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EFFECT OF ARTIFICIAL INTELLIGENCE ON NON-FINANCIAL PERFORMANCE OF DEPOSIT MONEY BANKS IN GOMBE METROPOLIS, NIGERIA

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Abstract

This study examines the effect of artificial intelligence adoption on the non-financial performance of deposit money banks in Gombe Metropolis, Nigeria. Specifically, it investigates how AI influences customer service quality, operational efficiency, risk management effectiveness, and employee productivity. A descriptive cross-sectional survey design was adopted. The target population comprised 506 staff from Operations, Customer Service, Information Technology, and Risk Management departments across five Tier-1 deposit money banks. Samples of 223 respondents were determined using Yamane's formula and proportionally allocated across the banks. Data were collected using a structured questionnaire adapted from validated instruments, achieving a Cronbach's Alpha reliability coefficient of 0.892. A total of 199 valid responses (89.2% response rate) were analyzed using descriptive statistics and multiple regression analysis. The results reveal that AI adoption has a significant positive effect on all four dimensions of non-financial performance. The combined effect shows that AI adoption explains 58.4% of the variance in non-financial performance. The study concludes that AI adoption significantly enhances non-financial performance in deposit money banks, with the most substantial impact on operational processes and customer-

facing activities. AI capabilities serve as strategic resources that enable banks to achieve superior service quality, streamlined operations, robust risk management, and improved workforce productivity. Therefore, the study recommended among others that, bank management should accelerate AI integration across all operational areas, prioritizing applications that enhance operational efficiency and customer service quality. Comprehensive training programs should be developed to equip employees with skills to work effectively with AI tools, addressing the relatively lower impact on productivity. Also, banks should strengthen AI-powered risk management systems, particularly fraud detection and credit scoring applications.

Keywords: Artificial Intelligence, Customer Service Quality, Operational Efficiency, Risk Management, Employee Productivity

1. Introduction

Artificial intelligence is one of those far-reaching technological innovations with unprecedented impacts on the banking industry. Artificial intelligence is a data-driven computational technology that has brought about momentous change in all aspects of human endeavour. The argument for artificial intelligence is largely based on the premise that artificial intelligence represents a transformative digital capability that enhances risk analytics, operational efficiency, and customer engagement in banking institutions. When effectively integrated with organizational knowledge processes, artificial intelligence contributes significantly to improved financial and non-financial performance outcomes (Bruce et al., 2025). According to Advani (2022) artificial intelligence is designed to mimic human cognitive functions such as learning, reasoning, and problem-solving, assists humans in executing specific tasks with enhanced precision and efficiency.

The banking sector, as a critical pillar of modern economies, has been particularly receptive to AI adoption. Financial institutions continuously seek innovative strategies to minimize liabilities, optimize asset portfolios, and streamline compliance management (Bruce et al., 2025). AI has emerged as a cornerstone technology enabling banks to deliver cost-effective, reliable, and customer-centric services (Henry et al., 2025). Its applications in banking span diverse areas including cybersecurity, fraud detection, customer service automation, process optimization, predictive analytics, and regulatory compliance (Le et al., 2021).

By reducing reliance on manual, paper-based processes, AI assists banks in inventory management, risk assessment, transaction balancing, and overall performance enhancement (Le et al., 2021; Udodiugwu et al., 2024) conceptualize AI as technology that replicates human intelligence to create advanced systems capable of performing tasks with speed and accuracy beyond human capability. Beyond operational benefits, AI also mitigates employee monotony associated with repetitive tasks, thereby fostering a more engaged and productive workforce (Umamaheswari et al., 2023).

In Nigerian, technology has profoundly reshaped social dynamics, workforce structures, and service delivery paradigms. The banking sector has witnessed revolutionary changes in customer relationship management, driven largely by AI-enabled solutions (Bruce et al., 2025; Elegunde & Shotunde, 2020). The introduction of automated teller machines (ATMs) marked a significant milestone, empowering customers to conduct transactions without human

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intervention (Gbolagade et al., 2022; Henry et al., 2025). This innovation catalysed further demand for AI applications across the banking value chain (Russell & Norvig, 2022).

Despite the transformative potential of AI, Nigerian deposit money banks continue to grapple with persistent performance challenges that extend beyond traditional financial metrics. According to the National Bureau of Statistics (NBS, 2023), customer complaints against banks increased by over 40% between 2021 and 2023, reflecting sustained dissatisfaction with service delivery. The Central Bank of Nigeria (CBN, 2023) reported operational inefficiencies including frequent system downtime and a 44% increase in fraud cases during the first half of 2023 alone. Similarly, there is a scarcity of empirical studies examining the relationship between artificial intelligence and non-financial performance, particularly in the banking sector. Extant studies has predominantly conceptualized bank performance in monetary or financial terms (e.g.,Mohit et al., 2024; Paul et al., 2024), often neglecting critical non-financial indicators such as customer satisfaction, operational efficiency, employee engagement, and compliance effectiveness (Paschen et al., 2020). This narrow focus fails to recognize that non-financial performance factors are equally vital for long-term sustainability and stakeholder trust, particularly in a sector where service quality and regulatory compliance are paramount.

In addition, most AI research in banking is concentrated in advanced economies such as North America and Europe (Brynjolfsson & McAfee, 2017; Chatterjee et al., 2020). Furthermore, while theoretical frameworks such as the resource-based view (RBV) and dynamic capabilities theory (DCT) have been extensively employed to explain how firms leverage technology for competitive advantage (Teece, 2018), few empirical studies have tested these theories specifically in relation to AI's impact on non-financial performance in developing countries. More so, no known study has specifically examined the effect of AI on non-financial performance in the banking sector of northeastern Nigeria, particularly in Gombe Metropolis. This study aims to address these gaps by investigating how AI affects the non-financial performance of deposit money banks in Gombe metropolis.

i. The focus of current study is to examine the effect of AI on non-financial performance through the following research questions:

ii. What is the effect of artificial intelligence on operational efficiency of deposit money banks in Gombe metropolis?

iii. What is the effect of artificial intelligence on customer service quality of deposit money banks in Gombe Metropolis?

iv. What is the effect of artificial intelligence on employee productivity of deposit money banks in Gombe Metropolis?

v. What is the effect of artificial intelligence on risk management of deposit money banks in Gombe Metropolis?

2. Literature Review and Theoretical Framework

2.1.1 Artificial Intelligence

Artificial intelligence is relatively new technology in the space of the business and banking world. It is affirmed that, artificial intelligence technology ensures quality decision making and trust credible outcome of operations. According to Russell and Norvig (2022), artificial

intelligence refers to the simulation of human intelligence processes by computer systems, encompassing learning, reasoning, problem-solving, perception, and language understanding. In banking, AI manifests through various applications including chatbots for customer service, robotic process automation (RPA) for routine tasks, machine learning algorithms for fraud detection, predictive analytics for credit scoring, and natural language processing for regulatory compliance (Volovici et al., 2022).

2.1.2 Non-Financial Performance

The concept of non-financial performance encompasses a broad set of intangible, qualitative, and process-oriented indicators that complement traditional financial measures (Ittner & Larcker, 2003). Non-financial performance measures are significant predictors of future economic trends in Nigeria's banking sector (Samad, 2020; Kurdi & Alshurideh, 2020). According to Lin and Huang (2021), these indicators connect value-driving activities with organizational performance. This study focuses on four dimensions:

Customer Service Quality: This refers to the overall assessment of service excellence, encompassing reliability, responsiveness, assurance, empathy, and tangibles (Parasuraman et al., 1988). AI technologies provide banks with the ability to offer personalized services, thereby addressing individual customer needs more effectively than traditional methods. For instance, AI-driven mobile applications allow a consumer to conduct transactions seamlessly, which not only improve convenience but also fosters customer loyalty. According to the study of Farhi et al. (2024) AI enhances service quality and customer support, thereby bolstering the overall relationship between banks and their clients. Their results revealed a significant impact of customer support services on providing product information ($p>0.008$) and service quality ($p>0.000$).

Operational Efficiency: This is the ratio of output to input in banking operations, reflecting how effectively resources are utilized to deliver services. The integration of artificial intelligence (AI) in the banking sector has substantially contributed to enhancements in operational efficiency, transforming traditional banking practices. By employing sophisticated algorithms and data analytics, banks can streamline processes, reduce the incidence of nonperforming loans, and effectively manage credit risks, as evidenced by the findings from a study illustrating the relationship between efficiency measures and managerial control tools (Epure et al., 2015)

Risk management: This encompasses the ability to identify, assess, monitor, and control various risks including credit, operational, market, and compliance risks (Basel Committee, 2011). AI strengthens risk management through real-time fraud detection, predictive analytics, and automated monitoring.

Employee Productivity: This refers to the degree to which employees effectively use their time, skills, and tools to achieve organizational goals efficiently Davenport, 2018)

AI enhances productivity by automating routine tasks, providing decision support, and enabling focus on higher-value activities.

2.2 Theoretical Framework

The Resource-Based-View and the Dynamic Capability Theories are employed to underpin this study.

Resource-Based View (RBV)

The RBV theory was primarily introduced by Wernerfelt in 1984. However, the RBV theory was further developed and popularized by Barney in 1991. This theory posits that organizations gain a competitive advantage by leveraging valuable, rare, inimitable, and non-substitutable resources and capabilities. In this study, artificial intelligence is viewed as technological resources that can help banks enhance their operational capabilities and improve performance. The RBV suggests that organizations that successfully deploy these technologies can achieve superior outcomes, such as increased efficiency, enhanced customer satisfaction, and reduced operational costs (Barney, 1991). Furthermore, the RBV underscores the importance of absorptive capacity, which enables organizations to effectively acquire, assimilate, and apply external knowledge, especially in the context of advanced technologies like AI and BD (Cohen & Levinthal, 1990). Several studies information system (IS) researchers used RBV theory to underpin their studies (Bharadwaj, 2000; Lind, 2007). Barney (1991) specifically described conditions for banks resources to be source of competitive advantage. When valuable resources are rare it means few banks have access to it. Therefore, the RBV framework helps explain why banks with advanced AI capabilities demonstrate enhanced customer service, operational efficiency, risk management, and employee productivity.

Dynamic Capabilities Theory

Building on RBV, Teece et al. (1997) introduced dynamic capabilities theory, which emphasizes firms' abilities to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. In the context of AI adoption, dynamic capabilities manifest through banks' capacities to sense technological opportunities, seize them through investment and implementation, and continuously transform operations to leverage AI's full potential (Teece, 2018). This framework is particularly relevant for understanding how banks in developing economies navigate institutional and infrastructural challenges to realize AI's benefits.

2.3 Empirical Review

Abiodum et al. (2025) investigated the role of artificial intelligence in advancing sustainable banking and service efficiency in Nigerian financial institutions. A cross-sectional study of clients from five Nigerian deposit money banks, namely Access Bank Plc, Fidelity Bank Plc, First Bank Plc, Guarantee Trust Bank Plc, and Zenith Bank Plc were adopted. The study used self-administered questionnaire on 384 individuals. The study adopted descriptive and inferential statistics to analyse the data. The finding revealed that AI awareness, application, and effectiveness have an impact on the service efficiency of a subset of Nigerian quoted deposit money banks. The study recommends that Nigerian officials automate identity verification and risk assessment to speed up procedures.

Adeyemo and Okoronkwo (2024) examined the effect of artificial intelligence on the operational efficiency of deposit money banks in Lagos State, Nigeria. The study identified the

types of AI technologies that are used by banks and examined the impact of the different types of technologies on the operational efficiency of five deposit money banks, namely: First Bank of Nigeria, United Bank of Africa, Guaranty Trust Bank, Access Bank, and Zenith Bank. The study adopted a survey research design. Copies of the questionnaire were administered to 450 regular employees selected randomly from the five banks. The study revealed that deep learning; Automation and fraud detection had positive and significant effects on the operational efficiency of the selected deposit money banks, while chatbots had a positive but insignificant effect. The study concluded that artificial intelligence significantly contributed to the operational efficiency of the selected deposit money banks in Nigeria. The authors recommend that deposit money banks should effectively make use of artificial intelligence, especially deep learning, automation, and fraud detection, to improve organizational efficiency.

Alzaidi (2018) conducted a study on the impact of artificial intelligence on performance of banking industry in Middle East. The study employed descriptive and explanatory research methods. 200 bank employees across a few selected banks in the region were adopted for the study. The finding of the study found that the application of AI in banking sector can provide more efficient and fast services as compared to any financial advisor.

Elegunde and Shetunde (2020) examined the effects of artificial intelligence on business performance in the banking industry. Survey research design was used in the study. 200 copies of questionnaires were administered to employees and customers of Access Bank Plc and United Bank for Africa (UBA). Simple random sampling technique was adopted in selecting respondents, and content validity was employed to validate the research instrument. Data collected were analyzed with regression analysis. The study findings revealed that artificial intelligence has significant positive impact on customer satisfaction, service quality, competitive advantage and employees' efficiency.the study recommended that banks and other technology receptive firms in Nigeria should push for full adoption of AI, as it brings greater value, efficiency and effectiveness to business.

Le et al. (2021) conducted a study on “some stylized empirical results on the effect of artificial intelligence in banking sector”. The reviewed literature shows tha the application of artificial intelligence has significantly positive effect on the performance of banks, enhance risk management, and big data analytics support the decision-making process.

Mohammed (2024) investigated the transformative impact of artificial intelligence (AI) on supply chain management on Arab companies. The study focused on enhancing demand forecasting, operational efficiency, and customer satisfaction, while also managing costs and streamlining logistics operations. The study underscores the importance of AI technologies in reshaping supply chain dynamics by providing a comprehensive analysis of both the benefits and challenges associated with its implementation. The results revealed the optimization of inventory management, enhanced accuracy of demand forecasting, reduced operational costs, and improved customer service. These enhancements are pivotal in achieving a competitive edge and adapting to changing market demands. In conclusion, while AI presents substantial opportunities for advancing supply chain management, it also necessitates careful consideration of various implementation challenges. The paper provides strategic recommendations for Arab companies aiming to leverage AI technologies effectively. These

guidelines emphasize the need for thorough planning, continuous risk assessment, and fostering an adaptive organizational culture.

Nabwami (2024) investigated the impact of artificial intelligence on the operational effectiveness of commercial banks in Uganda, focusing on Stanbic Bank Uganda Limited. Employing a cross-sectional approach, data was collected from a substantial sample of 266,862 individuals, encompassing external customers and bank staff at various levels. Both qualitative and quantitative data were analyzed using descriptive and inferential statistics with SPSS version 29. Key results indicate that AI-powered customer service tools significantly correlate with performance. AIbased fraud detection systems also showed positive associations with both financial and non-financial performance. Moreover, AI-driven automation processes exhibited a significant positive relationship with performance. AI applications in risk management and credit scoring were similarly impactful. The study recommends continued investment and expansion in AI technologies due to their proven positive effects on performance.

Udodiugwu et al. (2024) examine the impact of artificial intelligence on the performance of selected commercial banks in Nigeria. A sample of 128 employees from Access Bank, Fidelity Bank, Guaranty Trust Bank, and First Bank of Nigeria in Awka was adopted. Data analysis was performed using linear regression in SPSS version 23. the findings show that implementing AI in customer service improves banks' non-financial aspects, while strong cybersecurity measures enhance financial performance. Gumbo et al. (2024) from Zimbabwe found that Conversational AI improves operational efficiency in banks by enhancing customer service, reducing costs through automation, and improving workflow.

Ukpo (2022) investigated the integration of artificial intelligence applications for financial process innovation by commercial banks in Nigeria. A sample size of 143 selected from a population of 174 comprising accounting lecturers in public universities in Akwa Ibom State and bank managers, operational staff and key personnel in commercial banks operating in Uyo, Akwa Ibom State were used for the study. Descriptive survey research design was employed for the study. The data generated was analyzed using mean, standard deviation and t-test Analysis. Findings of the study revealed that AI can be applied for credit risk management and personalized banking experience. Furthermore, Experts (Bankers and Accounting Lecturers) do not differ significantly on their responses on application artificial intelligence (AI) in credit risk management and personalized banking experience in promoting financial process innovation by commercial banks in Nigeria.

Dwivedi et al. (2021) conducted a multidisciplinary study on artificial intelligence in the United Kingdom, focusing on the implications of AI adoption across multiple sectors, including banking. Using a qualitative research design and thematic analysis of expert interviews, they found that AI enhances decision-making, operational efficiency, and customer personalization but requires organizational readiness and governance structures. The study concluded that firms must align AI deployment with dynamic capabilities to achieve sustainable gains and recommended that managers invest in continuous reskilling and change management programs to support AI integration. Chatterjee et al. (2020) carried out an empirical study on AI adoption in Indian banking sector. Using a quantitative research design, they surveyed 400 banking professionals using purposive sampling and structured

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questionnaires. Data were analyzed using structural equation modeling (SEM). Results indicated that technological readiness, organizational culture, and perceived benefits were significant predictors of AI adoption. The study concluded that fostering a culture of innovation is critical to AI implementation and recommended that banks develop clear strategies for integrating AI into core processes.

Similarly, Bharadwaj (2000) investigated the resource-based perspective of IT capability and firm performance among Fortune 500 firms in the United States. Employing a quantitative design, secondary data were analyzed using regression analysis. The findings confirmed that firms with superior IT capabilities significantly outperformed others in both operational efficiency and customer responsiveness. The study concluded that IT resources must be rare and firm-specific to create advantage, recommending ongoing investment in human expertise and system integration. Boakye and Agyei (2021) examined the impact of digital banking on customer service quality among rural banks in Ghana. Using a descriptive survey design, they collected data from 300 customers through convenience sampling. Data were analyzed using SPSS descriptive and correlation analysis. The study found that mobile banking apps and AI-enabled chatbots improved service speed and customer experience. They concluded that digital tools must be user-friendly and accessible, recommending further rural digital literacy initiatives.

Arora and Rahman (2017) investigated customer satisfaction and mobile banking adoption among millennials in India. Using a mixed-methods design, they surveyed 350 customers using stratified sampling and conducted follow-up interviews. Data were analyzed using descriptive statistics and thematic coding. Findings showed that AI-enabled features such as real-time assistance and personalization significantly influenced satisfaction levels. They concluded that personalization is vital for customer retention and recommended banks to leverage AI chatbots and predictive analytics.

Based on the empirical review, several gaps were revealed. First, most studies concentrate on developed economies, with limited evidence from sub-Saharan Africa. Second, existing research predominantly examines single dimensions of non-financial performance rather than adopting a multi-dimensional approach. Third, few studies employ robust quantitative methods to establish causal relationships between AI and non-financial outcomes. Fourth, no known study has specifically examined AI's effect on non-financial performance in Gombe Metropolis, northeastern Nigeria. This study addresses these gaps by providing multi-dimensional, quantitative evidence from an under-researched context.

Based on the above review of previous studies, and research question figure 1 indicate research model of the study.

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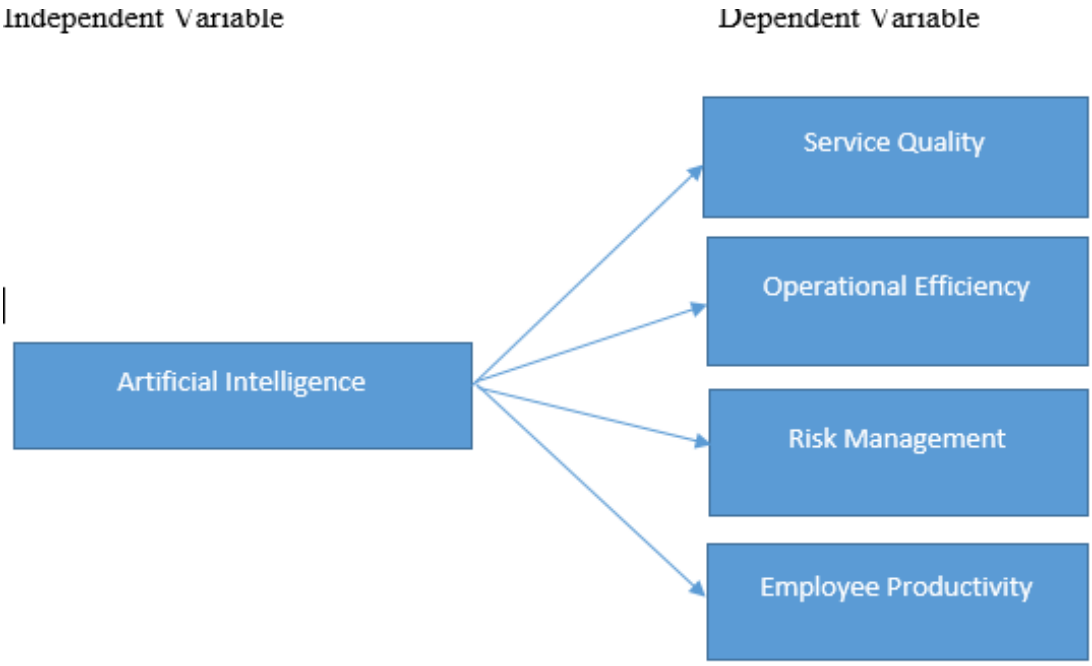

Figure 1: Research Conceptual Model (Researcher, 2026)

3. Methodology

This study adopted a descriptive cross-sectional survey design to examine the effect of artificial intelligence on non-financial performance dimensions in Tier-1 deposit money banks in Gombe Metropolis, Nigeria. The target population comprised 506 staff from Operations, Customer Service, Information Technology, and Risk Management departments across five banks (First Bank Nigeria Plc, United Bank for Africa Plc, Access Bank Plc, Zenith Bank Plc, and Guaranty Trust Bank Plc). Using Yamane's (1967) formula at 95% confidence level and 5% margin of error, a sample of 223 respondents was proportionally allocated across the banks. A structured questionnaire with items measured on a five-point Likert scale was adapted from validated instruments (Dwivedi et al., 2021; Chatterjee et al., 2020) and subjected to expert review for content validity. A pilot test with 50 respondents yielded a Cronbach's Alpha coefficient of 0.892, confirming high reliability. Following questionnaire administration, 199 valid responses (89.2% effective response rate) were analyzed using descriptive statistics and multiple regression analysis at 0.05 significance level.

Results and Discussion

Table 4.1: Summary of Aggregate Mean Scores

Variable	*Aggregate Mean*	*Std. Deviation*	*Interpretation*
Artificial Intelligence Adoption	4.09	0.77	Agree
Customer Service Quality	4.12	0.74	Agree

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Operational Efficiency	4.12	0.76	Agree
Employee Productivity	4.05	0.78	Agree
Risk Management	4.10	0.76	Agree

Source: Field Survey (2026)

The summary shows that respondents across all five Tier-1 banks agree that AI adoption is prevalent and has positively influenced all four dimensions of non-financial performance, with operational efficiency and customer service quality recording the highest aggregate means (4.12 each)

Test of Hypotheses

This section presents the inferential statistical analysis conducted to test the research hypotheses. Pearson's correlation coefficient was used to test hypotheses one through four, while multiple regression analysis was employed for hypothesis five. All tests were conducted at a 0.05 significance level.

H_{01}: There is no significant relationship between AI adoption and operational efficiency in Tier-1 deposit money banks in Gombe Metropolis.

Table 4.2: Pearson Correlation between AI Adoption and Operational Efficiency

Variable	*N*	*Mean*	*Std. Dev.*	*r*	*p-value*	*Remark*
AI Adoption	199	4.09	0.77	0.684**	0.000	Significant
Operational Efficiency	199	4.12	0.76			

**Correlation is significant at the 0.01 level (2-tailed).

Source: Field Survey (2026)

Using the correlation, it shows that p-value < 0.05. Therefore, we reject the null hypothesis and conclude that artificial intelligence (AI) has a significant effect on operational efficiency in Tier-1 deposit money banks in Gombe metropolis.

H_{02}: There is no significant relationship between AI adoption and customer service quality in Tier-1 deposit money banks in Gombe Metropolis.

Table 4.3: Pearson Correlation between AI Adoption and Customer Service Quality

Variable	*N*	*Mean*	*Std. Dev.*	*r*	*p-value*	*Remark*
AI Adoption	199	4.09	0.77	0.657**	0.000	Significant
Customer Service Quality	199	4.12	0.74			

**Correlation is significant at the 0.01 level (2-tailed).

Source: Field Survey (2026)

Using the correlation, it shows that p-value < 0.05. Therefore, we reject the null hypothesis and conclude that artificial intelligence (AI) has a significant effect on customer service quality in Tier-1 deposit money banks in Gombe metropolis.

H_{03}: There is no significant relationship between AI adoption and employee productivity in Tier-1 deposit money banks in Gombe Metropolis.

Table 4.4: Pearson Correlation between AI Adoption and Employee Productivity

Variable	*N*	*Mean*	*Std. Dev.*	*r*	*p-value*	*Remark*
AI Adoption	199	4.09	0.77	0.592**	0.000	Significant
Employee Productivity	199	4.05	0.78			

**Correlation is significant at the 0.01 level (2-tailed).

Source: Field Survey (2026)

The results in Table 4.4 show that p-value < 0.05. Therefore, we reject the null hypothesis and conclude that there is a significant relationship between AI adoption and employee productivity.

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H_{04}: There is no significant relationship between AI adoption and risk management in Tier-1 deposit money banks in Gombe Metropolis.

Table 4.5: Pearson Correlation between AI Adoption and Risk Management

Variable	*N*	*Mean*	*Std. Dev.*	*r*	*p-value*	*Remark*
AI Adoption	199	4.09	0.77	0.623**	0.000	Significant
Risk Management	199	4.10	0.76			

**Correlation is significant at the 0.01 level (2-tailed).

Source: Field Survey (2026)

Table 4.5 indicates p-value of 0.000 is less than 0.05. Therefore, we reject the null hypothesis and conclude that AI adoption has a significant effect on risk management.

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H_{05}: AI adoption has no significant combined effect on operational efficiency, customer satisfaction, employee productivity, and risk management in Tier-1 deposit money banks in Gombe Metropolis.

To test this hypothesis, multiple regression analysis was conducted with AI adoption as the independent variable and the four non-financial performance dimensions (operational

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efficiency, customer service quality, employee productivity, and risk management) as dependent variables. The results are presented in Tables 4.6, 4.7, and 4.8.

Table 4.6: Model Summary

Model	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*
1	0.786a	0.618	0.610	0.3421

a. Predictors: (Constant), AI Adoption

Source: Field Survey (2026)

The model summary in Table 4.6 shows an R-value of 0.786, indicating a strong positive correlation between AI adoption and the combined non-financial performance dimensions. The R Square value of 0.618 indicates that AI adoption explains approximately 61.8% of the variance in the combined non-financial performance dimensions (operational efficiency, customer service quality, employee productivity, and risk management). The adjusted R Square of 0.610 confirms the model's goodness of fit.

Table 4.7: ANOVA[a]

Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Regression	36.847	4	9.212	8.694	0.000b
Residual	22.713	194	0.117		
Total	59.560	198			

a. Dependent Variable: AI Adoption

b. Predictors: (Constant), Risk Management, Employee Productivity, Customer Service Quality, Operational Efficiency

Source: Field Survey (2026)

The ANOVA results in Table 4.7 show an F-statistic of 78.694 with a p-value of 0.000, which is less than 0.05. This indicates that the regression model is statistically significant, meaning that AI adoption significantly predicts the combined non-financial performance dimensions.

Table 4.8: Coefficients[a]

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.

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	β	Std. error	β		
(Constant)	0.847	0.213		3.976	0.000
Operational Efficiency	0.312	0.068	0.298	4.588	0.000
Customer ServiceQual	0.286	0.071	0.267	4.028	0.000
Employee Productivity	0.194	0.064	0.191	3.031	0.003
Risk Management	0.237	0.069	0.226	3.435	0.001

a. Dependent variable: AI Adoption

Source: Field Survey (2026)

The coefficient table shows that all four non-financial performance dimensions have positive and significant relationships with AI adoption. Operational efficiency has the highest beta coefficient (β = 0.298, p = 0.000), followed by customer service quality (β = 0.267, p = 0.000), risk management (β = 0.226, p = 0.001), and employee productivity (β = 0.191, p = 0.003). All p-values are less than 0.05, indicating that each dimension significantly contributes to the model. Therefore, the null hypothesis (H_{05}) is rejected. This confirms that AI adoption has a significant combined effect on operational efficiency, customer satisfaction, employee productivity, and risk management in Tier-1 deposit money banks in Gombe Metropolis.

Discussion of Findings

H1 evaluated whether artificial intelligence significantly and positively influences operational efficiency in Tier-1 DMBs. The correlation result revealed that artificial intelligence have a significant positive effect on operational efficiency (r = 0.684, p = 0.000). Therefore, H1 was supported. This finding aligns with previous studies (Adeyemo & Okoronkwo, 2024; Gumbo et al., 2024). The finding also supports the resource-based view of the firm, suggesting that AI capabilities serve as valuable organizational resources that enable banks to achieve operational excellence. By automating routine processes, banks can reallocate human resources to more complex, value-adding activities, and thereby optimizing overall operational performance.

H2 investigated whether artificial intelligence adoption significantly and positively influences customer service quality in Tier-1 DMBs. The correlation results showed that artificial intelligence have a significant influence on customer service quality (r = 0.657, p = 0.000). Therefore, H2 was supported. Previous studies (Abiodum et al., 2025; Mohammed, 2024; Udodiugwu et al., 2024) have supported this, indicating artificial intelligence impact on customer service quality.

H3 evaluated whether artificial intelligence significantly and positively influences employee productivity in Tier-1 DMBs. The correlation result revealed that artificial intelligence have a moderate positive effect on employee productivity (r = 0.592, p = 0.000). Therefore, H3 was supported. This finding aligns with the study of Elegunde and Shotunde (2020).

H4 evaluated whether artificial intelligence significantly and positively influences risk management effectiveness in Tier-1 DMBs. The correlation result revealed that artificial intelligence have a significant positive effect on risk management ($r = 0.623$, $p = 0.000$). Therefore, H4 was supported. This finding aligns with the studies of Nabwami (2024); Le et al. (2021) and Ukpo (2022).

H5 investigated whether artificial intelligence adoption has significant combined effect on operational efficiency, customer satisfaction, employee productivity, and risk management in Tier-1 deposit money banks in Gombe Metropolis. The regression coefficient result shows that all four non-financial performance dimensions have positive and significant relationships with AI adoption. Operational efficiency has the highest beta coefficient ($\beta = 0.298$, $p = 0.000$), followed by customer service quality ($\beta = 0.267$, $p = 0.000$), risk management ($\beta = 0.226$, $p = 0.001$), and employee productivity ($\beta = 0.191$, $p = 0.003$). All p-values are less than 0.05, indicating that each dimension significantly contributes to the model. Therefore, H5 was supported. This finding aligns with previous studies (Abiodum et al., 2025; Adeyemo & Okoronkwo, 2024; Nabwami, 2024; Udodiugwu, 2024; Ukpo, 2022).

Conclusion and Recommendations

This study examined the effect of artificial intelligence on non-financial performance of deposit money banks in Gombe Metropolis, Nigeria. The findings lead to the conclusion that AI adoption significantly enhances all four dimensions of non-financial performance: customer service quality, operational efficiency, risk management effectiveness, and employee productivity. The strongest effect is on operational efficiency, followed by customer service quality, risk management effectiveness, and employee productivity. Overall, AI adoption explains 58.4% of the variance in non-financial performance, confirming its strategic importance in the banking sector.

Therefore, the study recommends that DMBs should accelerate AI integration across all operational areas, recognizing that AI investments yield significant returns across multiple performance dimensions. Priority should be given to AI applications that enhance operational efficiency and customer service quality, as these show the strongest effects. Also, comprehensive training programs should be developed to equip employees with skills to work effectively with AI tools, addressing the relatively lower impact on productivity. DMBs should also strengthen AI-powered risk management systems, particularly fraud detection and credit scoring applications.

Additionally, policymakers like the Central Bank of Nigeria should develop a comprehensive AI governance framework addressing data privacy, algorithmic fairness, model transparency, and accountability.

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