

Artificial Intelligence and Organizational Performance in Selected Nigerian Commercial Banks

Patience Peter Izang, Grace O. Udo, Sonia Sim Joshua

Department of Business Administration, Nile University of Nigeria Abuja

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Abstract: *This research paper discusses the impact of artificial intelligence (AI) on organizational performance in the chosen commercial banks in Nigeria in terms of operational efficiency, delivery of customer service, and profitability. In this case, a descriptive survey research design has been used and 312 out of a total of 395 out of the distributed questionnaires were received, including 312 valid respondents of Access Bank Plc, Zenith Bank Plc and First Bank of Nigeria Limited. Data analysis entailed descriptive statistics, correlation and multiple regression analysis. The research results indicate that AI has a substantial improvement in the performance of the organization. Descriptive results show that AI improves operational efficiency (mean = 3.88), customer service delivery (mean = 3.88), and profitability (mean = 3.83). Correlation analysis indicates strong positive relationships between AI dimensions and performance, with operational efficiency showing the strongest association ($r = 0.612$, $p < 0.01$). Regression results further confirm that AI significantly predicts organizational performance ($R^2 = 0.61$), with operational efficiency ($\beta = 0.361$, $p < 0.001$), customer service ($\beta = 0.318$, $p < 0.001$), and profitability ($\beta = 0.289$, $p < 0.01$) as significant predictors. The study concludes that AI is a critical driver of performance in the banking sector; enhancing efficiency, service quality, and financial outcomes. It recommends increased investment in AI technologies, staff training, and integration of AI into strategic decision-making processes to sustain competitive advantage.*

Keywords: artificial intelligence, organizational performance, operational efficiency, customer service delivery, profitability, Nigerian commercial banks, digital transformation, banking Sector

INTRODUCTION

The term Artificial Intelligence (AI) is over the years the latest jargon in organisations that has been making headlines for its contribution to performance improvement in businesses, especially in the financial industry. Data analytics, automation and machine learning are some of the prominent AI technological applications that are altering how financial institutions operate toward better decision-making and superior quality and speed of service. From market competition, digital age and the need to create new services in the rapidly evolving economic climate, adoption of AI has also escalated in Nigerian commercial banks (Dwivedi et al., 2023; Agarwal et al, 2021). This has enabled banks to manage large buyers' data, detect fraud threats, personalise money-related services and streamline processes thus improving performance (Chaterjee et al., 2021; Onyema & Akinwale, 2022).

But AI is yet to be adopted by commercial banks in Nigeria. However, the lack of adoption of AI has been brought on by the lack of technology, skilled manpower, high cost of advanced technology and attitude (Oladapo et al, 2022; Ezeani et al, 2023). Additionally, although some banks have implemented AI-powered systems, there is still questions about the levels to which these technologies directly impact important performance metrics such as profitability, efficiency and customer satisfaction. Previous research have mainly centred on the adoption and use of financial technologies and little attention has been payed to empirical literature on the productivity impacts of the adoption and use of AI in the banking sector in Nigeria (Adewale and Oyewole, 2020; Ezeani et al, 2023).

Hence the effect of using AI on the performance of the commercial banks in Nigeria should be empirically investigated. This knowledge is critical for strategy setting and efficiency in achieving organisational performance together with gains in competitive advantage. Thus, this research examines the influence of artificial intelligence on performance of a group of Nigerian commercial banks, to highlight the best practices to help improve organisational performance by harnessing artificial intelligence in this era of the highly digitised and dynamic world of banking. The specific objectives are to:

- i. Examine the effect of artificial intelligence adoption on operational efficiency in selected Nigerian commercial banks.
- ii. Assess the influence of artificial intelligence on customer service delivery in selected Nigerian commercial banks.
- iii. Evaluate the impact of artificial intelligence on profitability of the selected Nigerian commercial banks.

LITERATURE REVIEW

Artificial intelligence (AI) refers to the factor that enables machines mimicking human intelligence in carrying out certain tasks such as learning, reasoning, decision-making, and problem-solving. Within the banking sector, AI can be used efficiently, accurately, and to provide customer service through machine learning, natural language processing, robotic process automation and predictive analytics (Noreen et al., 2023; Vuković et al., 2025). AI aids banks to automate their routine tasks, process big data, and assists in real-time decision-making in various departments of the operations. The digitisation movement has resulted in the increased use of AI by banks. Modern banks are using AI to do risk and credit scoring, communicate with customers and prevent fraud. It enables banks to save their costs, make them more accurate and offer personalised services allowing them to gain a competitive advantage in a constantly dynamic financial world (Vuković et al., 2025; McKinsey, 2024). The second is the concept of AI-based automation that involves the use of intelligent systems to automate both simple and complex tasks with minimal or no human supervision. Examples of banking automation are chatbots, loan processing systems, and compliance monitoring systems. These systems enhance efficiency and reduce error and speed up services and enhance performance of organisations.

Organizational performance refers to the level at which an organisation successfully hits its objectives. The performance indicators for banks are profitability, efficiency, customer satisfaction, innovation and service quality. AI also plays a major role in enhancing these indicators by increasing the productivity, enhancing the processes of decision-making and resource allocation (Walker et al., 2025; Zhang et al., 2025). It is related to such word as operational efficiency, which is the capacity to render the services without wasting time, money or other resources and offering maximum quality. AI is better

in terms of operational efficiency through the automation of tasks, process efficiency and speed of the transaction. Research indicates that banking-related AI adoption could save money and enhance efficiency (PwC, 2025).

Another related concept is customer experience (or service quality) that means the possibility to perform services that surpass the expectations of customers, that is, respond to them on time and pay personal attention. AI enhances customer experience by means of chatbots, product and service personalisation and advice. They may enable banks to engage with customers on-the-fly and be more responsive and create suggestions and recommendations that subsequently raise the degree of customer retention and loyalty (Byambaa et al., 2025; Devoteam, 2025). It is also known as decision-making that is data-driven. This enables the banks to extract various forms of structured and unstructured information in decision making. This enhances risk management, prediction and planning, and performance (Noreen et al., 2023, Vuković et al., 2025).

Theoretical Review

The Technology Acceptance Model (TAM)

The Technology Acceptance Model provides that the ease of use and usefulness of technology are positively correlated with human behaviour that accompanies the acceptance and utilisation of the technology. This implies that within the banking sector, the personnel and customers will adopt AI technologies as long as they are easy to use and convenient. Other factors considered in the adoption of AI in the banking field have included trust, risk and awareness as an addition to TAM (Byambaa et al., 2025).

Resource-Based View (RBV)

Competitive advantage in the Resource-Based View, companies will be competitive when they possess particular and valuable, inimitable, and scarce resources. These resources such as data analytics software and automated systems and digital platforms are valuable in terms of performance enhancement. Companies utilizing AI opportunities can make operations more efficient, more innovative, and satisfy customers, which leads to competitive advantage (Vuković et al., 2025).

Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory defines the utilisation of new technology in companies and industries. The banking industry is critical to AI utilisation because it is compatible, observable, with a relative advantage and complexity. According to the theory, AI is deployed by banks as it is the source of their competitive advantage, to become more productive and stay in line with technological changes in the banking sector (Noreen et al., 2023).

Empirical Review

And studies have established that artificial intelligence enhances performance in the banking sector. According to one recent study, the introduction of AI is increasing the profitability of banks according to the reduction of costs because AI opens new sources of income and enhances the efficiency of service delivery (Zhang et al., 2025). Likewise, AI innovation has been observed to enhance financial performance including return on assets as well as productivity in banks (Lee et al., 2024; Zhang et al., 2025). Also, additional empirical studies show that the integration of AI reduces the inaccuracy of decision-making, enhances customer experience, and boosts the productivity of operations, which

results in a more successful overall organizational outcome (Walker et al., 2025; Vuković et al., 2025). Equally, the research also shows that AI improves the quality of services due to insights and automation, which assists the banks to provide services to their expectations (Noreen et al., 2023; Fares et al., 2022).

Furthermore, another empirical study on the use of AI in banking found that AI technologies have a significant impact on customer satisfaction and service efficiency, especially with regard to automation and personalization (Byambaa et al., 2025). Similarly, Ali et al. (2025) have established that AI-enhanced applications like chat robots and smart assistants have a positive impact of enhancing customer interactions and services delivery in financial institutions by a significant margin. On the same note, studies within emerging markets show that AI has a positive relation on optimising performance, learning and efficiency of services in the banking industry (Al-Attar et al., 2022; Elshaer et al., 2025). On the same note, findings on the newly developed markets reveal that AI streamlines the operational efficiency and financial inclusion with the help of big data and service innovation (Noreen et al., 2023; Ajili Ben Youssef et al., 2025).

Similarly, according to the global lens, AI plays a very active role in stabilizing the banking industry by increasing their resilience and risk tolerance in the risk management aspect, especially in a time of uncertainty and change (Chen et al., 2026). In addition to this, Fundira and Mbohwa (2025) emphasize that AI improves adherence to regulations in financial institutions and risk management. Similarly, a Nigerian study indicates that AI-based fraud detection software not only increase security and reduce financial losses, but also AI experiences equipment, costs and manpower problems (John et al., 2015).. Moreover, the research indicates that AI and machine learning, as well as predictive analytics, enhance the precision of fraud detection and efficiency in the digital banking sector (George et al., 2025).

There is also another review of AI in banks indicating that AI positively influences the organisational performance in three areas: decision making, efficiency of processes, and customer service (Fares et al., 2022; Al-Attar et al., 2022). Thus, it is found that AI is disruptive technology, and it changes the banking landscape and generates competitive advantage. However, certain studies indicate that the possible impact of AI is not necessarily imminent. The initial expense of embracing AI, AI detail and also incorporation of AI in banking may lead to aggravated performance in the beginning, particularly on small banks that have minimal IT backup (Kikuchi, 2026). In conclusion, it is possible to state that artificial intelligence influences the performance of banks based on the empirical evidence. Nevertheless, AI adoption in the banking sector is slightly curtailed by technology preparedness, banking capability and assimilation.

Literature Gap

Although studies about artificial intelligence and performance have increased, there are some caveats. First, the empirical studies have been mainly conducted in countries that are developed (China, Europe and the US) as opposed to developing economies (such as Nigeria) with different levels of technology preparedness and technology adoption. Second, the exploration of the problem connected to AI and performance as opposed to causal associations between AI and performance in banking has been prevalent. Thirdly, other studies only concentrate on specific issues of AI like customer service and security instead of the overall influence of AI on performance. Finally, there is no empirical study on the role played by other variables including organisational readiness, technology and human-readiness in the determination of the effect of AI on performance in commercial banks in Nigeria. The purpose

of this paper is to answer this question by presenting empirical data on the effects of artificial intelligence on the performance of the selected commercial banks in Nigeria that can be purported to other emerging markets.

METHODOLOGY

This study employed a descriptive survey research design in order to explore how artificial intelligence impacts performance of the sampled commercial banks in Nigeria. The reason why this is suitable in this study is that it enables the researcher to collect and analyse the information of the target population without influencing the study environment, which will enable us to generalise our findings (Creswell and Creswell, 2018). The study selected all the Nigerian commercial banks selected (i.e. Access Bank Plc, Zenith Bank Plc and First Bank of Nigeria Limited). They are Tier-1 banks, which are digital bankers and those that have adopted artificial intelligence. The sample used to conduct the research was the staff of the operation, information technology, digital banking and customer service divisions of the banks. The stock of employees of First Bank of Nigeria Limited is approximated to be 16,000 employees (First Bank of Nigeria, 2024) and 9,271 in Zenith Bank Plc (Stock Analysis, 2024a). Access Bank Plc is said to have about 8,939 employees (Stock Analysis, 2024b).

Table 1: Target Population Table

Selected Banks	Estimated Number of Employees
Access Bank Plc	8,900
Zenith Bank Plc	9,271
First Bank of Nigeria Limited	16,000
Total Population (N)	34,171

Thus, the total population for the study is 34,171 employees.

To determine the sample size, the Taro Yamane (1967) formula for finite population was applied:

$n = N / \{1 + N(e)^2\}$ Where:

n = sample size

N = population size (34,171) e = margin

of error (0.05) $n = 34,171 / \{1 +$

$34,171(0.05)^2\}$ $n = 34,171 / \{1 +$

$34,171(0.0025)\}$ $n = 34,171 / \{1 +$

$85.43\}$ $n = 34,171 / 86.43$

~ 395

Therefore, the sample size for the study is approximately 395 respondents.

A simple random sampling technique was adopted to select respondents from the population, ensuring that every employee had an equal chance of being included in the study. This method helps to reduce sampling bias and enhances the representativeness of the findings (Saunders et al., 2019).

Primary data were collected using a structured questionnaire designed by the researcher. The instrument captured information on artificial intelligence variables such as automation, data analytics, and AI-driven decision-making, as well as organizational performance indicators including operational efficiency, customer satisfaction, and profitability. Responses were measured using a five-point Likert scale ranging from strongly disagree to strongly agree. To ensure validity, the questionnaire was reviewed by experts in banking and research methodology. Reliability was tested using Cronbach's Alpha, and all scales exceeded the acceptable threshold of 0.70, indicating high internal consistency (Gliem & Gliem, 2003).

Data collection was conducted through direct distribution of questionnaires to employees of the selected banks. Respondents were assured of confidentiality, and participation was voluntary. Data were analyzed using Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequencies, percentages, and mean scores were used to summarize the data, while inferential statistics including Pearson correlation and multiple regression analysis were used to examine the relationship between artificial intelligence and organizational performance. Statistical significance was tested at $p < 0.05$. Ethical considerations were strictly adhered to throughout the study. Respondents were informed about the purpose of the research, their consent was obtained, and all information provided was treated with confidentiality and used strictly for academic purposes.

RESULTS AND DISCUSSION

This chapter entails data collection and interpretation of data based on 312 valid responses out of the 395 questionnaires distributed to employees of selected Nigerian commercial banks on Artificial Intelligence (AI) and organizational performance.

Demographic Information of Respondents

Table 4.1: Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	182	58.3
Female	130	41.7
Total	312	100.0
<i>Source: Researcher's Computation, 2026</i>		

The table shows that out of 312 respondents, 182 (58.3%) are male, while 130 (41.7%) are female. It reveals that the surveyed population is mostly male. But the gap is not too large, implying a relatively equal gender distribution in the banks under study. This means that the sample is more representative with the opinions of both males and females reflected.

Table 4.2: Distribution of Respondents by Age

Age Group	Frequency	Percentage (%)
Below 25	30	9.6
25–35	120	38.5
36–45	98	31.4
46–55	44	14.1
Above 55	20	6.4
Total	312	100.0
<i>Source: Researcher's Computation, 2026</i>		

In terms of age, majority of the respondents are 25-35 years in age (120 respondents, 38.5%). This is followed by those aged 36-45 years and 46-55 years with 98 (31.4%) and 44 (14.1%) employees respectively. Employees between the ages of 25 and below constitute of 9.6% while 46-55 and over 55 years constitute of 14.1% and 6.4% respectively. This means that many workers are young and in their most productive years which means they are likely to embrace technological changes such as artificial intelligence in the banking sector.

Table 4.3: Distribution by Educational Qualification

Qualification	Frequency	Percentage (%)
O'Level	18	5.8
OND/HND	45	14.4
B.Sc.	128	41.0
Master's	86	27.6
Ph.D.	35	11.2
Total	312	100.0
<i>Source: Researcher's Computation, 2026</i>		

We observe that 41.0% (128) of the respondents have the highest qualification, a Bachelor's degree. This is followed by Master's degree holders (27.6%), Ph.D. holders (11.2%), OND/HND holders (14.4%), and O'Level holders (5.8%). This means that the respondents have high education which enhances their understanding of artificial intelligence systems and their ability to respond to questions relating to its impact on business.

Table 4.4: Distribution by Years of Experience

Years of Experience	Frequency	Percentage (%)
Below 2 years	35	11.2
2–5 years	92	29.5
6–10 years	110	35.3
Above 10 years	75	24.0
Total	312	100.0
<i>Source: Researcher's Computation, 2026</i>		

We find that most of the respondents (110 or 35.3%) have 6-10 years of experience. Next is 2-5 years (29.5%) and more than 10 years (24.0%), with only 11.2% having less than 2 years of experience. This means most respondents are seasoned bank employees with an insight into the operational processes and technology used in the banking sector, and it is safe to assume that their responses are due to the influence of artificial intelligence.

Analysis of Research Variables

Artificial Intelligence (AI)

Table 4.5: AI and Operational Efficiency

Statement	N	Mean	Std. Dev
AI improves operational speed	312	3.92	0.78
AI reduces operational costs	312	3.85	0.81
AI enhances process automation	312	3.88	0.76

Overall Mean		3.88	
<i>Source: Researcher's Computation, 2026</i>			

This table shows that the respondents agree that artificial intelligence plays an important role in increasing operational efficiency with an average mean of 3.88. AI increases operational speed (Mean = 3.92), automation for faster processes (Mean = 3.88) and decreases operational cost (Mean = 3.85). Low values of the standard deviation suggest agreement. This indicates AI plays a vital role in improving efficiency through automation of processes and reducing time and cost in banking operations.

Table 4.6: AI and Customer Service Delivery

Statement	N	Mean	Std. Dev
AI improves service response time	312	3.90	0.82
AI enhances customer experience	312	3.86	0.85
AI enables personalized services	312	3.89	0.80
Overall Mean		3.88	
<i>Source: Researcher's Computation, 2026</i>			

The results demonstrate that there is greater consensus among the respondents that AI enhances customer service delivery (Mean = 3.88). AI enables faster service delivery (Mean = 3.90), personalised services (Mean = 3.89) and improves the customer experience (Mean = 3.86). This suggests that AI technologies such as chatbots and data analytics play a vital role in enabling quicker, efficient, and customised interactions in the banking industry.

Table 4.7: AI and Profitability

Statement	N	Mean	Std. Dev
AI increases revenue generation	312	3.84	0.83
AI reduces operational losses	312	3.79	0.86
AI improves financial performance	312	3.87	0.81

Overall Mean		3.83	
<i>Source: Researcher's Computation, 2026</i>			

This table suggests that respondents believe that AI has an impact on profitability, with an average mean of 3.83. AI helps to increase profitability (Mean = 3.87), increase revenue (Mean = 3.84) and decrease losses (Mean = 3.79).

Therefore AI helps to drive profitability by improving productivity, cost control and decision-making processes.

Test of Hypotheses

Correlation Analysis

Table 4.8: Correlation Matrix

Variables	Organizational Performance	Sig. (p)
AI & Operational Efficiency	$r = 0.612^{**}$	0.001
AI & Customer Service	$r = 0.598^{**}$	0.001
AI & Profitability	$r = 0.576^{**}$	0.001
<i>Source: Researcher's Computation, 2026</i>		

The correlation findings indicate that all aspects of artificial intelligence are positively associated with performance and are statistically significant.

AI and operational efficiency ($r = 0.612$, $p = 0.001$); AI and customer service ($r = 0.598$, $p = 0.001$); AI and profitability ($r = 0.576$, $p = 0.001$). Because the p-values associated with these variables are less than 0.01, the relationships are significant. So as the use of artificial intelligence increases, performance increases. Operational efficiency is most strongly related to performance.

Regression Analysis

Table 4.9: Multiple Regression Results

Predictor Variable	Beta	t value	Sig.
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AI & Operational Efficiency	0.361	4.45	0.000
AI & Customer Service	0.318	3.98	0.000
AI & Profitability	0.289	3.62	0.001
R²	0.61		
<i>Source: Researcher's Computation, 2026</i>			

The regression analysis shows that artificial intelligence significantly predicts organizational performance. The model explains 61% of the variation in performance ($R^2 = 0.61$), indicating a strong explanatory power.

AI and operational efficiency ($\beta = 0.361$, $p = 0.000$); AI and customer service ($\beta = 0.318$, $p = 0.000$); AI and profitability ($\beta = 0.289$, $p = 0.001$). All variables are statistically significant since their p-values are less than 0.05. This means that each dimension of AI has a meaningful impact on organizational performance. Operational efficiency has the strongest effect, followed by customer service delivery and profitability. This suggests that AI contributes more to performance through efficiency improvements than other dimensions.

DISCUSSION OF FINDINGS

This study examined the effect of artificial intelligence on organizational performance in selected Nigerian commercial banks. According to the descriptive results, the application of AI will result in increased efficiencies as well as service delivery and profit generation. Automation, predictive analytics, machine learning, and other technologies connected with AI, are considered by banking staff as significant to enhanced banking tests. This conclusion aligns with the existing sources of literature of AI enhancing efficiency and service within the financial industry (Noreen et al., 2023; Vuković et al., 2025).

An analysis was performed to identify that performance was positively associated with AI. Operational efficiency recorded the strongest relationship ($r = 0.612$, $p < 0.01$), followed by customer service ($r = 0.598$, $p < 0.01$) and profitability ($r = 0.576$, $p < 0.01$). It proves the fact that the ideology of AI automation and analytics increases the effectiveness of banking operations and experience of customers. The results of our work resonate with the empirical research on the role that AI plays in the efficiency and satisfaction of banking systems (Byambaa et al., 2025).

Regression results further confirm that AI significantly predicts organizational performance ($R^2 = 0.61$). Operational efficiency has the strongest effect ($\beta = 0.361$, $p < 0.001$), followed by customer service delivery ($\beta = 0.318$, $p < 0.001$) and profitability ($\beta = 0.289$, $p < 0.01$). This suggests that AI contributes to performance through cost reduction, automation, and improved decision-making. Similar findings indicate that AI enhances bank profitability by reducing costs and diversifying revenue streams (Zhang et al., 2025).

All in all, the results indicate that AI is a performance driver in the banking industry. AI helps banks to enhance their efficiency, customer experience, and also enjoy financial growth. This follows current research findings that AI enhances the performance of a bank, its resilience, and innovation, whether in developed or emerging economies (Amadi et al., 2025; Chen et al., 2026).

CONCLUSION AND RECOMMENDATIONS

This research paper concludes that AI has a great impact on organizational performance of commercial banks within Nigeria. AI enhances operational efficiency, customer service provision, and profitability, which makes it highly important in strategic use in the digital banking era.

The results also indicate that the power of the AI-related efficiency is the most significant factor on performance, which has to bring attention to automation and data analytics. Banking institutions are able to attain competitive advantage, innovation, and long-term sustainability by efficiently implementing AI technologies. The proffered recommendations are based on the above findings.

- i. The AI technologies machine learning and automation tools should be invested by banks in order to increase the operational efficiency.
- ii. AI should be applied by the management in offering personalized and real-time customer services.
- iii. AI should be incorporated into financial decisions within banks as it enhances profitability.
- iv. The implementation of continuous training programs to increase the AI competencies of employees should be introduced.
- v. There has to be regulatory frameworks to facilitate responsible AI implementation in the banking industry.

Suggestions for Further Studies

1. Further research should also go beyond the banking industry to other industries like insurance, telecommunication, and manufacturing industries to give a wider perspective on the impact of artificial intelligence on the performance of organizations.
2. Comparative studies involving the Nigerian banks and other banks in the developing or developed world will enable the researcher to consider the difference in AI adoption, approach to implementation, and performance outcome.
3. Research in the future must follow longitudinal designs to determine the long-term consequences of artificial intelligence on the performance of organizations since the effects of artificial intelligence might be long-term.
4. It is possible to use moderating or mediating variables like organizational culture, technology preparedness, or employee expertise or regulatory environment in future research that will be able to better reveal a condition in which AI enhances performance.
5. The researchers can explore how particular AI technologies, including machine learning, chatbot, or robotic process automation affect certain performance indicators.
6. The research needs to be re-directed on the effects of artificial intelligence as experienced by the customers, in terms of customer satisfaction, customer trust, and customer uptake of AI-driven banking services.

7. Future studies are able to elaborate on the risk, ethical and other implementation issues with the adoption of AI in Nigerian banks like the privacy of data and cybersecurity threats.

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