

## Generative AI in Entrepreneurship: Applications, Opportunities, Challenges and Future Directions

Ms Neha Nain<sup>1</sup>, Dr Monika Sharma<sup>2</sup>, Dr Gunjan Bhayana<sup>3</sup>, Ms Priya<sup>4</sup>, Ms Poonam<sup>5</sup>, Dr Yashna<sup>6</sup>

<sup>1,2,3,4,5,6</sup> Assistant Professor, Department of Management Studies, The Technological Institute of Textile & Sciences, Bhiwani, Birla Colony, Haryana, 127021, India

**Emails:** [nehanain@titsbhiwani.ac.in](mailto:nehanain@titsbhiwani.ac.in)<sup>1</sup>, [monikajiya@mba.titsbhiwani.ac.in](mailto:monikajiya@mba.titsbhiwani.ac.in)<sup>2</sup>, [gunjan@titsbhiwani.ac.in](mailto:gunjan@titsbhiwani.ac.in)<sup>3</sup>, [poonamsharma@titsbhiwani.ac.in](mailto:poonamsharma@titsbhiwani.ac.in)<sup>4</sup>, [priya@titsbhiwani.ac.in](mailto:priya@titsbhiwani.ac.in)<sup>5</sup>, [yashnamarks@titsbhiwani.ac.in](mailto:yashnamarks@titsbhiwani.ac.in)<sup>6</sup>

### Abstract

Generative Artificial Intelligence (GenAI) is transforming entrepreneurship by helping entrepreneurs generate ideas, analyze information, create content, develop business models, support marketing, and make decisions. This review examines the growing role of GenAI in entrepreneurial activities, with a focus on opportunity recognition, creativity, innovation, SMEs, emerging economies, and responsible AI use. GenAI can reduce resource constraints and provide affordable support to small businesses, but challenges such as inaccurate information, overdependence, privacy concerns, and unequal digital skills remain. The article highlights the importance of human-AI collaboration and introduces the concept of AI entrepreneurial capability, which includes AI literacy, effective prompting, evaluation of AI outputs, decision-making, and responsible use of AI. The review concludes that future entrepreneurship should focus not only on using AI to generate more opportunities but also on improving the quality, sustainability, and responsible development of those opportunities.

**Keywords:** Generative Artificial Intelligence, Entrepreneurship, Entrepreneurial Capability, SMEs, Emerging Economies

### 1. Introduction

Entrepreneurship is fundamentally concerned with recognizing possibilities, creating value under uncertainty and mobilizing limited resources to transform ideas into viable economic or social activity. Although entrepreneurial processes have always been influenced by technological change, digital technologies have increasingly altered how entrepreneurs search for information, interact with customers, develop products, organize resources and communicate value propositions. The emergence of Generative Artificial Intelligence represents a further development because it does not merely provide access to information or automate predetermined processes; it can participate interactively in the production of ideas, text, images, code, analyses and alternative solutions. This characteristic makes GenAI particularly relevant to entrepreneurship. Recent empirical research, for example, indicates that ChatGPT adoption can influence opportunity recognition, digital entrepreneurial knowledge and digital entrepreneurial self-efficacy, thereby

affecting entrepreneurial intentions and behaviour (Duong & Nguyen, 2024). The significance of GenAI extends beyond individual entrepreneurs. Small and medium enterprises (SMEs), which often operate with limited financial and human resources, may be able to access capabilities that were previously available primarily to larger organizations. Rajaram and Tinguely (2024) argue that GenAI can democratize scalability and creativity for SMEs, while simultaneously emphasizing the importance of employee competence, leadership, organizational culture, collaboration and relationships with external stakeholders. Recent research also suggests that the relationship between AI and entrepreneurial outcomes should not be understood as a simple technology-adoption relationship. Zhang et al. (2025), using data from 1,021 Chinese university students, found that AI knowledge was positively associated with entrepreneurial ability and that different modes of GenAI use helped explain this relationship. Similarly, research on entrepreneurial

opportunity recognition conceptualizes GenAI chatbots as potential external enablers whose contribution may depend on entrepreneurial alertness, digital literacy and domain experience (Hossain Chowdhury et al., 2026). This article presents a conceptual and narrative review of these emerging developments. It does not claim to provide an exhaustive systematic review of the literature. Instead, it synthesizes selected recent scholarship and develops an integrative conceptual argument concerning the entrepreneurial role of GenAI. Particular emphasis is placed on human–AI collaboration, AI entrepreneurial capability, opportunity recognition, SMEs, responsible AI and emerging economies.

## 2. Generative AI in the Entrepreneurial Context

Generative AI refers broadly to artificial intelligence[1] systems capable of producing new content based on patterns learned from large datasets.

**Table 1 Distinguishing traditional digital tools from GenAI-enabled entrepreneurship**

| Dimension            | Traditional digital technology        | GenAI-enabled entrepreneurship              |
|----------------------|---------------------------------------|---------------------------------------------|
| Primary function     | Information processing and automation | Generation, synthesis and transformation    |
| User interaction     | Predefined interfaces and commands    | Natural-language interaction                |
| Idea generation      | Primarily human-led                   | Human and AI co-generation                  |
| Content production   | Template- or rule-based               | Adaptive and generative                     |
| Experimentation      | Often resource-intensive              | Rapid and comparatively low-cost            |
| Decision support     | Structured information                | Scenarios, alternatives and interpretations |
| Entrepreneurial role | Technology user                       | User, evaluator and AI orchestrator         |
| Major requirement    | Digital proficiency                   | AI literacy plus critical judgment          |

## 3. Transformation of Entrepreneurial Activity

The evolution from traditional entrepreneurship toward AI-augmented entrepreneurship can be understood as a gradual movement from technology as a supporting infrastructure toward technology as a collaborative cognitive resource.

**Table 2 Evolution of the entrepreneur–technology relationship**

| Stage                     | Dominant technology role                  | Entrepreneurial role               |
|---------------------------|-------------------------------------------|------------------------------------|
| Traditional entrepreneur  | Limited technological assistance          | Primary creator and decision-maker |
| Digital entrepreneur      | Digital platforms and information systems | Technology-enabled operator        |
| AI-assisted entrepreneur  | Recommendations and automation            | AI user and decision-maker         |
| AI-augmented entrepreneur | Generation, synthesis and experimentation | Human–AI orchestrator              |

Tseng (2025) highlights the use of GenAI for idea generation, simulation and decision support in entrepreneurial learning and emphasizes its potential contribution to opportunity recognition, problem-solving and adaptation[2].

## 4. Applications of Generative AI in Entrepreneurship

### 4.1.Opportunity Recognition and Idea Generation

Opportunity recognition is one of the most significant areas in which GenAI can influence entrepreneurship. Recent conceptual work explicitly proposes that GenAI chatbots may function as external[3] enablers of entrepreneurial opportunity recognition, with entrepreneurial alertness acting as a potential mechanism and digital literacy and domain experience influencing the relationship (Hossain Chowdhury et al., 2026).

#### 4.2. Entrepreneurial Creativity

Creativity is another central application. Entrepreneurs can ask GenAI systems to generate alternative product concepts, identify unusual combinations, rewrite value propositions from different customer perspectives or develop multiple communication approaches. Mostafiz et al. (2026) provide an especially [4] important ethical qualification. Their study, drawing on evidence from India and Bangladesh, reports that GenAI use was positively associated with unethical creativity under certain entrepreneurial personality conditions, while its direct influence on creativity itself was statistically insignificant.

#### 4.3. Business-Model Development

Business-model development requires entrepreneurs to integrate customers, value propositions, resources, channels, partnerships and revenue mechanisms. GenAI can assist by producing alternative business-model configurations and challenging entrepreneurs to consider different assumptions. For example, an entrepreneur can request several revenue mechanisms for a digital service, alternative customer segments for a product or different distribution arrangements for a local enterprise.

#### 4.4. Entrepreneurship Education

GenAI is also changing entrepreneurship education. Students can use AI to develop ideas,

simulate decisions, obtain feedback and experiment with business models. Zhang et al. (2025) found that AI knowledge and different patterns of GenAI use were associated with entrepreneurial ability among Chinese university students, with creativity influencing some relationships. The educational objective should therefore not be simply to teach students how to generate content with AI [5].

### 5. Opportunities Created by Generative AI

#### 5.1. Democratization of Entrepreneurial Resources

One of the most important potential contributions of GenAI is the democratization of access to knowledge-intensive capabilities. A small business with limited financial resources can potentially access assistance in marketing, communication, coding, customer interaction and business analysis. Rajaram and Tinguely (2024) specifically highlight this potential for SMEs, arguing that GenAI can democratize scalability and creativity even where firms have limited technical expertise and financial resources [6].

#### 5.2. Faster Experimentation and Productivity

GenAI can reduce the time required to generate and revise alternatives, allowing entrepreneurs to move through early-stage experimentation more rapidly. As shown in Table 3 Entrepreneurial opportunities and associated conditions [7].

**Table 3 Entrepreneurial opportunities and associated conditions**

| Opportunity                | Potential contribution of GenAI          | Important condition         |
|----------------------------|------------------------------------------|-----------------------------|
| Opportunity recognition    | Rapid generation of market possibilities | Human validation            |
| Creativity                 | More alternatives and perspectives       | Contextual judgment         |
| Marketing                  | Low-cost content generation              | Authenticity and editing    |
| Product innovation         | Faster concept experimentation           | Customer testing            |
| Decision support           | Scenario generation and comparison       | Verification                |
| Productivity               | Automation of routine knowledge work     | Appropriate task allocation |
| SME scaling                | Access to specialized capabilities       | Skills and governance       |
| Entrepreneurship education | Simulation and iterative feedback        | Critical AI literacy        |

### 5.3. New Venture Creation

Emerging evidence suggests that AI capabilities may influence the entrepreneurial ecosystem itself. UN Trade and Development (UNCTAD, 2025) notes that AI is increasingly being used by start-ups and MSMEs in areas such as marketing, customer service, logistics, finance and product design, while emphasizing that skills, finance, data, infrastructure and enabling ecosystems remain critical to successful adoption [8].

### 6. Generative AI, SMEs and Resource-Constrained Entrepreneurship

SMEs represent one of the most important contexts for examining GenAI because they often face simultaneous constraints in finance, human resources, specialist expertise and managerial capacity [9].

**Table 4 GenAI capability requirements for SMEs**

| Capability area  | What SMEs need                             | Consequence of weakness    |
|------------------|--------------------------------------------|----------------------------|
| AI literacy      | Understanding capabilities and limitations | Poor tool selection        |
| Employee skills  | Ability to formulate and evaluate prompts  | Low-quality outputs        |
| Data capability  | Appropriate data practices                 | Inaccurate or insecure use |
| Leadership       | Clear strategic direction                  | Fragmented adoption        |
| Governance       | Rules for privacy, IP and accountability   | Higher risk exposure       |
| Culture          | Openness to experimentation                | Resistance or misuse       |
| Human oversight  | Verification and contextual evaluation     | Overdependence             |
| External support | Vendors, advisors and ecosystem partners   | Capability gaps            |

### 7. Generative AI in Emerging Economies

The implications of GenAI are particularly significant in emerging economies because technology can simultaneously reduce capability constraints and expose existing infrastructural inequalities. Shore et al. (2024) found that GenAI and entrepreneurial orientation contributed to entrepreneurial resilience among SMEs, although market turbulence altered the relationships under examination. This produces a paradox: “GenAI may democratize entrepreneurial capability at the level of the individual while simultaneously widening capability differences between individuals and regions.”

### 8. Challenges of Generative AI in Entrepreneurship

#### 8.1. Hallucination and Reliability

AI systems may generate confident but inaccurate information. This creates significant risks when entrepreneurs use GenAI for market research, financial analysis, legal interpretation, regulatory advice or competitor assessment [10 – 11].

#### 8.2. Algorithmic Bias

AI systems can reproduce biases embedded in training data or system design. Bias can influence customer segmentation, hiring, market recommendations and other entrepreneurial decisions. This is particularly important when AI-generated recommendations affect individuals or groups.

#### 8.3. Privacy and Data Security

Entrepreneurs may unintentionally provide confidential information to AI systems. Such information can include customer records, financial data, product designs, supplier information and strategic plans. AI governance should consequently be incorporated into routine entrepreneurial management.

#### 8.4. Cognitive Dependence

Perhaps the most subtle risk is cognitive dependence. If entrepreneurs continuously outsource ideation, communication and analysis to AI, they may become less inclined to independently question assumptions or develop alternatives. This produces a central research question: “How can entrepreneurs use AI extensively without becoming

cognitively dependent on it?”

### 9. Human–AI Collaboration as the Core of AI-Augmented Entrepreneurship

The replacement narrative asks whether AI will replace entrepreneurs. A more useful entrepreneurial question is how human and artificial capabilities can be combined. As shown in Table 6 Human–AI division of entrepreneurial capabilities.

**Table 6 Human–AI division of entrepreneurial capabilities**

| Entrepreneurial activity | Human contribution       | GenAI contribution               |
|--------------------------|--------------------------|----------------------------------|
| Opportunity recognition  | Context and judgment     | Alternative opportunities        |
| Creativity               | Meaning and originality  | Idea variation                   |
| Market analysis          | Interpretation           | Information synthesis            |
| Business planning        | Feasibility judgment     | Scenario generation              |
| Marketing                | Brand identity           | Content alternatives             |
| Decision-making          | Responsibility           | Decision support                 |
| Innovation               | Strategic direction      | Concept generation               |
| Ethics                   | Moral accountability     | Identification of possible risks |
| Implementation           | Relationships and action | Process support                  |

Mostafiz et al. (2026) demonstrate that GenAI's relationship with entrepreneurial creativity and ethicality is more complicated than the assumption that AI simply makes entrepreneurs more creative. The entrepreneur should therefore remain in the loop, especially when decisions involve uncertainty, stakeholders, ethics or substantial

financial consequences.

### 10. Conceptual Framework for Future Research

Based on the reviewed literature, the following conceptual pathway is proposed. As shown in Figure 1 GenAI Exposure and Access

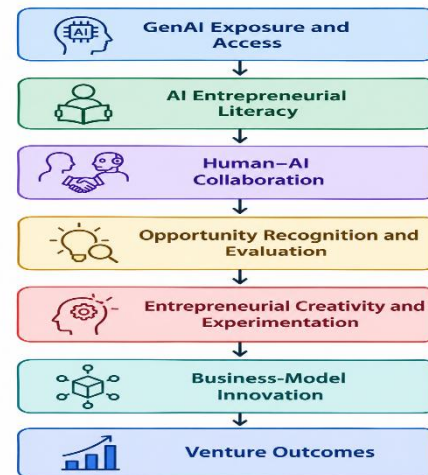


**Figure 1 GenAI Exposure and Access**

The strength of these relationships may depend on entrepreneurial experience, digital competence, domain knowledge, entrepreneurial self-efficacy, environmental uncertainty, resource availability, technology anxiety, institutional support and responsible AI capability. The framework differs from a simple AI adoption → performance model.

### 11. Emerging Research Directions

Future research should move beyond measuring AI adoption toward examining strategic human–AI collaboration and its impact on entrepreneurial capabilities. Greater attention is needed to opportunity quality, including novelty, feasibility, customer value, scalability, and relevance. Researchers should develop validated measures of AI entrepreneurial capability, covering AI literacy, prompting, verification, orchestration, and responsible AI use. Micro and small enterprises also require greater attention because they may gain significantly from accessible AI while facing limited governance, training, and data resources. Emerging economies should be studied as distinct contexts shaped by differences in infrastructure, institutions, language, finance, regulation, and

entrepreneurial ecosystems. Finally, responsible AI should be examined as a strategic entrepreneurial capability and potential source of competitive advantage, rather than only as a compliance requirement.

### Conclusion

Generative AI represents an important development in the evolution of entrepreneurship because it expands the entrepreneur's capacity to generate ideas, synthesize information, experiment with alternatives and perform knowledge-intensive activities. Its potential applications extend from opportunity recognition and creativity to marketing, business-model development, product innovation, decision support and entrepreneurship education. The emerging literature suggests that the greatest entrepreneurial value of GenAI may not lie in replacing human capabilities but in augmenting them. AI can increase the speed and breadth of entrepreneurial experimentation, while humans contribute contextual knowledge, judgment, ethical reasoning, accountability and implementation capability. This distinction is particularly significant for SMEs and entrepreneurs in emerging economies. GenAI can potentially democratize access to capabilities that were previously expensive or difficult to obtain, but unequal infrastructure, skills, finance and institutional support may also reproduce existing inequalities. Digital literacy, institutional conditions and structural inequalities will influence outcomes. The article therefore proposes AI entrepreneurial capability as a useful conceptual construct for future research. The capability involves AI literacy, effective interaction, critical evaluation, human-AI orchestration, entrepreneurial integration and responsible governance. Ultimately, the future of entrepreneurship is unlikely to be either purely human or purely artificial. A more plausible trajectory is human-led, AI-augmented entrepreneurship, in which entrepreneurs use machine-generated capabilities while retaining responsibility for defining opportunities, evaluating alternatives, making ethical judgments and creating real-world value.

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