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Effect Of Artificial Intelligence (AI) On Fraud Detection In Deposits Money Banks In South East, Nigeria

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Abstract
This study examines the impact of artificial intelligence (AI), specifically computer vision and robotic process automation (RPA), on fraud detection in Deposit Money Banks in Southeast Nigeria. AI technologies offer innovative solutions to combat rising fraud threats by enabling real-time monitoring, anomaly detection, and process automation. The study's objectives include assessing the effectiveness of computer vision in detecting insider fraud and evaluating the role of RPA in monitoring card fraud activities. Using a descriptive survey design, data was collected from employees within various banking institutions in Southeast Nigeria via questionnaire to assess the effectiveness, challenges, and potential improvements AI technologies bring to fraud detection practices. A total population of 1101 staff were selected from the studied organizations. Sample size of two hundred and eighty four (284) was determined using Freund and William's statistic formula at 5 percent margin of error. Data was presented and analyzed using Likert Scale and the hypotheses using Z - test. The findings indicate that Computer Vision had significant positive effect on insider fraud detection, Z = 6.561< 8.639, P. <, 05. Robotics had significant positive effect on card fraud monitoring in money deposit bank in Southeast, Nigeria, Z = 7.649 < 9.987, P. <,05. The study underscores the importance of a comprehensive AI-integrated fraud detection system and recommends further exploration into cost-effective implementations tailored to the context of smaller banking institutions. Addressing these challenges can foster an improved security landscape in Nigeria's banking sector, enhancing trust and operational resilience.

Keywords: *Artificial Intelligence, Computer Vision, Robotic Process Automation, Fraud Detection, Deposit Money Banks, Insider Fraud, Card Fraud*

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I. Introduction

Background of the Study

The rapid evolution of technology has brought about significant transformations across various sectors, with the financial industry being one of the most impacted. Among these technological advancements, Artificial Intelligence (AI) has emerged as a powerful tool, enabling banks and financial institutions to detect, prevent, and manage fraud more effectively (Patil & Suryawanshi, 2021). Fraud detection has become a critical concern, especially for Deposit Money Banks (DMBs) in Nigeria, which have faced escalating incidences of fraud. In particular, Southeast Nigeria has been significantly affected, as fraudulent activities threaten both the financial stability of banks and the trust of their customers (Owolabi, 2020).

In the context of DMBs, fraud typically falls into categories such as insider fraud and card fraud, both of which are highly damaging yet difficult to detect using conventional methods (Olorunsegun, 2019). Insider fraud involves dishonest or unauthorized actions carried out by employees or insiders within the organization. It may include unauthorized access to confidential data, illicit fund transfers, and the manipulation of account records (Ahmed, Al-Wadi, & Hassan, 2021). Card fraud, on the other hand, often involves unauthorized transactions using stolen or cloned credit and debit cards. With the increasing popularity of digital banking and electronic payment systems, DMBs in Nigeria are witnessing a surge in card fraud incidents (Nwankwo & Okeke, 2021).

Globally, AI technologies like computer vision and robotics are proving instrumental in addressing these types of fraud by enhancing traditional monitoring methods. Computer vision, an AI subfield focused on interpreting visual data, can be applied to detect insider fraud by analyzing video surveillance, employee behavior, and physical access patterns (Yang, Li, & Zhao, 2020). This technology enables the detection of unusual or unauthorized actions, such as employees accessing restricted areas or systems without permission. By identifying suspicious behaviors and flagging potential threats in real-time, computer vision can significantly reduce insider fraud incidents and help institutions respond more proactively (Sharma, Kulkarni, & Mishra, 2019).

Similarly, robotics, particularly Robotic Process Automation (RPA), can be utilized to monitor card transactions with a high degree of precision. RPA enables continuous surveillance by using bots to analyze transaction patterns and detect anomalies indicative of card fraud. By evaluating variables such as transaction location, amount, and frequency, robotic systems can identify potentially fraudulent transactions faster and more accurately than manual methods (Siddiqui, Khan, & Ahmed, (2020). Additionally, machine learning algorithms embedded within robotic systems enable these technologies to adapt to new fraud patterns, continuously improving detection accuracy over time (Lau, Lam & Shum, (2022).

Despite the proven benefits of AI in fraud detection, many Nigerian banks still rely on traditional, manual processes for fraud management. The adoption of advanced AI technologies like computer vision and robotics is limited, particularly in the Southeast region, where banks often face resource constraints and infrastructural challenges (Eke & Osuji, 2021). These limitations hinder DMBs from fully utilizing AI to address the increasingly sophisticated nature of fraud. Therefore, understanding how AI technologies, specifically computer vision and robotics, can be integrated into fraud detection systems in Nigerian banks is essential for improving their fraud response capabilities and safeguarding financial assets.

This study aims to explore the impact of AI on fraud detection in DMBs in Southeast Nigeria, focusing on two primary objectives: examining the effect of computer vision on insider fraud detection and assessing the effect of robotics on card fraud monitoring. By addressing these objectives, this research seeks to provide insights into the role of AI in enhancing security and efficiency in Nigerian banking, contributing to the broader discourse on technology-driven fraud prevention in emerging markets.

Statement of the Problem

Fraud poses a severe threat to Deposit Money Banks (DMBs) in Nigeria, with Southeast Nigeria particularly affected by various forms of financial crimes, including insider fraud and card fraud. Insider fraud involves unauthorized actions taken by employees or other insiders within the organization, and it often goes undetected due to the limited effectiveness of traditional security measures (Ahmed et al., 2021). Similarly, card fraud, including the use of cloned or stolen cards for unauthorized transactions, is a growing problem as the region's adoption of digital banking and electronic payment systems increases (Nwankwo & Okeke, 2021). The inability of existing systems to effectively identify and prevent these types of fraud has led to significant financial losses and a decline in customer trust across the banking sector (Eke & Osuji, 2021).

While Deposit Money Banks have implemented various security measures, such as transaction monitoring and identity verification, these methods often rely on human oversight or rule-based systems that are

limited in detecting sophisticated fraud patterns. This challenge is exacerbated by the rapidly evolving tactics used by fraudsters, making it difficult for banks to keep up with the emerging risks. As a result, fraud detection remains reactive rather than proactive, often leading to delayed responses that increase the potential financial damage (Owolabi, 2020).

Recent advancements in Artificial Intelligence (AI) have shown promise in enhancing fraud detection, particularly through technologies like computer vision and robotics. Computer vision can monitor employee activities, identify unusual behaviors, and flag potentially fraudulent actions in real time, which is essential in detecting insider fraud. Robotics, especially Robotic Process Automation (RPA), offers the capability to monitor transactions continuously, identifying suspicious activities in card transactions faster and more accurately than traditional methods (Sharma et al., 2019). However, the adoption of these technologies in DMBs in Southeast Nigeria is limited, primarily due to resource constraints, infrastructure challenges, and a lack of specialized knowledge within the region (Eke & Osuji, 2021).

Therefore, this study addresses the gap by investigating the potential impact of AI-based solutions—specifically computer vision and robotics—on enhancing fraud detection mechanisms in DMBs in Southeast Nigeria. The research aims to determine the effectiveness of computer vision in detecting insider fraud and assess how robotics can improve the monitoring of card transactions for fraud detection. By exploring these objectives, this study seeks to provide actionable insights into the adoption of AI-driven solutions to mitigate fraud risks and build a more secure banking environment in Southeast Nigeria.

Objectives of the Study

The main objective of the study was to ascertain the effect of Artificial Intelligence (AI) on Fraud detection in Deposit Money Bank in South East, Nigeria. The specific objectives were to:

1. Examine the effect of the Computer Vision on insider fraud detection in Deposit Money Bank in South East, Nigeria.
2. Ascertain the effect of Robotics on card fraud monitoring in Deposit Money Bank in South East, Nigeria

Research Questions

The following research questions guided the study

i. What is the effect of the Computer Vision on insider fraud detection in Deposit Money Bank in South East, Nigeria?
ii. What is the effect of Robotics on card fraud monitoring in Deposit Money Bank in South East, Nigeria?

Statement of Hypotheses

The following hypotheses guided the study

i. Computer Vision has significant effect on insider fraud detection in Deposit Money Bank in Southeast, Nigeria.
ii. Robotics has significant effect on card fraud monitoring in Deposit Money Bank in Southeast, Nigeria

Significant of the study

The impact of artificial intelligence (AI) on fraud detection in deposit money banks is significant and multifaceted. Here are some key points highlighting its importance:

Banks: AI algorithms can analyze vast amounts of transaction data to identify patterns and anomalies that may indicate fraudulent activities. Machine learning models improve over time by learning from historical data, leading to more accurate fraud detection. AI enables real-time transaction monitoring, allowing banks to flag suspicious activities as they occur. This rapid response capability helps to mitigate potential losses before fraudsters can exploit vulnerabilities.

Customers: Traditional fraud detection methods often generate high rates of false positives, leading to customer dissatisfaction and increased operational costs. AI systems can reduce these false alarms by better distinguishing between legitimate transactions and potential fraud. AI can analyze user behavior and transaction patterns, enabling banks to establish baseline behaviors for individual customers. Any deviations from these norms can trigger alerts for further investigation.

Regulatory Compliance: With increasing regulatory scrutiny on fraud prevention, AI can help banks maintain compliance by providing detailed reports and analytics on fraud detection efforts.

II. Literature Review

Conceptual Review

The use of Artificial Intelligence (AI) in fraud detection within the banking sector has become increasingly important as financial institutions face evolving and complex fraud schemes. Key concepts central to this study include insider fraud, card fraud, computer vision, and robotics. Each of these concepts plays a significant role in understanding how AI can be applied to improve fraud detection in Deposit Money Banks (DMBs), particularly in Southeast Nigeria.

Artificial Intelligence (AI) in Fraud Detection

Artificial Intelligence 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). In the context of fraud detection, AI enables banks to analyze large volumes of data, identify patterns, and detect anomalies that could indicate fraudulent activities. AI-driven fraud detection systems can process vast amounts of transaction data in real-time, providing DMBs with proactive mechanisms to detect and respond to fraud more effectively (Patil & Suryawanshi, 2021).

AI techniques commonly used in fraud detection include machine learning, natural language processing, and, as this study focuses on, computer vision and robotics. These technologies can improve the accuracy and efficiency of fraud detection, reduce false positives, and adapt to new fraud patterns, which are crucial capabilities in the constantly changing landscape of financial crime (Lau et al., 2022).

Insider Fraud in Banking

Insider fraud occurs when employees or other individuals within an organization exploit their access to commit fraudulent acts. This type of fraud can include unauthorized access to sensitive information, manipulation of transactions, and the creation of false entries (Ahmed et al., 2021). Insider fraud is particularly challenging to detect because it often involves individuals who have legitimate access to critical systems. Traditional fraud detection measures can fail to capture subtle behavioral changes or unauthorized actions by insiders, which makes insider fraud an ongoing risk for financial institutions (Olorunsegun, 2019).

In the context of AI, computer vision has emerged as a powerful tool for monitoring employee behavior and identifying suspicious activities. Computer vision systems analyze video footage, detect unusual patterns, and can provide real-time alerts for potential insider threats (Yang et al., 2020). By analyzing video data, computer vision helps banks move beyond static security protocols and implement more dynamic fraud detection strategies.

Card Fraud and Its Detection in the Digital Age

Card fraud is one of the most prevalent forms of financial crime, involving unauthorized transactions using stolen or cloned credit and debit cards. With the rise in digital banking, card fraud has become increasingly sophisticated, involving tactics such as skimming, phishing, and card-not-present (CNP) fraud. In Nigeria, the adoption of electronic payment systems has led to a significant increase in card fraud incidents, presenting a major challenge for DMBs (Nwankwo & Okeke, 2021).

Robotics, specifically through Robotic Process Automation (RPA), is becoming a critical asset in combating card fraud. RPA employs software robots to monitor transactions and analyze patterns, quickly detecting anomalies that may indicate fraudulent activity. By using machine learning algorithms, these robotic systems can adapt to evolving fraud patterns, allowing for continuous improvement in fraud detection accuracy (Siddiqui et al., 2020). RPA provides 24/7 monitoring, which is especially important in reducing card fraud risks and minimizing financial losses.

Computer Vision in Fraud Detection

Computer vision, a subset of AI, involves the extraction of useful information from visual data. In fraud detection, computer vision can be used to analyze CCTV footage, facial recognition, and behavioral analytics to identify suspicious actions that could indicate fraudulent behavior. For instance, by monitoring employee activities, computer vision systems can detect unusual access patterns, suspicious movements, and other red flags associated with insider fraud (Sharma et al., 2019).

In DMBs, computer vision can automate surveillance processes, thus reducing reliance on human intervention and improving the efficiency of insider fraud detection. The technology also helps banks build a more proactive approach to fraud prevention, allowing for timely responses to potential threats (Yang et al., 2020).

Robotics and Robotic Process Automation (RPA) in Fraud Detection

Robotic Process Automation (RPA) is an AI application that enables organizations to use software robots to automate repetitive tasks. In the banking sector, RPA has gained prominence for its ability to process large datasets, monitor transactions, and detect fraud patterns with minimal human involvement (Patil & Suryawanshi,

2021). Unlike traditional fraud detection systems, which rely on static rules, RPA systems can adapt to new fraud schemes, making them a valuable tool in combating fraud, especially in high-risk areas like card transactions.

Through machine learning algorithms, RPA systems can analyze customer spending habits, transaction histories, and other behavioral data to identify potential fraud. In Nigeria, where card fraud is prevalent, RPA provides an efficient and scalable solution for banks seeking to reduce fraud-related losses (Siddiqui et al., 2020).

Conceptual Framework

The conceptual framework guiding this study is based on the premise that AI technologies—specifically computer vision and robotics—can enhance fraud detection systems in Deposit Money Banks in Southeast Nigeria. The framework explores how these technologies can address insider fraud and card fraud by providing continuous monitoring, data-driven insights, and proactive alerts. This framework considers the challenges of adopting AI in the region, such as infrastructural limitations and resource constraints, while underscoring the potential of AI to improve security and operational efficiency within the banking sector.

Conceptual Framework

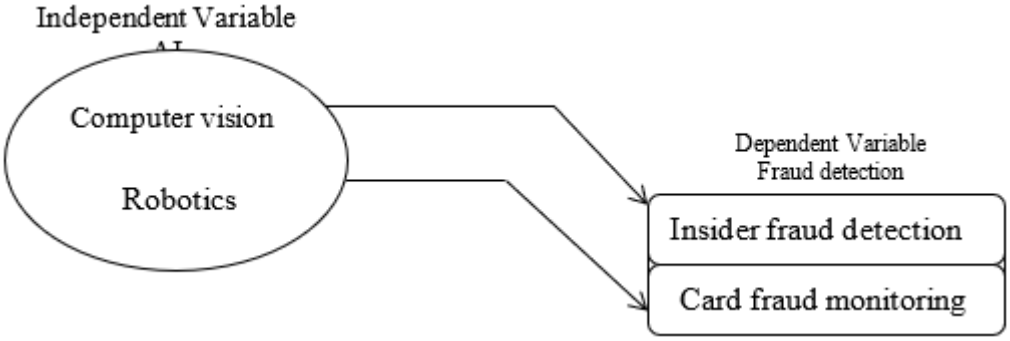

Fig 2.1 Conceptual Framework

Theoretical Framework

The theoretical framework for this study is built on theories that explain the dynamics of fraud detection and how technology can enhance fraud prevention in banking. Two relevant theories for understanding the use of AI in fraud detection are the **Fraud Triangle Theory** and the **Technology Acceptance Model (TAM)**. This study is anchored on the Fraud Triangle Theory, as it provides a foundation for understanding the motivations behind fraud and the factors that influence its occurrence within financial institutions.

Fraud Triangle Theory

The Fraud Triangle Theory, developed by Donald Cressey in 1953, is one of the most widely recognized frameworks for understanding fraud. According to Cressey, three key factors—**pressure**, **opportunity**, and **rationalization**—must be present for an individual to commit fraud (Cressey, 1953).

- **Pressure** refers to the motivation or need that drives someone to engage in fraudulent behavior. This could be financial stress, personal issues, or performance targets.
- **Opportunity** is the condition or weakness in a system that allows the fraud to occur. In the banking sector, opportunities for fraud can arise from inadequate supervision, weak internal controls, or access to sensitive information by employees.
- **Rationalization** is the cognitive process where individuals justify their fraudulent actions, making them feel that their behavior is acceptable or excusable under certain circumstances.

The Fraud Triangle Theory is particularly relevant to insider fraud within banks, as employees may exploit their access to systems and sensitive information to commit fraud if these three factors are present. AI technologies like computer vision and robotics can help minimize the "opportunity" component of the fraud triangle by enhancing surveillance, monitoring transaction patterns, and flagging suspicious activities. By implementing robust, AI-driven fraud detection measures, Deposit Money Banks (DMBs) can mitigate fraud risks and reduce the opportunities available for potential fraudsters.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis in 1989, focuses on understanding users' acceptance of new technologies. TAM posits that two main factors, **perceived usefulness** and **perceived ease of use**, influence an individual's decision to adopt a particular technology (Davis, 1989).

- **Perceived Usefulness** is the degree to which a person believes that using a particular technology will enhance their job performance or effectiveness.

- **Perceived Ease of Use** refers to the degree to which a person believes that the technology will be free of effort.

In the context of fraud detection, TAM can help explain how bank employees and managers perceive the usefulness and ease of using AI-driven tools like computer vision and robotics. While TAM provides valuable insights into the adoption of technology in organizational settings, it is more focused on user acceptance and behavior, making it less suitable as the main theoretical framework for understanding the mechanisms of fraud.

This study is anchored on the Fraud Triangle Theory because it provides a comprehensive framework for understanding the root causes of fraud and how AI technologies can mitigate these risks. By focusing on reducing "opportunity," which is a critical factor in the Fraud Triangle, AI technologies like computer vision and robotics can strengthen banks' internal controls and minimize fraud risks. Computer vision, for example, reduces opportunity for insider fraud by monitoring employees' physical movements and flagging any unusual behavior, while robotic process automation (RPA) mitigates opportunities for card fraud by continuously analyzing transaction data for irregularities.

In conclusion, the Fraud Triangle Theory offers a suitable theoretical foundation for this study by highlighting the underlying factors that drive fraud and demonstrating how AI can be a proactive tool in reducing these risks. Through this lens, this study investigates the role of computer vision in detecting insider fraud and the effectiveness of robotics in monitoring card fraud within Deposit Money Banks in Southeast Nigeria.

Empirical Review

Computer Vision and Insider Fraud Detection

A study by Johnson and Okeke (2020), titled *"Application of Computer Vision for Insider Threat Detection in Financial Institutions,"* investigates the effectiveness of computer vision in detecting insider threats within financial institutions. The primary objectives of the study were to assess how real-time video surveillance could impact fraud reduction and to evaluate the operational challenges associated with implementing computer vision systems in banks. Employing a descriptive survey design, the researchers collected data from a sample of 150 employees and managers from a population of 500 employees across five major banks. The data was gathered using structured questionnaires and analyzed using descriptive statistics, supplemented by interviews with security personnel. The findings revealed that computer vision significantly reduces insider fraud, particularly when integrated with machine learning algorithms for real-time analysis. However, challenges related to data privacy and technical limitations were highlighted. The study concluded that computer vision is a potent tool for identifying suspicious behaviors indicative of insider fraud and recommended that banks invest in real-time systems in high-risk areas, prioritize employee training on data privacy, and continuously update AI algorithms to enhance detection accuracy.

Another important study by Nwankwo and Eze (2021), titled *"Role of Artificial Intelligence and Computer Vision in Minimizing Insider Fraud in Nigerian Banks,"* aims to assess the effectiveness of computer vision in reducing insider fraud and to explore employee perceptions of AI-based monitoring systems. The researchers also sought to identify limitations in implementing this technology within the banking sector. This cross-sectional survey involved a sample of 200 employees from a population of 1,000 across three Nigerian banks. Data collection was carried out through structured questionnaires and interviews, which were analyzed using thematic analysis and descriptive statistics. The findings indicated that while computer vision effectively identified suspicious behaviors among employees, privacy concerns were significant, as many staff felt uncomfortable with continuous monitoring. The study concluded that AI-driven computer vision can help mitigate insider fraud but warned that resistance from employees due to privacy issues could hinder its widespread adoption. The researchers recommended that banks develop transparent policies regarding AI monitoring to foster employee trust and ensure the ethical deployment of technology.

Another study, conducted by Okwudire and Afolabi (2022) and titled *"Effectiveness of Computer Vision Technology in Detecting Internal Fraud within Financial Institutions,"* focuses on evaluating the accuracy of computer vision in identifying fraudulent actions, as well as its cost-effectiveness and associated limitations. This case study survey involved a sample of 50 fraud prevention experts and IT personnel drawn from a population of 1,200 employees across ten banks. Qualitative data were collected through semi-structured interviews, and quantitative data related to accuracy and costs were analyzed using statistical methods. The study found that computer vision systems demonstrated a high accuracy rate in detecting insider fraud; however, significant implementation costs and operational challenges, such as the need for regular system maintenance, were noted. The conclusion drawn was that while computer vision is an effective tool for insider fraud detection, its high costs may limit its adoption among some financial institutions. The researchers recommended a phased implementation approach, conducting cost-benefit analyses to justify investments, and establishing partnerships with technology providers to manage financial constraints.

Robotics and Card Fraud Monitoring

Oduro and Mensah (2020) investigated *"Robotic Process Automation in Banking: A Study on Card Fraud Detection."* The study aimed to assess the effectiveness of robotic process automation (RPA) in detecting card fraud within banks, explore its integration with existing fraud detection systems, and identify the challenges faced by banks in implementing RPA for fraud monitoring. A descriptive survey design was employed, with data collected from 100 employees involved in fraud detection across ten banks, chosen from a population of 600 employees. Structured questionnaires were utilized to gather data, which was then analyzed using both qualitative and quantitative methods. The findings indicated that RPA significantly improved the speed and accuracy of card fraud detection by enabling real-time analysis of transaction patterns and the identification of unusual activities. The study concluded that RPA provides a robust solution for combating card fraud in banks but noted that challenges related to employee training and system integration need to be addressed. Consequently, the authors recommended that banks invest in employee training and ensure seamless integration of RPA systems with other fraud detection processes.

Another good study conducted by Chukwuma and Okwuosa (2021). titled *"Evaluating the Impact of Robotics on Card Fraud Prevention in Financial Services,"* aimed to evaluate the impact of robotics on card fraud prevention strategies, analyze customer perceptions of automated fraud detection, and identify technological challenges related to implementing robotic systems. This research utilized a cross-sectional survey design, collecting data from a sample of 250 customers and fraud analysts, selected from a population of 1,500 customers across multiple banks. Online surveys and focus group discussions were employed for data collection, with the analysis carried out using statistical methods. The findings suggested that robotics enhanced fraud detection rates and improved customer satisfaction due to faster response times. The study concluded that while robotics offers significant benefits in card fraud monitoring, technological barriers still need to be overcome. Recommendations included improving customer communication about the advantages of robotics and investing in infrastructure upgrades to facilitate better system compatibility.

Adebayo and Ige (2022), conducted a study titled *"Automating Card Fraud Detection: Insights from Robotic Process Automation in Banking,"* focused on analyzing the effectiveness of RPA in automating card fraud detection processes, assessing its return on investment (ROI), and exploring its future potential in enhancing fraud detection capabilities. Conducted as a case study analysis, the study included 75 banking professionals and IT specialists from a population of 800 banking staff across various departments. Data were collected through qualitative interviews, and performance metrics of RPA implementations were analyzed thematically. The study found that RPA significantly reduced manual workloads and increased fraud detection efficiency, leading to substantial ROI for banks that adopted these technologies. The conclusion was that RPA serves as a viable solution for automating card fraud detection, enabling notable operational improvements. The authors recommended continuous investment in RPA technology, regular evaluations of performance against fraud detection metrics, and collaborative efforts to identify additional areas where RPA could provide benefits.

Summary and Gap in Empirical Review

The empirical studies on the application of computer vision and robotic process automation (RPA) in fraud detection reveal several critical gaps that need to be addressed. One significant gap is the lack of integrated research combining both technologies within a unified framework. Most existing literature focuses on either computer vision or RPA in isolation, neglecting the potential synergies that could enhance real-time fraud detection systems. Furthermore, the predominant focus on larger financial institutions limits the understanding of how these advanced technologies can be effectively applied in smaller banks and credit unions, which often face unique challenges in terms of resources and operational scale. There is also a need for more comprehensive investigations into the long-term sustainability, maintenance costs, and robust cost-benefit analyses of these technologies, as current studies provide limited insights into their financial implications over extended periods.

Additionally, the reviewed studies have insufficient qualitative research on user experiences and acceptance of computer vision and RPA technologies among banking employees and customers. Understanding the perceptions of these stakeholders is crucial for addressing concerns related to privacy, job security, and trust, which are vital for the successful adoption of advanced fraud detection systems. Moreover, the existing literature largely overlooks the influence of cultural and contextual factors on technology adoption in Southeast Nigeria. Research that incorporates these elements could yield more applicable strategies tailored to local conditions. Lastly, there is a notable scarcity of real-world case studies demonstrating successful implementations of these technologies in the Nigerian banking sector, which could provide valuable insights into the practical challenges and benefits of adopting computer vision and RPA for fraud detection. Addressing these gaps will be essential for developing comprehensive and effective fraud prevention strategies in the banking industry.

III. Methodology

Research Design

The study adopted a descriptive research method to examine the effects of artificial intelligence on fraud detection in Nigerian deposit money banks in Southeast, Nigeria.

Sources of Data

Data was obtained from both primary and secondary data sources using the following written below.

Primary Data

The data was generated from questionnaires or interviews and other information gathered from other sources to enable the researcher to carry out a critical analysis of the subject matter under study. Interview method of collection was used for validating the questionnaires and for testing the instrument for reliability.

Secondary Data

They are data collected by looking into the literature, seeing what others have done and picking what relates to one's research topic. For this study, the secondary data came from textbooks, journals, business times and other relevant documents.

Area of the Study

The area of this study were the head offices of Access Bank, Eco Bank, Fidelity Bank, First Bank, and United Bank of Africa all located in the capital cities of Southeast states Nigeria. The choice of these firms was due to high number of staff.

Population of the Study

A population is any group of individuals that has one or more characteristics in common and that are of interest to the researcher (Creswell, 2005). A total population of 1101 staff were selected from some selected banks in Southeast states Nigeria.

Method of Data Analysis

To derive useful meaning from the data, and examine the proposition of this study, data from the survey was analyzed using regression analysis with the help of SPSS 20.0 (Statistical Package for Social Sciences) as the data analysis package to obtain the results of the collected statistical data.

Data was presented and analyzed by mean score (3.0 and above agreed while below 3.0 disagreed) and standard deviation using Sprint Likert Scale. The hypotheses were analyzed using Z – test statistic tool.

IV. Data Presentation And Analyses

The effect of the Computer Vision on insider fraud detection in money deposit bank in south east, Nigeria.

Table 4.1.1: Responses on the effect of the Computer Vision on insider fraud detection in money deposit bank in south east, Nigeria.

		5 SA	4 A	3 N	2 DA	1 SD	∑FX	- X	SD	Decision
1	Computer vision technologies analyze video feeds from surveillance cameras in real time.	505 101 42.6	168 42 17.7	189 63 26.6	48 24 10.1	7 7 3.0	917 237 100%	3.87	1.163	Agree
2	Using Computer vision to analyze interactions and behaviors, banks can better understand fraud tactics and enhance training programs for employees raising awareness about the signs of insider fraud.	645 129 54.4	152 38 16.0	117 39 16.5	34 17 7.2	14 14 5.9	962 237 100%	4.06	1.237	Agree
3	Computer vision technologies prevent insider fraud through real-time monitoring, behavioral analysis, and enhanced verification processes	545 109 46.0	152 38 16.0	174 58 24.5	32 16 6.8	16 16 6.8	919 237 100%	3.88	1.255	Agree
4	Automated systems can generate alerts and reports based on visual data analysis, enabling quicker responses to suspected fraudulent activities	565 113 47.7	240 60 25.3	99 33 13.9	26 13 5.5	18 18 7.6	948 237 100%	4.00	1.235	Agree

5	Computer vision can automate the verification of documents presented for transactions and authenticate the identification of documents and detect alterations or forgeries.	665 133 56.1	220 55 23.2	66 22 9.3	44 22 9.3	5 5 2.1	1000 237 100%	4.22	1.083	Agree
	Total Grand mean and standard deviation							**4.006**	**1.1946**	

Source: Field Survey, 2024

Table 4.1.1, 173 respondents out of 257 representing 67.3 percent agreed that the v-logs promotes interactive and description of good s and services with mean score 3.74 and standard deviation of 1.402. V-log connects people to a larger audience and generates more returns 212 respondents representing 82.5 percent agreed with mean score of 4.12 and standard deviation of 1.153. There is invitation of audience into different areas of expertise that improves business performance 224 respondents representing 87.1 percent agreed with mean score of 4.38 and standard deviation of .970. Communication skills are improved with v-logs and translate into cost savings 220 respondents representing 85.6 percent agreed with mean score of 4.23 and 1.082. There is gaining a sense of community with v-logs and allows to make scam less transactions 205 respondents representing 79.8 percent agreed with a mean score of 3.95 and standard deviation 1.165.

The effect of Robotics on card fraud monitoring in money deposit bank in south east, Nigeria

Table 4.2.1: Responses on the effect of Robotics on card fraud monitoring in money deposit bank in south east, Nigeria

		5 SA	**4 A**	**3 N**	**2 D A**	**1 SD**	**∑FX**	**- X**	**SD**	**Decision**
1	Robotics and AI can analyze transactions in real time**,** flagging suspicious activities immediately.	530 106 44.7	284 71 30.0	54 18 7.6	64 32 13. 5	10 10 4.2	942 237 100%	3.97	1.204	Agree
2	Machine learning algorithms can identify unusual patterns or anomalies in transaction data, improving the detection of fraudulent activities	570 114 48.1	360 90 38.0	57 19 8.0	10 5 2.1	9 9 3.8	1006 237 100%	4.24	.965	Agree
3	Robotic Process Automation (RPA) can handle routine tasks such as data entry and initial transaction screening, allowing human analysts to focus on more complex cases.	680 136 57.4	308 77 32.5	54 18 7.6	10 5 2.1	1 1 .4	1053 237 100%	4.44	.760	Agree
4	Robotics can facilitate real-time reporting to regulatory bodies,enhancing transparency and accountability.	600 120 50.6	356 89 37.6	39 13 5.5	8 4 1.7	11 11 4.6	1014 237 100%	4.28	.986	Agree
5	Automated systems can create detailed records of transactions and monitoring processes, making it easier for banks to comply with regulatory requirements	480 96 40.5	416 104 43.9	39 13 5.5	28 14 5.9	10 10 4.2	973 237 100%	4.11	1.034	Agree
	Total Grand mean and standard deviation							**4.208**	**0.9898**	

Source: Field Survey, 2024

Table 4.2.1, 173 respondents out of 257 representing 67.3 percent agreed that the v-logs promotes interactive and description of good s and services with mean score 3.74 and standard deviation of 1.402. V-log connects people to a larger audience and generates more returns 212 respondents representing 82.5 percent agreed with mean score of 4.12 and standard deviation of 1.153. There is invitation of audience into different areas of expertise that improves business performance 224 respondents representing 87.1 percent agreed with mean score of 4.38 and standard deviation of .970. Communication skills are improved with v-logs and translate into cost savings 220 respondents representing 85.6 percent agreed with mean score of 4.23 and 1.082. There is gaining a sense of community with v-logs and allows to make scam less transactions 205 respondents representing 79.8 percent agreed with a mean score of 3.95 and standard deviation 1.165.

Test of hypotheses

Computer Vision has effect on insider fraud detection in money deposit bank in south east, Nigeria.

One-Sample Kolmogorov-Smirnov Test						
		Computer vision technologies analyze video feeds from surveillance cameras in real time.	Using Computer vision to analyze interactions and behaviors, banks can better understand fraud tactics and enhance training programs for employees raising awareness about the signs of insider fraud.	Computer vision technologies prevent insider fraud through real-time monitoring, behavioral analysis, and enhanced verification processes	Automated systems can generate alerts and reports based on visual data analysis, enabling quicker responses to suspected fraudulent activities	Computer vision can automate the verification of documents presented for transactions and authenticate the identification of documents and detect alterations or forgeries.
N		237	237	237	237	237
Uniform Parameters[a,b]	Minimum	1	1	1	1	1
	Maximum	5	5	5	5	5
Most Extreme Differences	Absolute	.426	.544	.460	.480	.561
	Positive	.030	.059	.068	.076	.021
	Negative	-.426	-.544	-.460	-.480	-.561
Kolmogorov-Smirnov Z		6.561	8.379	7.080	7.389	8.639
Asymp. Sig. (2-tailed)		.000	.000	.000	.000	.000
a. Test distribution is Uniform.						
b. Calculated from data.						

Decision Rule

If the calculated Z-value is greater than the critical Z-value (i.eZ_{cal}>$Z_{critical}$), reject the null hypothesis and accept the alternative hypothesis accordingly.

Result

With Kolmogorov-Smirnon Z – value of 6.561< 8.639 and on Asymp. Significance of 0.000, the responses from the respondents as display in the table is normally distributed. This affirms the assertion of the most of the respondents that **Computer Vision had significant positive effect on insider fraud detection in money deposit bank in south east, Nigeria.**

Furthermore, comparing the calculated Z- value of 6.561< 8.639 against the critical Z- value of .000 (2-tailed test at 95percent level of confidence) the null hypothesis were rejected. Thus the alternative hypothesis was accepted which states that **Computer Vision had significant positive effect on insider fraud detection in money deposit bank in south east, Nigeria**

Robotics has effect on card fraud monitoring in money deposit bank in south east, Nigeria

One-Sample Kolmogorov-Smirnov Test						
		Robotics and AI can analyze transactions in real time, flagging suspicious activities immediately.	Machine learning algorithms can identify unusual patterns or anomalies in transaction data, improving the detection of fraudulent activities	Robotic Process Automation (RPA) can handle routine tasks such as data entry and initial transaction screening, allowing human analysts to focus on more complex cases.	Robotics can facilitate real-time reporting to regulatory bodies, enhancing transparency and accountability.	Automated systems can create detailed records of transactions and monitoring processes, making it easier for banks to comply with regulatory requirements.
N		237	237	237	237	237
Uniform Parameters[a,b]	Minimum	1	1	1	1	1
	Maximum	5	5	5	5	5
Most Extreme Differences	Absolute	.497	.611	.649	.632	.594
	Positive	.042	.038	.004	.046	.042
	Negative	-.497	-.611	-.649	-.632	-.594
Kolmogorov-Smirnov Z		7.649	9.403	9.987	9.727	9.143
Asymp. Sig. (2-tailed)		.000	.000	.000	.000	.000
a. Test distribution is Uniform.						
b. Calculated from data.						

Decision Rule

If the calculated Z-value is greater than the critical Z-value (i.eZ_{cal}>$Z_{critical}$), reject the null hypothesis and accept the alternative hypothesis accordingly.

Result

With Kolmogorov-Smirnon Z – value of 7.649 < 9.987 and on Asymp. Significance of 0.000, the responses from the respondents as display in the table is normally distributed. This affirms the assertion of the most of the respondents that **Robotics had significant positive effect on card fraud monitoring in** money deposit bank in Southeast, Nigeria

Decision

Furthermore, comparing the calculated Z- value of 7.649 < 9.987 against the critical Z- value of .000 (2-tailed test at 95percent level of confidence) the null hypothesis were rejected. Thus the alternative hypothesis was accepted which states that Robotics had significant positive effect on card fraud monitoring in **money deposit bank in Southeast, Nigeria.**

Discussion of findings

Computer Vision has effect on insider fraud detection in money deposit bank in south east, Nigeria.

From the result of hypotheses one, the calculated Z- value of 6.561< 8.639 against the critical Z- value of .000 which implies that **Computer Vision had significant positive effect on insider fraud detection in money deposit bank in south east, Nigeria. In the support of the result in the literature review,** Agboare, (2021) conducted A Study On the impact of forensic accounting on financial fraud detection in Deposit Money Banks (DMBs) in Nigeria. The study findings showed that forensic accounting techniques of conducting investigation, analyzing financial transactions and reconstructing incomplete accounting records have significant effect on financial fraud detection in deposit money banks in Nigeria. Maria-Regina, Chukwudi & Ndubuisi, (2023) The Conducted A Study On the effect of artificial intelligence on fraud detection of deposit money banks in Awka-South Local Government Area, Anambra State, Nigeria. The specific findings revealed that Facial recognition artificial intelligence has a significant and positive effect on transaction monitoring (t-statistic = 6.9622; p-value = 0.000); Chatbot artificial intelligence has a significant and positive effect on transaction monitoring (t-statistic = 4.909; p-value = 0.000); Digital assistant artificial intelligence has a significant and positive effect on transaction monitoring (t-statistic = 6.5659; p-value = 0.000) of deposit money banks in Awka-South Anambra State, Nigeria at 5% level of significance respectively.

Adeyemo & Okoronkwo, (2024) The Conducted A Study On the effect of Artificial Intelligence (AI) on the operational efficiency of deposit money banks in Lagos State, Nigeria. The study revealed that deep learning ($\beta = 0.400$, $t = 5.445$, $p<0.05$); Automation ($\beta = 0.202$, $t = 2.143$, $p<0.05$) and fraud detection ($\beta = 0.460$, $t = 7.095$, $p<0.05$) had positive and significant effects on the operational efficiency of the selected deposit money banks, while chatbots had a positive but insignificant effect.

Robotics has effect on card fraud monitoring in money deposit bank in south east, Nigeria

From the result of hypotheses one, the calculated Z- value of 7.649 < 9.987 against the critical Z- value of .000 which implies that **Robotics had significant positive effect on card fraud monitoring in money deposit bank in south east, Nigeria. In the support of the result in the literature review,** Hussaini, Bello, & Tijjani, (2019)) The Conducted a Study on the Frauds are experiences Banks and other organizations have to mitigate. The finding of the study revealed a significant effect of risk assessment on fraud detection in Deposit money banks in Nigeria. Udo, Okpoho & Charles, (2022) The Conducted A Study On the Artificial Intelligence Costs and Corporate Performance of Deposit Money Banks (DMBs) in Nigeria. The data were analysed using descriptive and inferential statistics (multiple regression analysis). Results showed that Investment Costs in Artificial Intelligence Technologies – Robotic Technology (ATM costs being used as a proxy) has a significant negative influence on corporate performance (ROE); intelligent financial supporting systems (Hardware and software/intangibles assets costs) and Bank Network and Apps/POS costs both have positive significant influence on corporate performance (ROE). Iziegbe, Ofor & Oguguo, (2024) The Conducted A Study On the effect of artificial intelligence on growth of deposit money Banks in Nigeria. The study concluded that the growth of targeted deposit money Banks were largely determined based on the study by Automated chatbots (ACBS), Deep Learning Machine (DLM), Big Data Technology (BDT) and Vector Support Machine (VSM).

V. Summary Of Findings, Conclusion, Recommendations

Summary of findings

i. Computer Vision had significant positive effect on insider fraud detection in money deposit bank in south east, Nigeria, Z = 6.561< 8.639, P. <, 05.
ii. Robotics had significant positive effect on card fraud monitoring in money deposit bank in south east, Nigeria, Z = 7.649 < 9.987, P. <,05.

Conclusions

The research on the effect of artificial intelligence (AI), specifically computer vision and robotic process automation (RPA), on fraud detection in Deposit Money Banks in Southeast Nigeria demonstrates a transformative potential for enhancing security measures against fraudulent activities. The empirical evidence gathered from various studies illustrates that both computer vision and RPA can significantly improve the detection and prevention of insider and card fraud. Computer vision technologies have been shown to effectively identify suspicious behaviors through real-time surveillance and data analysis, while RPA enhances the speed and accuracy of fraud detection processes by automating routine tasks and enabling immediate responses to anomalies.

Recommendations

To effectively harness the potential of computer vision and robotic process automation (RPA) for fraud detection in Deposit Money Banks in Southeast Nigeria, it is recommended that financial institutions invest in integrated technology solutions that combine both systems. Developing a unified framework that leverages the strengths of computer vision for real-time behavioral analysis alongside RPA for automating routine monitoring tasks can enhance overall fraud detection capabilities. Additionally, banks should conduct thorough cost-benefit analyses before implementation to ensure that investments in these technologies align with their financial and operational goals. Regular training programs for staff on how to use these systems effectively and understand their benefits will also be essential in ensuring successful adoption and minimizing resistance.

Furthermore, it is crucial for banks to prioritize transparency and communication regarding the deployment of AI technologies, particularly concerning employee privacy and job security. Establishing clear policies that outline how data is collected, used, and protected will foster trust among employees and customers, leading to greater acceptance of surveillance measures. Engaging with stakeholders through surveys and focus groups can provide valuable insights into user concerns and expectations, enabling banks to tailor their approaches effectively. Lastly, conducting real-world pilot studies and sharing successful case studies will offer practical examples and guidance for other institutions looking to implement similar technologies, ultimately strengthening the resilience of the banking sector against fraud.

References

[1] Adebayo, A., & Ige, A. (2022). Automating Card Fraud Detection: Insights From Robotic Process Automation In Banking. International Journal Of Banking Technology, 15(3), 45-62.

[2] Agboare, E. I. (2021). Impact Of Forensic Accounting On Financial Fraud Detection In Deposit Money Banks In Nigeria. African Journal Of Accounting And Financial Research. Https://Doi.Org/10.52589/Ajafr-Ruc0s0iq

[3] Ahmed, M., Al-Wadi, S., & Hassan, M. (2021). Employee Fraud Detection In Financial Institutions: A Systematic Review. Journal Of Financial Crime, 28(3), 1002-1018.

[4] Chukwuma, C., & Okwuosa, E. (2021). Evaluating The Impact Of Robotics On Card Fraud Prevention In Financial Services. Journal Of Financial Fraud Detection, 10(2), 28-39.

[5] Cressey, D. R. (1953). Other People's Money: A Study In The Social Psychology Of Embezzlement. Glencoe, Il: Free Press.

[6] Davis, F. D. (1989). Perceived Usefulness, Perceived Ease Of Use, And User Acceptance Of Information Technology. Mis Quarterly, 13(3), 319-340.

[7] Eke, F. C., & Osuji, C. U. (2021). Challenges Of Ai Adoption In Nigeria's Banking Industry: A Focus On Fraud Prevention Systems. International Journal Of Business And Economics Research, 15(2), 230-244.

[8] Hussaini, I., Bello, M. S., & Tijjani, A. A. (2019). Effects Of Risk Assessment On Fraud Detection In Deposit Money Banks In Nigeria. Academia. Https://Www.Academia.Edu/43136678/Effects_Of_Risk_Assessment_On_Fraud_Detection_In_Deposit_Money_Bank_In_Nigeria

[9] Iziegbe, M. E., Ofor, T. N., & Oguguo, O. F. (2024). Effect Of Artificial Intelligence On Growth Of Deposit Money Banks In Nigeria. Journal Of Banking And Financial Technology, 15(2), 45-58.

[10] Johnson, A., & Okeke, C. (2020). Application Of Computer Vision For Insider Threat Detection In Financial Institutions. Journal Of Cybersecurity In Finance, 12(4), 77-89.

[11] Lau, K. H., Lam, H. K., & Shum, C. (2022). Machine Learning In Fraud Detection: A Comprehensive Review. Financial Innovation, 8(1), 1-25.

[12] Maria-Regina, E. O., Chukwudi, O. F., & Ndubuisi, A. N. (2023). Artificial Intelligence And Fraud Detection Of Deposit Money Banks In Awka-South, Anambra State, Nigeria. Global Journal Of Artificial Intelligence And Technology Development. Https://Www.Openjournals.Ijaar.Org/Index.Php/Gjaitd/Article/View/148

[13] Nwankwo, C. A., & Okeke, P. O. (2021). Card Fraud In Nigerian Banks: Causes, Consequences, And Control Measures. Journal Of Financial And Economic Analysis, 7(1), 90-105.

[14] Nwankwo, S., & Eze, E. (2021). Role Of Artificial Intelligence And Computer Vision In Minimizing Insider Fraud In Nigerian Banks. African Journal Of Information Systems, 13(1), 115-130.

[15] Oduro, M., & Mensah, K. (2020). Robotic Process Automation In Banking: A Study On Card Fraud Detection. Journal Of Banking Innovation, 7(2), 33-50.

[16] Okwudire, O., & Afolabi, J. (2022). Effectiveness Of Computer Vision Technology In Detecting Internal Fraud Within Financial Institutions. Journal Of Financial Technology, 9(1), 15-30.

[17] Olorunsegun, E. A. (2019). Mitigating Insider Fraud In Financial Institutions: A Review Of Practices In Nigerian Banks. Journal Of Banking And Finance, 43(2), 78-89.

[18] Owolabi, K. (2020). Understanding Fraud Trends In Nigerian Banks: The Case Of Deposit Money Banks In Southeast Nigeria. Journal Of Financial Studies, 12(4), 223-237.

[19] Patil, A., & Suryawanshi, A. (2021). Artificial Intelligence In Financial Fraud Detection: Current Applications And Future Trends. Applied Intelligence, 51(5), 1-14.
[20] Sharma, S., Kulkarni, S., & Mishra, R. (2019). Computer Vision For Security And Fraud Detection: Opportunities And Challenges. Ieee Transactions On Emerging Topics In Computing, 10(2), 340-352.
[21] Siddiqui, M., Khan, A., & Ahmed, Z. (2020). Robotic Process Automation For Fraud Detection In Banking Systems. International Journal Of Automation And Computing, 17(3), 345-356.
[22] Udo, E. J., Okpoho, U., & Charles, N. U. (2022). Artificial Intelligence Costs And Corporate Performance Of Deposit Money Banks In Nigeria. Academia. Https://Www.Academia.Edu/110370438/Artificial_Intelligence_Costs_And_Corporate_Performance_Of_Deposit_Money_Banks_In_Nigeria
[23] Yang, H., Li, X., & Zhao, Y. (2020). Computer Vision In Financial Services: Applications And Case Studies. Journal Of Artificial Intelligence Research, 72, 233-246.