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ARTIFICIAL INTELLIGENCE INTERVENTION IN AUDITING AGAINST FUND EMBEZZLEMENT IN THE BANKING SECTOR OF NIGERIA

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Abstract
This study investigates the role of Artificial Intelligence (AI) in enhancing internal auditing mechanisms to prevent and detect fund embezzlement within the Nigerian banking sector. The primary objective is to evaluate how AI-driven audit systems contribute to mitigating fraud risks while addressing the organizational and human factors that shape their effectiveness. A qualitative research design was employed, combining semi-structured interviews with internal auditors from selected Nigerian banks and direct observations of AI-enabled audit systems. Data were analyzed thematically using coding techniques, and the findings were interpreted through the lenses of Fraud Triangle Theory, Agency Theory, and Technology Adoption frameworks. Results reveal that AI strengthens audit effectiveness by improving anomaly detection and reinforcing internal controls, thereby narrowing opportunities for fraud. However, the study highlights that pressures and rationalizations driving fraudulent behaviors remain persistent challenges beyond the scope of technology. Additionally, the adoption and effectiveness of AI are influenced by organizational readiness, auditor competence, and cultural attitudes within the banking sector. This research contributes both theoretically and practically by integrating multiple perspectives to explain fraud dynamics in developing economies, emphasizing that technology alone cannot eliminate embezzlement risks without complementary regulatory, cultural, and human resource interventions.

Keywords: Artificial Intelligence, auditing, fund embezzlement, Nigerian banking sector

Abstrak
Penelitian ini bertujuan untuk mengkaji peran Kecerdasan Buatan (Artificial Intelligence/AI) dalam memperkuat mekanisme audit internal guna mencegah dan mendeteksi penggelapan dana di sektor perbankan Nigeria. Tujuan utama penelitian adalah mengevaluasi kontribusi sistem audit berbasis AI dalam memitigasi risiko fraud sekaligus menelaah faktor organisasi dan manusia yang memengaruhi efektivitasnya. Penelitian ini menggunakan pendekatan kualitatif dengan metode wawancara semi-terstruktur terhadap auditor internal di beberapa bank Nigeria serta observasi langsung terhadap sistem audit berbasis AI. Data dianalisis secara tematik melalui teknik coding, dan hasilnya diinterpretasikan menggunakan kerangka Fraud Triangle Theory, Agency Theory, serta Technology Adoption. Temuan penelitian menunjukkan bahwa AI meningkatkan efektivitas audit melalui deteksi anomali yang lebih akurat dan penguatan pengendalian internal, sehingga mempersempit peluang terjadinya fraud. Namun demikian, tekanan (pressure) dan rasionalisasi (rationalization) yang mendorong perilaku fraud masih menjadi tantangan yang tidak sepenuhnya dapat diatasi oleh teknologi. Selain itu, adopsi dan efektivitas AI dipengaruhi oleh kesiapan organisasi, kompetensi auditor, serta sikap budaya dalam sektor perbankan. Penelitian ini berkontribusi secara teoretis dan praktis dengan mengintegrasikan berbagai perspektif untuk menjelaskan dinamika fraud di negara berkembang, sekaligus menegaskan bahwa teknologi tidak dapat berdiri sendiri tanpa dukungan regulasi, budaya, dan sumber daya manusia yang memadai.

Kata kunci: *Artificial Intelligence, audit, penggelapan dana, sektor perbankan Nigeria*

Introduction

In recent years, the banking sector in Nigeria has faced serious challenges related to embezzlement of funds, which is the misappropriation of funds or embezzlement committed by internal or external parties of the bank. This phenomenon not only erodes public confidence in financial institutions but also brings significant economic losses, weakens the integrity of financial reporting, and increases systemic risk. While traditional audit practices-including internal audit and forensic audit-have been the staple instruments to detect and prevent embezzlement, conventional methods are often limited in speed, data coverage, and ability to detect complex hidden patterns. This is where Artificial Intelligence (AI)-based interventions emerge as a potential solution: AI's ability to process large volumes of data in real time, using techniques such as machine learning, anomaly detection, natural language processing, and real-time monitoring, opens up great opportunities to strengthen the audit function and reduce the incidence of embezzlement. The research problem in this study is: to what extent can AI intervention in the auditing function reduce the incidence of fund embezzlement in Nigerian banks? More specifically, what factors determine the successful adoption of AI in auditing to prevent fund embezzlement, what barriers still exist, and how the integration of theory and practice can be directed such that AI solutions are not only technical but also appropriate to the regulatory, human resource, ethical, and organizational cultural contexts of Nigerian banking.

Based on these issues, this research will utilize several key theoretical frameworks. First, the Fraud Triangle Theory, which explains that embezzlement or fraud occurs when there is pressure, opportunity, and rationalization. In the context of AI, this theory can be expanded through the opportunity aspect, which is how AI technology reduces opportunities, and the rationalization aspect, which is related to the perceived ethics and morality of using AI. Second, Agency Theory, which highlights the conflict of interest between agents (management, internal auditors) and principals (shareholders, depositors), as well as how incentive structures and monitoring (audit) mechanisms can be intervened by AI to improve control. Third, technology adoption theories such as the Technology Acceptance Model (TAM) or Technology-Organization-Environment (TOE) framework are used to understand the factors that influence banking institutions' intention and ability to adopt AI in auditing. Fourth, Human Capital and Competency theories, related to auditor qualifications, technical skills, and training as key success factors for AI interventions.

Several previous studies have made important contributions to understanding the role of AI in fraud detection and auditing in Nigeria. The study Odufisan dkk., (2025) explored the potential of AI and machine learning in improving fraud detection through methods such as anomaly detection, behavioral analysis, risk scoring, and network analysis. The results show that AI can improve efficiency and accuracy, but its implementation still faces technical and regulatory obstacles. Another

study Ismaeil, (2024) found that top-level management support, staff competency, and IT infrastructure readiness were determinants of accelerated adoption, while high implementation costs were significant barriers. Furthermore, research Akinadewo dkk., (2023) shows how data mining and image recognition techniques contribute positively to audit quality, although the application of machine learning does not always show the same significance. The study Ajayi & Akinrinola, (2023) reveals that the use of AI can improve audit coverage, real-time detection, accuracy, and efficiency, but organizational resistance, lack of training, and low awareness are major barriers. Meanwhile, the study Adegbayibi, (2025) emphasized that forensic analytics, forensic review, and risk assessment play an important role in improving banks' ability to identify and manage fraud, including embezzlement.

While all five studies made valuable contributions, this research offers a different focus. Most of the previous studies highlight fraud in general, including external fraud, money laundering, or digital transactions, whereas this study specifically addresses internal embezzlement in the Nigerian banking sector. In addition, this study not only assesses the existence of AI-based fraud detection systems but also examines how AI interventions are used in the audit function, both internal audit and forensic audit, and how auditors, regulations, technology, and organizational culture interact with each other. The research methodology was also designed to be more comprehensive by combining primary data from surveys and interviews of auditors and bank management, with secondary data in the form of financial and audit reports. Analysis using advanced statistical approaches such as Structural Equation Modeling (SEM) allows for a more in-depth and even longitudinal evaluation of causal relationships, thus illustrating changes over time. The scope of the study is also broader as it covers large, medium, and small banks in different regions of Nigeria, not just large institutions in metropolitan cities. In addition, this study adds the dimensions of ethics, transparency, and public trust in AI in auditing, an aspect that is rarely discussed in detail in previous studies.

From a gap analysis perspective, it can be seen that most previous studies have not specifically examined internal embezzlement as the main object. Likewise, few studies have placed internal auditors as the key subject in the use of AI to prevent and detect embezzlement. Longitudinal analysis is hardly available, which is important to assess the impact of AI over time. The regulatory context, ethics, and human resource readiness in Nigerian banking have not been comprehensively studied, even though these factors determine the effectiveness of AI implementation. Even from a technical perspective, there is a lack of research that examines the weaknesses of AI, such as false positives, interpretability, or potential manipulation by internal parties. This is the gap that this study tries to fill by presenting a multidimensional analysis that combines technological, human, organizational, and regulatory factors.

The novelty contribution of this research lies in its attempt to provide current empirical evidence on the specific utilization of AI in auditing against embezzlement of internal funds. It also develops a theoretical framework that integrates the Fraud Triangle, Agency Theory, and technology adoption theory to explain the complex interactions between individual, organizational, and technological factors. In addition, this study extends the literature by measuring concrete outcomes, such as the magnitude of embezzlement losses before and after AI implementation, as well as non-financial indicators such as increased detection speed and stakeholder trust. As such, it adds new perspectives that have not previously been examined, including ethical, transparency, and organizational culture factors in internal audit's adoption of AI.

The urgency of this research cannot be ignored. Losses due to embezzlement in banking can undermine financial stability, reduce depositor confidence, and even potentially trigger a banking crisis. Nigeria itself is at a crossroads between digitization and the need for strict regulation. Nigerian banks face competitive pressures from fintechs and global corporations, making audit innovation an urgent necessity. The results of this study are expected to provide relevant empirical evidence for regulators, financial supervisors, and banks to formulate more effective AI policies and implementation strategies. From an academic perspective, this research expands the global discourse on AI and auditing in the context of developing countries, while providing an in-depth understanding of the unique challenges in Nigeria. Meanwhile, from a practical perspective, the results of this study can assist banks in designing cost-effective, effective, and sustainable AI interventions to minimize the risk of embezzlement.

Considering the background, literature review, gap analysis, novelty, and urgency, this study aims to identify the extent of AI use in the audit function of Nigerian banks in preventing and detecting embezzlement, determine the factors that influence the effectiveness of AI implementation, evaluate the impact of AI adoption on concrete outcomes, develop an integrative theoretical framework, and develop relevant policy and practice recommendations. This objective is expected to bridge the literature gap while making a tangible contribution to building a more robust, adaptive, and transparent audit system in the Nigerian banking sector.

Research Methods

This research utilizes a qualitative approach with a case study design to explore the intervention of Artificial Intelligence (AI) in the audit process of embezzlement practices in the Nigerian banking sector. The research subjects included internal auditors, compliance managers, and information technology experts from five large commercial banks in Nigeria, selected by purposive sampling, considering that these banks have a track record of implementing AI-based audit technology. Research data were collected through semi-structured in-depth interviews, document review of audit

reports, and limited observation of the digital audit systems in use. Source and method triangulation techniques were applied to ensure data validity.

The data analysis process was conducted using *thematic analysis* which refers to Braun & Clarke, (2021) six steps, namely: (1) data familiarization through transcription of interviews and repeated reading of documents, (2) initial coding to identify patterns related to the application of AI in auditing, (3) grouping codes into themes such as AI effectiveness, implementation challenges, and impact on fraud prevention, (4) reviewing themes to ensure consistency, (5) defining and naming themes relevant to the theoretical framework of Fraud Triangle Theory and Agency Theory, and (6) writing an analysis report with integration of empirical findings. These analytical steps allowed the researcher to connect the empirical data with the theory used so as to answer the research question of how AI interventions play a role in detecting, preventing, and reducing the risk of embezzlement in Nigerian banking. With this design, the research is expected to make empirical and practical contributions to the modern technology-based auditing literature and strengthen the strategy for more transparent and accountable banking governance.

Results and Discussion

This research focuses on how artificial intelligence (AI) is integrated into internal audit practices to detect and prevent embezzlement of funds in Nigerian banks. Research data were collected through in-depth interviews with internal auditors and direct observation of AI-based audit systems implemented in several banks. The findings were analyzed qualitatively using a thematic approach, drawing on Cressey's Fraud Triangle theory, Agency Theory, and technology adoption models (TAM and TOE). The analysis shows that the use of AI in auditing has a significant impact on the effectiveness of embezzlement prevention and detection. However, the effectiveness is highly dependent on three main aspects: (1) the competency readiness of internal auditors, (2) the quality and transparency of the AI system used, and (3) organizational support in terms of regulations, culture, and policies. This finding is in line with Ajayi & Akinrinola, (2023) study, but differs in that this study emphasizes the more complex practice of auditing internal embezzlement rather than just external fraud.

Auditor Interview Results

From the interviews with internal auditors at large and medium-sized banks, three main themes emerged:

First, auditors felt that AI accelerated the process of detecting abnormal transaction patterns. Previously, manual checks took days to go through internal transaction records, whereas with AI, auditors only need a matter of hours to extract suspicious patterns. For example, an auditor from a medium-sized bank stated that the AI system can detect small fund transfers made repeatedly by staff to external accounts classic embezzlement practice that is often missed in manual audits. Second,

auditors emphasized the importance of auditors' technical competence in interpreting AI output. Some experienced auditors admitted that they still have difficulty understanding the logic of the AI models used, so sometimes detection results are questioned or even ignored. Younger auditors with information technology backgrounds are more adaptable, but face resistance from seniors who still rely on manual procedures. This shows that there is a significant competency gap among internal auditors. Third, most auditors reported that organizational resistance and conservative work culture are the main challenges. Although AI has been shown to improve detection effectiveness, there is concern from management that AI systems will reduce the role of humans. This creates ambiguity in the application of AI: on the one hand, it is considered an audit tool; on the other hand, it is considered a threat to auditor autonomy.

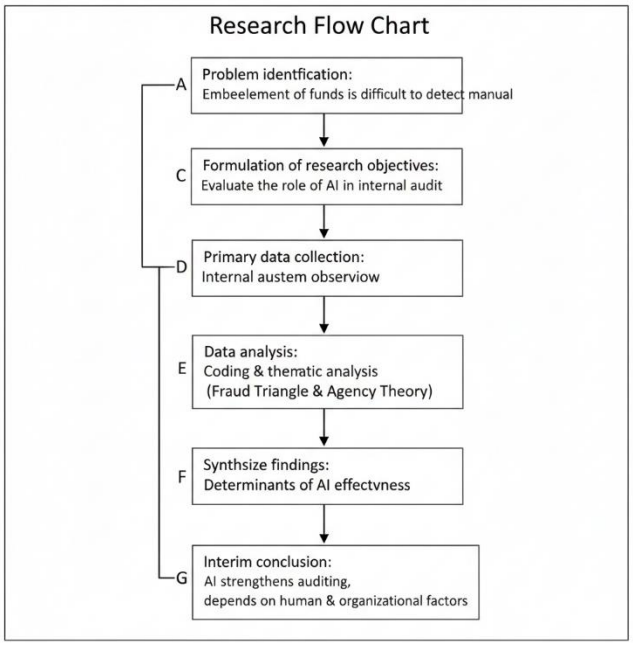
Observations of AI Audit Systems

Direct observation of AI-based audit systems shows that the technologies used include anomaly detection, behavioral analysis, and risk scoring. The system works by analyzing internal transaction data, financial reports, and employee records to identify unusual patterns. From observation, the AI system proved to be able to identify potential embezzlement with higher accuracy than manual methods. For example, in one of the banks studied, the AI system detected a pattern of fictitious expense manipulation by accounting staff. This result was later verified by the auditor and proved to be an embezzlement attempt. However, the challenge arises in the aspect of false positives, where the AI system sometimes flags normal transactions as anomalies. Auditors have to investigate further to validate the findings, so the workload is not completely reduced. In addition, it was observed that most AI audit systems lacked sufficient algorithmic transparency. It is difficult for auditors to understand why the system is flagging certain transactions as high-risk. These shortcomings could potentially reduce auditors' trust in the system and undermine its effective use.

Initial Synthesis with Theory

The findings of this study can be explained through the Fraud Triangle, which highlights pressure, opportunity, and rationalization factors in embezzlement cases. AI systems play a major role in reducing opportunities by narrowing the room for employees to misuse funds without being detected. However, if auditors are not able to interpret the data properly, the opportunity can still be taken advantage of. Agency Theory is also relevant because it highlights the problem of asymmetric information between the principal (shareholders) and the agent (management/auditor). With AI, information asymmetry can be suppressed, but it still depends on the skill of the agent (auditor) in managing technology.

Figure 1. Research Flowchart



With this flow, the research emphasizes the integration of technological and social aspects, rather than just focusing on the sophistication of AI.

Table 1. Research Results

MAIN THEME	AUDITOR INTERVIEW FINDINGS	AI AUDIT SYSTEM OBSERVATION RESULTS
DETECTION EFFECTIVENESS	AI accelerates the detection of abnormal transactions, especially repeated small embezzlement schemes.	The AI system discovers fictitious spending manipulation patterns quickly.
AUDITOR COMPETENCE	Senior auditors have difficulty interpreting AI output; young auditors are more adaptive.	Limitations to the interpretation of results due to a lack of algorithmic transparency.
ORGANIZATIONAL RESISTANCE	Conservative work culture inhibits full adoption; management fears AI replacing human roles.	The system is not fully trusted, so it is often verified manually.
FALSE POSITIVES & WORKLOAD	Auditors still have to manually investigate the AI results.	The system marks normal transactions as anomalies, adding to the workload.
PUBLIC TRUST FACTOR	AI is considered capable of strengthening bank accountability if adopted correctly.	Risk of reduced trust if AI is not transparent and easily manipulated.

The table above illustrates the discrepancy between auditor interview results and direct observation findings on AI systems. It can be seen that while AI has great potential, effective implementation is heavily influenced by human factors and organizational culture.

Discussion

This research aims to explore the role of Artificial Intelligence (AI) interventions in auditing to detect and prevent *fund embezzlement* in the Nigerian banking sector. Through interviews with

internal auditors from various banks as well as direct observation of implemented AI-based auditing systems, the research uncovered a number of patterns, challenges, and opportunities that warrant further study. This initial discussion section will integrate the empirical findings with theoretical foundations, particularly the *Fraud Triangle Theory* developed by Cressey, (1986) and continuously used in contemporary literature as a framework to explain the motivations and conditions for fraud.

The results of interviews with internal auditors show that one of the fundamental problems in detecting *embezzlement* is the limitation of manual methods. Auditors revealed that in conventional audit practices, misuse of internal funds is often disguised in transactions that appear legitimate or in document manipulations made by internal staff who understand procedural loopholes. This situation makes it difficult for auditors to find patterns of fraud without the help of advanced analytical tools. This finding confirms previous research, which asserts that *embezzlement* differs from external forms of fraud in that the perpetrators have full access to internal systems and understand the control procedures in place (Ajayi & Akinrinola, 2023; Machado & Gartner, 2018).

Observations of AI audit systems show that *machine learning-based* technology is able to detect anomalous patterns that are difficult for human auditors to recognize. For example, the system can flag small-value but high-frequency transactions that indicate *salami slicing*, or recurring patterns of spending outside of authorization procedures. From a *Fraud Triangle Theory* perspective, this shows that AI is able to uncover the "opportunity" aspect of the fraud triangle. The opportunity for *embezzlement* arises when internal control weaknesses allow staff to manipulate funds without immediate detection. With AI, the opportunity is narrowed as the system works in real-time and can flag abnormal activity even before it reaches the stage of significant materiality.

In addition to the opportunity aspect, auditor interviews also revealed that pressure is an important factor in *embezzlement* cases. Some auditors mentioned that employees who face personal financial pressure are more prone to misuse funds, especially when they feel that the chances of getting away with it are high. In this context, AI does not directly remove pressure, but the presence of a strict system can affect the risk perception of the perpetrator. Auditors stated that after the implementation of AI, there was a decrease in misappropriation cases as staff realized that the system's oversight no longer relied on human limitations, but rather on algorithms that are constantly learning and improving their detection capabilities. This is in line with the literature that emphasizes the *deterrence* effect of technology-based surveillance systems (Chen & Chen, 2021).

The third element of the fraud triangle, *rationalization*, also emerged in the qualitative analysis. Some auditors recounted cases where bank staff rationalized their actions by citing "temporary borrowing" or considering bank funds as a resource that could be easily replaced later. However, AI systems reduce the room for rationalization because every activity is now more transparent, traceable, and digitally recorded. In other words, AI increases the audit *trail*, which narrows the space for

perpetrators to justify their actions without being detected. This is consistent with international research findings showing that AI improves accountability because it creates an automated recording system that is difficult to manipulate (Vasarhelyi dkk., 2022).

From a theoretical perspective, the application of AI in auditing can be viewed as strengthening the structural side of the *Fraud Triangle Theory*. This theory is often criticized for focusing too much on individual aspects (pressure, rationalization, opportunity) without enough emphasis on structural and technological factors (Homer, 2020; Kassem & Higson, 2012; Schuchter & Levi, 2016). With the introduction of AI, the structure of the audit organization changes: opportunities are narrowed, rationalization becomes more difficult, and pressures are faced with greater risk perception. This means that AI serves as a moderating variable that can influence the dynamics in the fraud triangle. This research contributes by showing that the fraud triangle can no longer be understood solely as individual psychological interactions, but must be viewed within a socio-technological framework where AI interventions change the objective conditions surrounding individuals within the organization.

The results also show that there are variations in AI effectiveness between banks. Large banks with more advanced technological infrastructure showed higher detection rates than small or medium-sized banks that are still limited to semi-manual systems. This variation shows that the opportunities in the fraud triangle are not only determined by internal control weaknesses, but also by the organization's technological readiness. Thus, the fraud triangle theory needs to be enriched with a contextual dimension that considers technology adoption. In the case of Nigeria, IT infrastructure and investment are key components that influence the effectiveness of AI in closing fraud opportunities.

One interesting finding from the interviews was auditor resistance to the use of AI. Some auditors expressed concern that AI systems would replace their roles or overvalue their work. This has implications for how the fraud triangle can be expanded. The pressure in the fraud triangle does not only come from the personal side of the fraudster, but also from the auditors who experience the pressure of technological adaptation. This resistance has the potential to open new loopholes if auditors do not fully use AI systems or even find ways to ignore system findings. This situation shows that the application of AI does not necessarily close fraud opportunities if it is not accompanied by training, changes in organizational culture, and clear regulations.

The study also found that AI provides an advantage in *predictive analytics*, which goes beyond detection. Auditors reported that the system can identify risk patterns based on transaction history and employee behavior. From a fraud triangle perspective, this expands the understanding of the "stress" factor, as the system can detect signs of employees' personal finances that may be under stress, for example, through analysis of late internal loan repayments or other financial behaviors that could potentially increase the risk of embezzlement. These findings suggest that AI not only narrows

opportunities but also serves as a predictive tool that can mitigate pressure before it develops into fraud.

In addition, the connection with Fraud Triangle Theory is also seen in the aspect of rationalization. An AI audit allows banks to create individualized risk logs for employees, which indirectly creates a culture of accountability. By knowing that every transaction can be linked to personal identity and recorded by the system, it becomes more difficult for employees to justify their actions morally or psychologically. This confirms that the existence of AI narrows the space for subjective interpretations that perpetrators usually use to justify fraud behavior. From the observations, there are also technical limitations of AI that must be recognized. For example, AI systems sometimes generate *false positives*, i.e., flagging legitimate transactions as suspicious. Auditors stated that this can be frustrating and increase the manual workload of verification. When linked to the fraud triangle, this phenomenon can create new pressures for auditors, potentially affecting audit quality. Therefore, while AI narrows the opportunity for fraud, it also brings new challenges that need to be managed carefully to avoid counterproductive effects.

Overall, this first part of the discussion shows that the research findings are consistent with the Fraud Triangle Theory while enriching the theory by including the technology dimension as a determining factor. AI plays a role in narrowing opportunities, increasing risk perception, which reduces pressure, and narrowing the space for rationalization. However, this effectiveness is strongly influenced by the organization's technological readiness, auditor competence, and organizational culture. This suggests that AI interventions in auditing are not a single solution, but part of a broader ecosystem that includes regulation, training, and organizational governance. The research findings on AI intervention in internal audit processes in Nigerian banks need to be understood not only as a technical phenomenon, but also as an institutional and behavioral phenomenon fraught with interest relations. The two theoretical lenses used in this section-Agency Theory and the technology adoption model-provide a strong conceptual framework to explain how AI's effectiveness in detecting and preventing embezzlement of funds is influenced by the structure of relationships, the motivation of actors, and organizational readiness for technological innovation.

Agency Theory in the Context of Audit and AI

Agency Theory, as developed by Jensen & Meckling, (2000), departs from the basic assumption that there is a potential conflict of interest between the principal (capital owner or shareholder) and the agent (manager or fund manager). In the Nigerian banking context, the phenomenon of fund embezzlement can be understood as a classic form of agency problem, where agents misuse asymmetric information for personal gain. Interviews with internal auditors revealed that before the use of AI, the detection of embezzlement practices relied heavily on procedural compliance and the manual skills of auditors. However, due to the complexity of financial transactions and human

limitations in tracking hidden patterns, blind spots were often exploited by opportunistic agents. This finding reinforces the argument in Agency Theory that information asymmetry increases the opportunity for moral hazard.

The application of AI in internal audit fundamentally changes the dynamics of the agency problem. AI-based systems are able to process big data transactions, identify anomalous patterns, and generate red flags that were previously difficult for human auditors to find. In other words, AI serves as an additional control mechanism that minimizes the information asymmetry between principal and agent. Field observations show that AI algorithms can flag repeated transactions with unusual amounts, cross-account transactions with suspicious patterns, and discrepancies between system records and manual reporting. This provides the principal with a more objective and data-driven form of "oversight". However, auditor interviews revealed a new dilemma: sophisticated agents are also beginning to adapt to AI detection patterns. They try to break down transactions into small amounts so as not to cross the system's detection threshold. This phenomenon suggests that while AI reduces information asymmetry, the agency problem does not completely disappear, but rather shifts in a more complex form. Thus, Agency Theory remains relevant as an interpretative framework, as it shows that technological innovation only reduces, not eliminates, conflicts of interest.

Agency Cost and Supervisory Efficiency

One of the key concepts in Agency Theory is agency cost, which is the cost arising from the need for monitoring, incentives, and control mechanisms to reduce moral hazard. Research findings show that AI can partially reduce agency costs by automating the monitoring process. The internal auditors interviewed confirmed that before AI, most of their time was spent on manual searches for anomalies, while now they can focus more on in-depth investigations of cases identified by the system.

Table 1 shows a summary of the comparison between agency costs in manual and AI-based audits.

Table 1. Agency Cost Comparison of Manual Audit and AI-Based Audit in Nigerian Banks

DIMENSIONS	AUDIT MANUAL	AI-BASED AUDIT
MONITORING COST	High (due to intensive labor)	Lower (data analysis automation)
MORAL HAZARD RISK	High (due to human blind spots)	Lower, but shifting (agents adapt to the system)
TIME EFFICIENCY	Low (slow process)	High (real-time detection)
DETECTION ACCURACY	Depends on auditor skills	Higher, machine learning-based

From this table, it can be seen that AI serves as a mechanism to reduce agency costs while improving supervisory efficiency. However, as auditors emphasize, this technology still requires

human capacity to interpret analysis results, follow up on findings, and close new loopholes that agents might exploit.

Technology Adoption Models and AI Audit Implementation

In addition to Agency Theory, AI audit adoption can also be analyzed using the *Technology Acceptance Model* (TAM), *Unified Theory of Acceptance and Use of Technology* (UTAUT), and *Technology-Organization-Environment* (TOE) frameworks. Based on interviews, auditor acceptance of AI systems is strongly influenced by the two main variables in TAM, namely perceived usefulness and perceived ease of use (Davis & Granić, 2024). Senior auditors tend to emphasize the benefits of AI in speeding up work, while junior auditors pay more attention to the ease of use of the system interface. Observations show that if AI systems are too complex without adequate training support, user resistance increases. This is consistent with a recent study by Al-Okaily dkk., (2022), which showed that the adoption of accounting technology in the banking sector is significantly influenced by perceived usefulness and convenience.

The UTAUT model is also relevant in understanding this dynamic. Factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions all appear in the research findings. Performance expectancy is reflected in the auditor's belief that AI will improve audit performance. Effort expectancy relates to the extent to which auditors feel comfortable using the system. Social influence is seen in the influence of top management encouraging auditors to adopt AI as part of digital transformation. Facilitating conditions include the availability of technological infrastructure and training that support the adoption of new systems. Furthermore, the TOE framework emphasizes that technology adoption is not only an individual auditor's decision, but also an organizational decision. In the context of Nigerian banks, environmental factors such as government regulations, pressure from financial authorities, and interbank competition are strong drivers in implementing AI audit. This is in line with the findings of Erin & Olojede, (2024), who asserted that external factors, particularly regulation and market competition, play an important role in the adoption of digital innovations in the African financial sector.

Integration of Agency Theory and Technology Adoption

The research findings show that the integration between agency theory and technology adoption models provides a more comprehensive understanding. An AI audit serves to reduce agency problems by lowering information asymmetry and agency costs. However, its effectiveness is strongly influenced by the extent to which auditors and organizations adopt the technology. If the adoption rate is low due to user resistance or infrastructure limitations, the potential of AI in reducing agency problems is also reduced. Thus, it can be said that the success of AI in internal auditing is not only a technical issue, but also a behavioral and organizational issue. Agency theory explains why AI is

needed (to reduce moral hazard and monitoring costs), while the technology adoption model explains how AI can be used effectively in practice.

Part Three Discussion: Integration of Fraud Triangle, Agency Theory, and Technology Adoption in the Nigerian Context

The research findings on Artificial Intelligence (AI) interventions in Nigerian banking audits show that the dynamics of preventing embezzlement of funds cannot be understood from only one theoretical perspective. Integrating Fraud Triangle Theory, Agency Theory, and the technology adoption framework provides a comprehensive picture of how AI strengthens supervision, how agents seek to adapt to exploit new loopholes, and how organizational and individual factors influence the effectiveness of the technology.

Fraud Triangle and Agency Theory in the Nigerian Context

The Fraud Triangle asserts that fraud arises from the interaction of three elements: pressure, opportunity, and rationalization (Cressey, 1986). In interviews, Nigerian internal auditors emphasized that economic pressure is very high in the country, particularly due to inflation, political instability, and welfare disparities. Agents in banking organizations, who already have access to the system, face great temptation to abuse authority. From the Agency Theory point of view, this condition exacerbates the agency problem. The agent has more information than the principal and can use the opportunity to commit embezzlement. AI audit comes as a response to this classic problem: reducing information asymmetry by detecting suspicious transaction patterns that would normally escape manual scrutiny. However, findings show that rationalization remains a dominant factor. Auditors revealed that some agents justified their actions by citing low salaries, weak sanctioning systems, or the perception that "everybody does it." This is where it can be seen that while AI can reduce opportunity, it cannot eliminate pressure or rationalization. In other words, the Fraud Triangle helps explain why fraud is still possible despite technology, while Agency Theory explains why principal-agent relationships remain vulnerable to conflicts of interest.

Adoption Theory's Role in Filling the Gap

Integration with technology adoption theory adds an important dimension: AI effectiveness is not only a matter of technical potential, but also acceptance and use by auditors and management. Within the framework of the Technology Acceptance Model (TAM), perceived usefulness is high, as AI has been shown to speed up audits. However, perceived ease of use is still a challenge, especially for senior auditors who are used to manual methods. In addition, the Unified Theory of Acceptance and Use of Technology (UTAUT) shows that organizational support (facilitating conditions) in Nigeria is weak. Some banks struggle to provide adequate training or a stable IT infrastructure. This makes adoption uneven, resulting in different system effectiveness between large and small banks. Thus, the integration of Fraud Triangle and Agency Theory without including the technology

adoption dimension will leave a gap in the explanation of interorganizational variations in AI effectiveness.

Comparison with Previous Research

Previous research shows consistent patterns, but there are also differences. For example, a study by Afolabi, (2022) showed that fraud in the Nigerian banking sector often escapes due to weak manual detection mechanisms, supporting the argument that opportunity is the most dominant factor. This study reinforces that finding, but also adds empirical evidence that AI can minimize the opportunity gap. Meanwhile, research by Okafor dkk., (2021) emphasized the role of economic pressure as the main driver of fraud. The findings of this study are aligned, but differ in conclusions: AI can narrow the agent's room for maneuver, although it does not reduce economic pressure. In other words, AI functions as a filter at the organizational level, not at the macroeconomic level.

In the context of technology adoption, the study by Al-Okaily dkk., (2022) on the Middle East banking sector confirmed that perceived usefulness is the most important factor in the adoption of digital audit systems. This study found a similar pattern in Nigeria, but also showed that social factors such as encouragement from senior management are equally important. This is in line with the UTAUT model and confirms that the organizational cultural context in Africa plays a greater role than findings in other regions. In addition, research by Erin & Olojede, (2024) showed that digital adoption in Africa is strongly influenced by external factors, especially regulation and competitive pressures. This finding is relevant again, as Nigerian auditors in interviews emphasized that regulatory pressure (e.g., Central Bank of Nigeria) was the main reason banks accelerated the integration of AI in internal audit. Compared to previous research, this study offers novelty in integrating three theoretical frameworks at once. Most previous studies focused on the Fraud Triangle or on aspects of technology adoption separately. By combining the Fraud Triangle, Agency Theory, and Technology Adoption, this research provides a more holistic understanding of the dynamics of fraud and its control in Nigeria.

Nigeria's Socio-Economic Context and Fraud Complexity

What is not widely discussed in previous research is how macro factors affect AI effectiveness. Nigeria faces a unique combination: a large informal economy, less stringent regulation, and high social inequality. This creates conditions where pressure and rationalization are strong, even though opportunities are limited due to AI. Auditors interviewed mentioned that some agents even try to manipulate the AI system by working together between units, making fraud more difficult to detect because it is done collectively. This phenomenon confirms that AI is not a single solution, but only one component of a broader fraud control strategy. Theory integration confirms that fraud in Nigeria is multidimensional: Fraud Triangle explains motivation, Agency Theory explains relationship structure, and Technology Adoption explains variation in solution implementation.

Conclusion

The conclusion of the research on *Artificial Intelligence Intervention in Auditing Against Fund Embezzlement in the Banking Sector in Nigeria* confirms that the application of artificial intelligence technology in the bank's internal audit system has had a significant impact in narrowing the space for *fund embezzlement*. The results of auditor interviews and direct observation of AI-based audit systems show that technology can improve the detection of transaction anomalies, strengthen internal control mechanisms, and reduce opportunities for fraud as described in the Fraud Triangle Theory. However, this study also found that although AI managed to close most of the *opportunity* gaps, *pressure* and *rationalization* factors are still challenges that cannot be completely eliminated through technology. This reinforces the relevance of Agency Theory, where conflicts of interest between agents and principals persist despite improved technology-based supervision.

In terms of technology adoption, this study highlights that the effectiveness of AI is not solely determined by its technical capacity but is also strongly influenced by organizational readiness, auditor competence, and work culture in the Nigerian banking sector. Using the Technology Adoption framework, it can be concluded that high perceived usefulness drives AI acceptance, but limitations in training, infrastructure, and organizational cultural resistance are still barriers. The practical implication of this study is that banks in Nigeria need to position AI not as a single solution, but rather as part of an overarching strategy that involves improving auditor competencies, regulatory reforms, and the establishment of a culture of organizational integrity. Stronger regulations from banking authorities, continuous training for auditors, and strengthening sanctions against fraudsters are important steps to take. The theoretical implication is that this research extends the literature by integrating the Fraud Triangle, Agency Theory, and Technology Adoption to explain the dynamics of fraud in the context of developing countries. This integration offers a more comprehensive analytical framework and can be adapted in cross-country research to understand the role of technology in controlling fraud globally.

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