

ARTIFICIAL INTELLIGENCE AND ENTREPRENEURSHIP: TRANSFORMING BUSINESS INNOVATION IN THE DIGITAL ECONOMY

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Abstract

AI was gradually revolutionising entrepreneurship through innovation, efficiency in business processes, decision-making, customer relationships, and business growth opportunities. This paper analysed the role of AI in revolutionising business innovation through the digital economy. The paper reviewed the literature on the impact of AI on entrepreneurial innovation, digital business revolution, challenges of adoption, and ethical considerations. The review was done using three themes that included AI as an entrepreneurial innovation driver, digital business revolution and AI, and challenges and ethical considerations of AI in entrepreneurship. The Technological–Organisational–Environmental (TOE) framework was used to analyse the impact of technological capability, organisational readiness, and environmental factors on the adoption of AI. The review suggested that the use of AI could overcome barriers to entrepreneurship, increase efficiency, assist in identifying opportunities, increase customer engagement, and encourage innovation. Nevertheless, difficulties related to infrastructure, skill sets, financing, cybersecurity, information privacy, algorithmic bias, and governance ethics should not be ignored, especially by small and medium-sized enterprises.

Keywords: Artificial intelligence; Entrepreneurship; Digital economy

Introduction

Entrepreneurship is being transformed through artificial intelligence (AI), which brings about innovations, improves efficiency, and creates business opportunities. The 21st century has witnessed immense developments in technology, especially Artificial Intelligence (AI), which has changed organisations and industries. Artificial Intelligence makes computer and robotic systems learn, reason, solve problems, make decisions, and comprehend language. Artificial intelligence has changed entrepreneurship by making it possible for entrepreneurs to automate processes, make better decisions, offer enhanced consumer experiences, and develop innovative products (Turner, 2026).

The emergence and growing use of AI in entrepreneurship have been influenced by the challenges faced by entrepreneurs and organisations in managing increasingly complex business activities. Businesses have had to deal with increasing competition, the need for faster decision-making, changing consumer demands, inefficient business processes, rising operational costs, and the growing need to develop innovative products and services. These challenges have made it necessary for entrepreneurs to seek technological solutions that can improve efficiency, support decision-making, reduce operational difficulties, and create new opportunities for business growth.

AI technology has evolved from an academic study to become a mainstream technological tool used by most companies in almost all sectors of the world economy, according to Russell and Norvig (2021). Dwivedi et al. (2023) stated that AI has become more common in organisations as they seek ways to gain a competitive advantage and achieve growth. Entrepreneurship is a critical factor that plays a central role in driving economic development and innovation, as well as social development. Entrepreneurship involves the act of identifying opportunities and coming up with innovative ideas for organising resources and executing projects with an intent of developing economic, social, or cultural value (Lavery & Little, 2023).

Some of the important components of this definition include: Opportunity Recognition - The entrepreneur has the ability to see the niches that exist in the market. • Innovation - The entrepreneur can innovate a product,

process, or business model. • Risk – Financial risk, market risk, and technological risk. • Value – The entrepreneur does not just create value for himself, but also for consumers, society, and the economy (Asgary et al., 2024). While current research stresses how AI has the potential to increase opportunities for recognising opportunities, innovating, decision-making, operations, and growth of businesses, many issues arise relating to organisational readiness, digital competency, infrastructure, budget, data protection, cybersecurity, bias in algorithms, and ethical management. In addition, the current literature places more emphasis on the technological aspects of AI rather than the organisational and environmental aspects affecting the use of AI, especially in developing countries. Thus, the current literature review is a critical evaluation of the significance of AI in entrepreneurship and its impact on transformation and innovation in business, along with the hurdles to its implementation. The TOE framework serves as an analytical tool to evaluate how technological capability, organisational readiness, and environmental conditions have an effect on AI adoption and entrepreneurial performance. In essence, the review attempts to offer a comprehensive insight into how AI technology can be used responsibly to encourage sustainable entrepreneurship.

Theoretical Foundation: Technology–Organisation–Environment (TOE) Framework

This TOE model was developed by Tornatzky et al. (1990) in an effort to provide a complete explanation for behavioural intentions and innovation implementation in a business setting. The advantage of this particular theory over others is the consideration of many factors (both internal and external) that influence the decision to adopt innovations, and that too through three contextual factors named technology, organisation, and environment



Figure 1: Researchers' Construct (2026): Technological–Organisational–Environmental (TOE)

Framework for AI Adoption and Business Innovation in the Digital Economy

Technology context refers to the existing technologies and new technologies that are relevant to each firm. The organisational context involves the features of the firm, such as its scope, size, and resources, while the environmental context shows the sphere in which firms operate, involving industries, competition, and government (Tornatzky, 1990). TOE consists of a wide variety of context applications. Hashimy et al. (2023)

explained the process of blockchain adoption by looking into various aspects of technology (that is, relative advantage, complexity), organisation (that is, competency, support from top management), and environment (that is, competitive pressure). According to Tajudeen et al. (2018), who applied the TOE framework, technology (that is, relative advantage, compatibility); organisation (that is, support from top management, entrepreneurial orientation) and environment (that is, institutional pressure) influence significantly the use of social media for the needs understanding and communication purposes. The main strength of this framework is its capability to show how both internal and external variables affect organisational decisions on adoption of innovation.

Within the scope of this research, the technological context describes how technologies of artificial intelligence, including machine learning, generative AI, big data analysis, cloud computing, and intelligent automation, become significant innovations used by entrepreneurs for the identification of business opportunities, development of innovative business models, decision-making, automation of business processes, and enhancement of organisational performance. The attributes of AI technology, such as relative advantage, compatibility, and complexity, affect the adoption level of such innovations within entrepreneurial companies.

The organisational context underlines the role of the attributes of the firms in the adoption of AI. Organisational factors like organisational size, financial capacity, digital competence, managerial support, entrepreneurial orientation, and individual capabilities play a critical role in determining whether an organisation is ready to adopt AI into its processes. In this research, organisational readiness indicates why some entrepreneurial organisations have been able to utilize AI successfully to foster innovation, productivity, customer relations, and competitive advantage compared to other organisations. The environmental context brings out the role of the external environment in AI adoption. Some of the factors include competition, industry structure, government policies, technological infrastructure, institutional support, and regulation. In this case, as firms are operating in digitally competitive environments, entrepreneurs should adopt

AI technology to stay competitive and meet ethical and regulatory standards.

Accordingly, the TOE framework can be seen to provide an all-inclusive perspective for the understanding of the core arguments of the research in question entitled *Artificial Intelligence and Entrepreneurship: Transforming Business Innovation in the Digital Economy*. It clearly indicates that the successful transformation of business innovation using artificial intelligence is dependent not only on the presence of the latter, but also on organisational preparedness and on the business environment. Hence, the framework can be regarded as explaining how the three factors mentioned above affect AI adoption and entrepreneurship success in the digital economy.

Methodology

Objectives of the Review

The literature review was conducted based on the following research objectives:

1. To critically analyse the influence of artificial intelligence (AI) on entrepreneurial innovation, opportunity identification, business modeling, and venture performance.
2. To assess the impact of AI on business activities, customer relationships, strategic decisions, scaling and innovations in the digital economy.
3. To explore the key barriers to AI usage in entrepreneurship, including ethical and legal problems.

Review Method

The critical literature review methodology was employed in this paper for the synthesis and critical evaluation of existing scientific literature related to artificial intelligence and entrepreneurship. The following issues have been considered in the literature review process: entrepreneurial innovation through AI, business transformation, and digitalisation through AI, AI adoption challenges, ethical concerns regarding the use of AI, and the impact of AI on entrepreneurship performance and sustainable business growth. The scientific literature included in the review consisted of peer-reviewed journal articles, theoretical works, literature reviews, and empirical studies. The literature was not only summarised but also critically

analysed. Specific focus was made on the key assumptions, contributions, limitations, contextual relevance, and shortcomings recognized in each of the articles analysed. This critical review takes into account both positive, negative aspects of the implementation of artificial intelligence, including its ability to decrease the barriers to entrepreneurship, increase creativity, and decision-making capabilities, automate business processes, and increase customer engagement. On the other hand, the review focused on issues associated with biases in algorithms, data privacy, cybersecurity, and intellectual property, and labour displacement, skills of workers, infrastructure, organisational preparedness, and regulatory requirements. It was identified in the manuscript that most of the existing research in the literature are theoretical, experimental, case studies or have been based on educational studies, and there is very little longitudinal research in the field. To synthesise the literature, it was first grouped into three broad themes for analysis: (1) Artificial Intelligence as an Enabler for Entrepreneurial Innovation, (2) Artificial Intelligence and Transformation in Business in the Digital Economy, and (3) Challenges, Ethical Concerns and Future Trends in AI in Entrepreneurship. Thematic organisation allowed for comparison of converging and diverging views in the literature and identification of gaps in knowledge that need future research attention. In addition, the TOE (technological-organisational-environmental) model was used in the literature review as an analytical perspective. This model takes into account such technological elements as relative advantage, compatibility and complexity, organisational elements such as firm size, firm resources, management support, digital competence and employees' competence, and environmental elements like competition, policies of the government, infrastructure and institutional environment. In conclusion, the aim of this synthesis was to offer a balanced perspective of AI as both an enabling factor and as an obstacle to entrepreneurship. Instead of making the implicit assumption that the presence of technology is sufficient to ensure entrepreneurial success, the review was conducted taking into account how AI adoption is influenced by organisational readiness and the business environment. The mentioned approach is fully compatible with the important idea of the study.

Theme 1: Artificial Intelligence as a Driver of Entrepreneurial Innovation

The arrival of artificial intelligence (AI) technology, and more importantly the arrival of generative AI technology into entrepreneurship as disruptive technology that eliminates the barriers that exist when creating businesses and improves innovation at all stages of the entrepreneurship process, is very clear from the reviewed literature. The review of the literature sees AI as not only a technology, but also more as an enabling one that can be used to help entrepreneurs identify opportunities, develop business models, make decisions, and achieve high levels of business performance. Nonetheless, some limitations exist with AI.

One of the most compelling arguments made in all of the studies is that generative AI makes entrepreneurship more democratic by lowering entry barriers. According to Fossen, McLemore, and Sorgner (2024), AI acts as a virtual co-founder, which allows entrepreneurs to acquire strategic knowledge without the need for experience from working partners or consultants. Likewise, Tran and Murphy (2023) stated that AI increases efficiency in operations, automates mundane business processes, and gives affordable access to entrepreneurial resources. These abilities become especially useful for resource-limited entrepreneurs and businesses. Nevertheless, these studies assume that entrepreneurs have enough digital competences to work with AI. In some developing economies, like Nigeria, low-quality digital infrastructure, low-level technological competence, and unreliable access to the internet may considerably diminish the effectiveness of using AI in entrepreneurship. Thus, the literature tends to make generalizations based on results obtained mainly in advanced technological settings.

Another notable contribution in terms of research made by the literature review is the role of AI in business model innovation. As Kostis et al. (2024) proved, entrepreneurs could utilize the capabilities of generative AI to evolve their business ideas by applying the process of a feedback loop. At the same time, Boussioux et al. (2024), using experimental design, found that the collaboration of humans and artificial intelligence allows generating more innovative business ideas than human efforts alone. The above-mentioned results confirmed the hypothesis that AI and entrepreneurship complement each other in generating ideas. However, the

utilisation of AI-generated business ideas is accompanied by some challenges concerning originality and competitiveness. Because AI models rely on pre-existing databases of information, there is a high chance that entrepreneurs with identical prompts will generate similar business ideas. The literature also discusses the educational importance of AI for entrepreneurship education. For instance, Hammada (2024) showed that ChatGPT helped students form entrepreneurial groups, assign roles, and suggest equity structures. Students regarded AI as an efficient learning aid, implying its efficiency in educating entrepreneurs. Although the above proves the effectiveness of AI as a decision-making tool, the results need to be understood with caution. Team building is characterised by many of human factors, including trust, emotional intelligence, compatibility of leadership style, conflict resolution, among others – aspects that modern AI technologies cannot account for.

The process-oriented approach used in the analysis of Shepherd et al. (2019), Chalmers et al. (2021), and Giuggioli and Pellegrini (2023) created a holistic approach to the influence of AI at all stages of the entrepreneurial process. These authors used the concept of an "AI-enabled entrepreneurial process", in which three stages - opportunity recognition, decision-making, and venture performance are mentioned as interrelated stages, influenced by the potential of artificial intelligence. It should be noted that the proposed model is a significant contribution to the existing theories of entrepreneurship, as it involves the influence of technological innovation within the well-developed body of entrepreneurship theories. Nevertheless, the framework lacks empirical justification of the influence of AI in different industries, enterprises, countries, and cultures.

In addition, there are a number of researchers who see AI as an exogenous facilitator of entrepreneurship (Davidsson et al., 2020; Davidsson & Sufyan, 2023). Although his view recognised the innovative potential of AI, it pays significantly less attention to the related risks. Problems like algorithmic bias, data protection, intellectual property ownership, cybersecurity risks, and ethical decision-making get little mention, although these problems become increasingly significant for AI-based businesses. Business people using the recommendations from AI may end up applying biases or violating the law due to issues of intellectual property generated

by AI. The other weakness among the studied sources was that their methodology was mainly theoretical in nature. Most of the findings have been drawn from experiments, theoretical analysis, reviews, and educational settings rather than empirical studies involving actual firms. Although this methodology offers useful theoretical information, it fails to produce any evidence concerning the economic success and survival rates of AI-enabled firms in the end. This would be an important focus for future research.

All in all, the existing literature provides ample proof of the fact that the role of AI in promoting entrepreneurial innovations becomes increasingly important due to the reduction in the barriers to entering a market, increasing creativity, making decisions, and business model formation. Despite this, the current literature pays little attention to potential issues that may arise from applying AI. To advance future research, scholars must consider more sophisticated, context-specific approaches that examine the role of AI entrepreneurship in developing countries, conduct empirical longitudinal studies, and explore how to integrate AI capabilities with human traits such as creativity, ethics, and emotion.

Theme 2: Artificial Intelligence and Business Transformation in the Digital Economy

From the reviewed literature, it is evident that AI has become one of the important determinants of the transformation of businesses within the digital economy by helping organisations achieve efficiency in operations, engage customers, innovate, and make sound decisions. AI is emerging as one of the main technologies that drive digital transformation along with cloud computing, Internet of Things (IoT), big data and mobile technologies (Ilić & Damjanović, 2024). Despite the convincing information presented about the potential of AI for the transformation of business organisations, it is important to point out that there are numerous cases where this information is highly optimistic.

The prevailing argument is that AI substantially boosts operational efficiency via automation. According to Yusuf et al. (2024), AI automation saves time by executing repetitive tasks, cutting down costs, eliminating mistakes made by humans, and improving risk management. This is especially true for SMEs, which lack financial resources and labour force.

Likewise, Mardani (2024) claimed that AI opens up opportunities for innovation and sustainable growth of a business due to increased organisational efficiency. Despite the fact that plenty of studies have corroborated these research results, their findings presume that companies have the required digital infrastructure, money and skilled labour force to implement AI successfully. In practice, however, many firms, especially those from developing countries, suffer from insufficient digital infrastructure, poor access to the latest technologies, cybersecurity problems and lack of AI professionals.

Another important AI contribution is related to organisational scalability and digital growth. As argued by Yusuf et al. (2024), cloud AI platforms allow for business growth and processing of increasing amounts of business information without considerable infrastructure investment. In other words, this flexibility will allow organisations to cope with new challenges that arise on the market efficiently and cost-effectively. However, although this is an important aspect of digital transformation, there is too little consideration given in the literature to the financial and organisational costs related to the adoption of AI. Despite the fact that cloud computing decreases the costs of purchasing hardware, organisations have to face large expenses in terms of software purchases, employee training, data management, cybersecurity, and constant systems maintenance.

Customer engagement constitutes yet another important theme in the reviewed literature. According to Yusuf et al. (2024), AI allows businesses to understand the behaviour of their customers and use personalized marketing strategies in order to improve their satisfaction and performance. It is clear that recommendation engines, predictive models, and conversational AI chatbots have transformed customer relationship management, making it highly efficient and personalized. However, the extensive use of personalized AI-based solutions raises a number of ethical and legal challenges. The gathering and analysis of vast quantities of customer data give rise to problems connected with the issues of data privacy, informed consent, algorithmic transparency, and consumers' trust. Even though the issue is not considered extensively in the literature analyzed, it receives more and more attention.

Furthermore, AI is perceived as an efficient technology in identifying opportunities and analysing the market according to the available literature. Nambisan et al. (2019), affirm, "Digital technologies allow entrepreneurs to identify emerging market opportunities," whereas Trocin et al. (2021) highlight that AI is able to find patterns of consumer behaviour with structured and unstructured data sets. Without a doubt, it increases the effectiveness of entrepreneurs' decision-making because companies can react promptly to changing market conditions. However, at the same time, any recommendation from AI systems depends on the data that is used. In case of poor-quality data, biased algorithms, or fast-changing market conditions, a company might make wrong decisions.

The field of strategic planning and business decision-making is yet another area where artificial intelligence shows its significant potential. According to Venkatesh et al. (2003), AI-based decision systems contribute to the responsiveness of organisations due to their ability to predict demand, assess risks, and recommend alternative strategies. Likewise, Marikyan and Papagiannidis (2023) suggested that intelligent technologies facilitate evidence-based decision-making owing to the ability to analyze large and complicated data sets in ways traditional systems do not. Despite the emphasis on the analytical power of AI-based technologies, however, those studies do not take into account the restrictions of algorithmic decision-making in uncertain, politically unstable conditions, as well as rapidly changing consumers' preferences. Strategic business decisions are subjective and rely heavily on ethics, organisational culture, and leadership experience.

In addition to this, the literature points out AI's role in fostering innovation in products and services. Chalmers et al. (2021) stated that digital technology led to faster innovation among entrepreneurs, while Huang and Rust (2021) posited that AI increases creativity by aiding problem solving and speeding up research and development activities. Generative AI has been able to reduce product development cycles by facilitating quick prototypes, market simulations, and designs centred on customers. However, at the same time, the literature takes for granted the assumption that AI is innovative in nature. In reality, AI does not produce original outputs; it creates its output by following the existing patterns of

knowledge. Overreliance on ideas generated by AI can fail to produce disruptive innovations due to lack of differentiation.

One major limitation in the reviewed literature is the focus on technology aspects while neglecting other important organisational factors. The majority of articles discussed the benefits of AI implementation without paying attention to employees' resistance, leadership preparedness, ethics of AI implementation, reskilling of staff, compliance with regulations, or management of organisational change. In fact, digital transformation itself is more of an organisational matter than purely technical. Thus, the success of AI implementation does not depend only on advanced technologies but also on proper leadership, learning, organisational culture, and regulation.

Methodologically, many of the studies that have been undertaken tend to focus more on conceptual arguments, theories, and case studies than long-term empirical longitudinal analysis in terms of organisational benefits. The lack of evidence regarding whether AI adds to the bottom line in terms of profitability, innovation, customer retention, or competitive advantage is still evident within various contexts. In the future, there is a need for longitudinal and comparative studies of AI adoption in both developed and developing countries.

In general, there is ample empirical support for AI as an influential force for digital transformation of businesses through improved efficiency, decision-making, innovation, scalability, and customer interaction. Nevertheless, current literature seems to be biased toward technological potential and overlooks issues related to implementation challenges, ethics, organisational readiness, and contextual issues. Future research efforts need to focus on the development of multidimensional views of AI adoption. This will help in achieving a better understanding of the influence of AI on sustainable business transformation in the digital economy.

Theme 3: Challenges and Ethical Issues of AI in Entrepreneurship

Even though AI can revolutionise the entrepreneurial landscape, there are several difficulties and ethical questions posed by the integration of AI into entrepreneurship. The first difficulty relates to algorithmic biases, as AI deals with huge amounts of data and produces customized outputs.

However, the output of such an AI system may be biased despite all the calculations and computations made by this system (Di Vaio et al., 2020; Nishant et al., 2024). The issue is crucial, since more entrepreneurs and managers depend on AI to help them make decisions and introduce organisational innovations. There are different types of AI biases, which include dataset biases, algorithm biases, and interaction biases (Mehrabi et al., 2021). The potential ramifications could include misinformed decisions by operations and furthering biases against minorities and misrepresented populations in the dataset. Thus, the very technology, which is able to create significant economic and social value, is also capable of replicating inequalities and generating discriminatory results. Ethical AI development and use involve cooperation between practitioners, academics, technology providers, and policy makers.

However, such difficulties are highly pertinent to SMEs and startups that operate with restricted access to finances, technology, and people. Dwivedi et al. (2023) recognize technological, organisational, and ethical constraints as the main inhibitors of successful adoption of AI, while George, Merrill and Schillebeeckx (2021) call for an alignment between AI-based entrepreneurship and innovation with ethical management and business operations. The costs of investing in AI technology, digital infrastructure, its maintenance, and training of the staff can be substantial for enterprises with limited resources.

Data privacy and cybersecurity present another major issue. For AI applications to function properly, they need many data to learn from, make predictions, perform analysis, and make decisions. Thus, companies utilizing AI can collect, analyse, and store a significant amount of personal, financial, customer, and company-related data. This raises many issues in terms of cybersecurity threats, data breaches, identity theft, and misuse of sensitive information. It is essential for entrepreneurs to create proper data protection strategies and mechanisms. According to Davenport et al. (2020), the need for data governance is important in AI implementation, and according to Floridi et al. (2018), responsible data management is essential to protecting stakeholders in AI-powered technologies. Lack of proper data governance may lead to loss of customers' trust, and this creates risks for entrepreneurial organisations.

Algorithmic discrimination is another example of an ethical problem faced by entrepreneurs using AI. The use of biased, incomplete, and non-representative data in the training of AI models results in biases being amplified in the output generated by AI systems. In the field of entrepreneurship, AI biases could manifest themselves when making decisions on hiring people, financing ventures, customer profiling, marketing, and service delivery. For instance, AI-assisted hiring and financing processes can be used to exclude certain individuals or groups, while discriminatory customer profiling processes may undermine consumer confidence in organisations. Algorithmic bias is highlighted as one of the most pressing ethical issues when designing and implementing AI technology (Mehrabi et al., 2021). Hagendorff (2020), on the other hand, emphasises systematic evaluation and governance of AI to reduce discriminatory outcomes.

In general, the difficulties faced in relation to AI entrepreneurship indicated that simply because of the adoption of technology does not mean positive results for entrepreneurs. The use of AI can improve innovation and the business process itself, but all these aspects can be influenced negatively because of algorithmic bias, security problems, and privacy issues, lack of money, skills and regulation. Thus, AI entrepreneurship should include not only technological innovations but also ethics, organisation, and regulations as well. Such an approach is in line with the TOE perspective since; according to it, AI adoption depends not only on the technological aspect but on the organisational one as well.

Conclusion

From the review, it is clear that AI is an important factor in entrepreneurial innovation and change in the digital age. Artificial intelligence offers entrepreneurs the opportunity to enhance efficiency, identify opportunities in the market, create new products and business models, engage customers, and make strategic decisions. It is noteworthy that the benefits of AI can only be realised through the right technological, organisational, financial, digital literacy, infrastructure, and business environments. The review identified several concerns with regard to bias in algorithms, data privacy, cyber-security, ethics in governance, and AI reproducing inequalities. The TOE framework proved that there is a need for interaction among

technological, organisational, and environmental factors in order for AI to be successfully adopted. AI should be seen as a tool for making decisions and supporting innovation.

Recommendations

Based on the review done of the focus of the paper, the authors recommended that :

1. Entrepreneurs and SMEs need to enhance their capability to implement AI technologies through investing in skill development and continual learning.
2. The government and other organizations mandated with the responsibility of regulating these areas should upgrade the digital infrastructure, internet connectivity, and technology that will make it easier to use AI systems, especially among SMEs and entrepreneurs from developing nations.
3. The individuals charged with the development of the AI system should ensure that there is fairness, transparency, accountability, and diversity during the design of the AI technology in order to prevent any form of bias and discrimination.
4. Policymakers should create an environment that will support the implementation of the AI system.
5. Entrepreneurial firms need to put in place data governance, cybersecurity, and privacy policies to ensure safety and protection of personal and business data that is used by AI technologies.
6. Future research should make use of longitudinal and comparative empirical research to understand the long-term impact of AI adoption on innovation, profitability, sustainability, and competitiveness of entrepreneurial firms.

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