



Research Article

An Exploratory View: Artificial Intelligence as an Enabler of Entrepreneurship in India

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Abstract

Entrepreneurship plays a pivotal role in India's economic development by fostering innovation, employment generation, and inclusive growth. In recent years, Artificial Intelligence (AI) has emerged as a transformative general-purpose technology with significant implications for entrepreneurial activity. This paper presents a comprehensive review of existing literature to examine the role of AI in enabling entrepreneurship in the Indian context. Adopting a qualitative research design, the study synthesises secondary data from peer-reviewed journals, reports, and policy documents to identify key themes, opportunities, and challenges associated with AI-driven entrepreneurship. The review highlights that AI enhances entrepreneurial capabilities by supporting opportunity identification, improving strategic decision-making, enabling personalised marketing, optimising operational efficiency, and facilitating access to finance through AI-enabled fintech solutions. AI adoption has been particularly prominent in technology-driven sectors such as Fintech, Healthcare, and social commerce, where data-driven business models and automation have contributed to scalability and competitiveness. The paper also illustrates the role of AI-enabled platforms in promoting inclusive entrepreneurship, as demonstrated through the case of Meesho, which leverages AI to support micro-entrepreneurs and small sellers. Despite its potential, the review identifies persistent challenges limiting widespread AI adoption among Indian entrepreneurs, including skill gaps, infrastructure constraints, high implementation costs, and ethical concerns related to data privacy and transparency. The study further identifies research gaps, particularly the lack of empirical evidence on AI adoption among MSMEs and rural entrepreneurs. The paper concludes that coordinated policy support, skill development initiatives, and responsible AI adoption are essential to harness AI's full potential for fostering sustainable and inclusive entrepreneurship in India.

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KEYWORDS: Artificial Intelligence; Entrepreneurship; Start-ups; MSMEs; Innovation; Digital Transformation; India.

1. INTRODUCTION

Entrepreneurship is widely regarded as a critical driver of economic development, particularly in emerging economies such as India. Entrepreneurial activity contributes to employment creation, innovation, competitiveness, and inclusive growth. Over the last decade, India has experienced a notable expansion of its entrepreneurial ecosystem, supported by demographic advantages, rapid digitalisation, and government initiatives such as Start-up India, Digital India, and Make in India. Alongside these developments, technological progress has reshaped business environments, with Artificial Intelligence (AI) emerging as one of the most impactful general-purpose technologies.

Artificial Intelligence refers to the capability of computational systems to perform tasks that typically require human cognitive functions, including learning, reasoning, pattern recognition, and decision-making. Advances in machine learning, natural language processing, predictive analytics, and automation have enabled AI applications across a wide range of business activities. For entrepreneurs, particularly those operating with limited resources, AI provides opportunities to enhance efficiency, improve strategic decisions, and scale operations.

Despite its growing relevance, the adoption of AI among Indian entrepreneurs remains uneven. While digitally native start-ups increasingly integrate AI into their business models, a large segment of MSMEs continues to face barriers to adoption. Against this background, a systematic review of existing literature is essential to understand how AI enables entrepreneurship in India, the benefits it offers, and the challenges that constrain its diffusion. This paper undertakes a literature review to synthesise current knowledge and identify research gaps related to AI-driven entrepreneurship in India.

In his article, David Bozward (2025) Emphasises that Artificial Intelligence (AI) has become an essential component of modern entrepreneurial practice, fundamentally reshaping how new ventures are conceptualised, operated, and scaled. According to the author, AI enhances entrepreneurial effectiveness by enabling data-driven decision-making; for example, AI tools analyse large datasets to reveal market trends, forecast demand, optimise pricing, and assess risks, thus reducing reliance on intuition and guesswork in strategic decisions. He also discusses how AI revolutionises customer experience. By leveraging machine learning and automation technologies, entrepreneurs can deliver personalised product recommendations, automate customer support through chatbots, and run targeted marketing campaigns—resulting in stronger customer engagement and retention. Internally, the article highlights that AI streamlines business operations by automating repetitive tasks such as data entry, inventory management, and hiring processes.

2. LITERATURE REVIEW

(Kalyanaraman, 2025) According to this study, AI benefits Indian business owners by spotting market opportunities, improving product development, customising user experiences, and streamlining corporate processes. According to his theory,

these skills give businesses a competitive edge and sustainable growth in a market that is changing quickly. It demonstrated how AI may be used to find market possibilities and improve product development in certain areas. It highlights the particular difficulties and possibilities that emerging market entrepreneurs confront, which have an impact on their product strategy. The results offer governments, investors, and entrepreneurs insightful information about how AI might help achieve competitive advantage and sustainable growth.

They discovered through their study report that there isn't a thorough examination of how AI directly affects product strategy in the context of these areas' startups. The goal of the paper is to shed light on the creative AI-driven strategies used by startups to improve product development, customise user experiences, and streamline corporate processes. The study came to the conclusion that AI is revolutionising the way technology-enabled firms in Africa and India develop their product strategy.

In order to examine the connections between entrepreneurial orientation (EO), global technology competency (GTC), product differentiation (PD), and product quality (PQ), Ramtiyal et al. (2025) used a thorough empirical investigation. The main analytical technique used to find significant correlations between the variables is structural equation modelling.

AI benefits Indian business owners by fostering innovation and risk-taking, improving product quality and differentiation, and strengthening global technology competency. This makes foreign marketplaces more competitive, which eventually boosts the performance of entrepreneurs who are born globally. The approach places a strong emphasis on AI's function as a mediator in the connection between technological innovation and successful entrepreneurship.

(Singh et al., 2025) AI helps Indian entrepreneurs by boosting business innovation, enhancing product and process advancements, and providing competitive advantages through improved innovation capabilities and digital readiness, particularly in sectors like Fintech and Healthcare, as highlighted in the study. The study concludes that AI adoption significantly boosts business innovation in Indian startups, leading to advancements in products, processes, and business models. It is expected that AI-driven startups will gain competitive advantages through enhanced innovation capabilities and improved digital readiness. A cross-sectional survey is conducted among 279 Indian company founders, managers, and AI leaders.

He collected Data using stratified sampling to ensure representation across multiple sectors, including Fintech, Healthcare, Retail, Manufacturing, and EdTech.

The findings indicated that the impact of AI varies across industries, with Fintech and Healthcare showing higher levels of adoption compared to Manufacturing and EdTech, which are emerging trends. The research highlights the importance of AI in contributing to improved business performance and competitive advantage for startups.

(Khullar et al., 2025) AI helps entrepreneurs in India by enhancing operational efficiency, driving growth, and improving customer experiences. With over 77% of start-ups investing in AI and related technologies, it facilitates innovation and competitiveness in the rapidly evolving digital landscape. It highlights the significant role of AI in transforming industries and improving customer experiences in India. The authors project that the global AI market will grow substantially, reaching between USD 320 billion and USD 380 billion by 2027, indicating a promising future for India's AI sector. The integration of AI and other advanced technologies signifies a period of digital disruption that Indian start-ups are actively navigating. The paper references a report that outlines the growth and potential of AI in India, indicating a review methodology to assess the current landscape. The paper concluded that over 77% of Indian start-ups are adopting advanced technologies, including AI, to enhance operational efficiency and drive growth.

(Divekar & Mali, 2025). The paper aims to explore the levels of GenAI adoption, identify associated barriers, and provide recommendations for up-skilling initiatives and policy interventions to support women entrepreneurs in leveraging AI for business growth. AI helps entrepreneurs in India by enhancing decision-making, enabling faster scaling, and improving access to networks. Despite limited adoption due to barriers, those who utilise AI tools experience significant business performance and innovation benefits, fostering growth in their ventures. Despite a high level of interest in Generative AI tools among women entrepreneurs in India, actual adoption remains limited due to structural and cultural barriers. The research indicates that where AI is adopted, it correlates with faster scaling of businesses, improved decision-making, and better access to networks. The authors recommend targeted AI up-skilling initiatives and ecosystem support to address the gendered digital divides that hinder adoption. Policy interventions are suggested to further facilitate the integration of AI in women-led ventures, enhancing their overall business outcomes. The study concluded that exposure to Artificial Intelligence (AI) has the potential to positively influence women entrepreneurs' business strategies, performance, and innovation.

(Srikanth, 2025) The research provides a data-based blueprint for policymakers and incubators to develop resilient, sustainable startup ecosystems. The paper employs a computational model that integrates artificial intelligence (AI) with the entrepreneurial ecosystem in the green technology sector.

It utilizes to simulate various growth paths of green startups under different conditions using system dynamics, agent-based modelling, and machine learning. The research includes multiregional studies conducted in three green tech centres: Bangalore (India), Berlin (Germany), and San Jose (USA). The methodology incorporates publicly available metrics of startups, environmental key performance indicators, and innovation indices to test the framework. The model features a

feedback-loop structure that connects AI analytics, investor behaviour, and ecological targets, enhancing the scalability and sustainability of startups.

3. RESEARCH METHODOLOGY

This study adopts a qualitative research design based on a comprehensive review of secondary data. Relevant literature was collected from peer-reviewed journals, conference proceedings, academic books, government publications, and reports by reputed national and international organisations. Sources were identified through academic databases and open-access repositories such as Google Scholar and official institutional websites. The collected literature was analysed thematically to identify dominant themes, patterns, and gaps related to Artificial Intelligence and entrepreneurship in India. As a review-based study, no primary data were collected.

3.1 OBJECTIVES OF THE STUDY

The study is guided by the following objectives:

1. To review existing scholarly literature on Artificial Intelligence and entrepreneurship.
2. To analyse the role of AI in enabling entrepreneurial activities in the Indian context.
3. To examine opportunities created by AI for start-ups and MSMEs in India.

4. Artificial Intelligence and Entrepreneurship: Conceptual Overview

The literature conceptualises Artificial Intelligence as a technology that enhances entrepreneurial capability by augmenting human decision-making and automating routine processes. AI enables entrepreneurs to analyse large datasets, generate actionable insights, and respond more effectively to market dynamics. Several studies characterise AI as a facilitator of entrepreneurial innovation, allowing new ventures to develop scalable and data-driven business models.

Researchers have also emphasised that AI reduces entry barriers for new firms by offering access to advanced digital tools through cloud-based platforms. This aspect is particularly relevant in the Indian context, where small enterprises often face capital constraints. By enabling cost-effective access to analytics, automation, and customer insights, AI contributes to the democratisation of entrepreneurial opportunities.

5. Review of Literature on AI-Enabled Entrepreneurship

5.1 AI and Opportunity Identification

A significant body of literature suggests that AI enhances entrepreneurial opportunity recognition by enabling systematic analysis of market data. Studies indicate that AI-based tools such as sentiment analysis, trend forecasting, and big data analytics assist entrepreneurs in identifying emerging consumer preferences and unmet needs. Compared to traditional methods, AI-supported opportunity identification is considered timelier and data-driven.

5.2 AI and Entrepreneurial Decision-Making

Existing research highlights the role of AI in improving the quality and speed of entrepreneurial decision-making. Predictive analytics and machine learning models support decisions related to demand forecasting, pricing, inventory management, and risk assessment. Scholars argue that AI reduces reliance on intuition alone and helps mitigate cognitive biases, thereby enhancing strategic outcomes for entrepreneurs.

5.3 AI in Marketing and Customer Engagement

The application of AI in marketing has been extensively discussed in the literature. AI-powered customer relationship management systems, chatbots, and recommendation engines enable personalised interactions and improved customer engagement. Studies focusing on Indian start-ups note that AI-driven digital marketing tools help entrepreneurs optimise marketing expenditure and strengthen brand relationships.

5.4 AI in Operations and Process Efficiency

Literature also documents the role of AI in operational optimisation and process automation. AI applications in inventory control, supply chain management, quality assurance, and workflow automation contribute to efficiency gains and cost reduction. For MSMEs, these operational benefits are particularly significant, as they enable better utilisation of limited resources.

5.5 AI and Access to Entrepreneurial Finance

Access to finance remains a persistent challenge for entrepreneurs in India. The reviewed literature indicates that AI-enabled fintech solutions play an important role in addressing this issue. AI-based credit assessment models utilise alternative data to evaluate the creditworthiness of small enterprises, thereby improving access to formal finance and supporting financial inclusion.

Technological Drivers of Entrepreneurial Transformation

AI is significantly aiding entrepreneurs in India by enhancing innovation, operational efficiency, and market competitiveness. The integration of AI technologies allows startups to leverage data-driven insights, optimise product strategies, and improve customer engagement, ultimately driving growth in various sectors.

- **Business Model Advancements:** AI adoption fosters innovation in product, process, and business models, particularly in sectors like Fintech and Healthcare, which are leading in AI integration (Singh et al., 2025).
- **Global Technology Competence:** Entrepreneurs are utilising AI to improve product quality and differentiation, which enhances their competitiveness in international markets (Ramtiyal et al., 2025).
- **Operational Efficiency and Customer Experience**

Streamlined Operations: Over 77% of Indian startups are investing in AI to achieve operational efficiency and enhance customer experiences (Khullar et al., 2025).

Personalisation and Automation: AI-driven marketing strategies, including chatbots and predictive analytics, improve customer engagement and brand loyalty, leading to increased sales (Monica et al., 2024).

• Market Opportunities and Growth

Identifying Market Trends: AI helps startups identify market opportunities and optimise business operations, contributing to sustainable growth (Kalyanaraman, 2025).

Investment Attraction: The growth of AI-driven services is fostering a technology-driven ecosystem, attracting investments and stimulating entrepreneurship in India (Monica et al., 2024). Conversely, while AI presents numerous advantages, concerns about job displacement and the need for up-skilling in the workforce remain critical issues that entrepreneurs must address to ensure sustainable growth and social responsibility.

1. AI as a Strategic Decision-Support Tool

Artificial Intelligence enhances entrepreneurial decision-making by enabling the systematic analysis of large and complex datasets. Entrepreneurs can use AI-based analytics to identify market trends, forecast demand, evaluate risks, and optimise pricing strategies. This data-driven approach reduces uncertainty and minimises reliance on intuition, thereby improving the quality and accuracy of strategic decisions.

2. Enhancement of Customer Experience through AI

AI technologies enable entrepreneurs to deliver personalised and responsive customer experiences. Tools such as recommendation systems, intelligent chatbots, and predictive analytics allow businesses to tailor products, services, and communication to individual customer preferences. This personalisation strengthens customer engagement, improves satisfaction, and contributes to long-term customer retention.

3. Operational Efficiency and Automation

AI plays a significant role in automating routine and repetitive business processes, including data entry, inventory management, customer support, and recruitment-related activities. By automating these functions, entrepreneurs can reduce operational costs, minimise human error, and allocate more time and resources to innovation and strategic growth activities.

4. Reduction of Entry Barriers for Entrepreneurs

The availability of AI-powered tools and platforms has lowered traditional barriers to entrepreneurship. No-code and low-code AI applications, automated design tools, and AI-assisted content creation enable individuals with limited technical expertise or financial resources to start and manage businesses. This democratisation of technology supports broader participation in entrepreneurial activity.

5. AI as a Driver of Innovation and New Business Models

Artificial Intelligence facilitates the development of innovative products, services, and business models. Entrepreneurs increasingly leverage AI to create solutions such as intelligent virtual assistants, predictive healthcare tools, and adaptive educational technologies. AI thus acts not only as a support tool but also as a catalyst for entrepreneurial innovation.

6. Competitive Necessity of AI Adoption

The literature suggests that AI adoption is becoming a critical requirement for entrepreneurial competitiveness. In rapidly evolving and technology-driven markets, entrepreneurs who integrate AI into their operations are better positioned to respond to changing consumer needs, enhance efficiency, and

sustain competitive advantage. Failure to adopt AI may result in reduced relevance and market competitiveness.

6. Challenges in the Adoption of AI by Indian Entrepreneurs

Despite the potential benefits identified in the literature, several constraints hinder the widespread adoption of AI among Indian entrepreneurs. Key challenges include limited availability of skilled human resources, inadequate digital infrastructure, high initial investment costs, and data-related concerns. Ethical issues such as data privacy, algorithmic transparency, and cybersecurity are also highlighted as emerging concerns. Additionally, studies note that many small business owners lack strategic awareness regarding the integration of AI into business processes.

7. Case Study of Meesho: Uses AI-Powered Social Commerce for Micro-Entrepreneurs in India

Meesho is a prominent Indian social commerce platform that has played a significant role in enabling micro-entrepreneurs, home-based sellers, and small traders to participate in the digital economy. Meesho also employs AI to optimise product listings on its platform. AI-based tools assist sellers in improving product descriptions, categorisation, and visual presentation to enhance visibility and conversion rates. By automating these processes, Meesho reduces the technical and marketing expertise required to operate an online business. This significantly lowers entry barriers for first-time entrepreneurs and small sellers, particularly women entrepreneurs and individuals from semi-urban and rural areas.

Pricing strategy is another area where AI plays a crucial role on the Meesho platform. AI algorithms analyse competitor pricing, consumer demand elasticity, and historical sales data to suggest competitive pricing strategies to sellers. These data-driven pricing recommendations help entrepreneurs balance affordability with profitability, thereby improving their business sustainability. Such AI-enabled pricing support is especially valuable for micro-entrepreneurs who may lack access to market intelligence and professional advisory services.

From an entrepreneurial development perspective, the Meesho case illustrates how AI-enabled platforms can foster inclusive entrepreneurship by providing digital infrastructure, market access, and decision-support tools to underserved segments. The platform empowers individuals to become entrepreneurs without the need for physical storefronts, complex logistics networks, or advanced technological skills. By embedding AI within its ecosystem, Meesho transforms complex business functions into user-friendly processes, thereby enabling scalable and sustainable entrepreneurial activity. In November 2024, Indian social commerce platform Meesho introduced a Generative AI (GenAI)-enabled voice assistant to transform its post-sales customer support operations. The primary objective of this initiative was to automate routine customer inquiries, enhance response quality, and provide continuous support across linguistic and geographic segments.

The voice bot currently manages approximately 60,000 customer calls per day, demonstrating the scalability of AI solutions in high-volume, customer-centric functions. It

employs advanced technologies such as natural language processing (NLP), automatic speech recognition (ASR), text-to-speech (TTS), and large language models (LLMs) to interpret and respond to customer queries in real time. The bot has achieved noteworthy operational efficiencies, including a 95% issue resolution rate and a 50% reduction in average call handling time, compared to traditional human-based systems. These improvements not only streamline support processes but also contribute to reduced service costs. This AI deployment represents a strategic use of generative artificial intelligence to enhance operational efficiency, reduce per-call costs, and improve overall customer experience—making it a compelling example of how AI technologies are being harnessed by Indian e-commerce ventures to support entrepreneurial growth and scalability. The case highlights the potential of AI-driven social commerce platforms to support micro-entrepreneurs and contribute to broader economic and social development.

8. Policy Support and Institutional Framework

The literature recognises the importance of policy and institutional support in facilitating AI adoption. Government initiatives aimed at promoting digital infrastructure, innovation ecosystems, and skill development are viewed as critical enablers. Policy documents such as the National Strategy for Artificial Intelligence emphasise inclusive and responsible AI development. However, researchers point out that effective implementation and coordination across regions remain ongoing challenges.

9. Research Gaps and Future Research Directions

The review identifies several gaps in existing research. There is limited empirical evidence on AI adoption among traditional MSMEs and rural entrepreneurs in India. Sector-specific studies examining AI use in manufacturing, agriculture, and services are also scarce. Future research could employ mixed-method and longitudinal approaches to examine the long-term impact of AI on entrepreneurial performance, sustainability, and employment generation.

10. CONCLUSION

This literature review demonstrates that Artificial Intelligence serves as a significant enabler of entrepreneurship in India by enhancing innovation, decision-making, operational efficiency, and access to finance. While existing studies underscore the transformative potential of AI, they also highlight persistent challenges related to skills, infrastructure, cost, and ethics. The findings suggest that a collaborative approach involving policymakers, educational institutions, industry stakeholders, and entrepreneurs is essential to fully realise the benefits of AI-driven entrepreneurship. Strengthening digital capabilities and promoting responsible AI adoption will be crucial for fostering sustainable and inclusive entrepreneurial growth in India.

REFERENCES

1. Adoption of AI in Indian MSMEs: benefits, challenges, and prospects. Adv Consum Res. n.d. Available from: <https://acr-journal.com/article/adoption-of-ai-in-indian-msmes-benefits-challenges-and-future-prospects-1306/>

2. Brynjolfsson E, McAfee A. Machine, platform, crowd: Harnessing our digital future. New York: W.W. Norton & Company, 2017.
3. Bozward D. The role of artificial intelligence in modern entrepreneurship [Internet]. 2025 Feb 18. Available from: <https://david.bozward.com/2025/02/the-role-of-artificial-intelligence-in-modern-entrepreneurship/>
4. Divekar NDG, Mali NDP. Understanding micro-scale urban women entrepreneurs' awareness and use of generative AI: Implications for business performance, innovation, and growth. Int J Latest Technol Eng Manag Appl Sci. 2025;14(8):160–163. Available from: <https://doi.org/10.51583/ijltemas.2025.1408000020>
5. ETtech. Meesho launches GenAI-powered voice bot to provide 24x7 customer support. Econ Times [Internet]. 2024 Nov 26. Available from: <https://economictimes.indiatimes.com/tech/artificial-intelligence/meesho-launches-genai-powered-voice-bot-to-provide-24x7-customer-support/articleshow/115693862.cms>
6. Huang MH, Rust RT. Artificial intelligence in service. J Serv Res. 2018;21(2):155–172. Available from: <https://doi.org/10.1177/1094670517752459>
7. Kalyanaraman K. AI-powered product strategy: Case studies from tech startups in India and Africa. Int J Res Appl Sci Eng Technol. 2025;13(4):5461–5464. Available from: <https://doi.org/10.22214/ijraset.2025.69486>
8. Khullar S, Joshi ML, Devi P. AI for startups in India: Pathways to innovation and competitiveness. Int J Sci Res Archive. 2025;16(3):695–705. Available from: <https://doi.org/10.30574/ijsra.2025.16.3.2620>
9. McKinsey Global Institute. Artificial intelligence: The next digital frontier. New York: McKinsey & Company; 2017.
10. NITI Aayog. National strategy for artificial intelligence: AI for all. New Delhi: Government of India; 2018.
11. OECD. Artificial intelligence and entrepreneurship: Policy considerations. Paris: OECD Publishing; 2019.
12. PwC India. Artificial intelligence in India: Hype or reality? Mumbai: PwC; 2020.
13. Raisch S, Krakowski S. Artificial intelligence and management: The automation–augmentation paradox. Acad Manage Rev. 2021;46(1):192–210. Available from: <https://doi.org/10.5465/amr.2018.0072>
14. Ramtiyal B, Sakka G, Mehmood K, Narula S, Verma S. Harnessing the power of AI for unlocking Indian-born global entrepreneurs in the global market profile. Int Mark Rev. 2025;42(6):1175–1204. Available from: <https://doi.org/10.1108/IMR-10-2024-0428>
15. Singh R, Khan S, Joshi A, Raghuvver K, Kumar V. Exploring the role of artificial intelligence on business innovation and entrepreneurship. Strategy Leadership. 2025. Available from: <https://doi.org/10.1108/SL-04-2025-0080>
16. Srikanth D. AI-powered entrepreneurial ecosystems: A computational model for sustainable startup growth in green tech sectors. Int J Environ Sci. 2025;1068–1077. Available from: <https://doi.org/10.64252/ewn4zw141>
17. World Economic Forum. Entrepreneurship in the age of artificial intelligence. Geneva: World Economic Forum; 2019.
- . World Economic Forum.

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