Influence of Artificial Intelligence on Promoting Adaptability and Decision-Making Processes among SME Operators in Anambra State, Nigeria

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Abstract

This study investigates the influence of Artificial Intelligence (AI) on promoting adaptability and enhancing decision-making processes among Small and Medium Enterprise (SME) operators in Anambra State, Nigeria. In the face of an increasingly dynamic business environment, SMEs must respond swiftly to market fluctuations, consumer behaviour, and competitive pressures. AI technologies such as predictive analytics, real-time data processing, and trend forecasting, offer significant potential to support these responses by equipping SMEs with tools for strategic adaptability and informed decision-making. A descriptive survey research design was adopted, and data were gathered from 105 SME operators selected using an accidental sampling technique. The instrument used for data collection was a structured questionnaire titled "Influence of AI on Promoting Adaptability and Decision-Making Processes among SME Operators Questionnaire", structured on a five-point Likert scale. The instrument was validated by experts and demonstrated high reliability with Cronbach's alpha values of 0.86 for adaptability and 0.79 for decision-making components. Data were analyzed using the weighted mean and standard deviation. The findings reveal that AI significantly contributes to improving SME operators' adaptability through personalized learning, real-time market tracking, and behavioural insights. Similarly, AI enhances decision-making by enabling data-driven judgments, identifying patterns, and supporting risk assessment and opportunity recognition. Based on the results, it is recommended that SME operators adopt AI tools to strengthen operational flexibility and strategic thinking. Investments in AI literacy and digital capacity-building are also advised to ensure effective adoption.

Keywords: Adaptability, Anambra State, Artificial Intelligence, Decision-Making, Nigeria, SMEs

Introduction

The existence and vitality of small businesses are crucial to the growth and development of national economies worldwide. Small and Medium Enterprises (SMEs) have a unique role, particularly in employment creation, innovation, and fostering economic expansion. As highlighted by Bandari (2019), SMEs significantly contribute to the economy by generating jobs, driving innovation, and stimulating local economies. In many regions, these enterprises serve as primary catalysts for economic expansion by creating employment opportunities, providing avenues for economic advancement for local citizens, and responding dynamically to environmental changes. In Nigeria, for instance, SMEs form a critical part of the business landscape, contributing to both urban and rural economies by fostering local production and providing essential services (Ayozie, Jacob, & Umukoro, 2017).

In today's fast-paced and highly competitive business environment, the skill sets required for SME operators extend beyond traditional entrepreneurial qualities. To survive and grow, business owners and operators must demonstrate not only strong creative and leadership abilities but also the capacity to adapt to disruptions brought about by rapid technological changes, such as those introduced by Artificial Intelligence (AI) (Leib, 2011). As Ambulkar, Blackhurst, and Grawe (2015) suggest, enterprises that fail to evolve and adapt to technological advancements are more vulnerable to disruption, whereas those embracing change have better chances for sustainable success. AI has emerged as a transformative tool, offering advantages in adaptability and decision-making essential for navigating the modern market environment.

The history of AI stretches back to 1956, originating at a conference held at Dartmouth College, United States, where the concept was introduced by leading scholars (Iqbal & Khan, 2021). Although it initially gained traction in fields like Engineering and Science, AI has evolved over recent decades, impacting a wide range of disciplines, including Medicine, Finance, Education, and Business (Stefanuk & Zhozhikashvili, 2002). As noted by Helm et al. (2020), AI has become a central topic in business discourse and is anticipated to dominate future developments across industries. Today, AI applications are widespread, ranging from data analysis and forecasting to personalized learning and automation.

In the African context, however, AI adoption among SMEs is often hindered by perceptions of it being exclusive to large firms, primarily due to perceived high costs and technical complexities. Yet, contrary to this belief, scholars like Delponte, Mahidhar, and Davenport (2018) argue that AI technologies have become more accessible to small businesses. Many small enterprises are already benefiting from AI in various capacities, applying it in operations to enhance productivity and competitiveness. Similarly, Iansiti and Lakhani (2020) contend that affordable AI solutions are now within reach of entrepreneurs, dispelling the notion that only large corporations can afford or benefit from such advanced technology. This shift allows SMEs to access tools that can significantly influence their adaptability and decision-making processes.

Adaptability is widely regarded as a crucial factor in entrepreneurial success, allowing businesses to adjust and thrive amid changing market conditions. As Savitri, Dp, and Syahza (2021) note, adaptability and flexibility are essential for entrepreneurs aiming to succeed in today's economic climate. Adaptability encompasses the ability to remain open-minded and resilient in the face of rapid changes. For SME operators, this means staying attuned to market shifts, embracing innovation, and making informed choices under uncertain circumstances

(HustleHub, 2023; Rawal, 2023). In a constantly evolving business environment, being adaptive and flexible is fundamental for maintaining a competitive edge (Alewo, 2016).

On the other hand, the decision-making process is equally important in entrepreneurship, where it plays a pivotal role in determining business success or failure. The entrepreneur's decision-making ability often defines the trajectory of a business from its inception. Cognitive perspectives emphasize that entrepreneurs utilize specific types of information to make decisions, particularly during the early stages of business development (Busenitz et al., 2003). According to Sarasvathy (2001), the entrepreneurial decision-making process begins with unchangeable characteristics of the decision-maker, which in turn influence the steps taken to bring a business idea to fruition.

In Anambra State, located in Nigeria's South-East, SMEs hold a critical position in the local economy. According to Okpochefo and Alika (2017), well-managed enterprises by local operators contribute not only to economic stability but also to the social fabric of the community by generating employment and tax revenue. As such, the influence of AI in promoting adaptability and decision-making processes among SME operators could play an instrumental role in enhancing the sustainability of these businesses. Although extensive literature exists on the role of AI in global entrepreneurial development, studies addressing the influence of AI specifically on adaptability and decision-making among SME operators in Anambra State remain limited. This gap is what the present study seeks to address by evaluating the impact of AI in empowering SMEs in Anambra State, with an emphasis on promoting adaptability and refining decision-making processes.

Statement of the Problem

The COVID-19 pandemic underscored various vulnerabilities within the global business ecosystem, impacting sectors worldwide regardless of size, location, or funding. In Nigeria, SMEs faced significant challenges as restrictions and lockdowns halted business operations for an extended period, affecting both small-scale entrepreneurs and larger enterprises alike. The effects of the pandemic were felt acutely in Anambra State, where SMEs experienced reduced sales volumes, staff reductions, and even closures. As the business sector strives to recover, some SMEs have recognized the potential of AI to mitigate challenges and aid in navigating the post-pandemic practices.

The researchers observe that many small businesses are struggling to regain pre-pandemic performance levels, particularly those unable to adapt to new technological advancements such as AI. Some operators have started to adopt AI as a means of enhancing adaptability and decision-making, enabling them to forecast market trends, streamline operations, and improve customer engagement. Therefore, this study seeks to explore how AI influences adaptability and decision-making among SME operators in Anambra State. Addressing this research problem can provide critical insights into how SMEs in the region can harness AI for sustainable growth in a rapidly digitizing world.

Research Questions

This study is guided by the following research questions:

1. What is the influence of AI on promoting adaptability skills among SME operators in Anambra State?
2. What is the influence of AI on supporting decision-making processes among SME operators in Anambra State?

Conceptual Framework



Figure 1: The Schematic Representation of the Study Concept
The influence of AI among SME operators significantly promotes adaptability and enhances decision-making processes. AI aids adaptability by enabling operators to pivot and innovate in response to changing market conditions, driving resilience, innovation, and growth within SMEs. For decision-making, AI enhances processes by providing informed choices through predictive analytics, scenario planning, and real-time feedback.
Source: *Researchers' Perspective (2024)*

Theoretical Framework

This study is underpinned by Contingency Theory, as introduced by Austrian psychologist Fred Edward Fiedler in his 1964 article 'A Contingency Model of Leadership Effectiveness'. This theory posits that effective leadership requires adapting one's style based on the situation's specific demands. According to Contingency Theory, leadership actions are shaped by both internal and external factors, and the success of leadership depends on situational responsiveness and adaptability.

In the context of small-scale enterprises, Contingency Theory is particularly relevant, as it provides a framework for understanding the flexible nature required by SME leaders to address daily challenges. Leaders operating under this theory develop a rational understanding of their environment, adjusting their behaviour to adopt the most appropriate leadership style to meet specific situations. Here, Artificial Intelligence (AI) becomes instrumental, as it enhances SME leaders' adaptability and decision-making processes. For small business operators in Anambra State, Nigeria, AI provides practical tools to support dynamic responses to challenges, fostering resilience and potentially boosting business outcomes.

Methods

This study employs a descriptive survey research design to explore the influence of AI on adaptability skills and decision-making processes among SME operators in Anambra State, located in Nigeria's southeastern region. The study population includes 1,051 SME operators identified through records from the Anambra Small Business Agency (ASBA) in collaboration with the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN). For sampling, the study used Accidental Sampling, where respondents encountered by chance were

selected if they met the study's criteria (Sugiyono, 2015). This approach resulted in a sample size of 105 SME operators. Data collection was conducted through a structured questionnaire titled 'Influence of AI on Promoting Adaptability Skills and Decision-Making Processes among SME Operators', using a five-point scale. To ensure reliability and validity, the questionnaire was reviewed by three experts in the field. Internal consistency was measured using Cronbach's alpha, yielding reliability coefficients of 0.86 and 0.79 for different sections of the instrument. The questionnaires were distributed by the researchers with the help of three research assistants, and data were analyzed using mean ratings and standard deviation for the research questions. Data were analyzed using SPSS Version 25. The mean ratings were interpreted thus: A mean score of 3.0 and above are accepted while mean scores of less than 3.0 are rejected.

Results

The results are presented in line with the research questions.

Research Question 1: What is the influence of AI on promoting adaptability skills among SME operators in Anambra State?

Table 1: Mean Scores of Respondents on the Influence of AI on Promoting Adaptability Skills among SME Operators in Anambra State

S/N	AI and Adaptability Skills	Mean	Std. Deviation	Remark
1	AI helps SME operators adapt to changes in marketing trends	4.24	0.41	Agreed
2	AI helps SME operators identify potential business opportunities	3.90	0.21	Agreed
3	AI improves businesses' ability to pivot when necessary	4.21	0.39	Agreed
4	AI offers customized learning paths for SME operators, focusing on adaptability skills and knowledge gaps	4.09	0.72	Agreed
5	AI helps monitor customers and market conditions, enabling quick response to changes	4.04	0.34	Agreed
6	AI fosters a culture of innovation and adaptability among SMEs	3.90	0.18	Agreed
7	AI helps SMEs simulate scenarios, preparing them for future challenges and opportunities	4.69	0.23	Agreed

Grand Mean = 4.15 Remark = Agreed

The data in Table 1 indicate that all items scored above the study's criterion mean of 3.0, with a grand mean of 4.15. The standard deviations, ranging from 0.18 to 0.72, suggest a closely related set of responses among participants. This implies that AI significantly influences the promotion of adaptability skills among SME operators in Anambra State.

Research Question 2: What is the influence of AI on supporting decision-making processes among SME operators in Anambra State?

Table 2: Mean Scores of Respondents on the Influence of AI on Supporting Decision-Making Processes among SME Operators in Anambra State

S/N	AI and Decision-Making Processes	Mean	Std. Deviation	Remark
1	AI provides insights and patterns not apparent to humans, facilitating decision-making	4.25	0.18	Agreed
2	AI helps SME operators build predictive models based on historical data, forecasting outcomes	2.91	0.25	Agreed
3	AI provides real-time data and updates, enabling more informed decisions	3.93	0.52	Agreed
4	AI helps SME operators analyze decision outcomes, identifying areas for improvement	4.71	0.34	Agreed
5	AI allows SME operators to automate complex routines	4.28	0.74	Agreed
Grand Mean = 4.06 Remark = Agreed				

As shown in Table 2, all items except item 2 obtained mean scores above the study's criterion mean of 3.0, with a grand mean of 4.06. The standard deviations, ranging from 0.18 to 0.74, indicate a high degree of agreement among responses. This suggests that AI plays a significant role in supporting decision-making processes among SME operators in Anambra State.

Discussion of Findings

The findings of this study are discussed under two subheadings, reflecting the influence of AI on adaptability skills and decision-making among SME operators in Anambra State. This study revealed that Artificial Intelligence (AI) significantly enhances adaptability skills among SME operators, enabling them to succeed in dynamic markets. AI assists SMEs in adapting to changing market trends, identifying emerging business opportunities, and pivoting as needed. AI-driven personalized learning paths also help operators bridge knowledge gaps, improving adaptability. Furthermore, real-time monitoring of customers and market conditions allows SMEs to respond quickly to external changes. AI's capability to simulate various scenarios prepares SMEs for potential challenges and future opportunities, cultivating a culture of innovation, agility, and resilience. This allows SMEs to stay competitive, handle uncertainty, and capitalize on new trends effectively.

These findings align with Gartner (2019), which highlighted that AI tools, such as chatbots and virtual assistants, facilitate real-time customer feedback. This enables SMEs to quickly adapt products and services to meet evolving customer demands, fostering agility and customer satisfaction. The study further found that AI revolutionizes decision-making for SME operators by revealing hidden insights and patterns that support informed decision-making. AI enables the creation of predictive models based on historical data, providing forecasts of potential outcomes and real-time updates for proactive decision-making. Additionally, AI allows SMEs to analyze the outcomes of decisions, identify areas for improvement, and automate complex processes, leading to greater operational efficiency. SME operators can make data-driven decisions, improve forecasting, manage risks, and drive strategic growth by utilizing AI tools.

These findings are consistent with Brynko (2017), who demonstrated that AI tools such as predictive analytics and machine learning algorithms empower SMEs to analyze vast data, identify patterns, and predict trends, all of which contribute to strategic decision-making and competitive advantage.

Conclusion

Based on the study's findings, it can be concluded that AI significantly supports adaptability and decision-making among SME operators in Anambra State. AI enhances adaptability by identifying market trends, bridging knowledge gaps, and simulating future scenarios. In addition, AI transforms decision-making by uncovering insights, facilitating informed choices, and optimizing operational processes. SMEs that leverage AI tools are better equipped to navigate complex business environments, drive growth, and achieve sustainable success.

Recommendations

From the findings of this study, it is recommended that SME operators:

1. Leverage AI tools for data analysis to detect patterns and forecast market trends, enabling proactive responses to shift in customer needs and market conditions.
2. Enhance adaptability through AI-driven personalized learning and continuous market tracking, which can help SME operators respond flexibly to dynamic challenges and opportunities.

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