UNIOFFA JOURNAL OF INTERDISCIPLINARY STUDIES (OJIS)
A Multidisciplinary Journal of Science, Management and Social Sciences
Website: www.unioffajis.com

PERCEIVED INFLUENCE OF ARTIFICIAL INTELLIGENCE ON FINANCIAL FRAUD DETECTION AND PREVENTION IN NIGERIAN BANKS

ADENIYI, Abdullah Adeoye
Ikirun College of Health Technology, Ikirun, Osun State
adeniyiabdullah12@gmail.com, 08105928393

ADEWUYI, Simeon Adedotun
Ikirun College of Health Technology, Ikirun, Osun State
adewuyisimeonadedotun@gmail.com, 09122450871

Volume 1:2

Abstract
This study examined perceived influence of Artificial Intelligence on financial fraud detection and prevention in Nigerian Banks. The study specifically investigated the degree of awareness and adoption of artificial intelligence for financial fraud detection and prevention in Nigerian Banks, examined the perceived effectiveness of Artificial Intelligence in detecting and preventing financial fraud within Nigerian Banks, evaluated the influence of Artificial Intelligence on improving fraud management and security systems in Nigerian Banks and find out the challenges that banks faces in deploying AI-driven fraud detection and prevention solution in Nigerian Banks. The researchers employed the descriptive survey research design in collecting data through the use of a structured questionnaire administered to respondents drawn from selected Nigerian banks. A total of 118 valid responses were used for the analysis. The data collected were analyzed using frequency distribution, mean, and standard deviation. Findings from the study revealed a high level of awareness and adoption of Artificial Intelligence for fraud detection and prevention in Nigerian banks, with a grand mean of 3.61 and standard deviation of 1.16. The study further established that Artificial Intelligence has significantly improved the effectiveness of fraud detection and prevention, particularly in the identification of suspicious transactions, early fraud detection, fraud investigation, and real-time transaction monitoring, with a grand mean of 3.71 and standard deviation of 1.14. The findings also showed that Artificial Intelligence has positively influenced fraud management and security systems by strengthening internal controls, improving customer data protection, and enhancing transaction security, with a grand mean of 3.73 and standard deviation of 1.12. However, the study identified several challenges affecting the effective implementation of Artificial Intelligence in Nigerian banks, including inadequate technical expertise, insufficient staff training, high implementation cost, cybersecurity threats, and regulatory concerns, with a grand mean of 3.76 and standard deviation of 1.11. The study concluded that Artificial Intelligence has become an important tool for improving fraud detection, fraud prevention, and security management in Nigerian banks. The study therefore recommended continuous investment in technological infrastructure, regular staff training, improved cybersecurity frameworks, and supportive regulatory policies to enhance the effective utilization of Artificial Intelligence in fraud management within the Nigerian banking sector.

Keywords: Artificial Intelligence, Fraud Detection, Fraud Prevention, Nigerian Banks, Financial Security, Banking Technology.

Introduction

The banking sector Omorogbe, Ighoakpo, Anyanwu, Obande, Ukaoha, Izevbuwa, Ighotuweyin and Arenvbaguehita (2025) is vulnerable to various types of fraud, including identity theft, phishing, and insider threats. Jibrin, Ejur, Moses, Uchubiyojo and Ismaila (2025) noted that fraud has become an urgent and complex issue within the global financial sector, affecting financial institutions and consumers alike. From identity theft and account takeovers to cybercrimes, these fraudulent activities continue to result in substantial financial losses and have a deep impact on consumer trust in financial systems (Musa & Moses, 2022). A recent report from the Association of Certified Fraud Examiners (2023) highlights that global financial institutions lose trillions of dollars annually to fraud, underscoring the growing scale of the issue. To combat these rising threats, many banks have turned to Artificial Intelligence (AI), leveraging its capacity to process vast amounts of data in real time. Artificial Intelligence (AI) has been vigorously defined by several scholars and organisations. IEEE (2017) Artificial Intelligence (AI) is broadly regarded as the theory and development of computer systems capable of performing tasks traditionally requiring human intelligence, such as visual perception, speech recognition, decision-making, and language translation. According to the European Commission's High-Level Expert Group on AI (2019), AI encompasses systems that exhibit intelligent behavior by analyzing their environment and making

autonomous decisions to achieve specific objectives. Polo et al. (2024) further describe AI as technology designed to carry out tasks that demand a certain level of intelligence, essentially mimicking human cognitive functions through trained machines or tools.

As explained by Musa and Moses (2022), AI has become a vital tool in fraud detection, prevention, and overall risk management. Research by Ngai et al. (2019) suggests that AI, particularly machine learning and data mining enables faster and more accurate detection of fraudulent transactions compared to traditional methods. This problem isn't confined to the developed world. In Africa, the issue of fraud is also pervasive, amplified by the continent's expanding digital economy. The African Union Cyber security Report (2022) highlights a sharp increase in cybercrimes across Africa, with banks being frequent targets of fraudsters. As mobile banking, online payments, and digital financial services grow, so do the opportunities for cybercriminals. Akinmoladun and Olagunju (2020) point out that many African countries struggle with underdeveloped cyber security frameworks, leaving financial institutions vulnerable to fraud. Inadequate fraud detection systems and low levels of financial literacy further exacerbate the problem, leaving customers and banks open to a wide range of fraud schemes. In Nigeria, the situation is no different.

Fraud remains a major issue for Deposit Money Banks (DMBs), with rising instances of account takeovers, identity theft, and various cybercrimes. The Central Bank of Nigeria (CBN) estimates that Nigerian banks lost over ₦10 billion to fraud in 2021 alone (CBN, 2021). Corroborating this, Omorogbe et al (2025) noted that the banking sector is highly susceptible to diverse forms of fraud. However, detecting fraudulent activities has long been a persistent challenge, necessitating ongoing innovation to keep pace with the continually evolving nature of financial crimes (Dwivedi et al., 2019). The consequences of financial fraud extend beyond individual losses; they threaten the broader integrity and stability of the financial ecosystem (Ajayi & Ogunseye, 2022). Traditional fraud detection techniques, once considered effective, are increasingly inadequate in combating the sophisticated and technology-driven methods employed by modern fraudsters (Bao et al., 2022). In the complex realm of finance, where enormous volumes of transactions are processed daily, distinguishing between legitimate and illegitimate activities is crucial (Hashim et al., 2020). Effective fraud detection is not just a safeguard for consumers and financial institutions, it is fundamental to maintaining trust and resilience within the financial sector (Xu et al., 2023). Against this backdrop, this study sought to examine the perceived influence of Artificial Intelligence on financial fraud detection and prevention in Nigerian Banks.

Statement of the Problem

According to Omorogbe et al (2025), for decades now, Nigeria's financial sector has experienced a sharp increase in fraudulent activities. This trend intensified further following the COVID-19 lockdown in 2020. According to the Nigeria Inter-Bank Settlement System (NIBSS) Annual Fraud Landscape (2023) cited in Omorogbe et al (2025), the number of reported fraud cases more than doubled, rising by 112% from 44,947 cases in 2019 to 95,620 in 2023. Moreover, the monetary losses incurred surged by 496%, escalating from ₦2.9 billion to ₦17.67 billion over the same period. The growing complexity of financial crimes, combined with the sheer volume of transactions, has made fraud detection a pressing concern for financial institutions.

Artificial Intelligence has emerged as a promising solution for enhancing fraud detection capabilities. However, despite the increased interest and adoption of AI in this domain, comprehensive research into its real-world impact remains limited (Hashim et al., 2020). Chen *et al.* (2018) noted that most existing studies focus primarily on the technical aspects of AI applications, while overlooking the practical challenges and implications of implementation. Related studies such as Ibrahim, Success and Musa (2022), Moses, et al (2022), Ejura, et al. (2023) and Jibrin, et al (2022) demonstrated the effectiveness of biometric systems in preventing fraud. Given the lack of empirical evidence on the effectiveness of AI in financial fraud detection and reduction, this study intends to examine the perceived influence of Artificial Intelligence on financial fraud detection and prevention in Nigerian Banks.

Objectives of the Study

The broad objective of this study is to examine the perceived influence of Artificial Intelligence on financial fraud detection and prevention in Nigerian Banks. Specifically, the study intends to:

i. Assess the degree of awareness and adoption of artificial intelligence for financial fraud detection and prevention in Nigerian Banks.
ii. Examine the perceived effectiveness of Artificial Intelligence in detecting and preventing financial fraud within Nigerian Banks.

iii. To evaluate the influence of Artificial Intelligence on improving fraud management and security systems in Nigerian Banks.
iv. Find out the challenges that banks faces in deploying AI-driven fraud detection and prevention solution in Nigerian Banks.

Research Questions

i. What is the degree of awareness and adoption of artificial intelligence for financial fraud detection and prevention in Nigerian Banks?
ii. What is the perceived effectiveness of Artificial Intelligence in detecting and preventing financial fraud within Nigerian Banks?
iii. What is the influence of Artificial Intelligence on improving fraud management and security systems in Nigerian Banks?
iv. What are the challenges that banks faces in deploying AI-driven fraud detection and prevention solution in Nigerian Banks?

Research Hypotheses

In order to address the research questions, the following null hypotheses are formulated:

H_o1: There is no significant level of adoption of artificial intelligence in financial fraud detection and prevention in Nigerian banks.

iii. **H_o2:** Artificial intelligence has no significant impact on fraud detection and prevention in Nigerian banks.

iv. **H_o3:** There are no significant challenges affecting the deployment of AI-driven fraud detection and prevention solutions in Nigerian banks.

Conceptual Review

Overview of Artificial Intelligence (AI) Use in Banking System

Artificial Intelligence (AI) is broadly conceptualized as the ability of machines and computational systems to perform tasks that typically require human intelligence, including learning, reasoning, and decision-making. Russell and Norvig (2021) define AI as the study of agents that perceive their environment and act to maximize goal achievement, while Mitchell (1997) further emphasizes that machine learning, a core branch of AI enables systems to improve performance through experience without explicit programming. In contemporary scholarship, AI is commonly categorized into techniques such as machine learning, neural networks, and deep learning, which allow systems to identify patterns in large datasets and make predictive decisions (Goodfellow, Bengio, & Courville, 2016). These developments have significantly expanded the scope of AI applications across disciplines, particularly in data-intensive environments where automation and predictive analytics are essential for efficiency and accuracy. Consequently, AI is now regarded as a foundational technology within computer science that supports intelligent automation and data-driven decision systems (Russell & Norvig, 2021).

In financial systems, AI has gained prominence due to its ability to enhance decision-making, risk assessment, and anomaly detection in complex transactional environments. Nguyen and Reddi (2021) observe that deep learning models have significantly improved predictive accuracy in high-dimensional financial datasets, making them highly suitable for fraud detection tasks. Similarly, Phua et al. (2010) highlight that AI-based fraud detection systems outperform traditional rule-based methods by identifying hidden and evolving fraud patterns in large-scale banking data. More recent studies also show that AI improves the speed and accuracy of detecting fraudulent transactions by continuously learning from new data streams (West & Bhattacharya, 2016). However, despite these advantages, scholars such as Abdallah, Maarof, and Zainal (2016) caution that AI systems in fraud detection face challenges including data imbalance, model interpretability issues, and evolving fraud tactics. Therefore, while AI presents a transformative opportunity for strengthening fraud detection in banking systems, its effectiveness depends on the quality of data, algorithm design, and institutional readiness for advanced analytics.

Concept of Financial Fraud in Banking

Financial fraud in banking refers to deliberate acts of deception carried out to obtain unlawful financial gain or to cause financial loss to banking institutions or their customers. It involves the intentional manipulation, misrepresentation, or concealment of financial information for personal or organizational benefit (Bhattacharyya, Jha, Tharakunnel, & Westland, 2021). According to Albrecht, Albrecht, Albrecht, and Zimbelman (2015), financial fraud is a purposeful act involving the use of deceit, concealment, or violation of trust to manipulate financial statements or transactions. In the banking context, fraud typically manifests through unauthorized transactions, identity theft, insider abuse, phishing attacks, and falsification of account information. These activities undermine the integrity of financial systems and erode public confidence in banking institutions.

Scholarly literature further emphasizes that financial fraud in banking is both technologically and behaviorally driven, evolving alongside advancements in digital banking systems (Bhattacharyya et al, 2021). Button and Cross (2017) note that fraud in financial institutions has become increasingly sophisticated due to the adoption of digital platforms, which provide new opportunities for cyber-enabled financial crimes. Similarly, Association of Certified Fraud Examiners (ACFE, 2024) reports that banking and financial services remain among the most targeted sectors globally, with fraud schemes ranging from asset misappropriation to cyber fraud and payment system manipulation. Furthermore, Bhattacharyya et al. (2011) highlight that the complexity and scale of financial transactions in modern banking systems make fraud detection particularly challenging without advanced analytical tools.

AI Adoption and Efficiency of Fraud Detection and Prevention

Artificial Intelligence (AI) adoption is increasingly reshaping the financial services landscape, offering innovative solutions to persistent challenges such as fraud detection and operational inefficiencies. In the context of Nigerian deposit money banks, fraud remains a critical threat to financial stability and customer trust. Conceptually, AI adoption encompasses the integration of intelligent systems such as machine learning, deep learning, predictive analytics, and anomaly detection into fraud prevention protocols to enhance their accuracy, speed, and adaptability (Vijayakumar, 2022; Žigienė, 2019; Adebisi, Okonji, Adeeyo & Ezebuiro, 2023). Unlike traditional rule-based systems, AI models can learn from historical fraud patterns, recognize complex and evolving fraudulent behaviors, and adapt to new risks without requiring manual updates. Furthermore, AI systems provide real-time monitoring of high-volume transactions, facilitating faster decision-making and significantly reducing human error. This transformation is especially vital in Nigeria, where the increasing adoption of digital banking services has made fraud schemes more sophisticated and harder to detect using conventional methods (Ononiwu, 2024).

The growing complexity of financial fraud requires equally advanced technological interventions. As such, AI can serve as a force multiplier, allowing banks to proactively prevent fraud before significant damage occurs. Operationalizing AI adoption involves assessing the extent to which these technologies are implemented in fraud detection systems across Nigerian banks. This includes evaluating the nature of AI tools used, their functional scope, integration level, and the frequency of updates and training using new data. Effectiveness is measured by improvements in fraud detection rates, reduction in false alarms, time-to-detection, and increased compliance with regulatory standards (Schneider, Müller & Tesch, 2024). However, the benefits of AI adoption can be constrained by challenges such as inadequate data quality, limited technical expertise, and ethical concerns related to data privacy and algorithmic bias.

In addition to detection, AI plays a significant role in fraud prevention by enabling real-time monitoring and proactive risk mitigation. Abdallah, Maarof, and Zainal (2016) explain that intelligent fraud prevention systems use classification and anomaly detection techniques to flag suspicious activities before financial losses occur. Similarly, Hilal, Gadsden, and Yawney (2022) observe that deep learning models enhance fraud prevention by continuously analysing large-scale financial data streams and detecting subtle deviations in user behaviour.

Conceptual Model

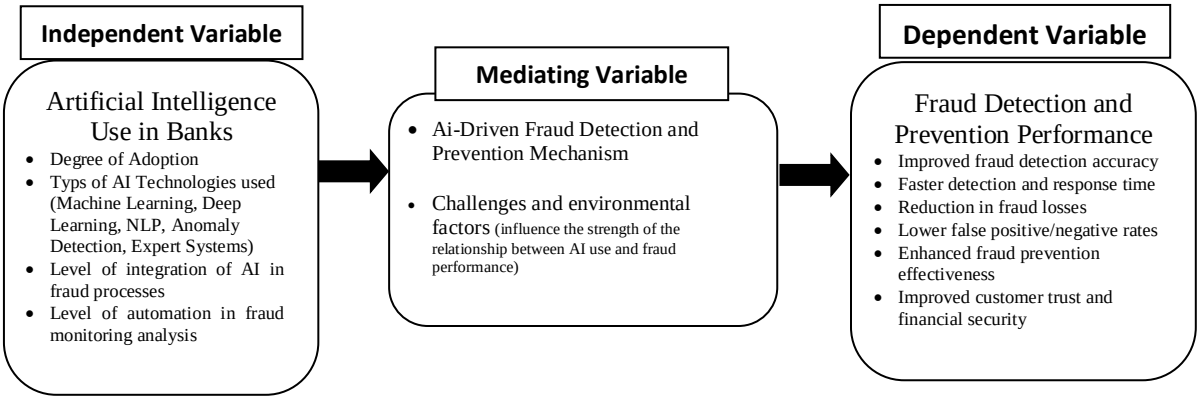


Fig. 1: Conceptual model for *influence of artificial intelligence use on financial fraud detection and prevention in Nigerian banks.*

The interaction in the conceptual model explains how Artificial Intelligence (AI) functions as the central driving force that shapes fraud detection and prevention outcomes in the banking sector. In this context, the independent variable is the use or adoption of AI technologies (such as machine learning algorithms, anomaly detection systems, biometric verification, and predictive analytics), while the dependent variable is the effectiveness of financial fraud detection and prevention in Nigerian banks. The model assumes that increased and more advanced use of AI leads to improved ability to identify suspicious transactions, detect unusual customer behaviour, and prevent fraudulent activities in real time. This relationship is strengthened by factors such as data quality, staff competence, regulatory compliance, and IT infrastructure, which may act as moderating or intervening variables that influence how effectively AI translates into fraud control outcomes. Conversely, challenges like high implementation costs and limited technical expertise can weaken this interaction. Overall, the model illustrates a direct and dynamic relationship where AI enhances fraud detection efficiency, reduces financial losses, and strengthens trust in Nigeria's banking system when properly implemented.

Theoretical Review

Technology Acceptance Model (TAM)

Proposed by Davis (1989), the Technology Acceptance Model claims that the acceptance of new technologies is driven by two fundamental factors: perceived usefulness and perceived ease of use of a technology. The model aids in understanding how financial institutions and forensic accountants embrace and depend on AI techniques in the context of forensic accounting. Adoption and efficacy may be hampered if users believe AI technologies are too complicated or untrustworthy because of defects. Given that low digital literacy and infrastructure issues may impede adoption, this theory is especially pertinent to understanding how forensic accountants and financial institutions in Nigeria are embracing artificial intelligence (Eze et al., 2023).

The Diffusion of Innovation Theory (DOI)

Rogers' Diffusion of Innovation (DOI) theory describes how innovative technologies proliferate in a community or company. This idea states that variables including relative advantage, compatibility, trialability, complexity, and observability all have an impact on how quickly innovations are adopted. This theory can be used to the Nigerian financial sector and forensic accounting to examine how banks and forensic accountants view the advantages and difficulties of new technologies, as well as the elements that support or impede their adoption. While factors like the inability to detect fraud or flag legitimate transactions as suspicious present challenges, artificial intelligence's relative advantages, such as its ability to identify irregular patterns and flag potentially fraudulent activities in real time, may encourage banks to adopt these technologies (Adeleke, 2022).

Empirical Review

Oluwadare, Adekanmbi and Omodara (2025) examined effectiveness of artificial intelligence in preventing fraud within Nigerian deposit money banks by evaluating the roles of AI adoption, investment in AI technologies, and public perception in enhancing fraud detection efficiency. This research is vital given the increasing sophistication of financial crimes in the banking sector. A cross-sectional survey design was used, targeting professionals in forensic auditing, risk management, and IT security across five leading Nigerian banks. Structured questionnaires yielded 138 valid responses. Data analysis employed descriptive statistics and multiple regression using SPSS. Findings show that AI adoption, investment in AI, and public perception all significantly enhance fraud detection efficiency. Investment in AI technologies was the most influential predictor. Correlation analysis confirmed strong positive relationships between AI-driven tools and fraud prevention measures. The study provides actionable insights for bank executives, policymakers, and IT professionals seeking to optimize AI integration for fraud risk management. The paper offers empirical evidence on the strategic role of AI in improving financial security in emerging economies.

Akinnagbe and Akinsanya (2025) investigated the features, advantages, and difficulties of using AI-powered virtual assistants in Nigerian banking. The research highlights important aspects including 24/7 customer assistance, multilingual capabilities, and transaction processing by comparing a few chosen banks, such as GTBank, Zenith Bank, and Access Bank. Benefits include convenience and individualized services for customers, as well as cost savings, increased customer service, and operational efficiency for banks. However, obstacles to widespread adoption include limited digital literacy, technical difficulties, and regulatory compliance. The

report ends with suggestions for how stakeholders may improve the efficiency of virtual assistants driven by AI, promoting digital transformation and financial inclusion in Nigeria.

Omorogbe et al (2025) carried out on the impact of Artificial Intelligence (AI) on fraud detection in Banks in Nigeria. Five research questions and one hypothesis guided the study. Descriptive research design was used, the population of the study consisted of 123 employees in five selected Banks in Nigeria. 94 respondents were selected using Taro Yamene and was randomly sampled. The instrument used for data collection was a researcher designed questionnaire. Data generated was analyzed using descriptive statistics of mean and standard deviation and shown on bar chart while the hypothesis was tested using linear regression with the aid of SPSS. The results of the study established that credit card fraud, phishing scams, identity theft, payment fraud as well as forged signatures are the types of frauds in Banks in Nigeria; identified machine learning, deep learning, natural language processing, deep learning as well as clustering and anomaly detection are artificial intelligence that can be used in fraud detection in Banks in Nigeria; The impact of artificial intelligence on fraud detection includes enhances accuracy amongst others; challenges banks faces in deploying AI-driven fraud detection solution in Edo State includes lack of skilled personnel amongst others; skilled personnel amongst others are the challenges banks faces in deploying AI-driven fraud detection solution in Edo State; There is significant relationship between artificial intelligence and fraud detection in Banks in Nigeria. It was recommended that Banks should integrate AI with emerging technologies like blockchain and the Internet of Things (IoT) to enhance security and detection capabilities amongst others.\

Ukpong (2022) investigated the Integration of Artificial Intelligence (AI) applications for financial process innovation by commercial banks in Nigeria. Three specific objectives and three research questions and hypotheses were stated for the study. 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 research instrument used for the study was a researcher- developed questionnaire tagged "Artificial Intelligence Applications for Financial Process Innovation Questionnaire" (AIAFPIQ). 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.

Elemide and Araoye (2025) examined Artificial Intelligence (AI) based forensic accounting and its implications for detecting and preventing high-level cyber frauds in the Nigerian banking sector. Despite the growing adoption of AI-driven systems, Nigerian banks continue to record significant financial losses, raising concerns about the effectiveness of these technologies. Survey research was employed, 250 forensic accountants, auditors, IT specialists, and compliance officers across selected banks with respect to adapted questionnaire. Data were analyzed using descriptive statistics, regression analysis, through thematic coding. Findings reveal that AI-based forensic accounting systems exhibit notable flaws, including false positives and negatives, algorithmic bias, lack of transparency, and infrastructural limitations. While respondents acknowledged improvements in fraud detection speed and coverage, statistical results indicated no significant impact of AI on detection and prevention effectiveness. The study concludes that AI, though promising, cannot independently guarantee robust fraud management without human expertise, regulatory support, and infrastructural enhancement. It recommends hybrid approaches integrating AI with forensic accounting judgment, improved data governance, capacity building, and regulatory reforms. The study contributes to forensic accounting and financial technology literature by highlighting the contextual limitations of AI adoption in emerging economies.

Methodology

This study employed a cross-sectional survey research in assessing the influence of Artificial Intelligence use on financial fraud detection and prevention in Nigerian Banks. Employees who work directly in fraud detection and prevention, such as those in forensic accounting, internal audit, compliance, and IT security departments, made up the population for this study. The target population consisted of 167 employees drawn from ten selected Nigerian banks in Osun State: Union Bank Nigeria Plc (14 employees), First Bank Nigeria Plc (21), Guaranty Trust Bank Nigeria Plc (22), Wema Bank (16), Polaris Bank (10), Fidelity Bank Nigeria Plc

(18), Jaiz Bank (8), FCMB (19), Sterling Bank (12) and Zenith Bank Nigeria Plc (27). Using Taro Yamane's formula, a sample size of 118 respondents was determined. The commercial banks were chosen using a stratified random sampling procedure with a purposive approach. The research employed the use of structured questionnaire in gathering data from 118 respondents who were the target of the quantitative survey. A five-point Likert scale was used in the questionnaire's design to measure respondents' opinions on the subject matter. Data collected were analyzed using mean and standard deviation for the research questions, while linear regression analysis was employed to test the formulated hypotheses.

Results and Discussion

Research Question 1: *What is the degree of awareness and adoption of artificial intelligence for financial fraud detection and prevention in Nigerian Banks?*

Table 1: Degree of awareness and adoption of artificial intelligence for financial fraud detection and prevention in Nigerian Banks

S/N	Items	SA	A	N	D	SD	N	Mean	SD	Remark
1	I have adequate knowledge of the use of Artificial Intelligence applications in fraud detection and prevention within my bank	30	42	18	18	10	118	3.43	1.24	Agreed
2	My department actively uses AI-driven tools in monitoring and detecting fraudulent transactions	36	45	16	13	8	118	3.63	1.17	Agreed
3	AI systems are integrated into the fraud detection processes of my unit	32	48	18	12	8	118	3.61	1.15	Agreed
4	AI solutions are regularly updated to address emerging fraud techniques	34	44	20	12	8	118	3.60	1.16	Agreed
5	The adoption of AI has become essential in fraud control operations in my bank	40	46	14	12	6	118	3.79	1.10	Agreed
	Grand Mean							**3.61**	**1.16**	**Agree**

Source: Field Survey, 2026

Table 1 revealed that the respondents agreed that Artificial Intelligence is widely adopted and utilized for fraud detection and prevention in Nigerian banks, as indicated by the grand mean of 3.61, which is above the criterion mean of 3.00. Specifically, the respondents agreed that AI has become essential in fraud control operations (Mean = 3.79), while AI-driven tools were actively used and incorporated into fraud monitoring processes. Also from the table, the respondents affirmed that their banks regularly update AI systems to address emerging fraud techniques. However, the relatively lower mean score on respondents' knowledge of AI applications (Mean = 3.43) indicates that their knowledge of AI's adoption in fraud detection and prevention is low, thereby suggesting the need for continuous staff training and technical capacity development.

Research Question 2: *What is the perceived effectiveness of Artificial Intelligence in detecting and preventing financial fraud within Nigerian Banks?*

Table 2: Perceived effectiveness of Artificial Intelligence in detecting and preventing financial fraud within Nigerian Banks

S/N	Items	SA	A	N	D	SD	N	Mean	SD	Remark
1	AI tools have improved the identification of suspicious transactions in my bank	34	44	18	14	8	118	3.67	1.16	Agreed
2	AI enables early detection of fraudulent activities before financial loss occurs	36	46	16	12	8	118	3.73	1.13	Agreed
3	AI systems improve the accuracy of fraud investigation in my bank	33	48	17	12	8	118	3.70	1.14	Agreed
4	AI systems perform better than manual fraud detection approaches	31	47	18	14	8	118	3.61	1.18	Agreed
5	AI enhances real-time monitoring of financial transactions	38	45	15	12	8	118	3.79	1.10	Agreed
6	AI has improved the efficiency of fraud reporting and investigation	37	46	16	11	8	118	3.76	1.12	Agreed

Grand Mean	**3.71**	**1.14**	**Agreed**

Source: Field Survey, 2026

In the above table, as reflected by the grand mean of 3.71, which is above the criterion mean of 3.00, most of the respondents agreed that Artificial Intelligence has significantly improved fraud detection and prevention effectiveness in Nigerian banks. The respondents also agreed that AI enhances real-time monitoring of financial transactions (Mean = 3.79) and improved efficiency of fraud reporting and investigation (Mean = 3.76). The table as well shows that AI enables early detection of fraudulent activities, improves the identification of suspicious transactions, and enhances the accuracy of fraud investigations. Additionally, the respondents agreed that AI systems perform better than traditional manual fraud detection approaches. This implies that the respondents were of the opinion that AI has contributed positively to the effectiveness, speed, and accuracy of fraud detection and prevention mechanisms in Nigerian banks.

Research Question 3: *What is the influence of Artificial Intelligence on improving fraud management and security systems in Nigerian Banks?*

Table 3: Influence of Artificial Intelligence on improving fraud management and security systems in Nigerian Banks

S/N	Items	SA	A	N	D	SD	N	Mean	SD	Remark
1	AI supports better analysis of suspicious transaction patterns	32	46	18	14	8	118	3.62	1.15	Agreed
2	AI has strengthened internal control systems against financial fraud	38	44	16	12	8	118	3.74	1.12	Agreed
3	AI has increased confidence in the bank's fraud prevention mechanisms	36	45	17	12	8	118	3.71	1.13	Agreed
4	AI has improved customer data protection and transaction security	40	43	15	12	8	118	3.79	1.10	Agreed
5	AI has improved customer data protection and transaction security	39	44	16	11	8	118	3.78	1.11	Agreed
	Grand Mean							**3.73**	**1.12**	**Agreed**

Source: Field Survey, 2026

As shown by the grand mean of 3.73, which is above the criterion mean of 3.00, the Table showed that majority of the respondents agreed that Artificial Intelligence has positively influenced fraud management and security systems in the selected Nigerian banks. Also, the respondents agreed that AI has improved customer data protection and transaction security (Mean = 3.79), indicating the important role of AI in enhancing banking security frameworks. Majority of the respondents also agreed that AI has strengthened internal control systems against financial fraud, increased confidence in fraud prevention mechanisms, and improved the analysis of suspicious transaction patterns. These findings shows that AI has significantly enhanced fraud management efficiency, internal control effectiveness, and transaction security within Nigerian banks.

Table 4: Challenges that Banks Faces in Deploying AI-Driven Fraud Detection and Prevention Solution in Nigerian Banks

S/N	Items	SA	A	N	D	SD	N	Mean	SD	Remark
1	Limited technical expertise affects the effective use of AI systems in fraud control	38	44	16	12	8	118	3.74	1.12	Agreed

2	High cost of AI implementation is a major challenge in my bank	40	42	16	12	8	118	3.75	1.13	Agreed
3	Inadequate staff training limits the effectiveness of AI tools	42	43	15	12	6	118	3.81	1.08	Agreed
4	Data privacy and confidentiality concerns affect AI deployment	36	46	18	12	6	118	3.73	1.11	Agreed
5	Regulatory requirements create challenges for AI integration in fraud management	35	45	20	12	6	118	3.70	1.10	Agreed
6	Cybersecurity threats undermine the reliability of AI-based fraud detection systems	41	44	17	10	6	118	3.82	1.09	Agreed
	Grand Mean							**3.76**	**1.11**	**Agreed**

Source: Field Survey, 2026

Table 4 revealed that the respondents agreed that several challenges affect the effective adoption and utilization of Artificial Intelligence in fraud detection and prevention in Nigerian banks, as indicated by the grand mean of 3.76, which is above the criterion mean of 3.00. The respondents particularly agreed that cybersecurity threats undermine the reliability of AI-based fraud detection systems (Mean = 3.82), while inadequate staff training also limits the effectiveness of AI tools (Mean = 3.81). The findings further show that high implementation cost, limited technical expertise, data privacy concerns, and regulatory requirements constitute significant barriers to effective AI integration in fraud management. The results suggested that despite the benefits of AI in fraud control, Nigerian banks still face technological, financial, operational, and regulatory challenges that may hinder optimal AI deployment and performance.

Discussion of Findings

The study examined perceived influence of Artificial Intelligence on financial fraud detection and prevention in Nigerian Banks. Findings from the study revealed a high level of awareness and adoption of Artificial Intelligence for fraud detection and prevention in Nigerian banks, with a grand mean of 3.61 and standard deviation of 1.16. The result indicates that majority of the respondents acknowledged the growing relevance and application of Artificial Intelligence in banking fraud control operations. Also from Table 1 of the study, respondents strongly agreed that the adoption of Artificial Intelligence has become essential in fraud control operations in their banks, with a mean score of 3.79. This finding suggests that banks increasingly depend on intelligent technological systems to improve operational control and reduce exposure to financial fraud. The finding is in line with the submission of Davenport and Ronanki (2018), who observed that financial institutions across the world are integrating Artificial Intelligence into operational and control systems to improve efficiency and risk management. The result is also in line with Kshetri (2020), who found that the banking sector has increasingly adopted Artificial Intelligence-driven technologies in response to rising digital financial crimes and sophisticated fraud patterns.

On the perceived effectiveness of Artificial Intelligence in detecting and preventing financial fraud within Nigerian Banks, Table 2 showed that Artificial Intelligence has significantly improved the effectiveness of fraud detection and prevention in Nigerian banks, as reflected in the grand mean score of 3.71 and standard deviation of 1.14. The respondents agreed that Artificial Intelligence enhances real-time monitoring of financial transactions, with a mean score of 3.79, and improves the efficiency of fraud reporting and investigation, with a mean score of 3.76. This implies that Artificial Intelligence has contributed substantially to improving the speed, accuracy, and efficiency of fraud management processes in banks. The finding corroborates the work of West and Bhattacharya (2016), who argued that Artificial Intelligence-based fraud detection systems possess stronger predictive and analytical capabilities than traditional fraud detection methods. Similarly, Ngai et al. (2011) established that intelligent systems and data mining technologies significantly improve the detection of suspicious financial activities and minimize fraudulent losses within financial institutions.

While examining the influence of Artificial Intelligence on improving fraud management and security systems in Nigerian Banks, it was revealed that Artificial Intelligence positively influenced fraud management and security systems in Nigerian banks, with a grand mean of 3.73 and standard deviation of 1.12. Respondents strongly agreed that Artificial Intelligence has improved customer data protection and transaction security, with mean scores of 3.79 and 3.78 respectively. The result indicated that the integration of Artificial Intelligence into banking operations has strengthened internal control systems

and enhanced the protection of sensitive financial information. This finding agrees with IBM (2023), which reported that financial institutions increasingly utilize Artificial Intelligence technologies to improve cybersecurity systems, transaction monitoring, and fraud prevention mechanisms. The finding also aligns with the study conducted by PwC (2022), which noted that Artificial Intelligence has become an important tool for strengthening risk management frameworks and improving institutional security within the financial sector.

Lastly on the challenges that banks faces in deploying AI-driven fraud detection and prevention solution in Nigerian Banks; the findings revealed that there are various challenges affecting its effective utilization in fraud detection and prevention. The finding recorded a grand mean of 3.76 and standard deviation of 1.11, indicating respondents' agreement that significant barriers still exist. Among these challenges, cybersecurity threats recorded the highest mean score of 3.82, while inadequate staff training recorded a mean score of 3.81. This finding suggested that although banks have embraced Artificial Intelligence systems, concerns relating to cybersecurity vulnerabilities and insufficient technical competence among employees continue to hinder optimal performance. The finding supports the position of Kumar, Lim and Pandey (2021), who observed that cybersecurity risks, privacy concerns, and regulatory challenges remain major constraints affecting the implementation of Artificial Intelligence in banking operations. Similarly, Akinyemi and Samuel (2022) identified inadequate technical expertise and poor staff training as significant obstacles to the successful deployment of Artificial Intelligence technologies in Nigerian financial institutions. On the high cost of Artificial Intelligence implementation, with a mean score of 3.75, it was found that the selected banks face financial difficulties in acquiring, maintaining, and upgrading advanced technological systems. This supports the assertion of Bughin et al. (2017), who argued that organizations adopting Artificial Intelligence technologies require substantial financial investment in infrastructure, employee training, and system maintenance to achieve sustainable operational benefits.

Conclusion

This study examined the perceived influence of Artificial Intelligence on financial fraud detection and prevention in Nigerian Banks. The study specifically investigated the level of awareness and adoption of Artificial Intelligence, its effectiveness in fraud detection and prevention, its influence on fraud management and banking security systems, as well as the challenges affecting its implementation within the Nigerian banking sector. Findings from the study established that Nigerian banks have demonstrated a considerable level of awareness and adoption of Artificial Intelligence technologies in fraud detection and prevention activities. The study as well revealed that many banks now integrate Artificial Intelligence-driven systems into transaction monitoring, fraud investigation, and internal control processes. The findings further showed that Artificial Intelligence has improved the identification of suspicious transactions, enhanced real-time monitoring of financial activities, strengthened fraud investigation processes, and improved the efficiency of fraud reporting mechanisms. This indicates that the adoption of modern technological systems has significantly contributed to improving fraud management practices and operational security within the banking sector. The study also established that Artificial Intelligence has positively influenced banking security systems by improving customer data protection, strengthening transaction security, and enhancing confidence in fraud prevention mechanisms. The integration of these technologies has improved the ability of banks to respond to evolving fraud patterns and emerging financial crimes. This demonstrates that the application of Artificial Intelligence has become increasingly important in strengthening internal control systems and safeguarding financial operations in Nigerian banks.

However, despite these benefits, the study identified several challenges affecting the effective implementation of Artificial Intelligence in fraud management. The findings revealed that inadequate technical expertise, insufficient staff training, high implementation cost, cybersecurity threats, data privacy concerns, and regulatory compliance issues remain major obstacles confronting Nigerian banks. These challenges suggest that the successful deployment of Artificial Intelligence systems requires not only technological investment but also continuous staff development, effective cybersecurity measures, and supportive regulatory frameworks. Based on the findings, the study concludes that Artificial Intelligence has become an important instrument for improving fraud detection, fraud prevention, and security management within the Nigerian banking industry. The technology has enhanced the efficiency, accuracy, and reliability of fraud management systems while strengthening the overall control environment of banks. Nevertheless, the sustainability and effectiveness of these systems depend largely on the ability of banks to address

existing operational, technical, and regulatory challenges associated with Artificial Intelligence implementation. The study therefore recommended continuous investment in technological infrastructure, regular staff training, improved cybersecurity frameworks, and supportive regulatory policies to enhance the effective utilization of Artificial Intelligence in fraud management within the Nigerian banking sector.

REFERENCES

Abdallah, A., Maarof, M. A., & Zainal, A. (2016). Fraud detection system: A survey. *Journal of Network and Computer Applications, 68*, 90–113. https://doi.org/10.1016/j.jnca.2016.04.007

Akinmoladun, O. I., & Olagunju, A. M. (2020). Cybersecurity challenges and financial fraud in Africa. *International Journal of Scientific & Technology Research, 9*(4), 1452–1458.

Akinnagbe, S. O., & Akinsanya, B. (2025). Artificial intelligence in accounting: Emerging opportunities and threats. *International Journal of Accounting Research, 18*(1), 44–59.

Albrecht, W. S., Albrecht, C. O., Albrecht, C. C., & Zimbelman, M. F. (2015). *Fraud examination* (5th ed.). Boston, MA: Cengage Learning.

Association of Certified Fraud Examiners. (2023). *Occupational fraud 2023: A report to the nations*. Austin, TX: Author.

Association of Certified Fraud Examiners. (2024). *Occupational fraud 2024: A report to the nations*. Austin, TX: Author.

Bao, Y., Ke, Q., Li, Z., Yu, Y., & Zhang, J. (2022). Detecting financial fraud: Applications of machine learning and artificial intelligence in banking systems. *Expert Systems with Applications, 189*, 116–132. https://doi.org/10.1016/j.eswa.2021.116132

Bhattacharyya, S., Jha, S., Tharakunnel, K., & Westland, J. C. (2021). Financial fraud detection using data mining techniques: A decade review. *Decision Support Systems, 50*(3), 602–613.

Bughin, J., Seong, J., Manyika, J., Chui, M., & Joshi, R. (2017). *Notes from the AI frontier: Modeling the impact of AI on the world economy*. New York, NY: McKinsey Global Institute.

Button, M., & Cross, C. (2017). *Cyber frauds, scams and their victims*. London, England: Routledge.

Central Bank of Nigeria. (2021). *Annual report 2021*. Abuja, Nigeria: Central Bank of Nigeria.

Chen, H., Chiang, R. H. L., & Storey, V. C. (2018). Business intelligence and analytics: From big data to big impact. *MIS Quarterly, 36*(4), 1165–1188. https://doi.org/10.2307/41703503

Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review, 96*(1), 108–116.

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... Williams, M. D. (2019). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 57*, 101994. https://doi.org/10.1016/j.ijinfomgt.2019.08.002

Ejura, B.,E, Musa, S., J, Karim,I., B, Mubarak, M.,S, & Ahmed Z,(2023) Impact Of Unsystematic Risk On Financial Performance Of Quoted Nigeria Insurance Firms. *Baltic Journal of Law & Politics 16* (3), 2908- 2918

Elemide A.O. & Araoye F.E. (2025) Impact of Artificial Based Forensic Accounting on Cyber Fraud in Deposit Money Banks in Nigeria, *International Journal of Business and Management Review, 13*(8), 139-159.

European Commission High-Level Expert Group on Artificial Intelligence. (2019). *A definition of AI: Main capabilities and scientific disciplines*. Brussels, Belgium: European Commission.

Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep learning*. Cambridge, MA: MIT Press.

Hashim, H. S., Razak, F. A., & Ahmad, M. N. (2020). Artificial intelligence applications in fraud detection: A review. *Journal of Financial Crime, 27*(4), 1335–1349. https://doi.org/10.1108/JFC-11-2019-0145

Hilal, W., Gadsden, S. A., & Yawney, J. (2022). Financial fraud: A review of anomaly detection techniques and recent advances. *Expert Systems with Applications, 193*, 116429. https://doi.org/10.1016/j.eswa.2021.116429

IBM. (2023). *Global AI adoption index 2023*. Armonk, NY: IBM Corporation.

Ibrahim, K., M., Success, B.E & Musa, S. J. (2022). Agency theory and corporate governance: A comparative study of Board diversity and financial performance in Nigeria. *Journal of Positive School Psychology*, 10364– 10372-10364–10372.

IEEE. (2017). *Ethically aligned design: A vision for prioritizing human well-being with autonomous and intelligent systems*. Piscataway, NJ: Institute of Electrical and Electronics Engineers.

Jibrin, Ejur, Moses, Uchubiyojo and Ismaila (2025). Effect of Artificial Intelligence (AI) on Fraud Prevention of Listed Deposit Money Banks in Nigeria. *MRS Journal of Multidisciplinary Research and Studies. 2*(9),1-10.

Jibrin, M., S, Success. B, E, & Ibrahim, K.,M, (2022). Investigating the entrepreneurial action of small scale enterprises for sustainable development in Nigeria. *International Journal of Health Sciences, 6* (s4), 11154– 11168.

Kshetri, N. (2020). Artificial intelligence in financial services. *IT Professional*, *22*(2), 15–19. https://doi.org/10.1109/MITP.2019.2959061

Mitchell, T. M. (1997). *Machine learning*. New York, NY: McGraw-Hill.

Moses, I., K , Jibrin, S., M, Success, & B., E, (2022). Moderating effect of audit quality on value relevance of accounting information of listed firms in Nigeria. *Neuro Quantology 20* (7), 2639-2648

Ngai, E. W. T., Hu, Y., Wong, Y. H., Chen, Y., & Sun, X. (2011). The application of data mining techniques in financial fraud detection: A classification framework and an academic review of literature. *Decision Support Systems*, *50*(3), 559–569. https://doi.org/10.1016/j.dss.2010.08.006

Ngai, E. W. T., Hu, Y., Wong, Y. H., Chen, Y., & Sun, X. (2019). The application of data mining techniques in financial fraud detection: A classification framework and an academic review of literature. *Decision Support Systems*, *50*(3), 559–569. https://doi.org/10.1016/j.dss.2010.08.006

Nguyen, G., & Reddi, V. J. (2021). Deep reinforcement learning for cyber security. *IEEE Transactions on Neural Networks and Learning Systems*, *32*(9), 4125–4137. https://doi.org/10.1109/TNNLS.2020.3016894

Nguyen, G., & Reddi, V. J. (2021). Deep reinforcement learning for cyber security. *Financial Risk and Management Reviews. 2*(2) 43-50.

Ola-Oluwa, S. A. (2024). Artificial intelligence adoption and fraud management in Nigerian banking institutions. *Nigerian Journal of Financial Technology, 6*(1), 44–58.

Oluwadare, Adekanmbi and Omodara (2025). Artificial Intelligence and Fraud Prevention in Nigerian Deposit Money Banks (DMBs). *ACTA Universitatis Danubius, 21*(3), 128-150.

Omorogbe, O. H., Eduje, A. I., Anyanwu, L., Obeka, O. B., Ukaoha, K. C., Izevbuwa, O. G., Ighotuweyin, A. F., & Arenvbaguehita, O. D. (2025). The impact of artificial intelligence (AI) on fraud detection in banks in Edo State. *GAS Journal of Engineering and Technology (GASJET), 2*(9), 26-35.

Omorogbe, O. H., Ighoakpo, A. I., Anyanwu, L., Obande, O. B., Ukaoha, K. C., Izevbuwa, O. G., Ighotuweyin, A. F., & Arenvbaguehita, O. D. (2025). The impact of artificial intelligence (AI) on fraud detection in banks in Edo State. *GAS Journal of Engineering and Technology (GASJET), 2*(9), 26–35.

Ononiwu, C. G., Eze, P. N., & Okafor, T. C. (2024). Digital banking expansion and cyber fraud risks in Nigeria. *African Journal of Information Systems, 16*(2), 87–103.

Ononiwu, E. C. (2024). The evolution of fraud detection technologies in Nigerian banks: AI as a gamechanger. *Journal of Financial Crime, 27*(1), 23-39.

Phua, C., Lee, V., Smith, K., & Gayler, R. (2010). A comprehensive survey of data mining-based fraud detection research. *Artificial Intelligence Review*, *34*(1), 1–14. https://doi.org/10.1007/s10462-009-9119-y

Polo, F., Garcia, M., & Torres, J. (2024). Artificial intelligence and human cognition: Emerging perspectives in intelligent systems. *Journal of Artificial Intelligence Research, 71*, 221–239.

PwC. (2022). *Global artificial intelligence study: Sizing the prize*. London, England: PricewaterhouseCoopers International Limited.

Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Hoboken, NJ: Pearson.

Schneider, J., Müller, T., & Weber, S. (2024). Artificial intelligence and fraud analytics in banking systems. *Journal of Financial Crime*, *31*(1), 66–84. https://doi.org/10.1108/JFC-07-2023-0152

Schneider, P., Müller, M., & Tesch, J. (2024). Integrating life cycle assessment and failure mode effects analysis in manufacturing: A sustainability perspective. *Journal of Manufacturing Sustainability*, *17*(4), 15-27.

Ukpong, E. G. (2022). Integration of Artificial Intelligence Applications for Financial

Process Innovation by Commercial Banks in Nigeria. *AKSU Journal of Administration and Corporate Governance (AKSUJACOG)*, 2 (1),

West, J., & Bhattacharya, M. (2016). Intelligent financial fraud detection: A comprehensive review. *Computers & Security*, *57*, 47–66. https://doi.org/10.1016/j.cose.2015.09.005

West, J., & Bhattacharya, M. (2016). Intelligent financial fraud detection: A comprehensive review. *Computers & Security*, *57*, 47–66. https://doi.org/10.1016/j.cose.2015.09.005

Xu, J., Zhao, K., Liu, Y., & Wang, H. (2023). Artificial intelligence-driven fraud detection in financial services: Trends and challenges. *Journal of Financial Regulation and Compliance*, *31*(2), 210–228. https://doi.org/10.1108/JFRC-08-2022-0091

Zhao, Y., & Fariñas, J. C. (2022). Artificial intelligence applications in banking fraud detection systems. *Journal of Banking Regulation*, *23*(4), 312–327. https://doi.org/10.1057/s41261-021-00177-8

Žigienė, G., Rybakovas, E., & Alzbutas, R. (2019). Artificial intelligence based commercial banking risk assessment systems. *Sustainability*, *11*(16), 4504. https://doi.org/10.3390/su11164504