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Artificial Intelligence: A Strategic Tool for SMEs in Nigeria

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Abstract

The study examined artificial intelligence (AI) as a strategic tool for small and medium enterprises (SMEs) in Nigeria. It explored how AI can improve business growth, productivity, and competitiveness. The paper reviewed existing literature and case studies. The study discussed the strategic uses of AI in Nigerian SMEs, such as enhancing efficiency, reducing costs, and improving marketing and financial performance. It also identified key challenges like limited resources, poor infrastructure, and lack of technical knowledge that hinder AI adoption. To overcome these challenges, the study suggested step-by-step implementation strategies, employee training, and government support through awareness and funding. The paper concluded that AI is not only a technological innovation but a strategic necessity for Nigerian SMEs seeking sustainable growth and competitiveness in the modern business environment.

Keywords: *Artificial Intelligence, Strategic Tool, SMEs, Nigeria, Business Growth, Competitiveness*

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Background to the Study

Over the years, Small and Medium Enterprises (SMEs) have adopted various strategic tools for the purposes of growth and competiveness. These tools included Social Media, CRM systems, SWOT analysis, Balance scorecard, Porter's Five Force, PESTEL Analysis, TQM, CRM systems, etc. There is no gainsaying the fact that AI is gradually altering the way businesses operate, compete, and deliver value. SMEs occupy a significant aspect of Nigeria's economy, constituting about 96% businesses in Nigeria while contributing about 48% of the national GDP (Pulka & Gawuna, 2022). SMEs in Nigeria have traditionally operated with limited resources and technological infrastructure. However, the availability of infrastructure such as cloud-based solution and API services are gradually making expensive technological tools such as AI accessible to even SMEs.

SME, in the context of Nigeria, are usually conceptualised using criteria such as number of staffs, annual turnover, and amount of capital. The Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) categorised businesses in Nigeria into three categories. These include micro business, small businesses and medium businesses. SMEDAN defined micro-enterprises as business with less than 10 employees and annual turnover of below 5 million. Small-enterprises are described as businesses with 10 to 49 employees and annual turnover of between 5 to 49 million naira. Lastly, medium enterprises are described as businesses with 50 to 199 employees and annual turnover of between 50 to 499 million naira (Ikon & Chukwu, 2018).

The idea of intelligent machines is not as recent as many people will like to think. In fact, as late as 384 BC, the philosopher Aristotle had contemplated and written on autonomous objects. It was, however, during mid-20th century that AI emerged as a field of study (Santoro et al., 2021). Alan Turing 1950 paper on 'Computing Machinery and Intelligence' later laid the theoretical foundation for the field. The term 'Artificial Intelligence' was coined by John McCarthy in 1956 at the Massachusetts Institute of Technology (Karaboga & Vardarlier, 2021). McCarthy thus provided one of the most common definition of AI.

According to McCarthy (1956), AI referred to the science of creating machines that possess intelligence and capable of carrying out tasks that will require intelligence if done by human. Central to this definition is the principle of similarity. In other words, machines are capable of executing the same functions carried out by humans. Liu and Hu (2024) described it as systems that can perceive their environment, analyse data, learn from experience, and take actions to achieve specific goals. AIs can make decision, solve problem, reason, and learn (Ozturk, 2024). Today, AI has evolved from a theoretical concept to a pervasive technology transforming numerous sectors including healthcare, finance, education, and entertainment.

Case Studies of Strategic Impact of AI among SMEs

The adoption of artificial intelligence (AI) by SMEs marks an important change in business strategy and competition. SMEs are applying AI to improve operations and expand business opportunities. For example, KPMG has automated auditing services using AI, while Bridgewater Associates applies AI to strengthen operational activities (Vrontis et al., 2022;

Rana et al., 2021). Research shows that SMEs adopting digital technologies supported by AI can enhance competitiveness and productivity (Tominc et al., 2024).

Case studies demonstrate the strategic impacts of AI adoption by SMEs. In manufacturing, a German family-owned SME, TKG, integrated AI into its order entry system. The business, with an annual turnover of approximately 1.5 million euros, achieved time savings of more than 50%. The payback period was less than three years. The strategic impact was an improvement in marketing performance and competitive advantage (Salmen, 2022). In digital transformation, research on 85 SMEs from the West Midlands region of England shows practical applications of AI. One SME moved from manual operations to fully digital processes. Another, an additive manufacturing company, adopted machine learning to optimize production parameters. These changes demonstrate how SMEs apply AI to strengthen efficiency and innovation (Tawil et al., 2024).

AI has also been applied in customer service and logistics. KLM Royal Dutch Airlines introduced an AI-powered chatbot to automate 60% of customer queries. Also, UPS implemented the ORION platform to optimize delivery routes, leading to financial savings and lower environmental impact (Molete et al., 2025). In healthcare, IBM Watson Health used AI to analyse medical images, improving diagnostic accuracy. In retail, an SME applied AI-driven analytics for personalized marketing, achieving a 25% sales increase within one quarter (Molete et al., 2025). Further evidence comes from a study of six SMEs operating in IT, laboratory services, manufacturing, agriculture, healthcare, and robotics. The findings show that AI is applied across different organisational functions and levels. This demonstrates the flexibility of AI technologies and their role in supporting strategic growth in SMEs (Rasdi et al., 2025).

It can be inferred from the reviewed cases that AI thus offers strategic potential for small and medium-sized enterprises (SMEs). It reshapes their operating environments and improves day-to-day business processes. Key applications include streamlining customer interactions, optimizing supply chains, and automating repetitive tasks. AI also supports changes in product development, marketing, customer service, and data management (Tominc et al., 2024). Research shows that AI enables SMEs to redesign their business models and practices. By integrating AI, firms can redefine how they approach product design, promotional strategies, customer engagement, and information management (Klein et al., 2021). The operational benefits of AI adoption extend to competitive positioning and business scalability. SMEs are able to respond more effectively to market demands and adjust their operations as they grow (Saleem et al., 2023). AI also improves market insight through predictive analytics and customer behaviour analysis. With these tools, SMEs can identify new markets and customer segments. This allows them to expand their customer base and strengthen their market presence (Tominc et al., 2024).

Strategic Use of AI to Nigerian SMEs

The use of artificial intelligence (AI) is becoming increasingly important for SMEs in Nigeria. Research conducted across sectors such as manufacturing, hospitality, information and

communication, and administrative support in Southwest Nigeria found that AI innovations are positively linked to SME growth. Muktar et al. (2024) confirmed that AI has strong direct and indirect effects on the growth of SMEs. Although AI is often seen as a tool mainly for large companies, this perception is changing among Nigerian SMEs. Many small businesses are now using AI in practical ways as AI technologies have become more affordable and accessible (Ebuka, et al., 2023).

For many Nigerian businesses, artificial intelligence (AI) helps solve several ongoing problems in their operating environment. AI has great potential to improve how organizations work by addressing issues common to Nigerian SMEs. Such challenges include fragmented information systems, weak technology infrastructure, and skill gaps among workers (Ola-Oluwa, 2024). By investing in AI strategically, Nigerian SMEs can increase workforce efficiency, support key business goals, raise productivity, and become more flexible, giving them a competitive edge (Ola-Oluwa, 2024). In today's global economy and business environment characterised by rapid changes and intense competition, AI has become important for SMEs that want to remain competitive. As competition increases in the market, it is now important for SMEs to adopt and use AI as strategic tool (Lemos et al., 2022). A strategic tool refers to a structured approach, method or technology that businesses use to assess their internal and external environment in other to identify opportunities and threat while formulating strategies to enhance their strategic decision making and efficiency (Keller et al., 2017).

For SMEs, artificial intelligence (AI) offers a powerful way to enhance how they operate. When SMEs include AI in their management processes, they can make their operations more efficient and support long-term growth (Liu et al., 2020). Using AI is especially helpful in times of uncertainty and rapid change, as it helps businesses respond quickly and strengthen their supply chains (Lee et al., 2024). In addition to improving operations, AI helps SMEs analyse data, connect with customers, and use resources more effectively. These benefits allow SMEs to meet market needs more easily, making AI an important strategy for handling global economic challenges. Some of the ways in which AI can contribute strategically to SMEs in Nigeria are discussed below.

AI tools can be employed for automation of processes in area such as such as supply chain management, customer service, and financial operations. According to Andayani et al. (2024), this can lead to fewer human errors, quick decision making, and enhanced customer satisfaction. For SMEs, using AI technology makes it possible to automate everyday tasks like data entry, responding to customer questions, and managing inventory. This allows business owners and staff to focus more on activities that support business growth and development. More so, AI implementation among SMEs can lead to reduction in operational cost (Obot, et al., 2021). Unlike human, AI systems can work continuously without fatigue. Hence, SMEs can reduce cost by employing AI systems for some tasks.

Furthermore, Haridasan et al. (2023) opined that, integrating AI into accounting information systems helps SMEs make more accurate decisions. By employing tools such as business

intelligence, data mining, and expert systems, SMEs can study and analysis trends in order to make more data-driven business decisions. Research also shows that using AI can improve business performance by optimizing processes such as distribution routes which helps reduce distribution costs (Pamungkas, et al., 2023). Other studies confirmed that SMEs using AI experience better productivity and higher profits (Kandeel, Saleh & Elrefae, 2024). AI technologies can be deployed to assess and manage risks commonly faced by SMEs. SMEs can implement deep learning, speech and language recognition, customer targeting, chatbots, and dynamic pricing to enhance customer interactions (Obot et al., 2021). AI enables personalized advertising based on customer data. This can help SMES improve their marketing effectiveness.

Strategies for Implementing AI among SMEs

Having identified and established the potential of AI as a strategic tools for SMEs in Nigeria, this section focuses on strategies that can be employ by SMEs for implementing AI. It must be noted that adopting AI in SMEs requires a careful and strategic approach that considers their limited resources. A step-by-step implementation plan can help SMEs overcome common challenges and successfully apply AI in their business operations.

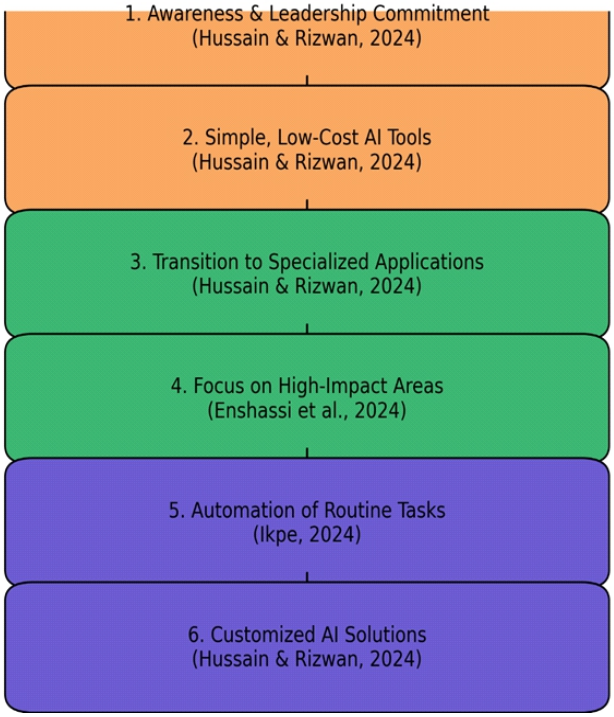

Figure 1: Strategies for Implementing AI among SMEs

This process should start with raising awareness and gaining commitment from leadership. When business leaders understand the value of AI and support its use, SMEs can build a strong foundation for effective AI integration. The second step of AI in SMEs involve using simple,

widely available AI tools that are low-cost and easy to use. This helps businesses with limited resources gain experience without needing advanced technical skills (Hussain & Rizwan, 2024). As SMEs become more comfortable with basic AI tools, they can gradually move on to more advanced and specialized applications (step three) which improve efficiency in specific areas of their operations. Understandably, this step-by-step approach reduces financial risk and allows businesses to see benefits before making larger investments.

Step four requires implementing AI tools in high-impact area of the organisations. Enshassi et al. (2024) recommended that SMEs should focus on applying AI in key areas like digital marketing and financial technology. Research shows that using AI in these areas can greatly improve competitiveness and profitability (Enshassi et al., 2024). These applications offer strong opportunities for SMEs to grow their market reach and strengthen financial performance. Fifth step involves using AI tools to automate routine task. This approach can bring quick improvements in efficiency without requiring complex or costly systems (Ikpe, 2024). Lastly, as their technical capability grow, SMEs can thus move toward more advanced uses of AI (step six). This will include developing customized tools that offer greater control and meet specific business needs (Hussain & Rizwan, 2024). During these processes (step 2-6), it is important to address employee concerns and provide proper training to reduce resistance to new technologies. By taking a step-by-step technical approach even SMEs with limited resources can successfully adopt AI and achieve significant improvements in operations and competitiveness.

Challenges to AI Adoption among SMEs in Nigeria

Although AI offers various potential for SMEs, several challenges impede its widespread adoption. Many SMEs in Nigeria have considered AI as technically complex and expensive despite evidence that even small enterprises can implement AI in certain operational aspects (Ebuka et al., 2023). Hence, limited resources present a significant obstacle for SMEs seeking to adopt AI technologies. This financial barrier is further compounded by knowledge gaps and insufficient technical expertise within SMEs. Many small businesses do not have staff with adequate AI knowledge. This makes them dependent on external service providers and increases the complexity of implementation (Ingalagi et al., 2021). Research shows that 65% of SMEs identify lack of technical expertise as a significant barrier to AI adoption (Olalekan, 2025). The knowledge gap is made worse by limited access to AI literacy programs and advanced AI tools. Compared to larger firms, SMEs in Nigeria struggle to access training opportunities and modern technologies. This places them at a disadvantage in developing the necessary skills for AI adoption (Tominc et al., 2024).

Poor telecommunication infrastructure also creates difficulties. In Nigeria, many SMEs operate in areas where internet and network services are unreliable. Studies confirm that weak infrastructure is one of the most significant barriers to technology adoption in Nigerian SMEs (Ladokun, et al., 2013). Organizational and cultural barriers further restrict adoption. Resistance to change remains a common challenge. Many SMEs prefer to rely on traditional practices and are reluctant to embrace new systems. The attitude of "this is how we used to do it" creates fear of the unknown and uncertainty about the value of AI (Ebuka et al., 2023). This cultural resistance delays innovation and adoption of new technologies

Conclusion

This paper has argued that AI is not just another technological trend but a strategic tool that Nigerian SMEs can adopt to for strategic purposes. The paper argues that AI offers new possibilities for SMEs. Despite the belief that AI is meant only for large businesses, evidence shows that SMEs in Nigeria can also benefit from it. However, the paper emphasises that the adoption of AI among Nigerian SMEs is still limited due to several challenges. The paper posited that addressing these barriers requires a step-by-step approach. This approach will begin with leadership commitment, awareness creation, and adoption of simple AI tools with low complexity. As SMEs gain capacity, they can gradually move to more advanced AI solutions.

Recommendations

To encourage adoption of AI among SMEs in Nigeria, there is need for coordinated efforts among different stakeholders. To facilitate SMEs' adoption of AI technologies, government agencies, business association, tech experts, etc. need to engage in awareness campaigns. Such campaigns will focus on educating SMEs owners on the applicability and utility of AI for their businesses. This is encouraging SMEs to recognise that AI tools are not exclusively for big corporations alone. Sharing success stories of local SMEs using AI can help change this perception. There is also need for government to provide financial support in form of grants, low-interest loan, and tax incentive to encourage and aid SMEs in covering cost of adopting AI in the early stages of implementation. Tech experts and companies need to start developing simple and low-cost AI tools that small businesses like SMEs can adopt requiring no advanced skills to operate. This will allow SMEs to start small as they grow gradually. It is also important for SMEs to start building digital system and framework that will enable them collect and manage data. Availability of data is very paramount to AI adoption.

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