

ARTIFICIAL INTELLIGENCE (AI) AND ENTREPRENEURSHIP: OPPORTUNITIES AND CHALLENGES

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ABSTRACT

The paper reviewed Artificial Intelligence (AI) and Entrepreneurship: Opportunities and Challenges. As AI technology continues to advance, businesses can improve their use of AI to better serve and connect with their customers in more meaningful ways. The paper discussed concepts such as Artificial Intelligence (AI) and Entrepreneurship. The paper also discussed applications of artificial intelligence in entrepreneurship practice, opportunities in implementing artificial intelligence in entrepreneurship, challenges in implementing AI in entrepreneurship, solutions to the challenges of artificial intelligence in entrepreneurship practice and future evolution of AI in entrepreneurship. It was concluded that AI brings many benefits to businesses, but some potential limitations and problems need to be addressed. Concerns about data security and privacy, the potential for bias in AI decision making, and the need for businesses to blend their operations and employees with fast growing technology are some of the obstacles. As entrepreneurs are integrating artificial intelligence into their business operations, they must be aware of these concerns and work on reducing their impact.

Keywords: Artificial intelligence, entrepreneurship, businesses, opportunities, challenges

Introduction

Artificial Intelligence (AI) is transforming all sectors including entrepreneurship. The infusion of artificial intelligence (AI) into the entrepreneurial landscape marks a transformative era (Robledo et al., 2023) where value creation through innovation is not just an aspiration but a tangible reality. The presence of AI in contemporary entrepreneurial practices has redefined the essence of business operations, strategy formulation, and decision-making processes (Le vesque, Obschonka, & Nambisan, 2022). AI can be applied to several entrepreneurial processes to increase productivity, efficiency, and decision making, including product development, marketing, sales, customer service, operations, and finance (Sahadevan, 2023). Entrepreneurs can obtain a competitive advantage and accomplish their goals by utilizing AI tools and approaches.

AI uses machines and algorithms to replicate and improve human intellect. This technology can analyse vast amounts of data, spot trends, and make predictions. Real-time customer support and interaction can also be offered via AI-powered chatbots, and automated processes can provide entrepreneurs more time to concentrate on other essential tasks. Although AI offers many potential advantages, it also has drawbacks. For AI to be effective, a large investment in expertise and data is necessary. Additionally, AI needs human supervision and assistance because it cannot replace human oversight and support. Overall, it's critical to properly balance the benefits and drawbacks of integrating AI in business (Rana et al., 2022).

Concept of Artificial Intelligence (AI)

Artificial intelligence is a complex entity. There are several definitions and many more impressions of what constitutes AI. Russell and Norvig (2021) defined Artificial

Intelligence as the development of algorithms that enable machines to perform tasks traditionally requiring human intelligence, such as problem-solving and learning from experience. Rouse et al. (2020) further defined it as a branch of computer science that focuses on building and managing technology that can learn to autonomously make decisions and carry out actions on behalf of a human being. Simply put, AI is an artificially-intelligent system that can learn on its own (Garnier, 2024). AI is not a single technology; instead, it is an umbrella term that includes any type of software or hardware component that supports machine learning, expert systems, generative AI and certain types of robotics. According to the Subcommittee on Machine Learning and Artificial Intelligence (2016), there are many categories of AI. These include thinking like humans, acting like humans, thinking rationally, and acting rationally. Venture capitalist Sulemana and Chen (2019) broke AI into five categories: logical reasoning, knowledge representation, planning and navigation, natural language processing, and perception. Although most are aware of the core idea of AI, it is difficult to pin down.

Hintze (2016) stated that there are four different types of AI. These four types are on a continuum from reactive to self-aware. The Type I AI that Hintze described is reactive. This type of machine does not form memories nor use past experiences to make decisions. His example for this type is that of Deep Blue, IBM's chess-playing computer which beat Kasparov in the late 1990s. This type of computer acts on what it sees; it does not rely on an internal concept of the world. Hintze categorized his Type II AI as those with limited memories. These machines can look into the past. The shortcoming with this machine is that it does remember its experiences and use those experiences to handle new situations. For his Type II machine, Hintze (2017) gives the example of self-driving cars. These cars can observe the speed and direction of other cars. The observations are added to the cars database along with other driving elements. The next two types of AI do not yet exist. Hintze classifies his Type III AI as the theory of mind. The theory of mind-machine will form an understanding that people, creatures, and objects in the world can have thoughts and emotions that affect their behaviour. This type of machine can interact socially. The Type IV AI are considered self-aware, which also includes the theory of mind.

Concept of Entrepreneurship

The concept of entrepreneurship encompasses the process of identifying and exploiting business opportunities, taking risks, and creating value through innovative ideas, products, or services (Adeniran, Akinola, Oyewo & Usaini, 2021). According to Richard Cantillion's (2018) interpretation, an entrepreneur is someone who purchases something at a set price with the intention of reselling it for a variable price. By doing this, they decide how to use and acquire resources while also accepting the risk associated with the enterprise. Entrepreneurship, according to Nzewi, Onwuka, and Onyesom (2017), is a dynamic cycle of invention, change, and vision. It necessitates channeling energy and excitement towards the development and application of ground-breaking ideas and explanations. An entrepreneur is someone who comes up with ideas, innovates, takes calculated risks, and realizes their dreams. An entrepreneur is seen as someone whose concepts have resulted in the founding of a successful company endeavor or the creation of a remedy for a specific social issue. An entrepreneur is seen as an important game-changer for company practices, product passion, effective use of scarce resources, etc. A risk-taker is someone who is prepared to incur both known and unknowable risks in order to make sure that their goals and ideas are effectively implemented. An entrepreneur is

seen as someone who does all in his power to make sure that his ambitions come true. He has unfathomable dreams and, without prejudice or concern about failure, he makes sure they come true.

Entrepreneurship, according to Radulov (2019), is the process of seeing and developing new company prospects while taking on financial risks in the quest for success and profit. An entrepreneur is an individual who organizes and operates a business, typically with innovative ideas or by leveraging existing resources in new ways. Entrepreneurship involves various processes, such as recognizing market gaps or needs, developing innovative products or services, mobilizing resources (including capital, labor, and technology), managing risks, and assuming responsibility for the success or failure of the venture. Entrepreneurs often exhibit characteristics such as creativity, passion, determination, and a willingness to take calculated risks. They are driven by a desire to bring about change, make an impact, and create value in the marketplace. Successful entrepreneurship can contribute to economic growth, job creation, and the development of new industries and markets. Entrepreneurs can be found in various sectors, including technology, manufacturing, finance, social enterprises, and more.

Applications of Artificial Intelligence in Entrepreneurship Practice

Artificial Intelligence according to Inalegwu, Terver, Nuvalga and chukwuaguzie (2024) can be applied in entrepreneurship practice through the following ways:

Idea generation: Idea generation in the application of Artificial Intelligence (AI) in entrepreneurship practice is the use of AI techniques to generate innovative business ideas, solutions or products. Artificial Intelligence can identify patterns and trends in market data, inspiring ideas for new products or services. It can also merge seemingly unrelated ideas or technologies to create novel solutions. According to Kabiru Mohammed (2024), artificial intelligence driven analytics can forecast customer preference, guiding entrepreneurs to develop targeted products or services. Artificial intelligence for idea generation can unlock new possibilities-driven innovation and build successful businesses that meet real customer needs. Artificial Intelligence can create digital prototypes or mockups, streamlining the ideation process and assist entrepreneurs in brainstorming sessions, offering suggestions and building upon human ideas. More so, it can assess the potential success of an idea providing entrepreneurs with data-driven insights and iterate on initial ideas, refining them based on feedback and performance metrics.

Market Research: Marketing research in the application of Artificial Intelligence in entrepreneurship practice is the use of artificial techniques to gather, analyze, and interpret data about target markets, customers and competitors. By leveraging artificial intelligence for market research, entrepreneurs can gain a deeper understanding of their market, make informed decisions, and drive business success. Artificial intelligence powered market research can process vast amount of data, providing insight on market trends, customer behavior and competitor activity. It can also detect relationship between data points, revealing hidden market dynamics and opportunities and the driven analytics can create precise customers profile, predicting purchasing decisions and loyalty. Radulov (2019) states that artificial intelligence also track brand mentions, sentiments analysis and trends, enabling entrepreneurs to respond promptly. Furthermore, it can analyze open-ended responses, sentiment and preference, providing actionable insights and also can pinpoint unmet needs, untapped markets and potential disruptions. It can monitor competitors' strategies, market positioning and performance. According to Elujekwute, Nwaokwa, Aja and Oigoch (2021), Artificial Intelligence enhanced market research in entrepreneurship

practice can: Enhance market understanding; inform data-driven decision-making; Improve product development; Optimize marketing strategies; Identify new business opportunities; Support competitive advantage and Foster sustainable business growth.

Predictive Analytics: Predictive analytics in the application of Artificial Intelligence (AI) in entrepreneurship practice is the use of artificial intelligence algorithms to forecast future business outcomes, trends and customer behaviors. Artificial Intelligence can predict future sales patterns, enabling entrepreneurs to make informed decision on inventory, pricing and resource on allocation, more so, predict customer churn, allowing entrepreneurs to proactively retain valuable customers. It predicts market shifts, enabling entrepreneurs to adjust their strategies and stay competitive. By leveraging artificial intelligence for predictive analytics, entrepreneurs can gain a competitive edge, drive business success and navigate uncertain market with confidence. It can predict potential risk and challenges, allowing entrepreneurs to proactively develop contingency plans. Artificial intelligence can predict emerging markets and opportunities, enabling entrepreneurs to innovate and expand. According to Elia, Margherita and Passiante (2020), artificial intelligence powered predictive analytics in entrepreneurship can: Improve decision-making; Enhances business agility; Optimize resources allocation; Increase revenue and profitability; Foster innovation and competitiveness; Support sustainable business growth and Reduce uncertainty and risk.

Automation and Efficiency: Automation and efficiency in the application of Artificial Intelligence (AI) in entrepreneurship practice is the use of AI to streamline and optimize business processes, leading to increased productivity, reduced cost and improved decision making. AI-powered automation and efficiency can take over tasks such as data entry, bookkeeping and customer service, freeing up the time for strategic activities. Also, it can analyze and optimize processes, identifying bottlenecks and opportunities for improvement. Artificial intelligence can predict equipment failures, reducing downtime and increasing overall efficiency. It can manage workflows, assigning tasks and resources optimally as well as predict demand, manage inventory and optimize logistics. Guglielmo and Massimilino (2022) maintain that artificial intelligence can make data-driven decisions, reducing the needed for human intervention and enhanced customer experiences through chatbots and virtual assistants which can provide personalized support, improving customer satisfaction. According to Chen, Chen and Pandlin (2020), artificial intelligence powered automation and efficiency in entrepreneurship practice can: Increase productivity; Reduce costs; Improve accuracy; Foster scalability; Enhance decision-making; Support sustainable growth and Enable competitive advantage. By leveraging artificial intelligence for automation and efficiency, entrepreneurs can transform their businesses thus achieving greater agility, innovation and success.

Chatbots and Virtual Assistants: Chatbots and virtual assistants in the application of artificial intelligence (AI) in entrepreneurship practice is the use of artificial intelligence powered computer programs that simulate human conversation and provide customer support, answer frequently asked questions and assist with tasks. By leveraging artificial intelligence powered chatbots and virtual assistants, entrepreneurs can revolutionize customer interaction, streamline business processes, and drive innovation. According to Guglielmo and Massimiliano (2022), artificial intelligence powered chatbots and virtual assistants can provide 24/7 customers support, answer frequently asked questions, help with order placement and tracking as well assist with product recommendations and offer personalized support. Furthermore, it routes complex issues to human representatives, integrate with other business systems and analyze customer interactions to improve

services, chatbots and virtual assistants can be used in various entrepreneurship application, such as E-Commerce, customer service, marketing, sales, human resources, finance, healthcare and education among others. As AI technology evolves, more and more entrepreneurs are likely to adopt it as a valuable tool to provide better services to their customers.

Opportunities in Implementing AI in Entrepreneurship

AI presents considerable opportunities for entrepreneurs to enhance customer experiences and stay ahead in a competitive landscape. AI integration can transform startups' operations and the way entrepreneurs connect with customers. It frees up entrepreneurs to focus on meaningful tasks and automate routine workloads. Decisions become more informed, and customers benefit from enhanced experiences that build lasting connections (Sahadevan, 2023). As AI technology continues to evolve, customers can look forward to more personalized interactions that resonate with them on a human level. Although AI-generated content may lack a human touch, it offers ample opportunities for entrepreneurs to provide superior customer experiences that build lasting people connections. As AI technology continues to advance, businesses can improve their use of AI to better serve and connect with their customers in more meaningful ways. Startups can analyse vast data, improve their marketing plans, and get a competitive edge with AI. Customer service is one area for entrepreneurs where AI is really helpful. Chatbots and virtual assistants powered by AI may offer round the clock customer service, respond to questions, and even complete transactions. This lets entrepreneurs to concentrate on other crucial tasks like expanding their line of products or services (Nambisan et al., 2019).

AI can also be applied to many business processes to increase their accuracy as well as efficiency. For instance, AI-powered systems can analyse financial data to find trends and forecast future outcomes, assisting business owners in making better investment and revenue projection decisions. Additionally, typical chores like bookkeeping and data entry can be automated using AI-powered technologies, saving entrepreneurs time and money. AI may also assist entrepreneurs in learning valuable information about their target market and customers. Entrepreneurs may design more successful marketing strategies and find potential new growth prospects by evaluating data from social media and other online sources (Wiklund et al., 2011). With AI in enterprise, there are, nevertheless, some additional difficulties. Entrepreneurs may face challenges with regards to using AI due to concerns around potential bias in the algorithms, as well as a lack of technical knowledge and resources needed to develop AI solutions.

Challenges in Implementing AI in Entrepreneurship

These challenges according to Inalegwu, Terver, Nuvalga and chukwuaguzie (2024) are briefly discussed below:

Limited Access to Artificial Intelligence Resources Infrastructure: This is a significant challenge in integrating Artificial Intelligence (AI) into entrepreneurship practice. AI requires powerful computational resources, such as high-performance GPUs, TPUS or cloud computing services. Limited access to these resources hinders entrepreneur's ability to develop and train artificial intelligence models. Also, limited access to data centers cloud storage, or data management tools make it difficult for entrepreneurs to handle large dataset. According to Abdulkadir (2018), access to AI software, frameworks and tools, such as tensor flow, PYTorch or Scikit-learn, is crucial for developing AI applications as limited access to these resources restricts entrepreneurs' ability to build and deploy AI

models effectively. It requires specialized expertise, including data scientists, machine learning engineers and artificial intelligence researchers.

High Cost of Artificial Intelligence Power Tools: The high cost of AI power tools and platforms is a significant challenge in integrating Artificial Intelligence (AI) into entrepreneurship practices this is because artificial intelligence software, platforms and tools such as machine learning frameworks, natural language processing libraries and predictive analytics software can be expensive to purchase or subscribed to, since it requires vast amounts of data, which can be expensive to acquire, store and manage.

Lack of Literacy in Artificial Intelligence: Lack of literacy in Artificial Intelligence (AI) is a significant challenge in integrating AI into entrepreneurship practices. This is because the entrepreneurs may lack the technical expertise to understand artificial concepts, tools, and applications, making it difficult to implement solutions. The inability to collect, analyze and interpret data effectively hinders artificial intelligence adoption of data as the foundation of AI application.

Ethical Concerns/bias: The ethical concerns and bias are significant challenges in integrating artificial intelligence into entrepreneurship practices. Artificial intelligence algorithms can perpetuate and amplify existing biases present in the data used to train them, leading to discriminatory outcomes. Its decision-making processes can be opaque, making it difficult to identify and address biases. AI system can be vulnerable to cyber-attacks, compromising sensitive data and decision-making processes.

Dependence on Data Quality: The dependence on data quality is a significant challenge in integrating Artificial Intelligence (AI) into entrepreneurship practices. Artificial intelligence requires accurate data to produce reliable results as inaccurate data can lead to flawed decision-making. Artificial intelligence application benefits from diverse data sources and formats, but inconsistent data types can create integration challenges.

Need for Continuous Updating: The need for continuous updating is a significant challenge in integrating Artificial Intelligence (AI) into entrepreneurship practices. Artificial intelligence technologies and techniques are constantly evolving, requiring entrepreneurs to stay updated on the latest development. Entrepreneurial businesses are dynamic and their needs change rapidly. Artificial intelligence system must be updated to address these changing needs.

Addressing Potential Job Displacement: Addressing potential job displacement and societal impact is a significant challenge in integrating Artificial Intelligence (AI) into entrepreneurship practices. Artificial intelligence can automate routine and repetitive tasks, potentially displacing jobs in sectors like manufacturing, customer service and data entry. It may require new skills sets, making existing skills obsolete and potentially displacing workers who cannot adapt. It redefines jobs, requiring workers to take on new responsibilities and potentially displacing those who cannot adapt.

Ensuring Inclusivity and Diversity in AI Driven Entrepreneurship: This is a significant challenge in integrating Artificial Intelligence (AI) into entrepreneurship practices. Underrepresentation of diverse groups in artificial intelligence development teams can result in artificial intelligence systems that neglect diverse needs. Artificial intelligence powered products and services may not be accessible to people with disabilities or those from low-income backgrounds. It may not be compatible with diverse languages, limiting accessibility.

Navigating Regulatory/Legal Framework for AI in Entrepreneurship: Navigating the regulatory and legal framework for AI in entrepreneurship practice is a significant challenge in integrating Artificial Intelligence (AI) into entrepreneurship practices. Lack

of clear guidelines, unclear or evolving regulations for artificial intelligence development and determining ownership and intellectual property rights for artificial intelligence generated content and establishing liability and accountability for artificial intelligence-driven decisions and actions is a challenge.

Solutions to the Challenges of Artificial Intelligence in Entrepreneurship Practice

These steps according to Elujekwute, Umar, Aja and Danburam (2024), are briefly discussed below:

Job Displacement: AI may automate certain tasks, potentially displacing jobs. Entrepreneurs can up skill and reskill employees to work alongside AI systems.

Bias and Discrimination: AI systems can perpetuate biases if trained on biased data. Entrepreneurs can ensure diverse datasets and implement fairness and transparency in AI decision-making.

Dependence on Technology: Over-reliance on AI can lead to decreased human skills and abilities. Entrepreneurs can strike a balance between technology and human judgment.

Ethical Considerations: AI raises ethical concerns, such as privacy and accountability. Entrepreneurs can prioritize transparency, accountability, and ethical AI development.

Regulatory Compliance: Entrepreneurs can stay updated on evolving regulations and ensure AI systems comply with laws and standards.

Public Perception: Negative perceptions of AI can impact business. Entrepreneurs can educate customers and stakeholders about AI benefits and address concerns.

Data Quality: AI relies on high-quality data. Entrepreneurs can ensure accurate and diverse data collection and management.

Cyber Security: AI systems can be vulnerable to cyber threats. Entrepreneurs can implement robust security measures to protect AI systems and data.

Liability and Accountability: Entrepreneurs can establish clear guidelines for AI decision making and ensure accountability for AI-driven actions.

Continuous Learning: AI is rapidly evolving. Entrepreneurs can stay updated on AI advancements and continuously develop their skills and knowledge.

Future Evolution of AI in Entrepreneurship

The future growth of AI in entrepreneurship according to Sahadevan (2023), looks promising as various analyses have assessed its potential impact. Sahadevan posits that the global economy could potentially benefit from a staggering \$15.7 trillion with the help of AI by the year 2030. The same study by Sahadevan also predicts that AI will contribute to a 26% increase in global GDP by 2030. The global market for AI in business is projected to reach \$118.6 billion by 2025, indicating a rapid growth rate. AI is also expected to automate nearly half of all existing work activities by 2055. Finally, the AI market is expected to grow to \$190.61 billion by 2025, at a Compound Annual Growth Rate (CAGR) of 36.62% from 2018 to 2025. These statistics highlight the growing importance and impact of AI in entrepreneurship, making it a key area for future investment and growth (Zhang et al., 2021).

Conclusion

Using cutting edge tools to improve operations, optimize decision making, and maximize satisfaction with customers has fundamentally altered how entrepreneurs run business. Predictive analytics, chatbots, and other AI powered advancements like voice assistants have a huge impact on how businesses run. AI will most likely continue to progress in the future. The various benefits that artificial intelligence could offer to a

business include increased productivity, effectiveness, and profitability. AI brings many benefits to businesses, but some potential limitations and problems need to be addressed. Concerns about data security and privacy, the potential for bias in AI decision making, and the need for companies to blend their operations and employees with fast growing technology are some of the obstacles. As entrepreneurs are integrating artificial intelligence into their business operations, they must be aware of these concerns and work on reducing their impact. While AI has inherent risks, the potential benefits make it a viable investment for businesses wanting to remain competitive and successful in today's digital environment.

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