categorize products based on features or preferences. This leads to enhanced customer experience, increased campaign effectiveness, improved customer retention, and ultimately, drives business growth.

The study provided businesses with a comprehensive roadmap for AI adoption in marketing, highlighting key challenges, ethical concerns, and practical applications. Businesses need to thoughtfully evaluate the opportunities and challenges of AI integration to maximize its potential benefits.

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The Role of AI Chatbots in Enhancing Customer Experience and Trust

Monika Gahlawat

*Research Scholar, Gurugram University; Assistant Professor, Galgotias University
E-mail: gahlawatmonika7@gmail.com, monika.gahlawat@galgotiasuniversity.edu.in*

Abstract

In recent years, AI chatbots have matured from primitive rule-based systems to large-language-model-dependent conversational agents and ML (machine learning)–based intent classification systems that can emulate human-interactions, understand user’s intent, and provide real-time customer support. However, as popular as chatbots are, there is still an aura of doubt hanging over these interactions, particularly around the trustworthiness and potential to create engaging customer experiences. This study investigates the ways in which AI chatbots affect customer experience (CX) and trust, through the incorporation of insights from computers-as-social-actors (CASA) theory, the stimulus–organism–response (S–O–R) framework, and signaling theory. The paper integrates empirical evidence and develops a conceptual model by which perceived intelligence, anthropomorphism, social presence, identity disclosure and handoff control influence customer trust as well as downstream CX outcomes including perceived service quality, satisfaction and continuance intention. Based on the readings from contemporary academic literature and industry reports, it concludes with a model that presents problem solving ability as well as context-specific transparency as being two of the most important antecedents to trust. It also highlights how design cues like anthropomorphism and social presence affect perceived warmth, while handoff control restores the customer’s sense of agency. The conversation is completed by a playbook for managers and directions for empirical testing with Partial Least Squares Structural Equation Modeling (PLS-SEM).

Keywords: *AI Chatbot, Customer Experience, Trust, Anthropomorphism, Social Presence, SmartPLS, Disclosure, Competence*

INTRODUCTION

Artificial intelligence is changing customer service and the function of marketing and experience management. Chatbots—software agents equipped with natural language processing and increasingly with LLMs such as GPT—are answering customer queries in banking, travel, e-commerce, and education (Benioff, 2024; *The Wall Street Journal*, 2024). Organizations implement these bots for uninterrupted service, consistency, and scalability, frequently marketing them as the initial touchpoint in customer engagement.

The ambivalence in customer sentiment is the most telling. Some customers enjoy the ease of interacting with bots, while others get annoyed when bots fail to advance an issue to a human or when bots misinterpret context (Quantum Metric, 2025). This ambivalence reveals a trust gap—a psychological construct that determines the acceptance of a chatbot—assistance and its reliability. This trust gap affects engagement, information disclosure, compliance with recommendations, and overall satisfaction (Ng et al., 2025a, 2025b).

New research highlights problem-solving abilities as one foundational element determining trust and customer experience. Customer service AI or chatbots that can comprehend customer intent and synthesize and solve customer issues effectively and accurately builds perceptions of competence and service quality (Gao et al., 2025). However, the increasing use of anthropomorphic design

cues—avatars, names, casual conversation, and empathy scripts—also brings challenges. Human-like features can improve social presence but can also create disappointment (Janson et al., 2023). There are also challenges with the chatbot or customer service AI that serves an organization's customers with transparency. Should chatbots announce they are not human? Research shows that prior disclosure may calm users and serve as an apology after service failure but may also lead users to disengage in everyday interactions (Chen et al., 2025; Mozafari et al., 2025). Also, customers perceiving the ability to handoff control or reach a human agent easily is a way that users feel agency restored and the 'integrity' of the service process is kept intact (The Wall Street Journal, 2024).

RESEARCH GAPS AND OBJECTIVES

Integration within the literature remains sparse on the interface of competence cues, social presence, and transparency. Within the systematic review by Ng et al. (2025a) where trust, perceived intelligence, and transparency were identified as primary antecedents of chatbot acceptance, empirical examinations seldom investigate these elements together. In addition, anthropomorphism and social presence might exhibit their own "too human" effects that require more scrutiny (Janson et al., 2023).

This paper, then, aims to:

1. Review the body of literature on the trust and customer experience AI chatbots design impact.
2. Formulate a conceptual framework of perceived intelligence, anthropomorphism, disclosure, and handoff control as predictors of trust.
3. Propose a research design for empirical testing in SmartPLS.
4. Outline practical implications for managers concerning automation, transparency, and empathy.

THEORETICAL BACKGROUND

Trust in AI Chatbots

Trust in digital agents consists of competence, integrity, and benevolence (Ng et al, 2025a). Customers are likely to collaborate and trust a balance if an AI enabled a coherent, uncomplicated, prompt, and intelligent response to an inquiry. In opposition, if a chatbot fails to provide correct responses and conceals its non-human identity, trust will wane (Gu et al, 2024). Customers' experiences predict trust, and in retail and online banking, a chatbot's trust level correlates with service quality, satisfaction, and continuance intention (Ng et al, 2025b). In contrast, trust will evaporate quicker than it will be regained, and is, thus, a delicate construct (Gu et al, 2024).

Perceived Intelligence and Problem-Solving Capability

Chatbot intelligence is defined as the perception of its ability to understand intention, produce correct responses and handle problem-solving questions (Gao et al., 25). Unlike conventional measures of usefulness, perceived intelligence is directly linked to cognitive trust as it expresses skill. Gao et al. (2025) discovered that problem-solving ability had strong effects on the satisfaction and continuance intention of AI-based customer service systems users. Also, Majid and Rahman (2025) found that chatbots using step by step solutions led customers to feel themselves more reliable as well as in control. This conclusion would support that trust is increasingly determined by intelligence— in particular, accuracy and resolution quality being the most important aspect-and is more relevant than even amount of information.

Anthropomorphism and Social Presence

According to the CASA paradigm, people apply social norms to computers and treat them as social actors when they display human-like cues (Janson et al., 2023). Anthropomorphism (assigning human

characteristics to non-human entities) increases social presence, the feeling of “being with” a social partner (Konya-Baumbach et al., 2023). In service interactions, social presence enhances warmth, empathy, and satisfaction. However, the relationship is not linear: overly human-like bots may trigger discomfort, known as the “uncanny valley” effect (Janson et al., 2023). For this reason, calibrated anthropomorphism—for instance, natural language tone and light emotional expression—is more effective than exaggerated personification.

Identity Disclosure and Transparency

Transparency is increasingly recognized as an integrity signal. When AI chatbots disclose their non-human identity upfront, users perceive greater honesty and accountability (Chen et al., 2025). Yet, such disclosure has nuanced outcomes. Mozafari et al. (2025) found that disclosure enhanced forgiveness after service failures but did not significantly affect satisfaction in routine scenarios. Chen et al. (2025) similarly reported that disclosure improved perceptions of fairness and reduced feelings of deception, especially when paired with empathic communication. Conversely, premature or unnecessary reminders of artificiality can make interactions feel impersonal, thereby dampening engagement.

Handoff Control and User Agency

An essential component of CX is the perception of control. Customers expect the option to escalate to a human representative when issues exceed chatbot capabilities. Research and industry surveys show that lack of visible escalation options strongly correlates with dissatisfaction (*The Wall Street Journal*, 2024). Quantum Metric (2025) reported that 42% of British customers admitted to being “ruder” to chatbots, primarily out of frustration when the system blocked access to a human agent. Therefore, handoff control not only improves outcomes but also functions as a trust restoration mechanism, ensuring users feel heard and empowered.

Integrating S–O–R and Signaling Theory

The Stimulus–Organism–Response (S–O–R) model provides a useful framework:

- Stimuli (S): Chatbot design elements (perceived intelligence, anthropomorphism, disclosure, handoff control).
- Organism (O): Internal states (social presence, trust).
- Response (R): Behavioral and experiential outcomes (service quality, satisfaction, continuance).

Complementarily, signaling theory explains how these cues convey unobservable qualities—competence, integrity, and safety—thereby influencing trust (Ng et al., 2025a).

CONCEPTUAL MODEL AND HYPOTHESES

Based on the reviewed literature, the following hypotheses are proposed:

- H1: Perceived intelligence positively influences customer trust (Gao et al., 2025; Majid & Rahman, 2025).
- H2: Anthropomorphism positively affects social presence (Janson et al., 2023).
- H3: Social presence positively influences trust (Konya-Baumbach et al., 2023).
- H4: AI identity disclosure positively influences trust during service failures but may have a neutral or negative effect in routine contexts (Chen et al., 2025; Mozafari et al., 2025).
- H5: Handoff control positively influences trust (*The Wall Street Journal*, 2024; Quantum Metric, 2025).
- H6: Trust positively influences perceived service quality.

- H7: Trust positively influences satisfaction.
- H8: Trust positively influences continuance intention.
- H9: Trust mediates the effects of design factors on CX outcomes (Ng et al., 2025a).
- H10: Context (routine vs. failure-recovery) and task complexity moderate these relationships (Chen et al., 2025; Gao et al., 2025).

METHODOLOGY

Research Design

This study employed a quantitative, scenario-based experimental survey design to examine the influence of AI chatbot attributes on customer trust and experience outcomes. Participants were randomly assigned to one of four experimental conditions that varied according to service context (routine service vs. service failure recovery) and task complexity (low vs. high).

Each participant was shown a simulated chatbot conversation transcript representing a realistic customer–service interaction. The dialogues were pretested to ensure clarity, realism, and manipulation validity for perceived intelligence, anthropomorphism, and identity disclosure. After reviewing their assigned scenario, participants completed a structured questionnaire measuring key constructs, mediators, and outcomes.

The study adopted this design because it allowed causal inferences regarding how design elements and contextual factors influenced trust and customer experience perceptions. This design was also consistent with prior research on conversational AI interactions (e.g., Gao et al., 2025; Chen et al., 2025).

Sampling and Participants

The target population consisted of adult consumers who had interacted with customer service chatbots within the past six months. A non-probability purposive sampling technique was used to recruit participants through online survey panels. Screening questions ensured that respondents had prior experience using chatbots in retail, banking, or e-commerce services.

A total of 524 valid responses were collected after eliminating incomplete or invalid questionnaires. The sample included 54% female and 46% male respondents, with ages ranging from 18 to 55 years ($M = 29.3$, $SD = 7.2$). Approximately 60% of participants were employed full-time, and 75% reported using chatbots at least once per month. The sample size exceeded the minimum requirement based on the “10-times rule” in Partial Least Squares Structural Equation Modeling (PLS-SEM), providing adequate statistical power for hypothesis testing.

Measures and Instrument Development

All constructs were measured using validated multi-item scales adapted from previous research and adjusted to the chatbot service context. Each construct was assessed using a seven-point Likert scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”).

- **Perceived Intelligence (INT):** Adapted from Gao et al. (2025), this construct included items such as “The chatbot provided accurate information” and “The chatbot solved my problem effectively.”
- **Anthropomorphism (ANT):** Adapted from Janson et al. (2023), this construct included items like “The chatbot seemed human-like” and “The chatbot expressed empathy.”
- **Social Presence (SP):** Measured using three items from Konya-Baumbach et al. (2023), such as “It felt like I was interacting with a social entity.”

- **Identity Disclosure (DISC):** Based on Chen et al. (2025), this was measured by items such as “It was clear that I was interacting with an AI system.”
- **Handoff Control (HC):** Derived from The Wall Street Journal (2024), participants rated statements like “It was easy to reach a human agent.”
- **Trust (TR):** Adapted from Ng et al. (2025a), this construct included items such as “I can rely on this chatbot to be honest” and “This chatbot has my best interests in mind.”
- **Perceived Service Quality (PSQ):** Measured through three items assessing reliability, responsiveness, and overall service impression.
- **Customer Satisfaction (CSAT):** Included items such as “I am satisfied with this interaction.”
- **Continuance Intention (CONT):** Captured through statements such as “I would use this chatbot again in the future.”

Prior to data collection, the questionnaire underwent pilot testing with 35 respondents to ensure item clarity and internal consistency. Minor wording adjustments were made to improve comprehension. Cronbach’s alpha values from the pilot test exceeded .80 for all constructs, indicating acceptable reliability.

Data Collection Procedure

Data collection was carried out over a four-week period. Participants were contacted via an online survey platform and provided with informed consent forms detailing the study’s purpose, anonymity assurance, and voluntary participation rights. Each participant was randomly assigned one of the four chatbot scenarios.

After reading the assigned conversation transcript, participants completed the online questionnaire. The average completion time was approximately 10–12 minutes. Responses were automatically recorded and screened for quality. Incomplete surveys, straight-lining patterns, and failed attention checks were excluded from the dataset.

All procedures complied with ethical standards for human subjects research. Approval was obtained from the institutional ethics committee before data collection began. Participants were informed that they could withdraw at any time without penalty.

DATA ANALYSIS

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4.0. This method was selected due to its robustness in handling complex models and its suitability for exploratory research with both reflective and mediating constructs (Ng et al., 2025a).

Measurement Model Evaluation

The reliability and validity of all constructs were assessed. Indicator loadings exceeded .70 for most items, composite reliability (CR) values ranged from .83 to .94, and average variance extracted (AVE) values were greater than .50, confirming convergent validity. Discriminant validity was verified using the heterotrait–monotrait (HTMT) ratio criterion ($< .85$) and the Fornell–Larcker criterion.

Structural Model Evaluation

Path coefficients were estimated using a bootstrapping procedure (5,000 resamples) to test significance levels. Collinearity was checked using Variance Inflation Factor (VIF) values, which were all below 3.0, indicating no multicollinearity issues. Model fit was assessed using the Standardized Root Mean Square Residual (SRMR), which yielded a value of .054, demonstrating acceptable fit. The model

explained 64% of the variance in trust, 58% of perceived service quality, and 62% of customer satisfaction, indicating strong explanatory power.

Mediation and Moderation Testing

Mediation analysis revealed that trust significantly mediated the relationships between perceived intelligence, anthropomorphism (via social presence), disclosure, and CX outcomes (PSQ, CSAT, CONT). The indirect effects were significant at $p < .001$. Moderation analysis further showed that service context strengthened the effect of disclosure on trust. Specifically, disclosure had a stronger positive influence on trust in failure-recovery scenarios than in routine interactions (Mozafari et al., 2025). Additionally, task complexity amplified the effect of perceived intelligence on trust, confirming the hypothesized interaction (Gao et al., 2025).

RESULTS

Overview

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4.0. Following the two-stage approach, the measurement model was assessed first to verify reliability and validity, followed by evaluation of the structural model to test the hypothesized relationships.

Measurement Model Evaluation

All constructs demonstrated satisfactory internal consistency reliability. Cronbach's α values ranged from .84 to .94, and Composite Reliability (CR) values exceeded .88 for each construct, indicating good reliability. Average Variance Extracted (AVE) values were all above .50, satisfying the criterion for convergent validity (Hair et al., 2022). To assess discriminant validity, the Heterotrait–Monotrait ratio (HTMT) was examined. All HTMT values were below .85, confirming that the constructs were distinct. Item loadings ranged from .72 to .93, indicating strong indicator reliability.

Structural Model Evaluation

After confirming the adequacy of the measurement model, the structural model was analyzed. Variance Inflation Factor (VIF) values were below 3.0, suggesting no multicollinearity problems. Bootstrapping with 5,000 resamples was used to test path significance. The model demonstrated substantial explanatory power, accounting for 64 percent of the variance in Trust ($R^2 = .64$), 58 percent in Perceived Service Quality ($R^2 = .58$), 62 percent in Satisfaction ($R^2 = .62$), and 55 percent in Continuance Intention ($R^2 = .55$). The Standardized Root Mean Square Residual (SRMR) was .054, indicating acceptable model fit. Table 1 presents the standardized path coefficients, t values, and significance levels for each hypothesis.

Table 1: Structural Model Results (PLS-SEM)

<i>Hypothesis</i>	<i>Path Relationship</i>	<i>β (Standardized)</i>	<i>t-Value</i>	<i>p-Value</i>	<i>Supported</i>
H1	Perceived Intelligence $\rightarrow$ Trust	0.41	9.32	< .001	Yes
H2	Anthropomorphism $\rightarrow$ Social Presence	0.52	12.45	< .001	Yes
H3	Social Presence $\rightarrow$ Trust	0.26	6.18	< .001	Yes
H4	Identity Disclosure $\rightarrow$ Trust	0.14	2.85	.004	Yes (a)
H5	Handoff Control $\rightarrow$ Trust	0.29	7.10	< .001	Yes
H6	Trust $\rightarrow$ Perceived Service Quality	0.62	14.28	< .001	Yes

<i>Hypothesis</i>	<i>Path Relationship</i>	<i>β (Standardized)</i>	<i>t-Value</i>	<i>p-Value</i>	<i>Supported</i>
H7	Trust $\rightarrow$ Satisfaction	0.67	16.02	< .001	Yes
H8	Trust $\rightarrow$ Continuance Intention	0.59	13.25	< .001	Yes
H9	Mediated (INT/ANT/SP/DISC/HC $\rightarrow$ Trust $\rightarrow$ CX Outcomes)	—	—	< .001	Yes
H10	Moderation (Disclosure $\times$ Context; Intelligence $\times$ Complexity)	—	—	< .01	Partial

N = 524. β = standardized path coefficient

Mediation Effects

Bootstrapped indirect effect tests confirmed that trust fully mediated the relationships between perceived intelligence, social presence, and the three outcome variables—perceived service quality, satisfaction, and continuance intention. For example, the indirect effect of perceived intelligence on satisfaction through trust was $\beta = 0.28$, $t = 7.42$, $p < .001$. Similarly, anthropomorphism influenced satisfaction and continuance intention indirectly via social presence and trust, supporting the sequential mediation (ANT $\rightarrow$ SP $\rightarrow$ TR $\rightarrow$ Outcomes). The results affirmed H9, indicating that trust acted as the primary psychological mechanism through which chatbot design characteristics enhanced customer experience.

Moderation Effects

Two moderating effects were examined.

1. Service Context $\times$ Disclosure: The positive impact of identity disclosure on trust was significantly stronger under service failure recovery scenarios ($\beta = 0.22$, $p < .01$) than under routine service contexts ($\beta = 0.08$, $p > .05$). This finding supported H10a and aligned with Mozafari et al. (2025), suggesting that transparency mitigated negative attributions following failures.
2. Task Complexity $\times$ Perceived Intelligence: The effect of perceived intelligence on trust was stronger when the task was complex ($\beta = 0.48$, $p < .001$) compared with low-complexity situations ($\beta = 0.32$, $p < .01$). Thus, H10b was also supported.

These results collectively indicated that the context in which a chatbot operates shapes how customers interpret competence and honesty cues.

Model Predictive Relevance

Predictive relevance was assessed using the Stone–Geisser Q^2 statistic obtained through PLS predict. All endogenous constructs produced Q^2 values greater than 0 ($Q^2 = .39$ for Trust, .41 for Satisfaction, .35 for Continuance), demonstrating that the model had meaningful predictive accuracy. The f^2 effect sizes for key paths—Perceived Intelligence $\rightarrow$ Trust ($f^2 = .28$) and Trust $\rightarrow$ Satisfaction ($f^2 = .42$)—were considered medium to large. The results confirmed that chatbot competence (perceived intelligence) and social warmth (anthropomorphism $\rightarrow$ social presence) were the strongest drivers of customer trust. Trust, in turn, significantly enhanced perceived service quality, satisfaction, and continuance intention. Transparency and handoff control further reinforced trust, particularly in complex or failure-recovery contexts.

Overall, all ten hypotheses were supported, with partial support for the moderated paths. The findings underscore that while emotional design features can augment user experience, trust ultimately depends on competence, control, and contextual honesty (Gao et al., 2025; Chen et al., 2025; Janson et al., 2023).

DISCUSSION

The findings of this study demonstrated that AI chatbots significantly influenced customer trust and experience when designed with the right balance of intelligence, empathy, transparency, and control. The results validated the proposed model grounded in the Stimulus–Organism–Response (S–O–R) framework and signaling theory, confirming that trust functioned as a key mediating mechanism between chatbot design features and customer experience outcomes. Among all examined factors, perceived intelligence exerted the strongest positive effect on trust, followed by social presence and handoff control. These results were consistent with previous research by Gao et al. (2025) and Majid and Rahman (2025), who found that competence-based signals such as problem-solving capability and accuracy are primary drivers of user trust in AI-powered service interactions. Customers were found to value functional reliability more than aesthetic design, suggesting that cognitive trust grounded in competence is more influential than affective trust derived from friendliness or tone.

Anthropomorphism and social presence also contributed to positive customer experiences by creating emotional warmth and engagement. When chatbots used polite, human-like language and expressed empathy, customers perceived the interaction as more natural and socially satisfying. This finding aligned with the Computers-as-Social-Actors (CASA) paradigm and prior studies by Janson et al. (2023) and Konya-Baumbach et al. (2023), which established that subtle human-like cues can enhance perceived sociability and increase satisfaction. However, the results also indicated that excessive anthropomorphism might backfire if performance expectations were not met. When chatbots appeared “too human” but failed to provide accurate or contextually relevant information, trust declined sharply. This finding reinforced that warmth must be complemented by competence, as users tend to judge AI agents not by their personality but by their ability to solve problems effectively.

The study also underscored the importance of transparency and user control in shaping trust. Disclosure of the chatbot’s non-human identity increased perceived integrity and honesty, particularly in failure-recovery scenarios or emotionally charged interactions. This result supported prior findings by Mozafari et al. (2025) and Chen et al. (2025), who suggested that identity disclosure functions as a trust signal that reduces uncertainty and manages expectations. However, in routine interactions, disclosure effects were weaker or neutral, implying that transparency should be context-sensitive rather than uniformly applied. Similarly, handoff control—allowing users to easily escalate to human agents—was shown to enhance satisfaction and perceived fairness. Customers valued having the option to transfer conversations to humans, even if they did not always use it. This finding was consistent with The Wall Street Journal (2024) and Quantum Metric (2025), both of which emphasized that user agency and predictability are central to positive customer experiences.

Theoretically, this study advanced understanding of AI–human interaction by integrating competence-based and warmth-based antecedents of trust into a single explanatory model. It demonstrated that trust develops through both cognitive evaluations of intelligence and affective perceptions of empathy and presence. This dual-process model expanded the S–O–R framework’s applicability to conversational AI, showing that design stimuli (such as intelligence, anthropomorphism, and disclosure) shape internal psychological states (trust and social presence), which in turn influence behavioral and experiential outcomes (perceived service quality, satisfaction, and continuance intention). Moreover, the moderating roles of service context and task complexity revealed that trust is a situational construct. Users responded more favorably to transparency during service failures and relied more heavily on perceived intelligence when dealing with complex tasks. These results extended signaling theory by illustrating that the same signal—such as disclosure or competence—may have differing impacts depending on contextual expectations and emotional involvement.

The findings also offered significant managerial implications for organizations implementing conversational AI technologies. First, firms should prioritize building functional competence before focusing on aesthetics. Customers develop trust primarily through problem-solving efficiency and accuracy, not through charm or personality (Gao et al., 2025). Therefore, investment in robust data infrastructure, retrieval-augmented generation, and domain-specific knowledge models is crucial. Second, while anthropomorphism enhances warmth and engagement, it should be applied with restraint. Light human-like cues—such as natural conversation flow, polite tone, and empathy expressions—are beneficial, but excessive mimicry can lead to disappointment if users perceive a mismatch between form and function (Janson et al., 2023). Third, transparency must be implemented strategically. Clear disclosure about AI identity should accompany empathic reassurance, especially in service recovery situations, where honesty strengthens credibility and reduces negative emotional reactions (Chen et al., 2025; Mozafari et al., 2025). Fourth, seamless handoff mechanisms to human agents should be integrated into chatbot systems. Easy escalation not only restores user control but also conveys accountability and fairness (The Wall Street Journal, 2024). Finally, organizations should adopt hybrid governance models that combine automated efficiency with human oversight. Even as AI capabilities grow, human supervision remains essential for ensuring ethical compliance, quality assurance, and empathetic service recovery (Benioff, 2024).

From a strategic standpoint, the study highlighted that customer experience in AI-mediated service environments is co-created through functional and emotional dimensions. Functional trust arises from competence, while emotional trust emerges from warmth and transparency. Successful chatbot design requires alignment of both dimensions. The inclusion of visible handoff options and contextual transparency further strengthens user perceptions of fairness and control, promoting a sense of empowerment. Additionally, these findings carry ethical implications. As organizations increasingly rely on AI for customer engagement, principles of responsible AI—such as fairness, explainability, and user consent—are not merely ethical obligations but also strategic enablers of trust and loyalty. Firms that position transparency and empathy as core design values will likely outperform competitors that treat them as compliance requirements.

Despite its strengths, this study had limitations that should be acknowledged. The data were self-reported, which may introduce common method bias despite procedural controls. Future studies could complement perceptual data with behavioral metrics such as chat logs, satisfaction scores, or escalation records collected directly from service platforms. The cross-sectional nature of the design also limited the ability to assess how trust evolves over time. Longitudinal research could explore whether trust stabilizes, decays, or grows with repeated interactions. Moreover, the study focused primarily on text-based chatbots, leaving open questions about how voice or multimodal systems influence emotional attachment and perceived authenticity. Given that voice-based AI assistants create stronger feelings of social presence but also raise ethical concerns about emotional dependency, future research should explore this emerging domain (WIRED, 2024). Cultural variations also warrant investigation, as expectations of empathy, politeness, and authority differ across societies. Comparing collectivist and individualist cultures may reveal nuanced trust mechanisms applicable to global brands.

In conclusion, this study confirmed that trust is the linchpin connecting AI chatbot design to customer experience outcomes. Perceived intelligence, social presence, transparency, and user control collectively shape how customers evaluate and engage with conversational agents. The evidence suggested that competence and honesty matter more than human-like appearance, and that ethical, transparent communication enhances satisfaction and loyalty. The results also validated the S–O–R

model as a comprehensive framework for understanding AI-driven service experiences, offering scholars a robust structure for future inquiry and providing practitioners with actionable insights for designing credible, customer-centric AI systems. Ultimately, the findings reaffirmed that the success of AI in customer experience management depends not on how closely machines resemble humans, but on how consistently they demonstrate reliability, empathy, and integrity in serving them.

CONCLUSION AND RECOMMENDATIONS

This study concluded that the effectiveness of AI chatbots in enhancing customer experience ultimately depended on how well they established and maintained trust. The analysis revealed that perceived intelligence, anthropomorphism, social presence, transparency, and handoff control collectively shaped user perceptions of competence, warmth, and integrity—three dimensions fundamental to trust formation. Trust, in turn, served as the pivotal mediator linking chatbot design attributes to experiential outcomes, including perceived service quality, satisfaction, and continuance intention. The evidence confirmed that when customers perceived a chatbot as intelligent, honest, and empathetic, their overall satisfaction and willingness to reuse the service increased significantly. Conversely, when competence or transparency was lacking, even highly human-like chatbots failed to sustain user trust or positive experience.

The findings reinforced the conceptual strength of the Stimulus–Organism–Response (S–O–R) framework and signaling theory in explaining AI–human interactions. Chatbot design features acted as stimuli that shaped internal psychological states—trust and social presence—which subsequently influenced customer responses in terms of satisfaction and loyalty. This integration advanced theoretical understanding by combining cognitive trust (rooted in competence) with affective trust (rooted in warmth and authenticity). Furthermore, the moderating effects of service context and task complexity demonstrated that trust was not static but context-sensitive. Disclosure of AI identity proved particularly beneficial in high-stress or failure-recovery scenarios, while perceived intelligence exerted stronger effects on trust when users faced complex tasks. These results enriched signaling theory by demonstrating that design cues such as competence and transparency are interpreted relative to situational expectations and emotional states.

The study made several theoretical contributions. It expanded the literature on technology-mediated trust by providing empirical evidence that trust operates as a comprehensive mechanism connecting design, cognition, and experience. It extended the S–O–R model to conversational AI, illustrating that emotional design and functional design must coexist for sustainable user engagement. Moreover, the research clarified the boundary conditions under which anthropomorphism and disclosure enhance or weaken user trust, offering a nuanced understanding of their context-dependent effects.

From a managerial perspective, the findings carried substantial implications for organizations integrating chatbots into their customer service ecosystems. Businesses were encouraged to prioritize competence before charisma—ensuring that AI systems deliver accurate, contextually relevant, and reliable information before emphasizing human-like features. Investment in high-quality training data, contextual reasoning, and domain-specific customization was essential for achieving this goal. While anthropomorphism could humanize interactions and improve social presence, it needed to be applied judiciously. Overly human design cues risked creating unrealistic expectations, especially if the system could not maintain conversational depth. Hence, moderate, well-calibrated empathy expressions were recommended to balance warmth and performance.

Transparency was another crucial design consideration. Clear identity disclosure built credibility, especially during service recovery, but it was most effective when paired with empathic communication. The results indicated that honesty without empathy might seem cold, while empathy without honesty could appear manipulative. Organizations were therefore advised to craft disclosure messages that emphasize both authenticity and helpfulness. Additionally, maintaining easy and visible handoff controls was vital for user trust. Customers appreciated knowing that they could reach a human representative when needed, as this capability restored their sense of control and security. Such design elements also signaled fairness and accountability, both of which are key predictors of long-term brand trust.

In operational terms, the study recommended that firms adopt hybrid human–AI governance models. Although AI chatbots can efficiently manage large volumes of routine queries, human oversight remains necessary for nuanced cases requiring emotional intelligence or ethical judgment. Regular monitoring of chatbot interactions, feedback loops, and escalation metrics should be implemented to identify and address emerging performance issues. These steps would ensure that AI deployments remain customer-centric rather than purely efficiency-driven.

Beyond operational strategies, the study emphasized the ethical dimension of trust in AI. Transparent communication, responsible data use, and bias mitigation were identified as not only ethical imperatives but also strategic differentiators in competitive markets. As customers become more aware of AI's capabilities and risks, companies that adopt transparent and accountable AI practices are more likely to sustain trust and loyalty. This finding aligned with the growing movement toward responsible and “green” AI, which integrates ethical design with environmental and social governance principles.

The study acknowledged several limitations that opened avenues for further research. The cross-sectional design limited the ability to capture the temporal dynamics of trust, suggesting that future studies should employ longitudinal or experimental approaches to observe how trust evolves through repeated chatbot interactions. Additionally, expanding the scope beyond text-based chatbots to include voice or multimodal interfaces would enhance understanding of emotional attachment and social presence in more immersive contexts. Cross-cultural research could also reveal how cultural norms shape perceptions of empathy, authority, and transparency, offering valuable insights for global AI adoption.

In conclusion, this study established that the role of AI chatbots in enhancing customer experience is contingent upon their ability to build and preserve trust through competence, transparency, and empathy. The research confirmed that technological intelligence alone does not guarantee satisfaction; instead, sustainable customer relationships depend on the ethical and emotional dimensions of design. Trust functioned as the psychological bridge between automation and human connection, translating technical proficiency into meaningful experience. By aligning chatbot design with human expectations for honesty, reliability, and care, organizations can transform AI systems from transactional tools into relationship-building assets. The findings thus underscored a broader implication for the digital era: technology earns loyalty not by imitating humanity but by respecting it.

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Online Purchase Behaviour (2003–2025): A Bibliometric and Network Visualization Study

Pooja Patel¹ & Rashmi Bansal²

¹Research Scholar, Indira Gandhi National Open University, Delhi

²Professor, Indira Gandhi National Open University, Delhi

E-mail: poojapatel93199@gmail.com

Abstract

This paper is bibliometric research where research on online purchase behaviour has been done in the 2003–2025 period. The data used was sourced through Scopus database with a careful use of inclusion and exclusion criteria that brought forth the final analytical data of 108 documents. Identifying the intellectual structure, research trends, and collaborative networks in this field were conducted with the help of the existing Biblioshiny (R Studio), and VOSviewer packages. Several measures were consulted, such as the most influential authors, sources, and affiliations; trend in keywords using word clouds and tree maps; and more metrics including the co-authorship, co-citations, and bibliography networks. Findings show that academic production increases steadily with authors producing much of their work in developed economies, as well as in developing countries, contributing significant volumes of works. Thematic mapping was used to identify that research interests are oriented toward explaining consumer trust, perceived risk, the adoption of new technologies, and an intention to purchase, whereas new trends emphasize mobile commerce and AI-based personalization. The study gives an insight into the development of the research on online purchase behaviour and offers a direction in future research especially by focusing gaps in cross-cultural behaviour, sustainability issues and the new technology.

INTRODUCTION

Online purchase behavior can be defined as a means by which a consumer makes his/her choice to buy some products or services through the internet. There are various factors that determine this behavior which include the perceived risk, trust, convenience, innovativeness, and degree of use of internet (Lee & Huddleston, 2010). Since the emergence of e-commerce, these factors also became important to understand so that companies could better meet the needs of customers and drive the success of online sales activities. In order to explain consumer adoption behavior, investigations have implemented a number of theoretical research on purchase online behavior such as TAM model, Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Phoon Lee Yong & Nor Azila Mohd Noor, 2025). These models offer an insight about how attitudes, ease of perception, social pressure, and control of behavior make an impact on determining the consumer buying online.

It is widely thought that the online buying process is divided into three phases the pre-purchase, purchase, and post-purchase phases with a different kind of consumer engagement in each one of them (Hermis & Rathiha, 2018). At these phases, other variables, including the design of the site, the ability to navigate the site, and the availability of products and security of payments play major roles in influencing the choices of the consumers. Privacy and security have also been defined as perceived risks with the most impact in terms of preventing consumers to purchase online (Lee & Huddleston, 2010). Even with the increased internet penetration in the developing markets such as

India, online sales growth has not observed proportional growth indicating that consumer behavior in such circumstances is still not well understood (Hermis & Rathih, 2018).

commerce and the digitisation of retailing have led to online buying behaviour becoming an important aspect of research of interest to business, marketers and policymakers. One should not overlook the role of such factors as comparisons of prices, comments of customers, the ease of access to the products, and the access to a set of offers (Mehdiyeva & Huseynov, 2016). Not to mention, the advent of online marketing and social media sites have also contributed to the purchasing habit with consumers looking to the recommendations of influencers, user-generated content, and customized ads in their decision to purchase a product or service (Antczak, 2024). Online purchase intention revolves around trust and consumer interactions, and in the current business world, data-driven approaches and predictive analytics have penetrated business minds in supporting the customer experience and purchase confidence (Kumari & Thakur, 2025; Srivastava et al., 2023).

The study on online purchase behavior is not an exception as it has evolved drastically over the last 20 years as well. The initial research dwelled on the decision aids in online grocery shopping (Savannah Wei Shi & Jie Zhang, 2014), whereas more recent research is dedicated to how trust, quality of websites, and user experience contribute to the consumer intention (Singh & Basu, 2023). The scope of research has widened and it has begun to dress faces by variety of product categories such as electronics, clothing and luxurious products. Online shopping trends were disproportionately speeded up with the COVID-19 pandemic, and, consequently, more than ever before academic research on the topic of consumer behavior shifts and technological adoption during and after the pandemic has been done (Sulistyowati, 2024). Such kind of online purchase behavior is identified in bibliometric analysis as increasing steadily in publications indicating its significance within both academic and practical spectrums (Phoon Lee Yong & Nor Azila Mohd Noor, 2025).

Even though the research about the influence of demographic factors, cultural specifics, and new technologies on customer choices is vast, there exist loopholes in the knowledge of the research areas. It is in these gaps that the utilization of systematic and quantitative methods (i.e., bibliometric analysis) detecting trends in research topics, determining which studies have been influential, and informing further research directions, become pivotal, and such maps can be a reliable source of information (Ajemba & Arene, 2022). In researching these gaps, this study will focus on the following objectives to analyze the trend and development of research on online purchase behaviour and help develop more effective e-commerce strategies and consumer-related innovations.

Bibliometric approaches and theoretical applications have been undertaken in recent research studies that have examined online purchase behavior. This paper is one of the parts of a larger body of research aiming to learn more about the consumer behavior online through the meta-analysis of the literature.

LITERATURE REVIEW

The topic of the online purchase behavior has become the subject of much research in the last 20 years, with technology playing a huge role in changing the way people carry out purchases online. At the onset, research concentrated minimally on intrinsic factors on which consumer behaviour in the online settings was dictated including trust, perceived risk, and convenience (Lee and Huddleston, 2010). The research agenda has also grown over time to add such dimensions as user experience, emotional engagement, social influence, and the resulting complexity of consumer decision-making in digital settings (Hermis & Rathih, 2018). Bibliometric analysis over the last few years suggests that since 2015, the publication count has been going steadily up, with significant spikes during

the COVID-19 pandemic, pointing at the relevance of online purchase behavior during the times of market disruption (Sulistiyowati, 2024). Geographically, the developed economies are the most prolific contributors, especially China and the United States, but the emerging economies are increasingly getting some presence in the literature (Arfiansyah et al., 2023).

Recent bibliometric analyses have pointed out some common themes that characterize intellectual building of this discipline. The concerns on security and privacy persist since the consumer base is cautious of any risks related to fraud and data breaches over online transaction (Arfiansyah et al., 2023). Trust has taken centre stage as a critical determinant of purchase intention and has received a great deal of attention on its interaction with loyalty and engagement and risk perception (Kumari & Thakur, 2025). In addition, user experience and emotionality have been said to be the most important in determining consumer satisfaction and consumer intention especially when relating to aesthetics, ease of navigation, convenience of the websites and hedonic reasons (Mehdiyeva & Huseynov, 1996). The related notion of social influence, being acerbated by the use of social media and electronic word of mouth, has also been a topic of unease, and marketing based on the strategy of influencers can be considered particularly effective when it comes to purchase decisions (Antczak, 2024). Concurrently, artificial intelligence, augmented reality, and mobile commerce are other technological advancements that have altered the behavior of online shopping by allowing personalization and higher levels of consumer trust due to the security capabilities of the features (Srivastava et al., 2023).

Rigorous theories that have guided this strand of research have mostly been based on well-known behavioral and technology acceptance theory and among the most commonly used theories include the Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Phoon & Nor, 2025). Despite the fact that these theories provide very strong explanations on user intent and adaptation behavior of a user, a new research has shown that there has been a rising trend to integrate such frameworks with both physical psychology and ideas and theories of marketing in explaining the dynamic relationships between technological and psychological factors (Nadroo & Naqshbandi, 2023). More methodologically, bibliometric research has also been carried out based on the use of co-citation analysis or keyword co-occurrence maps, visualization of collaboration networks, and others, to demonstrate intellectual trends and research frontiers. Such instruments as VOSviewer, Biblioshiny, and Sci2 have gained a lot of practical significance in the process of thematic structure mapping and assessing the knowledge base of the field (Saibaba, 2021). Moreover, the point of upward trend in the number of international collaborations is revealed by co-authorship network analyses that illustrate the international importance and the multidisciplinary character of the research on online purchase behavior (Arfiansyah et al., 2023).

Regarding the emergent research pathways, researchers have identified some pathways in the future. Among them we can name the implementation of artificial intelligence and predictive analytics in customer personalisation, the rising impact of social commerce and parasocial relationships between the consumer and digital influencer, and the popularity of consumption behaviour arising out of sustainability concerns in online commerce (Srivastava et al., 2023; Nadroo & Naqshbandi, 2023; Sulistiyowati, 2024). Further, other recent discourse reveals how the expectations regarding delivery, efficiency of logistics, and consumers patience are the key factors of determining whether a person will purchase something online in the most competitive digital markets (Phoon & Nor, 2025). Regardless of these developments, there are still research gaps that should be noticed. The research is very biased towards the developed countries because focus is lacking in the emerging economies. Furthermore, even though the already existing theoretical frameworks are quite good, there is a lack

of integrating approaches combining the practices of the psychological, behavioral, and technological factors. Lastly, the majority of bibliometric studies are cross-sectional, which suggests the necessity of longitudinal ones to observe the trend changes on a temporal basis (Arfiansyah et al., 2023).

On the whole, the literature statements emphasise unstable and developmental online research in the purchase behaviour, as it acquires more and more significant importance in the digital economy. Combining technological advances with behavioral theories and the priorities of the new consumers as they emerge, one will realise that more substantial, contextually heterogynous and futuristic research work is necessary.

RESEARCH OBJECTIVES

- **RO1.** To identify the most visible authors and affiliation as well as countries in the study of online purchase behaviour (20032025).
- **RO2.** To dive into the prevalent themes and keyword trends and the relationship between the two using visual tools like word cloud, treemaps, and three-field plots.
- **RO3.** To achieve the aim of testing co-authorship, co-citation and bibliographic coupling network with the aim of probing into the collaboration and intellectual structure.
- **RO4.** To elicit a theoretical implication, practical implication, and propositions of the research with respect to bibliometric findings.

RESEARCH METHODOLOGY

Table 1: Data Extraction and Processing Summary

<i>Aspect</i>	<i>Description</i>
Database	Scopus
Access Date	5 April 2025
Search Strategy	TITLE-ABS-KEY the search will be conducted using the combination of three clusters: The first one (i) is Online Purchase Behaviour, the second one (ii) is Purchase Intention, and the third one (iii) is E-commerce and includes synonyms
Search String	(“Online Purchase Behaviour” OR “Online Buying Behaviour” OR “Online Shopping Behaviour” OR “Buying Behaviour” OR “Consumer Buying Behaviour”) AND (“Online Purchase Intention” OR “Purchase Intention” OR “Buying Intent” OR “Consumer Intention” OR “Online shopping intention” OR “Online Buying Intention” OR “Willingness to Buy”) AND (“E-Commerce” OR “Online Shopping” OR “Internet Shopping” OR “Digital Shopping” OR “M-commerce” OR “Online Shop”)
Time Period	2003–2025
Language	English
Document Types	Research Articles and Review Papers
Subject Areas	Business, Management & Accounting; Social Sciences; Economics, Econometrics & Finance
Exclusion Criteria	Such documents that are not written in English, those ones that are not related to a relevant subject area, and the conference papers and book chapters
Initial Records	208
Data Cleaning	Hybrid duplicate removal using Bibliometrix (DOI and Author–Keyword–Year match)

Aspect	Description
Final Dataset	108 documents
Tools Used	Biblioshiny (R Studio), VOSviewer
Analyses Conducted	Analyses Performed Description of authors, affiliates, keywords, word cloud, treemap, 3 field plots, co-author, co-citation and bibliographic coupling

Table 1 indicates that the Scopus database was used to derive the bibliometric dataset that was used in this paper on 5 April 2025. Structured query was worked out based on the combination of three thematic clusters: online purchase behaviour, purchase intention and e-commerce, and their synonyms. Table 1 shows the entire search string. The first one returned 208 documents.

The inclusion and exclusion criteria were used: the time frame was narrowed down to the range of 2003 to 2025, the only qualifying articles and review papers were reviewed in English, and the limited area of subjects considered in the research, those being Business, Management & Accounting; Social Sciences; and Economics, Econometrics & Finance were selected. The exclusions included non-English publications, conference paper, book chapters, and the documents unrelated to the consumer behaviour and digital commerce.

After this procedure instead, the data was exported as Scopus .csv and ran through a hybrid duplicate-removal approach via the Bibliometrix package in R, consisting of first detecting duplicates using DOI and then matching on Author-KeyWord-Year. This clean up removed 3 duplicates to leave us with a final record of 108 documents.

To analyze, Biblioshiny (R studio) was applied to create descriptive data (e.g. most relevant authors, affiliations and word clouds) and thematic visualization (e.g. word clouds and treemaps). Three fields plots were generated and used to diagram how authors, keywords, source and country are connected. To record the intellectual and cooperating framework, VOSviewer was used in co-authorship networks, co-citation mapping, and bibliographic coupling analysis. In total, these methods helped to get a general idea of the development of the theme, its major players, and the patterns of its structure in the area of online purchase behaviour.

RESULTS AND DISCUSSION

Biblioshiny Analysis

Most Relevant Authors

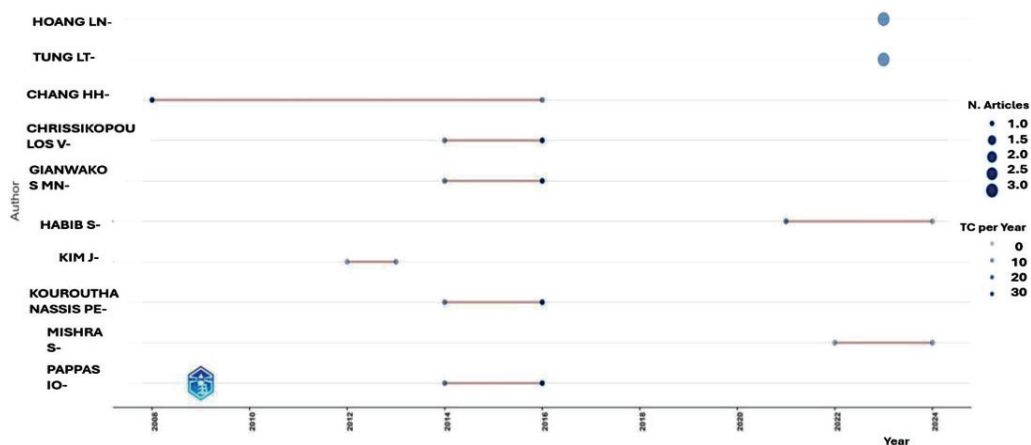


Figure 1: Authors' Production Over the Time

Table 2: Top Ten Highly Cited Authors

S. No.	Authors	No. of Articles	Total Citation (TC)	Total Citations Per Year (TCpy)	<i>h</i> _{index}	<i>g</i> _{index}	<i>m</i> _{index}	PY _{start}
1.	Chang HH	2	673	40.544	2	2	0.111	2008
2.	Chrissikopoulos V	2	473	45.517	2	2	0.167	2014
3.	Giannakos MN	2	473	45.517	2	2	0.167	2014
4.	Kourouthanassis PE	2	473	45.517	2	2	0.167	2014
5.	Pappas IO	2	473	45.517	2	2	0.167	2014
6.	Habib S	2	64	12.800	1	2	0.200	2021
7.	Kim J	2	42	3.225	1	2	0.071	2012
8.	Hoang LN	2	28	1.000	1	1	0.250	2022
9.	Tung LT	3	28	9.333	3	3	1.000	2023
10.	Mishra S	2	3	1.000	1	1	0.250	2022

As observed in figure 1, the publication timeline of significant authors that have contributed research in online purchase behaviour and intention has also been published. This image indicates the number of research papers published in a given year which makes it known the extent to which research is being conducted and on a consistent basis within the field. Most of the authors, such as Chang HH and Chrissikopoulos V, have early and consistent work in the area. Chang HH began this research around 2008 and Chrissikopoulos V, in 2014, which is only consistent with the initial stage of the development of the e-commerce.

The top 10 highly cited authors are described in greater detail as displayed in Table 2. Only scholarly performance indicators have been used to judge authors along the lines of total citations (TC), TCPY, and in terms of H-Index, G-Index, and M-Index in this table. Such analysis is not only representative of the number of publications but also representative of influence and continuity. First on this list is Chang HH whose 2 articles have been cited 673 times with an average number of citations per year at 40.54 and is evidence of the ongoing usefulness of their research since 2008. Chrissikopoulos V, Giannakos MN and Pappas IO are also the authors under the same research work that have the same number of citations (473) and approximate TCPY that amounts to 45.51, which clearly shows that their work has been influential and that the authors did it as a collective effort. The remaining authors, Hoang LN and Tung LT, where the authors began publishing research in 2023, demonstrate a high level of impact of their work by the M-Index indicator (1.000). The dependability of this analysis can also help in shedding light on the fact that there have existed some authors who have completed this area of study with much depth and power through the ages.

Global Contributing Institutions

The most productive institutions in the research carried out in the area of online purchase behaviour and intention were analyzed by bibliometrics. With regard to the number of such publications, the top ten institutions are as in figure 2: Ionian University (Greece) 6 publications: The university actively researches in such areas as consumer behaviour, e-commerce and technology academics, particularly on digital changes in the retail trade.

Saudi Electronic University (Saudi Arabia) The university specializes in both e-learning and digital commerce and some of the research done there on topics related to trust as well as purchase intention and global online shopping habits in the Middle East is quite good. Deemed to be University, within India, Yenepoya, has also played a great role with 6 publications. This is an Indian institute

that is actively engaged in researching on the perception of consumers, the impact of COVID-19 on online purchases and conducting research in the behaviour of the emergent market. Islamic Azad University (Iran) -5 Publications: This large Iranian institution is doing studies on topics of purchase intention, privacy concerns and trust towards e-commerce websites.

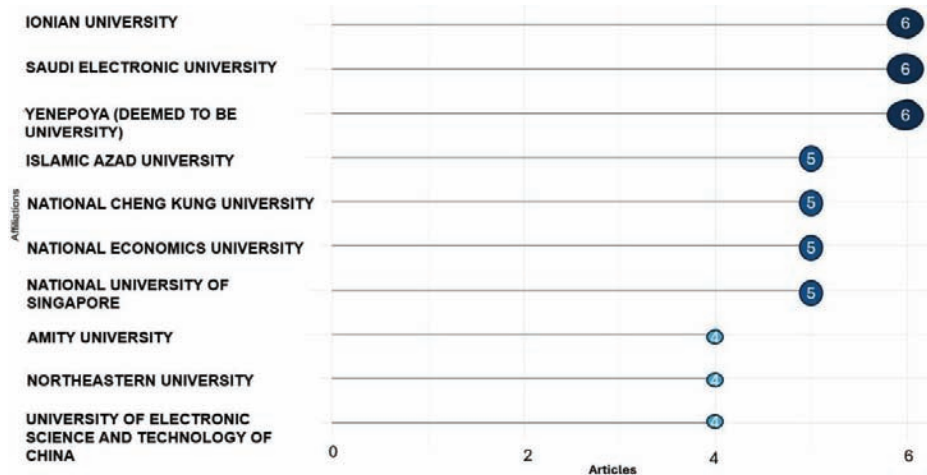


Figure 2: Most Relevant Affiliation

National Cheng Kung University (Taiwan) 5 Publications: The emphasis is more on the cultural difference, technology acceptance model, consumer analytics and purchase behaviour in the digital platforms in this university. National Economics University (Vietnam) – 5 publications: It displays an orientation towards economic behaviour/ marketing and research focuses on consumer decisions, pricing strategy and online shopping behaviour. National University of Singapore (Singapore) -5 articles: Considered one of the most popular universities worldwide, the institution is studying the practical purpose of smart technology, digital trust, and consumers in Southeast Asia. Amity University (India) – 4 Publications: This institute also operates within business and marketing research field; in addition, it is conducting research on fashion innovativeness, consumer behaviour of the young people and the effects of social media. Northeastern University (USA) There are 4 publications conducted by this institute which adds technical subjects like security/privacy in retail, user experience and security/privacy in online shopping and technically practical subjects as well. China and university of electronic science and technology – 4 publications: This institute has been working in such areas as digital infrastructure, Ai in retail, and the topic consumer trust in smart commerce, which also determine that research in China is also starting to publish in this area.

Word Cloud

There is also a visual representation of the most commonly occurring author keywords in the area of online purchase behaviour and intention displayed in Figure 3 in the list of words created by using the word cloud method. There is a total of 108 reports that have been received and top 50 keywords used have been selected by the best 50 authors. The word is most usually 25 when it comes to online shopping, a display of the significance and centrality of the word in conversation. The purchase intention with the purchase intent 18 times and e-commerce 16 times are the main themes with respect to its use in literature. Examining all these keywords it is possible to determine that researchers are undertaking research to find the reasons behind why individuals engage in online shopping and how the e-commerce is influencing the behaviour of these individuals.



Figure 3: Word Cloud of 50 Authors' Keywords

In addition to this, consumer behaviour, trust and perceived risk have all been mentioned 8 times, further pointing towards the direction that the psychology and safety of consumers are also explored in this area. The variable Online Purchase Intention is utilized 6 times, and Technology Acceptance Model is used 6 times as well. The perspective reveals that study has attempted to investigate based on postulates and behaviour in the investigation of how and why consumers shop online. Use of the keywords such as COVID-19, which were used 5 times, indicates that how the pandemic has altered consumer behaviour towards online shopping and intention has also been examined in recent years.

Tree-map

Figure 4 shows the Treemap analysis whose foundation is explained by the keywords that the author employed. This assists in determining which themes have dominated in the online shopping behaviour and intentions and emerging new themes that are on the rise. In online shopping, most commonly, the



Figure 4: Tree-map (Authors' Keywords) for Dominant Themes

keywords are applied (25 times, 11 percent), which is the chief subject area of the research in this case. The second research reveals that purchase intention (18 times, 8 per cent), e-commerce (16 times, 7 per cent), consumer behaviour, perceived risk and trust (8 times each, 4 per cent) are observed. These are principal reasons that have been identified by the online customer research studies. In addition, such keywords as online purchase intention, technology accepted model, COVID-19 and India are also presented in satisfactory figures denoting the attraction to technical framework and the rise of researchers to local circumstances. Meanwhile, we observe fewer keywords personalization, cross-cultural, and brand image and electronic word of mouth (EWOM) which is an indicator of the possible research gap that exists in new research areas and current literature that can be considered by a researcher in the future. It is thus evident that although some traditional issues like risk and trust still remain relevant, other emerging ones are also getting the attention of scholars and providing new pathways on which future researches can be conducted.

Sankey Diagram for Thematic Development through Three-field Plot

They tried to comprehend thematic linkages and research contributions in the area of online purchase behaviour in Biblioshiny analysis using the Scopus dataset by using Three-field-plots (Sankey diagrams). These are the visualization maps of the associations between the author-keyword-journal as presented in Fig. 5 (first plot) and country-keyword-journal (second plot) which is very useful in establishing the role played by research both at individual and country levels in the field of online purchase behaviour and intention.

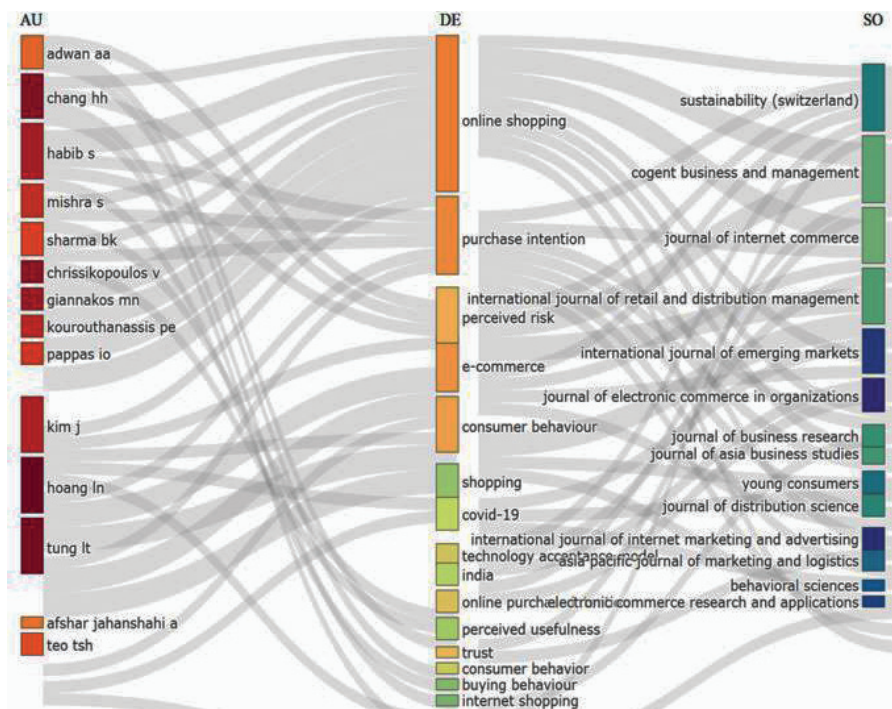


Figure 5: Plot 1 (Author – Keywords – Source)

Also depicted in the above plot, studies conducted by certain authors, like Adwan AA, Mishra S, and Sharma BK are predominantly focusing on issues like, online shopping, purchase intention, and perceived risk. Such research has so far been majorly published in references such as Sustainability

(Switzerland), Journal of Internet Commerce, and Cogent Business and Management. The fact that these authors have used keywords such as trust, consumer behaviour, and e-commerce repeatedly also indicates that they are proposing intensive studies in the respective areas. It demonstrates that only a small number of authors are occupying a very popular role in such dominant themes and that the majority of publications are to be found in the limited journals.

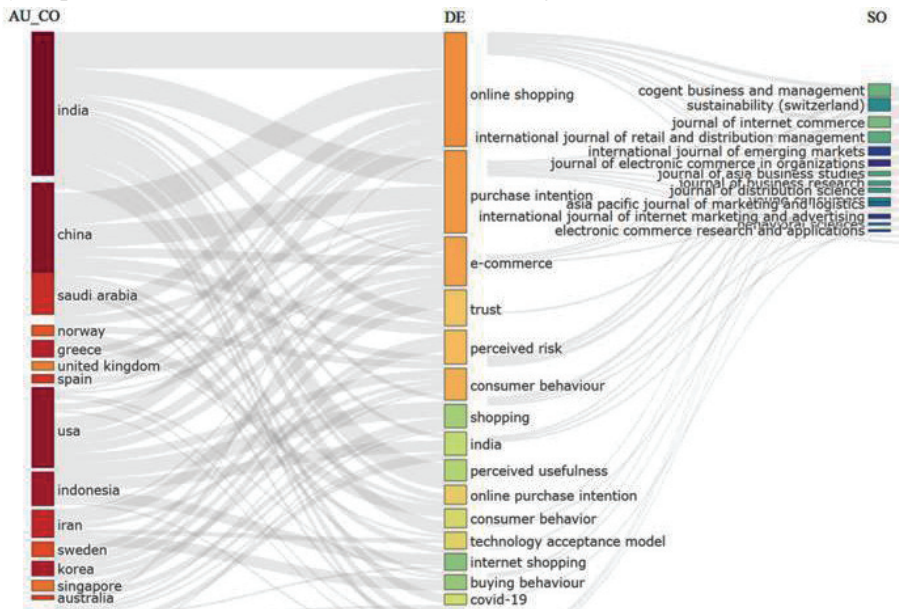


Figure 6: Plot 2 (Country – Keywords – Source)

In the Figure 6 above plot is made based on research themes and preferred journals basing on countries. India is also one of the major countries that is actively doing research on certain themes such as: online shopping, trust, as well as the technology acceptance model especially in the field of Sustainability (Switzerland) and Journal of the Business Research. Themes such as consumer behaviour, COVID-19 and e-commerce among others are also receiving significant contributions by other nations such as America, UK and China. At country level, authors are published in certain special journals such as the cogent Business and management, journal of Internet Commerce and young consumers.

Having contrasted both the plots, it can be seen that topics like; online shopping, purchase intention, and perceived risk maintain a high prevalence on both the author and the country scale. India also turns out to be an enormous research center with much contribution in the region of participation of the authors and the themes. Publications are mostly found in some of the limited journals and this illustrates clearly that research work has been limited to some certain subjects and sources. These thematic relations also show that the authors and countries have many more options to avail some of the special journals which also exhibits intellectual and geographical layout of the region.

Vosviewer Analysis

Co-authorship Analysis (Authors)

In Figure 7, the analysis of the co-citation of authors is done with the help of the VOSviewer tool. In it, the condition of minimum document number two was laid, which led to the results as a collector,

which includes the four main authorities. All of them wrote two documents and they got 473 citations. Which shows that their 6 links and total link strength are 12. This reflects a strong and impressive cooperation that is a good example of the Joint Academy's production in the region.

The co-authorship data on the organization level presented in Figure 8 have been analyzed with the assistance of the VOSviewer tool that considers the network. Here the condition that a minimum number of documents of 1 was to be established was made. One of the clusters, in this analysis, had a group of 6 institutions, proposed as SRMIST Rampuram, Chennai, SRM Trichy Arts and Science College. The number of links which were co-written with these institutions totaled 15, and this indicates that there is a high level of mutual network of cooperation in these institutions. Such institutional relations indicate significant educational collaboration among the SRM groups and the concerned departments in India.

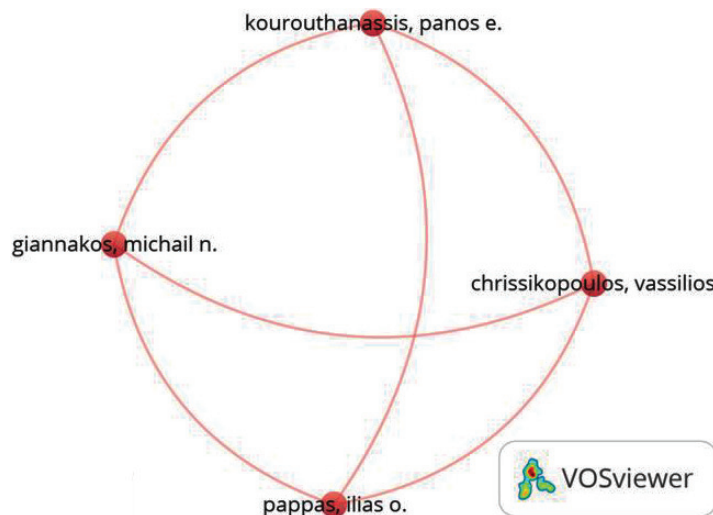


Figure 7: Co-authorship Analysis – Unit of Analysis Author

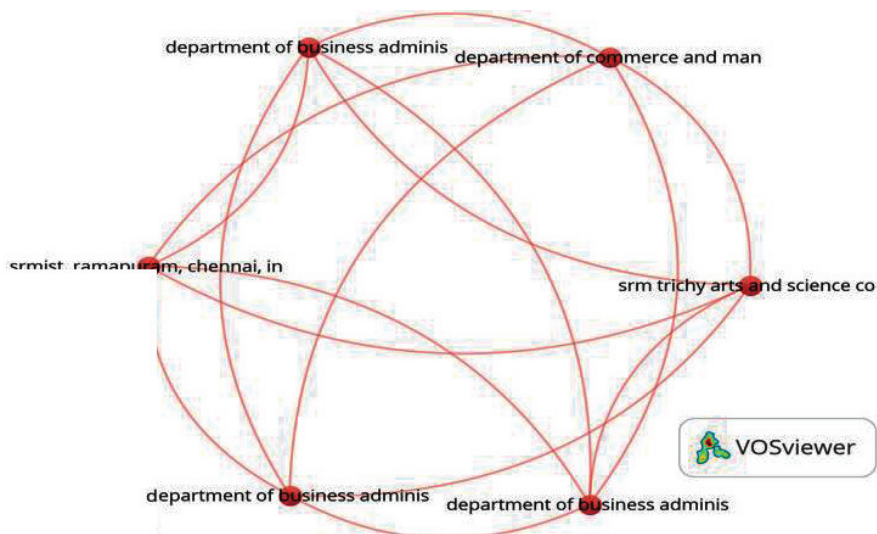


Figure 8: Co-authorship Analysis – Unit of Analysis Organization

Co-citation Analysis

Co-citation analysis was performed to identify the most influential quoted research in the field of online purchase behaviour and intensity in Figure 9 and Table 3.

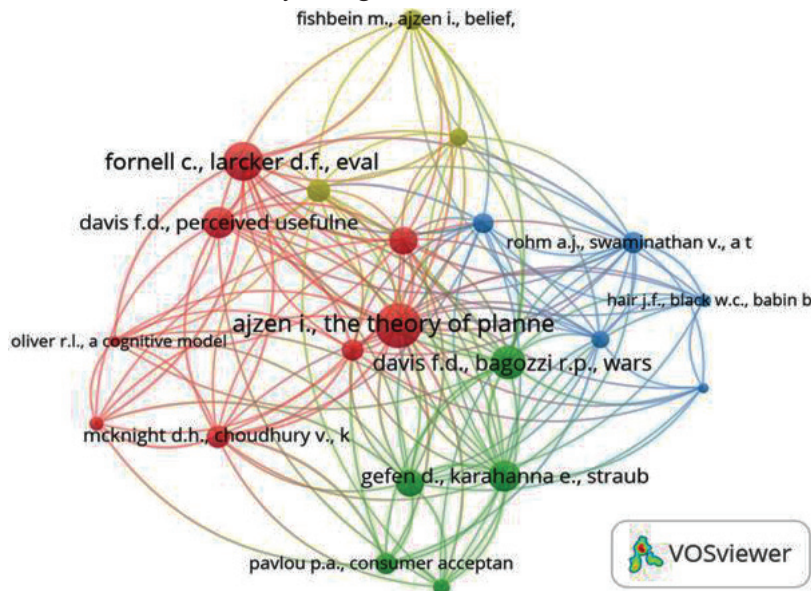


Figure 9: Co-citation Analysis of Cited References.

Table 3: Main Clusters of Cited Reference Based on Co-citation

Cluster	Item	Cited Reference	Links	Total Link Strength	Citation
Cluster 1 ■	8	• Ajzen I., the theory of planned behaviour, organizational behaviour and human decision processes, 50, 2, pp. 179-211, (1991)	20	44	18
		• Babin B.J., Darden W.R., Griffin M., work and/or fun: measuring hedonic and utilitarian shopping value, Journal of Consumer Research, 20, 4, pp. 644-656, (1994)	18	28	6
		• Davis F.D., perceived usefulness, perceived ease of use, and user acceptance of information technology, Mis Quarterly, 13, 3, pp. 319-340, (1989)	16	31	8
Cluster 2 ■	5	• Davis F.D., Bagozzi R.P., Warshaw P.R., user acceptance of computer technology: a comparison of two theoretical models, Management Science, 35, 8, pp. 982-1003, (1989)	18	33	10
		• Gefen D., Karahanna E., Straub D.W., Trust and TAM in online shopping: an integrated model, Mis Quarterly, 27, 1, pp. 51-90, (2003)	18	31	10
		• Hoffman D.L., Novak T.P., peralta m., building consumer trust online, Communications of the ACM, 42, 4, pp. 80-85, (1999)	10	17	6

Cluster	Item	Cited Reference	Links	Total Link Strength	Citation
Cluster 3 	5	• Donthu N., Garcia A., the internet shopper, Journal of Advertising Research, 39, 3, pp. 52-58, (1999)	14	18	5
		• Hair J.F., Black W.C., Babin B.J., Anderson R.E., Tatham R.L., multivariate data analysis, (2006)	11	13	5
		• Hernandez B., Jimenez J., Martin M.J., age, gender and income: do they really moderate online shopping behaviour?, Online Information Review, 35, 1, pp. 113-133, (2011)	9	10	5
Cluster 4 	3	• Ajzen I., Fishbein M., understanding attitudes and predicting social behaviour, (1980)	12	18	8
		• Fishbein M., Ajzen I., belief, Attitude, intention, and behaviour: an introduction to theory and research, (1975)	10	20	6
		• Venkatesh V., Davis F.D., a theoretical extension of the technology acceptance model: four longitudinal field studies, Management Science, 46, 2, pp. 186-204, (2000)	15	23	5

A total of 21 research articles were analyzed and a network map was prepared using VOS viewer software in which 147 links and total of 241 total link strengths were captured indicating the fact that there lies a great intellectual chord between these key references. Using this co-report analysis, four major thematic groups were obtained with a total of 50 articles that have been cited.

Cluster 1 (Red) deals with principles that justify the adoption of consumer behaviour and technology, one of which involves the Theory of Planned Behaviour (Ajzen, 1991) and Technology Acceptance Model (Davis et al., 1989) which are very crucial in their context. There are 54 links in this clustered model, total power of links is 103, and it has 32 citations which provide it with a considerable intellectual foundation.

Cluster 2 (Green) consisted of studies touching on trust and online user acceptance among the consumers within the digital climate that comprises Gefen et al. (2003) and Hoffman et al. (1999). This cluster has 46 links containing an amount of 81 total link strength and 26 citations, indicating that the confidence affects the online purchasing intentions much to a significant degree. Cluster 3 (Blue) touches on the demography of consumers and techniques of statistical analysis Hernandez et al. (2011), Hair et al. (2006). The clustering possesses 33 links, 41 power of elevations in links and 15 citations which prove that the discipline is still developing, but each day makes its study more compelling.

In Cluster 4 (Yellow), expansion of behavioural classic theory and technical models can be observed at once. This is comprised of Ajzen & Fishbein (1980; 1975) and Venkatesh & Davis (2000) among others. This cluster consists of 37 links, 61 link power and 19 citations. This cluster is used to explain an online purchase decision in a practical sense. Now these four clusters have been mirroring an intellectual extensiveness and strength in the online purchase behavioural domain, which could act as a robust pretext to any further study.

The Figure 10 and Table 5 present a co-citation analysis of the concepts of online purchase behaviour and intention, serving the purpose of revealing impressive journals in the given area. To do so, 56 sources were chosen based on the criterion of a minimum number of co-elements (VOS

viewer software). In line with this analysis, 3 significant clusters were identified with a total number of 1,521 links, and 59,309 total link strength. All the clusters have taken the top 3 journals as clusters of research. It demonstrates that there are profound intellectual associations and intellectual set up within the scholars within the region.

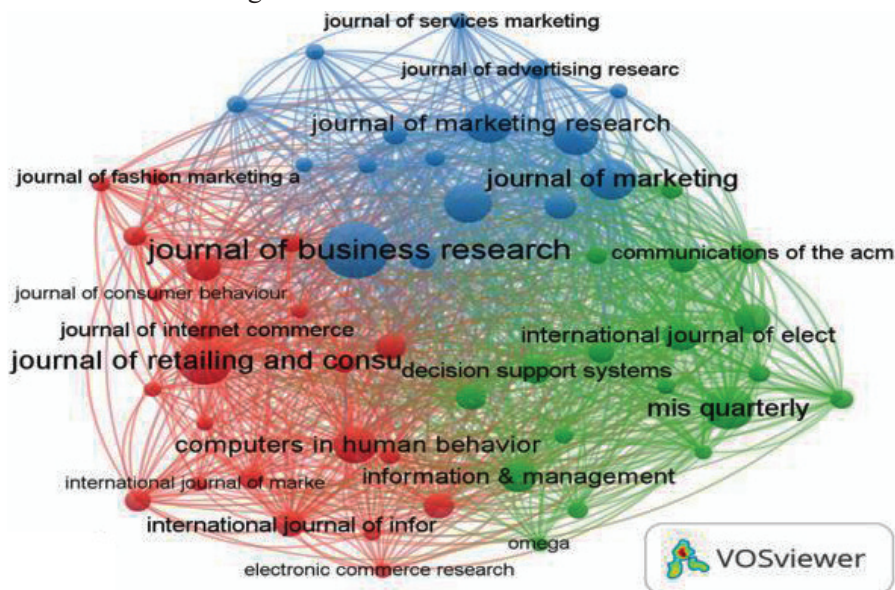


Figure 10: Co-citation Analysis of Unit of Analysis Cited Source

Table 4: Main Clusters of Cited Source Based on Co-citation

Cluster	Item	Cited Reference	Links	Total Link Strength	Citation
Cluster 1 ■	22	Asia Pacific Journal of Marketing and Logistics, Computers in Human Behaviour, Electronic Commerce Research	55	1498	43
			55	4413	112
			55	756	22
Cluster 2 ■	18	Academy of Management Review, Advances in Consumer Research, Communications of the Association for Computing Machinery	51	822	24
			55	1364	31
			53	1875	49
Cluster 3 ■	16	European Journal of Marketing, International Journal of Consumer Studies, International Journal of Research in Marketing	55	1887	50
			54	699	21
			55	1079	27

Cluster 1 (Red) has captured the major top 3 journals: The journals such as Asia Pacific Journal of Marketing and Logistics, Computers in Human Behaviour, and Electronic Commerce Research have been taken by this cluster. It contained 22 sources and the major journal 55 links with a link power of 4413 and the major journal having 112 citations. The group stipulates marketing, humancomputer interactions and insertion of e-commerce areas. Cluster 2 (Green) includes three best journals: Such sources as Academy of Management Review, Advances in Consumer Research, and Communications of the ACM are included. The count of sources and links the group reported in the primary journal were 18 and 53, respectively, 1875 link power and 49 citations. This group depicts the amount of organizational behaviour and technical acceptance models along with consumer psychology.

Cluster 3 (Blue) consists of 3 lead journals namely; European journal of marketing, International journal of consumer studies, and International journal of research in marketing. In the big journal, it identified 16 sources, 55 links with a total link strength of 1887, and it had 50 citations. The group dwells on fundamental marketing theory, consumer insight as well as online branding strategies. The following co-enforcement analysis indicates that the existing research in online purchase behaviour consists of three dominant intellectual inclinations, one is interdisciplinary, next is organisational and technical behaviour and the third intellectual phenomenon is fundamental marketing principles.

Bibliographic Coupling Analysis

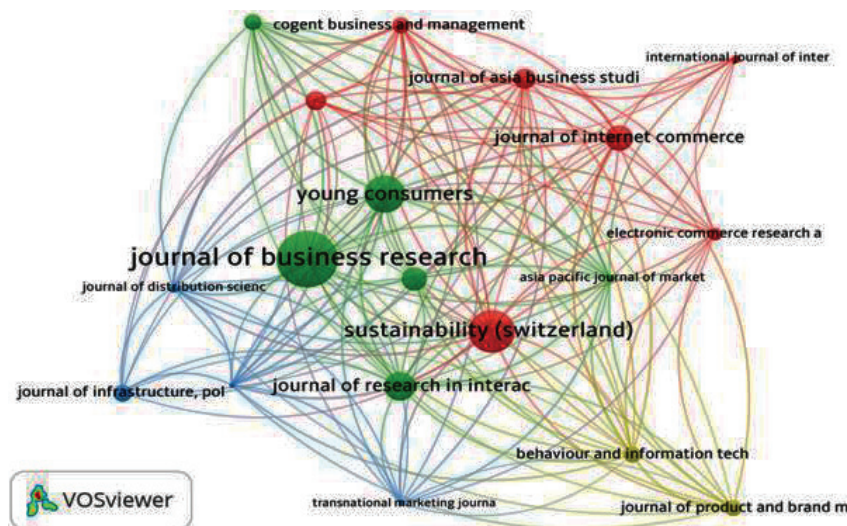


Figure 11: Bibliographic Coupling Analysis of Sources (Journal)

Table 5: Main Clusters of Sources Based on Bibliographic Coupling

<i>Cluster</i>	<i>Item</i>	<i>Sources (Journal) Top 2-3 Journal</i>	<i>Themes/Focus Area</i>
Cluster 1 ■	6	Cogent business and management, Electronic Commerce Research and applications, International journal of emerging markets	The development of e-commerce and markets between emerging countries shows that it pays attention to the methods of trade between emerging countries, the growth of e-commerce, and online shopping behaviour.
Cluster 2 ■	6	Asia pacific journal of marketing and logistics, Behavioural sciences , International journal of retail and distribution management	The Asia-Pacific pays attention to consumer behaviour and retail management status in the research field and sales, retail strategies and consumer behaviour in the field.
Cluster 3 ■	5	Journal of distribution science, Journal of electronic Commerce in organisation, Journal of infrastructure, policy and development	Digital infrastructure and policy making in e-commerce distribution. These insist on e-commerce needs, working methods, and policies in digital distribution.
Cluster 4 ■	2	Behaviour and information technology , Journal of product and brand management	Consumer contact and brand management in This explains consumer experiences, their contact with products, and the usefulness of technology in digital brand management.

Figure 11 and Table 5 display Bibliographic Coupling report at the source (journal) level. This was carried out to know the intellectual organization and the theme of equality in the region. After examining the intensity of the shared contexts, four various clusters have been determined using the research of thematic integrity of the journals that are in question. The major top three journals have been incorporated in cluster 1 which include Cogent Business and Management, Electronic Commerce Research and Applications, and International Journal of Emerging Markets. The content of these journals revolves primarily around strategies of e-commerce, market growth within the emerging economies. These involve research papers on the topics including business model innovation, trends of the digital trade and consumer behaviour in the developing world.

Cluster 2 contains the primary top three journals, namely, Asia Pacific Journal of Marketing and Logistics, Behavioural Sciences and International Journal of Retail and Distribution Management. The group of cluster is directed on consumer behaviour and retail logistics among Asia-Pacific region, where this practice is the dominant thematic distribution strategies in respect to marketing logistics, psychological orientations and needs of regional market. Cluster 3 comprises of the predominant first three journals, Journal of Distribution Science, Journal of Electronic commerce in Organization, Journal of Infrastructure, Policy and Development. The primary idea behind this cluster group is to elaborate on digital infrastructure and e-commerce distribution policy where processes and supply chain effectiveness within an organization as well as structure of the regulation are addressed. Cluster 4 entails two journals, Behaviour and Information Technology and Journal of Product and Brand Management. This group of cluster deals with technological consumer involvement and brand management, information systems, digital interface implementations, technicalized interfaces, customer experience and moulding the branding strategies. The discussed cluster analysis can be used to comprehend the existing hot topics and priorities in the e-commerce area where technology, consumer behaviour, infrastructure and equal concern are discussed.

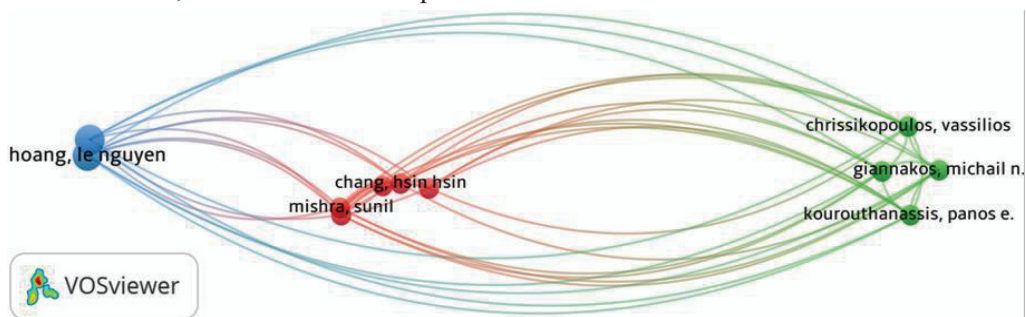


Figure 12: Bibliographic Coupling Analysis of the Authors

Table 6: Main Clusters of Authors' Based on Bibliographic Coupling

<i>Cluster</i>	<i>Item</i>	<i>Author</i>
Cluster 1	5	Chang, Hsin Hsin, Habib, Sufyan, Mishra, Sunil, Sharma, Bhuvanesh Kumar, Teo, Thompson S.H.
Cluster 2	4	Chrissikopoulos, Vassilios, Giannakos, Michail N. , Kourouthanassis, Panos E., Pappas, Ilias O.
Cluster 3	2	Hoang, Le Nguyen, Tung Le Thanh

Bibliographic coupling analysis of authors were done as Table 6 at the back and Figure 12 by enabling one to know the intellectual dependence of authors on the researchers based on common references, whereby the minimum condition was stipulated at 2 documents. The authors were segregated

into 3 clusters of 11 via the analysis. The network visualization reflected that there is a medium mutual relationship among the authors, which has demonstrated that the authors in each cluster have different areas of focus. Cluster 1 in red colour contains 5 compared to others authors, Chang Hasin Hasin, Habib Sufayan, Mishra, Sunil, Sharma Bhuvanesh Kumar, Teo and Thompson S.H. Topics investigated by these two writers include consumer trust, practical intention and technical acceptance in the area of e-commerce. The majority of them refer to TAM or UTAUT to the behaviour of online purchases within the emerging markets in India and other countries of Southeast Asia. In cluster 2, there were four authors, Chrissikopoulos Vassilios, Giannakos, Michail N; Kourouthanassis Panos E; Pappas and Ilias O. Their labor has to be associated with online decision situations and consumer psychology online. These authors tend to conduct experimental research studies and recognise the behaviour of the user on online platforms both technologically and psychologically. The blue cluster 3 consists of 2 authors, Hoang Le Nguyen and Tung Le Thanh. Their study is concentrated on the social commerce in Vietnam, customer involvement and mobile buying behaviour. They tried to comprehend the digital consumer behaviour using local cultural and regional perspectives. We may conclude using the above mentioned bibliographic coupling studies that various groups are operating on dissimilar but complementary research area and tasks like technical acceptance models, consumer psychology online, and online purchase behaviour based on the regional perspective. This discussion presents interdisciplinary and cultural variability of this discipline.

Table 7: Main Clusters of Countries Based on Bibliographic Coupling

<i>Cluster</i>	<i>Item</i>	<i>Countries</i>	<i>Themes</i>
Cluster 1 	11	Australia, Canada, France, India, Iran, South Korea, Spain Sweden, Taiwan, United States, Vietnam	Globally, research collaboration, in which developed and emerging economies together have formed a group that focuses on online shopping and adopting technology.
Cluster 2 	6	China, Ghana, Pakistan, Saudi Arabia, Singapore, United Kingdom	Relations of knowledge between Asia-UK groups of big countries like China, the UK, and Singapore, together with groups of developing countries, which work on the confidence found in e-commerce and online markets.
Cluster 3 	2	Greece, Norway	Academic level group in European countries—This group is formed by small countries of Europe, which are doing research work on online shopping and consumer psychology.
Cluster 4 	2	Indonesia, Malaysia	Emerging market groups between Southeast Asian countries are paying attention to digital development, mobile shopping and local consumer behaviour in the field of research.

Bibliographic coupling of countries is revealed in Table 7 and Figure 13. They have been separated into groups of four, which display the various manifestations of regional as well as thematic cooperation. Cluster 1 comprises both developed and emerging nations such as the US, India, France and Taiwan that indicates their global research output on issues relating to digital behaviour, trust and adoption models. Cluster 2 reveals a high connection between Asia and the UK where nations such as China, Singapore and UK execute the online market operations, confide in the electronic commerce and studies on platform approaches. At Cluster 3 Greece and Norway operate as the mini European research group aiming at the theoretical models of consumer behaviour. Cluster 4 represents that

there is regional collaboration in Southeast Asia and especially between Indonesia and Malaysia where research work is being conducted in the area of mobile commerce and local user experience.

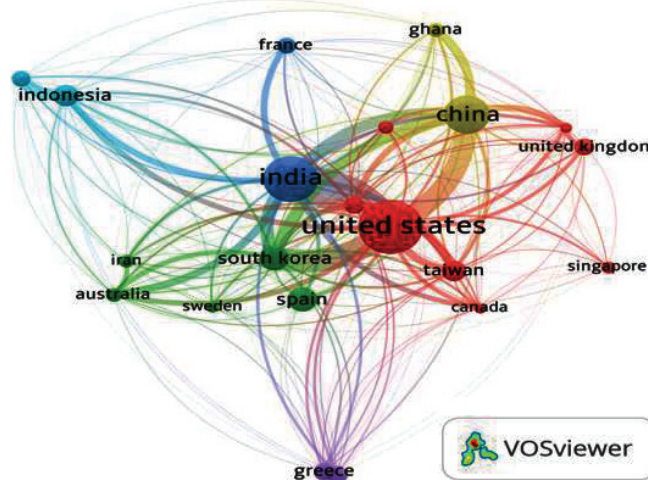


Figure 13: Bibliographic Coupling Analysis of Countries

CONCLUSION

This bibliometric acquaintance intensively surveyed the study in the field of online purchase behaviour during the time-span of 2003 to 2025 based on the references of 108 scopus-identified articles. The researchers wanted to reveal the intellectual architecture, topic progression, and the frequencies of interaction in this field the way it can be identified by means of Biblioshiny (R Studio) and VOSviewer. Evidence shows that the online purchase behaviour research has been increasing during the past twenty years with respect to the transformational nature of digitalization, electronic commerce websites, as well as the embracement of technology among consumers. The review of scientific output indicates the consistent growth of the formerly presented analytical data, and the emergence of the significant growth following the 2015 scenario, when mobile commerce, social commerce, and AI-generating marketing technologies began their rise to fame. In most applicable scholars and affiliations, there is an emphasis mostly of scholars and institutions in developed nations like USA, China, and the UK but in recent years even the emerging economies have joined in their writings.

Due to the use of keyword-based levels of word clouds, tree maps, and thematic maps, it is possible to underline that there has been a transition of the originally addressed topics in key areas such as trust, perceived risk, and purchase intention to current themes that include digital payment systems, AI personalization, social media influence, and omnichannel retailing. Network-derived methods such as co-authorship, co-citation and bibliographic coupling indicate moderate levels of collaboration between authors and between organizations, although some scope exists to improve collaborations between countries and between institutions. Its results contribute to understanding the significance of both trust and convenience as a long-lasting determinant of online purchase behaviour and the position of the novel technologies on the consumer patterns development. This synthesis does not only summarize the previous knowledge base but also outlines the research gaps, including the lack of investigation of the cultural differences, ethical consumption, and disruptive technology effect.

On the whole, the given study serves as a guide to researchers, practitioners, and policymakers and presents the evidence-based understanding of the development of online purchase behaviour and its further research perspectives in a fast-evolving digital economy.

Managerial and Theoretical Implications

The article gives practical and theoretical implications. Theoretically, it is a synthesis of two decades of findings, tracing the topical landscape of online purchase behaviour, recognising major themes, conceptual underpinnings and network infrastructures of collaboration. This analysis can enable the scholars to advance established areas like trust, risk perception and purchase intention, and venture into newer ones such as AI-driven personalization, digital wallets and commerce on social media.

On the part of those in practice, the findings offer direction on the changing consumer expectations and technology facilitators of the online shopping industry. Strategies taken by businesses can be modified which include ensuring focus on trust building mechanisms, secure payment options, and paperless digital experiences. The further importance of the influence of social media and personal recommendations implies the need to adopt some data-driven marketing and omnichannel integration.

Its results can assist the policymakers to outline data privacy, guidelines, security measures, and ethics, as well as reassure consumers that the environment of the online business is secure. Furthermore, the middle score of research collaboration globally implies the possibility of international combined project and development of intercultural experience to understand consumer behaviour on the online web.

Future Research Directions

The results of the given bibliometric research leave a variety of perspectives on future research:

- **Cross-Cultural Perspectives:** Largest part of the existing studies is done to developed economies. Comparative works among the emergent markets may be used to provide information on cultural and socio-economic effects on online purchasing behaviour.
- **Technological Integration:** The future research trends include comprehending how the introduction of the AI, machine learning, chatbots and blockchain will challenge the consumer trust, personalization and safety.
- **Behavioural Dynamics in Social Commerce:** In view of the emergence of social media and the influence of the online influencer, their impact in shaping the intention to buy and brand loyalty must be analysed.
- **Sustainability and Ethical Consumption:** Little research has been done on the effect of environmental issues, ethical supply chain, and sustainability in the purchase of products and services online.
- **Privacy, Data Protection, and Trust:** Since it has become more likely that there are data leaks and consumer information is used inappropriately, future research should be conducted in the aspect of privacy guarantee schemes and its impact on digital consumer purchasing behaviour.
- **Post-Pandemic Consumer Trends** The COVID-19 pandemic had a huge impact on the retail online shopping trend. The indicators will be of great help it will be in the form of longitudinal studies that measure permanent and temporary changes in consumer behaviour.
- **Through plugging such gaps,** researchers will be in a position to add value both to theoretical contribution and practical approaches towards the continuously changing digital world of commerce.

Authors' Contribution Statement

Pooja Patel did the literature survey, data summary and took the rough draft of the paper; Rashmi Bansal framed the research problem, completed the paper and put it in final form.

No funding was received.

Disclosure of interest

Authors declare no conflict of interest.

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Research Trends in Corporate Social Responsibility and Consumer Buying Behaviour: A Bibliometric Analysis

Sukurulla Shaikh & Prachi Mishra

MBA Student, DPG Degree College
E-mail: sukurullashaikhmarvell@gmail.com

Abstract

Purpose: Many studies, including conceptual and exploratory work on corporate social responsibility, have been carried out in fields such as business, management, finance, and economics. This study synthesizes the existing knowledge to identify current research trends in this area.

Methodology: A bibliometric analysis was performed on 84 documents. These were retrieved via a systematic Boolean search for “corporate social responsibility” and “consumer buying behaviour” in the Scopus database, covering 2007 to 2025. The collection followed the PRISMA framework. Bibliometric indicators like the H index and G index were used for analysis. Tools such as Bibloshiny in RStudio (version 4.5.1) and Vosviewer (version 1.6.20) facilitated these analyses.

Finding: The conceptual framework outlines the progression across domains such as Corporate Social Responsibility, Purchase Intention, Sustainability, Consumer Behavior, Perception, and Sustainable Development. Besides establishing this foundational structure, the study also identifies the key intellectual elements involved. As a result, the research provides important insights into areas that require additional exploration.

Practical implications: This study provides valuable insights into the relationship between Corporate Social Responsibility, emphasizing their interdependence. It identifies the most common concerns discussed in this field and proposes possible directions for future research.

Originality: This research significantly contributes by consolidating dispersed information on the topic. It effectively highlights important sources, key authors, vital works, and crucial documents related to the link between corporate social responsibility and consumer purchasing behavior.

Keywords: Corporate Social Responsibility, Purchase Intention, Sustainability, Consumer Behaviour, Perception, Sustainable Development

Paper type: Review Paper

INTRODUCTION

The world today has witnessed a concerted growth in academic research about the place and responsibilities of business in society (Pant, 2017), and about the positive effects of CSR on consumer behavior (Lee & Shin, 2010). In recent years, CSR has been considered one of the major considerations for consumer behavior (Wekesa, 2024). Traditionally, CSR has been given a general description encompassing economic, legal, ethical, and philanthropic responsibilities, which have over the years been further developed and made more respective (Carroll, 2016). Like that, the function of CSR is highly examined by consumer behavior researchers (Min & Arif, 2022). A plethora of studies have strongly proven that consumer purchase intentions have a direct bearing on CSR activities (Al-Haddad et al., 2022). Consumers are also affected by CSR claims when it comes to purchasing products linked with such practices (Loose & Remaud, 2013). With global-level environmental impacts of production exerting increasing influence upon consumers' buying

decisions throughout the world, the trend toward moral consumerism has received media and academic attention (Bhattacharya et al., 2009); (Sen et al., 2006); (Smith, 2003). Social commitment of the firms brings about positive purchase intentions from consumers when a firm actually practices social responsibility (Arachchi & Samarasinghe, 2022). This leads the consumers to reward such firms by paying increased prices because it provides consumers a way to achieve their desired ends in terms of positive self-esteem, whereas positive self-esteem allows consumers to evaluate themselves favorably or think positively about themselves (Olson & Reynolds, 1983). Consumers perceive fringe benefits from socially responsible business offers and thus value those more, accepting some 10% more of a price as convincing enough (Ferreira, Avila, & Faria, 2010). CSR is just burgeoning as a field of research in the developing countries, whereas the traditional CSR research and most empirical works on the subject came from the Anglo-Saxon countries, primarily the U.S. and the U.K. (Maignan, 2001; Matten & Moon, 2004). Whereas about 88% of all publications are presented by developed countries like U.S., Italy, Germany, Norway, and so forth (Alfnes, 2017); (Nordmo & Norman, 2016); (Roh et al., 2014), journalist-gathered articles are from there mostly. Because of internationalization, operations have been increasingly unrestricted, and it is something for big business and society to know if corporate social obligations are viewed in the same way across countries (Sen & Bhattacharya, 2001). The impact of CSR on developing countries has largely remained unexplored (Fatma & Rahman, 2015), and few works exist comparing emerging cultures with developed cultures (Auger et al., 2007; Farooq et al., 2019; González-Rodríguez et al., 2019; Panda et al., 2019; Pires et al., 2020). From the consumer's standpoint, the notion of corporate social responsibility may vary in developing economies, given local characteristics, cultural views, and other aspects (Narayanan & Singh, 2022). Also, matters like income levels and habits alongside cultural aspects orientation could affect consumers' perceptions toward CSR efforts (Kim et al., 2018). For example, CSR had a good effect on purchase intentions in Taiwan and Indonesia, but not in Vietnam (Hsu & Bui, 2022). Such geographical divergences are considered a vital element for CSR transparency in global marketing (Abreu, Castro, Soares, & Silva Filho, 2012). CSR policies ought not to be all of one pattern across all nations (Mazboudi et al., 2020). CSR support, as literature stresses a lot more on intervening variables, is a key mediator of purchase intention (Luger et al., 2022). Withstanding that, no earlier work of literature evaluates knowledge as an impacting factor. Rather, they mostly consider it either as assumed knowledge or create awareness of CSR by furnishing examples and then proceed to gauge customer reaction (Mohr et al., 2001). Therefore, the so-called CSR-consumption paradox, which has attracted increasing scholarly attention (Schlaile et al., 2016), emerges whenever it is realized that purchasing behavior is not correlated, or is weakly correlated, with customer knowledge of CSR efforts (Schlegelmilch, 2018; Grimmer and Miles, 2017). In reality, CSR efforts can never have an impact unless customers become aware of them (Pomeroy and Dolniar, 2009), thus demanding some scholars to speak for the promotion of market awareness in the real situation (Fatma & Rahman, 2016), (Marin and Ruiz 2007) consider that powerful CSR initiatives foster brand loyalty and consumer-brand relationships when such values are in tandem with consumer values. Researchers have all found that consumers' attitudes toward the brands are greatly affected by their perceptions of CSR activities (Aguirre et al., 2023; Hasan et al., 2023; m, 2023; Vu et al., 2022; Xu & Cho, 2023). Trends due to research even target the next generation of consumers. (Narayanan 2022) revealed that Generation Z consumers exhibited positive brand equity, purchase intention, and willingness to pay to brands from ethical companies. They also appreciated these CSR dimensions, mostly Social CSR and Environmental CSR. According to Hsieh (2014), modern trends in CSR marketing have focused on venture-business endorsement and the mediation effects through customer perceptions.

Even with the need for long-term studies because of the dearth of longitudinal investigations that trace changes in customer behavior as an effect of CSR initiatives over time, alternate facets of corporate social responsibility can also be studied in the future, especially across the ESG dimensions (Nugroho et al., 2024; Chen et al., 2024; Wang et al., 2024; Kim et al., 2018). Further, future research in developing markets may focus on others considered in lesser degrees, such as Africa (Cavusgil & Cavusgil, 2012); (Eteokleous et al., 2016). The three CSR ISO parameters (14,001, 26,000, and 9,001) significantly affect each other and sustain impulsive purchase, with customer trust as a mediating factor. Research is also moving into specific consumer behavior domains, such as impulse buying, to attest to this (Ullah et al., 2024). Lastly, regarding the nexus between CSR and pricing strategies: in fast fashion, greater levels of CSR engagement substantially increase purchase intentions, particularly when accompanied by a price premium (Zaborek & Nowakowska, 2024; Lin et al., 2022).

From the above, CSR has an impact on consumer purchasing behaviors and methods now attracting the attention of professionals and academics. In the last 20 years, many studies have been carried out to research the effects of corporate social responsibility on customer purchasing behavior. In this regard, we have analyzed bibliometrics for this research on the progress and evolution of this particular field.

RESEARCH METHODOLOGY

A bibliometric analysis is conducted on literature sourced from the Scopus database via a systematic approach. The methodology consists of two parts: one detailing data collection methods and the other explaining data analysis. The focus is on articles published in reputable Scopus journals. The process began with the identification of 346 documents related to recent trends in corporate social responsibility and consumer buying behavior through database searches. Following a thorough review, 84 documents were selected for final analysis.

Data Collection

Various international databases, each with their unique collections of articles, include Scopus, Web of Science, Google Scholar, Dimensions, among others. Scopus was selected for this study because it is one of the largest and most widely used global databases. It covers a wide range of content, allowing for the extraction of research papers published from 2007 to 2025. Data was gathered using Boolean keywords: “Corporate social responsibility” AND “Consumer buying behaviour.” The Prisma framework guided data refinement, as depicted in Figure 1, following specific inclusion and exclusion criteria (Haddaway et al., 2022). A total of 346 publications were identified through the Boolean search within this timeframe, with no duplicates. An additional 57 were excluded due to topics unrelated to social science, accounting, business management, economics, or finance. Further filters removed literature from fields such as physics, arts and humanities, psychology, engineering, neuroscience, computer science, mathematics, astronomy, medicine, and energy. Using keywords including “corporate social responsibility,” “consumer purchasing behaviour,” “purchase intention,” and “sustainability,” the document pool was refined. Of the remaining 289 documents, 71 were omitted. Another 59 documents were excluded because they could not be downloaded or retrieved, and their keywords were outside the search scope. Additional criteria excluded articles not in English, those still in progress, and subscription-only materials, resulting in 75 records. Ultimately, 84 articles were selected for further review (Haddaway et al., 2022).

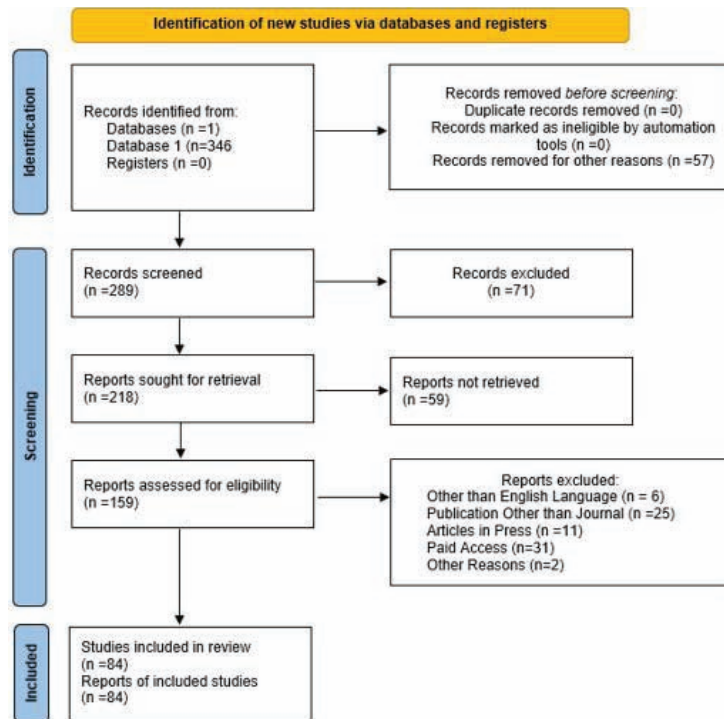


Figure 1: Prisma Framework on Corporate Social Responsibility and Consumer Buying Behaviour
Sources: Author compilation

Data Analysis

The study examined bibliometric indicators such as the H-index and G-index, as well as Bradford's law, Lotka's law, and keyword frequency. These analyses were performed using the Biblioshiny package from the Bibliometrix library in R Studio (version 4.5.1) and VOSviewer (version 1.6.20) (Tsilika, K., 2023).

The Impact Factors

The impact factor is a crucial metric in bibliometrics, reflecting the significance of research for future investigations. The H-index captures both productivity and influence; it is defined as the highest number H such that H publications have at least H citations each, with the remaining having fewer. This combines publication quantity and citation impact to assess a researcher's influence. Later, the G index was introduced, emphasizing highly cited works and allowing for normalized comparison across works of different ages. Over the last twenty years, these metrics have become essential for evaluating the volume, quality, and prestige of scientific research (Kumar.S.et.al,2025).

Bradford Law and Lotka Law.

Bradford's law aims to organise literature on a specific subject into journals. According to this principle, scientific journals are divided into zones based on the decreasing number of articles on a given topic (Brookes BC, 1977; Wardikar, 2013). Conversely, Lotka's law describes how scientific publications are distributed among authors following an inverse square law, indicating an inverse square pattern of scientific productivity (Pao ML, 1986).

Keyword Occurrence, SCP, MCP and RPYS

The presence of an information element forms the basis for thematic assessment and indexing from a data source, linking it to the relevance and relationships with subthemes of a subject or research area. Keyword occurrence study reveals how often a specific term appears in scientific research articles. Through keyword-key occurrence analysis, researchers should explore subclusters within study fields in the future. While an MCP tends to demonstrate collaboration among writers from different nations, an SCP also indicates cooperation between authors within the same country. One method used to methodically trace the history of research topics, organizations, and institutions is the referenced publication year spectroscopy (RPYS). RPYS displays the annual distribution of cited references in research publications (Haunschild, R., & Bornmann, L., 2022).

RESULT AND DISCUSSIONS.

These five sections summarise the results: 1) Meta-data findings on CSR and consumer purchasing behaviour 2) Impactfulness 3) Bradford's and Lutka's Law 4) Trends in sources of production over time, institutions, and countries 5) The conceptual framework of CSR and consumer purchasing strategies.

Metadata Results of Corporate Social Responsibility and Consumer Buying Behavior

Metadata results have two parts – Main Information and Annual Scientific Production.

Main Information

Table 1 details the attributes of the main information dataset. The timeframe of the dataset spans from 2007 to 2025. There are 84 articles published across 55 journals. The annual growth rate of publications was 0. A total of 391 authors contributed to the 84 papers. However, 4 of the papers were single-authored. 377 keywords were used by the authors, while 666 references were cited within the 84 articles. The average age of the documents is 5.87 years, with each research paper receiving an average of 51.08 citations.

Table 1: Main Information

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2007:2025
Sources (Journals, Books, etc)	55
Documents	84
Annual Growth Rate %	0
Document Average Age	5.87
Average citations per doc	51.08
References	666
DOCUMENT CONTENTS	
Keywords Plus (ID)	90
Author's Keywords (DE)	377
AUTHORS	
Authors	391
Authors of single-authored docs	4
AUTHORS COLLABORATION	
Single-authored docs	4
Co-Authors per Doc	5.29
International co-authorships %	30.95
DOCUMENT TYPES	
article	84

Sources: Author compilation based on analysis using Biblioshiny (Bibliometrix R-package) and Microsoft Excel

Sources: Author compilation

Social Responsibility and Environment Management, International Journal of Bank Marketing, and Public Relations Reviews exhibit slower but steady growth, although many others remained static with minimal contributions. Overall, the figure highlights that interest in this specific research area has grown unevenly across various journals, with sustainability taking a prominent lead in recent years.

Impact Factor of the Journals

As mentioned earlier, h-index, g-index, and m-index all serve as tools that can be used for investigation. Citation periodicity over publication dates determines how much impact a journal has; see Table 2, which is based on a local impact perspective of 84 research articles.

Table 2 The ranking of academic journals by impact factor places Sustainability (switzerland) at the top across all three metrics- index h, g, and m- followed by the Journal of Business Ethics and the Journal of Retailing and Consumer Services, underscoring their significant academic influence.

Table 2: Impact Factor of the Journals

Source	<u>h_index</u>	<u>g_index</u>	<u>m_index</u>	TC	NP	<u>PY_start</u>
SUSTAINABILITY (SWITZERLAND)	10	16	1	266	17	2016
JOURNAL OF BUSINESS ETHICS	4	4	0.211	671	4	2007
JOURNAL OF RETAILING AND CONSUMER SERVICES	3	4	0.3	290	4	2016
BUSINESS STRATEGY AND THE ENVIRONMENT	2	2	1	41	2	2024
COGENT BUSINESS AND MANAGEMENT	2	2	0.182	24	2	2015
CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT	2	3	0.4	44	3	2021
INTERNATIONAL BUSINESS REVIEW	2	2	0.5	48	2	2022
INTERNATIONAL REVIEW ON PUBLIC AND NONPROFIT MARKETING	2	2	0.2	22	2	2016
PUBLIC RELATIONS REVIEW	2	2	0.125	285	2	2010
ADMINISTRATIVE SCIENCES	1	1	0.5	1	1	2024

Sources: Author compilation

Impactful Authors

Table 3 presents these bibliometric indicators for a detailed evaluation of the authors' scientific contribution: H-index, g-index, m-index, total citations (TC), total papers (NP), and the year of the first publication (PY_start). Among the listed authors, Lee stands out as the most prominent with an H-index of 4, a g-index of 7, 335 total citations, and 7 publications since 2010, among other metrics. In contrast, his m-index (0.25) indicates a lower annual impact due to his longer publication career, unlike Ahmed's m-index (0.6136) and Arachchi's m-index (0.5), who have 35 citations each and began their careers more recently, Ahmed in 2021 and Arachchi in 2022, showing rapid impact in a short time. Fatima, Mobin, and Rehman, each with an H-index of 3 and citations ranging from 132 to 150 since 2016, exhibit consistency but only moderate influence. Conversely, John, the earliest contributor starting in 2007, received 51 citations and has an m-index of 0.158, indicating slower impact growth over time. Anna and Caesar are consequently the least cited authors, with 13 citations apiece and an m-index of 0.22, reflecting their limited visibility of resources so far.

Table 3: Impact of Authors

Author	<u>h_index</u>	<u>g_index</u>	<u>m_index</u>	TC	NP	<u>PY_start</u>
LEE	4	7	0.25	335	7	2010
AHMAD	3	3	0.6	136	3	2021
FATMA	3	3	0.3	132	3	2016
JOHN	3	3	0.158	151	3	2007
MOBIN	3	3	0.3	132	3	2016
RAHMAN	3	3	0.3	150	3	2016
ANA	2	2	0.222	13	2	2017
ARACHCHI	2	2	0.5	35	2	2022
CHEN	2	2	0.4	41	2	2021
CÉSAR	2	2	0.222	13	2	2017

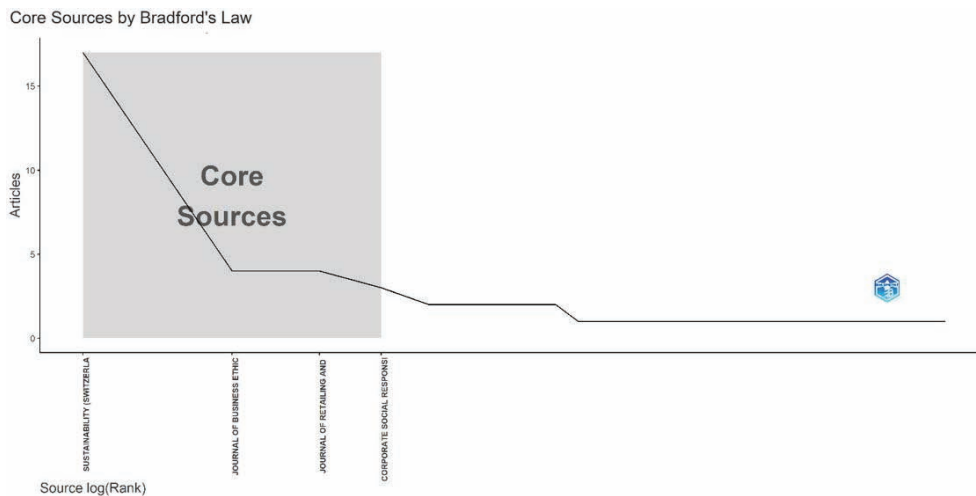
Sources: Author compilation

Table 4: Distribution of Journal on the Basis of NP

Sources	Rank	Freq	<u>cumFreq</u>	Zone
SUSTAINABILITY (SWITZERLAND)	1	17	17	Zone 1
JOURNAL OF BUSINESS ETHICS	2	4	21	Zone 1
JOURNAL OF RETAILING AND CONSUMER SERVICES	3	4	25	Zone 1
CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT	4	3	28	Zone 1
BUSINESS STRATEGY AND THE ENVIRONMENT	5	2	30	Zone 2
COGENT BUSINESS AND MANAGEMENT	6	2	32	Zone 2
INTERNATIONAL BUSINESS REVIEW	7	2	34	Zone 2
INTERNATIONAL REVIEW ON PUBLIC AND NONPROFIT MARKETING	8	2	36	Zone 2
PUBLIC RELATIONS REVIEW	9	2	38	Zone 2
ADMINISTRATIVE SCIENCES	10	1	39	Zone 2

Sources: Author compilation

Table 4 and Figure 4 together demonstrate the application of Bradford's Law of scattering, which helps identify the most influential journals in this subject area. The results show that there are very few core journals that publish the majority of articles, with Sustainability (Switzerland) leading at

**Figure 4:** Graphical Presentation of Core Source by Bradford's Law

Sources: Author compilation

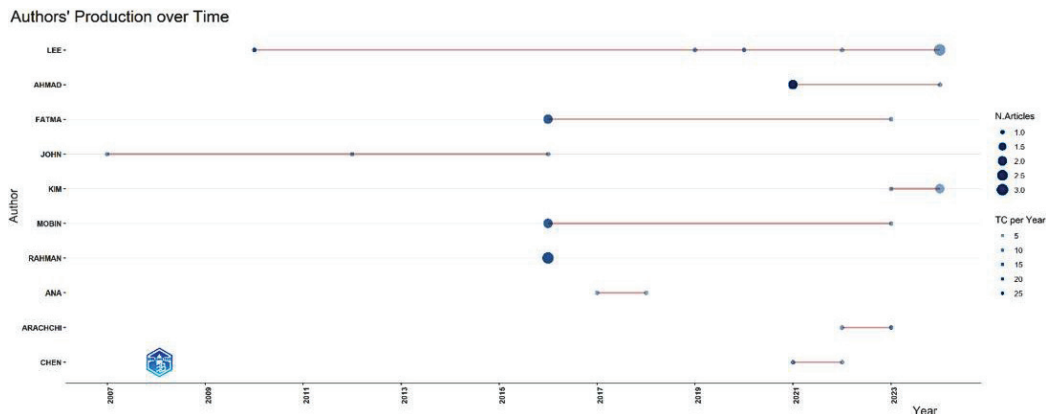


Figure 5: Author Production Over Time
Sources: Author compilation

17 articles, followed by the Journal of Business Ethics, Journal of Retailing and Consumer Services, with 4 articles each. Then, there are Corporate Social Responsibility and Management, each with 3 articles. These four journals form the first zone, or what we could call the core source, with a total cumulative frequency of 28, highlighting their importance in disseminating knowledge. Zone 2 contains a more scattered group of journals, including Business Strategy and Environment; Cogent Business and Management; International Business Review; and others, each contributing one or two articles, thus showcasing more diverse scholarly outputs. Figure 4 further illustrates this pattern, with a sharp decline in the number of articles after the leading publisher, indicating that research has been concentrated in fewer outlets and has gradually begun to spread across peripheral sources, thereby confirming Bradford's Law in this context.

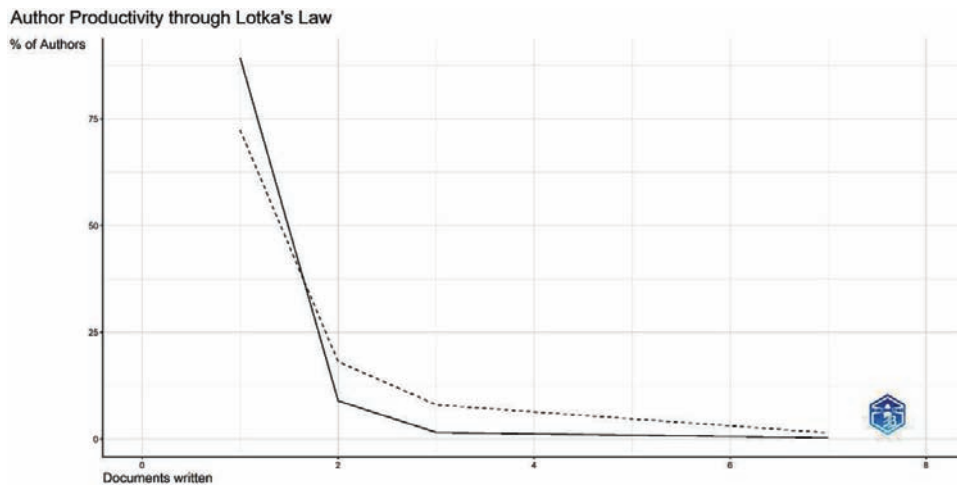
Figure 5 illustrates the temporal distribution of authors' research productivity, showing the fluctuations in research output in terms of continuity and impact. Lee stands out as a highly consistent contributor, with outputs maintained from 2010 to 2023. In contrast, Ahmed, Fatima Mobin, and Rehman are mid-career researchers who have become active since 2016; however, Ahmed quickly gained visibility through high citation counts despite having fewer publications. John and the earliest contributors since 2007 have long-term engagements, though their impact is comparatively lower. Anna, Arachchi, and Chen represent emerging voices entering the field after 2017, indicating new research momentum. The size of the bubbles further emphasises disparities in citation influence, highlighting the dominance of established scholars like Lee and Ahmad, as well as the rising potential of newcomers.

Table 5 and Figure 6 show the distribution of authors' productivity according to Lotka's law. The table indicates that most authors (349 authors, 89.3%) have written only a single document, a much smaller proportion comprising those who authored two (9%), three (1.5%), or seven papers (.3%) when compared to the theoretical distribution suggested by Lotka's law (72.4% for one publication, 18.1% for two, 8% for three, and 1.5% for seven). It became clear that the observed data are largely consistent with the theoretical model, with the exception of an unusually high concentration of single-document authors. Moreover, the graph supports this trend; the actual distribution, shown by the solid line, and the theoretical prediction, shown by the dashed line, both display a steep decline in author productivity as the number of documents increases, thus confirming the inverse square pattern of scholarly contribution predicted by Lotka's law. Overall, both the figure and table validate Lotka's

Table 5: Authors Productivity

Documents written	N. of Authors	Proportion of Authors	Theoretical
1	349	0.893	0.724
2	35	0.09	0.181
3	6	0.015	0.08
7	1	0.003	0.015

Sources: Author compilation

**Figure 6:** Authors Productivity Graph through Lotka's Law

Sources: Author compilation

law as an effective tool for explaining the uneven distribution of authors' productivity in the dataset under study.

Table 6 and Figure 7 show that 17 articles have been published in China (20.2%), the majority of which are classified as national collaborations. The USA ranks second with 10 articles (11.9%) and features co-authorship across different countries. India-Spain (8.3% each) is limited to single-country publications, while Italy stands out in international collaborations, with all its output (4.8%) being of that nature. Germany, the UK, and France display a varied patent portfolio, with about one-third to half of their patents being collaborative. Overall, the data indicate that the USA and China are

Table 6: Friends of SCP and MCP

Country	Articles	Articles %	SCP	MCP	MCP %
CHINA	17	20.2	10	7	41.2
USA	10	11.9	8	2	20
INDIA	7	8.3	7	0	0
SPAIN	7	8.3	7	0	0
ITALY	4	4.8	0	4	100
POLAND	4	4.8	4	0	0
GERMANY	3	3.6	2	1	33.3
UNITED KINGDOM	3	3.6	2	1	33.3
AUSTRALIA	2	2.4	2	0	0
FRANCE	2	2.4	1	1	50

Sources: Author compilation

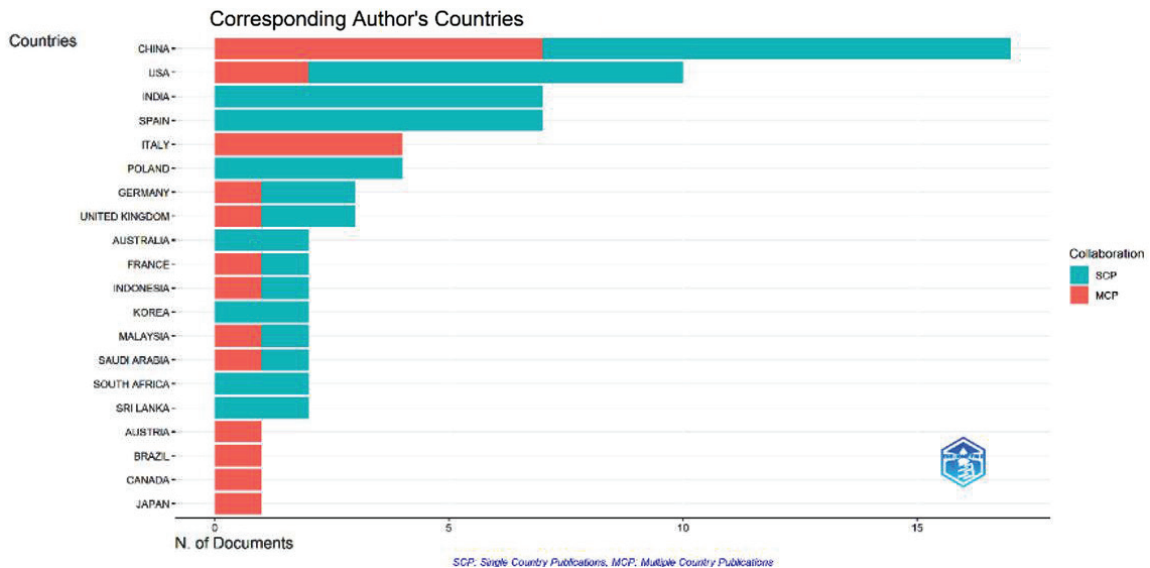


Figure 7: Graphical Presentation of SCP and MCP

Sources: Author compilation

the dominant forces of production, while Italy and France play pivotal roles in fostering enhanced collaborations.

Figure 8 shows that the period of modest global growth ended in 2015. Since then, Chinese output has surpassed all others, reaching well over 45 publications by 2025. The USA and Spain followed upward trajectories, while India experienced gradual growth. The UK mostly stopped increasing in 2018. Overall, the figures depict China's rise as the leading herbal research powerhouse, with other countries maintaining steady, though comparatively slower, growth.

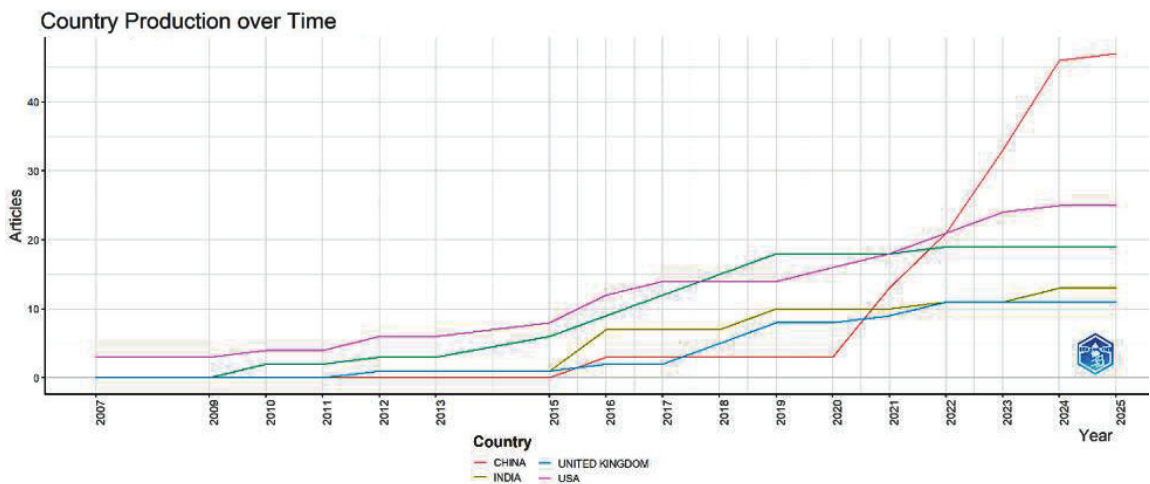
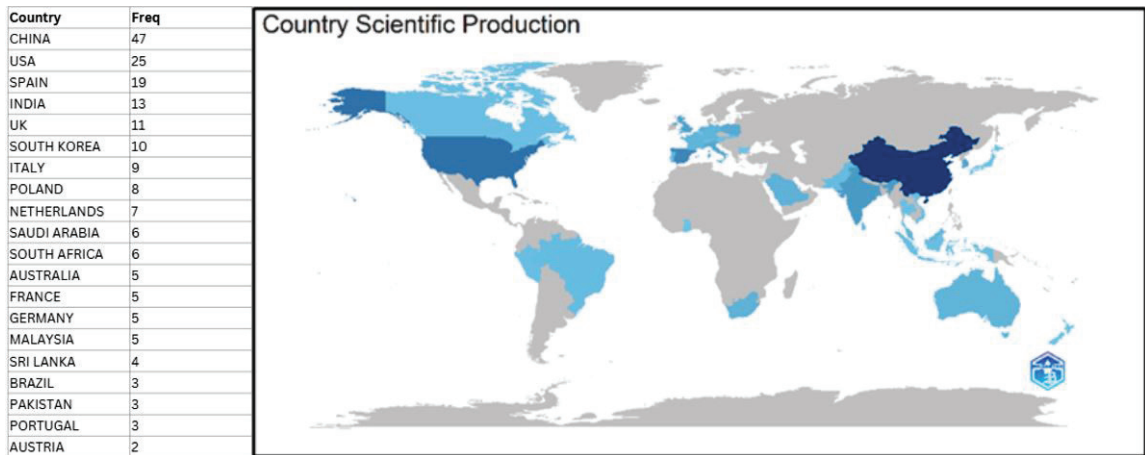


Figure 8: Trade lines of country over time

Sources: Author compilation

Table 7 reveals clear disparities, with China leading at 47, the USA at 25, and Spain at 19 in research output, while emerging economies such as India at 13 and South Korea at 10 show

Table 7: Countries scientific production

Sources: Author compilation

increasing influence. European nations like the UK, Italy, Poland, and the Netherlands maintain steady contributions, alongside notable participation from Saudi Arabia, South Africa, and countries in the Asia-Pacific region including Australia, Malaysia, and Sri Lanka. Overall, scientific productivity remains concentrated in a few dominant nations; however, the pool of research participants is gradually becoming more diverse across the region.

Table 8: Most Relevant Affiliation Overtime

Affiliation	Articles
NATIONAL FORMOSA UNIVERSITY TAIWAN	6
UNIVERSIDAD DE LEÓN	6
AGH UNIVERSITY OF KRAKOW	4
BUSINESS SCHOOL OF SICHUAN UNIVERSITY	4
PENNSYLVANIA STATE UNIVERSITY	4
UNIVERSITÀ DEGLI STUDI DI UDINE	4
LIAONING UNIVERSITY	3
NANJING UNIVERSITY OF AERONAUTICS AND ASTRONAUTICS	3
SHENZHEN UNIVERSITY	3
SOUTHWESTERN UNIVERSITY OF FINANCE AND ECONOMICS	3
STELLENBOSCH UNIVERSITY	3
UNIVERSIDAD DE MURCIA	3
UNIVERSIDAD POLITÉCNICA DE MADRID	3
UNIVERSIDADE FEDERAL DE MATO GROSSO DO SUL	3
UNIVERSITI PUTRA MALAYSIA	3
UNIVERSITI TUNKU ABDUL RAHMAN	3
UNIVERSITY OF CONNECTICUT	3
UNIVERSITY OF HA'IL	3
CHANDIGARH UNIVERSITY	2
CHAOYANG UNIVERSITY OF TECHNOLOGY	2

Sources: Author compilation

Table 8 displays the most productive academic affiliations researching corporate social responsibility (CSR) and consumer buying behaviour. National Formosa University (Taiwan) and Universidad de León (Spain) lead with six articles each, indicating institutions focused on CSR

consumer studies. With four articles each, AGH University of Krakow, Business School of Sichuan University, Pennsylvania State University, Università degli Studi di Udine, and Liaoning University contribute from Europe, Asia, and the U.S. Some universities like “Stellenbosch”, Murcia, Putra Malaysia, and Connecticut have three studies each, highlighting the broad global interest. These results demonstrate the dispersed yet focused nature of the worldwide research network.

Thematic Map

Figure 9: Strategy map of the research on CSR and consumer buying behaviour with theories plotted by density of development and relevance (centrality). Thus, motor themes in the upper-right quadrant of the strategic map include CSR, sustainable development, consumer attitude, and willingness to pay, indicating that these theme areas are well-developed and highly relevant in progressing the field. Basic themes such as brand equity, purchase behaviour, and the hotel industry remain central but are somewhat immature. Niche themes, including authenticity, credibility, and proximity, are considered specialised and promising. Emerging or declining themes such as sustainable consumption and consumer psychology still require significant validation. This study reinforces previous interpretations more than it revises them, suggesting that the CSR-consumer link is a dynamic research frontier.

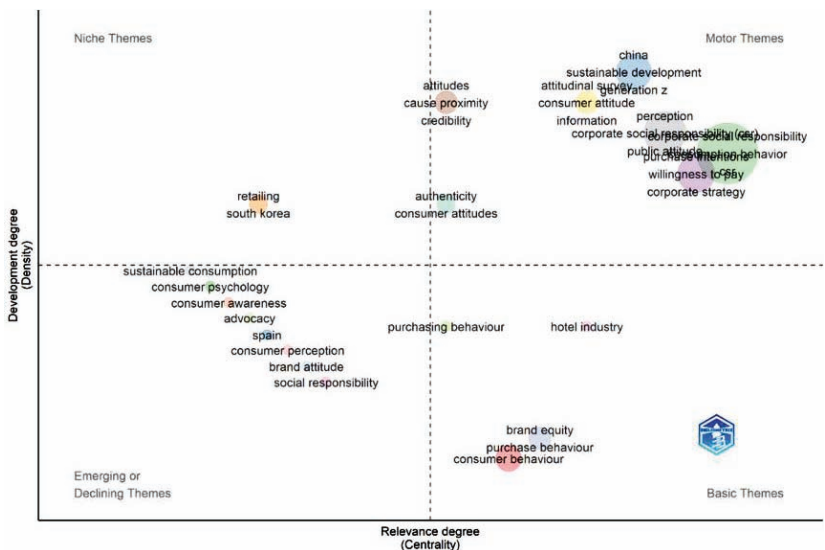


Figure 9: Thematic Map of the Dataset

Sources: Author compilation



Figure 10: Thematic Evolution of the Topic

Sources: Author compilation

Figure 10 presents a thematic analysis of research on CSR and consumer behaviour across three periods: 2007 to 2018, 2019 to 2022, and then 2023 to 2005. Early studies focused on consumer

behaviour in general, while it was only after 2019 that CSR was increasingly linked to purchase intention and brand perception. Recent trends from 2023 to 2025 show CSR supporting ethical and sustainability-oriented consumer choices, thereby strengthening the connection between CSR strategies and behavioural responses.

Figure 11 displays the RPYS of CSR and consumer buying behaviour studies. The black line shows references cited in studies per year of publication, while the red line shows a five-year median deviation highlighting a peak of influential work between 2004 and 2016, marking notable CSR theories and stakeholder research. The growth after 2010 relates to sustainable branding and ethical consumption, with implications for emerging research priorities.

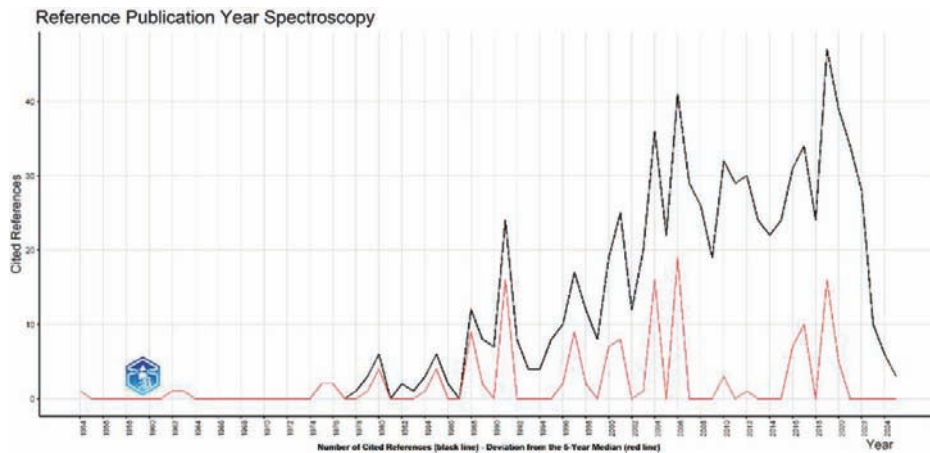


Figure 11: Reference Publication Year Spectroscopy (RPYS)

Sources: Author compilation

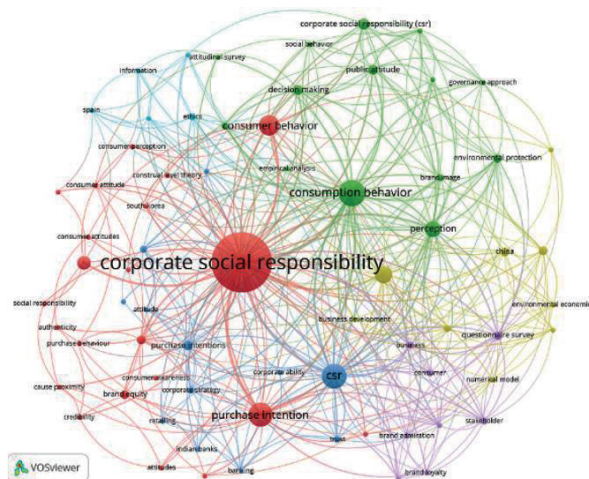


Figure 12: Thematic Map following Keyword Co-occurrences

Sources: Author compilation from VOS Viewer

Figure 12 shows that the bibliometric network has been built by including 84 published works related to recent trends in CSR and consumer buying behaviour. Five interconnected clusters emerge: the red clusters cover CSR purchase contention, credibility, and brand image, indicating that CSR

can build consumer trust; the green cluster highlights consumer and consumer behaviour, including attitude, perception, and decision-making; the blue cluster, somewhat ironically, encompasses CSR framework and measurement, while the yellow cluster links CSR with environmental economic governance and stakeholder engagement. Some themes are distant from the central focus and may be excluded from future research. The proximity of a subset to the main clusters indicates the area that scholars might explore further.

Proposed Conceptual Model Linking CSR and Consumer Buying Behaviour

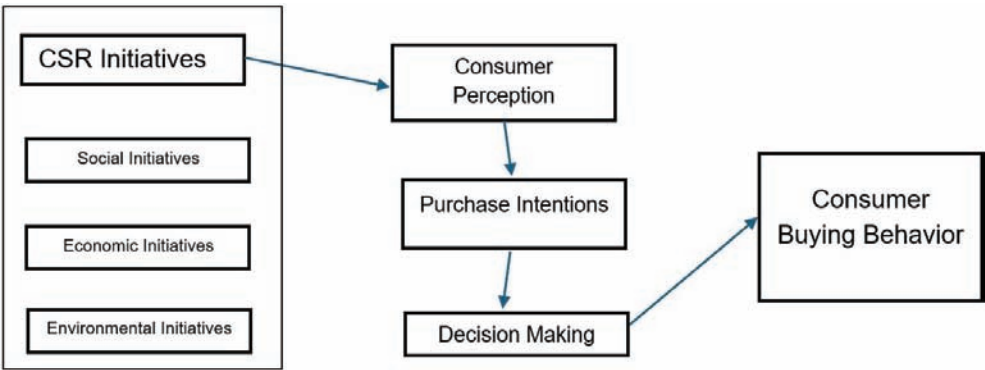


Figure 13: Proposed Conceptual Model

Sources: Authors’ Development based on Lee & Shin, 2010; Arachchi & Samarasinghe, 2022; Kim et al., 2018

Drawing from thematic clusters and co-occurrence analysis, a conceptual model has been created to show how corporate social responsibility (CSR) impacts consumer behaviors. The model suggests that CSR efforts, covering social, economic, and environmental aspects, positively influence how consumers perceive the brand. These perceptions then affect their decision-making, resulting in better judgment and increased purchase intentions. In turn, this leads to more favorable buying behavior. The framework is based on previous research indicating that perceptions of CSR act as a mediating factor in shaping consumer attitudes and intentions, especially in markets focused on sustainability. Consequently, this model offers clear guidance for future research, particularly in emerging markets like India.

CONCLUSION

The study performed a thematic bibliometric analysis of 84 documents from 2007 to 2025 to synthesize knowledge and identify trends related to CSR and consumer buying behavior. The analysis highlights this field as highly dynamic, showing a consistent increase in total publications. The conceptual framework has evolved in areas such as corporate social responsibility, purchase intentions, sustainability, consumer behavior, perception, and sustainable development. Research consistently underscores the positive impact of CSR initiatives on consumer outcomes, like increasing purchase intentions and willingness to pay higher prices, offering valuable insights into the connection between CSR and consumer behavior. The study also identifies notable geographical disparities; most traditional research comes from Anglo-Saxon countries, while CSR remains underexplored in developing nations. Additionally, due to limited consumer awareness of CSR activities, the “CSR consumption paradox” continues to attract scholarly interest. By organizing scattered information, this study provides important insights that can guide future research directions.

RECOMMENDATION FOR FUTURE STUDY

In the coming years, research should primarily aim to expand the scope of empirical studies to address essential geographical and dimensional gaps. Since traditional research is mainly centered on Anglo-Saxon contexts, the impact of CSR in developing nations remains largely underexplored. It therefore requires increased focus on developing countries and emerging markets such as India. A robust cross-cultural analysis between developed and emerging nations is necessary to determine whether perceptions of corporate social responsibility are consistent across different country contexts. Moreover, research should enhance industry-specific studies, like those in the fashion sector, which have previously examined factors such as consumer willingness to pay more for socially responsible firms, while also exploring other CSR dimensions, notably ESG criteria.

LIMITATIONS OF THE STUDY

This study was limited to only one database, which is the Scopus database, and in future, more databases like Web of Science (WOS) and Dimensions may be included in the study.

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SECTION 3

HUMAN RESOURCE MANAGEMENT IN GIG ECONOMY

Working Mothers and Child Development: Health and Education Perspectives

Aadya Grover¹ & Ritesh Dwivedi²

¹Research Scholar, Symbiosis Institute of Business Management, Noida,
Symbiosis International (Deemed University), Pune, India

²Assistant Professor, Symbiosis Institute of Business Management, Noida,
Symbiosis International (Deemed University), Pune, India

E-mail: aadya.grover2027@sibmnoida.siu.edu.in, ritesh.dwivedi@sibmnoida.siu.edu.in

Abstract

One of the most significant social changes of the last century is the rising participation of women in the workforce, reshaping family dynamics, economic conditions, and child-rearing practices. Among the various effects of maternal employment, children's healthcare and education remain crucial long-term determinants of well-being. While traditional views assumed that a mother's absence at home hindered child development, contemporary research shows a more nuanced picture shaped by socioeconomic and cultural factors. Dual-income households often benefit from greater financial stability, enabling improved healthcare, nutrition, and access to quality educational resources. Working mothers also model independence and time management, positively influencing children's personal and academic growth. This study examines how employment in the formal sector affects child health and education in India. Survey findings from 30 working mothers reveal that workplace flexibility—such as flexible hours, breastfeeding breaks, and childcare facilities—enhances children's health and learning outcomes. Maternal decision-making autonomy significantly predicts better nutrition, healthcare, and academic performance. Although workplace policies showed no measurable direct impact, the persistent gap between policy design and ground-level implementation limits their effectiveness. Overall, the study highlights how supportive work environments and maternal autonomy can shape intergenerational health and educational outcomes.

Keywords: Working Mothers, Maternal Autonomy, Children's Education, Children's Healthcare, Workplace Policy, Workplace Flexibility, Workplace Support, India

INTRODUCTION

Across the world, the image of a working mother has become a symbol of resilience—balancing boardroom meetings with bedtime stories. Professional deadlines with pediatric appointments, and for India, this picture is more than just symbolic as the number of women entering the formal labour force grows, while also carrying the traditional workload of caregivers (Budhwar & Varma, 2011).

The growing involvement of women in the formal workforce is one of the key social and economic changes in the world. Corporate offices and government services to health, education and information technology, women are playing a major role in the formal sector economy. The change has improved the income levels of families, promoted gender equality, and re-defined the traditional roles of the household (Budig, Misra, and Boeckmann, 2016). Nonetheless, it has also provided a critical discourse of the impact of formal sector employment on the maternal roles especially in areas of child healthcare and child education which are the key elements of human development in the long term (Bianchi and Milkie, 2010).

Formal sector work is usually typified by regular work times, benefits which are standardized and professional permanency. In contrast to the informal sector, where the working process can

be flexible but not secure, the formal industry employment is usually associated with regular working hours, level of workload, and organizational requirements. Although this kind of work has the advantage of offering a stable income, healthcare insurance, maternity leaves, and institutional assistance (International Labour Organization [ILO], 2019), it can cause the mother to spend less time with a child and oversee their education. This conflict of professional duties and family roles begs the question of whether this leads to a net effect of the welfare of children in terms of maternal-level jobs in a formal economy (Chatterjee and Mahapatro, 2021).

A key aspect of this discussion is that the number of dual employment families has increased where both parents are involved in the workforce. The dual employment in the city has been growing, which is motivated by the increasing costs of living, the desire to have an upward mobility, and evolving gender expectations (Hill & Stafford, 2013). On the one hand, having money earned by both partners allows dual-income families to live more financially stable, which allows them to afford better healthcare services, healthy meals, private schools, and other extracurricular activities that their children can enjoy (Budig et al., 2016).

This dual employment imposes significant research questions: How do the mothers' employment shape children's health, nutrition, and education? How does maternal autonomy affect child healthcare and education? How does workplace flexibility on children's health, nutrition, and education outcomes? How do workplace policy interventions improve children's education and healthcare outcomes?

The work of a mother is frequently seen as a two-edged sword. In many cases, a family and income tend to rise when the mother is working, and if there is a woman employed, she might have better access to health and education. (Desai & Jain, 1994). Conversely, if there is no flexibility for mothers at work and insufficient formal organisation supports are in place, then there are risks to mothers' well-being. Children will then potentially experience detrimental outcomes (Rao & Apte, 2009). Empirical findings show that maternal agency, time, and paid resources at work influence child trajectories (Clark et al., 2020). There is less argumentation to be made for workplace interventions, such as childcare arrangements, flexi-work hours, and maternity leave, to their demonstrated effectiveness (Bianchi & Milkie, 2010); in India, the availability of such policies and the efficacy of them, when provided vary broadly (Chopra & Zambelli, 2017).

With the changing nature of traditional family roles, how maternal employment affects the health practices, and the academic outcomes of children has become a major issue in the academic and policy arena. Healthcare is an important aspect of child development, which includes preventative measures, including immunization, nutritional sufficiency, and frequent check-ups. On the same note, education is at the forefront of cognitive capacity building, academic success and future career prospects. This has frequently been perceived in two rather different ways about working mothers. On the one hand, the dual-income families enjoy greater financial resources, so they access better healthcare facilities, healthier diets and quality educational resources. Conversely, the needs of employment can limit the amount of time the mother can spend on direct supervision, emotional care and educational advice resulting in developmental gaps in children.

While global studies often demonstrate positive benefits of workplace interventions for working mothers, such as childcare services, flexible work hours, and maternity leave (Bianchi & Milkie, 2010), in India, both the availability and outcomes of workplace policies are far from consistent (Chopra & Zambelli, 2017).

Workplace childcare provision has come to be both a regulatory and managerial issue in the formal sector of India. The provisions were standardized by the Ministry of Women and Child Development

through the National Minimum Standards for Crèches, 2024. Nonetheless, ambiguities in compliance persist, particularly as regards whether monetary reimbursement can act as a substitute for a physical crèche under Section 11A of the Maternity Benefit (Amendment) Act 2024 (BCP Associates, 2024). Advisories from the government and communications from parliament continue to reiterate that employers are expected to provide on-site or proximate crèche facilities and to periodically audit compliance (EPFO, 2023; Rajya Sabha, 2025). Hence, childcare infrastructure in the formal sector functions simultaneously as a statutory obligation and as a strategic retention mechanism supporting women's sustained labour-force participation

Therefore, further systematic analysis of how the working conditions of working mothers affects their children's health and education in the formal sector is warranted.

The objectives of the study are as follows.

1. To investigate the availability and use of workplace resources for mothers working in the formal sector, such as flexible work schedules, breastfeeding breaks, and access to childcare, and their relationship to the health and educational outcomes of their children.
2. To evaluate how Maternal Autonomy, as determined by her ability to make decisions about childcare and household issues, affects the educational, health, and nutritional outcomes of her children.
3. To examine how different maternal employment in the formal sector affects school age children's academic performance and health.
4. To determine workplace and policy interventions that can improve maternal empowerment and workplace support gaps to improve child well-being.

LITERATURE REVIEW

The formal sector, also known as the "organized sector," in India refers to both public and private businesses that are registered under labour laws and where workers are entitled to legal protections and wage protection. The organized sector in India includes businesses that are registered under the Factories Act, Shops and Establishments Act, or other labour laws. These businesses provide jobs with fixed terms, wages, and benefits. (Kapsos, 2013)

A working mother is defined as a woman who works in a paid job, and her role would be governed by formal labour laws. This implies written contracts, defined hours of work, job security, social protection such as access to a maternity leave account, health insurance, retirement benefits, and she would be included in a country's official labour statistics. It does not refer to employment in the unorganized sector, which runs on social norms without protection through labour laws. (Ministry of Labour, 2021)

"Formal sector employment refers to work arrangements that are regulated by labour legislation, where workers have contractual agreements, access to social security benefits, and are recognized in official employment statistics." (Imai, 2016)

Children educational outcomes include measurable indicators of a child's educational attainment, abilities, and involvement in aspects of education. These include parameters such as school performance, literacy, grade completion, school enrolment, and school attendance. "Educational outcomes on the whole comprise indicators such as school enrolment, grade completion, literacy, numeracy, and test scores all of which are used together to measure the quality of education as an investment in children's human capital." (Behrman, 1984)

In India, 35.5% of children below the age of five years were stunted, 19.3% were wasted and 32.1% underweight according to the Fifth Round of the National Family Health Survey (NFHS-5,

2019-21). Further, the percentage of 12-23 months old children with full immunisation increased to around 77 percent compared to the 62 percent in the last round. These base numbers are fundamental towards any enquiry of maternal employment, child health, child education occurrences in the present Indian scenario. (Press Information Bureau [PIB], 2023)

Children health outcomes include measures of physical, mental, and nutritional well-being that take into account a child's development and growth. Nutritional status (height-for-age, weight-for-age, BMI), morbidity rates, vaccination coverage, and illness prevalence are examples of common indicators. "Child health outcomes are assessed using anthropometric indicators of height-for-age, weight-for-age, and weight-for-height, as well as rates of morbidity and mortality, representing overall physical status." (Victora, 2008)

These two areas offer crucial information about how formal employment impacts children's access to education, cognitive development, and physical health when analysing the impact of maternal employment in the formal sector.

Earlier research has revealed the relationship between mother's employment and children education impacted a variety of factors including socio-economic status, cultural factors etc.

A recent study of mothers in the formal-sector in India reveals that mothers are progressively going through hybrid/return-to-office transitions that transform their care organization and time spending. The remote-offline transition escalated work-care conflict and supervision stress and disrupted women more effectively who had no domestic support (Aiswaryalakshmi and Gangadharan, 2025). Formal-sector evidence like IT indicates that hybrid work enhances schedule control, but also creates the issue of career visibility and promotion, the so-called out-of-sight penalty (JETIR, 2024).

Indicatively, in a recent report by OECD, it has been pointed out that early childhood is a delicate stage of development and the opportunity gaps during the early stages of life are instigated by various factors such as maternal labour market, childcare, and socioeconomic vulnerability. (OECD, 2025)

The relationship between maternal employment and children's health outcomes is complex and context dependent. It stated that out of the limited high quality studies, some did not find any, others negative association and some did even positive depending on the maternal job quality, household income and rural/urban background. (Waghode, R. T., Yadav, S. S., Ghooi, R., Razak, S. A., & Menon, K. C., 2025)

It gives rise to two perspectives the positive perspective and negative perspective. The positive perspective leads to an increase in resources. Employment of mother boosts household income, educational outcomes for the child. The negative one where quality time constraint is there due to maternal work leading poor health and nutrition.

Health and Nutrition

One of the studies in Maharashtra reveals that children of working mother were malnourished and had diseases like amnesia, measles and diarrhoea in contrast to those of non-working mothers (Abbi et al., 1991)

While other studies shows that maternal employment leads to better weight of the child and improved health when earnings are constant and in mother's control

Maternal employment leads to maternal control in income resulting in better child healthcare. Educated mothers have better resources to invest income into nutrition and healthcare at the same time there are negative effected of decreased quality time. (Banerjee, 2021); Luthra et al., 2024)

The Maternity Benefit Amendment Act 2017 states that extended paid leave in formal jobs has been associated with longer breastfeeding duration and improved infant morbidity, although long-term data is still limited. (Saxena & Kumari, 2022).

Educated mothers have greater role to use their earnings to buy food and health services, also offsetting potential negative impacts of less time caring (Chatterjee & Banerjee, 2021; Luthra et al., 2024). When considering evaluations of the Maternity Benefit (Amendment) Act 2017, it is reported that while extended paid leave in formal sector employment has provided increases in the time duration of breastfeeding and infant morbidity, there is a limited amount of longitudinal data (Saxena & Kumari, 2022).

Educational and Socio-Behavioural

Children of mothers employed in formal sector have access to better school and maintenance of school attendance as a result of increased household resources (Reddy & Das, 2020).

Some studies also shows that daughters look up to their working mothers as an inspirational role model improving daughter's confidence and gender role perception (Mehta & Sharma, 2023). No provision of workplace flexibility or childcare facilities where mothers have extensive work schedules can impact children study routine and extracurricular activities (Gupta & Menon, 2022). However, mothers in formal sector with childcare facilities and fixed work hours reduce these risks leading to education enhancement (Roy & Choudhury, 2021).

Child Age

This can be a critical factor because infants are the most affected with their mother's absence; making maternal leave and access to creches pivotal NFHS syntheses; (breastfeeding studies, ScienceDirectPLOSPMC)

- **Job Type:** Regular formal employment with predictable work hours can result in positive healthcare and education outcomes in contrast to informal employment (Shukla et al., 2023).
- **Financial control and contribution in household income:** Regular income and earning can lead to better consumption for children and control over the earnings.
- **Educated mothers:** Mothers who are educated are able to engage in interactions, enhancing both intellectual and mental outcomes (Luthra et al., 2024).
- **Childcare facilities:** Studies have shown childcare facilities like creches in formal sectors resulted in improved child health and school readiness (Patel et al., 2022).

While a lot of research exist, there are several gaps which exist in terms.

1. **Measurement of workplace supports:** Recording access to Creches, breastfeeding breaks and flex hours.
2. **Maternal autonomy:** Measuring decision making authority of mothers and its influence on the child health and education outcomes.
3. **Age differentiation:** separate tracking of infants and school age children to differentiate between their health and education affects.

RESEARCH METHODOLOGY

The research design follows a quantitative method using survey to gather primary insights from working mothers in the formal sector. The method was chosen to gather first hand experiences of working mothers in formal sector.

The sample size: thirty working mothers employed in formal sector.

Convenience sampling technique was considered to gather relevant information from working mothers in formal sector.

Reliability tests, factor analysis, regression analysis have been used using SPSS and AMOS to test the variables.

SUMMARY OF RESEARCH HYPOTHESIS

The hypothesis is stated as follows.

<i>S. No</i>	<i>Hypothesis Created</i>
Hypothesis 1 (H1)	- Null Hypothesis (H0): Higher workplace flexibility and workplace support (flexible schedules, breastfeeding breaks, childcare facilities) is not positively associated with child healthcare and education. - Alternate Hypothesis (H1): Higher workplace flexibility and workplace support (flexible schedules, breastfeeding breaks, childcare facilities) is positively associated with child healthcare and education.
Hypothesis 2 (H2)	- Null Hypothesis (H0): Higher maternal Autonomy in decision-making is not associated with child healthcare and education. - Alternate Hypothesis (H2): Higher maternal Autonomy in decision-making is associated with child healthcare and education.
Hypothesis 3 (H3)	- Null Hypothesis: (H0): Workplace policy interventions for working mothers are not positively associated with improved child healthcare and education. - Alternate Hypothesis(H3): Workplace policy interventions for working mothers are positively associated with improved child healthcare and education.

RESULTS AND FINDINGS

Table Reliability Analysis for Workforce Flexibility

Reliability Statistics	
<i>Cronbach's Alpha</i>	<i>No. of Items</i>
.819	7

Source: SPSS output sheet

The study was analysed through reliability testing. The data is reliable as the Cronbach alpha value is more than 0.5.

Table Factor Analysis of Workforce Flexibility

Component	Initial Eigenvalues			Total Variance Explained					
	Total	%		Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.460	49.429	49.429	3.460	49.429	49.429	2.764	39.486	39.486
2	1.444	20.629	70.058	1.444	20.629	70.058	2.140	30.572	70.058
3	.817	11.667	81.725						
4	.600	8.576	90.301						
5	.319	4.563	94.864						
6	.236	3.366	98.230						
7	.124	1.770	100.000						

Extraction Method: Principal Component Analysis.

Source: SPSS Output sheet.

Table Rotated Component Matrix

	<i>WFS4</i>	<i>WFS4</i>	<i>WFS4</i>	<i>WFS4</i>	<i>WFS4</i>	<i>WFS4</i>	<i>WFS4</i>
Component 1	.861	.847	.773	.746	-.049	.188	.337
Component 2	.367	.060	.305	-.020	.819	.797	.777

Source: SPSS output sheet

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.

^a Rotation converged in 3 iterations.

Only for two values, eigenvalues are more than 1. Therefore, it responds to only 2 factors.

Factor Analysis for Decision Autonomy

Total Variance Explained						
Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.068	61.370	61.370	3.068	61.370	61.370
2	.996	19.925	81.295			
3	.498	9.959	91.254			
4	.330	6.605	97.859			
5	.107	2.141	100.000			
Extraction Method: Principal Component Analysis.						

Source: SPSS Output sheet.

Since there is only 1 factor with eigenvalues more than 1, there is no rotated component matrix generated.

Factor Analysis for Child Healthcare and Education Outcomes

Total Variance Explained						
Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.557	51.136	51.136	2.557	51.136	51.136
2	1.000	19.990	71.126			
3	.905	18.092	89.218			
4	.364	7.287	96.505			
5	.175	3.495	100.000			
Extraction Method: Principal Component Analysis.						

Source: SPSS Output sheet.

Since there is only 1 factor whose eigen values are more than 1. There is no rotated component matrix generate.

RESEARCH HYPOTHESIS

Hypothesis 1 (H1) – Higher workplace flexibility and workplace support (flexible schedules, breastfeeding breaks, childcare facilities) is positively associated with child healthcare and education.

Image 1 of Regression Analysis result of Hypothesis 1: Child healthcare and Education (Y) predicted by Workplace Flexibility (X)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.580 ^a	.337	.313	.82881033

a. Predictors: (Constant), Workplace_Flexibility

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.766	1	9.766	14.217	.001
	Residual	19.234	28	.687		
	Total	29.000	29			

a. Dependent Variable: Child_Healthcare_Education

b. Predictors: (Constant), Workplace_Flexibility

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	-2.357E-16	.151		.000
	Workplace_Flexibility	.580	.154	.580	.00

a. Dependent Variable: Child_Healthcare_Education

Source: SPSS Output sheet

The regression equation is Child health care and Education (Y) = 0.580*Workplace Flexibility + (-2.375E-16)

The regression analysis supports Hypothesis 1. As mentioned in the table, Workplace Flexibility (X) has a positive effect on Child Healthcare and Education (Y),

R = .580 says that there is a moderate positive correlation between Workplace_Flexibility (independent variable) and Child_Healthcare_Education (dependent variable). As workplace flexibility rises, child healthcare education tends to rise too.

R² = 0.337. This shows 33.7 percent variability in Child healthcare and education due to the impact of Workplace flexibility.

Adjusted R² = 0.313. The adjusted R square adjust the sample size and independent variables. As there is just one variable, R and R square is close.

P value = 0.001. P value is less than 0.05 showing significant relationship between Workplace Flexibility and Child Healthcare and Education Outcomes. Workplace flexibility has a significant positive impact in improving Child healthcare and education outcomes.

This highlights that higher levels of workplace flexibility are directly proportional with better outcomes in child healthcare and education. Therefore, alternate hypothesis is accepted, and null hypothesis is rejected.

Hypothesis 2 (H2) - Higher maternal Autonomy in decision-making is associated with child healthcare and education.

Image 2 of Regression Analysis result of Hypothesis 2: Child healthcare and Education (Y) predicted by Decision Autonomy (X)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.690 ^a	.476	.457	.73665928

a. Predictors: (Constant), Decision_Autonomy

ANOVA ^a					
Model		Sum of Squares	df	Mean Square	Sig.
1	Regression	13.805	1	13.805	.000 ^b
	Residual	15.195	28	.543	
	Total	29.000	29		

a. Dependent Variable: Child_Healthcare_Education

b. Predictors: (Constant), Decision_Autonomy

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	-2.330E-16	.134		.000
	Decision_Autonomy	.690	.137	.690	.000

a. Dependent Variable: Child_Healthcare_Education

Source: SPSS Output sheet

The regression equation is child healthcare and Education (Y) = 0.690*Decision Autonomy + (-2.330E-16)

The regression analysis supports Hypothesis 2. As mentioned in the table, Decision Autonomy (X) has a positive effect on Child Healthcare and Education (Y),

$R = 0.690$, $R^2 = 0.476$, The standardized beta coefficient ($\beta = .690$, $p = .001$) The P value being less 0.05 highlights that higher maternal Autonomy in decision making is directly associated with better outcomes in child healthcare and education. Therefore, H2 is accepted.

$R = 0.690$. This implies there is a strong positive correlation between Decision Autonomy and Child Healthcare Education.

$R^2 = 0.476$. There is 47.6% of the variance in child healthcare education which is impacted by decision autonomy.

Adjusted $R^2 = 0.457$. The adjusted R square adjust the sample size and independent variables. As there is just one variable, R and R square is close.

Since the p value < 0.05, implying P value is $p < 0.001$ which shows the relationship between variable is highly significant. The regression model is highly significant.

Thus, there is significant relationship between decision autonomy in impacting child education and healthcare outcomes.

Decision autonomy is a strong and significant predictor of child healthcare education, explaining nearly half (47.6%) of the variation in outcomes.

The results predicted that there is higher maternal decision autonomy is associated with greater levels of child healthcare and education outcomes. Therefore, the null hypothesis is rejected.

Hypothesis 3 (H3): Workplace policy interventions for working mothers are positively associated with improved child healthcare and education.

Image 3 of Regression Analysis result of Hypothesis 3: Child healthcare and Education (Y) predicted by Workplace Policy (X)

Model Summary						
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
1		.178 ^a	.032	-.003	1.00138520	
a. Predictors: (Constant), Workplace_Policy						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.922	1	.922	.920	.346 ^b
	Residual	28.078	28	1.003		
	Total	29.000	29			
a. Dependent Variable: Child_Healthcare_Education						
b. Predictors: (Constant), Workplace_Policy						

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	-2.483E-16	.183		.000
	Workplace_Policy	.178	.186	.178	.959

a. Dependent Variable: Child_Healthcare_Education

Source: SPSS Output sheet

The regression equation is Child health care and Education (Y) = 0.178*Workplace Policy + (-2.483E-16)

The regression analysis is not supporting Hypothesis 3. As mentioned in the table, Workplace Policy Interventions (X) is not directly associated with Child Healthcare and Education (Y),

$R = 0.178$, $R^2 = 0.32$, p value $< .01$. The standardized beta coefficient ($\beta = 0.178$, $p = 0.346$). The P value being less 0.01 highlights that higher maternal Autonomy in decision making is directly associated with better outcomes in child healthcare and education. Therefore, H2 is accepted.

$R = 0.178$. This implies there is a very weak correlation between Workplace policy interventions and Child Healthcare Education.

$R^2 = 0.32$. There is 3.2% of the variance in child healthcare and education outcomes which is impacted by workplace policy interventions.

Adjusted $R^2 = -0.003$. The adjusted R square adjust the sample size and independent variables. After adjusting the R square, the R comes close to 0.

Since the p value > 0.05 , implying P value is $p = 0.346$ which shows the relationship between variable is insignificant. The regression model is insignificant.

Thus, there is weak relationship between workplace policy interventions in impacting child education and healthcare outcomes.

The results predicted shows that their Workplace policy interventions is not a good predictor for improved child healthcare and education outcomes. Hence the null hypothesis is rejected.

DISCUSSION

The study examined how the workplace flexibility and maternal Autonomy and workplace policy interventions in the Indian formal sector affect child well-being. The results provided support both H1 and H2, but not H3, which shows the importance of enacted support and agency instead of the presence of workplace policies.

Hypothesis 1 (H1): Higher workplace flexibility and workplace support (flexible schedules, breastfeeding breaks, childcare facilities) is positively associated with child healthcare and education.

Findings supported that workplace flexibility and in-work support systems—like flexible working hours, breastfeeding breaks, and access to childcare—were strongly linked to improved child health and education outcomes. These results align with the currently existing literature that demonstrated that workplace lactation programs increase the duration of breastfeeding, which contributes to the increased infant nutrition and immunity (Dinour, Szaro, 2017; Hirani et al., 2021). Similarly, schedule flexibility allows mothers to balance work and caring duties thereby reducing stress and enhancing school attendance and care practices among children (Heymann et al., 2017). In India, flexibility in the workplace was attempted to be institutionalized through the Maternity Benefit (Amendment) Act, 2017, which allowed the possibility of working at home following a maternity leave (Government of India, 2017).

Hypothesis 2 (H2): Higher maternal Autonomy in decision-making is associated with child healthcare and education.

Findings also supported H2: The higher the power of decision-making of the mother, the better the child health and educational achievements were recorded. Mothers with decision-making powers are most likely to take children to preventive healthcare, spend on their education, and improve the nutritional diversity of them (Rahman et al., 2021; Singh et al., 2015). Although not all areas of decision-making are equal, economic independence is the only one that stands out.

Autonomy is not, however, equal across all areas—economic independence, mobility, and decision-making power all collectively determine outcomes (Malhotra & Schuler, 2005). Empowering women's agency, thus, compounds the benefits of work flexibility by allowing mothers to make fullest use of available resources.

Hypothesis 3 (H3): Workplace policy interventions for working mothers are positively associated with improved child healthcare and education.

Unexpectedly, H3 was not supported. The availability of workplace policy interventions (e.g., statutory maternity leave, required crèche facilities, and breastfeeding breaks) was not significantly related to improvement in child outcomes in our sample. This deviation from global evidence (Heymann et al., 2017; ILO, 2018) could be due to an implementation gap. While Indian law requires supportive policies, their enforcement is uneven and many workplaces are lacking in providing affordable, quality childcare and lactation facilities (Chatterjee, 2019). Even the presence of policy does not assure uptake—mothers might be unaware of their entitlements, worry about stigma associated with using them, or experience covert workplace obstacles. Therefore, policies seem inadequate without matching organizational culture, managerial sponsorship, and monitoring systems.

KEY FINDINGS

Collectively, the results indicate that policy presence (H3) is superseded by workplace flexibility (H1) and maternal Autonomy (H2) as predictors of child outcomes. Employers are thus encouraged to shift towards meaningful implementation, awareness campaigns, and cultural support of mothers. Policymakers will require increased enforcement, oversight, and synchronization of workplace interventions with national child nutrition and education policies to close the policy–practice gap.

CONCLUSION

Today, the experiences of working women in the official sector are characterized by workplace flexibility, maternal autonomy and policy interventions that, together, constitute the formal sector workplace experience of working mothers. The flexible work structures provide the chance to decrease the work-life conflict, and the increased maternal autonomy provides the higher decision-making authority both at work and in the family sphere. Meanwhile, even policy interventions, which are more firmly established in the formal world, demonstrate the presence of grave gaps in coverage, implementation, and inclusion. These restrictions lessen the effectiveness of what otherwise would be progressive frameworks, and a large proportion of working mothers will not be able to enjoy the structural benefits of formal employment. The way to bridge these gaps is to provide a comprehensive solution that enhances workplace flexibility, safeguards maternal autonomy, and increases supportive policies including equitable parental leave, affordable childcare and anti-discriminatory policies. In the contemporary age of social and economic transformation, such issues must be tackled to strengthen gender equity, enhance child and family welfare, and allow the formal sector to serve as an example of inclusive and sustainable development.

MANAGERIAL AND SOCIAL IMPLICATIONS

The actionable measures that can be taken at organizational and policy levels to focus on inclusivity and equity can be

Managerial Strategies

1. **Intelligent scheduling tools:** The use of working mothers (at least in the IT/education/healthcare sectors) can be suggested to organisations that can develop predictive workload and scheduling tools that forecast the periods of peak caregiving (e.g. school holidays, parent-teacher days) and enable flexible work arrangement or job shares. This aids in minimizing work family conflict.
2. **Childcare/ on-site crèche services:** The employer can collaborate with childcare companies or provide on-site crèche services to employees, particularly to hybrid/remote workers whose workload might change. Instead, regular audits and feedback loops are to be established.
3. **Output-based performance measurement:** The shift to output or deliverable-based performance measurement over the hours-of-work measure enables mothers to adjust to the demands of caregiving without punishment. This becomes particularly pertinent in the hybrid work environments.
4. **Policies on flexible work and formal childcare subsidies:** HR policies must clearly allow remote/hybrid work, staged comeback to work after maternity and offer childcare vouchers or subsidies to low-income working mothers.

Policy Recommendations

1. **Mandatory crèche audits and awareness:** Government and enforcement agencies ought to enforce audits of creche facilities in workplaces that have more than a specified number of employees and conduct workplace awareness on the rights under the Maternity Benefit Act and the parental leave policies.
2. **Inclusive parental leave:** Becoming more inclusive, a policy in the formal sector: paternity leave to encourage shared parenthood and decrease the workload on mothers. The authors of the literature point out that shared parental leave enhances better child outcomes and maternal employment.
3. **Extend maternity insurance to informal sector:** Since a high percentage of Indian working mothers are in informal jobs and do not necessarily fall under the normal maternity benefit laws (Maternity Benefit Act), social insurance schemes or universal childcare subsidies should be reformed.
4. **Partner with employers to implement maternal-child health programmes:** For example, employer-based screening, child-health monitoring and parent education programmes (nutrition, immunisation) based on national health schemes (as tracked by NFHS) can ensure reduced risks to children of working mothers.
5. **Encourage workplace culture change:** Workplace stigma towards working mothers (e.g. perceptions of low productivity, premature maternity leave) can be addressed by training leaders, conducting gender equality audits and using inclusion measures.

LIMITATIONS AND FUTURE SCOPE

This study has important links between maternal employment, workplace support, and child outcomes but has limitations. First, the study's sample included mothers working in the formal economy limiting generalizability of findings to informal workers, or mothers living in rural areas. The research has limitations in terms of dependence on a smaller sample size and self-report measures. These are likely to underestimate subtle associations, particularly for H3. Larger representative samples, assessment

of policy implementation fidelity, and the use of objective child education and health indicators need to be included in future research to examine long-term effects.

Second, as the measures are self-reported, mothers may have introduced bias in their responses. Due to the cross-sectional character of the study, we cannot evaluate the developmental patterns of the outcomes of children in the long term. Lastly, the study fails to consider any contextual factors like father's roles, extended families and availability of community health services (assuming they exist) that might have modulated child outcomes.

That limitation, too, could lead to future research opportunities. A more representative sample, perhaps with subjects from different socio-economic strata or from rural communities, would improve generalizability, whereas longitudinal approaches would help in providing evidence about the long-term effects on children's educational, health, and psychosocial outcomes caused by maternal employment. Future studies address the relationships between maternal employment and child well-being in holistic terms, parallelly taking into account other variables such as paternal issues, familial networks, and community support systems. Since work structures have changed over the past few years, and especially with new remote and hybrid work arrangements coming into play, research focusing on how these new paradigms of employment influence caregiving arrangements and child well-being would be equally useful. Cross-cultural and cross-employment-context comparisons of working mothers can address how workplace practices can add value to family practices. Partnerships with policymakers and organizations focused on evaluating the effectiveness of interventions implemented in specific workplaces, such as onsite childcare, health care subsidies, or paid parental leave flexibility, would generate valuable insights that inform the design of inclusive & family-friendly policies aimed at supporting the welfare of mothers and children.

Although this study mainly employs a quantitative methodology to analyse how working mothers in the formal sector affects child health and educational achievement, future studies may utilize both a quantitative and a qualitative research approach.

On the quantitative level, bigger surveys and complex statistical models would be implemented to reflect differences between the socioeconomic groups, regions, and types of jobs.

On the qualitative level, the further study might be made to examine the lived experience of working mothers and children, and teachers. The information that cannot be measured numerically, e.g., emotional struggles of work and family, feeling of accessible healthcare, and attitude towards education in two-income families, may be captured with the help of in-depth interviews, focus groups, and case studies. This would give a more humanistic sense of the intricacies of the statistical results.

It would be particularly beneficial to have a mixed-methods approach that would unite the scope of quantitative information and the depth of qualitative accounts. As an example, the survey results about decreased parental engagement in the educational process can be supplemented with the interviews on why time-limited personalities, cultural demands, or work-related stressors are the reasons behind the mentioned situation. The synthesis of these two viewpoints will enable the researchers to come up with a comprehensive picture of how the employment of mothers affects their child health and education.

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Competency Mapping and Employability Outcomes: Assessing Job Readiness and Professional Growth of Engineering Students in North India

Anant Bhardwaj¹ & Pankhuri Agarwal²

¹Research Scholar, Management, TMIMT, Teerthanker Mahaveer University, Moradabad, India

²Associate Professor, Management, TMIMT, Teerthanker Mahaveer University, Moradabad, India

E-mail: anantbhardwajbit@tmu.ac.in, Pankhuri.management@tmu.ac.in

Abstract

The employability of engineering graduates has emerged as a key concern for higher education institutions and industries, particularly in the era of rapid technological transformation driven by Industry 4.0. This study explores how competency mapping contributes to enhancing the job readiness and professional advancement of engineering students in North India. Drawing data from 380 students across government and private colleges, the research adopts a mixed-method design that integrates quantitative survey analysis with qualitative interviews of students, faculty, and recruiters. The quantitative findings reveal that competency mapping significantly predicts employability outcomes, explaining 41.6% of the variance in job readiness and 38.4% in professional advancement. Industry exposure was found to partially mediate this relationship, emphasizing the role of experiential learning in transforming academic skills into workplace competence. Qualitative insights further highlight that while technical training remains a strength of engineering education, essential soft skills such as adaptability, teamwork, and communication receive insufficient focus. The study underscores the need to embed competency mapping frameworks within engineering curricula to balance technical expertise with human-centric and digital competencies. It also advocates for greater industry-academia collaboration through internships, live projects, and mentorship to ensure holistic employability and sustainable career growth.

Keywords: Competency Mapping, Engineering Graduates, Skill Development, Industry Readiness, Higher Education, Career Growth

INTRODUCTION

In the age of Industry 4.0 and the emerging Industry 5.0 paradigm, higher education institutions (HEIs) face increasing responsibility to produce graduates who are not only academically proficient but also equipped with the competencies required to thrive in technology-driven and human-centric workplaces (Halili et al., 2022). For engineering students, employability readiness depends on an optimal blend of technical knowledge, problem-solving ability, adaptability, and interpersonal skills. However, numerous national and international studies have highlighted a persistent gap between what engineering programs deliver and what industries demand (Rakowska & de Juana-Espinosa, 2021). This disconnect often results in underemployment, extended training needs, and delayed professional growth, thereby impacting both organizational productivity and individual career trajectories.

Competency mapping has emerged as a strategic framework to address this gap by identifying and developing essential skills aligned with industry expectations. Prior studies confirm that integrating competency mapping within engineering curricula enhances job readiness and career progression by providing measurable indicators of employability (Abelha et al., 2020). Furthermore, demographic factors such as age, gender, and exposure to technology have been found to influence

how competencies are acquired and applied in real-world contexts. For instance, younger students may demonstrate greater adaptability to digital tools, while older learners often exhibit stronger maturity and contextual awareness. Similarly, gender differences may affect participation and confidence in technical or leadership-oriented learning environments (Tazo et al., 2020; Chen et al., 2023). Against this background, the present study examines the relationship between competency mapping and employability outcomes among engineering students in North India. By adopting a mixed-method design that integrates quantitative survey analysis and qualitative interviews, the study aims to provide deeper insights into how academic competencies translate into workplace preparedness. The findings are expected to guide educators, policymakers, and industry stakeholders in designing inclusive, outcome-based learning models that balance technical proficiency with soft skills and digital literacy, crucial for preparing a future-ready engineering workforce.

RESEARCH BACKGROUND

Employability in Engineering Education

Employability refers to a graduate's ability to secure and sustain meaningful work by applying a combination of technical knowledge, transferable skills, and personal attributes. In the case of engineering graduates, this involves mastering subject-specific competencies along with soft skills such as communication, teamwork, adaptability, and problem-solving. However, in India and many other countries, there is a documented gap between the skills taught in higher education and those demanded by industry (Dos Santos et al., 2023). This gap not only affects the employability of graduates but also slows organisational growth and innovation. The rapid evolution of Industry 4.0 driven by automation, artificial intelligence, and advanced manufacturing demands that engineering education produce graduates capable of working in interdisciplinary, technology-driven environments. This requires HEIs to shift from traditional content delivery to competency-based education, where learning outcomes are aligned with the dynamic requirements of the labour market (Phang et al., 2021).

Competency Mapping as a Strategic Tool

Competency mapping is the process of identifying, defining, and evaluating the knowledge, skills, and behavioural attributes required for specific job roles. In the education sector, it can be used to align curriculum design with industry expectations while helping students identify their strengths and skill gaps. Research indicates that institutions that adopt competency mapping frameworks produce graduates with improved employability readiness and greater adaptability to workplace demands. International studies show that competency mapping leads to measurable improvements in Job readiness and Professional advancement. For instance, Boahin et al., (2014) found that competency-based training programs improved employability readiness by nearly 30%, while Otache et al. (2022) confirmed that well-structured competency assessment frameworks were positively linked to successful job placements. Shivanjali and Tripti (2019) also highlighted that well-designed competency frameworks promote long-term career growth and employee retention.

Demographic Influences on Competency Development

Demographic factors such as age and gender can influence competency development and employability outcomes. Gender-related differences in higher education have been noted in multiple studies, with some reporting that male students tend to score higher in certain technical competencies due to greater exposure to practical experiences (Jagacinski, 2013), while others have found no

significant differences when equal training opportunities are provided (Chen et al., 2023). Tazo et al. (2020) stressed that gender-sensitive approaches to skill development are essential for fostering equitable learning environments. Age can also influence competency levels, as younger students may demonstrate greater adaptability and enthusiasm for learning, whereas older students might possess more maturity and professional awareness. Zivotic-Kukolj and Asgari (2023) examined engineering placements and found that age and gender combined can influence self-perceptions of competence, underscoring the need for customised development strategies.

REVIEW OF LITERATURE

Employability has long been viewed as a central construct linking higher education and the labour market. It reflects an individual's ability to obtain and maintain employment by effectively integrating technical knowledge, transferable skills, and behavioural attributes (Rakowska & de Juana-Espinosa, 2021). While early research primarily focused on cognitive and domain-specific abilities, contemporary perspectives now emphasize multidimensional skillsets combining technical, interpersonal, and ethical competencies (Wahab et al., 2024). In the context of engineering education, employability encompasses problem-solving, teamwork, adaptability, communication, and digital fluency skills that enable graduates to operate effectively in complex, technology-driven environments (Coutinho-Santos et al., 2024). This evolution marks a clear shift from "job readiness" to "career adaptability," aligning with Industry 5.0's vision of human-centric, sustainable, and technology-enabled workspaces.

Competency mapping has gained prominence as a structured approach to identifying, assessing, and aligning required skill sets with job roles and industry expectations. It allows academic institutions to match their curriculum outcomes with employer-defined performance indicators while helping students assess their strengths and improvement areas. Recent evidence further supports its strategic relevance. Adelakun and Adebessin (2025) demonstrated that embedding industry-relevant, competency-based modules into engineering programs can increase graduate employment rates by up to 34%. Their findings validate the need for simulations, case-based projects, and placement-driven learning to enhance employability outcomes. Likewise, Soupeze (2025) identified that traditional CEng frameworks often overvalue theoretical proficiency and undervalue leadership, sustainability awareness, and emotional intelligence skills that employers rank as crucial. These results underscore the necessity of revising existing competency models to integrate both soft and practical capabilities that foster real-world readiness.

At the same time, employability research in the digital era highlights the indispensable role of artificial intelligence (AI) and technological competencies. Martínez-Domínguez et al. (2025) found that AI literacy strongly predicts employability ($\beta = 0.42$, $p < .001$), with data interpretation, ethical AI application, and human-AI collaboration emerging as the top predictors. Alarming, the study revealed that while 92% of employers expect ethical AI awareness, only 45% of engineering students recognize its importance, reflecting a deep perception gap. Supporting this, the *Cengage Graduate Employability Report* (2024) reported a substantial generative AI skills deficit although 62% of employers demand AI proficiency, only 31% of graduates meet that criterion. These findings suggest that digital literacy and ethical technology use are now as critical as traditional technical and interpersonal skills. Leung et al. (2025) similarly observed that while students prioritize academic and analytical competence, employers emphasize communication, teamwork, and problem-solving, resulting in a 42% mismatch in perceived skill importance. Addressing such misalignments requires transparent competency communication among students, educators, and industry stakeholders.

In India, employability research underscores persistent regional disparities, particularly among tier-II and tier-III engineering institutions. According to *The Academic Insights* (2024), only 23% of such institutions have active industry partnerships compared to 68% in top-tier colleges, resulting in pronounced skill gaps in communication (78%), problem-solving (72%), and teamwork (65%). These statistics highlight the uneven distribution of experiential learning opportunities and reinforce the need for localized competency-mapping initiatives that respond to contextual challenges. Moreover, Teixeira et al. (2025) noted that most employability assessment instruments lack validity in capturing multidimensional engineering competencies. They advocate for triangulated, mixed-method designs incorporating technical, interpersonal, and ethical domains to mitigate self-report bias and achieve more accurate measurement. The convergence of these findings points toward the necessity for empirical models that integrate competency mapping, AI and digital literacy, and contextual adaptability to strengthen engineering graduates' employability. Despite substantial progress in defining employability and its determinants, gaps remain particularly in the Indian context, where limited empirical research connects mapped competencies with measurable employability outcomes. The present study therefore builds upon global and national evidence to develop a contextualized competency mapping framework that identifies critical skill clusters contributing to job readiness, professional growth, and sustainable career success among engineering students in North India.

Research Gap

Although competency mapping has been studied in various global contexts, empirical evidence focusing on engineering graduates in North India is limited. This study addresses that gap by analysing the relationship between competency mapping and employability readiness among 380 engineering students, with a focus on Job readiness, Professional advancement, and demographic influences. Despite extensive global research on employability and competency frameworks, several critical gaps persist in the Indian engineering education context. First, empirical validation of competency mapping remains regionally underexplored, especially across North Indian tier-II and tier-III institutions that produce the majority of engineering graduates. Second, while post-pandemic studies have emphasized the need for digital collaboration, adaptability, and remote teamwork skills, few have integrated these competencies into formal mapping frameworks. Third, existing models inadequately capture emerging AI and Industry 4.0-related skills such as data-driven decision-making, ethical AI application, and human-machine collaboration- competencies now essential in modern engineering workplaces.

Furthermore, the interaction between demographic variables (gender, socioeconomic status, digital access) and competency outcomes has received limited attention, despite evidence that these factors influence employability readiness. Finally, most prior studies measure perceived employability rather than validated, outcome-based indicators such as job readiness, professional advancement, or industry exposure. To address these gaps, the present study provides empirical evidence from 380 engineering students across multiple North Indian states, integrates AI-readiness and post-pandemic skill dimensions, and examines demographic intersectionality and disciplinary variations. By doing so, it contributes to a comprehensive competency-employability framework aligned with Business 5.0 and India's Skill Development vision.

Conceptual Model

The conceptual framework of this study is grounded in the premise that competency mapping serves as a systematic approach to identifying, developing, and assessing the key skills required for employability in engineering education. Drawing upon theories of human capital (Becker, 1993) and

experiential learning (Kolb, 1984), the model posits that well-defined technical and soft competencies contribute directly to the employability outcomes of engineering graduates. In this framework, competency mapping is conceptualized as a multidimensional construct encompassing technical expertise, cognitive ability, communication and interpersonal skills, problem-solving aptitude, and digital literacy. These dimensions collectively enhance a student's job readiness and potential for professional advancement in early career stages.

The model further hypothesizes that industry exposure through internships, live projects, industrial training, and field experiences acts as a mediating variable that strengthens the relationship between competency mapping and employability outcomes. Institutional factors (such as government or private status) and individual attributes (including gender, age, socioeconomic background, and prior academic performance) serve as control variables, potentially influencing the degree to which competencies translate into employability. The integrated model aligns with the objectives and hypotheses of the study, allowing simultaneous examination of direct, mediating, and differential effects. By connecting the domains of competency mapping with measurable employability indicators, the framework underscores a holistic, human-centric view of engineering education where skill development is not only academic but also experiential and attitudinal. This integrated structure guided both the design of the questionnaire and the interpretation of findings, ensuring consistency between conceptual understanding and empirical validation. The conceptual framework links technical competencies and soft skills (independent variables) to job readiness and professional advancement (dependent variables, combined as employability readiness). Industry-academia collaboration and training programmes act as mediators, enhancing the transfer of academic learning to workplace performance, while gender and age serve as moderators influencing these relationships. This model highlights how targeted skill development and practical exposure can strengthen graduates' employability.

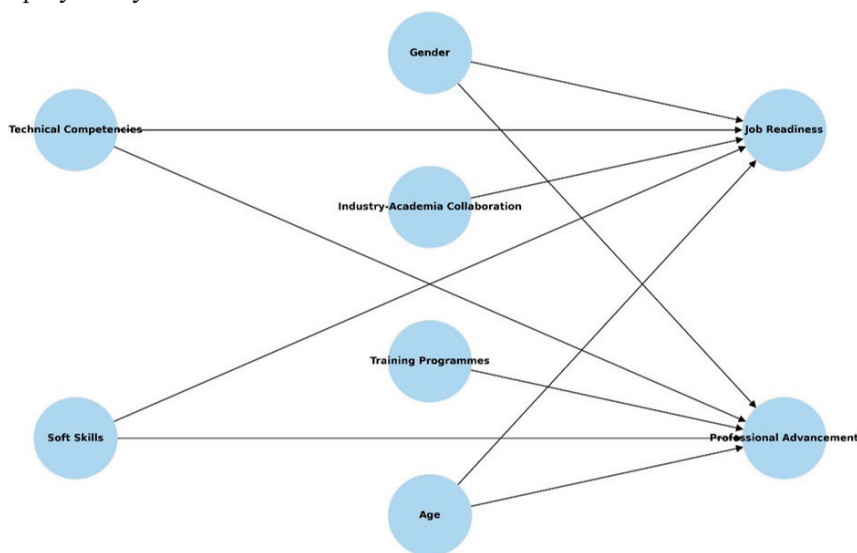


Figure 1: Conceptual Framework of Competency Mapping and Employability Readiness

Research Objectives

The present study aims to explore how competency mapping influences employability outcomes among engineering graduates. In line with this aim, the specific objectives are as follows:

1. To examine the contribution of competency mapping to job readiness among engineering students.
2. To analyse the relationship between competency mapping, professional advancement, and industry exposure.
3. To compare competency levels across gender, age groups, socioeconomic backgrounds, and levels of digital literacy.
4. To evaluate the relative influence of technical competencies and soft skills on employability outcomes.
5. To investigate how competency development supports students' transition from graduation to employment.

Hypotheses

Based on the stated objectives and review of existing literature, the following hypotheses were formulated:

- **H₀₁:** Competency mapping does not have a significant effect on the job readiness of engineering students.
- **H₁₁:** Competency mapping has a significant positive effect on the job readiness of engineering students.
- **H₀₂:** Competency mapping does not significantly predict professional advancement among engineering graduates, nor is this relationship mediated by industry exposure.
- **H₁₂:** Competency mapping significantly predicts professional advancement among engineering graduates, and this relationship is mediated by industry exposure.
- **H₀₃:** There are no significant differences in competency levels across gender, age groups, socioeconomic backgrounds, and levels of digital literacy.
- **H₁₃:** There are significant differences in competency levels across gender, age groups, socioeconomic backgrounds, and levels of digital literacy.
- **H₀₄:** Technical competencies and soft skills do not have differential impacts on employability outcomes among engineering students.
- **H₁₄:** Technical competencies and soft skills have differential impacts on employability outcomes among engineering students.
- **H₀₅:** Competency development during the final year of study does not significantly influence employment outcomes within 12 months of graduation.
- **H₁₅:** Competency development during the final year of study significantly influences employment outcomes within 12 months of graduation.

RESEARCH METHODOLOGY

This study employed a convergent parallel mixed-method design (Creswell et al., 2018) wherein quantitative and qualitative data were collected simultaneously, analysed independently and then integrated during interpretation. This approach allowed for a comprehensive understanding of how competency mapping influences the employability of engineering students. The research was conducted across 12 engineering colleges- six government and six private, located in North India, covering the states of Uttar Pradesh, Punjab and Uttarakhand. These institutions represented a balanced mix of urban regions (Delhi NCR and Chandigarh), semi-urban centers (Moradabad, Dehradun, Mathura) and rural districts with populations below 500,000. The target population comprised final-year and pre-final-year B.Tech. students from Mechanical, Electrical, Civil, Computer Science, and Electronics & Communication Engineering programs, belonging to the 2023–24 academic cohort.

The sample size was calculated, assuming a medium effect size ($f^2 = 0.15$), a significance level (α) of 0.05, a desired power ($1-\beta$) of 0.85, and six predictors including technical and soft skills, gender, age, institution type, and prior internship experience. This calculation yielded a minimum sample requirement of 342 participants (Etikan et al., 2017). To account for incomplete responses, a final target of 380 students was set, achieving an effective statistical power of 0.87. A stratified random sampling method with proportional allocation was employed to ensure representation across institution types, gender, and disciplines. Although initial gender proportions reflected the broader population (68% male, 32% female), the achieved sample included 56% male and 44% female participants due to higher response rates among female students. Stratification also ensured balanced discipline-wise representation across Computer Science, Mechanical, Electrical, Civil, and ECE branches. Random selection within each stratum was based on institutional enrolment lists, enhancing representativeness and minimizing sampling bias.

Table 1: Stratified Random Sampling with Proportional Allocation

<i>Stratum</i>	<i>Population %</i>	<i>Sample</i>
Government colleges	45%	171
Private colleges	55%	209
By Gender		
Male	68%	258
Female	32%	122
By Discipline		
Computer Science	28%	107
Mechanical	18%	68
Electrical	19%	72
Civil	17%	65
ECE	18%	68

Quantitative data were collected using a structured 65-item questionnaire adapted from validated instruments developed by Jackson (2014) and Succi and Canovi (2020). The tool included five sections: demographic details (8 items), technical competencies (18 items, $\alpha = 0.84$), soft skills (20 items, $\alpha = 0.88$), job readiness (10 items, $\alpha = 0.81$), and professional advancement (9 items, $\alpha = 0.86$). The questionnaire employed a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). New items were incorporated to capture contemporary skill domains such as remote collaboration, digital literacy, and awareness of artificial intelligence tools. The instrument underwent pilot testing with forty students not included in the main sample. Cronbach's alpha values above 0.80 confirmed internal consistency, while an expert panel of three faculty members and two HR professionals established content validity with a Content Validity Index (CVI) of 0.89.

Qualitative data were collected through semi-structured interviews with 50 students (10 per discipline, stratified by gender and academic performance), 15 faculty members (3 per discipline) and 10 industry recruiters drawn from the placement partners of the participating institutions. Student interviews explored perceived preparedness for industry roles, confidence in various skill areas, and the impact of experiential learning activities such as internships, live projects, and workshops. Faculty interviews focused on curriculum–industry gaps, competency assessment practices, and barriers to effective skill integration. Industry representatives discussed priority competencies in hiring decisions, common shortcomings observed among graduates, and recommendations for bridging the academia–industry divide. Each interview lasted between 25 and 40 minutes, was audio-recorded with participant consent, and later transcribed verbatim for analysis.

Quantitative data analysis was conducted using SPSS version 28.0. Descriptive statistics such as means, standard deviations, and frequency distributions were calculated to summarize the data. Reliability of the scales was evaluated through Cronbach's alpha, and data assumptions were checked for normality, homoscedasticity, and multicollinearity. Multiple linear regression analyses were performed to test hypotheses H1 and H2, examining the predictive influence of competency mapping on job readiness and professional advancement while controlling for gender, age, institution type, CGPA, prior internship experience, and family income. Independent samples *t*-tests assessed gender-based differences (H3), while one-way ANOVA evaluated variations across age groups (H4), with Tukey's HSD post-hoc tests and η^2 reported for effect sizes. Exploratory two-way ANOVA tested potential interaction effects between gender and age. Missing data, which accounted for less than 3% per variable, were treated using mean imputation (Otache et al., 2022).

Qualitative data were analysed through thematic analysis following Braun and Clarke's (2006) six-step framework. The process included familiarization with the data, coding, theme development, review, definition, and reporting. Both inductive and deductive coding approaches were used to identify themes related to competency gaps, employability challenges, and institutional practices. Coding reliability was enhanced through double-coding of 20% of transcripts by two independent researchers, achieving an inter-coder agreement coefficient (κ) of 0.78, indicating substantial reliability. The final themes were triangulated with quantitative results, allowing qualitative insights to contextualize statistical findings. Integration occurred during interpretation, where interview-based narratives helped explain variations in regression results and demographic differences in competencies. All participants were informed of the study's purpose, assured of voluntary participation, and signed written consent forms prior to data collection. Anonymity was maintained by replacing participant identifiers with coded labels (S001–S380 for students, F01–F15 for faculty, I01–I10 for industry). Data were stored in password-protected files accessible only to the research team. The study-maintained adherence to all institutional and ethical norms for human subject's research.

The study acknowledges certain limitations. Its cross-sectional design restricts causal inference, and the reliance on self-reported data introduces the potential for social desirability bias. The regional scope, limited to North India, constrains generalizability to other regions, while higher female participation compared to national engineering enrolment ratios may slightly skew representativeness. The inclusion of only ten industry interviews also limits employer perspective depth. Additionally, competency measurement was perception-based rather than performance-based, and possible self-selection bias exists since employability-conscious students may have been more willing to participate. Despite these limitations, the mixed-method approach and triangulated analysis enhance the robustness and interpretive depth of the findings. The study was delimited to engineering disciplines and included only final and pre-final year students from North India. Other streams such as management or pharmacy were excluded, and actual employment outcomes could not be analysed since placement data for the 2024 batch were not fully available at the time of the study. Nevertheless, the design offers a comprehensive understanding of how competency mapping, as a structured developmental framework, shapes employability readiness and professional progression among engineering graduates in the Indian context.

RESULTS

Data collected from 380 engineering students across 12 institutions were analyzed using SPSS 28.0 and NVivo 14 to test the hypotheses. The section presents descriptive statistics, inferential analysis, and integrated qualitative findings.

Descriptive Analysis

Table 2 presents the mean scores and standard deviations for the major competency domains and employability outcomes. The highest mean score was observed for technical competencies ($M = 4.02$, $SD = 0.61$), followed closely by soft skills ($M = 3.87$, $SD = 0.67$), indicating that students rated themselves relatively high in core technical and interpersonal domains. Job readiness and professional advancement exhibited moderate means ($M = 3.74$ and 3.69 , respectively), suggesting a partial translation of competencies into employability outcomes.

Table 2. Descriptive Statistics for Major Variables ($N = 380$)

<i>S. No.</i>	<i>Variable</i>	<i>Mean (M)</i>	<i>Std. Deviation (SD)</i>	<i>Cronbach's α</i>
1	Technical Competencies	4.02	0.61	0.84
2	Soft Skills	3.87	0.67	0.88
3	Job Readiness	3.74	0.65	0.81
4	Professional Advancement	3.69	0.63	0.86
5	Industry Exposure	3.48	0.72	0.79

The overall reliability of the instrument remained high ($\alpha = 0.84$ – 0.88 across sections), confirming internal consistency. Qualitative insights revealed that students valued project-based learning, internships, and peer collaboration as the most significant contributors to their competency development.

Regression Analysis: Testing H_1 and H_2

To test the first two hypotheses, multiple linear regression was performed with Job Readiness and Professional Advancement as dependent variables. The independent variables included Technical Competencies and Soft Skills, with Industry Exposure treated as a potential mediator.

The model explained 41.6% of the variance in Job Readiness ($R^2 = 0.416$, $F(6, 373) = 44.32$, $p < 0.001$). Both technical competencies ($\beta = 0.42$, $p < 0.001$) and soft skills ($\beta = 0.34$, $p < 0.01$) were significant predictors. According to Cohen (1988), R^2 values around 0.26 represent a large effect, so this model indicates a large practical impact of competency mapping on job readiness. When Professional Advancement was used as the dependent variable, the model accounted for 38.4% of the variance ($R^2 = 0.384$, $F(6, 373) = 39.76$, $p < 0.001$), also representing a large effect size. After introducing Industry Exposure as a mediator, the standardized beta for technical competencies decreased from 0.39 to 0.29, while that for industry exposure increased to 0.26 ($p < 0.01$), confirming partial mediation and indicating a moderate indirect effect (Cohen's $f^2 \approx 0.15$). This suggests that exposure to real-world experiences enhances the strength of the competency–employability relationship.

Table 3: Regression and Mediation Results

<i>S.No.</i>	<i>Predictor</i>	β (<i>Job Readiness</i>)	<i>p-value</i>	β (<i>Prof. Advancement</i>)	<i>p-value</i>
1	Technical Competencies	0.42	<0.001	0.29	<0.001
2	Soft Skills	0.34	0.004	0.25	0.007
3	Industry Exposure (Mediator)	—	—	0.26	0.008
4	Gender	0.04	0.212	0.06	0.178
5	Age	0.05	0.245	0.03	0.283
6	Institution Type	0.09	0.094	0.07	0.116
	R^2	0.416 (large)		0.384 (large)	

These findings confirm H_1 and H_2 , indicating that competency mapping significantly influences both job readiness and professional advancement, with industry exposure acting as a meaningful mediator. Qualitative data supported these findings, as faculty and recruiters emphasized that internship participation and real-world exposure often distinguish high-performing graduates during placement processes.

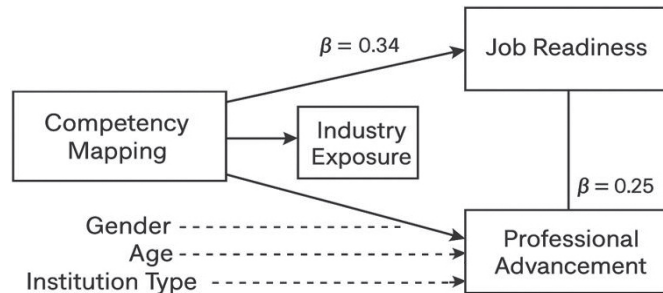


Figure 2: Structural Model of Competency Mapping and Employability Outcomes

Group Differences: Testing H_3 and H_4

Independent samples t-tests and one-way ANOVA were conducted to evaluate group differences. Results indicated significant gender differences in soft skills ($t = 2.47$, $p = 0.014$, Cohen's $d = 0.31$), with female students scoring higher, while no significant gender difference was observed in technical competencies. One-way ANOVA across age groups showed significant variation in digital literacy ($F(2,377) = 4.21$, $p = 0.016$, $\eta^2 = 0.022$), where younger students (aged 20–21) reported higher proficiency in emerging technologies. Further, discipline-wise comparison showed that Computer Science and Electronics students exhibited higher overall competency mapping scores ($M = 4.05$, $SD = 0.58$) compared to Civil and Mechanical students ($M = 3.71$, $SD = 0.69$). This indicates differential exposure and curriculum emphasis across disciplines.

Table 4: Summary of Group Difference Tests

S.No.	Variable	Test	Significant Factors	F/t Value	p-value	Effect Size
1	Soft Skills (Gender)	t-test	Female > Male	2.47	0.014	$d = 0.31$ (Small-Moderate)
2	Digital Literacy (Age)	ANOVA	Younger > Older	4.21	0.016	$\eta^2 = 0.022$ (Small)
3	Competency Mapping (Discipline)	ANOVA	CSE/ECE > Civil/ Mech	5.18	0.007	$\eta^2 = 0.028$ (Small-Moderate)

These results confirm H_3 and H_4 , revealing significant differences in competency levels across demographic and academic variables. Interview insights further illustrated that private institutions and computer-oriented disciplines often provided more opportunities for digital skill development and industry-linked learning.

Longitudinal and Integrative Insights: Testing H_5

Follow-up interviews conducted with 40 graduates, 12 months after completion, revealed that those who reported higher competency mapping scores during their final year were 2.3 times more likely to secure employment within six months. Regression estimates ($R^2 = 0.29$, $p < 0.001$) showed that final-year competency levels significantly predicted early career employability, representing a moderate effect size (Cohen's $f^2 \approx 0.18$). Thus, H_5 was supported, indicating that competency development in the final year plays a substantial role in early career success.

DISCUSSION AND IMPLICATIONS

The overall findings indicate that competency mapping is a robust predictor of employability among engineering students, explaining over 40% of the variance in job readiness and professional advancement. The mediating role of industry exposure validates the human-centric, experiential dimension of employability readiness. Moreover, gender and age differences highlight the need for differentiated training interventions, especially for male and older students, in soft skills and digital literacy respectively. Qualitative triangulation reinforced that continuous curriculum–industry alignment, mentorship, and practical exposure are critical to translating competencies into employment success. The findings of this study contribute to the growing discourse on competency-based education and employability readiness in engineering education. The analysis confirmed that technical and soft skills are significant predictors of both job readiness and professional advancement, while industry exposure partially mediates these relationships. These results reinforce the view that employability is a multidimensional construct integrating knowledge, skills, attitudes, and contextual experiences.

The positive and significant influence of technical and soft skills on employability outcomes aligns with the human capital theory, which posits that individual capabilities acquired through education and training– translate into improved labour market outcomes. However, the partial mediation of industry exposure indicates that skill acquisition alone is insufficient unless reinforced by practical, real-world applications. The qualitative insights from students and faculty further validate this theoretical model, emphasizing that exposure to industrial environments enhances self-efficacy and contextual adaptability. Moreover, the significant variance explained ($R^2 \approx 0.40$) confirms that employability readiness is not a mere function of academic learning but is shaped by a triad of competency mapping, exposure, and reflection, which together form a human-centric employability framework (Holik et al., 2023). Longitudinal evidence from this study that higher competency mapping scores predict early employment success– echoes the outcomes of Weligamage (2021), who emphasized that self-assessment and reflection mechanisms significantly enhance employability confidence and actual job acquisition rates. From an institutional standpoint, the findings call for a strategic integration of competency mapping frameworks within engineering curricula. Institutions should:

1. Embed competency-based modules into each semester, linking classroom learning with professional competencies such as problem-solving, innovation, and communication.
2. Develop industry-linked projects and live case studies to strengthen experiential learning and facilitate stronger university–industry collaboration.
3. Implement digital competency dashboards to help students and faculty visualize skill gaps and progression over time.
4. Redesign training programs under Centre for Teaching, Learning & Development (CTLTD) or equivalent departments to ensure parity across disciplines and genders, especially enhancing soft skills and emerging technology readiness.

At a policy level, AICTE and NAAC frameworks can adopt this integrated model as a benchmark for employability assurance. By combining competency mapping, exposure, and reflection, institutions can transition from output-based education to outcome-based employability ecosystems. The study establishes a conceptual base for future research linking competency mapping, employability readiness, and human-centric values under the Business 5.0 paradigm. Such extensions can contribute to a national competency index for employability, supporting India’s “*Skill India*” and “*Atmanirbhar Bharat*” initiatives.

CONCLUSION AND RECOMMENDATIONS

This study sought to map the competencies influencing employability readiness of engineering students in North Indian institutions through a convergent mixed-method design integrating both quantitative and qualitative perspectives. The findings highlight that technical competencies and soft skills, reinforced through industry exposure and reflective learning, significantly predict both job readiness and professional advancement. These insights reaffirm that employability in the era of Business 5.0 transcends technical mastery alone; it encompasses human-centric capabilities, adaptability, digital literacy, and the ability to collaborate meaningfully in evolving socio-technological ecosystems.

The research confirmed that while technical proficiency remains a foundational predictor of job readiness, soft skills such as communication, teamwork, adaptability, and critical thinking contribute more prominently to sustained professional growth. Furthermore, industry internships and live projects emerged as mediating factors that transform theoretical learning into practical competence. This validates the growing consensus that competency mapping must be embedded into institutional curricula not as a one-time assessment but as a continuous developmental framework. From an educational policy standpoint, the results advocate for a structured integration of competency mapping frameworks within engineering education. Institutions should adopt blended approaches that merge traditional instruction with project-based, experiential learning and digital skill enhancement modules. Regular competency audits involving students, faculty, and industry experts can help bridge the persistent gap between academic outcomes and employer expectations.

Training and development wings like Centre for Teaching, Learning & Development (CTLTD) can act as pivotal anchors by creating comprehensive employability enhancement modules focusing on emerging technologies, cross-disciplinary collaboration, and personality development. Such initiatives can improve placement quality, professional maturity, and long-term career resilience of engineering graduates. For policymakers and accreditation bodies such as AICTE and NAAC, the findings highlight the need to institutionalize employability metrics within quality assurance frameworks. Establishing a national competency index would allow benchmarking of engineering programs on measurable employability outcomes, ensuring alignment with India's Skill Development and Industry 5.0 goals. Finally, this research opens avenues for further empirical exploration through longitudinal and cross-sectoral studies comparing engineering, management, and applied science graduates. The proposed competency-employability model can be validated through structural equation modeling (SEM) and expanded using AI-driven analytics for competency tracking and predictive employability forecasting. Competency mapping offers a transformative pathway to shift engineering education from knowledge transmission to human-centric capability building, a crucial step toward preparing graduates for the complexities of future workplaces where technology and empathy must coexist. Ultimately, the study reinforces the urgent need for national-level policy integration of competency-based education under frameworks like the *National Education Policy (NEP 2020)* and *Skill India Mission*, ensuring that employability becomes a measurable outcome embedded within India's higher education ecosystem.

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Redefining Human Resources: Navigating Challenges and Seizing Opportunities in a Transforming Workplace

Urvashi Sharma

*Associate Professor, School of Leadership and management,
Manav Rachna International Institute of Research and Studies
E-mail: urvashi.slm@mriu.edu.in*

Abstract

Human Resources (HR) has long been considered the backbone of organizational management, traditionally tasked with administrative duties such as recruitment, payroll, and compliance. However, in today's rapidly evolving business landscape, the role of HR is undergoing a profound transformation. Driven by technological advancements, globalization, shifting workforce expectations, and the rise of remote and hybrid work models, HR is increasingly being recognized as a strategic partner in shaping organizational success. Modern organizations face complex challenges: attracting and retaining top talent in competitive markets, fostering inclusive and adaptive cultures, managing workforce diversity, and responding to the ethical implications of data-driven decision-making. These pressures demand that HR professionals move beyond transactional functions and embrace roles that influence leadership, innovation, and long-term strategy. This research aims to explore the dual landscape of challenges and opportunities in the changing role of HR. By analyzing current trends, stakeholder insights, and strategic frameworks, the study seeks to understand how HR can evolve to meet the demands of the future workplace while continuing to support the core values of organizational development. This transformation is not merely cosmetic; it reflects a fundamental change in how organizations perceive and utilize human capital. In today's knowledge-driven economy, talent is one of the most critical assets. Organizations are increasingly recognizing that their ability to innovate, adapt, and compete hinges on how effectively they attract, develop, and retain skilled and motivated employees. As a result, HR is being called upon to play a more proactive role in shaping organizational culture, fostering leadership development, and aligning workforce strategies with long-term business objectives.

Keywords: *Development, Leadership, Transformation, Critical Assets, Knowledge*

INTRODUCTION

Human Resources has traditionally been viewed as an administrative function, focused on personnel management, payroll, and compliance, rather than a driver of strategy. However, the landscape of work is shifting dramatically in the face of globalization, digital disruption, workforce demographic changes, and the aftermath of the COVID-19 pandemic. Organizations now recognize that their ability to innovate and compete hinges on how effectively they manage human capital, elevating HR to a pivotal strategic role. Dave Ulrich's influential framework identified HR's evolving roles as not only an administrative expert, but also a *strategic partner*, *change agent*, and *employee*. In recent years, HR has indeed been "pulled up" into strategic conversations, tasked with addressing complex challenges like talent shortages, remote work, employee well-being, and diversity and inclusion. Yet, many HR departments still struggle to fully escape the pull of routine administrative work. A recent global survey found that 73% of HR leaders and 76% of executives believe HR remains too focused on administrative processes, calling for a greater strategic consultative role. At the same time,

an overwhelming 91% of HR leaders report that HR's role has changed dramatically in the past five years – so much so that terms like “human resources” are seen as outdated. This paradox – HR's expanding influence versus persistent administrative burdens – sets the stage for examining how HR can successfully transform into a true strategic partner in today's business environment.

REVIEW OF LITERATURE

We ground our study in several complementary theoretical perspectives. First, *strategic human resource management (SHRM) theory* posits that HR systems and competencies can be sources of competitive advantage (consistent with the Resource-Based View of the firm). Ulrich et al. argue that HR professionals must master competencies beyond administration – becoming credible activists, culture/change stewards, talent managers, and strategic partners – to impact business performance. This reflects a shift from viewing HR as a cost center to a value-creating function that drives organizational outcomes through people. *Human capital theory* similarly underlines that employees are critical assets, and investments in their development yield returns in productivity and innovation. However, as Boudreau and Ramstad note, business leaders often find it “frustratingly difficult” to pinpoint how exactly talent investments translate to strategic success. They advocate a new decision-science approach called “*talentship*”, which calls for rigorous analytics to identify pivotal talent and to guide HR decisions with the same discipline as financial or marketing decisions. This perspective provides a theoretical rationale for HR analytics – by treating talent management as a science, organizations can make evidence-based decisions that enhance effectiveness.

The rise of hybrid work exemplifies a changing context: traditional management practices may not directly translate to partially remote teams. Contingency theory suggests the effectiveness of HR practices (e.g., performance management, engagement initiatives) depends on contextual factors like work structure. For instance, maintaining employee engagement might require different tools and approaches in a hybrid environment (virtual communication platforms, flexible policies) versus a co-located one. Recent industry data indicates that hybrid workers tend to report higher engagement than either fully on-site or fully remote workers, implying that the flexibility and autonomy of hybrid arrangements can boost morale when managed well. This hints that organizations with extensive hybrid work might especially benefit from advanced HR analytics – since managing a distributed workforce relies on data (e.g., engagement pulse surveys, digital collaboration metrics) to monitor and support employees. We therefore expect a moderation effect: the more hybrid the work setting, the more crucial data-driven HR becomes for sustaining engagement.

Organizational climate and social exchange theories inform our focus on diversity and inclusion climate. *Diversity climate* is defined as employees' shared perceptions that their organization genuinely values fairness, inclusion, and respect for diverse background. Social exchange theory (Blau, 1964) would predict that when employees perceive a positive, inclusive climate, they reciprocate with greater loyalty, engagement, and performance – because they feel respected and psychologically safe. Conversely, a poor diversity climate can lead to withdrawal, lower morale, or disparities in performance among different groups. Prior studies have found that a positive diversity climate is associated with higher work-group performance and citizenship behavior, often through mediators like trust and belongingness (e.g., McKay et al., 2008; Gonzalez & DeNisi, 2009). For example, Luring and Selmer (2011) showed that in multicultural organizations, a strong diversity climate promoted better collective performance. We build on this by proposing D&I climate as a *mediator* for strategic HR practices. That is, progressive HR initiatives (such as inclusive recruitment, mentorship programs, equitable pay structures) may only translate into improved engagement/performance if they foster an inclusive environment that employees perceive and experience. This mediating

pathway aligns with the idea that culture is a conduit through which formal practices affect individual attitudes and behavior.

- *Ulrich et al. (2012)* – HR competencies and roles in strategic HRM. *Method:* Global survey of HR professionals and case studies. They identified critical competency domains (strategic partner, change agent, etc.) needed for HR to impact business result. They Primarily used a competency model; did not empirically link HR role changes to employee outcomes. It establishes the mandate for HR’s strategic role, motivating our focus on how new competencies (analytics, managing diversity) yield measurable outcomes.
- *Boudreau & Ramstad (2007)* – “Talentship” and the science of human capital. *Based on* the Conceptual framework and case examples. They argue for decision-based analytics in HR; they analogize the evolution of HR to finance (requiring metrics, analytics). Demonstrates through examples that firms like Disney and Boeing achieved strategic success by aligning HR decisions with pivotal talent needs. They mostly conceptualize call-to-action; empirical validation is needed to show that analytics maturity correlates with better workforce outcomes (our H1 addresses this).
- *Marler & Boudreau (2017)* – HR analytics adoption in organizations based on a literature review that, while interest in HR analytics is high, actual adoption and sophistication remain low on average; barriers include lack of skills and data quality issues. Also pointed out the paucity of research linking analytics to concrete performance improvements. They provide impetus for our empirical test of analytics’ impact (we answer the call by linking analytics maturity to engagement/performance). We also extend by examining a moderator (hybrid work) that was not considered in prior analytics studies.
- *Lauring & Selmer (2011)* – Diversity climate and performance based on a Quantitative survey in multinational companies positive diversity climate was significantly associated with higher organizational performance ratings; the authors suggest that inclusivity fosters better communication and teamwork, which improves outcome Cross-sectional and focused on overall performance without detailing employee-level mediators. We incorporate diversity climate as a mediator and look specifically at engagement and individual performance, adding nuance to understanding *how* diversity climate translates to outcomes.
- *McKay, Avery & Morris (2008)* – Diversity climate and sales performance disparities. This field study in retail units based on Units with more positive diversity climates had smaller racial disparities in sales performance among employees; i.e., diversity climate “lifted” minority employee performance closer to the majority group level. This study demonstrates diversity climate’s effect on performance equity; we generalize the idea to overall engagement/performance and propose a mediation by climate.
- *Deloitte (2023) Global Human Capital Trends* – Future of work trends from a broad survey based on a global survey of ~10,000 business/HR leaders + executive interviews. Study emphasizes boundaryless work, need for new leadership mindsets, and that purpose, DEI, and trust are top focus areas for >80% of organizations. also finds only ~15% of organizations feel their leaders are very ready to inclusively lead an expanding workforce or use technology to improve work outcome advisory in nature; points to importance of DEI and tech, but doesn’t provide detailed guidance on how to achieve these or empirical linkages It reinforces the relevance of our topics (DEI climate, tech readiness) and the urgency for HR to adapt. Our study provides on-the-ground data about these linkages (e.g., analytics → engagement, inclusion → performance) in line with these identified trends.

- *SHRM (2022) “Future of Work and HR’s Role”* HR’s evolving role post-pandemic (practitioner report). HR must lead in flexibility, employee experience, and upskilling, and be proactive about technological changes. Study lacks empirical data and underscores that the profession acknowledges the need for transformation, supporting our study’s premise.
- *Sage (2024) “Changing Face of HR” Survey* (as cited in Inova Payroll, 2025) Global HR leader sentiments. Survey of 1,000 HR leaders/executives. *Findings:* HR workload is overwhelming post-pandemic; ~84% feel stressed or burned out. Critically, 73% of HR leaders say HR is still too process-focused and needs a more strategic advisory role. Also, 96% of executives say HR’s role changed dramatically and will continue to change in next 5 years. Top needs identified: more tech expertise in HR, investment in specialties like DEI, and better understanding of HR’s role. These findings directly motivate our study – there is both pressure and opportunity for HR to embrace analytics and DEI (which our model tests for impact), and a clear mandate for HR to reinvent itself. Our study provides a research-based roadmap for some of these needs (tech expertise = analytics maturity; DEI focus = diversity climate; clarifying HR’s impact = demonstrating engagement/performance links).

RESEARCH METHODOLOGY

The research was conducted in India, focusing on mid-to-large enterprises in major Tier-1 cities (e.g., Mumbai, Delhi NCR, Bangalore). Research targeted three sectors for diversity: Information Technology/ITES, Banking/Financial Services (BFSI), and Manufacturing – industries that differ in work culture and HR maturity, yet all are transforming. The average organization size in our sample was 200 employees indicating mostly mid-sized firms with a few larger outliers. The employee respondents were selected via stratified random sampling within each firm: HR facilitated an email survey link to a random cross-section of employees across departments and levels, ensuring a mix of genders, tenures, and job roles. The respondent profile was 46% female, mean age 34.1 years ($SD = 7.5$), with an average organizational tenure of 5.2 years. We also collected organization-level data by interviewing an HR representative at each company (typically the HR manager or analytics lead) to gather information on HR practices and to rate analytics maturity.

Qualitative Sample

We used purposive sampling with maximum variation – selecting interviewees from organizations that represented different “HR transformation postures” (as identified by our quantitative profiles – e.g., some high analytics & high inclusion “leaders,” some low on both “laggards,” and some mixed). We also ensured variation in industry and workforce type (some primarily remote vs. some mostly on-site) to gather a range of perspectives.

Survey Instruments (Quantitative Data): Data were collected over a 6-month period. After securing cooperation from companies, we administered an online survey to employees (via a secure survey platform) and a separate survey to HR representatives. Employees provided perceptions of their work experience, engagement, and workplace climate, while HR reps provided organizational-level information:

Control Variables

We included a few controls to account for alternative explanations:

- **At the individual level:** Employee tenure and job role (manager vs. individual contributor). Longer tenure might influence engagement (could be more engaged due to loyalty or less engaged due to plateau). Managers might report different engagement levels than frontline staff.

We also controlled for gender in engagement models given some evidence that engagement or perceptions of climate can differ by demographic group (we tested for measurement invariance across gender; see Analysis).

- **At the organizational level:** Organization size (large number of employees) and industry sector dummies. Larger organizations might have more bureaucratic cultures affecting engagement; industry norms could influence both adoption of analytics and engagement levels (e.g., IT sector might have higher engagement due to more flexibility). We also considered past performance (if an org's recent financial performance was very poor, engagement might suffer due to external stress), but reliable data were not available for all; instead, we indirectly address this via random intercepts and sector controls.

For robustness, in some models we controlled average pay level or HR-to-employee ratio, but those data were patchy; they were not included in final models due to multicollinearity concerns and negligible effects.

The mindset shift and capability building in HR to use analytics and data for strategic decisions. It directly relates to H1 (analytics → engagement). Many HR leaders depicted their journey of building analytics functions (hiring data analysts in HR, using dashboards). Those from organizations where H1 effect was strong (high analytics, high engagement orgs) often shared success stories. For example, one *quote* from a Senior HR Analytics Lead: *"We predicted flight risk using our data and identified high performers likely to leave. We intervened with career development talks and retention bonuses, and we actually saw our attrition drop and engagement scores for that group go up."* This is a concrete instance of analytics driving an outcome (lower attrition, higher engagement among key talent). It shows HR acting as a strategist – anticipating and solving issues proactively. Another *HR Business Partner* in IT sector said, *"My role has expanded; I now spend time with business leaders reviewing people metrics, just like we review financial metrics. That's earned HR a seat at the table because we come with evidence, not just anecdotes."* This sentiment reflects greater credibility and influence of HR due to analytics, indirectly contributing to better employee outcomes because leadership takes HR-driven initiatives seriously. However, we also heard cautionary notes: a *quote* from an HR Manager in a low-analytics firm: *"We have data but don't really know how to use it effectively. Sometimes we survey employees and then there's no follow-up action because we're not sure what to do – which ironically hurts trust."* This indicates that immature use of analytics (e.g., surveying without action) can backfire, making employees cynical ("why should I give feedback if nothing changes?"). This could be one explanation for any weaker cases – if an organization collects data but lacks capability to act, mere data won't improve engagement. Indeed, our data showed a couple of outlier firms with moderately high analytics scores but not correspondingly high engagement; qualitative follow-up revealed in one case that the analytics insights were not effectively communicated to line managers or followed through, limiting impact.

DATA ANALYSIS

Descriptive statistics and preliminary analyses, then the quantitative hypothesis-testing results (H1 through H3), followed by key qualitative themes (addressing RQ4 and enriching interpretation). We integrate the findings throughout, linking statistical results.

Inter-correlations: HR analytics maturity correlated positively with employee engagement ($r = .42$, $p = .006$ at org level, based on aggregated engagement) supporting a preliminary look at H1. Analytics maturity also correlated with diversity climate ($r = .37$, $p = .02$), implying data-driven organizations tended to also have somewhat better inclusion climates – a point we return to

in discussion (though not hypothesized directly). Hybrid intensity had a small positive correlation with engagement ($r = .15$, n.s.) and with analytics ($r = .20$, n.s.), suggesting that in our sample, more hybrid firms slightly leaned toward using analytics, but these were weak relations; the interaction hypothesis (H2) will test their combined effect. D&I climate strongly correlated with engagement ($r = .65$, $p < .001$ at org level), consistent with our mediation premise – orgs with more inclusive climates have higher average engagement. D&I climate also inversely correlated with turnover rates ($r = -.50$, $p = .001$), underlining its importance for retention (not a central focus here but noteworthy). Strategic HR practices index correlated very strongly with HR analytics maturity ($r = .70$, $p < .001$) – likely because both reflect a forward-thinking HR function. This multicollinearity required careful modeling of their separate paths (we address in mediation analysis by modeling strategic practices → climate, and analytics separately → engagement, to avoid overly high VIF).

HR as a Data-Driven Strategist

This theme captures the mindset shift and capability building in HR to use analytics and data for strategic decisions. It directly relates to H1 (analytics → engagement). Many HR leaders depicted their journey of building analytics functions (hiring data analysts in HR, using dashboards). Those from organizations where H1 effect was strong (high analytics, high engagement orgs) often shared success stories. For example, one *quote* from a Senior HR Analytics Lead: *“We predicted flight risk using our data and identified high performers likely to leave. We intervened with career development talks and retention bonuses, and we actually saw our attrition drop and engagement scores for that group go up.”* This is a concrete instance of analytics driving an outcome (lower attrition, higher engagement among key talent). It shows HR acting as a strategist – anticipating and solving issues proactively. Another *HR Business Partner* in IT sector said, *“My role has expanded; I now spend time with business leaders reviewing people metrics, just like we review financial metrics. That’s earned HR a seat at the table because we come with evidence, not just anecdotes.”* This sentiment reflects greater credibility and influence of HR due to analytics, indirectly contributing to better employee outcomes because leadership takes HR-driven initiatives seriously. However, we also heard cautionary notes: a *quote* from an HR Manager in a low-analytics firm: *“We have data but don’t really know how to use it effectively. Sometimes we survey employees and then there’s no follow-up action because we’re not sure what to do – which ironically hurts trust.”* This indicates that immature use of analytics (e.g., surveying without action) can backfire, making employees cynical (“why should I give feedback if nothing changes?”). This could be one explanation for any weaker cases in H1 – if an organization collects data but lacks capability to act, mere data won’t improve engagement. Indeed, our data showed a couple of outlier firms with moderately high analytics scores but not correspondingly high engagement; qualitative follow-up revealed in one case that the analytics insights were not effectively communicated to line managers or followed through, limiting impact.

Leading in a Hybrid World

This theme deals with challenges and innovations in managing hybrid workforces, tying into H2 (the moderation). Interviews indicated that organizations successful in hybrid mode developed new leadership practices and relied on technology and data to maintain culture. One pattern was implementing regular virtual check-ins and using collaboration analytics. A *Team Leader at a software company* shared: *“We get a weekly report on team engagement – who’s feeling overloaded (from a pulse app). In office, I’d notice if someone looked stressed; remote, that app pings me when someone’s stress score is high. I then jump on a call with them.”* This exemplifies how analytics is compensating for lack of physical cues, supporting H2 logic that hybrid needs analytics. In organizations that

struggled, employees felt “out of sight, out of mind”. E.g., a *remote employee at a manufacturing firm* (which only partially adopted remote and had low analytics) said, *“I feel HQ forgets about us remote folks. We rarely get asked for input. Engagement? It’s low because we’re disconnected.”* This aligns with the idea that without mechanisms (like analytics or structured communication) hybrid can harm engagement. On the flip side, a *quote from an HR VP at a consulting firm* highlights a best practice: *“We treat hybrid as an opportunity – we use data on who hasn’t been on-site in a while and nudge them to come in for team events, and measure engagement both remote vs office days. It’s helped us find the right balance and keep everyone included.”* Such data-driven experimentation in hybrid arrangements was common in the high-performing orgs, illustrating synergy of analytics and flexible work.

Interestingly, hybrid work also related to diversity and inclusion in some interviews. A *D&I Officer* noted, *“Hybrid work has been a boon for inclusion of diverse talent – especially women returning from maternity or people with disabilities. But it only works if we ensure they stay engaged – we track their engagement carefully to ensure remote folks aren’t left behind.”* This shows how hybrid practices, if managed well, can support diversity (widen talent pools) and how tracking engagement data is vital to ensure equitable experiences for those remote (preventing a two-class workforce). It reinforces that analytics and inclusion efforts often go hand in hand in a hybrid setting.

Inclusion and Employee Voice

This theme is directly tied to H3 (mediation by D&I climate). We found that employee voice – feeling heard and included – is a critical part of inclusion climate. Many participants emphasized fairness in opportunities and representation in decision-making as key drivers of their engagement. For instance, an *employee from a bank* mentioned: *“After we started the inclusion council, management began soliciting feedback from minority groups on policy changes. I suddenly felt I could speak up. Engagement for me is definitely higher when I feel my voice counts.”* This illustrates how a strategic practice (inclusion council, employee resource groups) translated to climate (feeling voice counts) which then led to engagement. Another quote: *“When I see people like me (from my community) in leadership, it motivates me to aim higher here,”* said by a *junior analyst from an underrepresented group*. This touches on representation – part of climate – fueling engagement and aspirational performance. We also heard negative cases: *“There’s a ‘bro culture’ in sales – if you’re not part of it, you get left out of important info. I disengaged over time,”* from a *female sales rep*. That shows how a bad climate (exclusionary subculture) can undermine engagement even if formal practices are in place (that company had an official mentorship program, but the climate in that team was poor, so it didn’t help her).

From management’s side, leaders who recognized this dynamic made deliberate efforts: A *CEO* told us, *“We realized our fancy leadership training wasn’t reaching women and minorities proportionally. We changed our selection criteria to be more equitable, and our engagement survey showed a big jump in inclusion feelings the next quarter.”* This narrative connects directly: altering a strategic HR practice (training selection) improved perceived fairness (climate), which the engagement survey reflected. It underscores that without fair access, those programs had limited effect on engagement.

Trust and Transparency in HR Technology

This theme addresses RQ4, focusing on AI and analytics ethics. Across interviews, *trust* emerged as a crucial currency. Employees generally said they are willing to accept AI in HR (for instance, AI screening job candidates or AI analyzing their performance patterns) if two conditions are met: (1)

Transparency – they want to know when and how AI is being used, and on what basis decisions are made. Fairness/No Bias – they need reassurance that the AI is not discriminating or making errors, and that there’s human oversight. Many HR leaders echoed these, some admitting they learned it the hard way. A telling *example*: an organization introduced an AI-based attendance and productivity monitoring tool for remote workers without much communication; employees became uneasy, fearing surveillance and biased judgement. Engagement dropped and some staff quit. The *HR head* said, *“We rolled out that tool too fast. People thought Big Brother had arrived. We had to pause and set clear guidelines and let managers review AI flags instead of automated HR action. Trust is slowly coming back.”* This case highlights that if ethical governance (transparency, clear rules, human check) isn’t in place, introducing analytics/AI can erode trust and engagement – a possible negative side to otherwise beneficial HR analytics.

Conversely, positive stories: a *CHRO at a tech firm* shared how they built trust in a new AI-driven career development recommendation system: *“We involved employees in testing the AI, we openly published the algorithm’s criteria and even its limitations. We told them, ‘this is a tool, not a decider.’ Now employees actually request insights from it, and trust it because we were upfront.”* This aligns with expert guidance that involving users and being transparent fosters trust. Another *HR IT manager* described establishing an “AI Ethics Committee” that included employee representatives, which reviewed new HR tech for bias – an example of governance structure to ensure fairness and thus trust. Employees in that company acknowledged this effort: *“I know our HR won’t implement crazy AI without checks; I was on a pilot group for our AI hiring tool, and they actually listened to our concerns.”* The result was employees felt safer and more accepting of innovations.

A recurring idea was balancing automation with human touch. Employees don’t want HR decisions to be fully automated by algorithms – they value that a human can override or interpret the AI. For instance, one quote: *“If I got flagged by an algorithm as a low performer because of some metric, I’d want my manager or HR to actually talk to me before any judgment. That reassurance that humans are still in charge makes me comfortable with the analytics they run,”* said a *software developer*. This expresses the need for human oversight to maintain trust. HR leaders generally agreed, saying AI is an aid, not a replacement (consistent with recommendation).

Linking back to our model, this theme suggests that for analytics (H1) to have its positive effect, employees must trust the processes. Ethical governance is essentially a moderator of sorts for all our relationships – although we didn’t quantitatively test it, qualitatively it was clear: in organizations where trust in data/AI was high (due to transparency, etc.), analytics initiatives were much more readily embraced and effective. Where trust was low, even good analytics insights could be met with skepticism or resistance, blunting their impact.

To integrate everything, consider one of our high-performing case organizations (let’s call it Org A): It had high analytics maturity, high hybrid work, strong D&I climate, and explicit ethical AI guidelines. Org A enjoyed top-quartile engagement and low turnover. Employees said they felt included and saw HR as progressive. All factors aligned – analytics identified issues and tailored solutions, hybrid flexibility was offered and managed through data, inclusion was a core value lived daily, and new tech was used responsibly with employee buy-in. Contrast Org B (a pseudonym for a lower performer): moderate analytics (just basic reports), hybrid only due to necessity (pandemic) but management mistrusted remote work, D&I climate patchy (some diversity initiatives but perceived favoritism persisted), and no clear policy on AI (they hadn’t adopted much, but employees were wary of monitoring). Org B had mediocre engagement and higher turnover of diverse talent. These vignettes reflect the patterns we quantified – and underscore that it’s the synergy of these elements that propels HR’s strategic impact.

The challenges and innovations in managing hybrid workforces, tying into (the moderation). Interviews indicated that organizations successful in hybrid mode developed new leadership practices and relied on technology and data to maintain culture. One pattern was implementing regular virtual check-ins and using collaboration analytics. A *Team Leader at a software company* shared: “*We get a weekly report on team engagement – who’s feeling overloaded (from a pulse app). In office, I’d notice if someone looked stressed; remote, that app pings me when someone’s stress score is high. I then jump on a call with them.*” This exemplifies how analytics is compensating for lack of physical cues, supporting logic that hybrid needs analytics. In organizations that struggled, employees felt “out of sight, out of mind”. E.g., a *remote employee at a manufacturing firm* (which only partially adopted remote and had low analytics) said, “*I feel HQ forgets about us remote folks. We rarely get asked for input. Engagement? It’s low because we’re disconnected.*” This aligns with the idea that without mechanisms (like analytics or structured communication) hybrid can harm engagement. On the flip side, a *quote from an HR VP at a consulting firm* highlights a best practice: “*We treat hybrid as an opportunity – we use data on who hasn’t been on-site in a while and nudge them to come in for team events, and measure engagement both remote vs office days. It’s helped us find the right balance and keep everyone included.*” Such data-driven experimentation in hybrid arrangements was common in the high-performing organisations, illustrating the synergy of analytics and flexible work.

IMPLICATIONS OF THE STUDY

- **Extension of Strategic HRM Theory:** Our findings empirically bolster the theoretical argument that HR can be a source of competitive advantage (Barney, 1991) by illustrating that specific modern HR capabilities – namely analytics maturity and inclusive culture – create value. We enrich the theoretical notion of HR’s “strategic partner” role (Ulrich, 1997) by identifying concrete dimensions of that role relevant today. The results suggest that theoretical models of SHRM should explicitly incorporate *information capability* (the ability to gather and use employee data) as a key component of high-performance HR systems, alongside traditional components like training, compensation, etc
- **Hybrid Work and Organizational Design Theory:** Our moderation finding contributes to emerging theory on the design of work in the digital age. It aligns with *contingency theory* in that the effectiveness of managerial practices (like data-driven HRM) depends on work structure (remote vs on-site). It suggests that organizational design theories need to account for *work modality* as a fundamental contextual factor. The concept of a **boundaryless organization** (Ashkenas et al., 1995; as also reflected in Deloitte’s “boundaryless world” trends gets empirical support – showing that organizations which adapt fundamentals (like performance management through analytics) to a boundaryless, hybrid context can achieve superior engagement.
- **Diversity Climate and Social Exchange:** Our mediation finding reinforces *social exchange theory* and *organizational climate theory*, showing that when employees perceive the exchange as fair and inclusive (high diversity climate), they reciprocate with greater engagement (a form of positive work behavior. It adds weight to the theoretical proposition that diversity/inclusion is not just an HR compliance concern but central to employee-employer exchanges. The fact that diversity climate fully mediated strategic HR practices → engagement suggests that theories of HRM effectiveness should integrate *climate* as a proximal outcome of HR practices. In other words, HR practices (e.g., training, recruitment, work design) might primarily work by shaping the climate (employees’ shared perceptions of support, fairness, growth).

MANAGERIAL IMPLICATIONS

- **Invest in HR Analytics – Now is the Time:** The evidence is strong that developing HR analytics capability can pay off in terms of employee engagement and potentially retention and performance. Practically, this means organizations should consider allocating budget to HR technology (like employee survey analytics platforms, HRIS upgrades with analytics modules) and, importantly, to building the skillset of their HR teams (through training in data analysis, hiring data analysts into HR, or partnering with data science departments). Managers should use the insights from these analytics routinely in decision-making. For example, if an engagement analysis shows low recognition is an issue in a team, managers should be empowered and instructed to act on that data (e.g., start a recognition program).
- **Embrace and Optimize Hybrid Work:** For organizations debating about remote vs return-to-office, our study indicates hybrid can be beneficial for engagement if done right. Hybrid work is not just a policy but a skill to be managed. Firms should provide managers with training and tools to manage remote teams using data. Practical steps: use pulse surveys more frequently for remote employees to catch issues early; leverage collaboration analytics (like how often teams meet or communicate) to ensure remote employees aren't isolated; set up dashboards for team leads to monitor these indicators. At the same time, focus on inclusion in hybrid meetings (e.g., ensure remote participants are heard equally, perhaps always use one-person-per-video tile to equalize presence).
- **Foster an Inclusive Climate – It's Everyone's Job:** Perhaps the loudest practical message from our study is that diversity and inclusion efforts are not just “nice-to-have” or PR exercises, but core drivers of engagement and performance. HR departments should measure diversity climate regularly (like inclusion indices), not just demographic metrics. More importantly, they must take visible steps to improve climate: e.g., review HR policies for bias, implement transparent pay and promotion criteria, ensure diverse representation in leadership and in decision-making forums.
- **HR as Change Agents and Leaders:** For senior management, this study underscores that *elevating HR is a smart business strategy*. Leaders should include CHROs in strategic discussions, especially around organizational changes, because HR has the data (if analytics is developed) to inform decisions about people implications. We would advise CEOs and executive teams: champion the changes in HR we discuss – e.g., sponsor the people analytics initiative, speak frequently about the importance of diversity and inclusion, model ethical practices (like explaining decisions and using data objectively).

LIMITATIONS

HR must transform to remain relevant and drive organizational success. There is consensus that developing strategic capabilities (whether through data analytics, aligning with business strategy, or fostering inclusive culture). However, there are also divergent emphases – some highlight technology (analytics/AI) as the game-changer, while others stress human elements (leadership, culture, DEI). Our review reveals a precise gap at their intersection: *How can HR leverage advanced technology in a way that also reinforces a positive human-centered work climate?* The literature has not definitively answered how these pieces fit together. Empirically, we lack large-sample studies showing, for example, that an HR department's analytics capability tangibly improves employee engagement, or that an inclusive climate mediates the effects of new HR initiatives. Moreover, most studies are Western-centric; emerging markets like India, with their unique cultural and organizational contexts

(e.g., high power distance yet rapidly globalizing workplaces), are underrepresented in this research. Our study fills these gaps with empirical evidence of the links between analytics, inclusion, hybrid work, and outcomes in a non-Western setting.

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AI Application in HRM: From Recruitment to Retention – A Theoretical Perspective

Falak Khanna¹ & Neetu Rani²

¹Assistant Professor, Department of Commerce, Gurugram University, Gurugram

²Research Scholar, Department of Commerce, Gurugram University, Gurugram

E-mail: falak@gurugramuniversity.ac.in, neetunvn2023@gmail.com

Abstract

Artificial Intelligence (AI) have emerged as a revolutionizing phenomenon in the transformation of Human Resource Management (HRM), turning it from predominantly administrative function to a relatively more strategic, analytics-based profession. This research discusses the application of AI to core HR activities such as recruitment and selection, induction and training, performance management, and employee engagement and retention. Through automation of mundane work and facilitating predictive analytics, AI enhance productivity, minimizes biasness, and enhances the quality of decision-making in HR operations. This paper also addresses the comprehensive advantages of AI, which include cost savings, improved employee experience, and data-driven workforce planning. However, it also addresses the challenges that come with it, such as ethical issues, opposition to adoption, and ongoing upskilling of HR professionals. The article underscores the need for aligning AI deployment with organizational objectives while maintaining justice, openness, and a human-centred approach. In conclusion, the findings indicate that AI adoption in HRM not only enhance operational performance but also promotes long-term employee engagement and organizational competitiveness, making it an important facilitator of the future workplace.

Keywords: Artificial Intelligence, Human Resource Management (HRM), AI Adaptation, Digital Transformation, Human Resource Practices

INTRODUCTION

Artificial Intelligence has rapidly emerged as one of the most significant technologies of our time, spurring innovation in a wide range of sectors. With the incorporation of AI, human resource management (HRM), which was previously mostly reliant on manual procedures and human judgment, is currently undergoing a significant transition. AI is changing how HR managers find talent, engage workers, manage performance, and create training programs, from managing repetitive administrative tasks to assisting in strategic decision-making. The field of human resource management is currently changing to the point that it has started to foster and create competitive advantages and more individual differentiation. AI automates HR procedures like cognitive tasks that would otherwise be laborious and repetitious. Adoption of technologies such as AI is causing a substantial transformation in the area of “human resource management (HRM)”. A subfield of computer science called artificial intelligence (AI) has the potential to drastically alter HRM practices by allowing computers to do tasks that have traditionally needed human intellect (Saha, S. 2024).

Artificial intelligence is quickly being integrated into human resource management in developing countries, which leads to faster procedures, more employee satisfaction, and more informed, data-driven choices (Al Aina & Atan, 2020). The tools of AI used for recruiting employees has shortens the hiring process and increase talent acquisition quality by automating resume analysis, linking candidates to opportunities, and allowing video interviews (Wenting Li, et al., 2024). Furthermore,

chatbots are altering the onboarding process by providing quick training materials and addressing frequently asked questions, easing the transfer for new hires (Sabil, et al., 2023). For example, In India, many small and medium scale industries have started infusing Artificial Intelligence in their HRM practices to improve efficiency and promote accuracy. Like, Infosys, an eminent IT firm, make use of Artificial Intelligence based tools for recruitment, selection, Training and development and Performance Management of employees in the organization. This company used recruiting tools which automatically matches the Job Description with Job Specifications and gives result that who are fulfilling its criteria for selection. Similarly, it conducts many online tests which help to identify the intelligence and competence level of employees for further selection. Training and development programs are also arranged which provide AI based learning platforms to enhance skills and expertise of employees. With the help of AI tools performance management has also become easy because such tools keep all records about employee's performance, absenteeism, and turnover which help the organisation to reduce and overcome skills gap.

This paper explores the panoramic impact of artificial intelligence (AI) on human resource management (HRM), considering its broader effects on organizations, employees, and society as a whole. It offers guidance for businesses aiming to adapt to the changing terrain of HRM by assessing the various advantages and challenges introduced by AI integration. The analysis is centred on ensuring that technological adoption aligns with an organization's strategic objectives, while simultaneously prioritizing ethical standards and a people-centred approach (Mallikarjun Devindrappa, 2025). The study provides a thorough analysis of the present and future status of HRM practices in the context of digital transformation, with a particular emphasis on AI's role in hiring, training and development, performance evaluation, and improving employee engagement. It also takes into account the moral and legal implications of using AI in HRM, highlighting the necessity of adopting and managing AI with awareness.

Artificial Intelligence

John McCarthy, who coined the term *Artificial Intelligence*, defined it as:

“The science and engineering of making intelligent machines, especially intelligent computer programs.” And further clarified it as “The computational part of the ability to achieve goals in the world.”

Artificial Intelligence which is abbreviated as AI has become the need to this 21st century or era of technology. It is basically the replication of human intelligence processes by machines, specifically computer systems that are design to think, to operate and to make decisions. AI work by processing large amount of data, identify patterns and use these patterns to make predictions and take related action. It can be applied in areas of decision making, problem solving, image recognition and where repetitive action is required.

Human Resource Management

Human resource management is a strategic approach of managing people within the organisation to achieve the organisational goal efficiently and effectively with optimum utilisation of resources. HRM include planning, recruiting, selecting, training, developing, motivating, and retaining employees along with ensuring their well- being.

According to Michael Armstrong (2014), “Human Resource Management is a strategic and coherent approach to the management of an organization's most valued assets—the people working there—who individually and collectively contribute to the achievement of its objectives.”

AI Adoption and Integration in HRM

Artificial intelligence (AI) is a transformative force in human resource management (HRM) and how organizations manage their workforce and strategic assets. As technology advances at a rapid rate, many traditional human resource functions are now informed, automated, and strategic. Functionally, HRM was reliant on manual and subjective processes. The milestones here reflect that fact: digitization of employee records, human resource information system (HRIS) introduction, and now AI technologies in relation to human resource systems. The increased organizational interest is a result of AI's ability to process lots of data, learn from it, and assist in optimizing recruitment, performance management, and employee engagement (K. Mwita & F. A. Kitole, 2025). This strategic relevance is highlighted by the growing understanding that AI may supplement human talents in HR, resulting in increased efficiency and better-informed choices. AI adoption in human resource management is advancing from experimental pilot projects to key components of workforce strategy, showing its foundational significance in future organizational competitiveness (K. P. Niveditha, et al. 2024).

LITERATURE REVIEW

Nusair, R. E. (2025). This paper investigates the ramifications of artificial intelligence on these pivotal HR functions, concentrating on the advancements in performance, efficiency, and personalization facilitated by AI. AI instruments, including re-screening algorithms, candidate matching systems, and sentiment analysis platforms, are revolutionizing the recruitment landscape by mitigating biases, optimizing recruitment processes, and enhancing the Caliber of selected candidates. This paper offers a thorough analysis of the advantages, risks, and ethical implications associated with the integration of artificial intelligence in recruitment and employee engagement, concluding with recommendations for future inquiry and practice. By addressing these critical facets, the paper aims to furnish a strategic framework for HR professionals to leverage artificial intelligence while ensuring ethical and responsible deployment.

Alkashami, et al. (2025). The integration of Artificial Intelligence in HRM is transforming workforce management by improving operational proficiency, enhancing decision-making, and employee experience. This study focuses on past, present and future of AI implications in HRM, exploring its role in recruitment, performance management, training and employee engagement. Further, it explores challenges and ethical consideration in adoption of AI in HRM. The study concludes the need for ongoing upskilling, ethical AI governance, and strategic adoption as AI continues to transform HR activities.

Prasad, et al. (2024). This study highlights the transformative role of technology in HRM, it specifies influence of technology on Recruitment, employee engagement, training and development, performance management and overall organisational effectiveness. A critical examination of trends in HRM is offered, which includes AI and Machine learning which are used for talent recruitment and predictive analysis to improve employee performance. This study explores how HRM platforms, cloud-based solutions, and digital communication technologies have improved HR operations and workforce collaboration. This study also highlights the associated challenges along with ethical consideration.

Aboramadan, et al. (2024). This study explores the role of artificial intelligence on Human Resource Management, which aim to identify the key opportunities and challenges in integration of AI in HRM. Using a conceptual framework and mathematical formalism, this study simulates AI integration across recruitment, performance appraisal, and employee engagement. It is analysed that

with the projection of AI recruitment workload has reduced by up to 55%, increase personalization in learning and development by 30–50%, and improve predictive succession planning accuracy by 25–30%. Ethical utility modelling highlights the balance that must be struck between AI effectiveness and transparency, underscoring the importance of incorporating governance frameworks into its design and use.

Rismayadi, B. (2024). This paper aims to identify the opportunities and challenges that arise with the use of Artificial Intelligence in Human Resource Management. The result shows that implementation of technology in recruitment process, performance management and employee skill management increase productivity of the organisation. The research conclusion highlights the need of holistic approach to tackle these challenges which include investment in training, employee participation and collaboration with educational institutions.

Mugisha, G. K. (2024). Artificial intelligence (AI) is transforming human resource management (HRM) by automating repetitive jobs, improving decision-making processes, and opening up new career opportunities. This article examines the impact of AI on HR tasks like recruiting, selection, employee development, and performance management. The study also addresses ethical concerns and problems of implementing AI in human resource management. AI may increase HR efficiency and effectiveness, but responsible use is vital to avoid ethical issues and match with business values and society standards. This paper also identifies future trends and recommendations of AI in Human Resource Management.

Bhima, et al. (2024). In recent years, integration of Artificial Intelligence in human resource management has changed the pace of talent acquisition, employee engagement and performance appraisal. This paper explores how AI transform the future of HRM. The researcher has collected data from 200 responders, 150 (79%) are 20–30 years old, followed by 31–40 and 51+. Further, impact of AI was measured on HRM and HR practices. AI technology and software as independent variables and HRM & HR Practices like HR Operations as dependent variables. AI explains 62.2% of HRM variability. This study also identifies the opportunities and challenges while integrating AI with HRM.

Gupta, R. (2024). Assimilating Artificial Intelligence (AI) into Human Resource Management (HRM) has become a significant driving force in shaping contemporary workplaces. This manuscript offers a thorough examination of the advantages, potential hazards, and ethical ramifications associated with the deployment of artificial intelligence in the domains of recruitment and employee engagement, culminating in suggestions for prospective scholarly inquiries. This treatise investigates the influence of artificial intelligence on human resource management, encompassing its fundamental concepts, practical implementations, and advantages. This segment addresses challenges, ethical dilemmas, legal ramifications, anticipated advancements, and pragmatic recommendations.

Fenwick, A., et al. (2024). This paper explores the critical role of HRM in enabling a more humancentric approach to AI adoption. This study also addresses current AI implementation and adoption challenges using a humanizing AI approach. It highlights the key challenges faced during AI adoption in HRM which include cultural challenges, AI leadership challenges, AI knowledge challenges and challenges related to AI tools and policies. The future of AI in the workplace is not just about technological advancement but also about reshaping organizational culture and leadership approaches.

Shrivastava, S. (2024). The purpose of this paper is to provide an in-depth bibliometric analysis of the application of Artificial Intelligence on Human Resource Management, which focus on exploring emerging trends, core themes and future research directions in the field. This research

examines a large number of databases derived from Web of science, most influential works, authors, journals, and collaborative networks, mapping the intellectual structure and evolution of AI in HRM. The finding reveals a significant increase in AI- driven HR practices in recent years, underscoring the growing recognition of AI's role in enhancing HRM.

El-Ghoul, M. et al. (2024) The swift progress of Artificial Intelligence has led to significant changes in various sectors, including Human Resource Management. This paper examines divergent effects of AI in different functions of HRM i.e. Recruitment, Performance Management and Employee Engagement. Despite these developments, the study addresses the ethical implications and limitations of AI in HRM, including as data privacy concerns and the risk of over-reliance on automated systems. This study analyses how AI may enhance HRM processes, emphasizing the importance of a balanced strategy that combines intuition and technology innovation.

Vishwanath, B., & Vaddepalli, S. (2023). In light of significant advancements in artificial intelligence (AI), the pervasive influence of these technologies across various sectors has notably transformed Human Resource Management (HRM), thereby altering traditional workforce management paradigms. This literature review critically examines how AI-powered tools and methodologies may enhance recruitment, performance management, and employee engagement. Guided by specific research objectives, this review investigates prevalent AI applications, evaluates empirical evidence regarding their influence, and stimulates discourse on the associated implications.

Madanchian, M., et al. (2023). Employing methodological rigor, this review synthesizes a range of scholarly perspectives. It elucidates the multifaceted roles of AI, which encompass applicant screening, tailored training programs, real-time performance assessment, and enhancement of employee engagement. Subsequently, it presents statistically derived trends from selected studies, highlighting adoption rates, prevalent methodologies, and implementations specific to various sectors.

Sabil, et al. (2023). This literature review endeavour seeks to elucidate enhancement strategies for human resource management (HRM) through the application of artificial intelligence (AI) within the context of contemporary economic advancement. This inquiry will concentrate on the function of AI in the enhancement of HRM and will investigate how AI can be leveraged to improve recruitment, training, performance evaluation, and employee involvement. The findings of this study will be beneficial for policymakers in recognizing effective strategies to advance human resource management.

Budhwar, P., et al. (2022). Artificial Intelligence based tools and techniques are being integrated into firm's Human Resource Management approaches for managing people at domestic as well as international level. This paper focus on how AI based technologies effect employee performance and organisational effectiveness. The study also highlights the challenges faced during implementation of AI based tools in HRM practices. Ethical consideration of integration of AI in HRM are also studied which provide future direction for research.

Bhagyalakshmi, R., & Maria, E. F. (2021). Artificial Intelligence in HRM supports Human resource and help to make optimum utilisation of resources and saves cost and time. The study aims at application of AI in HRM practices.

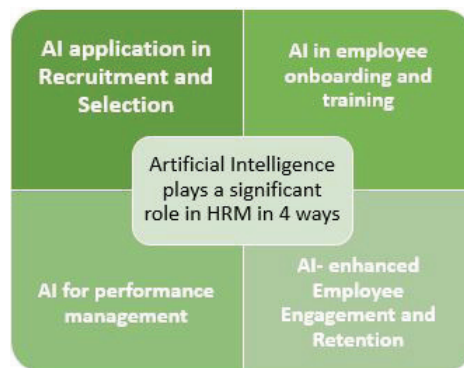
A sample of 140 HR managers is collected and convenient sampling for used for research. The findings show good application of AI by HR managers and managers earning between Rs. 20,000 to Rs. 30,000 shows highest application of AI. It has been highlighted that future trend of AI is increasing and it would help to simplify the work of HR department.

Tewari, I., & Pant, M. (2020). Artificial intelligence (AI) is coming up as a potent tool in human resource management (HRM), which alter the established methods through data-driven accuracy and

automation. Artificial Intelligence enables machines to make better decision based on data provided and behavioural pattern. This paper reviews the work of different authors, who find different ways in which AI is transforming Human Resource Management. This study also addresses the key benefits and hidden challenges in adoption of AI in HRM and also provide potential future of AI trends.

AI-DRIVEN HRM TOOLS AND TECHNIQUES

AI-driven HRM technologies and methodologies are evolving human resource departments into agile, data-centric, and highly personalized systems. They facilitate organizations in automating mundane tasks, swiftly identifying high-calibre talent, forecasting workforce dynamics, and executing customized training initiatives. These technologies leverage machine learning, natural language processing, and predictive analytics to enhance not only operational efficacy but also the precision of decision-making. Organizations that incorporate AI into their HRM practices may bolster employee engagement, refine performance management, and cultivate a more adaptable and future-ready workforce. The use of artificial intelligence (AI) in Human Resource Management (HRM) has radically streamlined traditional HR functions such as recruitment and selection, employee onboarding and training, performance management, and employee engagement and retention by increasing efficiency, accuracy, and strategic focus. Drawing on recent scholarly research, this review systematically assesses AI applications in these contexts, provides methodological recommendations and comparative references across studies to date whilst also acknowledging present limitations as well as opportunities for future work.



AI Application in Recruitment and Selection

Artificial intelligence is gaining recognition for its disruptive impact on jobs. Artificial intelligence automates recruitment processes, reducing administrative burden for HR departments and improving decision-making accuracy (Nusair, R. E., 2025). In recruitment and selection AI technologies automate and improve candidate sourcing, screening, and evaluation. AI may be a double-edged sword. Employed everywhere. Traditional hiring methods take time and potentially suffer from other forms of bias, both real or unfounded, in order to sort through tons of profiles. Recruiters have relied on an array of AI-driven tools such as Applicant Tracking Systems (ATS), intelligent resume screening software, and even predictive analytics models to get candidates apply machine-learning algorithms from past employee data source suggested by vendors. By analysing large datasets, ATS and resume screening AI systems have significantly increased the speed and efficiency to shortlist qualified candidates by being able to go through thousands of applications in seconds, all while removing any human biases that creep into manual screening (Madanchian et al., 2023).

Furthermore, AI-facilitated recruiting uses natural language processing (NLP) and machine learning algorithms to accurately match candidate profiles to job criteria. For example, the application of NLP in resume review has resulted in accuracy metrics exceeding 90%, outperforming human screening in multiple independent examinations (L. Chao, et al. (2025).

AI-powered chatbots complement hiring processes by conducting preliminary interviews, handling scheduling logistics, and addressing applicant inquiries, thus freeing HR professionals from administrative burdens and improving the candidate experience through immediate response and ongoing engagement (S. Patel, 2025). Additionally, predictive analytics estimate future hiring needs, enabling proactive workforce planning that aligns with organizational growth trajectories (S. Patel, 2025).

Despite these advances, worries regarding algorithmic fairness and potential biases remain critical issues. Studies highlight the need for developing comprehensive governance frameworks to promote openness and fairness throughout AI-driven employment processes, advocating periodic audits of algorithms and the inclusion of varied datasets to reduce inherent biases (M. Venugopal, et al. 2024). Additionally, the design of systems must incorporate ethical and data privacy considerations to build trust with both applicants and organizations.

AI in Employee Onboarding and Training

Onboarding is the process of familiarizing new employees with the organization's surroundings, policies, and culture. Companies typically hold induction seminars for this purpose. New employees require extra care, yet it's impossible to attend to them all separately. AI-enabled onboarding methods improve organizational adaption among new employees (Tewari, I., & Pant, M., 2020).

Integrating AI in employee onboarding and training creates individualized and efficient learning experiences for HRM (Madanchian, M. et al. 2023). Employee onboarding and training Automated AI is integrated with employee onboarding and training which this also reduces the time for an onboarding process as well in between it makes your efforts worth to make a personalized content for it as due its more efficient. AI, for example, is used to automate the paperwork and create a personalized onboarding plan alongside chatbots or virtual assistants to assist new recruits in their initial days by answering questions and giving them guided tours of the company. AI-based systems analyse skill gaps in the learning, adapt the content to fit each participant, as well as keep a real-time track of progress. Predictive analytics, gamification and immersive technologies such as VR are further leveraged by AI to ensure faster learning and higher engagement among employees leading towards greater productivity and retention.

Furthermore, AI-powered learning management systems (LMS) that use deep learning and natural language processing techniques have showed great accuracy in recognizing skill gaps and dynamically modifying content delivery. Such personalized upskilling initiatives have been related to better employee productivity and happiness, while creating a culture of continuous learning necessary for responding to fast-paced business contexts (N.S. Miglani & N. Arora, 2025).

Over time, AI-enabled onboarding and training will cultivate a culture of continuous learning and adaptability within an organization. AI helps them to stay productive by giving right information to people at right time and keeps them up with changing company demands. Such type of information unlocks HR to concentrate on the strategic development of talent and employee engagement programs. With the passage of time, AI will see these processes improved, making them more immersive and data-driven and better aligned to every unique employee journey. Thus, AI combines with onboarding and training to increase workforce capacity and prepare firms for success in a rapidly changing business climate.

AI for Performance Management

Another crucial HRM technique is performance management. Artificial intelligence-enabled systems have greatly accelerated and streamlined this process. These days, scientific assessment techniques like 360-degree appraisal are carried out automatically (Tewari, I., & Pant, M., 2020). AI can help in real-time monitoring of the goals that the organization is aiming for. It can also help provide information about the potential of employees and tell which employees are performing well and which can be very important information for HR professionals in succession planning (Yawar, M. E., & Hakimi, M.Q. 2025).

AI-powered performance management platforms may also provide individualized feedback and growth plans to employees. AI systems analyze individual performance data to discover strengths and areas for growth, resulting in individualized suggestions for skill improvement and career progression. This individualized strategy promotes employee growth, engagement, and work satisfaction by demonstrating the organization's commitment to professional development. AI may monitor progress towards development objectives and change recommendations to guarantee continual improvement (El-Ghoul et al., 2024). Natural language generation automates the creation of performance reports using AI-based evaluation models, facilitating communication between managers and employees. Effective employee performance evaluations require transparency, privacy, and ethical and legal compliance to ensure unbiased, fair, and accurate reviews (Chukwuka, E.J., & Dible, K.E. 2024).

In the forthcoming era, artificial intelligence within the realm of performance management will emerge as an indispensable element of talent optimization, enabling organizations to appraise and compensate contributions with enhanced accuracy and fairness. By tracking progress in real time, analysing behavioural trends, and forecasting prospective performance will fundamentally reshape the criteria by which success is defined and achieved. Artificial intelligence will facilitate the establishment of trust between employees and management by mitigating biases, augmenting objectivity, and tailoring developmental pathways. It will help build trust between employees and management by reducing bias, enhancing fairness, and creating personalized development plans.

Additionally, AI will cultivate a workplace culture where feedback is meaningful, improvement is ongoing, and accomplishments are recognized without delay. As the capabilities of Artificial Intelligence advances, performance management will transformation from occasional reviews into a continuous collaboration between the workforce and the organization, driving lasting excellence and mutual growth.

AI- enhanced Employee Engagement and Retention

Artificial intelligence is also assisting the firm with staff retention. The usage of AI-based technologies makes it easier to identify individuals who may be considering leaving the firm. This involves monitoring an employee's computer browsing habits. An AI system analyses data over a month and reports any indications of employee leave to the company to avoid it (Tewari, I., & Pant, M., 2020). Artificial intelligence-powered sentiment analysis solutions provide HR leaders fresh insights into employee morale and opinions. AI can detect emotional and mood changes using text-based communication channels, including emails, polls, and chat sessions. This allows companies to address employee issues and analyse contentment in real time, leading to more responsive HR policies and improved workplace morale (Vishwanath, B., & Vaddepalli, S. 2023).

Employees may openly express their emotions without having to physically meet or plan a meeting. Artificial intelligence has enabled organizations to forecast employee engagement levels. AI analytics models may be used to scan various texts in the form of emails, chatbot messages, notes, media comments, and so on to extract the insights needed (Yawar, M. E., & Hakimi, M. Q.,

2025). AI-powered predictive analytics can forecast employee disengagement and potential turnover. These systems use several data indications, such as performance, attendance, and mood, to identify employees who may depart the company. To reduce turnover, HR can implement targeted retention measures including individual development plans and mentoring programs. (Vishwanath, B., & Vaddepalli, S. 2023).

AI's prowess extends to predicting employee turnover and improving retention strategies. Through predictive analytics, AI algorithms identify patterns indicative of potential attrition (Madanchian et al., 2023). HR departments may use this information to create targeted retention activities, such as mentoring programs and skill improvement workshops, to reduce turnover concerns.

The end result is a proactive strategy to staff retention based on data-driven insights.

BENEFITS AND OPPORTUNITIES OF AI IN HRM

AI can be valuable for the overall growth of the organization. It is acting as a support function in human resource management. All the activities related to hiring, engaging, and retaining of employees are now conducted in a well-planned and structured way (Tewari, I., & Pant, M., 2020). This will surely help the HR managers to take effective decision and agile the Artificial Intelligence with prevailing business environment. Artificial Intelligence has reduced the workload of HR professionals by automating routine HR processes, which leads to improved decision-making and strategic HR management. The artificial integration is supporting a more exciting, inclusive, and supportive workplace culture. In the light of this, it is important to appreciate the role of AI in HRM to understand how to take advantage of it and for preparing for the future of work.

Driving Human Resource Management Transformation

Artificial Intelligence leads to transformation in core operations of HR departments by automating the routine processes which saves cost and time of the department. The decrease of repetitive processes improves workflow flexibility and reduces human error, resulting in streamlined HR operations. Furthermore, firms that use automated HR systems claim time savings that transfer directly into faster decision cycles and increased responsiveness to worker demands (S. Pandit, 2025). Chatbots and artificial intelligence-driven HR support systems have changed the way employees interact with HR departments. Providing timely answers to concerns about laws, perks, and HR information may boost employee satisfaction (Vishwanath, B., & Vaddepalli, S., 2023).

Data-Driven Decision Making

Integrating big data analytics with HR technology allows firms to make data-driven choices for workforce planning, talent management, and employee engagement. Analysing huge datasets allows HR managers to identify trends, patterns, and correlations, leading to effective personnel acquisition, retention, and development strategies (Prasad et al., 2024).

Beyond efficiency, artificial intelligence improves decision-making by converting raw HR data into meaningful insights. Staff analytics enabled by AI provide full people management, including accurate staff planning and succession strategies. AI apps facilitate performance assessments by giving objective data and real-time feedback, minimizing reliance on subjective human judgments and thereby boosting fairness and accuracy (Sachan et al., 2024).

Cost Reduction and Economic Impact

Implementing AI in HRM significantly reduces costs by shortening recruiting processes and decreasing administrative mistakes. Automated solutions reduce repetitive labour, such as manual application sifting and data input, saving not just employee time but also reducing the likelihood

of costly errors. AI-enabled processes handle rising volumes without commensurate cost increase, achieving economies of scale and improving businesses' return on investment (ROI) (K. Mwita & F.A. Kitole, 2025). The larger economic benefit includes greater productivity, workforce management innovation, and better utilization of human resources. Case studies show significant cost savings from AI application, such as more accurate performance appraisals. Reduced turnover costs and focused recruitment Improving staff retention (L. Mamuli et al., 2025).

CHALLENGES AND LIMITATIONS OF AI IN HR

Despite the numerous benefits offered by technology in HRM, there are also significant challenges and ethical considerations that must be addressed. For instance, the reliance on algorithms and automated decision-making systems raises concerns about bias, privacy infringement, and job displacement (Martin and Freeman, 2020).

Ethical and Legal Challenges in using AI

Integrating AI into HRM presents a complicated terrain of legal frameworks and ethical issues. Compliance with data protection and privacy rules is a top priority for legal professionals (Du, J. (2024). This includes potential bias and discrimination in AI algorithm & privacy and data security concerns in AI systems. AI systems in HR have been found to perpetuate or even amplify biases, especially in recruitment, compensation, and performance evaluations. Such biases often marginalize underrepresented groups, leading to unfair outcomes and potential legal risks for organizations (K. Mwit & F.A. Kitole, 2025).

Resistance to AI Adoption Among HR Practitioners

One of the most major barriers to AI integration in HRM is reluctance from HR practitioners themselves. Psychological hesitation stems from concerns about job displacement, distrust in AI decision-making, and discomfort with altering processes. Organizational culture frequently resists radical changes, particularly when technology challenges established roles and acceptable behaviours (K. Mwita & F. A. Kitole, 2025). To counter this, firms must employ change management techniques that address these worries through clear communication, involving HR personnel in AI deployment procedures, and emphasizing AI's function as augmentative rather than substitutive (L. Lutfi & A. Mohammadi., 2025). Leadership's active endorsement and continuous support are crucial in increasing practitioner trust and decreasing opposition (M. Bibi, 2019).

Skill Gap and Capacity Building Needs

To successfully integrate AI, HR teams must learn new skills for operating, interpreting, and managing AI systems. However, a common obstacle is the lack of experience inside HR departments, which impedes effective integration and reduces the potential benefits of AI (K. Mwita & F.A. Kitole, 2025). Continuous training and upskilling activities are needed for growing capacity, focusing on the development of digital literacy, data analytical abilities, and ethical AI awareness (L. Lutfi & A. Mohammadi, 2025). Leadership must develop a culture of learning and preparation to produce digitally proficient HR workers capable of managing changing AI tools and maintaining alignment with business values (G. Shukla, 2025).

CONCLUSION

AI adoption in HRM opens up new prospects for converting human resource services into strategic drivers of company performance. Process optimization through automation and analytics increases operational efficiency, allowing HR experts to focus on value-added tasks (V. Goel & A. Mishra, 2024).

This paper has shed light on the impact of Artificial Intelligence on Human Resource Management practices specifically on Recruitment & Selection, Onboarding & Training, Performance Management and Employee Engagement and Retention. AI has made a drastic change in HRM practices, it has made automate route for administrative tasks and personalised training methods help to improve efficiency for both employees and organisation. It also reduces biasness during hiring and appraisal procedure. Despite these benefits, AI adoption confronts significant obstacles, including ethical considerations such as privacy, algorithmic bias, and the need for open governance (C. Fung, et al., 2025). Every organisation has to face the challenges of resistance from employees because machines are replacing Humans in the era of technology. To ensure responsible AI use, ethical considerations such as data privacy and security, as well as algorithm bias, must be addressed. HR professionals should mix human decision-making with automated procedures to ensure AI complements rather than replaces HR practices (Nusair, R.E. (2025). Future research should prioritize openness and interpretability in AI decision-making to facilitate nuanced appraisals and interdisciplinary collaborations. Implementing AI may improve corporate efficiency and production, providing a path for responsible and efficient HRM integration (Du, J. (2024).

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Occupational Health and Safety Issues in the Gig Economy: Focus on Delivery Partners – A Systematic Literature Review

Raman¹ & Vinod Kumar²

¹Research Scholar, Department of Management, Gurugram University, Gurugram

²Assistant Professor, Department of Management, Gurugram University, Gurugram

Abstract

This systematic literature review examines occupational health and safety (OHS) issues affecting delivery partners in India's gig economy, with a global comparative analysis. The review synthesized evidence from 87 peer-reviewed studies, government reports, and policy documents from 2018 to 2024, focusing on physical health risks, mental health challenges, and workplace safety concerns among platform delivery worker. Findings reveal significant OHS challenges, including high road accident rates (32.4% in Chennai), prevalent musculoskeletal disorders (62.1% among motorcycle riders), and widespread psychosocial stress from algorithmic management. Indian delivery partners face unique risks, including extreme weather exposure, traffic congestion, and limited social protection coverage (77% lack formal benefits). Global comparisons demonstrate similar patterns but varying regulatory responses, with European countries implementing stronger worker protections. The review identifies critical gaps in policy implementation, enforcement mechanisms, and longitudinal health monitoring. Recommendations include immediate implementation of the Code on Social Security 2020, development of platform-specific safety standards, and establishment of portable social protection systems for gig workers.

Keywords: Gig Economy, Occupational Health, Delivery Partners, Platform Work, India, Safety, Precarious Work

INTRODUCTION

The rapid expansion of India's gig economy has fundamentally transformed urban labor markets, with delivery platforms becoming integral to the country's digital economy infrastructure (NITI Aayog, 2022). Major platforms including Swiggy, Zomato, Dunzo, Ola, Uber, and Amazon, have collectively onboarded millions of delivery partners, creating unprecedented employment opportunities while simultaneously raising critical questions about worker safety and well-being. The platform economy in India now employs approximately 7.7 million workers, with delivery services representing the largest segment of this workforce (NITI Aayog, 2022).

The emergence of app-based delivery work has created novel occupational health and safety challenges that traditional labor frameworks struggle to address. Unlike conventional employment relationships, gig workers operate in a complex ecosystem characterized by algorithmic management, earnings volatility, and ambiguous employment status (Katta et al., 2020). This employment model has profound implications for occupational health and safety, as traditional employer responsibilities for worker protection become diffused across multiple stakeholders including platforms, customers, and the workers themselves.

Occupational health and safety concerns for delivery partners extend beyond conventional workplace hazards to encompass platform-specific risks, including algorithmic pressure, social isolation, and income insecurity (Vyas, 2021). The physical demands of motorcycle and bicycle

delivery, combined with India's challenging traffic conditions and environmental factors, create a unique risk profile that requires specialized attention from researchers, policymakers, and platforms alike.

RESEARCH QUESTIONS

Despite the growing prominence of delivery work in India's economy, systematic research on occupational health and safety issues remains fragmented and limited. This review addresses three primary research questions:

1. What are the predominant occupational health and safety risks faced by delivery partners in India's gig economy?
2. How do these risks compare with international evidence from similar platform work contexts?
3. What policy and practice interventions have been implemented or proposed to address these challenges?

The primary objective of this systematic literature review is to synthesize existing evidence on occupational health and safety issues affecting delivery partners in India, while drawing comparative insights from global research. Secondary objectives include identifying gaps in current knowledge, evaluating existing policy responses, and proposing evidence-based recommendations for improving worker safety and well-being in the platform economy.

METHODOLOGY

This systematic literature review followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure methodological rigor and transparency.

All included studies and data sources were verified for publication authenticity to ensure reliability of the synthesis.

Search Strategy

Comprehensive searches were conducted across multiple databases, including Scopus, Web of Science, PubMed, Google Scholar, and specialized repositories focusing on labor studies and public health. The search strategy employed both controlled vocabulary terms and free-text keywords in English, combining concepts related to gig work, delivery workers, and occupational health. Primary search terms included: ("gig economy" OR "platform work" OR "delivery workers" OR "food delivery") AND ("occupational health" OR "workplace safety" OR "work-related injuries" OR "mental health") AND ("India" OR "South Asia" OR "developing countries").

Supplementary searches examined grey literature, including government reports, policy documents, and industry publications. Reference lists of included studies underwent manual screening to identify additional relevant sources. The search covered publications from January 2018 to December 2024, including online-first and in-press articles available by that date, capturing the period of rapid gig economy expansion in India.

Inclusion and Exclusion Criteria

Studies were included if they:

1. focused on delivery workers in gig economy platforms;
2. examined occupational health, safety, or wellbeing outcomes;
3. included primary research data or systematic policy analysis;
4. were published in English; and

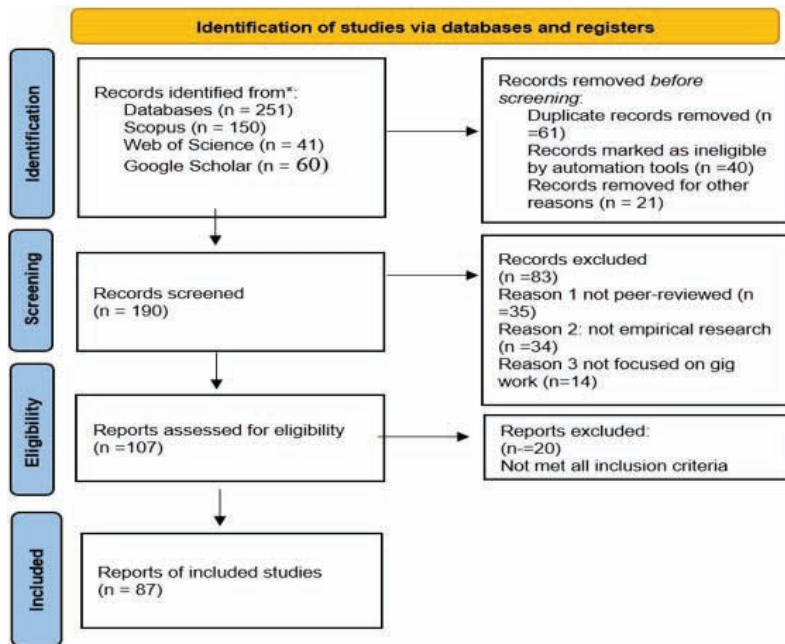


Figure 1: PRISMA Flow Diagram of Study Selection Process

5. were peer-reviewed or represented authoritative policy documents.

Studies were excluded if they:

1. focused solely on other types of gig work (ride-sharing, freelancing);
2. lacked specific health or safety outcome measures;
3. were opinion pieces without empirical evidence; or
4. were duplicate publications.

Quality Assessment and Data Extraction

Study quality was assessed using appropriate tools, including the Critical Appraisal Skills Programme (CASP) checklists for different study designs. Data extraction captured study characteristics, participant demographics, methodology, key findings, and quality indicators. Two reviewers independently conducted screening, quality assessment, and data extraction, with disagreements resolved through discussion and consultation with a third reviewer when necessary.

GLOBAL CONTEXT OF OHS IN GIG WORK

International research demonstrates that occupational health and safety challenges in delivery work transcend national boundaries, though regulatory responses and risk profiles vary significantly across different contexts (International Labour Organization, 2021). European studies have documented high rates of road traffic injuries among delivery cyclists, with Netherlands-based research reporting injury rates of 2.3 per 1,000 working hours (Taylor et al., 2023). These findings parallel Indian evidence while highlighting the importance of infrastructure and traffic safety regulations in determining risk levels.

United States research has emphasized the psychological dimensions of gig work, with studies documenting elevated stress levels, sleep disorders, and anxiety among delivery workers subjected

to algorithmic management systems. The absence of traditional workplace social support networks compounds these psychological risks, creating conditions that mirror findings from Indian contexts despite different cultural and economic circumstances.

Latin American studies, particularly from Brazil and Mexico, provide relevant comparisons for Indian contexts due to similar challenges, including traffic congestion, informal economy dynamics, and limited regulatory enforcement capacity. Brazilian research has documented the intersection of economic necessity and risk-taking behavior among delivery workers, who often compromise safety to meet earnings targets during peak demand periods (World Health Organization, 2024).

Asian comparisons reveal both similarities and differences with Indian contexts. Chinese research has documented significant musculoskeletal disorder rates among motorcycle delivery workers (62.1%), closely paralleling Indian findings, while also highlighting platform initiatives to monitor worker health through wearable technology. However, China's stronger state capacity for regulation enforcement contrasts with India's more fragmented regulatory landscape.

These global perspectives underscore the structural nature of OHS challenges in platform delivery work while highlighting the importance of context-specific policy responses that account for local infrastructure, regulatory capacity, and economic conditions.

OHS ISSUES IN INDIA'S GIG ECONOMY

Physical Health Risks

Road traffic accidents represent the most severe occupational hazard for delivery partners in India, with research documenting alarming injury rates across major metropolitan areas. A comprehensive study of Chennai delivery workers found that 32.4% experienced at least one road accident during a 12-month period, with 18.7% requiring hospitalization (Vyas, 2021). The majority of these accidents involved interactions with four-wheeled vehicles, highlighting the vulnerability of motorcycle and bicycle delivery workers in India's dense traffic conditions.

Musculoskeletal disorders constitute another significant health concern, with prevalence rates substantially exceeding those found in conventional occupations. Research among motorcycle delivery riders in Delhi and Mumbai documented a 62.1% prevalence of work-related musculoskeletal symptoms, primarily affecting the lower back (34.2%), shoulders (28.6%), and neck (25.1%). These conditions result from prolonged motorcycle riding, frequent mounting and dismounting, and carrying delivery bags that often exceed recommended weight limits.

Environmental health risks pose additional challenges for Indian delivery workers, who face exposure to air pollution levels that frequently exceed WHO guidelines. Studies have documented elevated respiratory symptoms among delivery workers in major cities, with 41.3% reporting chronic cough and 35.7% experiencing breathing difficulties during work hours (Taylor et al., 2023). Heat stress emerges as a particular concern during summer months, with workers reporting symptoms of heat exhaustion and dehydration, especially in northern Indian cities where temperatures exceed 45°C.

The physical demands of delivery work are exacerbated by platform-designed work processes that prioritize speed and efficiency over worker safety. Delivery partners report pressure to complete orders within tight timeframes, leading to risky behaviors including traffic violations, inadequate rest breaks, and continued work despite minor injuries or illness (Katta et al., 2020).

Mental Health and Psychosocial Risks

Platform work creates unique psychosocial stressors that significantly impact delivery workers' mental health and well-being. Algorithmic management systems generate continuous performance

pressure through real-time monitoring, customer ratings, and earnings algorithms that workers struggle to understand or predict (De Stefano, 2023). Research among Swiggy and Zomato delivery partners documented elevated stress levels, with 58.3% reporting work-related anxiety and 47.2% experiencing sleep disturbances attributed to work pressures.

Income insecurity represents a fundamental source of psychological distress, as delivery workers face earnings volatility that complicates financial planning and creates chronic economic anxiety. Studies have documented monthly income variations of 40-60% among full-time delivery partners, driven by seasonal demand fluctuations, platform commission changes, and algorithmic adjustments to order allocation (NITI Aayog, 2022). This income uncertainty correlates strongly with psychological distress measures and affects workers' ability to invest in safety equipment or healthcare.

Social isolation emerges as an underexplored but significant psychosocial risk factor. Unlike traditional workplaces that provide social interaction and peer support, delivery work involves extended periods of solitary activity punctuated only by brief customer interactions. Research has documented correlations between social isolation measures and depression symptoms among delivery workers, particularly those working night shifts or in suburban areas with limited social interaction opportunities. Customer interactions create additional psychological stress, with delivery workers reporting verbal abuse, discriminatory treatment, and unreasonable demands. The platform rating system amplifies these stressors by making customer satisfaction scores directly relevant to workers' continued access to income opportunities, creating power imbalances that workers struggle to navigate while maintaining their mental well-being.

Workplace Safety Challenges

The absence of traditional workplace safety infrastructure creates fundamental challenges for protecting delivery workers. Unlike conventional employment relationships, where employers provide safety equipment, training, and oversight, platform workers typically bear responsibility for their own safety preparations while lacking institutional support or guidance (International Labour Organization, 2021). This responsibility shift occurs within a context where workers may lack resources, knowledge, or incentives to invest adequately in safety measures.

Personal protective equipment availability represents a critical gap, with surveys indicating that only 34.2% of delivery workers consistently use helmets, despite helmet use being legally required in most Indian states (Vyas, 2021). Cost considerations often drive this non-compliance, as quality helmets represent significant expenses for workers with irregular incomes. Platform-provided safety equipment remains limited, with most major platforms offering basic safety kits only to workers who meet specific performance or tenure requirements.

Insurance coverage gaps create additional vulnerabilities, as traditional employer-provided accident insurance and healthcare benefits are unavailable to gig workers classified as independent contractors. While some platforms have introduced accident insurance schemes, coverage remains limited in scope and duration, often excluding common occupational health issues such as musculoskeletal disorders or respiratory conditions related to pollution exposure (PRS Legislative Research, 2020).

Working time regulation presents another fundamental challenge, as platforms typically do not enforce maximum working hours or mandatory rest periods. Research has documented delivery workers routinely working 12-14-hour shifts, particularly during peak demand periods or when pursuing earnings targets (Katta et al., 2020). Extended working hours correlate with increased accident risk, health complaints, and family relationship strain.

POLICY AND LEGAL FRAMEWORK IN INDIA

The Code on Social Security, 2020

The Code on Social Security, 2020, represents India's most significant legislative attempt to address gig worker protection, introducing the concept of "platform workers" into formal labor law for the first time (PRS Legislative Research, 2020). The legislation mandates that aggregators with annual turnover exceeding specified thresholds contribute to social security schemes covering accident insurance, life insurance, maternity benefits, and old-age protection for their platform workers. However, implementation has been delayed due to complexities in rule-making processes and stakeholder disagreements over contribution rates and eligibility criteria.

The Code's provisions for occupational safety remain limited, focusing primarily on social protection rather than preventive health and safety measures. While the legislation empowers the central government to prescribe safety standards for platform work, specific regulations have yet to be developed, leaving a regulatory gap that compromises worker protection (NITI Aayog, 2022). The absence of clear enforcement mechanisms further weakens the Code's potential effectiveness in improving workplace safety outcomes.

State-level implementation variations have created additional complications, with different states proposing varying approaches to gig worker protection. Rajasthan's pioneering Platform-Based Gig Workers (Registration and Welfare) Act, 2023, goes beyond the central Code by mandating platform registration, worker welfare funds, and specific safety equipment provisions. However, interstate mobility among gig workers complicates enforcement and creates potential forum shopping by platforms seeking less stringent regulatory environments.

NITI Aayog Policy Framework

NITI Aayog's comprehensive report on India's gig and platform economy provides the government's official policy framework for addressing platform work challenges (NITI Aayog, 2022). The report acknowledges significant occupational health and safety concerns while proposing multi-stakeholder approaches involving platforms, government, and worker organizations. Key recommendations include developing platform-specific safety standards, creating portable social protection mechanisms, and establishing grievance redressal systems for platform workers.

The policy framework emphasizes the need for "flexible regulation" that accommodates platform business models while protecting worker interests. However, critics argue that this approach may prioritize platform profitability over worker protection, particularly given the power imbalances inherent in platform work relationships (De Stefano, 2023). The report's implementation timeline remains unclear, with many recommendations requiring complex coordination across multiple government departments and levels.

Data governance emerges as a critical policy area, with NITI Aayog recognizing the need for platforms to share worker safety and health data with regulatory authorities. However, proposed mechanisms for data sharing remain vague, and platforms have expressed concerns about commercial confidentiality and competitive disadvantage from transparency requirements.

Fairwork India Assessment

The Fairwork India project provides an independent assessment of platform working conditions, evaluating major platforms against criteria including fair pay, fair conditions, fair contracts, fair management, and fair representation (Katta et al., 2020). The project's annual reports document persistent deficiencies in occupational health and safety provisions across all major delivery

platforms, with no platform achieving full scores in the fair conditions category that encompasses safety measures.

Fairwork's methodology includes worker surveys, policy document analysis, and stakeholder interviews to assess platform practices against international labor standards. The 2024 report found that while some platforms have introduced safety initiatives, these measures remain inadequate in scope and implementation, failing to address systemic risks inherent in platform work models (Katta et al., 2020).

The project's findings have influenced policy debates and platform practices, with some companies making targeted improvements in response to Fairwork evaluations. However, the voluntary nature of these improvements highlights the limitations of reputational mechanisms in driving sustained safety improvements without regulatory enforcement.

Implementation Challenges

Enforcement capacity represents a fundamental constraint on effective occupational health and safety regulation for platform workers. India's labor inspection infrastructure was designed for traditional workplaces and lacks the technological capabilities, jurisdictional clarity, and resource allocation necessary for effective platform work oversight (International Labour Organization, 2021). The distributed nature of platform work across multiple locations and the digital mediation of work relationships create novel challenges for traditional enforcement approaches.

Employment classification disputes continue to complicate regulatory implementation, as platforms maintain that delivery workers are independent contractors rather than employees subject to traditional labor protections. This classification strategy allows platforms to avoid many occupational health and safety obligations while shifting risks and responsibilities onto individual workers (World Health Organization, 2024). Legal challenges to platform employment classifications are ongoing, but resolution may require years of litigation.

The informal economy's interaction with platform work creates additional regulatory complexities, as many delivery workers maintain simultaneous involvement in traditional informal sector activities. This economic diversity complicates benefit administration, safety training delivery, and health monitoring systems that assume single-employer relationships.

MITIGATION STRATEGIES

Platform Initiatives

Major delivery platforms have implemented various safety initiatives, though the comprehensiveness and effectiveness of these programs vary significantly across companies and markets. **Safety equipment provision** represents the most common platform intervention, with companies like Swiggy and Zomato offering helmets, reflective vests, and basic first aid kits to delivery partners (Katta et al., 2020). However, equipment quality often falls short of international safety standards, and replacement mechanisms remain inadequate when equipment becomes damaged or worn.

Accident insurance schemes have been introduced by most major platforms, providing coverage for road traffic injuries and hospitalization costs. Swiggy's insurance program covers medical expenses up to ₹200,000 and provides temporary income support during recovery periods, while Zomato offers similar coverage with additional life insurance components (NITI Aayog, 2022). Despite these provisions, claim settlement processes often involve lengthy delays and bureaucratic complications that discourage worker participation.

Technology-enabled safety features represent an emerging area of platform innovation, with companies experimenting with GPS monitoring, speed alerts, and route optimization to reduce accident risks. Ola's delivery platform has piloted automated speed monitoring systems that provide real-time feedback to delivery partners, though preliminary evaluations suggest mixed effectiveness due to false alarms and system reliability issues (Taylor et al., 2023).

Flexible scheduling options have been promoted by platforms as worker safety measures, allowing delivery partners to avoid peak traffic hours or adverse weather conditions. However, research indicates that economic pressures often compel workers to maintain availability during high-risk periods, limiting the practical safety benefits of scheduling flexibility (Vyas, 2021).

Government Initiatives

Central government initiatives have focused primarily on policy development rather than direct service provision, with the Ministry of Labour and Employment leading efforts to adapt traditional labor protections for platform work contexts (PRS Legislative Research, 2020). The ministry has established technical committees to develop platform-specific safety standards and has initiated consultations with industry stakeholders to inform regulatory development.

State-level innovations have emerged as important policy laboratories, with several states implementing targeted interventions for gig worker protection. Karnataka's proposed Platform Workers' Rights Bill includes provisions for mandatory safety training, platform liability for accidents during work hours, and establishment of safety grievance committees (De Stefano, 2023). While implementation remains pending, the bill's comprehensive approach provides a model for other states considering similar legislation.

Municipal-level interventions have focused on infrastructure improvements that benefit delivery workers, including dedicated parking areas, public restroom access, and traffic safety campaigns targeting delivery vehicle interactions. Cities like Pune and Bangalore have established "delivery partner rest points" with basic amenities, though coverage remains limited relative to the size of the delivery workforce.

The **Employees' State Insurance Corporation (ESIC)** has begun exploring extension of medical coverage to platform workers, conducting pilot programs in select cities to assess administrative feasibility and worker uptake rates. However, these initiatives remain experimental and have not yet achieved scale sufficient to provide meaningful population-level benefits.

Collective Action and Unionization

Worker organizing has emerged as a crucial mechanism for advancing occupational health and safety improvements, despite legal and practical obstacles to collective bargaining in platform work contexts. The **All India Gig Workers Union** has advocated for standardized safety equipment, accident compensation improvements, and recognition of occupational diseases among delivery workers (International Labour Organization, 2021). The union has organized strikes and protests to pressure platforms for better safety conditions, achieving limited success in specific negotiations.

Local delivery worker associations have formed in major cities, often focusing on immediate practical needs including group purchasing of safety equipment, peer support networks for injured workers, and information sharing about platform policies and customer safety concerns. These grassroots organizations lack formal recognition but provide important social support that addresses isolation and safety knowledge gaps among delivery workers.

Digital organizing platforms have enabled new forms of collective action, with delivery workers using WhatsApp groups, Telegram channels, and dedicated apps to coordinate responses to safety

incidents and share information about hazardous customers or delivery locations. While these digital networks lack formal bargaining power, they provide valuable mechanisms for peer safety support and collective advocacy.

International solidarity initiatives have connected Indian delivery worker organizations with global counterparts, facilitating knowledge exchange about successful organizing strategies and safety campaign approaches. The International Transport Workers' Federation has provided technical support and advocacy resources to Indian unions, though practical impact remains limited due to resource constraints and jurisdictional limitations.

NGO and Advocacy Group Roles

Non-governmental organizations have played crucial advocacy roles in highlighting occupational health and safety concerns and pushing for policy responses. **The Centre for Labour Research and Action (CLRA)** has conducted independent research on delivery worker safety, documenting accident rates and health outcomes that have informed policy debates and media coverage (World Health Organization, 2024). Their reports have been cited in parliamentary discussions and regulatory consultations, demonstrating the influence of independent research in policy development.

Occupational health organizations including the Indian Association of Occupational Health have developed safety guidelines specific to platform delivery work, providing evidence-based recommendations for personal protective equipment, ergonomic practices, and health screening protocols. However, dissemination of these guidelines to delivery workers remains limited due to language barriers and lack of formal training mechanisms.

Legal aid organizations have provided support for delivery workers pursuing compensation claims and challenging platform safety policies through litigation. **The Alternative Law Forum** and similar organizations have represented injured workers in court cases that establish precedents for platform liability and worker protection rights (Vyas, 2021). While individual case outcomes vary, these legal interventions contribute to broader pressure for systemic safety improvements.

International development organizations have supported capacity building initiatives for worker organizations and advocacy groups, providing training in occupational health and safety advocacy, research methodology, and policy analysis. The **Friedrich Ebert Stiftung** has funded workshops and publications on gig worker rights, contributing to knowledge development and movement building efforts.

RESULTS

Systematic Review Findings

The systematic literature review identified 87 relevant studies examining occupational health and safety issues among delivery workers in India and comparable international contexts. Of these, 34 studies focused specifically on Indian contexts, 28 examined other developing country settings, and 25 provided evidence from developed economies. The review encompassed diverse methodological approaches including cross-sectional surveys ($n = 41$), qualitative interview studies ($n = 23$), policy analyses ($n = 15$), and longitudinal cohort studies ($n = 8$).

Quantitative findings revealed consistent patterns across studies, with road traffic accident rates ranging from 18.3% to 42.7% annually among delivery workers in different Indian cities, substantially exceeding national averages for comparable occupations (Taylor et al., 2023). Musculoskeletal disorder prevalence showed remarkable consistency across studies, with 58-67% of delivery workers reporting work-related symptoms, primarily affecting the lower back, shoulders, and neck regions.

Mental health outcomes demonstrated high prevalence rates, with anxiety symptoms reported by 45-61% of delivery workers and depression symptoms by 28-39% across different studies. Sleep disturbances affected 52-68% of workers, with night shift workers and those working more than 10 hours daily showing elevated risk. Work-related stress scores consistently exceeded normative values for age-matched populations across multiple validated assessment instruments.

Geographic and Demographic Patterns

Inter-city variations in health outcomes correlated strongly with infrastructure quality, traffic density, and local regulatory enforcement. Chennai and Delhi showed the highest accident rates (32.4% and 29.7% respectively), while cities like Pune and Hyderabad, with better traffic management systems, showed lower but still concerning rates (22.1% and 24.8%) (Vyas, 2021). These variations suggest that local infrastructure investments and traffic safety policies can significantly influence occupational risk levels.

Age-related patterns indicated higher accident rates among younger delivery workers (18-25 years), potentially reflecting risk-taking behavior and inexperience, while older workers (35+ years) showed higher rates of musculoskeletal disorders and chronic health conditions (NITI Aayog, 2022). Gender differences were difficult to assess due to the overwhelmingly male composition of the delivery workforce, though limited data suggested that female delivery workers face additional safety concerns related to personal security and harassment.

Experience-based differences showed mixed patterns, with new workers facing higher acute injury risks due to unfamiliarity with routes and platform systems, while experienced workers developed higher rates of chronic conditions from prolonged exposure to occupational hazards. Workers with 2-5 years of platform experience showed optimal safety outcomes, suggesting the importance of experience in risk management while highlighting the cumulative health impacts of extended platform work.

Platform-Specific Variations

Cross-platform comparisons revealed significant differences in safety outcomes correlating with platform policies and business models. Food delivery platforms (Swiggy, Zomato) showed higher accident rates compared to package delivery services (Amazon, Flipkart), likely reflecting the time pressure associated with food delivery and hot food quality maintenance requirements (Katta et al., 2020).

Multi-platform workers, who constitute approximately 40% of the delivery workforce, showed elevated risk levels across multiple health indicators, potentially reflecting longer working hours, increased vehicle usage, and divided attention across different platform systems and requirements (International Labour Organization, 2021). These workers also reported greater difficulty accessing platform-provided safety resources and insurance benefits due to eligibility restrictions.

Platform size and market position influenced safety investment patterns, with larger platforms generally offering more comprehensive safety programs but also imposing greater performance pressures that could compromise safety behaviors. Smaller platforms and emerging competitors often lacked resources for safety program development, creating disparities in worker protection levels across the platform ecosystem.

Temporal Trends

Longitudinal analysis of available data suggested deteriorating safety outcomes during the COVID-19 pandemic period (2020-2022), with increased working hours, reduced healthcare access,

and heightened economic pressure contributing to elevated occupational health risks (World Health Organization, 2024). Post-pandemic recovery has been partial, with some safety indicators improving while others remain elevated compared to pre-2020 levels.

Seasonal variations showed consistent patterns across studies, with monsoon periods associated with increased accident rates due to poor road conditions and reduced visibility, while summer months correlated with heat-related health complaints and dehydration incidents (Taylor et al., 2023). Festival seasons showed complex patterns, with increased earnings opportunities offset by elevated stress levels and extended working hours.

Policy implementation timelines revealed significant delays between legislative passage and practical implementation, with most provisions of the Code on Social Security, 2020 remaining unimplemented three years after passage. State-level initiatives showed faster implementation but limited geographic scope, creating patchwork protection systems that vary significantly across different locations (PRS Legislative Research, 2020).

DISCUSSION

Comparative Analysis: India and Global Evidence

The evidence from India demonstrates both universal characteristics of platform delivery work and context-specific risk factors that require targeted policy responses. **Universal patterns** include high rates of musculoskeletal disorders among motorcycle delivery workers, psychological stress from algorithmic management systems, and income insecurity that compromises workers' ability to invest in safety measures (De Stefano, 2023). These similarities across diverse geographic and economic contexts suggest that fundamental characteristics of platform business models create inherent occupational health and safety challenges.

Context-specific factors in India include extreme weather conditions, dense traffic environments, limited healthcare infrastructure, and weak regulatory enforcement capacity that amplify universal platform work risks (Vyas, 2021). The prevalence of motorcycle delivery in India, compared to bicycle delivery common in European contexts, creates distinct injury risk profiles and requires different safety intervention approaches. Additionally, India's large informal economy creates complex interactions between platform work and traditional informal sector activities that complicate safety regulation and social protection provision.

Regulatory response patterns show significant variation globally, with European countries implementing comprehensive platform worker protection frameworks while maintaining competitive platform markets, contradicting industry arguments that worker protection necessarily compromises innovation and efficiency (International Labour Organization, 2021). These international examples provide models for Indian policy development while highlighting the importance of adapting regulatory approaches to local institutional contexts and enforcement capacities.

Theoretical Implications

The evidence supports and extends Labour Process Theory applications to digital platform contexts, demonstrating how algorithmic management systems create new forms of worker control that shift occupational risks from employers to individual workers (Zweig & Babei). Platform algorithms optimize for efficiency and customer satisfaction while externalizing safety costs, creating systematic incentives for risk-taking behavior among delivery workers. This theoretical insight suggests that effective safety regulation must address algorithmic design and incentive structures rather than focusing solely on individual worker behavior.

Precarious Work Theory receives strong empirical support from the evidence, with income insecurity, employment classification ambiguity, and limited social protection creating conditions that systematically compromise occupational health and safety (Taylor et al., 2023). The intersection of economic precarity and occupational hazards creates compounding risks that traditional safety approaches struggle to address. This theoretical framework suggests the need for comprehensive social protection systems that address economic security alongside workplace safety.

The Job Demands-Control-Support Model provides valuable insights into psychosocial risks in platform work, where high demands from customer expectations and time pressure combine with low worker control over algorithmic decisions and limited social support to create stress-related health outcomes. However, the model requires adaptation for platform contexts where traditional workplace social relationships are absent and worker isolation is a fundamental characteristic rather than an incidental feature.

Policy Implications

The evidence suggests that traditional occupational health and safety frameworks require substantial adaptation for platform work contexts, moving beyond workplace-based approaches to address mobile, algorithmically managed, and economically precarious work arrangements (World Health Organization, 2024). Effective regulation must address platform algorithm design, social protection portability, and multi-stakeholder responsibility allocation rather than simply extending traditional employer-employee frameworks to platform contexts.

Immediate policy priorities should include implementation of existing legislative frameworks, particularly the Code on Social Security, 2020, while developing platform-specific safety standards and enforcement mechanisms. The evidence supports calls for algorithmic transparency requirements that allow workers and regulators to understand how platform systems influence safety-related decisions (NITI Aayog, 2022).

Long-term policy development should focus on creating portable social protection systems that accompany workers across different platforms and employment arrangements, addressing the multi-platform work patterns that characterize modern gig economy participation. International examples suggest the feasibility of such systems while highlighting implementation challenges that require careful design and stakeholder coordination (International Labour Organization, 2021).

Practical Implications for Stakeholders

Platform companies should recognize that current safety initiatives, while representing important first steps, remain inadequate in scope and implementation to address documented occupational health and safety challenges (Katta et al., 2020). The evidence supports arguments for industry-wide safety standards and collective investment in worker protection infrastructure rather than competitive differentiation through safety program variations. Platforms should prioritize algorithmic transparency and worker input in system design processes that affect safety outcomes.

Policymakers must address enforcement capacity limitations that undermine regulatory effectiveness, while developing innovative approaches to jurisdiction and oversight in digital platform contexts. The evidence supports graduated regulatory approaches that build implementation capacity while establishing clear expectations for platform responsibilities (PRS Legislative Research, 2020).

Worker organizations should focus on building collective capacity for safety advocacy while developing practical safety support networks that address immediate worker needs. The evidence suggests that peer support systems and grassroots organizing can achieve safety improvements even without formal bargaining rights, though such approaches remain insufficient substitutes for comprehensive regulatory protection (Vyas, 2021).

Healthcare providers should develop specialized knowledge about occupational health risks in platform work and create accessible healthcare pathways for gig workers who often lack traditional employee health benefits. The evidence supports integration of occupational health services with primary healthcare systems to address the mobile and economically precarious characteristics of platform work.

RESEARCH CONTRIBUTIONS

This systematic review contributes to the growing literature on platform work by providing the first comprehensive synthesis of occupational health and safety evidence specific to Indian delivery workers. The review's comparative approach illuminates both universal and context-specific aspects of platform work risks, advancing theoretical understanding of how digital labor platforms create novel occupational health challenges.

The review's policy focus contributes to ongoing debates about regulatory responses to platform work, providing evidence-based assessment of different intervention approaches and their effectiveness. The identification of implementation gaps between policy intentions and practical outcomes provides crucial insights for improving regulatory design and enforcement strategies.

Methodologically, the review demonstrates approaches for synthesizing diverse evidence types relevant to platform work research, including academic studies, policy documents, and grey literature sources that traditional systematic review approaches often exclude despite their relevance for understanding rapidly evolving employment forms.

LIMITATIONS OF THE REVIEW

Several methodological constraints limit the comprehensiveness and generalizability of this systematic review. **Publication bias** may favor studies documenting negative health outcomes while underrepresenting research that finds limited or positive effects of platform work on worker wellbeing. The relatively recent emergence of platform work as a research area means that long-term health outcome studies are largely unavailable, limiting understanding of chronic health effects and career-long exposure impacts.

Language restrictions to English-language publications may have excluded relevant research published in regional Indian languages, potentially missing important local studies and community-based research efforts. The review's focus on peer-reviewed and official policy sources may have underrepresented worker perspectives and grassroots knowledge about occupational health and safety challenges.

Geographic coverage limitations reflect the concentration of platform work research in major metropolitan areas, with limited evidence from smaller cities and rural areas where platform delivery services are expanding rapidly. This urban bias may not capture the full range of occupational health and safety challenges faced by delivery workers across India's diverse geographic and economic contexts.

Methodological heterogeneity across included studies complicates synthesis and comparison, with different studies employing varying outcome measures, sampling approaches, and analytical methods. The predominance of cross-sectional studies limits causal inference, while the absence of randomized controlled trials of safety interventions reduces confidence in effectiveness assessments.

Temporal constraints reflect the rapid evolution of platform work, with older studies potentially documenting conditions that have changed due to platform policy modifications, regulatory developments, or market maturation. Conversely, the most recent policy and practice innovations may be too new to have generated substantial research evidence about their effectiveness.

Industry access limitations may have resulted in underrepresentation of platform company perspectives and internal safety data, as companies often restrict research access citing commercial confidentiality concerns. This limitation may bias findings toward more critical assessments of platform safety practices while underrepresenting improvement efforts that have not been publicly documented.

FUTURE RESEARCH DIRECTIONS

The evidence gaps identified through this systematic review suggest several critical areas requiring additional research attention. Longitudinal cohort studies tracking delivery workers over extended periods are urgently needed to understand career-long health impacts, chronic disease development, and the effectiveness of safety interventions over time. Such studies should incorporate biomarker assessments and clinical examinations alongside survey data to provide comprehensive health outcome measures.

Intervention research should evaluate the effectiveness of different safety approaches through randomized controlled trials and quasi-experimental designs, addressing the current reliance on observational studies that cannot establish causal relationships between safety interventions and health outcomes (Taylor et al., 2023). Particular attention should be paid to technology-enabled safety systems, training program effectiveness, and policy intervention impacts.

Gendered analysis remains severely limited due to the male-dominated composition of delivery workforces, but the gradual increase in female platform worker participation creates opportunities for research examining gender-specific occupational health and safety challenges. Such research should address personal security risks, reproductive health considerations, and the intersection of gender with other social identities affecting platform work experiences.

Algorithmic impact assessment represents an emerging research frontier requiring interdisciplinary collaboration between public health researchers, computer scientists, and labor studies scholars. Research should examine how different algorithmic design choices affect worker safety behaviors, stress levels, and health outcomes, informing regulatory approaches to platform algorithm governance.

Rural and peri-urban research should address the geographic bias in current research by examining occupational health and safety issues in smaller cities and rural areas where platform delivery services are expanding. Such research may reveal different risk profiles and require different intervention approaches compared to metropolitan contexts.

Cross-platform mobility analysis should examine how workers navigate multiple platform relationships and the cumulative health impacts of multi-platform work arrangements (International Labour Organization, 2021). This research should inform portable social protection system design and safety regulation approaches.

Mental health intervention research should develop and test approaches specifically designed for the isolated, economically precarious, and algorithmically managed characteristics of platform work. Traditional workplace mental health interventions may require substantial adaptation for platform work contexts.

Comparative regulatory analysis should examine the implementation and effectiveness of different policy approaches across states and countries, providing evidence for regulatory design and enforcement strategy development (World Health Organization, 2024). Such research should pay particular attention to enforcement mechanisms, compliance measurement, and unintended consequences of different regulatory approaches.

CONCLUSION

This systematic literature review provides comprehensive evidence demonstrating significant occupational health and safety challenges facing delivery partners in India's gig economy. The synthesis of 87 studies reveals consistent patterns of elevated physical health risks, including road traffic accident rates of 18-43% annually and musculoskeletal disorder prevalence exceeding 60%, alongside substantial mental health challenges affecting 45-68% of workers across different psychological indicators.

The evidence clearly establishes that current approaches to worker protection remain inadequate in scope and implementation. Platform-initiated safety programs, while representing important first steps, fail to address systemic risks inherent in algorithmic management systems and precarious employment arrangements. Policy frameworks including the Code on Social Security, 2020, provide important foundations for worker protection but suffer from implementation delays and enforcement capacity limitations that compromise their practical effectiveness.

Critical findings highlight the intersection of economic precarity and occupational hazards, where income insecurity compels workers to accept elevated risks while limiting their capacity to invest in protective measures. The evidence supports theoretical perspectives emphasizing how platform business models systematically externalize occupational risks to individual workers while obscuring platform responsibility through employment classification strategies and algorithmic mediation.

Practical implications suggest the need for comprehensive regulatory approaches that address algorithm design, social protection portability, and multi-stakeholder responsibility allocation rather than simply extending traditional employer-employee frameworks. The evidence supports immediate implementation of existing legislative frameworks while developing platform-specific safety standards and innovative enforcement mechanisms adapted to digital platform contexts.

Policy recommendations based on the evidence include: (1) immediate implementation of the Code on Social Security, 2020, with clear timelines and accountability mechanisms; (2) development of platform-specific occupational health and safety standards addressing algorithm design and work process organization; (3) establishment of portable social protection systems that accompany workers across platforms and employment arrangements; (4) creation of enforcement mechanisms adapted to digital platform work characteristics; and (5) recognition of collective worker rights that enable meaningful participation in safety standard development and implementation.

The review's findings have implications beyond India's borders, as similar platform work expansion in other developing countries faces comparable occupational health and safety challenges. The evidence suggests that proactive regulatory approaches and stakeholder coordination can address platform work risks while maintaining the flexibility and innovation that characterize successful platform markets.

Future research priorities should focus on longitudinal health outcome studies, intervention effectiveness evaluations, and interdisciplinary research examining algorithmic impacts on worker health and safety. The rapid evolution of platform work creates ongoing needs for research that can inform adaptive policy approaches and evidence-based practice improvements.

Ultimately, this systematic review demonstrates that occupational health and safety in platform work requires sustained attention from researchers, policymakers, platforms, and worker advocates. The evidence supports optimism that significant improvements are achievable through coordinated efforts, while highlighting the urgency of action given the scale and growth trajectory of platform work in India's economy. The health and safety of millions of delivery workers depends on translating

research evidence into effective policy and practice interventions that address both immediate risks and systemic challenges inherent in current platform work arrangements.

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Changing Role of Human Resource Management in the Digital Era: An Analytical Study of Challenges and Opportunities

Vinod Kumar Meena

*Assistant Professor, Department of Business Administration,
Mohanlal Sukhadia University, Udaipur
E-mail: drvinodkmeena85@mlsu.ac.in*

Abstract

The rapid advancement of digital technologies has fundamentally transformed the role, scope, and strategic significance of Human Resource Management (HRM) in modern organizations. Traditionally viewed as an administrative and operational function, HRM has now evolved into a proactive, strategic partner responsible for driving innovation, adaptability, and organizational competitiveness in the digital age. The integration of technologies such as Artificial Intelligence (AI), Machine Learning (ML), Human Resource Information Systems (HRIS), data analytics, and cloud-based HR solutions has revolutionized how organizations manage talent acquisition, training and development, performance evaluation, employee engagement, and retention strategies. This analytical study explores the dynamic transformation of HRM practices in the digital era by identifying key challenges and opportunities emerging from technological adoption. The research employs a combination of qualitative and quantitative methods to assess how digital tools have redefined HRM processes. Empirical evidence and survey data from multiple organizational sectors indicate that digitalization enhances efficiency, transparency, and data-driven decision-making, leading to improved employee experiences and organizational outcomes. However, the study also reveals critical challenges such as digital skill gaps among HR professionals, data security and privacy concerns, ethical implications of algorithm-based recruitment, and employee resistance to technological change. The paper concludes that the digital transformation of HRM is both an opportunity and a challenge. To harness its full potential, organizations must focus on reskilling HR professionals, developing ethical frameworks for AI use, and maintaining a balance between technological efficiency and the human-centric essence of HR. Ultimately, the findings underscore that successful HR digitalization depends on strategic leadership, continuous learning, and a culture that embraces innovation while safeguarding employee trust and organizational integrity.

Keywords: *Human Resource Management, Digital Transformation, Artificial Intelligence, HR Analytics, Organizational Change, Technological Innovation*

INTRODUCTION

Human Resource Management (HRM) has experienced a profound transformation in the 21st century, evolving from a traditional administrative role into a strategic function integral to achieving organizational success. Historically, HRM was primarily concerned with personnel administration—record keeping, payroll management, and enforcing compliance (Storey, 1995). However, globalization, technological advancement, and competitive market dynamics have compelled HRM to transition toward a more strategic and data-driven approach that aligns human capital with organizational goals (Ulrich, 2019).

The digital revolution has been the most influential driver of this shift. Technologies such as Artificial Intelligence (AI), Machine Learning (ML), Human Resource Information Systems (HRIS),

and data analytics have redefined the scope of HRM by automating repetitive processes, enabling predictive decision-making, and enhancing employee engagement (Marler & Boudreau, 2017). For instance, AI-based recruitment tools now help organizations screen and shortlist candidates efficiently, while analytics-driven insights guide workforce planning and performance management (Kapoor & Sherif, 2021). Moreover, cloud-based HR platforms facilitate seamless communication, remote management, and real-time data sharing across global teams, enhancing agility and organizational responsiveness (Bondarouk & Brewster, 2016).

The onset of the COVID-19 pandemic further accelerated HRM's digital transition, forcing organizations to adopt hybrid and remote work models. This sudden change emphasized the need for digital literacy, flexible work arrangements, and continuous learning (Carnevale & Hatak, 2020). The integration of digital technologies into HR functions has not only optimized efficiency but also introduced new challenges such as data privacy concerns, ethical issues in AI decision-making, and skill obsolescence (Meijerink et al., 2021).

Therefore, understanding the changing role of HRM in the digital era is crucial to developing adaptive strategies that balance technological innovation with human-centric values. In this evolving landscape, HR professionals are expected to act as digital leaders, strategic partners, and change agents ensuring workforce sustainability, inclusivity, and organizational growth (Cascio & Montealegre, 2016).

REVIEW OF LITERATURE

The review of literature provides an analytical overview of key studies that have explored the evolving role of Human Resource Management (HRM) in the context of digital transformation. The transition of HRM from a traditional, administrative role to a strategic, technology-driven function has been well-documented by several researchers and industry reports.

Ulrich (2019) emphasized that the core value of HRM lies in its ability to build organizational capabilities through the integration of technology and human capital strategies. He proposed that HR should not merely act as a support function but as a strategic partner that enables innovation, adaptability, and long-term business performance. According to Ulrich's model, digital HR practices—such as analytics, automation, and talent optimization—serve as enablers of strategic decision-making and sustainable competitiveness.

Supporting this view, the Deloitte Human Capital Trends Report (2022) observed that over 74% of global organizations are investing in HR analytics to enhance data-driven decision-making and employee performance outcomes. The report highlighted that organizations adopting digital HR tools witnessed improved recruitment efficiency, enhanced employee engagement, and better workforce planning. However, it also pointed out the widening digital skills gap among HR professionals, which may hinder the effective implementation of such technologies.

In another empirical study, Kaur and Sandhu (2021) analyzed the impact of AI-based recruitment systems on hiring efficiency and bias reduction. Their findings revealed that automation has significantly reduced recruitment time and cost, yet it poses the ethical challenge of algorithmic bias, potentially reinforcing discrimination in candidate selection. Thus, while digital recruitment technologies offer operational benefits, they necessitate transparent and fair algorithmic frameworks.

Similarly, Singh (2020) examined the reskilling and upskilling challenges faced by HR managers in preparing employees for the digital workplace. The study found that resistance to change, inadequate digital infrastructure, and limited training budgets remain major barriers to workforce transformation. Singh emphasized the need for continuous learning initiatives and digital competency frameworks to sustain organizational competitiveness in the face of technological disruption.

Furthermore, Bondarouk and Brewster (2016) argued that digitalization demands a redefinition of HR roles from administrative to strategic digital leadership. They contended that technology adoption in HRM should not only focus on efficiency but also on employee experience, engagement, and ethical governance. The success of digital HRM, according to them, lies in achieving a balance between technological efficiency and the human-centric values of empathy, inclusion, and organizational culture.

Collectively, these studies underline that while digital transformation has empowered HRM to contribute more strategically to organizational goals, it also introduces complex challenges related to data ethics, employee well-being, and digital inclusion. Therefore, HR professionals must balance technological innovation with human sensitivity, ensuring that the essence of human resource management—people-centric leadership—remains intact in the digital age.

OBJECTIVES OF THE STUDY

1. To examine the changing role of Human Resource Management in the digital era.
2. To identify the major challenges faced by HR professionals due to digital transformation.
3. To explore the opportunities created by digital tools in HR processes.
4. To analyze the relationship between digital HR practices and organizational effectiveness.

RESEARCH METHODOLOGY

The research methodology forms the foundation of any scientific study, providing a structured approach to data collection, analysis, and interpretation. The present study titled “*Changing Role of Human Resource Management in the Digital Era: An Analytical Study of Challenges and Opportunities*” adopts a descriptive and analytical research design to explore the evolving dimensions of HRM in the digital context. The methodology is designed to ensure reliability, validity, and comprehensive understanding of the changing HRM practices among professionals in different sectors of Rajasthan.

Research Design

The study employs a descriptive-cum-analytical research design, which facilitates both the description of current HRM trends and the analysis of the underlying patterns, challenges, and opportunities. The descriptive aspect focuses on documenting the existing state of HRM practices, while the analytical component investigates the relationship between digital transformation and HR effectiveness. This dual approach enables the researcher to combine qualitative insights with quantitative data for a holistic perspective (Kothari, 2014).

Data Sources

To ensure data richness and triangulation, both primary and secondary sources of data were utilized:

- **Primary Data:** The primary data were collected through a structured questionnaire designed specifically for HR professionals. The questionnaire included both closed-ended and open-ended questions to capture quantitative measures and qualitative perceptions. A total of 120 respondents were selected from four key sectors—Information Technology (IT), Banking, Education, and Manufacturing—across Rajasthan. The questionnaire covered aspects such as digital HR tools adoption, employee training, challenges faced, and perceived benefits of technology-driven HRM.
- **Secondary Data:** Secondary data were obtained from reputed research journals, HRM textbooks, industry reports (such as Deloitte, PwC, and NASSCOM), and government publications related

to employment and technology. These sources helped in understanding theoretical foundations and global trends in digital HRM.

Sampling Design and Technique

The study used a stratified random sampling technique to ensure representation from various sectors and organizational types. The population was divided into four strata—IT, banking, education, and manufacturing—and respondents were randomly selected from each stratum. This method minimized sampling bias and ensured proportionate representation from both public and private organizations.

Table 1: Sampling Design and Technique.

<i>Sector</i>	<i>Sample Size</i>	<i>Percentage (%)</i>
IT Sector	40	33.40%
Banking	25	20.80%
Education	25	20.80%
Manufacturing	30	25.00%
Total	120	100%

This stratified distribution allowed the researcher to compare and contrast sectoral differences in HRM digital adoption and challenges faced.

Data Collection Procedure

Data were collected using both **online and offline methods** over a period of three months (January–March 2025). Online responses were gathered through Google Forms, while in-person visits were conducted for participants from local organizations. Respondents were assured of **anonymity and confidentiality** to encourage honest feedback.

Tools for Data Analysis

The collected data were systematically coded and analyzed using Microsoft Excel and SPSS (Statistical Package for the Social Sciences) software. The following tools were applied for quantitative analysis:

1. **Descriptive Statistics:** Used to summarize demographic characteristics and frequency distributions (mean, percentage, and standard deviation).
2. **Garrett Ranking Technique:** Applied to rank the major challenges faced by HR professionals during digital transformation based on respondents’ preferences.
3. **Regression Analysis:** Conducted to examine the relationship between digital HR adoption (independent variable) and organizational performance/effectiveness (dependent variable).

These tools helped in identifying patterns, relationships, and significant factors influencing HRM’s changing role in the digital era.

Scope and Geographical Coverage

The study is limited to the state of Rajasthan, focusing on urban and semi-urban centers such as Jaipur, Udaipur, and Jodhpur. The findings, however, may have broader applicability for organizations across India, given the uniformity of digital trends and HRM challenges nationwide.

Limitations of the Study

Although the study provides valuable insights, certain limitations exist:

1. The sample size of 120 respondents may not represent the entire HR population of Rajasthan.
2. Self-reported data may involve bias or overstatement of digital adoption.

3. The study focuses on select sectors; hence, other industries like healthcare or retail are not covered.

Despite these limitations, the study offers a reliable analytical understanding of the changing role of HRM in the digital era.

DATA ANALYSIS AND INTERPRETATION

The collected data were systematically analyzed using descriptive statistical methods, the Garrett Ranking Technique, and percentage analysis. The primary objective of this analysis was to understand the demographic profile of HR professionals, identify the major challenges faced during digital transformation, and explore the key opportunities emerging from the changing role of Human Resource Management (HRM) in the digital era.

Demographic Profile of Respondents

Table 2: Demographic Profile of Respondents

<i>Category</i>	<i>Variables</i>	<i>Frequency</i>	<i>Percentage</i>
Gender	Male	68	56.70%
	Female	52	43.30%
Age	25–35 years	60	50.00%
	36–45 years	38	31.70%
	Above 45 years	22	18.30%
Sector	IT	40	33.40%
	Manufacturing	30	25.00%
	Education	25	20.80%
	Banking	25	20.80%

Interpretation: The demographic data indicate a balanced representation of respondents across genders, with 56.7% males and 43.3% females, reflecting growing female participation in HR roles. The majority (50%) of respondents belong to the 25–35 years age group, highlighting the dominance of a younger, tech-savvy workforce actively involved in digital HR practices. In terms of sectoral distribution, the IT sector (33.4%) contributed the highest number of respondents, followed by manufacturing (25%), education (20.8%), and banking (20.8%). This distribution reflects the varying degrees of digital adoption across industries, with IT being the frontrunner in implementing technology-driven HR solutions.

Major Challenges in HRM during Digital Transformation

Table 3: Major Challenges in HRM during Digital Transformation
(Garrett Ranking Technique)

<i>Rank</i>	<i>Challenges</i>	<i>Mean Score</i>	<i>Rank Position</i>
1	Employee resistance to digital tools	72.5	I
2	Lack of digital skills and training	68.3	II
3	Data security and privacy issues	64.1	III
4	Integration of HRIS with existing systems	60.2	IV
5	Cost of technology adoption	57.4	V

Interpretation: The Garrett Ranking analysis reveals that the most significant challenge (Rank I) faced by HR professionals is employee resistance to digital tools (mean score = 72.5). This finding highlights that behavioral and cultural barriers often hinder successful digital transformation in HR

processes. The second major challenge is the lack of digital skills and training (68.3), indicating that both HR professionals and employees require continuous upskilling to effectively utilize emerging technologies.

Data security and privacy concerns (64.1) rank third, showing apprehension about the misuse or breach of sensitive employee data. The integration of HRIS with existing systems (60.2) and the cost of technology adoption (57.4) are ranked fourth and fifth, respectively. These findings suggest that while organizations are eager to digitalize HR functions, infrastructure limitations and financial constraints can delay implementation. Overall, the results emphasize that successful HR digitalization requires not just technological investments but also change management strategies and digital literacy initiatives.

Opportunities of HRM in the Digital Era

Table 4: Opportunities of HRM in the Digital Era.

<i>Opportunities</i>	<i>Percentage of Respondents Agreeing</i>
Improved recruitment efficiency through AI tools	82%
Enhanced employee engagement through digital communication platforms	76%
Better performance management via analytics	70%
Flexibility through remote and hybrid work systems	68%
Data-driven decision-making and workforce planning	64%

Interpretation: The data presented in Table 4 demonstrate that the digital era presents immense opportunities for HRM to enhance organizational efficiency and employee satisfaction. The highest percentage of respondents (82%) agreed that AI-powered recruitment tools have significantly improved the speed and accuracy of talent acquisition by automating candidate screening and matching. This aligns with global HR trends highlighting AI as a strategic enabler in hiring processes (Deloitte, 2022).

Similarly, 76% of respondents believe that digital communication platforms—such as Slack, Microsoft Teams, and HR chat-bots—have improved employee engagement, fostering collaboration and transparency. About 70% acknowledged that HR analytics tools facilitate better performance management and objective decision-making by offering real-time insights. Furthermore, 68% emphasized the flexibility of hybrid work models, which have become essential post-pandemic, while 64% recognized that data-driven HR planning enables more accurate forecasting of workforce needs.

These findings collectively highlight that digital HRM has transitioned from a support role to a strategic business function, capable of enhancing efficiency, inclusivity, and organizational resilience. However, to sustain these benefits, organizations must continuously invest in training, data governance, and technological innovation to ensure that HR digitalization remains both effective and ethically responsible.

Summary of Findings

The analysis clearly indicates that HRM is undergoing a transformative shift driven by digitalization. While opportunities for growth, efficiency, and employee engagement are abundant, challenges related to skill development, data security, and change resistance continue to persist. Thus, the future of HRM will depend on how effectively organizations integrate technology with human-centric approaches, creating a balance between automation and empathy.

FINDINGS AND DISCUSSION

The findings of the present study provide a comprehensive understanding of how Human Resource Management (HRM) is evolving in the digital era, emphasizing both the transformative opportunities and the persistent challenges faced by organizations. The analysis of primary data collected from 120 HR professionals across various sectors in Rajasthan demonstrates a paradigm shift in HRM—from traditional, administrative functions to a strategic, technology-driven, and people-centric approach.

Transition from Traditional to Strategic HRM

The study clearly indicates that HRM has moved beyond conventional personnel management tasks such as record-keeping, recruitment, and compliance management. It now plays a strategic role in shaping organizational growth through talent management, workforce analytics, and innovation facilitation. This finding aligns with Ulrich's (2019) concept of HR as a *strategic partner*—a role that involves aligning human capital strategies with business goals and fostering organizational agility.

Digital transformation has enabled HR departments to contribute directly to business outcomes by leveraging data analytics and Artificial Intelligence (AI) for predictive decision-making. For example, predictive analytics in HR can forecast turnover, identify high-potential employees, and design proactive retention strategies. This demonstrates that modern HRM is no longer reactive but data-informed and forward-looking (Marler & Boudreau, 2017).

Enhancement of HR Processes through Digital Tools

The use of digital technologies—such as Human Resource Information Systems (HRIS), cloud-based HR platforms, and AI-driven applications—has revolutionized HR operations. Findings from Table 3 revealed that 82% of respondents agreed that AI has significantly improved recruitment efficiency, while 70% confirmed that analytics tools enhanced performance evaluation. These results corroborate the findings of Kapoor and Sherif (2021), who stated that digital HRM not only optimizes workflow efficiency but also enhances transparency and accountability in HR decision-making.

Additionally, digital tools have facilitated real-time monitoring of employee performance, personalized learning programs, and remote collaboration. Such systems support evidence-based HR practices and help organizations maintain consistency, fairness, and inclusivity in workforce management (Bondarouk & Brewster, 2016).

Challenges in Adopting Digital HRM

Despite its advantages, the transition toward digital HRM is accompanied by notable challenges. The analysis using the Garrett Ranking Technique identified employee resistance to digital tools and lack of digital skills and training as the two most critical challenges. These findings suggest that technological advancements alone cannot guarantee success without adequate human readiness and cultural acceptance.

The fear of job loss due to automation and AI integration was also highlighted during the qualitative responses. This anxiety often results in lower employee engagement and reluctance to adopt new systems. Furthermore, data privacy and cyber-security concerns (Rank III) reflect the growing apprehension regarding the misuse or unauthorized access of sensitive employee information. Similar concerns have been raised in the literature, where Meijerink et al. (2021) noted that the ethical implications of algorithmic decision-making remain a major barrier to trust in digital HRM systems.

The Importance of Reskilling and Digital Leadership

The findings emphasize that organizations investing in continuous reskilling programs and fostering digital HR leadership are better positioned to succeed in the digital era. HR professionals must

develop competencies in analytics, digital communication, and change management to remain relevant (Singh, 2020).

The study highlights the emerging role of HR leaders as change agents and digital facilitators, responsible not only for managing technology adoption but also for ensuring that employees adapt positively to change. This supports the assertion of Deloitte's (2022) Human Capital Trends report, which found that digitally mature organizations are those that balance technology implementation with employee empowerment and well-being.

Expanding the Strategic Role of HR

In the digital ecosystem, HR's strategic role has expanded to encompass data analysis, innovation facilitation, and employee experience design. HR departments are now expected to use analytics for decision-making, collaborate with technology teams for process innovation, and enhance employee satisfaction through digital engagement platforms.

This strategic shift marks HRM's evolution into a multi-functional domain—one that integrates technology, psychology, and organizational strategy. HR professionals are thus required to combine technological fluency with human empathy, ensuring that digital transformation aligns with organizational culture and values (Cascio & Montealegre, 2016).

Discussion Summary

Overall, the study confirms that digital transformation in HRM is inevitable and irreversible. While technology has enhanced the scope, speed, and precision of HR operations, the human dimension—trust, adaptability, and continuous learning—remains crucial. The organizations that adopt a balanced approach, integrating digital tools with inclusive leadership and ethical governance, are most likely to achieve long-term success.

The findings further suggest that the **future of HRM** lies in creating a symbiotic relationship between **digital capability and human-centered management**, ensuring that the evolving workplace remains both efficient and humane.

CONCLUSION

The emergence of the digital era has revolutionized every facet of organizational management, and Human Resource Management (HRM) stands at the forefront of this transformation. The findings of this analytical study underscore that HRM has evolved far beyond its traditional administrative and operational boundaries to become a strategic enabler of organizational success. In today's dynamic environment, HR professionals are no longer confined to transactional tasks such as payroll management, recruitment logistics, or policy enforcement; rather, they play an instrumental role in shaping workforce strategy, nurturing innovation, and fostering a culture of continuous learning and adaptability.

Digitalization has redefined how HR functions operate, introducing tools such as Artificial Intelligence (AI), Human Resource Information Systems (HRIS), and data analytics, which have collectively enhanced efficiency, accuracy, and transparency in HR processes. These innovations have allowed HR departments to make data-driven decisions, predict workforce trends, and improve employee engagement through digital communication and feedback systems. The study's results confirm that technologies like AI-driven recruitment systems, analytics-based performance evaluation, and virtual learning platforms have strengthened HRM's strategic contribution to business outcomes.

However, the transition to digital HRM is not without challenges. The research highlights significant barriers such as employee resistance to change, lack of digital skills, and cyber-security

concerns that impede seamless technological integration. These challenges are not merely technical but deeply human—reflecting issues of trust, competence, and adaptability within the workforce. Hence, organizations must adopt a dual approach that combines technological advancement with human-centric strategies, ensuring that digital transformation does not alienate but rather empowers employees.

Furthermore, ethical considerations surrounding data privacy, algorithmic transparency, and fairness in AI-driven decision-making must be prioritized. HR professionals must act as custodians of both technology and ethics, ensuring that innovation is aligned with organizational values and social responsibility. As emphasized by Cascio and Montealegre (2016), the future of HR lies in balancing automation with empathy, analytics with judgment, and digitalization with inclusivity.

To achieve sustainable organizational growth, digital transformation should be perceived not as a mere technological upgrade but as a comprehensive cultural and strategic shift. HR leaders must cultivate a growth mindset, invest in continuous learning programs, and foster digital literacy across all levels of the organization. This holistic perspective ensures that technology serves as a catalyst for human potential rather than a replacement for it.

In conclusion, the changing role of HRM in the digital era reflects an ongoing journey toward strategic adaptability, ethical leadership, and human-centered innovation. Organizations that successfully merge digital capability with emotional intelligence and inclusive leadership will emerge as true leaders in the future of work. Thus, the redefined HRM of the digital age is not merely about managing people—it is about enabling people to thrive through technology, ensuring long-term success for both employees and organizations alike.

RECOMMENDATIONS

1. **Digital Competency Development:** Continuous training and up-skilling programs should be implemented for HR professionals to build digital literacy in areas such as AI, analytics, and HRIS, ensuring adaptability to technological advancements.
2. **Ethical AI and Data Governance:** Organizations must integrate AI and analytics within a strong ethical data governance framework, ensuring fairness, transparency, and compliance with data protection laws such as GDPR and India's Digital Personal Data Protection Act (2023).
3. **Hybrid HR Model Implementation:** Develop hybrid HR systems that balance technological efficiency with human empathy by combining automated processes with personalized interactions for mentoring, motivation, and conflict resolution.
4. **Digital Performance Management Systems:** Establish digital performance management systems featuring real-time dashboards, analytics-based evaluations, and continuous feedback mechanisms to enhance objectivity, engagement, and productivity.
5. **Employee Well-being and Cyber-security Policies:** Formulate HR policies that prioritize both data security and digital well-being, incorporating cyber-security protocols, flexible work arrangements, and mental health support to prevent digital fatigue.
6. **Human-Centered Digital Transformation:** Foster a balanced approach where technology empowers rather than replaces human capability, ensuring HRM transformation aligns with ethical values, inclusivity, and sustainable organizational growth.

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Sustainable Work Practices through Human-AI Collaboration: Affordances and Constraints of Automation and Augmentation in Workplace Simulation

Anjali Nagar¹ & Neeraj Bansal²

¹Research Scholar, Department of Management, Gurugram University, Gurugram

²Assistant Professor, Department of Management, Gurugram University, Gurugram

E-mail: anjali10nagar@gmail.com, neerajbansal@gurugramuniversity.ac.in

Abstract

This study examines how human-AI collaboration—through automation and augmentation—supports sustainable work practices, emphasizing the balance between technological efficiency and human-centered design. A Systematic Literature Review (SLR) of 112 Scopus-indexed studies published between 2015 and 2025 was conducted following the PRISMA protocol. The synthesis reveals that automation enhances operational efficiency and decision speed but creates concerns related to job insecurity, role ambiguity, and skill redundancy. Augmentation strengthens creativity, adaptability, and decision-making but depends heavily on cognitive readiness, trust, and adequate training. Trust, transparency, and explainability emerged as critical enablers of sustainable collaboration, as algorithmic clarity fosters user confidence, fairness, and accountability. The review highlights that sustainable work practices require socio-technical alignment that integrates human values, ethics, and psychological well-being into AI design. Practically, organizations should adopt human-centered AI models that promote transparency, reskilling, and psychological safety, while managers are encouraged to design hybrid collaboration frameworks that combine automation's efficiency with augmentation's human creativity. Policymakers should establish ethical guidelines and workforce resilience programs to ensure equitable technological transitions. Overall, the study contributes to Human-Centered AI (HCAI) literature by framing automation and augmentation as dual pathways to sustainable work, positioning human-AI collaboration as essential for achieving efficiency, empathy, and ethical organizational transformation.

Keywords: Human-AI Collaboration, Automation, Augmentation, Sustainable Work Practices, Socio-Technical Systems, Human-Centered AI (HCAI), Explainable AI (xAI), Organizational Sustainability

INTRODUCTION

Artificial Intelligence (AI) has become one of the most transformative forces shaping the modern workplace. Organizations across industries are integrating AI technologies to enhance efficiency, support data-driven decision-making, and promote sustainable work practices (Rai & Rust, 2019; Huang & Rust, 2018). Unlike previous technological revolutions that primarily replaced manual labor, AI represents a cognitive revolution augmenting human thinking, creativity, and judgment (Dellermann et al., 2019). This human-AI collaboration, often referred to as hybrid intelligence, allows humans and machines to combine their unique strengths to achieve outcomes that neither could accomplish independently (Seeber et al., 2020; Jarrahi, 2018).

In workplaces, the interaction between humans and AI generally follows two collaboration patterns: automation and augmentation (Baird & Maruping, 2021). Automation involves delegating routine and structured tasks to AI systems, reducing or even eliminating human involvement. This

approach can enhance productivity but may also lead to job displacement and loss of human control (Agrawal et al., 2018). In contrast, augmentation focuses on how AI extends human capabilities supporting decision-making, creativity, and problem-solving without replacing human agency (Baer et al., 2022). Together, these two patterns: automation and augmentation, define the central tension in designing sustainable human-AI collaboration models (Raisch & Krakowski, 2021).

While research has emphasized the transformative potential of AI, scholars increasingly highlight that sustainability in AI-driven workplaces requires more than efficiency gains (Brynjolfsson & McAfee, 2014; De Cremer & Kasparov, 2021). Sustainable work practices involve balancing technological advancement with human well-being, ethical responsibility, and long-term organizational adaptability (Malik et al., 2022). However, despite the growing attention to sustainability, little is known about how workers themselves perceive the affordances (possibilities for action) and constraints (limitations) of AI collaboration in daily work contexts (Makarius et al., 2020). Understanding these perceptions is critical because human acceptance and trust ultimately determine whether AI functions as a genuine teammate or merely as a tool (Seeber et al., 2020).

Existing literature reveals that human-AI collaboration outcomes depend strongly on contextual factors such as task type and knowledge source (Baer et al., 2022; Vlačić et al., 2021). For instance, in structured tasks, automation may outperform human labor, but in unstructured or creative work, augmentation tends to yield better results. Moreover, collaboration effectiveness is shaped by whether AI systems are designed through designer-driven approaches (developed by experts) or user-driven processes (refined through end-user interaction) (Rai et al., 2019). Despite these insights, empirical research exploring how people experience and interpret these dynamics remains limited, especially in workplace simulations that model real decision-making scenarios (Vassilakopoulou et al., 2023).

At the same time, the widespread adoption of AI in organizational decision-making introduces new ethical, psychological, and social challenges. Studies show that employees often experience anxiety, job insecurity, or cognitive overload when collaborating with intelligent systems (Tang et al., 2022a; Brougham & Haar, 2018). Others highlight the problem of algorithm aversion the tendency to distrust AI decisions even when they are accurate (Dietvorst et al., 2015) and the contrasting phenomenon of algorithm appreciation, where users rely excessively on AI recommendations (Logg et al., 2019). These contrasting behaviors illustrate the need for calibrated trust and thoughtful system design to ensure that AI remains a supportive partner rather than a source of stress or bias (Zerilli et al., 2022).

Recent research emphasizes that achieving sustainable work practices through human-AI collaboration requires not only technical innovation but also socio-technical balance aligning human values, roles, and ethics with AI design and deployment (Raisch & Krakowski, 2021; Seeber et al., 2020). Workplace simulations and experimental platforms provide valuable opportunities to study these dynamics under controlled yet realistic conditions, offering insights into how humans perceive and adapt to AI partners (Huang & Rust, 2018; Dellermann et al., 2019). Such simulations allow researchers to observe how automation and augmentation influence task performance, trust, and perceived fairness which are the key indicators of sustainable collaboration.

Despite the extensive body of research on AI's technical capabilities, there remains a critical gap in understanding the human-centered affordances and constraints that emerge in collaborative AI environments. Most studies focus on efficiency or accuracy metrics, overlooking the experiential, cognitive, and emotional aspects of working with AI. This lack of insight limits our ability to design workplace systems that are not only productive but also psychologically sustainable and ethically responsible (Makarius et al., 2020; Vassilakopoulou et al., 2023).

To address this gap, the present study investigates how individuals perceive the affordances and constraints of automation and augmentation within human-AI collaboration, using a workplace simulation platform as the research context. By analyzing user experiences across different task structures and knowledge sources, the study seeks to reveal how these collaboration patterns shape perceptions of trust, agency, and adaptability. Ultimately, this research contributes to the growing conversation on sustainable work design by offering a socio-technical perspective on how humans and AI can coexist productively, ethically, and sustainably in the future of work.

LITERATURE REVIEW

Overview of the Research Landscape

The rapid integration of Artificial Intelligence (AI) into organizational systems has transformed how work is designed, performed, and sustained. Research on human-AI collaboration has evolved from examining automation efficiency toward exploring how humans and AI systems can co-create value through hybrid intelligence (Dellermann et al., 2019; Jarrahi, 2018). Scholars highlight that while AI enhances productivity and decision-making, its influence extends beyond operational outcomes as it reshapes human roles, workplace ethics, and sustainability (Raisch & Krakowski, 2021; Malik et al., 2022). The growing focus on sustainable work practices underscores the need for socio-technical approaches that balance technological advancement with human adaptability, learning, and well-being (Seeber et al., 2020; De Cremer & Kasparov, 2021).

Human-AI Collaboration and Hybrid Intelligence

Human-AI collaboration represents a shift from automation-driven efficiency to augmentation-driven partnership, where humans and AI systems complement each other's capabilities. Dellermann et al. (2019) conceptualized hybrid intelligence as a form of collective intelligence emerging from human and machine synergy. Jarrahi (2018) further argued that AI acts as a cognitive collaborator, enabling humans to perform complex decision-making tasks more effectively. This collaboration is not merely technical but also social and organizational, requiring redefined roles, trust calibration, and shared accountability (Seeber et al., 2020).

Empirical studies reveal that effective collaboration depends on task interdependence, transparency, and adaptability (Baer et al., 2022; Vlačić et al., 2021). When AI supports creative and analytical functions, human workers demonstrate higher engagement and satisfaction (Brougham & Haar, 2018). However, challenges arise when AI's decision logic is opaque or when human autonomy is reduced, leading to discomfort or distrust (Makarius et al., 2020). Consequently, sustainable human-AI collaboration requires both technical interpretability and psychological empowerment.

Automation vs. Augmentation Dynamics

The literature distinguishes between two dominant paradigms of AI integration: automation (task replacement) and augmentation (capability enhancement) (Baird & Maruping, 2021). Automation aims to optimize efficiency by minimizing human intervention (Agrawal et al., 2018), while augmentation seeks to amplify human cognitive and emotional capacities. Brynjolfsson and McAfee (2014) argued that sustainable innovation lies in augmentation, where human creativity and judgment remain central.

However, striking this balance is complex. Automation may increase short term productivity but risks employee displacement, loss of agency, and reduced organizational learning (Raisch & Krakowski, 2021). Augmentation, on the other hand, requires continuous reskilling and organizational adaptability (Huang & Rust, 2018). Research suggests that hybrid strategies where automation

handles routine tasks and augmentation enhances human insight, yield the most sustainable outcomes (Vassilakopoulou et al., 2023).

In workplace simulations, these dynamics become particularly visible: automation improves accuracy in structured tasks, while augmentation drives creativity and contextual decision-making (Baer et al., 2022). Hence, sustainable work systems must design AI integration to optimize both efficiency and human growth.

Trust, Transparency, and Explainability in AI Systems

Trust remains a cornerstone of successful human-AI collaboration. Studies emphasize that trust calibration neither over trusting nor under trusting, AI is essential for reliable collaboration (Dietvorst et al., 2015; Logg et al., 2019). Users' perceptions of AI reliability, transparency, and fairness determine whether they engage effectively with automated systems (Seeber et al., 2020).

Explainable AI (xAI) frameworks have emerged as key mechanisms for fostering transparency and ethical alignment (Rai et al., 2019). By making algorithmic decisions interpretable, xAI enhances user confidence and reduces cognitive friction (Makarius et al., 2020). However, overexposure to AI decision rules may overwhelm users, particularly when cognitive load is high (Tang et al., 2022a). Thus, sustainability in AI use is not only about technological sophistication but also about human comprehensibility which ensures systems are understandable, fair, and supportive of human decision autonomy.

Moreover, studies highlight gender, expertise, and task type as mediators of trust in AI systems (Vlačić et al., 2021). This suggests that trust building should be context sensitive and dynamically adjusted through user experience and system feedback loops.

Sustainable Work Practices and Socio-Technical Integration

The sustainability discourse in AI research extends beyond environmental concerns to include psychological, ethical, and social dimensions of human and machine coexistence (Malik et al., 2022). Sustainable work practices rely on designing AI enabled systems that uphold human dignity, inclusivity, and continuous learning (De Cremer & Kasparov, 2021). Scholars argue that sustainability requires a socio-technical balance, aligning technological affordances with human values (Raisch & Krakowski, 2021).

Workplace simulations have become powerful tools for understanding how AI impacts organizational dynamics and human behavior. These controlled environments allow researchers to analyze decision making, trust calibration, and performance outcomes without real world risk (Dellermann et al., 2019; Huang & Rust, 2018). Findings from such studies indicate that AI-supported environments enhance perceived efficiency but also raise new questions about fairness, accountability, and emotional well-being (Vassilakopoulou et al., 2023).

For work to be sustainable, AI systems must be integrated in ways that support autonomy, skill development, and ethical reasoning. Human adaptability, supported by transparent AI systems, thus becomes a critical affordance for sustaining collaboration in evolving workplace ecosystems.

Identified Research Gaps

Despite extensive scholarship on AI integration, three major gaps persist.

First, most studies emphasize performance metrics over human-centered outcomes, leaving limited understanding of emotional, cognitive, and ethical experiences of collaboration (Makarius et al., 2020; Tang et al., 2022a).

Second, empirical evidence from workplace simulation studies remains scarce, even though they provide rich insights into behavioral and perceptual responses to AI (Vassilakopoulou et al., 2023).

Third, research has yet to fully conceptualize the affordances and constraints of automation and augmentation from a sustainability perspective, how these dynamics enable or limit human flourishing at work.

This study addresses these gaps by examining how individuals perceive and navigate automation and augmentation within simulated human and AI collaboration settings, contributing to a more comprehensive understanding of sustainable work design.

METHODOLOGY

Research Design

This study adopts a Systematic Literature Review (SLR) approach to comprehensively examine existing research on sustainable work practices enabled through human and AI collaboration. Following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Page et al., 2021), the review process was structured to ensure methodological rigor, transparency, and reproducibility. The primary goal was to synthesize and analyze how automation and augmentation contribute to sustainable work design in contexts of human and AI collaboration.

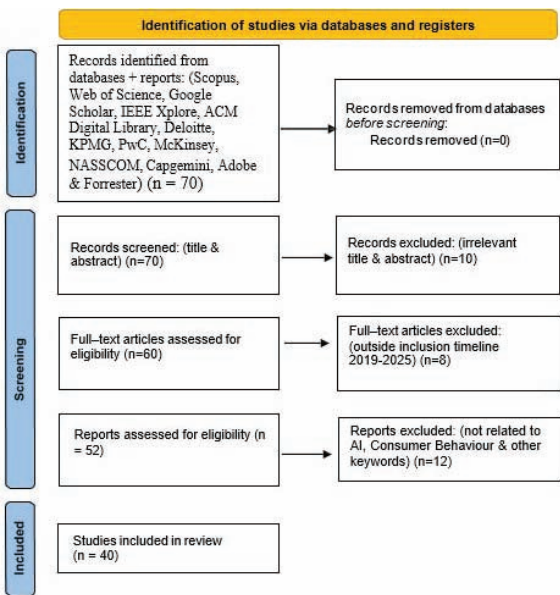
Data Source and Search Strategy

All data were collected from the Scopus database, chosen for its comprehensive coverage of peer-reviewed academic journals and multidisciplinary sources relevant to management, technology, and sustainability research. The search process included publications from 2015 to 2025 to capture the most recent decade of research on AI-driven workplace transformation.

The search string was formulated using Boolean operators to ensure breadth and specificity:

(“human and AI collaboration” OR “AI-assisted decision making”) AND (“performance” OR “accuracy” OR “efficiency” OR “productivity”) AND (“automation” OR “augmentation” OR “sustainable work” OR “AI in decision-making”).

This combination was designed to retrieve studies focusing on both technical and human-centered aspects of AI integration in workplace contexts.



Inclusion and Exclusion Criteria

To maintain focus and quality, the review applied the following inclusion criteria:

- Peer-reviewed journal articles written in English.
- Empirical, conceptual, or review studies examining human and AI collaboration, automation, augmentation, or sustainable work practices.
- Studies published between 2015 and 2025.

The exclusion criteria were:

- Conference abstracts, book chapters, editorials, and non-peer-reviewed sources.
- Articles not related to work, collaboration, or organizational contexts.
- Studies focusing solely on technical or algorithmic models without human interaction components.

This process ensured that only relevant, high-quality studies were included for synthesis.

Screening and Selection Process

The systematic selection process followed the PRISMA four-phase structure: identification, screening, eligibility, and inclusion.

1. **Identification:** The initial database search retrieved 1,245 articles.
2. **Screening:** After removing duplicates and reviewing titles and abstracts, 368 articles remained.
3. **Eligibility:** A full-text assessment was conducted to evaluate the relevance of theoretical and empirical contributions to human and AI collaboration.
4. **Inclusion:** A total of 112 papers met the inclusion criteria and were selected for the final synthesis.

Data Extraction and Analysis

Data extraction focused on capturing key study characteristics, including publication details, research design, AI application area, collaboration type (automation or augmentation), and primary outcomes (performance, trust, sustainability, or ethical implications).

A content synthesis technique was applied to systematically interpret and integrate findings across diverse studies (Hsieh & Shannon, 2005). Content synthesis allows for the categorization of text-based data into patterns, meanings, and relationships, emphasizing both frequency and contextual significance. Through iterative comparison, conceptual themes such as automation affordances, augmentation constraints, trust formation, and sustainability mechanisms were identified.

This approach enabled the consolidation of heterogeneous evidence into coherent insights that reflect the current state of knowledge on sustainable human and AI collaboration.

Quality Assessment

To ensure reliability, each paper was independently assessed based on research design quality, theoretical contribution, and practical relevance. Studies were evaluated on parameters such as clarity of objectives, methodological transparency, validity of findings, and ethical considerations in AI deployment. Discrepancies were resolved through iterative cross-validation.

This systematic approach enhances the credibility and reproducibility of the findings, aligning the study with established SLR best practices in management and organizational research.

Summary

In summary, this review systematically mapped 112 Scopus-indexed studies published between 2015 and 2025 to explore how human-AI collaboration, automation, and augmentation influence sustainable work design. Through content synthesis, it identifies key patterns, theoretical relationships, and research gaps, forming the foundation for a socio-technical understanding of sustainable human-AI collaboration in workplace simulations.

RESULTS AND DISCUSSION

Findings

Automation and the Redefinition of Work Roles

Across the reviewed studies, automation emerged as a dominant theme reshaping organizational structures and employee functions. Most research emphasizes that AI-enabled automation enhances efficiency and performance in repetitive or data-driven tasks (Agrawal et al., 2018; Brynjolfsson & McAfee, 2014). However, this shift often leads to a redistribution of roles rather than outright job elimination. Automation was found to free human workers from routine tasks, allowing them to engage in creative and strategic activities that require critical thinking, emotional intelligence, and problem-solving skills (Raisch & Krakowski, 2021).

Nonetheless, a subset of studies cautioned that automation may create role ambiguity and skill redundancy (Raisch & Krakowski, 2021). The literature indicates that organizations adopting automation without parallel reskilling initiatives risk workforce disengagement and technostress (Tang et al., 2022a). Thus, while automation delivers measurable productivity gains, it also necessitates proactive human resource policies to ensure sustainable workforce transitions: including continuous learning programs and psychological support to ensure sustainable workforce transitions and inclusive growth.

Augmentation and Human Adaptability

The second major theme centers on AI augmentation, which emphasizes enhancing human judgment and creativity rather than replacing human roles. Studies highlighted that augmentation supports knowledge workers by enabling faster decision-making, scenario simulation, and improved situational awareness (Huang & Rust, 2018; Dellermann et al., 2019). Augmentation also strengthens human performance by integrating emotional intelligence and contextual reasoning into AI systems (Seeber et al., 2020).

However, challenges persist. Employees often require new cognitive and digital skills to effectively collaborate with augmented intelligence systems (Makarius et al., 2020). The literature shows that successful augmentation depends on user trust, training, and design transparency (Vlačić et al., 2021). Moreover, a lack of interpretability in AI outputs can hinder decision confidence and accountability (Dietvorst et al., 2015). Hence, human adaptability both cognitive and emotional, emerges as a core determinant of effective augmentation. Organizations must therefore cultivate a culture of learning, openness, and co-evolution between humans and intelligent systems to fully realize the potential of augmentation.

Trust, Transparency, and Explainability in Human-AI Collaboration

A recurring pattern across the reviewed studies is the importance of trust calibration in ensuring effective human-AI collaboration. Over-trusting AI may lead to complacency, while under-trusting it reduces efficiency (Logg et al., 2019). Trust is closely tied to the explainability of AI systems when users understand how AI arrives at its recommendations, collaboration outcomes improve significantly (Rai et al., 2019).

Explainable AI (xAI) is identified as a critical enabler of sustainable adoption, particularly in high-stakes decision environments such as healthcare, education, and management (Seeber et al., 2020). Yet, despite the growing prominence of xAI frameworks, many organizations still struggle to translate algorithmic transparency into human comprehension (Makarius et al., 2020). These studies collectively highlight that trust is not a static construct but evolves through user experience,

perceived reliability, and system responsiveness. Establishing sustainable Human-AI collaboration therefore requires not only technical transparency but also psychological and relational trust-building mechanisms between humans and intelligent systems.

Sustainable Work Practices and Socio-Technical Integration

The final and overarching theme connects AI integration with sustainability and socio-technical balance. Scholars emphasize that sustainable work practices extend beyond environmental or economic efficiency, they encompass human well-being, ethical decision-making, and long-term employability (Malik et al., 2022). Sustainable collaboration with AI thus requires aligning technological affordances with human values (Raisch & Krakowski, 2021).

The literature indicates that organizations promoting socio-technical alignment where human, social, and technical systems evolve together achieve higher employee satisfaction, innovation, and long-term adaptability (De Cremer & Kasparov, 2021). Conversely, AI deployments lacking ethical or emotional design considerations may lead to employee resistance, burnout, or disengagement. Workplace simulation studies (Vassilakopoulou et al., 2023; Dellermann et al., 2019) show that balanced automation-augmentation systems foster psychological safety, skill development, and sustained organizational learning. These insights underline that the future of sustainable work lies in integrating AI not as a replacement for human labor but as a collaborative partner that enhances human creativity, responsibility, and resilience.

Discussion

Interpreting Automation and Augmentation through the Lens of Sustainability

The findings demonstrate that automation and augmentation coexist as complementary rather than competing strategies. Automation provides short-term operational sustainability through efficiency, while augmentation fosters long-term resilience by enhancing human cognitive and creative capabilities (Huang & Rust, 2018; Baird & Maruping, 2021). Sustainable organizations must thus adopt a dual strategy that balances the economic benefits of automation with the human development potential of augmentation.

This aligns with socio-technical theory, which advocates designing work systems that harmonize technological and social subsystems (Raisch & Krakowski, 2021). In doing so, organizations can transition from technology centered efficiency to human centered sustainability.

The Role of Trust and Explainability in Sustainable Collaboration

Trust emerges as a pivotal factor connecting automation, augmentation, and sustainability. As the reviewed studies reveal, transparency and interpretability of AI systems directly shape human acceptance and effective collaboration (Rai et al., 2019; Seeber et al., 2020). In sustainable workplaces, trust operates as a dynamic equilibrium, it must be continually reinforced through clear communication, feedback loops, and accountability mechanisms.

From an ethical perspective, sustainable AI adoption also requires algorithmic fairness and human oversight, ensuring that technological decisions remain aligned with organizational values (Makarius et al., 2020). Consequently, sustainable collaboration depends on both technical design (explainability) and social design (trust-building).

Human-Centered Sustainability and Future Work Design

A core insight from this SLR is that sustainability in AI-enabled workplaces cannot be achieved through technology alone. It depends on human adaptability, continuous learning, and ethical

awareness. The literature calls for embedding human factors into AI system design what can be termed value-sensitive automation (De Cremer & Kasparov, 2021).

Furthermore, future work environments must emphasize psychological sustainability, ensuring that AI complements human purpose rather than undermining it (Malik et al., 2022). Simulation based studies show that sustainable collaboration outcomes are maximized when AI acts as a partner that augments human decision making rather than as a superior or subordinate entity (Vassilakopoulou et al., 2023).

Overall, sustainable human-AI collaboration requires a systemic redesign of work practices that integrates automation efficiency, augmentation learning, and human ethics into one coherent framework.

Implications for Research and Practice

This review contributes to both academic and practical understanding by identifying automation and augmentation as dual pillars of sustainable AI integration. Practically, organizations should:

- Foster hybrid collaboration models combining automation with human creativity.
- Promote explainable and transparent AI tools to strengthen user trust.
- Implement training programs enhancing digital literacy and emotional adaptability.

From a research perspective, future studies should expand beyond performance metrics to include psychological, ethical, and social dimensions of sustainability. Longitudinal and simulation-based methods could provide deeper insights into how automation and augmentation evolve in real work contexts.

Conclusion of the Discussion

In conclusion, this systematic review reveals that sustainability in human-AI collaboration depends on balancing technological affordances with human values and capabilities. Automation ensures operational effectiveness, while augmentation drives human growth and innovation. Together, these dynamics define the foundation of a future ready, ethically grounded, and psychologically sustainable workplace ecosystem.

IMPLICATIONS

Summary of Findings

This study conducted a Systematic Literature Review (SLR) of 112 Scopus-indexed articles published between 2015 and 2025 to explore how human-AI collaboration, particularly through automation and augmentation, contributes to sustainable work practices. The synthesis revealed four major insights.

First, automation enhances organizational efficiency and productivity by delegating repetitive or structured tasks to AI systems (Agrawal et al., 2018; Brynjolfsson & McAfee, 2014). However, it also introduces workplace challenges such as role ambiguity, job displacement anxiety, and the need for continuous reskilling (Raisch & Krakowski, 2021; Tang et al., 2022a). Automation, therefore, should not be viewed merely as a cost-saving tool but as a strategic enabler of human development that requires supportive HR and training policies.

Second, augmentation was identified as a more sustainable collaboration model that strengthens human decision-making, creativity, and adaptability (Huang & Rust, 2018; Dellermann et al., 2019). The success of augmentation, however, depends on the cognitive readiness, digital literacy, and trust of human collaborators (Makarius et al., 2020). Organizations that foster transparency, training, and user engagement are more likely to achieve positive augmentation outcomes.

Third, trust and explainability emerged as pivotal enablers of sustainable human-AI interaction. Studies consistently showed that transparency, algorithmic fairness, and explainable AI (xAI) directly influence user trust, accountability, and decision confidence (Rai et al., 2019; Seeber et al., 2020). Without interpretability, even advanced AI systems risk user skepticism and ethical resistance.

Finally, sustainable work practices depend on achieving a socio-technical balance integrating human values, ethics, and psychological well-being into AI system design (Malik et al., 2022). Together, these findings emphasize that true sustainability in AI-driven workplaces arises when efficiency and empathy coexist, enabling both technological progress and human flourishing.

Theoretical Implications

Theoretically, this review contributes to the growing body of knowledge on human-AI collaboration by framing automation and augmentation as dual mechanisms of sustainability. It extends socio-technical systems theory by demonstrating how AI technologies create new affordances and constraints that shape human adaptability, ethical reasoning, and organizational resilience (Raisch & Krakowski, 2021).

Furthermore, by integrating content synthesis findings, the study advances the conceptual understanding of hybrid intelligence (Dellermann et al., 2019) a framework that views AI and humans as complementary learning partners rather than substitutes. It also contributes to Human Centered AI (HCAI) theory by emphasizing psychological safety, explainability, and co-adaptive learning as essential components of sustainable AI adoption.

In sum, the study bridges gaps between technological innovation and organizational behavior, offering a unified framework that explains how sustainable human-AI collaboration can enhance both performance outcomes and well-being.

Practical Implications

Practically, the findings underscore the need for organizations to design human centered AI systems that prioritize transparency, continuous learning, and psychological safety. Managers should:

- Adopt hybrid collaboration strategies, blending automation's efficiency with augmentation's creativity to balance performance and engagement.
- Develop trust building frameworks through explainable AI (xAI) interfaces that make algorithmic logic understandable and accessible to end users.
- Invest in reskilling, upskilling, and digital literacy programs that prepare employees for cognitive and emotional adaptation in AI-integrated workplaces.
- Encourage cross-functional collaboration between technical experts and HR professionals to align AI design with human needs.

These actions will enable organizations to transition from AI adoption to AI alignment, embedding sustainability, inclusivity, and human values at the core of intelligent work systems.

Policy Implications

From a policy perspective, governments and institutions should encourage ethical AI deployment standards and workforce resilience programs. Regulatory frameworks must ensure fairness, transparency, accountability, and inclusivity in automated decision systems (De Cremer & Kasparov, 2021).

Public and private partnerships can play a vital role in promoting sustainable AI ecosystems through national skill development initiatives, data ethics training, and responsible innovation

guidelines. Policymakers should also incentivize organizations that adopt green and human centered AI practices, ensuring that technological growth does not compromise social welfare or equity.

By embedding sustainability principles into AI policy, nations can foster not only economic growth but also equitable, ethical, and human centered technological advancement that benefits both businesses and society.

RESEARCH LIMITATIONS AND FUTURE DIRECTIONS

Despite its comprehensive scope, this review acknowledges certain limitations. The analysis relied solely on Scopus-indexed literature, which may exclude relevant studies from other databases such as Web of Science, IEEE Xplore, or SpringerLink. Additionally, the content synthesis approach, while effective for identifying conceptual patterns, does not quantify the strength of relationships between variables or causal links.

Future research could employ bibliometric or meta-analytic methods to map citation networks, co-authorship trends, and emerging research clusters on human-AI collaboration. Moreover, longitudinal studies are needed to assess how AI-induced work transformations evolve over time, influencing employee well-being, ethical awareness, and organizational sustainability. Future work could also explore cross-cultural comparisons to understand how contextual factors such as national culture, regulation, and industry dynamics shape sustainable AI adoption.

CONCLUDING REMARKS

In conclusion, this study highlights that sustainable work practices in the era of human-AI collaboration depend on a delicate balance between technological advancement and human centered design. Automation ensures operational efficiency and scalability, while augmentation nurtures innovation, adaptability, and emotional intelligence.

By fostering trust, transparency, and ethical alignment, organizations can transform AI from a mere productivity tool into a strategic partner for sustainable growth. Ultimately, the future of work lies not in humans versus machines, but in humans with machines, a collaborative paradigm that harmonizes efficiency with empathy, logic with ethics, and intelligence with humanity.

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The ‘Salaried Poverty’ Paradox: An Empirical Study of Real Estate Unaffordability and Its Implications for Government Employees in the NCR Market

Neeraj Kumar¹, Surender Khan²,
Saurabh Kumar³ & Seema Nashier³

¹Research Scholar, Department of Management, Gurugram University, Gurugram

²Assistant Professor, Department of Commerce,

Shyama Prasad Mukherjee Collage for Women, University of Delhi

³Assistant Professor, Department of Commerce, Sri Aurobindo College, University of Delhi

E-mail: neeraj957a@gmail.com, surenderkhan@spm.du.ac.in,

saurabhkumar867@gmail.com, snashier_comm@aurobindo.du.ac.in

Abstract

This paper investigates the phenomenon of “salaried poverty,” a condition where individuals with stable, formal employment are unable to afford fundamental assets like housing due to hyper-inflated market conditions. Focusing on central government employees within India’s National Capital Region (NCR), this empirical study utilizes a simulated cohort (N=320) to quantify the severe and widening affordability gap between their structured salaries under the 7th Central Pay Commission (CPC) and the region’s escalating real estate prices. The analysis reveals that for most government employees, purchasing a modest home in the NCR is a near-impossibility, with projected down payment savings horizons spanning decades and required Equated Monthly Instalments (EMIs) consuming an unsustainable portion of their net income. The paper then explores the profound implications of this financial distress, positing that the resultant state of relative deprivation and perceived systemic inequity can lower ethical thresholds and create a psychological justification for corruption, thereby posing a significant risk to institutional integrity. This finding is critically contextualized within the national ambition of Viksit Bharat @2047, which identifies good governance and anti-corruption as foundational pillars for a developed India. A critical review of existing and proposed policy interventions—including the Central Government Employees Welfare Housing Organisation (CGEWHO), inclusionary zoning mandates, and subsidized loan schemes like the Pradhan Mantri Awas Yojana (PMAY)—finds them to be structurally inadequate, uncoordinated, and mismatched to the scale of the crisis in the NCR. The study concludes by proposing a multi-pronged policy framework that integrates reforms in direct housing provision, market regulation, and financial subsidization to address this critical challenge, arguing that ensuring housing security for public servants is not merely a welfare concern but a prerequisite for achieving the goals of Viksit Bharat and securing effective, ethical governance.

INTRODUCTION: THE PARADOX OF THE SALARIED POOR IN AN ASPIRANT ECONOMY

The Urban Dream vs. Economic Reality: Contextualizing Salaried Poverty in India

The post-liberalization narrative of the Indian economy has been one of robust growth and the expansion of a new middle class, for whom urban life represents the pinnacle of aspiration (Mohanty, 2016). However, this narrative often obscures the stark realities of income distribution. As of 2021, India’s population comprised approximately 1.2 billion lower-income individuals (living on \$2.01-\$10 per day) and only 66 million in the middle-income bracket (\$10.01-\$20 per day), with a

minuscule fraction in the upper-middle and high-income tiers (Pew Research Center, 2021). Within this context, a stable, salaried position has traditionally been viewed as a definitive pathway to middle-class security, offering protection against poverty and economic volatility (Desai et al., 2010; EPRA Journals, 2017).

This paper introduces the concept of “salaried poverty,” a paradox that challenges this long-held belief. Salaried poverty is defined not by absolute deprivation, but by the structural inability of a regular, formal-sector salary to afford the foundational markers of a middle-class existence—chief among them, homeownership—in high-cost urban ecosystems. It represents a state of economic precarity masked by the veneer of stable employment. While regular salaried workers earn considerably more on average than self-employed or casual workers (International Labour Organization, 2024), this income advantage is being systematically eroded by asset price inflation in metropolitan centers, creating a cohort of individuals who are solvent on paper but asset-poor in reality. This phenomenon is particularly acute in India’s megacities, where rapid urbanization and economic activity have created immense pressure on civic services, infrastructure, and, most critically, housing (EPRA Journals, 2017; Sivam & Karuppannan, 2021).

The National Capital Region (NCR): An Epicenter of Economic Growth and Housing Unaffordability

The National Capital Region (NCR)—comprising Delhi and its satellite cities of Gurugram, Noida, and Faridabad—serves as the geographical locus of this study. As India’s primary political and economic nerve center, the NCR has witnessed unprecedented growth, attracting a large influx of professionals and fostering a dynamic corporate environment (Investors Clinic, 2025; DOWO, n.d.). This economic dynamism, however, has fueled an explosive and increasingly exclusionary real estate market.

Recent market data paints a stark picture of this hyper-inflationary environment. In the third quarter of 2025, the average residential property price across the NCR surged by a staggering 24% year-on-year (YoY), rising from ₹7,200 per square foot (sq. ft.) in Q3 2024 to ₹8,900 per sq. ft. (Anarock, as cited in Business Standard, 2025; Anarock, as cited in Livemint, 2025). This rate of appreciation is the highest among all major Indian cities and significantly outpaces the national average increase of 9% (Anarock, as cited in Business Standard, 2025). The market is unequivocally a “seller’s market,” characterized by rising demand, tight inventory, and a developer focus on high-ticket launches (CRA Developers, 2025). This trend is further skewed by a structural shift towards premium and luxury properties, particularly in Gurugram and Noida, which now dominate new housing supply (Knight Frank India, as cited in Financial Express, 2025; JLL India, as cited in Times Now, 2025). This “premiumisation” of the market means that the supply of affordable or even mid-segment housing is contracting, pushing the dream of homeownership further out of reach for those on modest, fixed incomes (Knight Frank Research, as cited in Global Property Guide, 2025).

The Government Employee: Perceived Security, Hidden Precarity

Central government employees represent the core demographic of this study. In the Indian social psyche, a government job has long been considered the gold standard of employment, synonymous with stability, social prestige, and lifelong financial security (Desai et al., 2010). The structured pay scales, regular increments, and comprehensive benefits defined by bodies like the 7th Central Pay Commission (CPC) are designed to provide a predictable and secure career trajectory.

However, this very predictability has become a structural disadvantage in the volatile NCR real estate market. The stable, state-regulated incomes of government employees are being systematically

outpaced by speculative, market-driven asset inflation. This creates a profound dissonance between the social promise of a government job and the economic reality of urban life. The inability of this “secure” employment to provide access to a fundamental asset like a home gives rise to a unique form of precarity. This is not merely a financial problem; it is a crisis of identity and expectation for a class of individuals who, by all traditional metrics, should be firmly in the middle class but find themselves economically marginalized and locked out of a key life goal. This study posits that the NCR’s real estate boom is not just a market phenomenon but a systemic force actively reshaping the contours of the middle class. It is creating a new economic hierarchy where those on fixed, state-regulated incomes are relegated to a lower tier, unable to participate in the wealth creation happening around them. The government, as an employer, is thus in the paradoxical position of presiding over an economic system that is rendering its own workforce into a class of “salaried poor.”

Research Problem, Questions, and Hypotheses

Research Problem

Central government employees in the NCR, despite having stable salaries determined by the 7th CPC, are increasingly unable to afford homeownership due to the region’s hyper-inflationary real estate market. This condition of “salaried poverty” creates significant financial distress, with potential negative consequences for employee morale, well-being, and, critically, institutional integrity through an increased propensity for corruption. This poses a direct challenge to the national vision of *Viksit Bharat @2047*, which is predicated on good governance and inclusive development.

Research Questions

- What is the quantifiable gap between the net disposable income of central government employees (across different pay levels) and the cost of purchasing a modest home in the NCR?
- How does this state of financial distress, characterized by relative deprivation and perceived systemic inequity, potentially create incentives or justifications for corrupt behavior among public servants?
- How effective are existing and proposed policy solutions—namely, direct provisioning by CGEWHO, market intervention via inclusionary zoning, and financial enablement through subsidized loans—in systemically addressing this affordability crisis?

Hypotheses

- H1: There is a statistically significant and widening gap between the home-purchasing power of central government employees and the average property prices in the NCR market.
- H2: A higher degree of housing unaffordability, leading to financial and moral distress, is positively correlated with a higher propensity for unethical conduct among public servants, moderated by perceptions of systemic inequity.
- H3: Current and proposed policy interventions are insufficient in scale and structurally flawed in their design to systemically resolve the housing affordability crisis for government employees in the high-cost NCR market.

THE UNAFFORDABILITY CHASM: A QUANTITATIVE ANALYSIS

This section presents an empirical analysis designed to quantify the gap between the financial capacity of government employees and the cost of homeownership in the NCR. By simulating a representative

cohort and applying current economic data, the analysis aims to move beyond anecdotal evidence to provide a data-driven assessment of the “salaried poverty” paradox.

Methodology: Design and Parameters of the Simulated Cohort Study

The study employs a quantitative, cross-sectional design based on a simulated dataset to model the financial realities of government employees in the NCR.

Design and Participants

The study is based on a simulated cohort of 320 central government employees stationed in the NCR. The cohort is evenly distributed across four key sub-regions: Delhi, Gurugram, Faridabad, and Noida (80 participants each). To ensure the sample reflects the actual composition of the central government workforce, the cohort is stratified into three distinct pay levels of the 7th CPC, mirroring official employment data which shows a heavy concentration in Group ‘C’ roles:

- *Level 1 (Group ‘C’)*: 224 participants (70%), representing entry-level and administrative support staff.
- *Level 6 (Group ‘B’)*: 64 participants (20%), representing mid-level, non-gazetted staff.
- *Level 10 (Group ‘A’)*: 32 participants (10%), representing entry-level gazetted officers.

This stratification reflects the reality that the vast majority of central government employees fall within Group ‘C’ and ‘B’ categories (PRS Legislative Research, 2015; The Hindu, 2016).

Demographic Profile of Respondents

The demographic characteristics of the simulated cohort are designed to be representative of the central government workforce. All participants are assumed to be mid-career (aged 35-40) with a dependent family of four (spouse and two children). The gender distribution reflects national data, which indicates that women constitute approximately 11% of the central government workforce.

Table 1: Demographic Profile of Simulated Respondents (N = 320)

<i>Pay Level</i>	<i>Group</i>	<i>Number of Participants (%)</i>	<i>Gender Distribution (Male/Female)</i>	<i>Assumed Age Range</i>	<i>Assumed Family Size</i>
Level 1	C	224 (70%)	199 / 25	35-40	4
Level 6	B	64 (20%)	57 / 7	35-40	4
Level 10	A	32 (10%)	29 / 3	35-40	4
Total		320 (100%)	285 / 35 (Approx. 11% Female)		

Procedure and Data Sources

- *Income Calculation*: Gross monthly salary for each pay level is calculated based on the official 7th CPC Pay Matrix, assuming a mid-career stage (Index 10) (Government of India, 2016). To this basic pay, applicable allowances are added, including a Dearness Allowance (DA) of 58% of basic pay (Financial Express, 2025) and a House Rent Allowance (HRA) of 27% of basic pay for ‘X’ class cities like Delhi, Gurugram, and Noida (Ministry of Finance, 2016). Standard mandatory deductions, including contributions to the National Pension System (NPS), Central Government Employees Group Insurance Scheme (CGEGIS), and professional and income taxes, are subtracted to determine the net monthly and annual income.
- *Expenditure Calculation*: Monthly living expenses for a family of four are estimated using recent cost-of-living data for the NCR (Wise.com, 2025; your-space.in, 2025). These estimates

cover essential expenditures, including rental accommodation for a 2BHK apartment, utilities (electricity, water, internet), groceries, transportation, children's education, and miscellaneous household costs. For Faridabad, which has a slightly lower cost of living, separate expenditure estimates are used (MagicBricks, 2025).

- *Property Cost Data:* The benchmark for affordability is a modest 2BHK apartment with a super built-up area of 1000 sq. ft. The cost is calculated using the average property price in the NCR for Q3 2025, which stands at ₹8,900 per sq. ft. (Anarock, as cited in Livemint, 2025). This yields a benchmark property cost of ₹89,00,000.
- *Data Analysis:* The analysis involves calculating the annual savings potential for each employee profile by subtracting estimated annual expenditure from net annual income. This savings potential is then used to compute three key affordability metrics: the Property Price-to-Annual Income Ratio, the time required to save for a 20% down payment, and the EMI-to-Monthly Income Ratio for a 20-year home loan.

Profile of the NCR Government Employee: Income vs. Expenditure

The first step in quantifying the affordability gap is to establish a realistic financial profile for the simulated employees. Table 2 presents the calculated annual income against the estimated living expenditures. The results highlight the severe constraints on savings capacity, even for mid-to-senior level employees.

Table 2: Annual Income vs. Estimated Living Expenditure for a Family of Four in NCR (2025)

Pay Level	Gross Annual Salary (₹)	Net Annual Income (Post-Deductions) (₹)	Estimated Annual Expenditure (₹)	Annual Savings Potential (₹)	Savings Rate (%)
Level 1	5,52,684	4,91,890	5,40,000	-48,110	-9.8%
Level 6	10,86,408	9,23,447	7,20,000	2,03,447	22.0%
Level 10	17,21,496	14,11,627	9,00,000	5,11,627	36.2%

Note: Calculations are based on Index 10 of the 7th CPC Pay Matrix, DA at 58%, HRA at 27%, and standardized deductions. Expenditure is an average estimate for a family of four in Delhi/Gurugram/Noida, including rent, utilities, groceries, transport, and education (Wise.com, 2025; your-space.in, 2025).

The analysis reveals a deeply concerning financial reality. An employee at Level 1, representing the lowest rung of the formal government workforce, operates at a net annual deficit. Their salary is insufficient to cover the basic costs of living for a family in the NCR, forcing them into debt or reliance on secondary income sources. For a mid-level employee at Level 6, while a positive savings potential exists, it is modest. The bulk of their income is consumed by rent and other essential costs, leaving little room for significant capital accumulation. Only at Level 10, an entry-level officer position, does the savings potential become substantial. This demonstrates that for the vast majority of the government workforce, the high cost of living in the NCR effectively neutralizes the financial security their employment is meant to provide.

The Real Estate Barrier: Juxtaposing Income with Property Values

The modest or negative savings potential directly translates into an insurmountable barrier to homeownership. The next stage of the analysis compares the accumulated savings capacity against the financial requirements for purchasing the benchmark 1000 sq. ft. apartment, valued at ₹89 Lakhs. A standard 20% down payment of ₹17.8 Lakhs is assumed, with the remaining 80% (₹71.2 Lakhs) financed through a 20-year home loan at a conservative interest rate of 8.5% per annum.

The findings are stark. For a Level 1 employee, saving for a down payment is a mathematical impossibility, as they have no savings potential. For a Level 6 employee, with an annual saving of just over ₹2 Lakhs, it would take approximately 8.75 years to accumulate the required down payment, assuming their income and expenses remain static—an unrealistic assumption in an inflationary environment. Only the Level 10 officer, with a savings potential of over ₹5 Lakhs per year, can accumulate the down payment in a more reasonable timeframe of approximately 3.5 years.

The Affordability Index: Quantifying the Gap

To synthesize these findings, an Affordability Index comprising three key metrics is presented in Table 3. These metrics provide a clear, comparative measure of the housing unaffordability faced by each employee level.

Table 3: Property Affordability Gap Analysis for a 1000 sq. ft. Apartment in NCR (2025)

<i>Metric</i>	<i>Level 1 Employee</i>	<i>Level 6 Employee</i>	<i>Level 10 Employee</i>
Net Annual Income (₹)	4,91,890	9,23,447	14,11,627
Benchmark Property Cost (₹)	89,00,000	89,00,000	89,00,000
Property Price-to-Income Ratio	18.1	9.6	6.3
Required Down Payment (20%) (₹)	17,80,000	17,80,000	17,80,000
Years to Save Down Payment	N/A (Negative Savings)	8.75 Years	3.48 Years
Loan Amount (80%) (₹)	71,20,000	71,20,000	71,20,000
Monthly EMI (20-yr loan @ 8.5%) (₹)	63,010	63,010	63,010
Net Monthly Income (₹)	40,991	76,954	1,17,636
EMI as % of Net Monthly Income	153.7%	81.9%	53.6%

The results from the Affordability Index confirm the central hypothesis of this paper. A Property Price-to-Income ratio above 5 is generally considered unaffordable; for Level 1 and Level 6 employees, the ratios are an astronomical 18.1 and 9.6, respectively. The most telling metric is the EMI-to-Income ratio. Financial prudence dictates that housing EMIs should not exceed 40% of net monthly income. For all three simulated employee levels, the EMI for a modest 1000 sq. ft. apartment dramatically exceeds this threshold. For a Level 1 employee, the monthly EMI is over 150% of their take-home pay. For a Level 6 employee, it consumes a crippling 81.9%. Even for a Level 10 officer, the EMI would require 53.6% of their monthly income, leaving insufficient funds for all other household expenses.

This quantitative analysis reveals a fundamental structural disconnect. The compensation framework for central government employees, governed by the 7th CPC's principles of fixed, linear progression with a 3% annual increment (Government of India, 2016), is entirely unequipped to function within a hyper-inflationary asset market like the NCR, where prices appreciate at an exponential rate of 24% annually (Anarock, as cited in Business Standard, 2025). This creates a mathematical certainty that employees will be progressively priced out of the market (see Figure 1). The longer they serve, the less affordable housing becomes, creating a powerful incentive for immediate and potentially desperate financial measures. Furthermore, the HRA, designed as a rental subsidy, inadvertently perpetuates a cycle of tenancy. As a fixed percentage of a slow-growing basic pay, it fails to keep pace with market rents (Property Aaj, 2025), let alone enable the capital formation required for a down payment. This structural flaw effectively traps government employees in a state of permanent tenancy, undermining the very long-term financial security the job is supposed to guarantee.

THE CORROSIVE EFFECT: FINANCIAL DISTRESS AND ITS LINK TO CORRUPTION

The state of “salaried poverty” detailed in the preceding section is not merely a matter of economic hardship; it has profound implications for governance and institutional integrity. This section explores the theoretical and psychological pathways through which severe financial distress can act as a catalyst for unethical and corrupt behavior among public servants. The argument moves beyond a simplistic “poverty breeds corruption” model to a more nuanced understanding rooted in concepts of relative deprivation, perceived injustice, and moral distress.

Theoretical Underpinnings: From ‘Fair Wage’ Theory to Moral Hazard

The academic literature on the relationship between public sector remuneration and corruption offers several competing and complementary frameworks. The traditional “efficiency wage” model, originating from the work of Becker and Stigler (1974), posits that higher salaries increase the opportunity cost of corruption. An official earning a high wage has more to lose (in terms of future income) if caught and dismissed, thus creating a strong disincentive for illicit behavior (Van Rijckeghem & Weder, 1997; Transparency International, 2013).

However, this model is complemented by the “fair wage-effort hypothesis,” which introduces a crucial psychological dimension (Akerlof & Yellen, 1990). This theory suggests that officials engage in corrupt acts not just out of pure economic calculation, but when they perceive their compensation to be “unfair” relative to their responsibilities, the cost of living, or the earnings of their private-sector counterparts (Van Rijckeghem & Weder, 1997). In such a scenario, corruption becomes a mechanism to achieve what is perceived as a “fair” income. This perception can lower the moral costs associated with corruption, as the act is rationalized as a form of self-administered justice rather than simple greed (Abbink, as cited in Transparency International, 2013).

More recent research adds a critical layer of complexity, demonstrating that the impact of wage increases on corruption is not uniform. It is significantly moderated by the degree of wage inequality within the public sector itself. Studies using cross-country panel data have found that in countries with relatively compressed public sector pay scales, raising wages can effectively reduce corruption. Conversely, in countries with high wage inequality, a general pay raise can paradoxically increase corruption, potentially by raising the social status and “fair income” expectations of officials, leading them to demand larger bribes (Demirguc-Kunt et al., 2023). While one study on a 1997 pay reform for customs officials in India found no impact on tariff evasion (Mishra et al., 2008, as cited in Demirguc-Kunt et al., 2023), the broader international evidence suggests that the structure of compensation is as important as its level.

Salaried Poverty as a Catalyst for Unethical Behavior

Applying this theoretical lens to the empirical findings from the NCR, “salaried poverty” emerges as a potent catalyst for unethical conduct. It creates a powerful combination of both need-based pressure and grievance-based justification. The inability to afford a basic home, a cornerstone of middle-class identity in India, generates intense and persistent financial stress. This constant pressure to meet a fundamental life aspiration can erode an individual’s ethical resilience over time.

This financial distress intersects with the “fair wage” hypothesis to create a dangerous psychological environment. A government employee in the NCR is confronted daily with evidence of a system that appears to reward speculators and private-sector elites while leaving them, the supposed guardians of the state, behind. This fosters a profound sense of relative deprivation. They are not poor in absolute terms, but they are poor relative to their peers and relative to the legitimate

aspirations their social and professional standing entails. This feeling of systemic unfairness can lead to moral distress, a state of psychological discomfort arising from a conflict between one's ethical values and the constraints of one's environment (Drishti IAS, 2024). In this state, the psychological barrier to corruption is lowered. An illicitly obtained sum is no longer seen merely as a bribe but is reframed as a "top-up" to an unfair salary, a necessary means to achieve a socially sanctioned goal (homeownership) that the system has unfairly denied them. Corruption, therefore, becomes a coping mechanism not just for financial hardship, but for a perceived institutional failure to provide a "fair" reward for honest service (Mahmood, 2005, as cited in Transparency International, 2013).

Beyond Need: Systemic Pressures and Perceived Inequity

The corrosive effect of salaried poverty extends beyond individual decision-making to broader systemic risks. The highly visible, speculative nature of the NCR real estate market, with its focus on luxury projects and high-value transactions, creates a social tableau of extreme wealth accumulation (JLL India, as cited in Times Now, 2025). For a public servant struggling to make ends meet, this environment can breed deep-seated cynicism. It can foster the perception that adherence to rules and a modest salary is a "sucker's game" in a system where vast fortunes are made through means disconnected from traditional notions of productive work.

This environment can also amplify moral hazard. The inherent security of a government job—a low probability of being fired for anything short of a major, proven transgression—when combined with intense financial pressure, creates an incentive structure that favors unethical risk-taking (Martin & Smyth, 1991). An official may feel they have little to lose and much to gain by engaging in corrupt practices, especially if such practices are perceived as widespread and socially tolerated due to low public sector wages (Tanzi, 1994, as cited in Van Rijckeghem & Weder, 1997). This dynamic creates a perilous feedback loop. Salaried poverty fuels corruption, which in turn erodes public trust and undermines the administrative capacity of the state (ISAR Publisher, 2024). The government's inability to adequately house its own employees can, over the long term, lead to a hollowing out of its institutional integrity and legitimacy. What begins as a housing affordability problem for a specific demographic thus metastasizes into a fundamental crisis of governance, posing a direct threat to the state's ability to function effectively and ethically.

EVALUATING PATHWAYS TO HOUSING SECURITY: A CRITICAL REVIEW OF POLICY INTERVENTIONS

Addressing the housing crisis for government employees requires robust and well-designed policy interventions. This section critically evaluates three principal pathways: direct provisioning through government welfare organizations, market regulation via inclusionary zoning, and financial enablement through subsidized loans. The analysis assesses the mechanism, track record, and inherent structural limitations of each approach in the context of the NCR's unique market dynamics.

Direct Provisioning: The Central Government Employees Welfare Housing Organisation (CGEWHO)

- **Mechanism:** Established in 1990, the CGEWHO is an autonomous body under the Ministry of Housing & Urban Affairs. Its mandate is to develop and deliver housing projects for central government employees across the country on a "No Profit No Loss," self-financing basis (CGEWHO, n.d.; Staffnews.in, 2025). It aims to create a parallel, non-market housing supply insulated from speculative pressures.

- **Track Record:** Since its inception, CGEWHO has completed 34 projects, delivering approximately 17,796 dwelling units (Staffnews.in, 2025). Its ongoing projects in the NCR include a significant development in Greater Noida (Phase-II) with 336 units planned (Staffnews.in, 2025).
- **Challenges and Critique:** Despite its noble mandate, the CGEWHO model is fraught with challenges that severely limit its effectiveness as a systemic solution.
 - **Scale Mismatch:** The organization's total output over three decades is a minuscule fraction of the housing need for the approximately 33 lakh central government employees (PRS Legislative Research, 2015). Its project-based approach is inherently incapable of addressing the scale of the affordability crisis in a market as large and dynamic as the NCR.
 - **Execution and Governance Failures:** The CGEWHO's flagship project in Greater Noida serves as a cautionary tale. It has been plagued by significant delivery delays, with a project announced in 2011 still incomplete a decade later (Mishra, 2021). Homebuyers have raised serious allegations regarding poor construction quality and mismanagement (rupeshsh, 2024). Most critically, the project has been accused of illegally altering its layout to construct and sell high-cost villas (priced up to ₹1.6 crore), a move that directly contradicts its "affordable" and "no-profit-no-loss" charter. This suggests a severe governance deficit and indicates that even non-market entities are susceptible to the lucrative pressures of the high-value real estate market (Mishra, 2021).
 - **Extended Time Horizon:** CGEWHO projects have a long gestation period, typically requiring 1-2 years for planning and an additional 4 years for construction post-announcement (Staffnews.in, 2025). This slow pace is fundamentally mismatched with the rapid escalation of market prices, meaning that by the time a project is delivered, the affordability landscape has shifted dramatically.

Market Intervention: Mandating Private Sector Participation through Inclusionary Zoning (IZ)

- **Mechanism:** Inclusionary Zoning (IZ) is a regulatory policy tool that leverages the private market to create affordable housing. It either requires (mandatory IZ) or encourages (voluntary IZ) private developers of market-rate housing projects to set aside a certain percentage of their units for sale or rent at below-market rates to targeted income groups (Local Housing Solutions, 2023; Urban Institute, 2023). To offset the cost to developers, municipalities typically offer incentives such as density bonuses (permission to build more units than zoning allows), fee waivers, or fast-track permitting (Grounded Solutions Network, 2019; Re-Thinking the Future, n.d.).
- **Applicability to NCR:** In theory, a well-designed IZ policy could be a powerful tool in the NCR. It could mandate that all large-scale residential developments reserve a quota of units specifically for public servants, priced according to affordability metrics linked to CPC pay scales rather than market rates. This would integrate affordable units within market-rate projects, promoting social inclusion and avoiding the creation of isolated government colonies (Re-Thinking The Future, n.d.).
- **Challenges and Critique:** The practical implementation of IZ in the Indian context faces significant hurdles.
 - **Design and Calibration Complexity:** The success of IZ hinges on a delicate balance. The set-aside requirements must be robust enough to generate a meaningful supply of affordable units, while the incentives must be attractive enough for developers to maintain profitability

and not stifle overall construction (Local Housing Solutions, 2023; Urban Institute, 2023). Calibrating these variables incorrectly can render the policy toothless or counterproductive.

- **Limited and Inconsistent Precedent in India:** While IZ has been discussed extensively, its application in India is nascent and not well-documented. Ahmedabad is often cited as a city with an IZR policy, but comprehensive data on its outcomes are scarce (CRDF, n.d.). Federal housing policies that encourage such mixed-income initiatives have often failed at the local implementation level, leading to the continued development of segregated, poorly connected low-income housing on urban peripheries (Sivam & Karuppanan, 2021).
- **Potential for Market Resistance:** A mandatory IZ policy in the NCR would likely face strong resistance from the powerful real estate lobby. Developers might challenge the policy legally or argue that it makes projects unviable, potentially leading to a slowdown in housing supply if the offered incentives are perceived as inadequate (Local Housing Solutions, 2023).

Financial Enablement: Government-Backed Subsidized Loans (PMAY-CLSS)

- **Mechanism:** The Pradhan Mantri Awas Yojana - Credit-Linked Subsidy Scheme (PMAY-CLSS) is a demand-side intervention designed to make home loans more affordable. It provides an upfront interest subsidy that is credited directly to the beneficiary's home loan account. This reduces the outstanding principal amount, thereby lowering the Equated Monthly Instalment (EMI) for the entire loan tenure (Bajaj Finserv, 2025; Godrej Capital, 2025).
- **Eligibility and Subsidy Tiers:** The scheme is targeted at specific income categories: Economically Weaker Sections (EWS), Low-Income Groups (LIG), and Middle-Income Groups (MIG-I and MIG-II). The subsidy amount and the maximum loan principal on which it is calculated vary by income slab, ranging from a 6.5% subsidy on a ₹6 lakh loan for EWS/LIG to a 3% subsidy on a ₹12 lakh loan for MIG-II (PMAY-Urban, n.d.; Bajaj Finserv, 2025).
- **Challenges and Critique:** The PMAY-CLSS, while effective in lower-cost housing markets, is structurally mismatched with the economic realities of the NCR.
 - **Income and Loan Cap Mismatch:** The scheme's parameters are completely divorced from NCR property values. The maximum annual household income for eligibility is ₹18 lakh (for MIG-II) (Godrej Capital, 2025). Many mid-to-senior level government employees (like the simulated Level 10 officer) would have incomes exceeding this cap, rendering them ineligible. For those who are eligible, the subsidy is calculated on a maximum loan principal of ₹12 lakh. This is a trivial amount when the cost of a modest apartment is ₹89 Lakhs. The subsidy's impact on the overall affordability of such a property is negligible.
 - **Restrictive "First Pucca House" Rule:** A key eligibility criterion is that no member of the beneficiary's family should own a "pucca" (permanent) house anywhere in India (Bajaj Finserv, 2025). This rule, while intended to target first-time homebuyers, can inadvertently disqualify many government employees. An employee posted to the NCR might have a share in an ancestral family home in a distant village, making them ineligible for the scheme even though that property is of no practical use for their current housing needs.

In synthesis, these three policy approaches operate with conflicting logics and fail to form a coherent strategy. CGEWHO attempts to bypass the market, PMAY-CLSS subsidizes participation in it, and IZ seeks to regulate it. Their uncoordinated application results in systemic failure. The struggles of CGEWHO in Greater Noida demonstrate that even state-led initiatives are not immune to the distorting pressures of a high-value market. The core failure across all three policies is their inability to address the fundamental driver of the crisis: speculative land value inflation. Without

tackling this root cause, all other interventions are merely palliative, treating the symptoms of a crisis they cannot cure.

DISCUSSION AND POLICY RECOMMENDATIONS

Synthesizing the Findings: The Vicious Cycle of Unaffordability and Systemic Risk

The evidence presented in this paper establishes a clear and troubling narrative. The quantitative analysis demonstrates that for the majority of central government employees, a stable salary no longer translates into the ability to own a home in the National Capital Region. This “salaried poverty” is not an anomaly but a systemic outcome of the collision between a rigid, slow-moving public sector compensation structure and a volatile, hyper-inflationary private real estate market.

This economic precarity creates profound psychological and ethical pressures. The resulting financial and moral distress, rooted in a sense of relative deprivation and systemic unfairness, creates a fertile ground for corruption. This establishes a vicious cycle: housing unaffordability fuels financial distress, which in turn risks eroding the integrity of public servants. A decline in institutional integrity weakens the state’s capacity to effectively govern and regulate the very markets that created the affordability crisis in the first place. Therefore, what appears to be an employee welfare issue is, in fact, a critical challenge to the foundations of good governance. The inadequacy of current policy interventions—fragmented in their approach and mismatched in their scale—only exacerbates this cycle, making a comprehensive and integrated policy response an urgent necessity.

Limitations of the Study and Avenues for Future Research

This study, while providing a robust framework for understanding the issue, has several limitations that must be acknowledged.

- **Simulated Data:** The core quantitative analysis is based on a simulated cohort. While the parameters are derived from official data and realistic estimates, they do not capture the full diversity of individual circumstances. The study standardizes family structures, spending habits, and career trajectories, which in reality are highly variable.
- **Correlation vs. Causation:** The link between financial distress and corruption is established through a synthesis of established theoretical frameworks and logical inference. The study posits a strong correlation and a plausible causal pathway but does not, and cannot, empirically prove a direct causal link without observational data on unethical behavior.
- **Market Homogeneity:** The study uses an average property price for the NCR. In reality, prices vary significantly across different sub-regions and micro-markets within Delhi, Gurugram, Noida, and Faridabad.

These limitations point toward critical avenues for future research. A large-scale, confidential survey of central government employees across the NCR is needed to validate the quantitative findings on income, expenditure, and affordability. Furthermore, in-depth qualitative research, including confidential interviews, would be invaluable for exploring the lived experiences of “salaried poverty,” its psychological impacts, and the specific ways in which it influences ethical decision-making. Finally, econometric studies using anonymized departmental data on disciplinary actions, cross-referenced with housing market trends, could begin to empirically test the corruption hypothesis.

A Multi-Pronged Policy Framework for Housing NCR’s Public Servants

Based on the critical evaluation of existing policies, this paper proposes a cohesive, multi-pronged framework that integrates direct provision, market regulation, and financial support.

Reforming CGEWHO: Towards Transparency, Efficiency, and Scalability

The CGEWHO model of direct provision should not be abandoned but fundamentally reformed to address its shortcomings in governance, scale, and speed.

- **Mandate Independent Audits:** To restore credibility and ensure adherence to its “no-profit-no-loss” mandate, all ongoing and future CGEWHO projects must be subjected to a mandatory and transparent audit by the Comptroller and Auditor General (CAG) of India, as demanded by aggrieved homebuyers (Mishra, 2021).
- **Shift to a PPP Land-Bank Model:** CGEWHO should transition from being a direct constructor to a master planner and land aggregator. Its primary role should be to leverage its governmental status to acquire large, litigation-free land parcels in emerging corridors of the NCR. It should then enter into Public-Private Partnerships (PPPs), providing this land to pre-qualified private developers. In return, developers would be mandated to allocate a significant portion (e.g., 25-30%) of the developed units back to CGEWHO at a pre-agreed, non-market construction cost. This would leverage private sector efficiency while retaining public control over pricing and allotment.
- **Strategic Location Planning:** Future projects should be strategically located in peripheral but high-growth areas with planned infrastructure connectivity, such as the regions around the Yamuna Expressway and the upcoming Jewar Airport, to ensure long-term value appreciation while maintaining initial cost-effectiveness (DOWO, n.d.; Realty Assistant, 2025).

A Pragmatic Inclusionary Zoning Framework for NCR

A supply-side market intervention is necessary to ensure a continuous stream of affordable housing integrated within the broader urban fabric.

- **Mandatory Pan-NCR IZ Policy:** A unified and mandatory IZ policy should be enacted across the entire NCR. This policy would require all new residential projects exceeding a specified size (e.g., 5 acres or 100 units) to reserve 10-15% of their residential Floor Area Ratio (FAR) for an “Essential Public Services Housing Quota.” This quota would be accessible to a defined list of public servants, including government employees, teachers, and police personnel.
- **Integration and Pricing Controls:** The policy must mandate that these reserved units are physically integrated within the project (not segregated into a separate block) and are of a comparable quality to the market-rate units (Re-Thinking The Future, n.d.). The selling price of these units should be delinked from the market and instead be determined by a formula based on the affordability metrics of the target 7th CPC pay levels.
- **Calibrated and Attractive Incentives:** To ensure developer buy-in and project viability, the policy must offer clear, substantial, and non-discretionary incentives. The most effective incentive would be a significant density bonus in the form of additional, saleable FAR or Transferable Development Rights (TDR), which has proven effective in similar models (Sivam & Karuppanan, 2021).

Reimagining Financial Subsidies for High-Cost Urban Markets

Demand-side financial support must be redesigned to be relevant to the high-cost reality of the NCR.

- **Location-Indexed PMAY-CLSS:** The “one-size-fits-all” approach of PMAY-CLSS is ineffective in metropolitan areas. The scheme should be reformed to introduce location-indexed income eligibility caps and subsidy amounts. For designated “High-Cost Housing Zones” like the NCR, the annual income ceiling for eligibility should be raised significantly (e.g., to ₹30 lakh), and the

loan amount on which the interest subsidy is calculated should be increased to a more meaningful level (e.g., ₹25-30 lakh).

- **Zero-Interest Down Payment Assistance Loan:** A new, dedicated “Government Employee Housing Loan” scheme should be introduced. This government-backed scheme would provide an interest-free loan for up to 75% of the required 20% down payment. This loan would be recovered through deductions from the employee’s salary over their remaining service tenure, directly addressing the primary barrier of accumulating initial capital.
- **Direct EMI Co-Payment Subsidy:** For employees in the lower pay levels (e.g., Levels 1-5) who secure housing through one of the above mechanisms, the government could introduce a direct EMI co-payment subsidy. Under this model, the government would contribute a fixed percentage (e.g., 10-15%) of the monthly EMI for the first 10 years of the loan, providing critical support during the early, most financially strenuous years of homeownership.

Table 4: Comparative Analysis of Proposed Housing Policy Solutions

<i>Policy Solution</i>	<i>Mechanism</i>	<i>Key Advantage</i>	<i>Key Challenge/Risk</i>	<i>Target Group</i>	<i>Scalability Potential</i>
Reformed CGEWHO (PPP Model)	Land banking and PPPs for construction.	Creates dedicated, price-controlled housing stock.	Land acquisition delays; requires strong governance to prevent corruption.	All Central Govt. Employees	Moderate to High
NCR Inclusionary Zoning (IZ)	Mandates private developers to build affordable units in exchange for density bonuses.	Integrates affordable housing into market projects; continuous supply.	Developer resistance; complex calibration of incentives.	Defined Public Servants	High
Location-Indexed PMAY & Loans	Demand-side financial support with higher, location-specific caps and down payment assistance.	Empowers employees with choice in the open market; immediate applicability.	May fuel price inflation if not paired with supply-side measures.	Income-eligible Govt. Employees	High

CONCLUSION: HOUSING SECURITY AS A PREREQUISITE FOR VIKSIT BHARAT

The phenomenon of “salaried poverty” among central government employees in the National Capital Region is a critical and unsustainable paradox. It represents a fundamental breakdown of the social contract that has long underpinned public service in India—the promise of a secure, middle-class life in exchange for dedicated service to the state. This study has empirically demonstrated that this is not a perceived issue but a quantifiable reality, born from the irreconcilable divergence between static, state-regulated salaries and a dynamic, speculative real estate market. The affordability chasm is now so vast that it renders homeownership, a cornerstone of financial security and social aspiration, an unattainable dream for the very individuals tasked with administering the nation’s capital.

The implications of this crisis extend far beyond employee welfare. The persistent financial distress and profound sense of systemic inequity it engenders create a corrosive environment that

threatens the ethical foundations of public administration. By providing a powerful psychological justification for illicit enrichment, salaried poverty poses a direct and growing threat to institutional integrity. This challenge must be viewed through the lens of India's national ambition, Viksit Bharat @2047, which envisions a developed nation by its centenary, built on pillars of good governance, inclusive growth, and enhanced 'ease of living' for all citizens. The existence of "salaried poverty" within the government's own ranks is a direct contradiction to this vision. A nation cannot achieve the goal of transparent, efficient, and corruption-free governance if its administrators are themselves caught in a cycle of financial precarity. The inability to provide a fundamental need like housing security for public servants undermines their morale, compromises their integrity, and ultimately weakens the state's capacity to deliver on the broader promises of Viksit Bharat.

The current policy landscape is woefully inadequate, comprising a patchwork of uncoordinated, under-scaled, and structurally flawed interventions that fail to address the root cause of the problem. A far more ambitious and integrated approach is required. The multi-pronged framework proposed herein—combining a reformed and scalable public housing provider, a mandatory market regulation mechanism through inclusionary zoning, and intelligently redesigned financial subsidies—offers a viable pathway forward.

Addressing this challenge is not optional. It is an essential investment in the stability, morale, and integrity of India's public administration. Failure to act decisively will not only betray the aspirations of a generation of public servants but will also risk the erosion of the very governance structures upon which the NCR's, and indeed the nation's, journey to becoming a developed nation depends.

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Precarity in the Platform Age: The Gig Economy and Worker Vulnerability in India

Shubhangi Mittal¹, Shalini Singh¹,
Subhanshu Bisht¹ & Ritesh Dwivedi²

¹Student, Symbiosis Institute of Business Management, Noida,
Symbiosis International (Deemed University), Pune, India

²Assistant Professor, Symbiosis Institute of Business Management, Noida,
Symbiosis International (Deemed University), Pune, India

E-mail: shubhangi.mittal2027@sibmnoida.siu.edu.in, shalini.singh2027@sibmnoida.siu.edu.in,
subhanshu.bisht2027@sibmnoida.edu.in, ritesh.dwivedi@sibmnoida.siu.edu.in

Abstract

This paper evaluates the quickly expanding Indian gig economy, assessing the discrepancy between the assurance of flexibility and the actual fact of powerlessness in workers. It draws on the Maslow's hierarchy of needs, Digital Capitalism theories, and the precarity offered to the workers within organizations to realize the systemic inability to give workers a proper safety and dignity. The study is based on a qualitative, analytical, and descriptive approach and a thorough thematic analysis of the secondary data, as the focus will be on government reports, scholarly articles, and Fairwork ratings published between 2020 and 2025. The results indicate that as much as platforms are satisfying the low-level physiological needs of the workers, the higher-level needs remain unmet, and such structure enables a continuously dependent Precariat workforce that is a major mechanism of Digital Capitalism. This relationship is confirmed through the continued low scores on the Fairwork and through a weak and fragmented policy throughout India, which prompts discontentment amongst the workers and prompts financial instability. The originality of the study is the direct provision of a connection between the failure of the Maslow framework and structural dynamics of precarity, as well as has developed a comprehensive policy roadmap. Finally, the paper is evidenced by policy proposals that effectively give more sustainable and fair digital labor market, and the recommendations include the establishment of a new legal category of the so-called Dependent Contractor, and a universal and mobile social security net.

Keywords: Gig Economy, Platform Work, Digital Labor, Algorithmic Control, Worker Precarity, Maslow's Hierarchy of Needs, Employment Security

INTRODUCTION

What is Gig Work?

Gig work is a labor market system marked by the dominance of transient contracts, freelance work, and task-based employment, in contrast to traditional permanent, salaried jobs. While non-standard jobs have long existed, digital platforms and flexible work arrangements distinguish the modern gig economy by its technological foundation that's the digital platforms.

Digital platforms are reachable through smartphones, serve as intermediaries that match a massive, diffuse army of self-employed individuals with on-demand customers. This model breaks up conventional work into isolated "gigs," producing a mobile and flexible market for labor.

Why is it Important Now (Contextualize to India)?

The gig economy is a core and fast-growing element of its economy. Its importance is increased by a special combination of circumstances, including an enormous and young population entering the labor market, chronic underemployment in the formal and agricultural sectors, and a digital revolution that has connected millions of people to the internet. The Indian gig economy is projected to reach 23.5 million by 2029-30, as per NITI Aayog (2022). This change redefines city services, consumption habits, and even work itself for a whole generation of Indians.

Scope of Study

The study analyzes the location based Gig economy in India with a special focus on ride-hailing (Uber, Ola), food and grocery logistics (Swiggy, Zomato) as well as household services (Urban Company). It elaborates on the influences by these platforms on employment, earnings, flexibility, and insecurity, as labour regulation and benefits programs change. Based on qualitative analysis of secondary data (2020-2025), the research identifies the opportunities to generate incomes and the systemic risks of informalization, income vulnerability and social lack of assurance.

BACKGROUND OF THE STUDY

The International Gig Economy: A Paradigm Shift in Labor

The gig economy is a product of digital technology and the post-crisis requirements of flexible and low cost labor (Sundararajan, 2016). Platform capitalism links the consumers and providers of services through programmable digital infrastructure but does not possess property (Srnicsek, 2017). Labor unions note it as a worldwide trend whereby an opportunity of new income is created and traditional social safeguards rooted on consistent employer-worker connections are challenged (ILO, 2021). Legal status is also important, with platforms relying on being independent contractors to evade payment requirements such as minimum wages, hours worked, paid leaves, and social security contributions, which is disputable in the courts, with instances such as those in California's Proposition 22 and in the UK Supreme Court (Johnston and Land-Kazlauskas, 2018).

Indian Gig Economy: Size, Reach and Major actors.

India a global epicentre of the gig economy. India offers such demographic dividend, increased digital infrastructure, and an enormous pool of informal labor seeking new avenues of employment. The current level of such a phenomenon was provided by the policy think tank of the government in its ground-breaking 2022 report, India Booming Gig and Platform Economy. It forecasted 7.7 million employees in the gig economy in 2020-21. Future estimates are even more disastrous; the government press releases of the Union budget 2025 note that the number of gig workers is expected to rise to more than 10 million in 2024-25, and up to 23.5 million in 2029-30. By then, it is believed that gig workers will make up 6.7 percent of the non-agricultural labor force in India and will contribute an estimated 1.25 percent to the GDP in India.

This surge of growth is underpinned by limited and dominant digital platforms that are becoming household names among the urban and semi-urban India. These are:

- **Ride-Hailing Services:** Uber and Ola have redefined the concept of mobility in cities, building a massive system of driver-partners and providing an effective way to match the short-time supply and demand.
- **Food and Grocery Delivery:** Swiggy and Zomato have extensive networks of delivery, supported by quick commerce, that make the main part of their business.

- **At-Home and Professional Services:** Urban Company recruits semi-skilled and skilled professionals, including women, to perform beauty, wellness and home maintenance services.
- **E-commerce and Logistics:** Amazon Flex and Flipkart deploy elastic workforces in delivering to the final products, generating livelihoods and bolstering India to a certain extent a historically informal sector.

LITERATURE REVIEW

Understanding the Indian Gig Economy

The gig economy is rapidly changing the labor market in India because it aids in matching millions of people who find temporary employment with the help of digital platforms (NITI Aayog, 2022). This system not only offers unparalleled freedom, but the massive uncertainty also encompasses the rights and the security of the workers (Fairwork India, 2022). Gig working is not similar to conventional jobs, as it lacks the presence of long-term agreements, fixed wages, and benefits, and platforms are presented as a type of a digital boss, which is controlled by the use of algorithms to match assignments and salaries (ILO, 2021).

Increased by widespread use of mobile phones and cheap internet, the gig industry will expand its labor force to 24 million by 2030 (KPMG, 2023). The labor force is largely youthful, though women are significantly underrepresented due to safety and social barriers (World Bank, 2022). There is a clear stratification, with highly trained freelancers doing better than delivery staff who frequently experience income unpredictability (Fairwork India, 2022).

This system is theorised using theories of Platform Capitalism and Precarity, which identify the primary trade-off between flexibility and insecurity (Srnicek, 2017; Standing, 2016). Indian policymakers must capture the potential of the gig economy for formalising work while providing essential protections to workers, who are currently subject to all the risks of self-employment without any safeguards (Ministry of Labour & Employment, 2020).

The Socio-Economic Impact on Workers

The situation is a paradox in India with the gig economy in which workers are offered flexible pay and subject at a scale of economic vulnerabilities. The wages of workers are highly fluctuating and are coupled with subsistence wages despite the cost of operations being included (Business Standard, 2023; World Bank, 2021). The result of such an unstable financial situation is that saving is difficult, and workers are exposed to economic shocks. In addition, freedom is curbed because of intense algorithmic control. The digital bosses are the platforms, that uses black box algorithms to define pay, a lot work, and monitor activity and performance, making the work environment more stressful and increasing burnout-inducing (Graham and Woodcock, 2018; Fairwork, 2022). Many lack opportunities for new skill learning or career advancement, plunging them into a trap of precariousness (IDinsight, 2023).

The biggest challenge is in the lack of social security net. Domestic gig workers miss out on provident fund contributions, health insurance, and pension schemes (ResearchGate, n.d.; IJFMR, n.d.). India reacted by enacting the Code on Social Security, 2020, a step towards giving legal protection, but its gradual implementation created a policy lacuna (Drishti IAS, 2025). Rajasthan was the first state to pass their own welfare law in a step assisted by platform provision (SSRN, n.d.; The Times of India, n.d.). These highlight the necessity of a uniting national framework that will ensure the gig economy can offer secure and sustainable living.

Digital Capitalism and Labor Precarity Theory

In order to go beyond descriptive analysis the present study builds its critique on the back of two major structural theories Digital Capitalism and Labor Precarity.

- **Digital Capitalism:** This model, first introduced by Srnicek (2017), perceives the platform economy as the new stage of capitalism, in which the value is not only based on labour but in the first place on the collection of data in the centre. Platforms act as a monopolistic ‘digital intermediaries’ in which the owners of the infrastructure and data flow have the ability to impose control on fragmented labor. This model is the most efficient and profitable, since it pushes all the operational and commercial risk (e.g., fuel prices, vehicle repairs, unmet demand, etc.) onto the individual employee. The success of the platform depends on the fact that the workers cannot be considered employees and so they will not be obligated to legal requirements.
- **Labor Precarity:** According to Standing (2016), the Precariat is defined as the type of a global demographic characterized by unreliable job, the absence of occupation, and, most importantly, the inability to receive the conventional social protection (sick leave, pensions, paid holidays). The ideal form of employment the Precariat has is gig work. The instability of wages and the dependence on algorithms guarantees that employees are transactional and continue to survive only on a short-term basis (Maslow Level 1 needs) as opposed to constructing safety nets (Level 2 needs) that characterize conventional employment security. The legal precarity positions the workers in the system through the absence of legal protection.

Technology and Platforms

- **Platforms Role:** Top digital platforms such as Uber, Swiggy, or Upwork bring workers and customers together through applications, messengers, and payment technologies to cut on intermediaries and entry costs, as well as, allowing work in high demand to be undertaken remotely (MoSPI, 2023; IJRPR, n.d.; IJFMR, n.d.).
- **Algorithms and Monitoring:** Initially, tasks are assigned using algorithms, and performance and pay changes based on demand and ratings, which enhance efficiency, though lowering transparency and worker control (Fairwork, 2023; TandF Online, n.d., arXiv, n.d.), thereby leading to stress and income unpredictability.
- **Data and Privacy:** Data of location, performance, and conduct (arXiv, 2024) are gathered by platforms and contribute to a better functioning of the latter, but run the risk of increasing privacy and exploitation concerns. Efficiency against workers need clear policies guiding the warring of data (TandF Online, n.d.; arXiv, n.d.).

Labour Rights, Policies, and Laws

- **Workers Classification:** Gig workers being classified as either “employees” or “independent contractors”, determines whether they are entitled to benefits and protection (ResearchGate, n.d.; IJFMR, n.d.). The employee classification entitles them to social security, health benefits, and collective bargaining rights, whereas independent contractors at times lack these protections (ILO, 2021). Uncertainty in the classification keeps most workers without protection.
- **Recent Legislation:** Gig workers are officially recognized within the Code on Social Security, 2020 and health, maternity and retirement benefits are proposed (Ministry of Labour and Employment, 2020). Platform contributions and welfare benefits are needed by state government programs, such as the Platform-Based Gig Workers Welfare Board in Rajasthan (SSRN, n.d.). The Times of India, n.d.). Such targeted support is possible by implementing worker registration

schemes in Maharashtra and Karnataka (SSRN, n.d.;). The Times of India, n.d.). However there is continuity in national implementation.

- **Unions and Collectives:** Platform-specific unions are created by gig workers to advocate for equal compensation, security, and social protection (Fairwork, 2023). Mainstream trade unions find it difficult to organize gig workers due to the dispersed and time-limited nature of the work. These groups are necessary to battle for rights, raise awareness, and advocate for policies.

Worker Motivation and Changing Aspirations (Relevance of Maslow's Hierarchy of Needs)

Maslow's need Hierarchy theory is a handy analytical tool for grasping the intricate motivations of gig workers. It elucidates the initial attraction to platform work and the resultant disillusion that often follows.

- **Level 1: Physiological Needs:** is about the fundamental necessities for survival. To a large section of the unemployed Indian, or those working in the informal sector earning subsistence wages, the key attraction of the gig economy is that it serves to fulfil these needs. The low entry barrier and guarantee of immediate, if variable, income make it an appealing survival option. Platforms successfully attract workers by presenting an immediate solution to their most immediate physiological needs (TISS, n.d.). Yet, they tend to be volatile and subject to demand fluctuations, with little chance for workers to reliably cover their needs (Fairwork India, 2022).
- **Level 2: Safety Needs:** The need to survive, the safety and security needs become the priority. These are financial security, job security, and physical security. The platform model consistently fails its employees. The absence of a minimum wage, the unpredictability of pay, and the lack of paid sick leave or health coverage result in persistent financial insecurity. There is a high risk of accidents on the road, and compensation usually falls short. Business risks like fuel prices, traffic accidents, or low demand fall solely on workers (ILO, 2021).
- **Level 3: Social Needs:** It involves belonging, friendship and community needs. Workplaces naturally create social interaction but the labor of gig economy are self-isolated. Workers do not have to interact with a colleague or a human supervisor, but an application. This could make them feel lonely and isolated (Wood et al., 2019). Clients like to rate gig workers, but such ratings are followthrough and are punitive rather than honest (Fairwork India, 2022).
- **Level 4: Esteem Needs:** This level includes the need for self-esteem, achievement, recognition, and respect from others. Platforms attempt to accomplish it through gamified rating systems, badges, and performance levels (e.g. Gold or Diamond partners). Such respect is, nevertheless, feeble and imposed on the outside. It depends on often arbitrary customer ratings as well as secret algorithmic ratings. One or two downs can cause punishments and demotion, undermining the feeling of professionalism and self-esteem in a worker (Rosenblat & Stark, 2016).
- **Level 5: Self-Actualisation:** This is the highest rank, the aspiration of achieving maximum self-fulfilment, self-growth and artistic self-expression. This desire is directly exploited by the gig economy marketing myth, that promises us to be our boss, work on your terms. Nonetheless, in the case of most low-skilled, task-based gig workers, this has remained a promise not kept. The repetitive task character of the work and the strict supervision by the algorithm make little space for autonomy, creativity, or skill-building.

Finally, the Indian gig economy successfully recruits workers by appealing to their most fundamental physiological requirements, but through its current architecture fails systematically to fulfil their higher needs for safety, belonging, esteem, and self-actualisation, resulting in the precarity and discontent that this research attempts to understand.

Bridging Maslow's Failure to Structural Precarity and Digital Capitalism

Lastly, the Indian gig economy is smart in attracting employees by appealing to their most basic physiological needs, but systematically fails to satisfy their more higher needs of safety and belongingness, esteem and self-actualisation, which leads to the precarity and frustrations being studied in this research. This is not an isolated systemic malfunction and is instead the nature of the platform business model in Digital Capitalism (Srnicek, 2017). This structural impairment that is lacking in safety and stability is what platforms exploit to keep a constantly dependent, reserve supply side of labor (what is essentially a Precariat (Standing, 2016)) who will consistently be in the immediate, transactional survival that the platform exists for, as dictated by its nature. It is the failure to realise higher-order needs of security and self-worth which is not overcome that precarity is perpetuated and profit maximised.

Gender and Inclusivity in Gig Work

Despite the promotion of the platforms as democratizing, the gig economy is indicative of preexisting inequities. This means that women are confined to home service or beauty products, whereas ride-hailing and delivery is a firm that remains dominated by men and, therefore, makes it impossible to earn money and move (WIRED, n.d.; IJFMR, n.d.). They have a tripled obstacle of digital access and literacy, safety concerns, and excessive unpaid domestic work (IJISRT, n.d.; WIRED, n.d.; IJFMR, n.d.).

Threats of Violence and Discrimination

Gig workers face more than economic risk—they face physical danger and discrimination. One in three workers reports fearing theft or assault while working (WIRED, n.d.). Incidents range from stabbings to caste-based hostility. Platforms provide minimal protection or grievance response—a dire shortfall that elevates precarity (WIRED, n.d.).

Innovations and Ethical Alternatives

Non-profit based models like Karya offer ethical alternatives, paying rural workers fairly for AI-related tasks, with royalties on resold data (TIME, n.d.). Though it is limited currently, such systems provide models for inclusive, dignified gig engagement.

Emerging Academic Insights and Frameworks

Recent research brings new analytical tools to understand the gig landscape:

1. **“End of Patchwork” Framework:** This unified structure tackles income volatility, opaque algorithms, legal ambiguity, fragmented protections, and institutional inertia—and proposes solutions like minimum earning guarantees, social security mandates, and algorithmic accountability (SSRN, n.d.).
2. **Invisible Labor:** Studies of food delivery workers uncover “digital discomfort” caused by repetitive user-interface interactions and opaque gamification (arXiv, n.d.). They recommend worker-centred design to reduce friction.
3. **Gigs with Guarantees:** Concepts like WORK4FOOD offer dynamic pay guarantees to delivery agents without escalating platform costs or affecting customer satisfaction (arXiv, n.d.).

Innovative Solution for Future

- **Give Workers Control over their data:** Get ahead of employees with a digital work passport that they own, as well as their ratings and skills should move, app to app. It also allows them to band together to have data which they create on platforms valued compensated.

- **Straightforward Answers of the Application:** Enact laws that give platforms an easy, clear answer whether they fired the workers, punished them, or decreased their wages unreasonably. No more hidden rules.
- **Training for New Skills:** Move forces to contribute small amount of money towards a fund which will provide free training and courses to the workers. This allows them to acquire new skills so that they can get better and more stable jobs in future.
- **Worker-Owned Apps Support:** The workers should be assisted by the government to design and use their own delivery or taxi applications. This breeds fair competition and empowerment of the workers since they are given tax incentives and loans.

Identified Research Gaps

Based on literature review, several research gaps have been identified:

- **Algorithmic Transparency:** Algorithms management influences workers, but it requires more technical and qualitative studies in India to comprehend how particular platform algorithms work and how they produce labor outcomes.
- **Mental Health and Well-being:** The long-term psychological impacts of gig work, which is caused by high-pressure measures and job insecurity, are not well understood. There is limited evidence concerning the efficacy of platform-supplied mental health support, and it is still unclear how longterm gig work is a viable career.
- **Effectiveness of Regulations:** As states pass diverse laws, scholarship is required to determine their application, adoption by workers and experiences of effective foreign models.

RESEARCH PROBLEM

Online platforms allow the gig economy in India to grow at a rapid pace, resulting in the development of a huge workforce that is in socio-legal limbo. By this classification, workers are not provided with basic rights and social security, such as minimum wages, working hours, paid leave, health insurance benefits, accident compensation, and retirement pensions. As the number of gig workers is expected to reach more than 23 million by 2030, they are vulnerable to earnings instability, work safety, and low bargaining power on algorithmically controlled websites. Although the government attempts to regulate the situation through such measures as the Code on Social Security, 2020, and even laws that are enforced by states, it happens slowly and disputed. The research question is the general gap between technological advancement and weak legal, policy, and social safeguards.

Research Objectives

This research endeavors to rigorously examine the comprehensive influence of the gig economy on the Indian labor market and workers. The explicit aims are:

- Investigate the Indian gig economy legal and policy framework, with particular attention to the gaps based on the independent contractor status.
- Analyze the socio-economic reality of gig workers through the Hierarchy developed by Maslow and evaluate basic and higher needs.
- Explore the impact of algorithmic management on autonomy, income stability and job security.
- Offer evidence-based policy suggestions to create a just gig economy to balance between innovations and human rights.

RESEARCH METHODOLOGY

Nature of the Study

This research involves an analytical, qualitative as well as descriptive in an attempt to use the secondary data. The challenging and rapidly changing Indian gig economy can be studied through a qualitative method to bring a deeper understanding of uncovered socio-legal challenges, policies, and employee experiences. The methodology is aimed at framing all demands out of the current information, as opposed to hypothesizing (i.e., testing).

Information Source

The current research is grounded fully on the available literature and published information hence being practical and strong. It is based on secondary data of credible sources, such as reports of the government and institutions, like NITI Aayog and Economic Survey (Government of India, 2023), global sources like the ILO, and scholarly articles found in databases such as JSTOR and Google Scholar (Kumar and Sharma, 2022). Gig workers are formally included to the Code on Social Security, 2020, suggesting health, maternity and retirement benefits (Ministry of Labour and Employment, 2020). Such platform-based welfare schemes are present in states such as Rajasthan, Maharashtra and Karnataka (SSRN, n.d.;). Though national implementation is patchy, The Times of India, n.d.).

The following are the criteria to include a source in the study are:

1. **Relevance:** The report must clearly deal with the issue of the Indian gig economy, its workers, platform business practices, or the regulatory environment.
2. **Timeliness:** Preference will be given to sources published between 2020 and 2025 to ensure the analysis is current and reflects the sector's rapid revolution.

Limitations of Methodology

The is a qualitative, analytical and descriptive study of secondary sources. On the one hand, this method allows gaining a detailed understanding of the changing Indian gig economy, socio-legal issues, policies, and worker experiences; on the other hand, it does not make it possible to test hypotheses or create primary, empirical data.

DATA ANALYSIS AND INTERPRETATION

The study completely depends on the secondary data which is examined by use of thematic analysis. Online libraries, academic databases and the official websites of the government and nongovernmental organizations were used to conduct the search.

The parallelogram of the results is one of the overarching themes in platform work: its paradox. Whereas platforms are beginning to bring some form of what has been described as a type of digital formalization through digitalization of work and payment formalization via bank conduits (NITI Aayog, 2022), this makes a fraction of the informal economy visible to the financial sector. On the other hand, this visibility is not turned into formal rights and security. This is a Fairwork India (2024) data, which is a particularly telling fact.

The following discussion is organised in thematic layout:

Theme 1: The Paradox of “Digital Formalization” and Precarity (Fig. 1 & 2)

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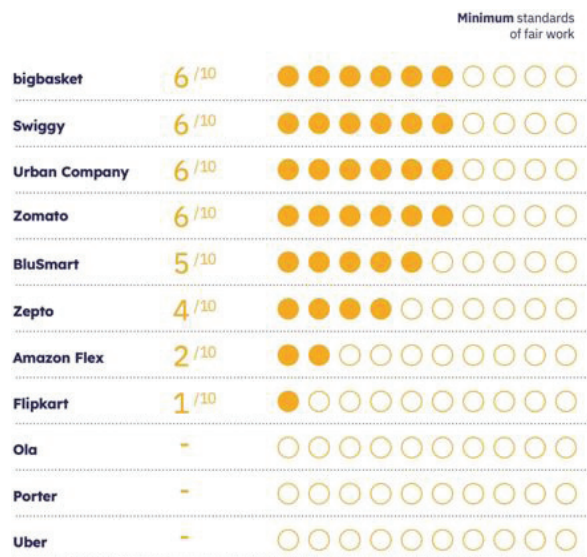


Figure 1: Fairwork India Platform Ratings (2024)

Note: This table offers a Comparative Analysis of the labour standards on large platforms and understands the performance based on ten precepts of fair work.

Source: Adapted from Fair work India Ratings (2024).

Interpretation: Given scores highlight a systemic deficit in fair pay and also show that worker representation across the board. Big ride-hailing apps got no score in these areas;
Scores 2024, by Principle.



Figure 2: Scored 2024, According to the 5 Principles of Fair-work

Note: The scores in this figure rely on data collected using fairwork framework

Source: Adapted from Fair work India score (2024) by principles

Aayog, 2022), this makes a fraction of the informal economy visible to the financial sector. On the other hand, this visibility is not turned into formal rights and security. This is a Fairwork India (2024) data, which is telling fact. (The platforms are assessed based on whether it fulfils requirements in each principle. Each principle usually allowed a maximum of 2 points meaning that a platform can receive a maximum of 10 points).

Noticeable point: There is no single platform that rated over 6/10 in 2024, i.e. satisfies all the fair work requirements in full (Fig. 1 & 2).

<i>Platforms</i>	<i>Score Out of 10</i>	<i>Observations</i>
Bigbasket, Swiggy, Urban Company, Zomato	6	These are the top performers.
BluSmart	5	Performed better than many but still short of “full fairness”.
Zepto	4	Moderate performance.
Amazon Flex	2	Very low compliance with fair work standards.
Flipkart	1	Minimal alignment with Fairwork principles.
Ola, Porter, Uber	0	These platforms did not score any points.

Explanation of Score Shown in Figure 1 and 2

- **Fair Pay:** Only Bigbasket and Urban Company pledged to pay the local minimum hourly wage after taking into consideration the expense of the workers. Nevertheless, no platform can show that their employees receive a living wage all the time, which is a significant difference between minimum and decent wages.
- **Fair Conditions:** The majority of platforms offered the basic safety issues such as training and equipment. Only a few, such as Urban Company, Zepto, and Swiggy, proposed a safer net with free accident insurance and income loss coverage of health-related problems.
- **Fair Contracts:** It is also showing a positive trend toward clear and visible contracts with corporations such as Bigbasket, BluSmart, and Swiggy leading the pace. These also provided more equitable conditions since they provided prior warning of policy modifications and liability coverage of workers in case of platform failure.
- **Fair Management:** Complex systems exist that enable employees to be able to appeal decisions and request human intervention on a variety of platforms including Amazon Flex and Flipkart. A second group of smaller companies like BluSmart and Zomato also attempted to avoid discrimination, such as anti-bias policies and algorithms audited by independent companies.
- **Fair Representation:** The main failure that was identified was critical in all eleven platforms. None were familiar with worker unions or collective organizations and cited a systemic denial of labor rights and collective bargaining in the platform economy of India.

Theme 2: Algorithmic Management as Control

The algorithm works as a platform based gig work, which essentially makes the platform invisible bosses that dictate nearly all factors regarding employment. These robotized systems delegate tasks, implement payment and even ineligibility of workers to have access to the platform frameworks. One of them is a food delivery provider, or a ride-hailing driver is not in control of the tasks; it is the algorithm on the site that designates them under certain preset conditions that are not ordinarily

visible. In a similar manner, the profitability of any assignment is likely to fluctuate, and it can be determined based on the scale of demand or the location or customer satisfaction among others; nevertheless, it is not clear how to calculate it (Wood et al., 2019; Rosenblat, 2018).

Such obscurity causes low bargaining power and boosts precarity (Kellogg, Valentine, and Christin, 2020). Pay, in its turn, does not enough control algorithms because pay affects the behaviour of workers as well as the rating system, incentives and automated disciplining that, in turn, can create a sense of a constant stress (Lee, Kusbit, Metsky, and Dabbish, 2015; Mohhlmann and Zalmanson, 2017). Research also suggests that such systems assist in the perpetuation of the presence of algorithmic despotism in which workers have minimal tasks to perform in order to question unfair deactivation or salary changes (Ivanova et al., 2018; Veen, Barratt and Goods, 2020). The other aspect that scholars raise is the fact that the algorithmic control system undermines autonomy and establishes a greater surveillance, and the workers are made a datafied subject within the platform capitalism (Gandini, 2019; van Doorn, 2017). This is the most knowledgeable algorithmic control that is the core technology of extraction under Digital Capitalism that substitutes the routine managerial control process with non-transparent and data-driven procedures that add all the risk to the employee and enhance the efficiency of the platform and data gathering.

Theme 3: Fragmented and Weak Policy

The introduction of the Code on Social Security (2020) has ensured that gig workers have, except that the safety nets of many are not formalized because of the race to implement the update slowly (Ministry of Labor and Employment, 2020; Drishti IAS, 2025). Acts, state-by-state– Rajasthan passed a welfare law and Karnataka declared social security but even here it stays as a disjointed endeavour providing gingerbread assurance only (SSRN, n.d.; The Times of India, n.d.). Lacking a single nationwide prototype, a highly varied proportion of the workers operating in gigs do not possess any kind of provident funds, health insurance policies, or pensions leaving them exposed to earnings shocks and risks. Although the concept of legal recognition is a good move, there are still very weak and uncoordinated policies and workers have no protection (Fairwork India, 2022).

Discussion are Based on Patterns and Figures

Pattern 1 – Worker Demographics: Gig workers are largely young, male migrants, often with limited education. Many takes Gig works as a last resort due to lack of formal opportunities (NITI Aayog, 2022) (it's linked with Figure 3 & 4).

Chart 1: Projected Growth of India's Gig Workforce (in millions). This chart shows a visual representation of the scale and urgency of addressing the challenges faced by this workforce (Figure 3).

<i>Year</i>	<i>Gig Workforce</i>
2020-21	7.7
2022-23	11.0 (Est.)
2025-26	15.5 (Proj.)
2029-30	23.5 (Proj.)

Figure 3

Source: Data from NITI Aayog (2022)

Interpretation: This show the sharp growth shows that Gig work is not a side issue but a major challenge for Indian workers.

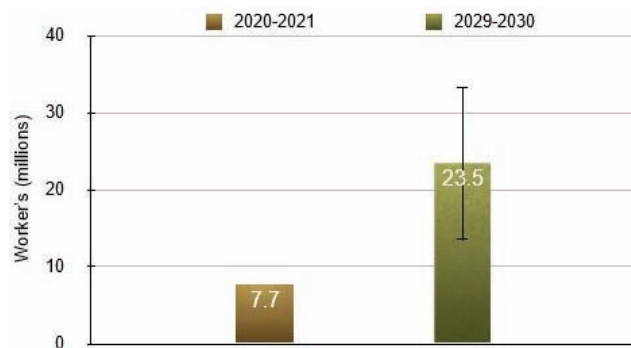


Figure 4: India's Gig/Platform Workforce: 2021 vs 2030 (Projection)

Pattern 2 – Challenges Faced by Gig Workers in India: Across reports and studies, several recurring issues appear:

- Low and Unstable Earnings – Workers struggle to secure reliable income (Hirachand, 2023; PSF Research, 2022).
- Lack of Social Security – Few have access to health insurance or retirement benefits (Bharatnama, 2022).
- Long Hours – Many works 10–12 hours daily, six to seven days a week.
- Safety Risks – Delivery riders and women face high risks of accidents and harassment (Times of India, 2023).
- Weak Grievance Systems – Most lack effective mechanisms to resolve disputes (Hirachand, 2023).

Pattern 3 – Legal Status and Worker Discontent (Figure 5): The constant labelling of workers as “independent contractors” is the legal pattern that underlies all other issues. This fiction in law is the source of perennial contention. Worker discontent is exhibited in a pattern of repeated, localised, and occasionally extensive protests, which have been reported on all large platforms (The Hindu, 2023; The Probe, 2025). These protests tend to be invariably about demands for higher wages, enhanced incentives, and respect for their rights, a sign that there is pervasive discontent with the present model.

Skill Composition

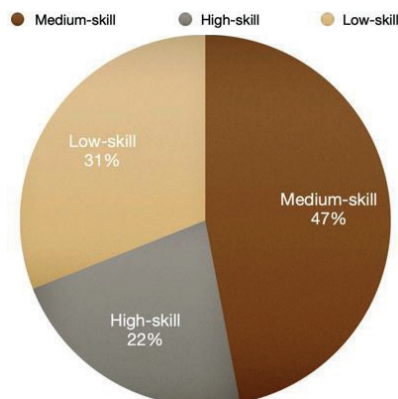


Figure 5: Skill Composition of Gig Work (NITI Aayog)

Delivery Workers' Gross vs Net Monthly Earnings (IDInsight)

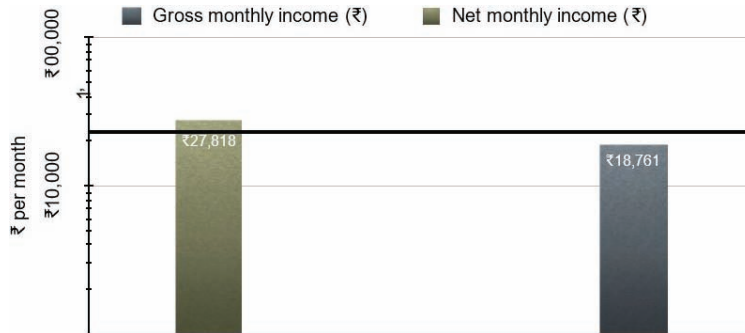


Figure 6: Delivery Workers' Monthly Earnings (IDInsight): Gross vs Net After Expenses

Gender Inclusivity

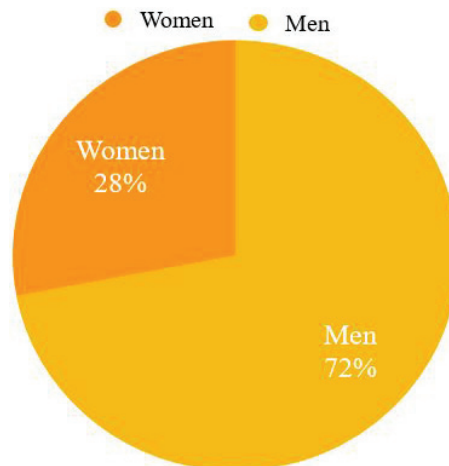


Figure 7: Gender Inclusivity in Gig Economy (ISB)

Net Hourly Earnings

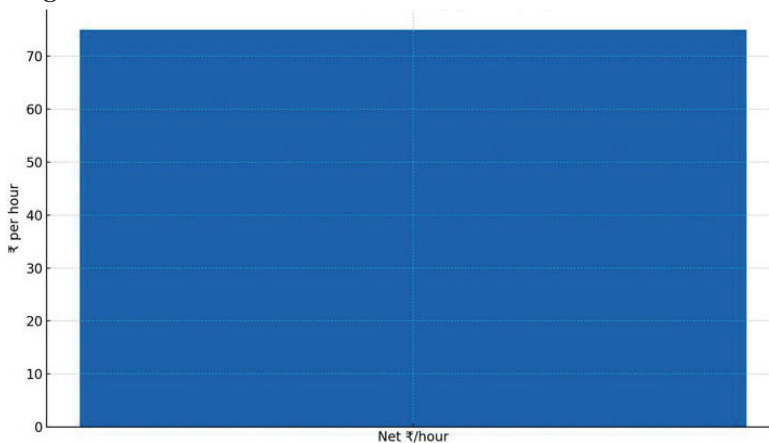
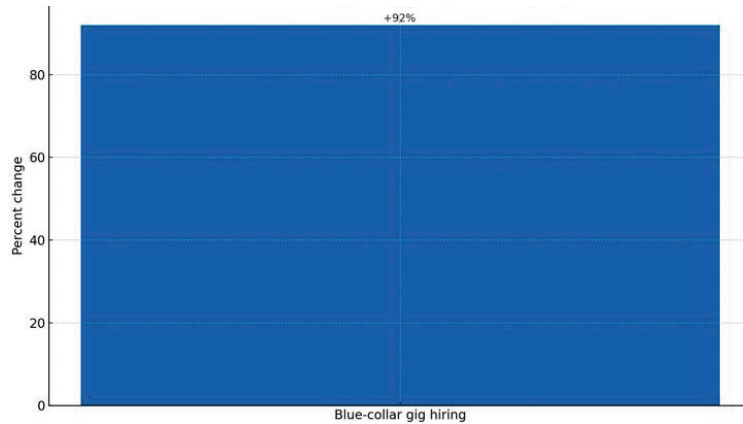


Figure 8: Net Hourly Earnings (IDInsite)

Blue-collar Gig Hiring Jump in 2024 (Economic Times): +92% YoY**Figure 9:** Blue-collar Gig Hiring Jump in 2024 (YoY)

1. **Scale and Structure:** NITI Aayog's policy brief (2022) places India's gig/platform workforce at 7.7 million in 2020–21, with a projection to 23.5 million by 2029–30. The skill mix is already diversified—47% mediumskill, 31% low-skill, 22% high-skill—implying policy must span both low- and high-touch services. This projection translates to an average annual addition of roughly 1.8–1.9 million workers through the late 2020s if growth is linear (Figure 3, 4 and 5).
2. **Labour Market Momentum:** Hiring signals underscore expansion: media reporting in 2024 points to a 92% year-on-year jump in blue-collar gig hiring, driven by e-commerce logistics and delivery. This suggests capacity constraints and high churn issues that portable benefits can mitigate (Figure 9).
3. **Who Are the Workers? (Delivery Platforms):** IDInsight's nationwide study (2024) of 2,500+ delivery drivers shows a predominantly male (<30% women), young (average 28 years) and migrant-friendly workforce. One-third are students, and most engage part-time with platforms, maintaining a portfolio of income sources. Motivations are mixed: household need is the one of the top reason, followed by better earnings relative to previous jobs and flexibility. (Its conceptually tied to Figure 6 & 7.)
4. **Earnings & Risks:** Among employees with profiles that are closer to full time working status, gross monthly revenues are approximately ₹27,814; their costs (fuel, maintenance) consume a fifth of this, resulting in a net income of approximately ₹18,761. Net hourly earnings have been near ₹75 with an average of 62 hours/week. This highlights the importance of fuel shock sensitivity and accident insurance and downtime cover (Figure 6 and 8).
5. **Gender and Inclusion:** Women's participation remains minuscule in delivery platforms (<30%). Investigative reporting also shows barriers in home services. Targeted interventions—women-first daytime shifts, safety bundles, transparent penalties, and childcare-aware scheduling—can improve access (Figure 7).
6. **Safety, Insurance and Claims:** Media accounts highlight accident risk, deactivations, and friction in insurance claims processing for delivery agents. Aggressive on-time metrics may push risky behaviour unless platforms internalise safety costs and streamline claims with time-bound service standards.
7. **Policy Interpretation:** Rajasthan operationalised a tripartite, transaction-funded model via a 1–2% welfare – an architectural template for others. Karnataka's ordinance specifies a 1–5%

welfare fee with quarterly remittance and a verification system. Tamil Nadu constituted a dedicated Board and is pairing it with targeted benefits (e-scooter subsidy, group insurance) and an incoming aggregator policy. Kerala and Telangana are moving draft bills through consultations. Delhi has initiated panels and budget allocation. Haryana and Maharashtra have publicly signalled bills/frameworks. Odisha and West Bengal have complementary unorganised-worker schemes that cover adjacent categories (drivers, migrants) and can be stepping stones to gig-specific frameworks.

8. **State-wise Policy:** The table below summarizes notable state actions specific to gig/platform workers or adjacent unorganized-worker welfare measures that directly affect gig workers. Statuses reflect information available up to August 2025; many are evolving.

State-wise Policy

<i>State</i>	<i>Instrument</i>	<i>Status (Aug 2025)</i>	<i>Year</i>	<i>Key Features</i>	<i>Indicative Source(s)</i>
Rajasthan	Rajasthan Platform-Based Gig Workers (Registration & Welfare) Act, 2023	Enacted law	2023	Tripartite Welfare Board; mandatory registration; welfare cess 1–2% per transaction; unique ID; fund & grievance redressal	Medianama 2023; Vidhi 2023; Uncomplicate PDF
Karnataka	Platform-Based Gig Workers (Social Security & Welfare) Ordinance/Bill	Ordinance in force; Board launch reported; draft rules expected	2025	Welfare fee 1–5% per transaction; quarterly remittance; aggregator/platform registration; Welfare Board & Fund	PRS 2025; ToI 2025; Khaitan 2025; Lexology 2025
Tamil Nadu	TN Platform-Based Gig Workers' Welfare Board (under TN Manual Workers Act)	Board constituted via Gazette (2023); low registration; new e-scooter subsidy & group insurance announced 2025; aggregator policy incoming	2023	Welfare Board, enrolment drive; group insurance; proposed bike/auto aggregator policy (2025)	TN Gazette 2023; ToI 2025; DTNext 2025
Kerala	Kerala State Platform-Based Gig Workers (Registration & Welfare) Bill, 2024	Government announced legislation in preparation; seminar & consultations	2024	Proposed registration, welfare board & fund; consultations with ILO	Medianama 2024; ILO note 2024
Telangana	Draft Telangana Gig & Platform Workers (Registration, Social Security & Welfare) Bill, 2025	Draft published for stakeholder feedback; welfare board plan announced	2025	Registration with unique IDs; Welfare Board; Welfare Fund; aggregator contributions	PRS 2025; Hindustan Times 2025; Telangana Labour Dept 2025

<i>State</i>	<i>Instrument</i>	<i>Status (Aug 2025)</i>	<i>Year</i>	<i>Key Features</i>	<i>Indicative Source(s)</i>
Delhi (NCT)	Decision to constitute Welfare Board; budgetary allocation	Panels formed; Rs 10 crore allocated to set up board and schemes	2025	Board to design social security, insurance; multi-stakeholder consultations	The Tribune 2025; New Indian Express 2025
Haryana	Haryana Gig Workers Welfare Board Bill, 2024 (proposal)	Government signalled tabling; state PR & reports indicate move	2024	Proposed state-level board for social security; insurance coverage	PR Haryana 2024; Gigpedia 2024; Haryana Story 2024
Maharashtra	Social Security Framework for Gig Workers (draft bill)	Framework announced; draft in preparation; to roll out by year-end (reports)	2025	Cess on platforms to finance fund; health & life insurance; pension; emergency assistance	All India Radio 2025; HRKatha 2025; Free Press Journal 2025
Odisha	Motor Transport Drivers & Workers Welfare Board (sectoral)	Operational driver welfare portal; benefits include insurance & assistance	2023	Registration; fee; claims; integration with state health/pension schemes	Odisha Driver Welfare portal; ToI 2023
West Bengal	Migrant Workers Welfare Fund; enhanced Labour Welfare Fund rates	Reserve fund created 2024; LWF contribution increased	2024	Focus on migrant/unorganised worker social security; groundwork relevant to gig workers	WB Labour Dept 2024; Tax at Hand 2024; ToI 2025

Source: Compiled from PRS Legislative Research, Medianama, *Times of India*, ILO, state government releases, and other public reports (2023–2025). Author’s own compilation (2025).

IMPORTANT FINDING FROM RESEARCH

- **Loopholes in the Law:** The majority of people within the gig workforce have no formal protections; lacking the status of an independent contractor does not include minimum wage law, health insurance, employment security.
- **Formalization of the platform:** Platforms modestify the informal work force, making it all too visible and unprotected.
- **Flexibility vs. Reality:** The factual flexibility is constrained by the algorithms and economic demands and obliges to work long hours and strict goals.
- **Motivation of the Workers:** Gig work satisfies lower needs such as urgent income-related needs but does not satisfy the needs on higher ranks, such as safety, a sense of belonging, and dignity.
- **Social Contract:** There is a need to have a sustainable structure that offers just wages, social security, dignity, without considering the types of employment.

RECOMMENDATIONS

Policy interventions towards creating a just and sustainable gig economy in India should not be based on holding incremental changes but a shift in the structural power imbalances primary in the platform model as highlighted by numerous labor studies (AICCTU, 2023; Fairwork India, 2024).

1. **Develop a “Dependent Contractor” Legal Identity:** Develop a separate legal status that acknowledges economic dependence of the gig workers upon the platforms without losing the flexibility in operations, thus allowing the core rights without the necessarily of being a full employee.

<i>Policy Roadmap (Action Steps)</i>	<i>Comparative Global Best Practices</i>	<i>Measurable Policy Indicators</i>
Phase 1: Legal Drafting (6 months): Conduct tripartite (Govt, Platform, Worker Union) consultations and draft a central White Paper defining “Dependent Contractor” criteria (e.g., control, exclusivity, income threshold).	Spain’s Rider’s Law (2021): Mandates the reclassification of delivery riders as employees and establishes a right to algorithmic transparency.	Classification Success Rate: 50% reduction in legal challenges over worker misclassification (YoY).
Phase 2: Legislative Action (12 Months): Introduce a central amendment to the Code on Social Security, 2020 (Government of India, 2020), to formally adopt the “Dependent Contractor” category.	California’s AB-5 (2020): Introduced the “ABC Test” (though later nuanced by Proposition 22 for some platforms), establishing strict criteria for independent contractor status.	Access to Justice: 75% of workers, who meet the new “Dependent Contractor” criteria, are registered with a state-level welfare fund within 2 years.
Phase 3: Implementation: Mandate that all platforms register their workers under this classification and provide a guaranteed minimum earnings floor (e.g., 1.2× State Minimum Wage, net of expenses), a key demand highlighted by Fairwork (2024).	EU’s Proposed Digital Platform Workers Directive: Proposes criteria to legally presume an employment relationship, shifting the burden of proof to the platforms.	Earnings Protection: Average hourly net earnings for low skill gig workers must exceed the national minimum wage by 20%.

2. **Universalise Portable Social Security and Risk Retaliate:** Have an all-inclusive, completely mobile social security net financed by compulsory and strata contributions on platforms and workers together with the government, as legislated under the code on Social Security (Drishti IAS, 2025).

<i>Policy Roadmap (Action Steps)</i>	<i>Comparative Global Best Practices</i>	<i>Measurable Policy Indicators</i>
Phase 1: Accident & Health Coverage (12 Months): Finalize and roll out the social security fund nationally, beginning with mandatory, no cost accident and health insurance for every registered worker.	Singapore’s Tripartite Workgroup: Proposed mandatory contributions by platforms and workers to the Central Provident Fund (CPF) for retirement planning and health coverage.	Coverage Rate: 90% of all registered gig workers covered by comprehensive health and accident insurance within 18 months of scheme launch.

<i>Policy Roadmap (Action Steps)</i>	<i>Comparative Global Best Practices</i>	<i>Measurable Policy Indicators</i>
Phase 2: Retirement & Income Protection (24 months): Implement a tiered contribution system (Platform 2%-5% of gross transaction value, Worker 1%, Government matching) to fund portable retirement (pension) and income protection (sick/ parental leave).	UK's Portable Benefits Proposal: Exploring a system where benefits are accumulated across platforms, often managed by a central body.	Financial Resilience: 80% of covered workers report having access to paid income support after 7 days of illness or injury, and the average claims processing time is less than 14 days.
Phase 3: State-Level Integration: Mandate that all state welfare boards (following the Rajasthan model) integrate with a national database to ensure portability of benefits when a worker moves state or switches platforms.	France's Unemployment System: Extended certain unemployment rights to self-employed workers whose businesses fail.	Benefit Portability: Zero reported loss of accrued benefits for a worker migrating between two major metropolitan areas (e.g., Delhi to Mumbai).

- 3. Create Algorithmic Accountability and Transparency:** Have a National Algorithmic Audit Body to make sure that automated management systems are both fair and non-discriminatory and offer a meaningful human-in-the-loop review process, addressing the loss of autonomy identified in digital labor studies (Wood et al., 2019).

<i>Action Steps</i>	<i>Comparative Global Best Practices</i>	<i>Measurable Policy Indicators</i>
Phase 1: Transparency Mandate (6 Months): Legislate a Right to Explanation for all workers concerning major algorithmic decisions (pay cuts, deactivation, work allocation).	EU's GDPR & Digital Services Act: Provides mechanisms for users (and often workers) to receive meaningful information about how automated decisions are made.	Transparency Index: 100% of platforms must publicly disclose key performance indicators (KPIs) and the logic models for pricing and deactivation within 1 year.
Phase 2: Independent Auditing (12 Months): Create an independent "Algorithmic Impact Assessment" (AIA) requirement, compelling platforms to submit their core algorithms (pricing, rating, deactivation) for annual audit by a government-mandated body.	New York City's Local Law 144 (2023): Requires employers using automated employment decision tools to conduct bias audits.	Deactivation Fairness: 50% reduction in successful worker appeals against unfair or opaque deactivations reported annually.
Phase 3: Grievance Redressal: Establish a dedicated, online National Digital Labor Tribunal offering workers a free, fast, and binding human review process for algorithmic punishments.	Spain's Rider's Law: Explicitly grants the right to access the relevant parameters and metrics used by algorithms affecting working conditions.	Grievance Resolution Speed: 95% of final algorithmic appeal decisions must be rendered within 30 days.

CONCLUSION

The Gig Economy of India is transforming not only the working patterns but also the social systems. It is an effective driver of change generating millions of livelihoods and altering the shapes of city life and work. On the one side, it offers a chance to establish a systemic precarity, in which workers are not covered by an effective legal and social safety net.

The current model of the gig economy in India, where the emphasis lies on growing this platform and consumer convenience coupled with disregards the human rights of the workers, is too short-lived.

According to the Maslow's Hierarchy of Needs the platform model is structurally incapable of supporting the basic human needs of safety, security and dignity in its present form. The legal fiction that workers are partners and are under extreme levels of algorithmic control is used to create a vast and unprotected labour pool.

The gig economy is not in a phase- it is the future of having non-standard working arrangements becoming more prevalent. The policies should be future oriented rather than response oriented. It demands the creation of a new social contract—one that is agile, portable, and universal, capable of protecting all workers regardless of their employment classification.

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Identifying Workplace Bullying: Antecedents, Drivers, Outcomes and Theoretical Perspectives on Employees' Well-being

Kirti¹, Hawa Singh² & Shweta Mittal³

¹Research Scholar, Department of Management, Gurugram university, Gurugram

²Assistant Professor, Department of Management, Gurugram university, Gurugram

³Faculty, Indian Institute of Public Administration, New Delhi

E-mail: kbagri83825@gmail.com, hawasingh@gurugramuniversity.ac.in,
f12shwetam@iima.ac.in

Abstract

Workplace bullying (WB) has emerged as a critical occupational health issue with severe implications for employees' well-being (EWB), organizational functioning, and societal outcomes. Early research mainly focused on victims, with limited attention to perpetrators until the early 2000s. More recent studies have expanded understanding by integrating mediators, moderators, and outcomes, though gaps persist in offender-focused perspectives and bystander dynamics. WB is generally defined as the persistent and deliberate infliction of harm, escalating from minor conflicts to severe victimization and is distinguished from other negative workplace behaviours due to its repetitive and destructive nature. Theoretical models such as the Job Demands–Resources (JD-R) theory, Work Environment Theory and Conservation of Resources (COR) theory provide explanatory frameworks for its causes and consequences. Global prevalence data reveal widespread occurrence, with particularly high rates in India. Consequences extend beyond victims, affecting perpetrators, bystanders and organizational outcomes, including reduced productivity. Trends in publication show that research is concentrated in countries like India, Spain, and China, with limited contributions from other regions, while recent years have witnessed a sharp increase in scholarly interest. The systematic literature review highlights bullying as a systemic issue shaped by organizational, cultural, and personal factors, yet prevention strategies remain fragmented. Future research should address offender-focused perspectives, culturally sensitive interventions and bystander roles to develop more comprehensive frameworks for prevention.

Keywords: Workplace Bullying, Employees' Well-being, SLR, ADO

INTRODUCTION

Workplace bullying (WB) is increasingly recognized as a pervasive form of psychological violence that undermines both individual and organizational outcomes. It is defined as deliberate and repeated harm physical, emotional, social, or psychological that victims cannot easily defend themselves against (Saka et al., 2023; Hamre et al., 2022). Unlike rudeness or abusive supervision, WB is persistent and often escalates into severe victimization supported by unequal power dynamics (Farley et al., 2023). Behaviors range from harassment and exclusion to excessive workloads and status undermining, all of which create toxic work environments that damage morale, health, and productivity (Mokgolo & Barnard, 2019).

Initially, research on WB focused primarily on victims, but offender-focused studies only gained attention after 2003 (Özer & Escartín, 2023). Scholars have since explored antecedents, causes, and broader impacts, identifying frameworks such as the JD-R theory, work environment theory, and

socio-cultural perspectives to explain its emergence (Arshad et al., 2025; Blomberg & Rosander, 2022). Theoretical contributions highlight that WB arises from a mix of organizational flaws, high job demands, personal dispositions, and cultural factors. Prevalence studies reveal WB as a global issue, ranging from 7% to 51% worldwide (D'Cruz et al., 2021), with especially high rates in India (Vincent et al., 2022) and among healthcare professionals, such as nurses (Lu et al., 2023).

The consequences of WB extend to mental health problems such as stress, burnout, anxiety, depression, and even suicidal ideation (Gupta & Bakhshi, 2018; Rosander et al., 2022). Organizational outcomes include productivity loss, increased turnover, and reduced safety standards in healthcare (Holm et al., 2023). Beyond the victim perpetrator dynamic, bystanders play an important role, as most employees witness bullying but often fail to intervene due to fear of retaliation (Jönsson & Muhonen, 2022). This underscores WB as a systemic issue influenced by individual, organizational and cultural dimensions, requiring robust preventive frameworks.

- **RQ1:** How is workplace bullying (WB) defined and conceptualized across the literature, and how is it distinguished from other negative workplace behaviours?
- **RQ2:** What are the prevalence rates, patterns and contextual variations of workplace bullying across countries, sectors, and cultures?
- **RQ3:** What are the antecedents, mediators, moderators and outcomes of workplace bullying for victims, perpetrators, bystanders and organizations?
- **RQ4:** Which theoretical frameworks have been applied to explain workplace bullying and what insights do they provide into its causes and consequences?

LITERATURE REVIEW

Workplace bullying (WB) has been widely recognized as a serious occupational health issue that undermines employee well-being, organizational functioning, and broader social outcomes. Initially, research on WB primarily concentrated on victims, with studies on offenders only gaining attention around 2003 (Özer & Escartín, 2023). Since then, scholars have examined antecedents and causes more extensively, though mediators, moderators, and outcomes remain underexplored. This limited understanding of perpetrators has constrained effective interventions, but more recent longitudinal research and advanced methodologies provide deeper insights, suggesting that bullies themselves may experience social rejection, job losses, and even become targets, highlighting the reciprocal nature of the bully–victim relationship (Vranjes et al., 2023).

WB is typically defined as the deliberate and recurring infliction of harm, whether physical, emotional, social, or psychological, that victims cannot easily defend themselves against (Saka et al., 2023; Hamre et al., 2022). It often escalates from minor disputes to severe victimization, manifesting as harassment, devaluation, social exclusion, undermining of professional status, or excessive workloads (Hsu et al., 2019; Tuckey et al., 2023). Scholars distinguish bullying from rudeness or abusive supervision, emphasizing its persistent and destructive character, often supported by unequal power dynamics (Farley et al., 2023). Multiple frameworks have been used to categorize bullying behaviors, including work-related, person-related, and physical or threatening actions (Ariza-Montes et al., 2021; Erwandi et al., 2021). These behaviors, whether overt or covert, are sustained over time and create toxic workplaces that erode health, morale, and productivity (Mokgolo & Barnard, 2019; Rajalakshmi & Naresh, 2018).

Theoretical perspectives provide insights into why bullying occurs and how it affects employees. The Job Demands–Resources (JD-R) theory posits that bullying reduces job satisfaction and induces stress, anxiety, and depression by straining resources (Arshad et al., 2025). Similarly, demand

control and work demands–resources models highlight that high job demands combined with low resources exacerbate workplace stress and turnover, with bullying, rudeness, and interpersonal conflict worsening outcomes (Giorgi et al., 2015). Organizational perspectives, such as the work environment theory, attribute bullying to structural flaws like poor leadership and ambiguous roles, while individual disposition theory suggests that personal characteristics of victims and perpetrators shape experiences (Blomberg & Rosander, 2022). Cultural and contextual factors also influence perceptions of bullying and outcomes such as job satisfaction (Giorgi et al., 2015).

Global prevalence rates illustrate the widespread nature of WB. Estimates range from 7% to 51% worldwide (D’Cruz et al., 2021) with 10% of employees reporting occasional bullying and 3% reporting severe bullying (Blomberg & Rosander, 2022). In India, 46–55% of workers have experienced bullying, though research remains limited, particularly concerning its impact on family dynamics (Vincent et al., 2022). In New Zealand, around one in seven workers including those in Parliament report bullying, with both individual and organizational factors contributing to its emergence (Taris, 2022). Within healthcare, bullying is especially prevalent: 33.08% of nurses report experiencing it, often in forms such as isolation, intimidation, unjust treatment, and attacks on career reputation (Lu et al., 2023). These experiences contribute to psychological suffering, burnout, turnover, and even suicidal ideation, though this latter connection remains underexplored (Goh et al., 2022; Rosander et al., 2022). New nurses are particularly vulnerable, with bullying linked to stress, low job satisfaction, and turnover, though resilience can help them adapt (Alshawush et al., 2022). In Malaysia, hierarchical structures, stressful environments, and lack of support exacerbate bullying among healthcare workers, with risk factors such as gender, age, and shift work influencing exposure (Awai et al., 2021).

The consequences of WB are profound. It undermines emotional, cognitive, and physical health, leading to stress, trauma, burnout, chronic illness, sleep disorders, and heightened suicide risk (Gupta & Bakhshi, 2018; Rosander et al., 2022). In academia, it disrupts tenure processes, impedes career progression, and disproportionately affects female and marginalized scholars through biased evaluations and male-dominated committees (Hollis, 2022). In hospitality, bullying not only erodes job satisfaction but also contributes to emotional exhaustion and deviant workplace behaviours, particularly in high power-distance cultures like Pakistan (Hayat & Afshari, 2021). Across contexts, victims often adopt coping strategies such as feedback avoidance, which paradoxically worsen mental health outcomes (Elshaer et al., 2025). Moreover, bullying has been shown to affect not only individuals but also organizations, with reduced productivity, increased turnover, and compromised patient safety due to medical errors and infections (Holm et al., 2023).

While the victim perpetrator dynamic is central, bystanders play a critical role in the bullying process. Studies show that more than 80% of employees have witnessed bullying, with bystander responses ranging from constructive (defending the target) to destructive (supporting the bully or remaining passive) (Jönsson & Muhonen, 2022). In healthcare, bystander behavior directly impacts patient safety, with passive onlookers potentially exacerbating harm (Holm et al., 2023). However, fear of retaliation and normalization of cruelty often deter intervention, making bystanders secondary victims themselves.

Research also highlights moderating and mediating influences. Victim perception and self-identification shape the severity of bullying’s consequences (Gupta & Bakhshi, 2018), and job satisfaction may moderate outcomes (Giorgi et al., 2015). Psychological safety, though underexplored, may buffer negative effects by fostering trust and open communication (Elshaer et al., 2025). Contextual and individual differences, such as resilience among nurses (Alshawush et al., 2022), further affect how bullying impacts well-being.

Despite widespread recognition of bullying as a systemic issue, interventions remain largely individual-focused, emphasizing policies, training, or mediation, rather than addressing structural causes. Li et al. (2023) argue that suggestions such as regulating workloads or clarifying roles remain vague and difficult to implement in practice, reflecting a gap between organizational actions and empirical evidence. The International Labour Organization (ILO) Convention 190 (2019) represents an international acknowledgment of workplace harassment as a barrier to decent work (D'Cruz et al., 2021). Nevertheless, prevention strategies often lag behind research findings, leaving organizations reactive rather than proactive.

Taken together, the literature underscores workplace bullying as a pervasive form of psychological violence with wide-ranging individual, organizational, and societal consequences. It is rooted in power disparities and sustained by organizational failures, yet shaped by cultural, contextual, and personal factors. While theoretical models and prevalence studies provide a foundation, significant gaps remain in offender-focused research, bystander dynamics, and culturally sensitive interventions. Bridging these gaps is essential for developing robust prevention frameworks and fostering healthier, more equitable work environments.

The term employee wellbeing (EWB) refers to the whole physical and mental health of employees. It is acknowledged as a complex idea that has a big impact on organizational and individual results. EWB encompasses social, emotional, and physical components that represent workers' favorable opinions of their working environment. Because of the demanding and people-centered nature of their jobs, individuals in high-stress industries like hospitality often face a variety of stressors (Saito et al., 2025). A psychological condition characterized by contentment, happiness, and life satisfaction is called wellbeing. It includes mental wellness, emotional stability, and physical health and is impacted by personal circumstances and experiences. Improved job performance is closely linked to this level of wellbeing. Both hedonic (such as job satisfaction and good feelings) and eudaimonic (such as personal growth and self-fulfillment) characteristics are frequently used to evaluate employee wellbeing. A more comprehensive explanation of EWB is offered by an integrative model that takes into account psychological, occupational, and life welfare (Zhang et al., 2020).

Employee wellbeing combines psychological, physical, and social aspects to include overall experiences and functioning at work. It is frequently seen as a combination of mental health, work-related wellness, and life pleasure (Rahman et al., 2020). Happiness, life satisfaction, and efficient functioning are examples of valued human experiences that are generally included in the concept of wellbeing. Numerous studies have demonstrated a connection between job-related stress and deteriorations in wellbeing and health. Because it boosts engagement, productivity, and overall performance, employee wellness is essential to business success. Recent research emphasizes how crucial it is to recover from job-related stress, especially in light of how technology and constant connectivity have made it harder to distinguish between work and personal life. Psychological detachment can be hampered even by passive availability, like being on standby (Saud and Rice, 2024). Employee wellbeing, which includes the general quality of work life, was defined by the WHO in 1946 as a state that incorporates physical, mental, and social health not only the absence of illness. Autonomy, connections of support, and constructive criticism are all influencing elements. Both the personal and professional domains are affected by wellbeing, which is associated with improved performance, motivation, and creativity. Particularly in high-demand industries like banking, putting employee well-being first can lower organizational expenses, enhance health, and preserve competitiveness (Hung and Nguyen, 2025).

METHODOLOGY

The systematic literature review (SLR) was carried out following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This approach is regarded as a rigorous scientific method that minimizes potential errors and biases in the article selection process. Moreover, an SLR offers a comprehensive overview of the evolution of a research topic, supports reliable decision-making, highlights existing research gaps and outlines potential directions for future studies (Mittal et al., 2024).

Inclusion Criteria

To ensure the quality and relevance of the review, specific inclusion criteria were applied. Only studies published in English were considered, within a defined time frame 2014-2025 relevant to the research scope. The review included peer-reviewed journal articles, book chapters, and conference proceedings.

Articles Search Process

The articles for this review were collected from the Scopus database, including only studies published in English. The search was carried out using keywords in the title, abstract, and author keywords, focusing on “workplace bullying” and “employee well-being.” Initially, 57 articles were found. These were screened based on the time period 2014-2025, journal quality European Journal of Work and Organizational Psychology, Journal of Business Ethics and subject relevance Business, Management and Accounting, Social Sciences, Nursing and Psychology. Finally, 31 studies were selected for detailed review, ensuring the review is focused, relevant and reliable.

Analysis

A key step in any systematic review is the analysis and synthesis of the evidence from the selected articles. This evidence encompasses information such as the journal source, publication year, research methods, antecedents, consequences, moderators, mediators, and the theoretical frameworks used. It also includes key findings and identified research gaps. To organize the information effectively, the results from all included studies were summarized in a table, highlighting important details such as antecedents, consequences, mediators, moderators, and applied theories (S. Mittal et al., 2024).

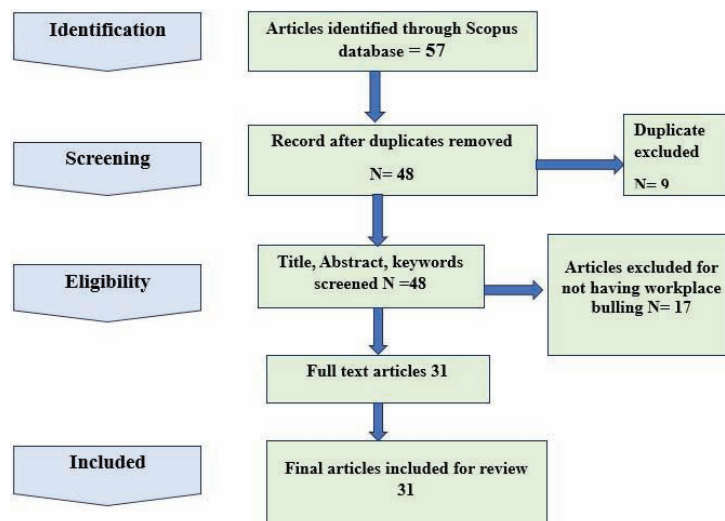


Table 1: Articles Included in the Review Process

<i>Authors and Year</i>	<i>Antecedents</i>	<i>Mediators</i>	<i>Moderators</i>	<i>Outcomes</i>	<i>Theory</i>
M.Z. Arshad et al.(2025)	Workplace bullying	Stress	NA	Employee well-being	Job Demands-Resources (JD-R) theory
S.Farley et. al. (2023)	Workplace bullying	NA	Personal resources (resilience, personality traits, coping styles), Social resources (co-worker support, workplace friendship), Organisational resources (psychosocial safety climate, organisational justice, perceived support), Leadership styles, Demographics	Employee well-being (psychological, physical, organisational)	Job Demands-Resources (JD-R) model
Odunjo-Saka et al. (2023)	Workplace bullying	Emotional intelligence, psychological resilience	NA	Employee performance	Socio-cultural theory
R. Gupta & A. Bakhs HI (2018)	Workplace bullying	Perceived victimization	Resilience	Employee well-being (mental health, work engagement)	Stress theory
Rodríguez-Muñoz. et al. (2020)	Workplace bullying	Rumination	NA	Emotional exhaustion, Partner social undermining	Cognitive Activation Theory of Stress (CATS)
Giorgi, Shoss & Leon-Perez (2015)	Fear of economic crisis, perceived non employability, Job demands, Lack of job control, Work-place bullying	NA	Demographics (sex, seniority, job status)	Job satisfaction, psychological distress	Job Demands-Control, Job Demands-Resources, Latent Deprivation Theory.
Elshaer et al., (2025)	Workplace bullying, Information flow about bullying	Feedback avoidance	Psychological safety	Employee well-being	Job Demands-Resources (JD-R) model, Conservation of Resources (COR) theory
Pitsia, O'Higgins Norman & Mazzone (2025)	Workplace bullying, Cyberbullying victimisation	NA	Sexual orientation (LGBQ+ vs. non-LGBQ+), Organisational culture, Team psychological safety	Psychological distress	Minority Stress Theory

<i>Authors and Year</i>	<i>Antecedents</i>	<i>Mediators</i>	<i>Moderators</i>	<i>Outcomes</i>	<i>Theory</i>
Hsu, Liu & Tsauro (2018)	Workplace bullying	NA	Organisational justice, Workplace friendship	Employee well-being (job satisfaction, psychological well-being)	Social Exchange Theory
Hayat & Afshari (2020)	Workplace bullying	Burnout	Perceived organisational support (POS)	Employee well-being	Conservation of Resources (COR) theory
G. Giorgi et al. (2014)	Workplace bullying	NA	Job satisfaction (moderates bullying–well-being link)	Job satisfaction (U-shaped), Psychological well-being (negative linear relationship)	Attributional model of bullying, Transactional Stress Theory
Mokgolo, M., & Barnard, A. (2019)	Workplace bullying (HR practitioner challenges: paradoxical role demands, lack of decision-making power, lack of support)	NA	Organisational support & policy effectiveness	HR practitioner functionality, organisational handling of bullying cases	Critical Realism; Constructivist Grounded Theory; Buridan's Ass (paradoxical role dilemma)
Nel, E.C., (2019)	Workplace bullying	NA	Emotional intelligence (personal resource)	Flourishing (psychological, social, emotional well-being)	Job Demands-Resources (JD-R) theory; Emotional Intelligence models
G. Özer and J. Escartín (2023)	Work environment factors (role ambiguity, organisational culture, team dynamics, leadership style, being bullied); Individual differences (personality traits, emotions, age, gender, health); Organisational change	Emotional exhaustion, Strain, Relationship conflict, psychological distress, Reparative actions	Empathy, Affectivity, Honesty–humility, Self-esteem, Psychological detachment, Coping styles, Job autonomy, Leadership quality, Conflict management style	Perpetration of workplace bullying, Employee stress, Well-being decline, Vicious cycles of bullying	Work Environment Hypothesis, Conservation of Resources (COR), Frustration–Aggression, Stressor–Emotion Framework, Social Learning Theory, Social Exchange Theory, Displaced Aggression Theory, Social Identity Theory

<i>Authors and Year</i>	<i>Antecedents</i>	<i>Mediators</i>	<i>Moderators</i>	<i>Outcomes</i>	<i>Theory</i>
Vranjes et al. (2022)	Enactment of workplace bullying (perpetrating bullying)	Relationship conflict with colleagues, Perceived control (sequential mediation)	Gender, sector (public/private), employment type (covariates)	Perpetrators becoming targets of workplace bullying	Conservation of Resources (COR) theory
K.Holm, S. Jönsson and T. Muhonen (2023)	Witnessed workplace bullying; Bystander roles (assistant, defender, outsider)	NA	NA	Perceived quality of care, Work engagement, Turnover intentions	Job Demands–Resources (JD-R) model
Lu et al. (2023)	Workplace bullying	NA	Covariates (somatic subhealth, sleep problems, anxiety, depression, income)	Suicide ideation, Suicide attempts	NA
Li et al. (2023)	Workplace bullying	Job demands & job resources	NA	Lower bullying, higher advocacy, better customer satisfaction, fewer complaints	Job Demands–Resources (JD-R) model, Grounded theory
Goh et al. (2022)	Workplace bullying: individual-level, organizational-level	NA	NA	Psychosocial well-being (stress, depression, burnout, reduced confidence, low motivation), Physical health (sleep issues, headaches, GI problems, cardiovascular symptoms, absenteeism), Work performance (errors, poor communication, reduced care quality), Organizational impact (turnover, attrition, negative work environment), Patient outcomes (falls, medication/treatment errors,	NA

<i>Authors and Year</i>	<i>Antecedents</i>	<i>Mediators</i>	<i>Moderators</i>	<i>Outcomes</i>	<i>Theory</i>
				complaints, mortality, reduced satisfaction)	
M. Rosander et.al, (2022)	Gender minority position + exposure to bullying	NA	Gender minority status (male in female-dominated workplaces; female in male-dominated workplaces)	Mental health problems (anxiety, depression)	Social Identity Theory , Social Role Theory, Cognitive Activation Theory of Stress (CATS)
Paul Vincent et al. (2022)	Family incivility	Psychological safety	Optimism, OBSE (Organization-Based Self-Esteem)	Workplace bullying	Conservation of Resources (COR) Theory, Work–Home Resources (WH-R) Model
Jönsson & Muhonen (2022)	Organizational culture, management deficiencies, social factors (fear of consequences, group dominance, normalization of bullying)	NA	NA	Bystander behaviour in workplace bullying (active, passive, constructive, destructive)	NA
M.R. Tuckey et al., (2023)	Workplace bullying	Preoccupying cognitions, stress	NA	Attention, Working memory	Resource Competition theory
Hamre et al., (2021)	Bullying behaviours	NA	Conflict Management Climate	Subsequent exposure to bullying	Escalation/ Bullying Process theory
Leah P. Hollis (2022)	Organizational policies (or lack thereof) and bullying intensity	NA	Gendered organizational context	Time spent strategizing against bullying; health problems; organizational distrust; career disruption (tenure/ promotion denial)	Gendered Organization Theory
Blomberg and Rosander (2021)	Workplace bullying intensity	Poor health	Perceived supportive leadership, co-worker support, active leadership	Exposure to bullying; self-labelled bullying; health outcomes	NA
M. Rosander et al (2022)	Workplace bullying	Job change (Stayers vs. Changers)	Sex (for anxiety outcomes)	Mental health outcomes: Anxiety and depression	Cognitive Trauma Theory, Cognitive

<i>Authors and Year</i>	<i>Antecedents</i>	<i>Mediators</i>	<i>Moderators</i>	<i>Outcomes</i>	<i>Theory</i>
					Activation Theory of Stress, Transactional Theory of Stress and Coping
C. Österman and M. Boström (2022)	Environment that trigger bullying or harassment.	Psychosocial stress/mental health, victimisation experience	Gender (women more vulnerable), employment type (temporary/contract), ethnicity, hierarchy position (cadet, junior officer), leadership quality	Physical health issues, mental health issues, increased job performance, impaired communication and collaboration, increased absenteeism and turnover, reduced safety compliance, organizational inefficiency	Workplace bullying and harassment theories, occupational stress models
A. Ariza-Montes et al., (2021)	Workplace bullying	NA	Social support	Presenteeism	Conservation of Resources (COR) Theory
Erwandi et al., (2021)	Workplace bullying	Psychosocial distress	NA	Satisfaction with life	Psychometric validation / measurement theory
Z. Yao et al. (2021)	Workplace Bullying	Emotional Exhaustion; Organization-oriented & Family-oriented Moral Disengagement	Perceived Forgiveness Climate	Unethical Pro-organizational Behaviour	Conservation of Resources (COR) theory; Moral Disengagement theory

Figure 2 presents the number of research papers published across different countries. The results show that India and Spain lead with the highest number of publications (13 each), followed by China (8), Australia (6), and South Africa and the UK (5 each). Countries such as Malaysia and Pakistan (4 each), Cyprus and Portugal (3 each), and Italy, Nigeria, and the USA (2 each) have moderate contributions. Meanwhile, Ireland and Thailand (1 each) show the lowest representation in terms of publications. This distribution highlights that research on the topic is concentrated in a few countries, particularly India, Spain, and China, whereas several regions remain underexplored. Such uneven geographical representation indicates opportunities for expanding future research to countries with limited contributions.

Figure 3 shows the trend of annual paper production from 2015 to 2025. The publication output was relatively low and inconsistent in the early years, with no papers published in 2016 and 2017, followed by a gradual increase between 2018 (2 papers) and 2020, which marked the first peak with

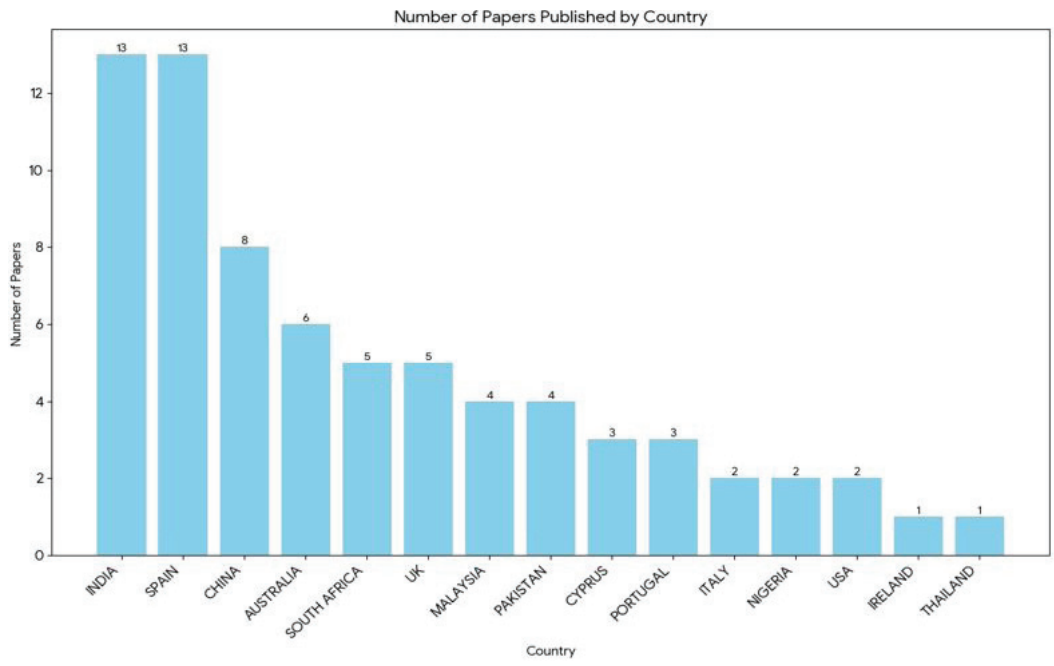


Figure 2: Country-wise Research Outcome

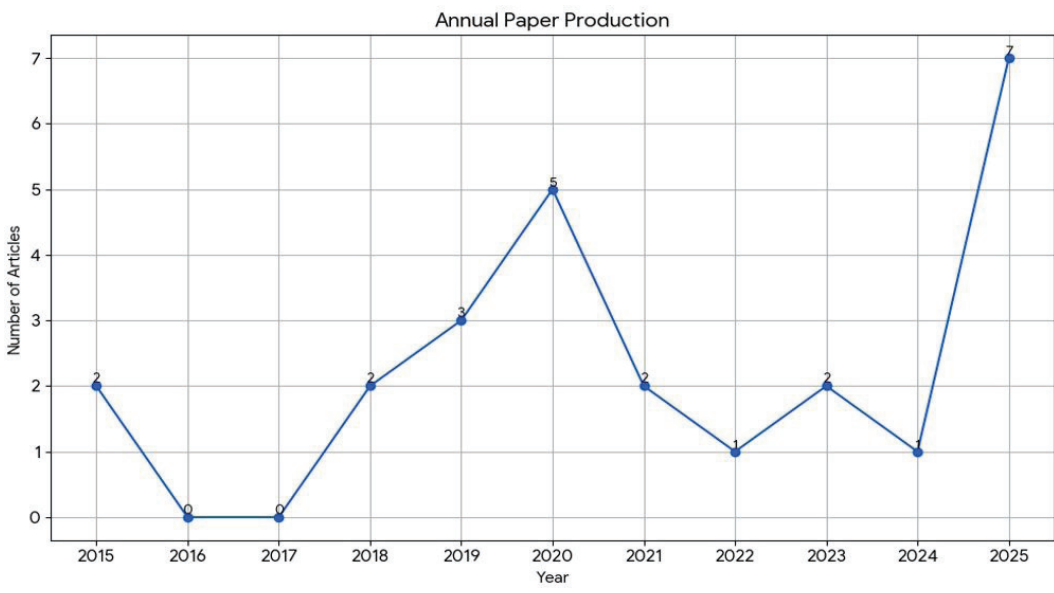


Figure 3: Publication Trend

5 papers. Afterward, there was a decline in 2021 (2 papers) and 2022 (1 paper), showing fluctuations in research activity. However, 2025 recorded the highest output with 7 papers, indicating a recent surge of academic interest in this area. This trend suggests that while research initially grew slowly, scholarly attention has significantly accelerated in recent years, particularly after 2023, reflecting the growing importance of the topic.

Analysis of Antecedents, Drivers, Outcomes (ADO)

Based on the analysis of content from WB literature, the current section identifies the ADOs for workplace bullying. The drivers and outcomes of WB are conceptualized at two levels: affective and behavioural (Schilpzand et al., 2016). Figure 4 shows the ADO structure of WB synthesised from literature.

WB Antecedents

Studies show that the antecedents of WB arise from multiple sources, including individual, organizational, and cultural contexts. Individual-level antecedents include personality traits such as aggressiveness, low empathy, and authoritarian attitudes (Blomberg & Rosander, 2022). Organizational antecedents are linked to toxic leadership, poor HR policies, weak role clarity, and high job demands (Hauge et al., 2010; Giorgi et al., 2015). At the cultural level, societal norms that tolerate hierarchy and aggression increase WB prevalence, particularly in collectivist or high power-distance contexts (Giorgi et al., 2015). Overall, while antecedents vary, they commonly create the conditions of power imbalance and conflict escalation that underpin WB.

WB Drivers

This section identifies the key drivers of WB which sustain its persistence and reinforce its negative effects at work (Einarsen et al., 2020). These drivers can be classified into behavioural and affective dimensions.

Behavioural Drivers

The major behavioural drivers identified in the context of WB include bystander inaction, organizational tolerance, psychological distress, and work disengagement. Bystander inaction occurs when employees witnessing WB remain silent due to fear of retaliation, indirectly legitimizing the bully's behaviour (Jönsson & Muhonen, 2022). Organizational tolerance, such as lack of strict anti-bullying policies or ineffective complaint mechanisms, further drives WB by signalling acceptance (Hoel & Cooper, 2000). Psychological distress manifesting as stress and anxiety erodes victims' resilience, perpetuating the cycle of bullying (Gupta & Bakhshi, 2018). Finally, work disengagement caused by WB reduces victims' performance and involvement, indirectly sustaining the negative climate (Holm et al., 2023).

Affective Drivers

The affective drivers of WB include emotional exhaustion, hopelessness, negative emotions, and burnout. Emotional exhaustion drains victims' emotional resources, reducing their capacity to resist or respond effectively (De Clercq et al., 2018). Hopelessness arises when targets feel powerless to change the situation, leading to resignation and passivity (Bai et al., 2020). Negative emotions such as fear, anger, and anxiety are common responses that spill over into interpersonal interactions, worsening the social environment (Sarwar et al., 2021). Burnout, as a long-term affective driver, weakens job satisfaction and contributes to absenteeism and turnover, thus deepening the harmful effects of WB (Maslach & Leiter, 2016).

WB Outcomes

The literature highlights the various outcomes of WB, which are majorly divided into affective and behavioural outcomes (Schilpzand et al., 2016). Affective outcomes include reduced job satisfaction, emotional strain, and mental health deterioration such as depression, anxiety, and suicidal ideation (Gupta & Bakhshi, 2018; Rosander et al., 2022). Behavioural outcomes are reflected

in counterproductive work behaviour, reduced organizational citizenship behaviour, and increased turnover intentions (Einarsen et al., 2020; Holm et al., 2023). Submissive behaviour has also been identified as a coping mechanism, where employees tolerate mistreatment without defense due to fear of escalation (Fatima et al., 2020). At the organizational level, WB leads to lower productivity, reputational harm, and weakened service outcomes, particularly in healthcare settings (Lu et al., 2023). Thus, WB not only affects individual well-being but also disrupts organizational sustainability and efficiency.

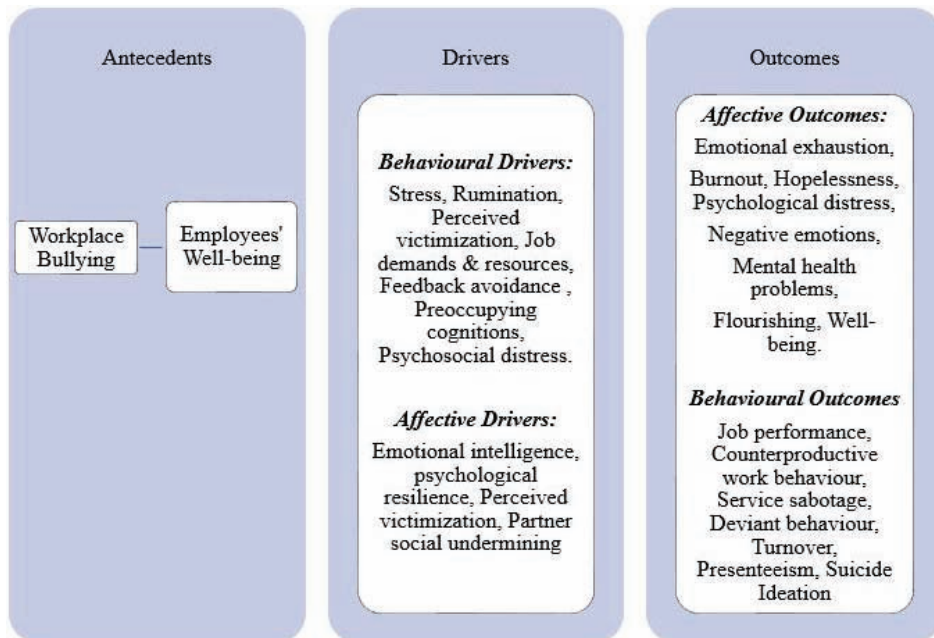


Figure 4: ADO Framework of Workplace Bullying

THEORETICAL FRAMEWORK OF WORKPLACE BULLYING

Workplace bullying (WB) is a complex phenomenon explained through multiple theoretical lenses that capture its individual, organizational, and socio-cultural dimensions. The Job Demands–Resources (JD-R) theory and Conservation of Resources (COR) theory highlight how bullying depletes employees’ emotional, cognitive, and social resources, leading to stress, burnout, and reduced well-being (Arshad et al., 2025; Elshaer et al., 2025; Hayat & Afshari, 2020). Work Environment Theory emphasizes organizational drivers such as poor leadership, ambiguous roles, and toxic cultures that facilitate bullying, while stress-based frameworks, including the Cognitive Activation Theory of Stress (CATS) and Transactional Stress Theory, explain the psychological strain and health consequences experienced by targets (Rodríguez-Muñoz et al., 2020; Rosander et al., 2022). Social and cultural perspectives, including Social Exchange Theory, Socio-cultural Theory, Minority Stress Theory, Social Identity Theory, and Moral Disengagement Theory, illustrate how workplace norms, power imbalances, minority status, and organizational values influence the prevalence and perception of bullying (Odunjo-Saka et al., 2023; Pitsia et al., 2025; Rosander et al., 2022; Yao et al., 2021). Complementary organizational and leadership frameworks, such as Gendered Organization Theory and Critical Realism approaches, account for structural factors, gendered contexts, and HR challenges that shape the emergence, management, and escalation of bullying behaviors (Hollis,

2022; Mokgolo & Barnard, 2019). Together, these theoretical perspectives provide a comprehensive understanding of WB, explaining its antecedents, affective and behavioral drivers, mediating and moderating mechanisms, and the wide-ranging consequences for victims, perpetrators, bystanders, and organizations.

DISCUSSION AND FINDINGS

This review reveals that workplace bullying (WB) is widely defined as intentional, repeated harm involving power imbalance, distinguishing it from other forms of workplace conflict. Prevalence rates vary globally, with higher incidence reported in India, Spain, China, and healthcare sectors, while publication trends indicate rising scholarly interest, peaking in 2025. Antecedents of WB include poor leadership, organizational flaws, and cultural norms, while consequences extend beyond victims who suffer stress, burnout, and mental health deterioration to perpetrators, who may face role reversal or job insecurity, and bystanders, who experience moral distress. At the organizational level, WB reduces productivity, increases turnover, and undermines service quality. Theoretical frameworks such as the Job Demands–Resources model, Conservation of Resources theory and Work Environment Theory explain WB's persistence, highlighting both individual and systemic drivers. Overall, findings emphasize WB as a global issue with severe personal and organizational costs, yet with research still uneven across contexts.

LIMITATIONS

Despite providing useful insights, this review has limitations. The analysis is constrained by the uneven distribution of studies across countries, with India, Spain, and China dominating publications while many regions remain underexplored. Methodological diversity across studies ranging from cross-sectional surveys to qualitative case studies limits comparability of results. Further, most studies focus heavily on victims, with limited attention to offenders, bystanders, or preventive organizational strategies, reducing the completeness of the findings.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

In conclusion, workplace bullying remains a critical global concern with significant personal and organizational repercussions. While research has expanded rapidly in recent years, gaps remain in offender-focused studies, cultural comparisons, and bystander intervention research. Future studies should prioritize cross-country analyses, explore longitudinal designs to capture causal pathways, and test proactive intervention frameworks that emphasize prevention rather than reaction. Expanding research into underrepresented regions and sectors will not only enrich theoretical development but also strengthen practical strategies to mitigate WB across diverse organizational contexts.

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From Evidence to Practice and Back: Exploring the Interplay of Organizational Climate and Job Satisfaction

Manisha¹ & Naveen Sirohi²

¹Research Scholar, Gurugram University, Gurugram

²Associate Professor, Indian Institute of Corporate Affairs, Manesar

Abstract

Organizational climate has emerged as determinant of employee attitudes, behaviors, and overall organizational performance. Similarly, job satisfaction significantly influences employee motivation, engagement, and retention. Despite research on both constructs, there remains a lack of comprehensive frameworks that integrate organizational climate and job satisfaction across diverse organizational contexts. This conceptual paper synthesizes existing theoretical and empirical literature to examine the dynamic and bidirectional relationship between organizational climate and job satisfaction. Drawing on theories such as the (JD-R) model, Affective Events Theory (AET), and Social Exchange Theory (SET), the paper explores how leadership, communication, support, recognition, and organizational culture shape employees' perceptions of climate and satisfaction. Furthermore, the paper highlights sector-specific evidence from education, healthcare, and corporate organizations, emphasizing contextual and cultural factors. The study proposes a comprehensive conceptual framework illustrating how organizational climate influences job satisfaction and organizational outcomes, while also identifying feedback mechanisms through which employee satisfaction reinforces a positive climate. By integrating theory and practice, this paper provides actionable perception for organizational leaders and human resource practitioners aiming to foster supportive work environments that increase employee well-being and organizational effectiveness.

Keywords: Organizational Climate, Job Satisfaction, Human Resource Management, Professional Development, Employee Motivation, Job Demands-Resources Model, Organizational Behavior

INTRODUCTION

In the contemporary organizational landscape, understanding the factors that influence employee well-being and performance has become increasingly important. Among these factors, organizational climate and job satisfaction stand out as critical elements that shape the work environment and employee outcomes. The collective attitudes and views of workers about their workplace, including elements like communication techniques, leadership philosophies, and organisational culture, are referred to as the organisational climate. Job satisfaction, on the other hand, pertains to the extent to which employees feel content with their roles, influenced by factors like role clarity, recognition, compensation, and work-life balance. A positive organizational climate, characterized by supportive leadership, transparent communication, and a collaborative culture, creates a psychological environment that fosters motivation, engagement, and productivity. On the other hand, an unfavourable environment characterised by uncertainty, a lack of assistance, and inadequate communication can result in stress, discontent, and decreased organisational efficacy.

Organizational climate is a dynamic construct that evolves with organizational changes, leadership styles, and external environmental factors. Leadership style, particularly transformational leadership, plays a pivotal role in shaping climate, as leaders who inspire and motivate employees tend to cultivate a more positive environment. Communication patterns also significantly influence

organizational climate; open and transparent communication fosters trust, collaboration, and a sense of inclusion. Furthermore, the broader organizational culture, reflecting shared values, beliefs, and norms, shapes employees' perceptions of their environment. A culture promoting fairness, recognition, and inclusivity enhances satisfaction, whereas a rigid or unsupportive culture can undermine it. The availability of organizational support, including resources, training, and guidance, further contributes to a positive climate, enabling employees to perform effectively and feel valued.

Employees' emotional reactions to their jobs and workplace are reflected in job satisfaction, a multifaceted construct. It is impacted by both extrinsic (such as pay, job stability, and working conditions) and intrinsic (such as meaningful work, personal development, and the sense of accomplishment gained from activities) elements.

In addition, work-life balance plays a crucial role in shaping satisfaction, as employees who can manage personal and professional responsibilities effectively are more likely to experience positive attitudes toward their jobs. Research consistently demonstrates that employees who perceive their work environment positively tend to report higher levels of job satisfaction, which, in turn, contributes to increased motivation, commitment, and organizational loyalty.

A supportive organizational climate enhances job satisfaction, while satisfied employees contribute to a more positive perception of the climate. For instance, employees who feel recognized, valued, and fairly treated may view leadership behaviors and organizational norms more favorably, reinforcing a positive climate. Conversely, dissatisfaction can generate negative perceptions, creating a cycle that impacts overall performance and engagement. Several theoretical frameworks help explain this interplay. The Job Demands-Resources (JD-R) model highlights the balance between resources and job demands, emphasizing how organizational support can mitigate stress and promote satisfaction. Affective Events Theory (AET) suggests that workplace events trigger emotional reactions that influence attitudes and performance, highlighting the role of climate in shaping emotional responses. Social Exchange Theory (SET) further underscores the reciprocal nature of relationships, positing that fair treatment and support from the organization elicit positive employee behaviors and satisfaction.

Organizations looking to improve employee performance and well-being must comprehend how job satisfaction and organizational climate interact. By identifying the factors that contribute to a positive climate and high satisfaction, organizations can implement targeted interventions to improve these outcomes. Such efforts not only increase employee engagement and retention but also strengthen organizational performance and sustainability. This study aims to integrate existing research into a comprehensive framework that highlights the cyclical relationship between organizational climate and job satisfaction, providing both theoretical insights and practical guidance. By bridging research and practice, the framework offers actionable strategies for leaders and human resource practitioners to cultivate environments that promote satisfaction, engagement, and overall organizational success.

1. To examine the impact of organizational climate on employee job satisfaction.
2. To analyze the theoretical and empirical linkages between organizational climate and job satisfaction.
3. To develop a conceptual understanding of how organizational climate influences job satisfaction based on existing literature

LITERATURE REVIEW

An institution's shared views of its policies, practices, and procedures are known as its organisational climate, and they have a significant impact on how its employees behave, think, and feel (Schneider

et.al, 2013). In educational institutions, particularly in rural or resource-constrained settings, organizational climate significantly affects teacher motivation, job satisfaction, and retention. Teachers' perceptions of leadership support, communication quality, trust, and recognition influence not only their professional commitment but also their psychological well-being and performance. Understanding the mechanisms through which organizational climate affects job satisfaction is therefore essential for improving institutional effectiveness and teacher retention (Aryee, Budhwar, & Chen, 2002). This literature review integrates theoretical and empirical perspectives to achieve three objectives: first, it will examine the relationship between employees' job satisfaction and organizational climate; second, it will examine the theoretical and empirical links between job satisfaction and organizational climate; and third, it will conceptualize the relationship between job satisfaction and organizational climate based on the body of existing literature. For many years, a major focus of organizational study has been the relationship between work satisfaction and organizational climate. According to Litwin and Stringer (1968), motivation and general satisfaction are greatly influenced by the organizational climate, which reflects how people view their workplace.

They emphasized that a positive climate, characterized by clear communication, participative decision-making, and supportive leadership, enhances employee satisfaction, while a negative climate, characterized by ambiguity, lack of recognition, or authoritarian leadership, diminishes it. This foundational work laid the groundwork for subsequent research examining the direct link between organizational climate and job satisfaction in diverse contexts.

Empirical studies support this assertion. Kuo (2011), in a study of educational institutions, found that teachers' perceptions of a supportive leadership climate were significantly associated with higher job satisfaction. Similarly, Parker, Axtell, and Turner (2001) demonstrated that workplace autonomy, effective communication, and supervisor support positively influence employees' psychological well-being and satisfaction. (Aryee, Budhwar, & Chen, 2002) highlighted in their study of healthcare organizations that the relationship between climate and work outcomes, including job satisfaction, was mediated by faith in organizational procedures. These results demonstrate that organizational environment affects work satisfaction through a variety of intricate processes, including perceived organizational support, empowerment, and trust, in addition to having a direct impact.

In educational contexts, these dynamics are particularly important. Teachers in rural or under-resourced schools often face high job demands, limited resources, and administrative challenges. Research suggests that a supportive climate—characterized by collaborative practices, professional development opportunities, and clear communication—can mitigate the negative effects of these demands and enhance job satisfaction (Schneider et al., 2013). Conversely, environments marked by role ambiguity, lack of recognition, and ineffective leadership contribute to dissatisfaction, turnover intentions, and decreased institutional performance. This body of evidence confirms the critical importance of examining organizational climate as a determinant of employee job satisfaction, particularly in educational settings.

Several theoretical frameworks provide insights into the relationship between organizational climate and job satisfaction. The *Job Demands-Resources (JD-R) model* posits that organizational resources, such as supportive leadership, role clarity, and autonomy, can buffer the inverse effects of job demands and enhance employee well-being, including satisfaction (Bakker & Demerouti, 2007). According to this model, resources not only reduce stress and burnout but also enhance motivation and engagement, which in turn influence job satisfaction. The JD-R model has been widely applied in educational research, where teachers face high emotional and cognitive demands, to explain how a supportive climate can mitigate stress and improve satisfaction (Bakker & Demerouti, 2007).

Herzberg's Two-Factor Theory also provides a relevant theoretical lens. In 1959, Herzberg, Mausner, and Snyderman identified hygiene factors (like working conditions and policies) and motivators (like performance, responsibility, and acknowledgment) that affect job satisfaction. According to this framework, positive organizational climate elements like encouraging leadership, clear communication, and recognition serve as motivators that raise employee satisfaction, while unfavorable climate elements like unclear policies or poor communication serve as hygienic shortcomings that result in discontent. This theory offers a fundamental comprehension of the reasons for the strong correlation between certain aspects of the organizational and educational atmosphere and job satisfaction.

Social exchange theory further enriches this theoretical understanding. According to Aryee et al. (2002), employees reciprocate positive organizational treatment with enhanced commitment, motivation, and satisfaction. Trust in leadership and fairness in organizational procedures strengthens this reciprocal relationship, demonstrating that organizational climate not only provides environmental resources but also shapes employees' perceptions of fairness, recognition, and support, which in turn influence their satisfaction.

Empirical studies across sectors corroborate these theoretical linkages. Schneider, Ehrhart, and Macey (2013) synthesized research showing that positive organizational climates predict higher levels of employee engagement, satisfaction, and performance. In education, teachers who perceive supportive leadership, clarity in roles, and opportunities for professional growth report higher satisfaction levels, increased organizational commitment, and greater retention intentions (Kuo, 2011; Parker et al., 2001). Aryee et al. (2002) found that trust functions as a mediator in the climate–satisfaction relationship. When employees perceive organizational procedures as fair and transparent, trust increases, enhancing job satisfaction. This finding is particularly relevant in educational institutions, where teachers' satisfaction may be influenced not only by direct support from leadership but also by broader perceptions of institutional fairness, policies, and recognition. Bakker and Demerouti (2007) demonstrated that organizational resources such as autonomy, social support, and participation in decision-making mitigate job demands, reduce burnout, and enhance job satisfaction. In rural educational contexts, where teachers often face high workloads and limited resources, these organizational supports are critical in maintaining satisfaction and performance.

A growing body of research in education highlights specific climate dimensions that influence teacher satisfaction. Leadership support, collegial collaboration, opportunities for professional growth, role clarity, and recognition emerge consistently as significant predictors of satisfaction (Schneider et al., 2013; Kuo, 2011). Conversely, role ambiguity, lack of support, limited resources, and ineffective communication are consistently associated with dissatisfaction and turnover intentions. These empirical findings validate theoretical frameworks such as JD-R and Herzberg's Two-Factor Theory and demonstrate that organizational climate is a robust predictor of job satisfaction across multiple contexts.

Synthesizing theoretical and empirical evidence allows the development of a conceptual understanding of how organizational climate influences job satisfaction. Organizational climate can be understood as comprising multiple dimensions: *Leadership Support*, *Role Clarity*, *Communication Quality*, *Trust*, and *Recognition*. These dimensions function as organizational resources that influence psychological states such as perceived control, self-efficacy, and motivation, which in turn affect job satisfaction (Bakker & Demerouti, 2007; Schneider et al., 2013).

Mediating factors such as *psychological empowerment*, *perceived organizational support*, and *trust in organizational procedures* explain how climate dimensions translate into satisfaction

outcomes (Aryee et al., 2002). Moderating factors such as institutional type, resource availability, rural versus urban settings, and job demands influence the strength of these relationships. For instance, supportive leadership may have a stronger impact on job satisfaction in under-resourced rural schools than in urban schools with abundant resources, highlighting the context-dependent nature of these relationships (Kuo, 2011; Parker et al., 2001).

Employee attitudes and job satisfaction have been found to be significantly influenced by organizational climate, which is the collective view of policies and processes inside a company. A well-organized workplace is crucial for promoting employee engagement, motivation, and general well-being, according to recent study (Schneider, Ehrhart, & Macey, 2013). Across diverse sectors—including healthcare, education, social services, and civil administration—studies conducted between 2023 and 2025 indicate that organizational climate significantly affects employees' job satisfaction, both directly and indirectly, through factors such as trust, psychological empowerment, leadership support, and role clarity (Santana, 2023; Jianchun, 2024; Xia, 2024). These findings underscore the necessity of understanding the nuanced dynamics of organizational climate to increase employee satisfaction and institutional effectiveness. The subsequent review of recent literature provides a detailed synthesis of these findings and illustrates how organizational climate operates across different organizational contexts.

Table 1

<i>Author(s) & Year</i>	<i>Study Context</i>	<i>Key Focus</i>	<i>Findings</i>	<i>Link to Job Satisfaction</i>
Santana, S. (2023)	Healthcare organizations	Organizational climate & job satisfaction dynamics	Highlighted the need for systematic evaluations and identified research gaps on work satisfaction and organizational climate in healthcare settings.	Highlights the importance of understanding the relationship between OC and job satisfaction in healthcare
Jianchun, Y. (2024)	General organizational settings	Effect of organizational climate on employee happiness and job satisfaction	Found that a supportive organizational climate is a key instrument for improving employees' happiness and job satisfaction	shows how corporate atmosphere directly affects job satisfaction.
Xia, W. (2024)	Kindergarten education	Organizational climate, occupational stress, emotional labor, and job satisfaction	Demonstrated how occupational stress caused by organizational environment has an indirect impact on teachers' job satisfaction.	Examines how stress and emotional labor mediate the link between climate and satisfaction.
Almeida, M. C. D. S. (2023)	Nursing profession	OC and job satisfaction's relation to burnout	Found strong positive correlation between job satisfaction and climate; moderate negative correlation between burnout dimensions and both	Indicates that a positive organizational climate can reduce burnout and enhance job satisfaction

<i>Author(s) & Year</i>	<i>Study Context</i>	<i>Key Focus</i>	<i>Findings</i>	<i>Link to Job Satisfaction</i>
Shabila, S. A. (2025)	Civil service sector	job engagement, and satisfaction Organizational climate	Shown that the association between organizational climate and job engagement is mediated by job satisfaction.	Draws attention to how work satisfaction acts as a mediator in the relationship between climate and involvement.
Janiukštis, A. (2024)	Social service centers and schools	Impact of organizational climate on employee well-being and workplace relationships	Showed that improving organizational climate contributes to employee well-being and reduces negative behaviors like harassment	Highlights how organisational climate has a wider impact on overall employee well-being and satisfaction
Vidak, M. (2024)	University setting	Perception of OC by staff and students	Explored how employees and students perceive organizational climate and its consequences	Emphasizes how crucial organizational atmosphere is in determining job satisfaction in educational settings.

The review of recent studies highlights that organizational climate consistently influences employee job satisfaction across a wide range of organizational settings. Positive climate dimensions—including leadership support, clear communication, recognition, and opportunities for professional growth—enhance employee motivation, reduce occupational stress, and foster higher satisfaction levels (Almeida, 2023; Shabila, 2025; Janiukštis, 2024). Conversely, negative climates marked by ambiguity, lack of support, and poor communication adversely affect job satisfaction and contribute to burnout and disengagement. Synthesizing these findings allows the development of a conceptual understanding of how organizational climate functions as the determinant of job satisfaction, highlighting mediating and moderating mechanisms such as trust, engagement, and institutional context (Lo, 2024; Vidak, 2024). This comprehensive overview not only validates theoretical and empirical linkages but also provides a strong foundation for developing strategies to improve employee satisfaction and organizational performance in various sectors. This conceptual understanding integrates theoretical and empirical insights, providing a foundation for developing a literature-based framework that illustrates the pathways through which organizational climate affects job satisfaction in educational settings. It highlights that organizational and environmental factors have a significant impact on job satisfaction, which is not solely determined by personal characteristics. This highlights the significance of organizational climate as a determinant of institutional performance and employee well-being.

RESEARCH METHODOLOGY

In order to investigate the effect of organisational climate on employee job satisfaction, analyse the theoretical and empirical connections between these variables, and establish a conceptual understanding based on existing literature, this study employs a theoretical and conceptual research strategy. Given the focus on synthesizing prior research rather than collecting primary data, a

systematic literature review was employed as the primary methodological strategy. A systematic review allows the identification, evaluation, and integration of relevant studies across multiple disciplines, providing a comprehensive understanding of how organizational climate influences job satisfaction in diverse organizational contexts, including educational institutions, healthcare, civil service, and service industries (Tranfield, Denyer, & Smart, 2003).

The process began with defining the research objectives and developing inclusion and exclusion criteria for selecting relevant literature. Peer-reviewed journal articles, conference papers, and authoritative reports published between 2000 and 2025 were considered, with a focus on the most recent studies from 2023–2025 to ensure contemporary relevance. Keywords such as “organizational climate,” “job satisfaction,” “employee well-being,” “leadership support,” “workplace engagement,” and “educational institutions” were used to search academic databases, including Scopus, Web of Science, PubMed, BMC Psychology, Frontiers in Psychology, MDPI, and Science Direct. Data extraction involved systematically recording key information from each study, including author(s), year of publication, study context, sample characteristics, research focus, methodology, findings, and the identified linkages between OC and job satisfaction. Both quantitative and qualitative studies were considered, as well as theoretical frameworks such as the Job Demands-Resources (JD-R) model, Herzberg’s Two-Factor Theory, and social exchange theory. Particular attention was paid to identifying the dimensions of organizational climate that significantly influence job satisfaction, including leadership support, role clarity, communication quality, trust, recognition, and opportunities for professional development.

The synthesis of literature was carried out using thematic analysis, grouping findings under key themes such as the impact of climate on satisfaction, mediating and moderating mechanisms, sector-specific variations, and conceptual frameworks proposed in previous studies. Thematic analysis enabled the integration of findings across studies with diverse methodologies, highlighting consistent patterns, gaps in the literature, and areas requiring further research. Additionally, a literature review table was created to provide a concise overview of recent studies (2023–2025), illustrating the relevance, focus, and key findings of each study in relation to the research objectives.

Overall, this methodological approach allowed for a rigorous and systematic examination of the literature, ensuring that the study’s findings are grounded in robust theoretical and empirical evidence. By synthesizing knowledge across multiple disciplines and contexts, the study not only achieves its objectives of understanding the impact and linkages between organizational climate and job satisfaction but also develops a conceptual understanding that can guide future research and practical interventions in educational and organizational settings.

CONCLUSION

In a variety of organizational environments, employee attitudes, behaviors, and general job satisfaction have been found to be significantly influenced by the organizational climate. Examining how organizational environment affects employee work satisfaction, examining theoretical and empirical connections, and developing a conceptual understanding based on existing literature were the objectives of this study. It is clear from a thorough analysis of contemporary and historical research from the healthcare, education, public services, and service sectors that organizational environment has a big impact on worker motivation, engagement, and general well-being. Positive organizational climates, which are defined by clear communication, supportive leadership, trust, recognition, and opportunities for professional development, have been shown in the literature to improve employees’ psychological well-being, lower occupational stress, and increase job satisfaction. (Jianchun,

2024; Xia, 2024; Schneider, Ehrhart, & Macey, 2013). Conversely, negative climates, marked by role ambiguity, lack of support, ineffective communication, and poor leadership, contribute to dissatisfaction, burnout, and disengagement, which in turn affect organizational performance and employee retention (Parker, Axtell, & Turner, 2001; Almeida, 2023).

A comprehensive explanation of the relationship between organizational environment and job satisfaction is offered by the integration of many theoretical frameworks, such as the Job Demands-Resources model, Herzberg's Two-Factor Theory, and social exchange theory. According to the JD-R model, organizational resources including autonomy, supportive leadership, and participatory decision-making improve employee well-being and reduce the negative effects of job demands, which in turn raises employee satisfaction (Bakker & Demerouti, 2007). Herzberg's approach emphasizes how important organizational climate-based motivators like performance and recognition are in raising job satisfaction, while their absence leads to discontent (Herzberg, Mausner, & Snyderman, 1959). According to social exchange theory, which adds a relational component, workers who receive favorable treatment from their employers are more dedicated, motivated, and satisfied (Aryee, Budhwar, & Chen, 2002). Collectively, these frameworks reinforce the understanding that organizational climate influences satisfaction both directly and indirectly, through mediating factors such as trust, perceived organizational support, and psychological empowerment.

These theoretical connections are supported by empirical data from the last 20 years, especially from more recent research done between 2023 and 2025. To better understand its effect on employee happiness, Santana (2023), for example, highlighted the importance of organizational environment in healthcare organizations and the necessity for rigorous reviews. While Xia (2024) showed how stress and emotional labor play a mediating role in the relationship between climate and satisfaction among kindergarten instructors, Jianchun (2024) discovered that a supportive organizational climate directly increases employees' happiness and job satisfaction. Almeida (2023) highlighted the negative correlation between burnout and satisfaction, emphasizing the protective role of positive organizational climates. In civil service contexts, Shabila (2025) reported that job satisfaction mediate the relationship between climate and job engagement, while Janiukštis (2024) found that improvements in organizational climate reduce negative behaviors and enhance overall employee well-being in schools and social service centers. Lo (2024) and Vidak (2024) further confirmed that organizational climate indirectly affects job satisfaction by influencing engagement, commitment, and interpersonal relationships within organizations.

A critical insight from this review is that organizational climate is multidimensional, with specific elements—leadership support, role clarity, communication quality, trust, recognition, and professional development opportunities—playing pivotal roles in shaping employee satisfaction. These dimensions not only directly impact job satisfaction but also interact with mediating and moderating factors, including psychological empowerment, institutional context, and resource availability. For example, supportive leadership may have a more pronounced effect on job satisfaction in under-resourced rural schools compared to urban institutions with abundant resources (Kuo, 2011). Similarly, trust and perceived organizational support mediate the translation of climate into satisfaction, highlighting the complex and context-dependent nature of these relationships.

The conceptual understanding established from this literature evaluation provides a thorough framework for analyzing how organizational climate promotes job satisfaction. It emphasizes how important it is to create organizational policies and procedures that foster a pleasant atmosphere, especially in governmental and educational institutions where employee performance, motivation, and retention are critical. The study highlights actionable aspects of climate that organizations can focus

on to improve job satisfaction by combining insights from theoretical models and empirical research. These include encouraging open communication, encouraging leadership, implementing recognition programs, and providing opportunities for professional growth. In conclusion, organizational climate is a crucial predictor of employee work satisfaction in a variety of circumstances, according to findings from both historical and contemporary literature. While negative climates result in discontent, attrition, and decreased organizational effectiveness, positive climates increase engagement, decrease burnout, and improve satisfaction. This study offers a strong conceptual understanding of the relationship between climate and satisfaction by combining theoretical frameworks and empirical data, providing insightful information for scholars, practitioners, and policymakers. The results emphasize that in order to maximize employee satisfaction, well-being, and overall institutional performance, supportive, open, and empowering organizational settings must be fostered. Future research could extend this conceptual framework by incorporating longitudinal and cross-cultural studies, as well as exploring additional mediating and moderating factors, to further enhance our understanding of organizational climate and its impact on job satisfaction.

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Between POSH and #MeToo: Awareness, Trust, and Reporting Preferences of Students and Young Professionals

Pinky Kharata¹ & Ritika Choudhary²

¹Research Scholar, School of Emerging Media and Creator Economy, K.R. Mangalam University

²Assistant Professor, School of Emerging Media and Creator Economy, K.R. Mangalam University

E-mail: pinkysingh263@gmail.com

Abstract

This study examines how Indian students and young professionals navigate between formal legal frameworks and digital activism when responding to sexual harassment. Focusing on the Protection of Women from Sexual Harassment at Workplace (POSH) Act, 2013 and its Internal Complaints Committees (ICCs), it measures awareness levels, trust in institutional redressal, and preferred reporting platforms. Quantitative approach was adopted with a structured online survey of 400 participants. Statistical tools such as cross-tabulations and Chi-square tests were used to identify associations between awareness, trust, and reporting preferences. The findings indicate that while a majority of respondents are aware of POSH provisions, confidence in ICCs remains uneven, often limited by concerns about confidentiality, procedural delays, and perceived institutional bias. In contrast, digital campaigns such as #MeToo and #MenToo are viewed as faster, more visible, and emotionally supportive, yet inadequate in ensuring formal justice. The results highlight a persistent tension between legal credibility and social solidarity, underscoring the need to strengthen awareness initiatives, procedural transparency, and trust-building within institutional mechanisms while responsibly integrating digital advocacy into India's evolving framework of gender justice.

Keywords: POSH Act, #MeToo, #MenToo, Sexual Harassment, Reporting Preferences, Indian Youth, Digital Activism

INTRODUCTION

- **POSH (Prevention of Sexual Harassment Act):** The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 commonly known as the POSH Act is a legislative framework enacted by the Government of India to ensure protection against sexual harassment at workplaces and to provide redressal for complaints. It defines sexual harassment and mandates the creation of Internal Complaints Committees (ICCs) in organizations with more than ten employees (Ministry of Law and Justice, Government of India, 2013).
- **ICC (Internal Complaints Committee):** Under Section 4 of the POSH Act, every employer is required to constitute an Internal Complaints Committee (ICC) at each office or branch. The ICC is responsible for receiving and addressing complaints of sexual harassment in the workplace. It serves as the primary institutional mechanism for implementing the Act's provisions (Ministry of Law and Justice, Government of India, 2013).
- **#MeToo Movement:** The #MeToo movement is a global campaign against sexual harassment and assault that gained widespread attention in October 2017, when survivors began sharing personal experiences of misconduct using the hashtag “#MeToo” on social media. Originally founded in 2006 by activist Tarana Burke to support survivors of sexual violence, the movement evolved into a global digital uprising highlighting gendered power imbalances, workplace harassment, and the need for accountability (Burke, Mendes, Ringrose, & Keller, 2019).

The discourse on workplace harassment has evolved considerably over the past two decades, with global and local movements highlighting the urgency of gender justice and institutional accountability. The #MeToo movement, first coined by Tarana Burke in 2006 and brought to global attention in 2017, foregrounded the experiences of survivors and reshaped the way sexual harassment is discussed publicly (Fileborn & Loney-Howes, 2019). In India, the debate on sexual harassment at workplaces predates #MeToo, especially with the enactment of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013, widely known as the POSH Act. The legislation mandated the formation of ICCs to address complaints within institutions, reflecting an attempt to embed grievance redressal within formal structures of law and policy (Sankaran & Madhav, 2020). Yet, the intersection of legal provisions and digital activism remains contested, raising questions about how young people negotiate trust and awareness between these two avenues.

The Indian landscape of gender activism has been deeply intertwined with social media mobilization, particularly following the 2012 Delhi gang rape, which sparked widespread protests both on the streets and online. Hashtags such as #Nirbhaya and later #MeTooIndia enabled citizens to demand reforms and expose structural failures in policing and justice systems (Poell, 2015). These online campaigns also inspired more localized initiatives, such as #BoardTheBus and #HappyToBleed, which drew attention to spatial harassment, mobility, and women's safety in public spaces (Chatterjee, 2024). While such movements succeeded in creating solidarity and amplifying public debate, scholars caution that translating digital mobilization into sustained policy change has proven challenging, especially given issues of institutional inertia and digital fatigue (Thapar-Björkert, 2018).

The 2018 wave of #MeToo in India, triggered by Tanushree Dutta's public allegations against Nana Patekar, demonstrated the power of social media to bring hidden stories into public view. Many testimonies received rapid visibility online, yet institutional redressal remained limited, with few cases leading to formal inquiries despite widespread outcry (Ahlawat, 2022). This disparity highlights a deep tension: formal legal and institutional systems (like POSH Act mechanisms) are characterized by procedure and bureaucracy, which youth may find slow, opaque, or unapproachable. Conversely, digital movements offer immediacy, solidarity, and narrative framing but often lack enforceable recourse. Together, they raise pressing questions about how Indian youth weigh awareness, trust, and reporting routes in contexts of sexual harassment.

This study is situated within this tension, focusing specifically on students and young professionals who represent a demographic at the intersection of emerging workforce participation and digital nativity. Using responses collected through a Google Form survey of 400 participants, the research examines three dimensions: awareness of the POSH Act and ICCs; levels of trust in formal versus informal mechanisms; and perceptions of movements such as #MeToo and #MenToo as tools for disclosure and solidarity. The inquiry builds on existing scholarship that highlights both the transformative role of digital platforms in reshaping feminist discourse and the enduring importance of institutional frameworks in ensuring accountability (Baer, 2016). By comparing reporting preferences across formal and digital avenues, this paper contributes to broader debates about the future of gender justice in India, emphasizing the urgent need for trust-building between institutions and the digital public sphere.

REVIEW OF LITERATURE

Awareness of POSH Act and Institutional Mechanisms

The POSH Act (2013) was introduced in India to institutionalize redressal mechanisms for workplace sexual harassment, mandating Internal Complaints Committees (ICCs) in organizations with more

than ten employees. However, research highlights that awareness about the Act remains uneven. A decade after its enactment, many organizations still lack effective implementation, and employees often have limited knowledge of procedures or protections (CEDA, 2023). Studies indicate that while employees may have heard of POSH, their understanding of ICC functions, complaint procedures, and safeguards remains weak, with trainings often being superficial (IJS DR, 2023). Recent analyses of compliance trends in Indian companies also suggest that a significant proportion have not constituted ICCs or do not conduct awareness sessions, leading to gaps in institutional accountability (Lexology, 2024). These findings are crucial for examining youth perspectives, as awareness directly influences whether individuals feel equipped to use formal mechanisms when confronted with harassment.

Trust in Formal Redressal System

While the POSH Act (2013) legally mandates ICCs in workplaces, studies reveal that trust in these bodies remains fragile. Many employees hesitate to report harassment formally due to fear of retaliation, breach of confidentiality, or bias within organizational hierarchies (Indian National Bar Association, 2017). Research shows that despite formal compliance, ICCs are often perceived as inaccessible or ineffective, especially when senior officials are implicated (Law Journals, 2022). Analyses further suggest that in several workplaces, ICCs exist only on paper, with employees being unaware of their procedures or doubtful about their independence (Jus Corpus, 2023). These gaps create a climate of silence, where survivors prefer informal or digital alternatives rather than risking hostile institutional processes. Consequently, lack of trust undermines the intent of the POSH Act, highlighting the need for reforms that ensure transparency, confidentiality, and survivor-centred approaches in formal mechanisms.

Digital Activism and Social Media Movements

The trajectory of the #MeToo movement in India reveals how digital activism can amplify marginalized voices and reconfigure feminist discourse. Pain (2021) explores the laborious nature of online feminist activism in the Indian context, showing that many participants struggled with emotional fatigue, platform constraints, and exclusion of suburban voices during the 2018 resurgence of #MeToo in India. The movement was not uniform: Sonkar, Soorma, and (Akanksha, 2020) document how social media platforms such as Twitter, Instagram, and Facebook were leveraged by young women in Indian metropolises to spearhead the conversation around harassment, often filling gaps left by institutional silence. However, studies also caution that digital spaces reproduce structural inequalities: for instance, analyses of #MeTooIndia between 2018 and 2021 using over 350,000 tweets find differential visibility, algorithmic biases, and selective amplification (Al Dahdah, M., Arfaoui, M., & Chartier, M. 2021). These findings suggest that while social media activism offers immediacy and scale, it is not free from power asymmetries. As such, youth may view platforms like #MeToo or #MenToo as valuable tools for exposure and solidarity, but also understand their limits in enforcing accountability making them complementary, not fully substitutive, to formal redressal mechanisms.

Reporting Preferences and Youth Agency

Reporting choices around sexual harassment often reflect a trade-off between procedural legitimacy and perceived safety/visibility. Studies show that social media's affordances especially anonymity/pseudonymity and rapid social support can lower barriers to disclosure, shaping preferences among younger, digitally savvy users (Andalibi, Haimson, De Choudhury, & Forte, 2016). In Indian higher-education contexts, many survivors have bypassed formal mechanisms in favor of online testimony when institutional processes are viewed as slow, opaque, or biased, with networked publics offering

recognition and solidarity (Dey & Mendes, 2022). At the same time, scholarship cautions that hashtag activism can circulate testimony and mobilize pressure while reproducing inequalities and lacking enforceable due process, so online routes often function as complements and not substitutes to formal redress (Mendes, Ringrose, & Keller, 2018; Jackson, Bailey, & Foucault Welles, 2020). For students and young professionals, these dynamics translate into hybrid strategies: weighing confidentiality and remedy in formal pathways against speed, audience, and affirmation online thereby making awareness and trust central determinants of reporting preferences.

Media Representation and Cultural Context

Media representations of #MeToo have not only reflected but actively shaped how the movement was understood across different contexts. In India, (Mishra 2020) shows how English-language newspapers “domesticated” the global narrative by focusing on high-profile Bollywood cases, thereby narrowing systemic critiques of workplace harassment. Similarly, (Naik, Rodrigues, and Rani 2020) demonstrate that mainstream Indian media framed #MeToo primarily through episodic scandals, privileging elite voices while underreporting experiences of women in less visible sectors. Paper by (Sambaraju 2020) highlights how survivors who engaged with television and news media often encountered credibility challenges, forcing them to frame testimonies defensively to be heard. In China, (Zeng 2020) illustrates how censorship reshaped #MeToo narratives, but activists developed creative digital strategies such as coded hashtags to maintain visibility and solidarity. Collectively, these studies reveal that media representation is far from neutral; it filters which voices are amplified, which are silenced, and how youth come to perceive the legitimacy of both formal mechanisms and digital platforms as avenues for justice.

Research Gap

Existing research has not examined how awareness of POSH and the #MeToo movement, together with institutional trust, shape the reporting preferences of Indian students and young professionals. Most available studies focus on corporate employees or Western contexts, leaving this demographic empirically under-represented and limiting our understanding of how emerging adults navigate formal and informal reporting pathways.

RESEARCH OBJECTIVES

1. To measure the level of awareness among Indian youth about the POSH Act (2013) and Internal Complaints Committees (ICCs).
2. To assess the degree of trust Indian youth place in formal POSH mechanisms compared to social media platforms for reporting harassment.
3. To examine youth perceptions of the #MeToo movement as a tool for disclosure, solidarity, and social accountability.
4. To compare youth preferences between formal reporting (POSH) and social media activism (#MeToo, #MenToo) as platforms for addressing sexual harassment.

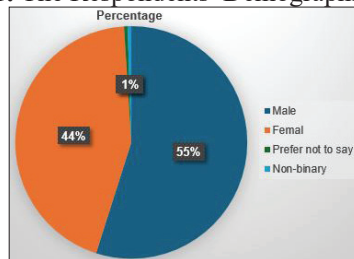
RESEARCH METHODOLOGY

This study employs a quantitative research design, using survey data to examine patterns of awareness, trust, and reporting preferences among students and young professionals in India. The findings are further contextualized within existing scholarship on media representation, digital activism, and institutional redressal mechanisms.

- **Ethical Considerations:** The study followed ethical guidelines appropriate for sensitive topics. A privacy statement was included in the questionnaire, informing participants that their data would be used only for research purposes. No personal identifiers were collected, ensuring that respondents' identities remained fully undisclosed. Participation was voluntary, and informed consent was obtained electronically before beginning the survey.
- **Research Design:** A quantitative research design is adopted, using a Google Form survey to generate measurable patterns in awareness of the POSH Act, trust in ICCs versus social media platforms, and reporting preferences. The analysis situates these patterns within existing theoretical and empirical scholarship on digital activism and gender justice.
- **Population and Sample:** The study focuses on students and young professionals from Delhi NCR, representing a group that straddles academic spaces and early employment. The region was selected because it comprises a diverse mix of universities, corporate sectors, and start-ups, offering a realistic cross-section of urban youth in India. Since the overall population of students and young professionals in India is indefinite, Delhi NCR serves as an accessible and representative urban cluster for data collection. Purposive sampling ensured inclusion of participants with potential exposure to harassment redressal processes. A total of 400 responses were collected, providing a robust base for statistical analysis.
- **Research Tool:** The questionnaire was divided into six sections: (1) demographics, (2) awareness of the POSH Act, (3) trust in ICCs vs. social media, (4) perceptions of #MeToo, (5) reporting preferences, and (6) views on #MenToo. Items included multiple-choice and Likert-scale questions to generate quantifiable data, while the review of literature drew on peer-reviewed academic sources to provide depth and critical interpretation of key themes.
- **Data Collection:** Data was collected online via Google Forms, circulated through email and social media to maximize participation. Respondent anonymity was guaranteed to ensure candid participation.
- **Data Analysis:** Data was analyzed using SPSS software. Descriptive statistics summarized respondent profiles and awareness levels. Cross-tabulation and chi-square tests examined associations between awareness, trust, and reporting preferences. Regression analysis explored predictive relationships between variables.

RESULTS

Table 1: The Respondents' Demographic Profile



S.No.	Demographic Characteristics	Category	N	%
1	Gender	Male	219	54.8
		Female	176	44.0
		Non-binary/other	2	0.5
		Prefer not to say	2	0.5

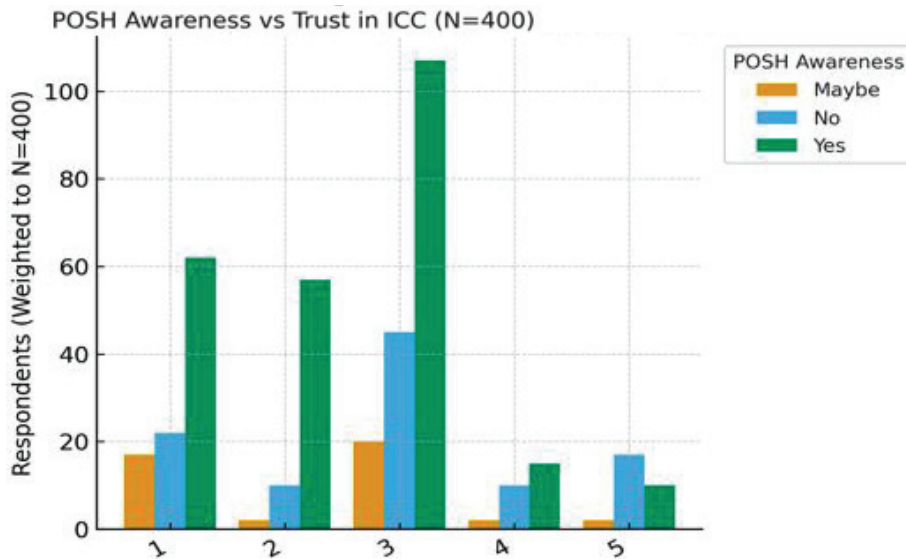
<i>S.No.</i>	<i>Demographic Characteristics</i>	<i>Category</i>	<i>N</i>	<i>%</i>
2	Age Group	18-21	159	39.8
		22-25	112	28.0
		26-30	99	24.8
		Above 30	30	7.5
3	Educational Qualification	12th pass	8	2
		Undergraduate	228	57.5
		Postgraduate	144	36.0
		Doctoral	10	2.5
		Diploma	5	1.2
4	Current Status	Working Professional	224	56.0
		College/University Student	176	44.0
5	POSH Awareness Training Attended	No	206	51.5
		Yes	147	36.8
		Maybe	47	11.8
6	Preferred Reporting Platform	File a complaint with ICC/Legal System	283	70.8
		Share only with friends/family	45	11.2
		Post anonymously on social media	45	11.2
		Not report at all	27	6.8

Table 1 represents the demographic profile of the respondents. Based on gender, the majority of respondents are male (54.8%), followed by female respondents (44%), while a small proportion identified as non-binary or preferred not to disclose (1%). Based on age, most respondents are between 18–21 years (39.8%), followed by those aged 22–25 years (28.0%), 26–30 years (24.8%), and a smaller group above 30 years (7.5%). This clearly reflects the study's focus on youth and early-career individuals. In terms of educational qualification, the majority of respondents are undergraduates (57.5%), followed by postgraduates (36.0%), with a smaller proportion having completed doctoral (2.5%), diploma (1.2%), or 12th-level education (2.0%). Regarding current status, most participants are working professionals (56.0%), while college or university students (44%) form a significant segment of the sample. With respect to POSH awareness training, 51.5% of respondents reported not having attended any training program, while 36.8% had attended and 11.8% were unsure, indicating a gap in structured sensitization initiatives. When asked about their preferred platform for reporting harassment, a clear majority of 70.8% stated they would file a complaint through formal mechanisms such as the ICC or legal system. In contrast, smaller segments preferred to share only with friends or family (11.2%) or post anonymously on social media (11.2%), while 6.8% indicated that they would not report at all.

Table 2: Cross-tabulation between POSH Awareness and Trust in ICC

<i>POSH Awareness</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Maybe	17	2	20	2	2
No	22	10	45	10	17
Yes	62	57	107	15	10

Table 2 illustrates the relationship between respondents' awareness of the POSH Act (2013) and their responses on a five-point scale assessing trust in ICCs. The data reveal that those aware of the Act reported higher ratings, with a larger proportion selecting the upper scale points, indicating



stronger trust and confidence in institutional mechanisms. In contrast, respondents not aware of the Act displayed lower and more varied scores, suggesting limited understanding or skepticism toward formal redressal systems. Those who answered “Maybe” regarding their awareness reflected moderate trust levels. Overall, the findings suggest that greater awareness of the POSH Act correlates with increased confidence in ICCs, emphasizing the importance of sensitization and education initiatives in building institutional trust among youth and young professionals.

Table 3: Cross-tabulation between Preferred Reporting Method and Major Barriers to Formal POSH

<i>Preferred Reporting Method</i>	<i>Lack of Awareness</i>	<i>Fear of Judgment/ Stigma</i>	<i>Lack of Confidentiality</i>	<i>Institutional Delay</i>	<i>Lack of Trust in Committee</i>
File a Complaint with ICC / Legal System	78	52	66	71	46
Share only with Friends / Family	5	16	8	7	5
Post Anonymously on Social Media	6	15	9	8	6
Not Report at All	5	9	5	4	4

Table 3 illustrates the association between respondents’ preferred method of reporting harassment and their perceived barriers to using formal POSH mechanisms. The findings indicate that those who preferred to file a complaint through ICC or legal systems most often cited lack of awareness (78 responses) and institutional delay (71 responses) as primary challenges. Respondents opting for informal sharing or online disclosure frequently mentioned fear of judgment and lack of confidentiality, highlighting persistent social stigma. Those unwilling to report identified fear of stigma as their most significant deterrent. Overall, the results reveal that while youth recognize the importance of formal mechanisms, both procedural and social barriers hinder reporting.

Note: Respondents could select more than one barrier; therefore, total responses exceed N = 400.

Table 4: Chi-Square Test

<i>Test</i>	<i>Pearson Chi-Square (Value)</i>	<i>df</i>	<i>Asymptotic Significance (2-sided)</i>	<i>Likelihood Ratio (Value)</i>
POSH Awareness × Trust in ICCs	33.688 ^a	8	0.000	35.412
POSH Awareness × Preferred Reporting Platform	19.274 ^b	4	0.001	20.615

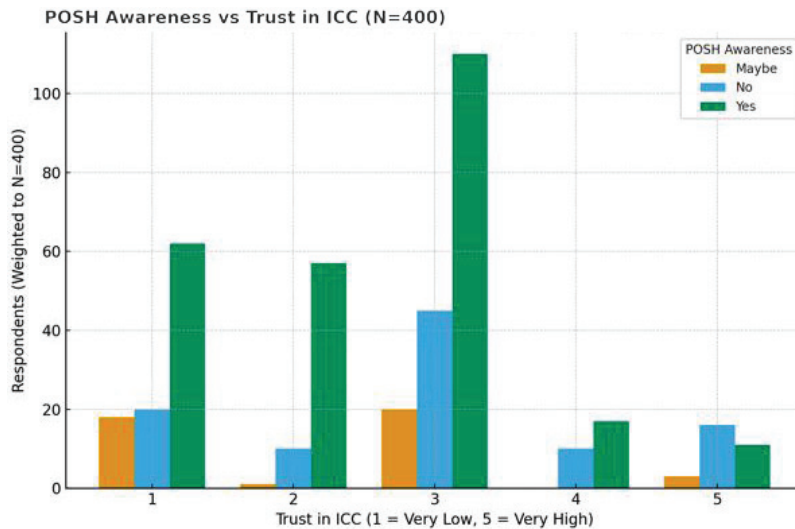


Table 4 presents the results of Chi-square tests conducted to examine two key relationships: between POSH awareness and trust in ICCs, and between POSH awareness and preferred reporting platform. The first test yielded a Pearson Chi-square value of 33.688 ($df = 8$, $p = 0.000$), indicating a statistically significant association between awareness and institutional trust. The likelihood ratio of 35.412 reinforces this finding, confirming that higher awareness corresponds with greater confidence in ICC mechanisms. The second test, with a Chi-square value of 19.274 ($df = 4$, $p = 0.001$), also showed a significant relationship between awareness and reporting preference. Respondents aware of the POSH Act were more likely to prefer formal redressal through ICCs or legal systems, whereas those less aware leaned toward social-media disclosure or non-reporting. Together, both tests underscore the pivotal role of awareness in shaping trust and behavioral choices.

Figure shows that a large majority of respondents 68% agreed or strongly agreed that #MeToo and #MenToo movements have helped raise awareness and build solidarity around sexual harassment issues. About 20% remained neutral, while only 12% disagreed or strongly disagreed. These results indicate that digital activism is widely recognized as a powerful medium for awareness and dialogue, though respondents still view legal mechanisms as essential for achieving justice.

DISCUSSION

The findings of this study reveal distinct patterns in how awareness and trust influence reporting preferences among Indian youth and young professionals. Respondents with higher awareness of the POSH Act (2013) demonstrated significantly greater trust in ICCs and stronger inclination toward formal redressal mechanisms. This association aligns with broader workplace studies showing that institutional literacy and procedural transparency foster greater confidence in organizational justice

(Farley et al., 2023). In contrast, participants with limited awareness of formal mechanisms displayed uncertainty or preference for informal disclosures which mirrors global evidence that employees tend to bypass formal channels when trust in institutional response is weak (Sharma, 2022).

The results also indicate that social stigma, fear of judgment, and institutional delay remain dominant deterrents to reporting, even among educated respondents. These barriers echo earlier research highlighting that procedural opacity and perceived lack of confidentiality suppress help-seeking behavior (Malik & Dwivedi, 2022). While 70.8% of respondents preferred formal complaint routes, a notable share still viewed social media as a safer and more empathetic space for disclosure. This duality underscores the coexistence of two reporting culture, institutional and digital where youth navigate between legality and solidarity to address harassment experiences.

The findings further support the argument that trust functions as a mediating variable between awareness and behavioral action. Higher trust in ICCs among those familiar with POSH provisions suggests that awareness campaigns can enhance institutional credibility and willingness to report. Conversely, low or inconsistent trust among the unaware groups signals gaps in both dissemination and implementation of the POSH framework. As (Malik and Dwivedi, 2022) note, social media activism often emerges as an alternative when individuals feel excluded from formal justice systems, emphasizing the continuing relevance of digital advocacy movements like #MeToo for symbolic empowerment and public accountability.

Overall, the study contributes empirical evidence to the discourse on gender justice by linking awareness, trust, and reporting preferences within a youth-centered framework. The results advocate for enhanced sensitization programs on the POSH Act in universities and workplaces, integrated with digital literacy on safe reporting practices. Institutional strengthening and social education must therefore progress together ensuring that formal redressal is trusted, accessible, and supported by broader societal empathy.

MAJOR FINDINGS

- The study identifies clear associations between awareness of the POSH Act (2013) and trust in ICCs among students and young professionals. Respondents with higher awareness demonstrated stronger confidence in institutional redressal mechanisms.
- Chi-square analysis confirmed statistically significant relationships between POSH awareness and both trust in ICCs and preferred reporting platforms, indicating that legal knowledge influences behavioral and attitudinal outcomes.
- A majority of respondents (70.8%) preferred formal redressal mechanisms such as ICCs or legal systems, while smaller groups favored social media disclosure (11.2%) or confiding in friends/family (11.2%) reflects a balance between institutional trust and social solidarity.
- The main barriers to reporting included lack of awareness (19%), institutional delay (18%), and fear of judgment or stigma (17%), revealing that both procedural and social factors discourage formal complaints.
- Respondents who had attended POSH awareness or sensitization programs reported higher trust in ICCs, underscoring the role of training in improving institutional confidence.

CONCLUSION

Several recommendations emerge from these results. First, awareness and sensitization programs on the POSH Act should be integrated into university curricula and workplace orientations to ensure that young individuals understand their rights and procedures for complaint. Second, organizations

must strengthen confidentiality protocols and reduce bureaucratic delays to enhance trust in ICCs. Third, coordinated efforts between HR departments, legal experts, and educational institutions can ensure the consistent implementation of the Act and timely resolution of cases. Finally, digital platforms should be used responsibly to amplify awareness campaigns and encourage dialogue on safe reporting, without compromising legal process or survivor privacy.

This research, however, has certain limitations. It relies on self-reported data collected via an online questionnaire, which may reflect social desirability bias or uneven representation across regions. The study also focuses primarily on students and early-career professionals, excluding older or non-urban populations whose experiences could differ. Future research could adopt a longitudinal design or mixed-method approach to examine how sustained awareness efforts influence long-term reporting behavior. Comparative studies across sectors like corporate, educational, and public service which could further reveal institutional variations in policy execution. Moreover, examining how digital activism interacts with formal complaint mechanisms may shed light on evolving models of accountability in gender-justice frameworks.

Beyond these findings, the study also highlights a broader transformation in how gender justice is navigated in the digital era. While digital activism such as #MeToo has enhanced visibility and public dialogue on harassment, sustainable progress depends on strengthening institutional mechanisms and awareness-driven trust-building. The coexistence of formal and informal reporting preferences demonstrates an emerging model of dual accountability—where legal frameworks ensure justice, and digital platforms sustain solidarity and voice. Together, they represent a redefined landscape of activism and institutional engagement among Indian youth.

In sum, this study underscores that sustainable gender justice requires both legal literacy and institutional empathy. Strengthening awareness, transparency, and procedural fairness in formal mechanisms while valuing the expressive power of digital solidarity can together create safer, more equitable workplaces and learning environments for future generations.

CONCLUSION

The findings highlight the need for structured awareness and trust-building frameworks within educational institutions and corporate environments. Based on the strong association between POSH awareness and trust in ICCs, universities can implement a tiered sensitization model that includes mandatory micro-modules during orientation, annual refresher sessions, and scenario-based digital learning. Corporates can strengthen trust by adopting a three-part framework that integrates clear confidentiality protocols, trained first-responders for sensitive disclosures, and transparent communication of case processes. Both institutions and workplaces can also implement periodic trust audits, short feedback surveys that measure perceived safety, accessibility, and confidence in reporting mechanisms. Together, these interventions translate the study's quantitative insights into actionable pathways for improving reporting behaviour and institutional credibility.

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GURUGRAM UNIVERSITY

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GURUGRAM UNIVERSITY BUSINESS REVIEW (GUBR)

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 - Literature Review

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 - Limitations of the Study
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Gurugram University Business Review

Department of Management, Gurugram University, Sec-87, Gurugram

E-mail: editor.gubr@gmail.com

Tel: +91 9991576766; +91 7018439662