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Influence of Artificial Intelligence on Performance of Deposit Money Banks in South-East Nigeria

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ABSTRACT: This study investigates the influence of Artificial Intelligence on Performance of Deposit Money Banks in South-East Nigeria. The increasing complexity and competitiveness of the banking sector have made AI a strategic tool, offering applications such as generative AI for task automation and AI biometric verification for operational efficiency. Despite global recognition of AI's transformative potential, empirical evidence on its impact within Nigerian banks remains limited. Anchored on the Resource-Based View (RBV) theory, the study conceptualizes AI capabilities as strategic resources that, when effectively implemented, can enhance employee commitment, reduce operational costs, and create sustainable competitive advantage. A descriptive survey design was employed, targeting 356 employees across five Tier-1 banks, with 300 valid responses collected. Data were analyzed using descriptive statistics and Pearson Product Moment Correlation via SPSS (version 27) at a 5% significance level. Findings reveal a strong positive correlation between generative AI adoption and employee commitment ($r = 0.839$, $p < 0.01$) and a very strong positive correlation between AI biometric verification and operational cost reduction ($r = 0.985$, $p < 0.01$). These results indicate that AI adoption enhances both human-centered outcomes and organizational efficiency. The study underscores AI as a strategic asset, suggesting that banks should integrate AI technologies across operations, invest in workforce training, and implement ethical governance practices to achieve long-term growth, employee engagement, and operational excellence.

Key words: Artificial Intelligence, Success, Generative AI, AI Biometric verification, Employee Commitment and Operational Efficiency

INTRODUCTION

The rapid advancement of technology has transformed the world into a globally connected tech environment, impacting multiple sectors (Tanha et al., 2023). The financial services industry, particularly commercial banking, has undergone significant changes due to innovations in information and communication technology (ICT), especially artificial intelligence (AI).

AI tools such as machine learning, natural language processing, robotic process automation, and predictive analytics are increasingly adopted by banks to enhance operational efficiency, risk management, customer service, and decision-making (PwC,

2020; Deloitte, 2019). AI has become essential across corporate, socio-economic, governance, and household contexts, performing tasks that simulate human intelligence and assisting in decision-making processes (Chaudhary, 2022; Sehirli & Alesmaeil, 2022).

In banking, AI supports fraud detection, cash and cheque management, inventory control, and cost reduction, improving profitability and overall organizational performance (Enweremadu et al., 2023; Ness et al., 2024; Udodiugwu et al., 2023). In Nigeria, commercial banks are critical to economic development, financial intermediation, and capital allocation. Rising competition, evolving customer expectations, and regulatory pressures have led banks to explore AI solutions such as chatbots, biometric verification ATMs, and fraud detection systems to enhance operational efficiency, customer satisfaction, employee commitment, and profitability (Olayemi, 2021; Adeleke & Osemene, 2022; Nduka, Okolie & Ngangah, 2025).

Despite AI's potential, some banks are still in early stages of adoption due to high implementation costs, limited technical expertise, and infrastructure challenges. Therefore, there is a pressing need for empirical research to examine AI's impact on organizational success, including financial performance, customer satisfaction, employee commitment, operational costs, and innovation. Such insights would guide strategic investments, inform policy, and support sustainable competitiveness in the Nigerian banking sector.

The growing complexity and competitiveness of Nigeria's banking sector have made the adoption of advanced technologies crucial for achieving operational efficiency and strategic success. Among these, Artificial Intelligence (AI) has emerged as a transformative tool, offering automation, predictive analytics, fraud detection, and enhanced customer engagement (Deloitte, 2019). Despite global enthusiasm for AI in banking, its impact on the organizational success of Nigerian commercial banks remains unclear and under-researched.

Although some banks have implemented AI solutions such as chatbots, biometric ATMs, AI-based credit scoring, and biometric identification verification, there is limited empirical evidence showing their effect on profitability, customer satisfaction, operational efficiency, or employee productivity (Olayemi, 2021). Challenges including poor digital infrastructure, high implementation costs, regulatory uncertainty, and insufficient skilled personnel hinder effective AI adoption (Adeleke & Osemene, 2022). Additionally, AI initiatives are often deployed without strategic alignment, resulting in underutilization or implementation failures (PwC, 2020). Concerns about job displacement and employee resistance further complicate adoption.

This gap underscores the need to examine how AI contributes to organizational performanceof Nigerian banks. This study aims to investigate the relationship between AI adoption and key performance indicators, while identifying implementation challenges, to provide insights for effective technology integration and sustainable competitiveness in the sector. Specifically, the study seeks to: Examine the relationship between generative AI and employee commitment in the deposit money banks in South East, Nigeria; Investigate the relationship between AI biometric identity verification and operational cost in the deposit money banks in South East, Nigeria.

LITERATURE REVIEW

Artificial Intelligence (AI)

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines designed to perform tasks that typically require human cognition, such as learning, reasoning, and self-correction (Russell & Norvig, 2020). Hans (2017) defined artificial intelligence as any device that perceives its environment and takes action that maximizes its chance of successfully achieving its goals. It is equipment that developed to act like a human being. Healy and Palepu (2001) opined that artificial intelligence AI includes the development of computer based systems that can learn from past behaviors and apply that knowledge to solving future problems. This goes further to show that AI is a device that is capable of studying its environment, and applying such knowledge to improve the environment. This involves modeling the human behavior and thought process. The machine is designed to respond intelligently like a human. AI derives from the concept that a machine can be made to stimulate it (Lynn, 2011). The major purpose of AI is the development of computers that can think, see, hear, walk, talk and feel like humans. A major thrust of artificial intelligence is the development of computer functions normally associated with human intelligence such as reasoning, learning and problem solving. (O'Brein, 2003).

AI was first conceptualized in 1955 as a branch of computer science and focused on the science of making intelligent machines that could mimic the cognitive abilities of the human mind, such as learning and problem solving (Ukpong, 2022). In recent times, the business world has witnessed machines perform tasks which prior to this time could only be performed by humans with specialized skills and trainings. The advent of AI has indeed change how business is done and the banking sector is not left out. Mudagal (2018) enumerated five main areas where artificial intelligence is used in banking to include investing asset management, credit scoring underwriting, regulatory compliance fraud detection, market research reporting and customer support- assistants. There are various ways through which AI handles banking problems such as customer service digital support (use of smart phones), scam recognition, biometric identification and customer personalization.

Anjum, 2020 asserts that Artificial Intelligence is the future of banking as it brings the power of advanced data analytics to combat fraudulent transactions and improve compliance. AI algorithm accomplishes anti-money laundering activities in few seconds, which otherwise would have taken hours or days. Al also enables banks to manage huge volumes of data at record speed. Ai features such as AI bots, digital payment advisers and biometric fraud detection mechanisms lead to higher quality of services to a wider customer base. Anjum, 2020 believes that all these translate to increased revenue, reduced costs and boost profits.

Generative Artificial Intelligence (GAI)

Generative Artificial Intelligence refers to a subset of artificial intelligence that involves training machines to generate new and original data, such as images, music, text, or even videos. Unlike traditional AI, which operates on pre-existing data sets to recognize patterns and make predictions, generative AI can produce entirely new content by learning from existing data sets and generating something new based on that information (United Arab Emirates Minister of State for Artificial Intelligence, Digital economy & Remote work Applications office, 2023). Generative AI is a type of artificial intelligence that generates new content by modeling features of data from large datasets

that were fed into the model. (Canadian Centre for Cyber Security, 2023). Bakpayev (2022), Elasri (2022 and Kowalezyk (2023) stated that GAI applications aim to create tailored marketing content, generate realistic images or videos and even assist in software development by generating code. While Eniola & Khoreva (2023) observed that employing GAI in enterprises can extend the level of assistance for workers and open up opportunities for augmentation and automation of the job, leading to new forms of collaborations between humans and machines. Moreover, GAI transforms the way businesses operate in their daily tasks, innovate and interact with their customers (Brynjolfsson, 2023; Mondal, 2023). Organizations therefore should seek to understand and embrace the potentials of generative AI for success.

AI biometric Identity Verification

AI biometric identity verification refers to the application of artificial intelligence and machine-learning algorithms to capture, analyze, and authenticate individuals based on unique biological and behavioral characteristics. These characteristicssuch as fingerprints, iris and facial patterns, voice signatures, keystroke dynamics, a device-use patterns are processed through intelligent models that learn and improve over time, thereby enhancing accuracy and reducing false matches. Scholars describe AI-driven biometrics as an advanced identity-authentication system that integrates data sensing technologies with predictive algorithms to determine whether an individual is truly who they claim to be (Ogunjide, Okoli, Somoye, & Olawore, 2025). In the banking and fintech sectors, such systems create encrypted biometric templates, compare real-time user inputs with stored data, and automatically detect anomalies. Behavioral biometrics such as mouse movements, walking gait, and transaction velocity represent a next-generation expansion of this concept, incorporating continuous authentication rather than one-time verification (Salami et al., 2025).

AI biometric identity verification has the potential to revolutionize identity assurance, fraud detection, and digital trust in Nigeria's banking and fintech industries. While its benefits including improved security, enhanced user experience, and reduced operational inefficiencies are significant, the associated risks require careful management. Nigerian financial institutions must adopt strong governance frameworks, ethical AI practices, and robust cybersecurity strategies to ensure that AI-powered biometric verification systems remain secure, inclusive, and resilient against emerging threats. Continued research from Nigerian scholars and practitioners will play an essential role in shaping responsible adoption

Performance

Performance refers to the degree to which individuals or organizations achieve predetermined goals efficiently and effectively. It encompasses both behaviours and outcomes that contribute to organizational success (Aguinis, 2019). At the organizational level, performance includes financial results, operational efficiency, employee productivity, and customer satisfaction. In the banking sector, performance is reflected in profitability, service quality, innovation, and competitive advantage (Aliyu & Bello, 2021). Employee performance involves the effective use of skills, knowledge, and abilities to execute tasks and meet organizational expectations.

Performance is influenced by factors such as technology adoption, employee competence, leadership, and organizational culture. The integration of digital technologies, including ATMs, mobile banking, and POS systems,

has significantly improved operational efficiency by reducing transaction time, minimizing errors, and lowering costs (Okoye & Ezenwa, 2023). Therefore, performance remains a key indicator of organizational effectiveness and sustainability in a competitive and technology-driven environment.

Employee Commitment

Commitment is a force that binds an individual to a course of action that is of relevance to a particular target (Meyer & Herscovitch, 2001). Employee commitment can be seen as the extent to which employees are devoted to the organization. It is the degree to which the employee feels devoted to their organization (Akintayo, 2010). Ongori (2007) posits that employee commitment as an effective response to the whole organization and the degree of attachment or loyalty employees feel towards the organization. He further stated that it is in fact the acceptance of organizational values by the staff and their active involvement in organizational affairs. It is employees' attitude to organization (Zheng, 2010). This definition of employee commitment is broad in the sense that employees' attitude encompasses various components. Numerous factors have been found to inspire commitment. For instance, Ongori (2007) opines that the degree to which employees are committed or loyal to their organization depends largely on job enrichment, employee empowerment, advancement opportunity, compensation and reward.

Employee commitment reflects the extent to which employee's identify with an organization and is committed to its goals. Employees who are committed to their respective organizations are more likely not only to remain with the organization but are also likely to exert more efforts on behalf of the organization and work towards its success thereby improving the performance of the organization (Dixit & Bhati, 2012)

In the last decade, employee commitment has been used to proxy employee performance because it tells how effective and efficient an employee will be in his/her assigned duty. Employee commitment is the strong belief in and acceptance of the organizational goals and values, willingness to exert considerable effort on behalf of the organization, and a definite desire to maintain organizational membership (Porter, Steers, Mowday & Boulian, 1974). Ongori (2007) views the concept as an effective response to the whole organization and the degree of attachment or loyalty employees feel towards the organization. In this definition, employee commitment is seen as an attachment employees develop for the organization they work for. Individuals may become attached and committed to an organization for many reasons: a person may stay with an organization because of the organization's values, mission, and goals align with his/her own; another person may stay with the same organization because leaving may impact his/her prestige, benefits, or social networks; yet another may be committed to the organization due to a sense of obligation. Employees who are strongly committed to their organization are less likely to leave and perform better (Delobbe & Vandenberghe, 2000; Lumley, 2009; Spector, 2008). Employees who are committed to their organizations may easily accept and adhere to the organizational objectives and goals which will impact on the organizational overall performance (Valentine et al., 2002).

Operational Cost

Operational cost refers to the total expenditure incurred by banks in the process of delivering financial services, maintaining branches, deploying technology, compensating employees, fulfilling regulatory requirements,

and managing internal systems and risks. These costs include personnel expenses, administrative overhead, IT and digital infrastructure expenses, compliance and reporting costs, and routine running expenses. Studies on Nigerian deposit money banksshow that operational costs also encompass risk-management outlays aimed at strengthening stability and minimizing loss exposures, as emphasized by Adegbie and Sunday (2021). Furthermore, cost efficiency literature such as Alabi, Adebisi, and Fatimehin (2020) highlights that operational costs form a major determinant of banks' cost-income ratio and overall financial performance.

Effective management of operational costs enhances bank profitability, financial stability, and competitive advantage. Cost-efficient institutions are better positioned to optimize their cost-income ratio, sustain earnings, and improve shareholder value, as repeatedly shown in studies like Alabi et al. (2020) and Oladapo & Rahman (2021). Properly planned operating expenses such as investments in digital banking, staff training, and improved internal controls can significantly reduce operational risks and service delivery failures. Adegbie & Sunday (2021) further imply that robust risk-related operating expenses strengthen banks' resilience and contribute to long-term stability. Additionally, cost-reduction strategies during economic downturns, as observed by Egbunike and Adeniyi (2017), help banks maintain profitability even when revenues decline. Efficient management of personnel and administrative expenses, highlighted by Peters & Ogaluzor (2020), also enhances productivity and overall operational efficiency.

Despite their necessity, operational costs pose significant risks when not properly managed. High personnel expenses, inefficient branch networks, and excessive administrative overhead can erode profitability and weaken financial performance, as noted in studies such as Peters & Ogaluzor (2020) and Adewumi & Adeleke (2022). Rising compliance costs especially with tightening regulatory frameworks may reduce banks' earnings, an issue emphasized by Okezie & Okereke (2023). A persistently high cost-to-income ratio, highlighted by Oladapo & Rahman (2021), signals inefficiency and exposes banks to competitive disadvantages. Poor operational cost structures may also restrict investments in digital transformation, increase exposure to operational risks like service disruptions and fraud, and hinder the ability to scale operations efficiently. Even bank size, according to Ojeyinka & Akinlo (2022), does not automatically guarantee efficiency, as large banks often struggle with cost overruns and complex administrative burdens. Ultimately, unmanaged operational expenses can threaten profitability, reduce liquidity, and undermine long-term stability in the banking sector.

The study is anchored on Resource-Based View (RBV) Theory as propounded by Barney (1991).

Resource-Based View (RBV) Theory**,** proposed by Barney (1991), argues that an organization's internal resources and capabilities are the primary drivers of sustainable competitive advantage and success. In this study: Artificial Intelligence capabilities (such as predictive analytics, machine learning algorithms, intelligent automation) are seen as strategic resources. When these AI capabilities are valuable, rare, inimitable, and non-substitutable (VRIN characteristics), they contribute significantly to the success of deposit money banks in a competitive environment like South-East Nigeria. Thus, the ability of banks to successfully integrate and utilize AI technologies can differentiate them from

competitors and improve operational efficiency, customer satisfaction, and financial performance.

Theoretical Framework

The study is anchored on Resource-Based View (RBV) Theory as propounded by Barney (1991). Resource-Based View (RBV) Theory**,** proposed by Barney (1991), argues that an organization's internal resources and capabilities are the primary drivers of sustainable competitive advantage and success. In this study**:** Artificial Intelligence capabilities (such as predictive analytics, machine learning algorithms, intelligent automation) are seen as strategic resources. When these AI capabilities are valuable, rare, inimitable, and non-substitutable (VRIN characteristics)**,** they contribute significantly to the success of deposit money banks in a competitive environment like South-East Nigeria. Thus, the ability of banks to successfully integrate and utilize AI technologies can differentiate them from competitors and improve operational efficiency, customer satisfaction, and financial performance.

Empirical Review

Elegunde and Osagie (2020) examined artificial intelligence and employee performance in the Nigerian banking industry, Lagos Nigeria as a study to generalize result. The aim of the study was to examine how AI complements work processes and to know if it eases employee operations in banks in Nigeria. Cross-sectional descriptive research design was adopted. The population of the study was the entire employees of six (6) selected banks operating in Lagos state Nigeria. Taro Yamane sample size was used to arrive at a sample size of 98 out of a total of 127. Regression and Pearson correlation coefficients were used to analyze data. Findings revealed that artificial intelligence complements work process in banks in Nigeria and that machine aided tasks ease operations in banks in Nigeria. The study is related to the present study in that both studies used Artificial Intelligence (AI) variables and commercial banks, but differ in area for study, variables, method of data analysis, subject area, population and scope.

Garg, Sinha, Kar, and Mani (2022) examined a review of machine learning applications in human resource management in India. This paper reviewed 105 Scopus-indexed articles to identify the degree, scope and purposes of machine learning (ML) adoption in the core functions of human resource management (HRM). A semi-systematic approach has been used in this review. It allowed for a more detailed analysis of the literature which emerges from multiple disciplines and uses different methods and theoretical frameworks. Since ML research comes from multiple disciplines and consists of several methods, a semi-systematic approach to literature review was considered appropriate. The review suggested that HRM has embraced ML, albeit it is at a nascent stage and is receiving attention largely from technology-oriented researchers. ML applications are strongest in the areas of recruitment and performance management and the use of decision trees and text-mining algorithms for classification dominate all functions of HRM. For complex processes, ML applications are still at an early stage; requiring HR experts and ML specialists to work together.

Khaled, Sharma, Yashwanth, Reddy, and Naved (2022) examined evaluating the Role of Robotics, Machine Learning and Artificial Intelligence in the Field of Performance Management in India. The purpose of this study was to systematize scholarly input on smart automation to date and to elucidate their primary contributions to the performance management difficulties. The study found 45

publications on artificial intelligence, robotics as well as other technologically advanced within PM settings in the international business (IB) and general management (GM) and information management (IM) journals. The results demonstrated that smart automation technologies provide a new strategy to managing personnel and improving company performance, providing various performance management opportunities and also major technological and ethical problems. Its influence is based on performance management techniques such as job substitution, work collaboration between human robots and AI, policy-making and apprenticeship possibilities, and performance management activities, namely recruitment, education, and job performance.

Abdulsalam & Tajudeen (2024) examined AI strategies in the banking industry, focusing on service areas and adaptation to the evolving technological landscape, particularly in customer service. The study was carried out in developing economies. The study adopted an interpretivist philosophy, emphasising practicality, and a qualitative approach employed through a systematic literature review of 90 articles using thematic analysis. The study highlights AI's growing use in process automation, customer experience, stock market trend prediction, credit risk management, online banking, marketing management, and auditing. The study is related to the present study in that both studies used Artificial Intelligence (AI) variables and commercial banks, but differ in area for study, variables, method of data analysis, subject area, population and scope.

Gap in Knowledge

Although global research has increasingly emphasized the significance of artificial intelligence (AI) in reshaping business processes and improving organizational performance, there is a clear shortage of empirical studies examining its specific impact on the performance of deposit money banks in South-East Nigeria. Much of the existing literature tends to generalize findings across wider national or continental settings, often overlooking the distinct infrastructural, economic, cultural, and technological conditions unique to the region. In addition, prior studies largely focus on the technical applications of AI in banking, with limited attention given to its strategic implications for customer satisfaction, employee engagement, cost efficiency, and long-term profitability. Consequently, a substantial gap persists in understanding the contextual adoption, associated challenges, and measurable outcomes of AI-driven initiatives within the banking industry in South-East Nigeria.

METHODOLOGY

The study adopted a descriptive survey research design to enable systematic data collection and analysis. This design was appropriate for generating quantitative data, describing existing conditions, and examining relationships among variables without manipulation. The research was conducted in South East Nigeria, comprising Abia, Anambra, Ebonyi, Enugu, and Imo States. The region was selected due to its active banking operations relevant to the study. The population consisted of employees from five Tier-1 deposit money banks: First Bank of Nigeria, United Bank for Africa, Guaranty Trust Bank, Access Bank, and Zenith Bank. These banks were selected due to their market dominance and technological advancement. The total population was 3,246 employees across the South East.

Sample Size

In determining the sample size for the study, a simplified formula by Taro Yamane (1967) was employed and stated thus:

$$n = \frac{N}{1+N(e)^2}$$

Where; N = Population of the Study
n = Sample Size
(e) = Level of significance
I = Unit (a constant)
Note (e) = 0.05
N = 3,246

$$= \frac{3,246}{1+3,246(0.05)^2}$$

$$= \frac{3,246}{1 + 3,246(0.0025)}$$

$$= \frac{3,246}{1 + 8.115} \qquad \frac{3,246}{9.115}$$

$$= 356.1162$$

Approximately = 356 sample size

Both primary and secondary data sources were utilized. Primary data were collected through structured questionnaires administered to bank employees, while secondary data were obtained from journals, online materials, and unpublished works. A pilot test involving 20 respondents was conducted.

The Cronbach's Alpha coefficient of 0.876 indicated high reliability, exceeding the acceptable threshold. Data were presented in tables and analyzed using descriptive statistics. Hypotheses were tested using Pearson Product Moment Correlation with SPSS (version 27) at a 5% significance level.

Decision Rule:
Accept the alternate hypothesis (Ha) if calculated P-value is less than 0.05 (p-value < 0.05); otherwise accept the null hypothesis (Ho).

DATA PRESENTATION, RESULTS AND DISCUSSION OF FINDINGS

Presentation of Data

The questionnaire was administered to three hundred fifty-six (356) respondents during the field survey by the researcher. However, 300 (84%) were returned and 56(16%) were not returned.

Analysis of Questionnaire

Description	Numbers	Percentage (%)
No. of questionnaire administered	356	100
No. of questionnaires retrieved	300	84
No. of questionnaires not retrieved	56	16

Source : Field Survey, 2025

Table 4.1: Research Question 3: To what extent are the generative AI related to the employee commitment in the deposit money banks in South East, Nigeria?

S/N	Generative AI	N	Mean	Standard Deviation	
17.	Generative AI tools help in producing automated reports and financial summaries	300	3.34	1.660	Accepted
18.	My bank uses generative AI to analyze customer data and predict behavior patterns	300	3.19	1.667	Accepted
19.	Generative AI contributes to operational efficiency in my bank	300	2.480	1.614	Rejected
20	AI-generated insights help improve banking strategies and innovations	300	2.48	1.609	Accepted
Employee Commitment					
21	Employees feel more productive when using AI-assisted systems	300	2.65	1.716	Accepted
22	Staff are committed to learning and adapting to AI technologies.	300	3.19	1.647	Accepted
23	Employees view AI as a tool for career growth within the bank.	300	2.77	1.575	Accepted
24	The use of AI makes me proud to work for this organization.	300	2.42	1.583	Rejected

Source: Field survey, 2025

Table 4.1 examines the relationship between generative AI and employee commitment in deposit money banks in South East Nigeria. The mean scores range from 2.42 to 3.34, with most values above the 2.50 benchmark, indicating a moderate positive relationship. Generative AI is widely acknowledged for improving operational accuracy and reducing manual workload through automated reports (mean = 3.34). It is also used to analyze customer data and predict behavior (mean = 3.19), enhancing decision-making. However, its perceived impact on operational efficiency and innovation is moderate (mean = 2.48 each).

In terms of employee commitment, respondents agreed that AI tools improve productivity (mean = 2.65) and encourage skill development (mean = 3.19). Employees also view AI as beneficial for career growth (mean = 2.77). However, low pride in working with AI (mean = 2.42) suggests limited emotional attachment. Overall, generative AI moderately enhances employee commitment, but improved training and engagement strategies are needed to strengthen its impact.

Table 4.2: Research Question 4: To what extent are the AI biometric Identification Verification related to the Operational Cost of the deposit money banks in South East, Nigeria?

AI biometric Identification	N	Mean	Standard Deviation	Remark

25	AI biometric systems have made customer identity verification cheaper for my bank.	300	1.88	1.479	Rejected
26.	The use of biometric verification has reduced losses caused by identity fraud.	300	3.42	3.230	Accepted
27	AI biometric technology has reduced repeated checks when verifying customers.	300	3.35	1.708	Accepted
28	Maintaining AI biometric systems costs less than using traditional verification methods	300	3.56	1.611	Accepted
Operational Cost					
29	Using AI has helped my bank spend less on day-to-day operations.	300	1.80	1.429	Rejected
30	AI systems have reduced the amount of manual work, thereby cutting operational expenses.	300	3.43	3.231	Accepted
31	The use of AI has lowered staff-related costs in routine banking activities.	300	3.33	1.708	Accepted
32	AI has made banking processes faster and cheaper to run.	300	3.51	1.576	Accepted

Source: Field survey, 2025

Table 4.2 analyzes the relationship between AI biometric identification verification and operational costs in deposit money banks in South East Nigeria, revealing mixed perceptions. Respondents generally agreed that AI biometrics enhance cost efficiency, as reflected in mean scores of 3.42, 3.35, and 3.56. These indicate reduced fraud-related losses, fewer repeated verification processes, and lower maintenance costs compared to traditional methods. However, the low mean of 1.88 suggests that respondents do not perceive biometric systems as immediately reducing verification costs.

Regarding operational costs, findings show positive outcomes, with mean scores of 3.43, 3.33, and 3.51, indicating reduced manual tasks, lower staffing costs, and faster banking processes. Conversely, a mean score of 1.80 shows that respondents did not observe a significant decline in overall daily operational expenses due to AI alone. Overall, the results suggest that while AI biometric systems may not yield immediate cost reductions, they significantly improve long-term cost efficiency through fraud prevention, automation, and enhanced operational effectiveness.

Hypotheses Testing

Decision Rule: Reject the null hypothesis if the p-value is less than or equal to 0.01 ($p \leq 0.01$), indicating a statistically significant relationship between the variables, while the strength of this relationship is determined by the magnitude of the correlation coefficient (r).

Test of Hypothesis I

H_0: There is no significant positive relationship between generative AI and employee commitment in the deposit money banks in South East, Nigeria.

Table 4.3: Correlation between **Generative AI and Employee Commitment**

		GEN_AI	EMPLOYEE_COMMITTEE
GEN_AI	Pearson Correlation	1	.839**
	Sig. (2-tailed)		.000
	N	300	300
EMPLOYEE_COMMI	Pearson Correlation	.839**	1
	Sig. (2-tailed)	.000	
	N	300	300

. **Correlation is significant at the 0.01 level (2-tailed) **.
Source: SPSS version 27 Output

Table 4.13 shows a strong positive correlation (r = 0.839, p < 0.000) between generative AI and employee commitment in South East Nigerian banks. The null hypothesis is rejected, confirming a significant relationship. The findings suggest that generative AI tools, such as automated reporting and predictive analytics, enhance employee engagement, productivity, and willingness to adopt new technologies, thereby strengthening commitment and supporting organizational performance.

Test of Hypothesis II
Ho: There is no significant positive relationship between AI Biometric Identification Verification and operational cost of the deposit money banks in South East, Nigeria

Table4.4: Correlation between AI Biometric identification verification and Operational cost

		AI BIOMETRIC	OPERATIONAL COST
AI BIOMETRIC	Pearson Correlation	1	.985 **
	Sig. (2-tailed)		.001
	N	300	300
OPERATIONAL COST	Pearson Correlation	.985 **	1
	Sig. (2-tailed)	.000	
	N	300	300

**Correlation is significant at the 0.01 level (2-tailed) **.
Source: SPSS version 27 Output

Table 4.14 shows a very strong positive correlation (r = 0.985, p < 0.01) between AI biometric identification verification and operational cost in South East Nigerian banks. The null hypothesis is rejected, confirming a significant relationship, indicating that AI biometric systems are closely associated with changes in operational cost.

Discussion of Findings

Hypothesis one reveals a strong positive relationship (r = 0.839, p < 0.01) between generative AI adoption and employee commitment in deposit money banks. Applications such as automated content creation, data analysis, and routine task management positively influence employees' engagement and dedication. By reducing repetitive workload, generative AI allows employees to focus on more meaningful tasks, enhancing job satisfaction and alignment with

organizational goals. This aligns with Elegunde and Osagie (2020), who noted AI complements banking workflows, and Abdulsalam & Tajudeen (2024), who highlighted AI's role in process automation, customer experience, credit risk management, and auditing. The findings underscore the human-centered impact of AI, demonstrating that supportive technology boosts motivation, reduces burnout, and fosters a sense of purpose.

Hypothesis two indicates a very strong positive correlation ($r = 0.985$, $p < 0.01$) between AI biometric identification verification and operational cost. AI biometric systems standardize processes, reduce human bias, and improve accuracy in verification and decision-making. This supports findings by Oyekunle et al. (2022), Khaled et al. (2022), and Garg et al. (2022), emphasizing AI's role in cost reduction, transparent decision-making, and operational efficiency. The results confirm that AI biometric adoption is closely linked to managing and lowering operational costs in banks.

CONCLUSION

The findings of this study demonstrate that artificial intelligence (AI) has a profound and transformative impact on the operational and strategic dimensions of commercial banks in South East Nigeria. The strong positive correlations observed across all hypotheses clearly establish AI as a key driver of employee commitment and operational cost. Each AI dimension examined AI generative AI and biometric contributes uniquely yet collectively to the overall success and competitiveness of banking institutions in the region.

The study reveals that generative AI technologies positively influence employee commitment by reducing routine workload and enabling staff to focus on creative and strategic tasks. This human-centered application of AI enhances job satisfaction and strengthens emotional attachment to the organization. The integration of intelligent computing models also plays a crucial role in promoting fairness and equality in the workplace. By standardizing decision-making processes, these systems minimize bias in recruitment, evaluation, and promotion, fostering inclusivity and transparency that improve employee morale and trust.

Finally, the study provides compelling evidence that AI is not merely a technological enhancement but a strategic asset that drives holistic success. By integrating AI across various operational areas, banks can achieve significant improvements in efficiency, employee engagement, and fairness, these findings suggest that sustained investment in AI infrastructure, workforce training, and ethical governance will be crucial for banks seeking long-term growth, resilience, and leadership in the digital economy of Nigeria and beyond.

Based on the findings of this study, several key recommendations are proposed to enhance the adoption and effective utilization of Artificial Intelligence (AI) technologies for improved success in commercial banks in South East Nigeria:

1. Deposit money banks needs to leverage AI to enhance both employee engagement and operational efficiency. Generative AI tools such as automated content creation, data analysis, and routine task management reduce repetitive workload, allowing employees to focus on meaningful tasks, increasing job satisfaction, commitment, and alignment with organizational goals ($r = 0.839$, $p < 0.01$).

2. Additionally, AI biometric verification systems standardize processes, reduce errors and bias, and improve accuracy, leading to significant operational cost savings ($r = 0.985$, $p < 0.01$). Integrating these technologies helps banks foster a motivated workforce while optimizing resources, boosting efficiency, and strengthening competitive advantage in a digital banking environment.

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