

Artificial Intelligence and Audit Quality in Multinational Audit Firms in Nigeria

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ABSTRACT: Audit quality in African countries faces numerous challenges that undermine the effectiveness and reliability of financial reporting. A prominent issue is the shortage of qualified audit professionals, which limits the capacity to conduct timely and thorough audits. This deficiency hinders the establishment of robust audit systems and adversely impacts the overall quality of financial reporting across the continent. This study specifically examined AI and audit quality in multinational audit firms in Nigeria, with a focus on the role of emerging technologies in enhancing audit quality. Data were collected through structured questionnaires administered to respondents from multinational audit firms in Nigeria. The population of this study is 500 audit professionals (partners, managers, and senior auditors) in multinational audit firms in Nigeria. The sample size for this study was determined using Yamane's (1967) formula 255 respondents. Using simple regression analysis, the study assessed the influence of various technological tools on audit quality. The findings revealed that Machine Learning Algorithms, Data Mining, Robotic Process Automation, Predictive Analysis, and Image Recognition each have a statistically significant positive effect on audit quality. These results suggest that integrating ethical standards with advanced technological innovations can significantly improve audit quality and strengthen financial reporting in Nigeria. The study recommends greater investment in digital transformation and ethical training to bridge existing gaps in audit capacity and performance

KEYWORDS: Machine Learning Algorithms, Data Mining, Robotic Process Automation, Predictive Analysis, Image Recognition, Audit Quality

1.0 INTRODUCTION

Audit has witnessed radical changes as a result of developments in cognitive computer technology, especially in the creation and implementation of artificial intelligence (Kokina & Davenport, 2017). The challenges of audit quality in a globalized environment, including differing regulatory frameworks, cultural differences, and various levels of enforcement, have led to concerns about the consistency and effectiveness of audit practices across borders. High-profile corporate collapses like Enron (2001), WorldCom (2002), and more recently, Wirecard (2020), exposed significant shortcomings in audit quality. In these cases, auditors either failed to detect or ignored significant financial irregularities. These failures eroded public trust in the reliability of audit reports and raised concerns about the overall effectiveness of the audit profession. Concerns have long existed about auditors' independence, especially when they engaged in non-audit services such as, consulting and tax advisory same clients.

Audit quality in African countries face a range of issues and challenges that impact their effectiveness and reliability. Many African countries experience shortage of qualified audit professionals, limiting the ability to conduct thorough and timely audits. This scarcity hampers the development of robust audit systems and affects the overall quality of financial reporting. Inconsistent or outdated regulatory environments across the continent pose significant challenges. Some nations lack comprehensive legislation governing audit practices, leading to variations in standards and enforcement. This inconsistency can undermine the credibility of financial statements and deter investment. The rapid evolution of technology necessitates that audit firms adapt to new tools and methodologies. However, limited access to advanced technologies and insufficient training impede the adoption of modern audit techniques, affecting efficiency and accuracy (KPMG Report, 2020).

Amani et al (2024), identified different issues faced by auditors In Tanzania. These included limited resources, insufficient training, and lack of management support, all of which impede effective auditing practices. Similarly, in South Africa, Nebbel et al (2024) the audit function in the South African public sector explored difficulties such as inadequate understanding of the public sector environment by internal auditors and insufficient support from management. Many Africa countries diverse issues confronting audit practices across different African countries, including issues related to capacity, governance, and resource. In addressing these challenges requires concerted efforts to strengthen regulatory frameworks, invest in capacity building, embrace technological advancements, and uphold ethical standards within the auditing profession across Africa.

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Auditors often face pressure from clients for favourable outcomes, which can compromise their independence. In the case of the collapsed Oceanic bank, it was highlighted that auditors sometimes forego independence to maintain client relationships (Akintoye, 2018). Corruption remains a significant challenge that undermines the integrity of audit quality. A report by the World Bank (2019) highlighted that corrupt practices often influence financial reporting, complicating the auditor's role. The Nigerian regulatory environment can be fragmented, leading to compliance difficulties. This was found to be the cause in the case of Oando Plc financial scandal, where inadequate regulatory oversight contributed to financial misstatements (Suleiman, 2019).

The rapid evolution of technology necessitates that auditors adapt to new tools and methodologies. However, the integration of computer technology into auditing practices in Nigeria has been slow, affecting the efficiency and effectiveness of audits. The rapid advancement of technology presents both opportunities and challenges for auditors. The adoption of audit technology, like data analytics, remains slow. Case studies from firms show that lack of investment in technology hampers efficiency (Oba, 2020). There exists a disparity between public expectations and the actual responsibilities of auditors in Nigeria. This gap can lead to misunderstandings about the role and capabilities of auditors (Ombugadu et al 2018). Political influences can undermine the audit function. A well-documented case is the inappropriate influence on the Nigerian National Petroleum Corporation (NNPC) audits, where political ties affected audit outcomes (Onyemaechi, 2021).

Artificial intelligence opens new opportunities for discipline that has progressed successfully since the invention of double entry book keeping in 1494. Before the adoption of AI and other advanced technologies, audits were largely manual and heavily reliant on sampling methods. This left significant gaps in coverage, where only a fraction of transactions were examined. As companies grew in complexity and size, these traditional methods became inadequate in detecting irregularities and providing comprehensive audit assurance. With the growing amount of data generated by large corporations, traditional audit methods struggle to process and analyze all the relevant information efficiently. The risk of missing crucial insights due to data overload raises concerns about the effectiveness of audits. Traditional audits, especially for large firms, are resource-intensive, both in terms of time and money. Stakeholders expect cost-effective solutions that would not compromise the quality of audits. AI can streamline audit processes, reducing the time and resources needed for thorough audits.

Rapid changes in technology and business practices have outpaced the training and skills of auditors. Using artificial intelligence tools to simplify paper authorizing and preparation can improve many internal auditing procedures including sourcing and ordering invoicing, sales order, cost reporting, accounts payable and receivables and others. Concerns have been raised about whether auditors are adequately prepared to assess complex financial instruments and new business models effectively. There are concerns that auditors may miss red flags or patterns indicating fraud. AI and machine learning tools can help identify anomalies and patterns in data that human auditors might overlook. As audit firms handle sensitive financial data, cybersecurity concerns are prominent. Ensuring the protection of client data while using AI systems is critical, as a breach could lead to financial loss and reputation damage. AI is being used to address these concerns by improving efficiency, enhancing fraud detection capabilities, increasing accuracy in complex audits, and ensuring better compliance with regulatory requirements. It allows for the automation of repetitive tasks, freeing auditors to focus on more complex, judgment-based aspects of the audit practices.

Previous studies have examined the extent to which artificial intelligence impacted audit quality such as the study of Victor et al. (2023) examined the evaluation of artificial intelligence and efficacy of audit practice in Nigeria. The study investigates the effect of AI applications on the operations of small and medium-sized accounting firms located in the Ikeja local government area of Lagos state in Nigeria. This study examines the effect of data mining, machine learning and image recognition on the efficacy of audit practice in Nigeria. Dagundaro et al. (2023) examined the application of artificial intelligence and audit quality in Nigeria. This study examined how expert systems, machine learning and intelligent agents affect audit quality in Nigeria. Despite previous empirical evidence linking artificial intelligence and audit practice in Nigeria, most studies concentrate on AI and quality: implication for practising accountants, usage and impact of artificial intelligence on accounting: evidence from Malaysian organization, in what way does AI influence empirical evidence from the southwest, Nigeria, and artificial intelligence and accounting profession.

This study is intended to fill the research gap by considering the artificial intelligence and audit practices in multinational audit firms in Nigeria from 2015 to 2024. The broad objective of this study is to investigate the impact of artificial intelligence on audit practices in multinational audit firms in Nigeria. Specifically, the study examines the impacts of machine learning algorithm, data mining, image recognition, robotic process automation, and predictive analytics. The significance of this study is to examine whether the AI system enhances the overall audit process, ultimately leading to better financial governance and strategic decision-making, not to the auditing profession but also for strengthening stakeholder trust and organizational performance.

2. LITERATURE REVIEW

This section reviewed related literature on relevant concepts, theories and empirical studies.

2.1 Conceptual Review

The conceptual review focused on the artificial intelligence and audit practice (machine learning, data mining, image recognition, predictive analytic, robotic process automation, and audit practice) that formed the independent and dependent variables of the study respectively.

2.1.1 Audit Quality

Audit quality refers to the systematic process of examining and evaluating financial information, systems, processes, and controls within an organization. The primary objective of audit practice is to provide an independent and objective assessment of an entity's financial statements, ensuring their accuracy, reliability, and compliance with applicable accounting standards and regulatory requirements. Audit practices are conducted by qualified professionals known as auditors, who follow established methodologies and standards to assess an organization's financial health, internal controls, and overall governance. The core focus of audit practice is the examination of an organization's financial statements, including the statement of financial position, income statement, and cash flow statement. Auditors verify the accuracy and completeness of financial data, ensuring that it fairly represents the entity's financial position and performance. Auditors assess the effectiveness of an organization's internal controls, policies, and procedures.

This includes evaluating the design and implementation of controls to prevent and detect errors, fraud, and other irregularities. Audit practice includes a review of an organization's adherence to relevant laws, regulations, and industry standards. Auditors verify that the entity is in compliance with legal and regulatory requirements governing financial reporting and other aspects of business operations. Auditors conduct risk assessments to identify and evaluate potential risks that may impact the accuracy and reliability of financial statements. This involves understanding the entity's business environment, industry risks, and internal control environment. Before conducting an audit, auditors develop an audit plan outlining the scope, objectives, and procedures for the audit engagement. Planning ensures that the audit is conducted efficiently and effectively. At the conclusion of the audit, auditors express an opinion on the fairness and reliability of the financial statements. The audit opinion may be unqualified, qualified, adverse, or a disclaimer, depending on the findings and compliance with accounting principles. Audit practice emphasizes continuous improvement by incorporating feedback from auditors.

Fedyk et al (2022) artificial intelligence gain is popularity as an innovative way to automate tasks, improve data analytic, reduce the risk and human error and auditing process is be increased. Financial transactions are becoming increasingly complex, regulatory landscape is constantly changing, and financial reporting needs to be timely and reliable. Busayo et al (2023) artificial intelligence has great impact in revolutionize the audit profession in Nigeria, which includes data mining, machine learning and image recognition help reduce the error rate in accounting information and improve audit practices. Derya (2020), artificial intelligence tools which allow for faster and reduce frauds and errors which as great impact on accounting and auditing practice that lead to significant change and influence the roles and skills of the professionals.

2.1.1. Artificial Intelligence

The literature indicates that AI technologies, such as machine learning, robotic process automation (RPA), and data analytics, have the potential to revolutionize audit practices (Kokina & Davenport, 2017; AICPA, 2019). AI facilitates real-time data analysis, fraud detection, and risk assessment, enabling firms to provide more comprehensive services (Warren et al., 2015). Artificial Intelligence (AI) is a term first coined by John McCarthy, a renowned computer scientist, in 1955-56 at the Logic Theorist program initiated by Allen Newell, Cliff Shaw, and Herbert Simon presented at the Dartmouth College Artificial Intelligence Conference to showcase how machines can be made to mimic the problem-solving skills of humans (Harvard Business School, 2017). McCarthy defined AI as the science and engineering of making intelligent machines (Akinadewo, 2021).

Also, AI which stands for the use of computerized systems to complete tasks ordinarily completed by human intelligence is quickly becoming a topic of interest (Sotoudeh et al., 2019). The first AI-based project occurred over sixty years ago when scientists attempted to design software that could translate between the Russian and English languages (Ilachinski, 2017). Kurzweil, (1990) defined Artificial intelligence (AI) as the art of creating machines that perform functions that require intelligence when performed by people. According to (Lugar; Stubblefield, 1993) Artificial intelligence (AI) is the branch of computer science that is concerned with the automation of intelligent behavior. Artificial intelligence is one of the computer science fields relating to improving the intelligence of computerization to emulate the human intelligence, and the expert systems one branch of the artificial intelligence, these systems implement duties popularly implemented by the special and expert human. In the past decades, there have been numerous articles about the application of Artificial intelligence (AI) as expert systems, which are called by some investigators "knowledge-based systems" also.

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2.1.1.1. Machine Learning

Machine learning is an area of computer science that studies learning computer algorithms that use statistics for determining patterns in a huge amount of data and making accurate predictions for unknown future events. Machine learning techniques have been used in many different fields, such as education, health, biology, and finance (Dogan & Birant, 2021). The term “machine learning” was described by Arthur Samuel in 1959 and was defined as “a field of study that gives computers the ability to learn without being explicitly programmed”. Tom M. Mitchell gave a more comprehensive description of machine learning in 1997, stating that it is concerned with creating computer programme that can automatically get better over time. Both meanings referred to computers' capacity to recognize patterns and trends in historical data and, by improving their learning capabilities, make accurate predictions about the future.

The goal of machine learning is to locate the model that offers the most reliable and precise forecast of future data. In order to accomplish that, algorithms are used to create mathematical models based on sample data (training data). The effectiveness of the model's predictive power is then assessed. (Cho et al., 2020). These are some common uses of machine learning that we see every day. A large number of data points pertaining to a certain set of circumstances can be analyzed via machine learning to discover which ones are important. The outcomes can then be predicted by comparing the findings to another set of data that is similar. (Shimamoto, 2018). Due to advancements in machine learning, artificial intelligence, big data usage, blockchain, and other technologies, accounting and auditing will experience more substantial changes in the very near future and will be supported to a greater extent by automation (Türegün, 2019).

Machine learning has multiple applications in auditing; it is already used by leading accounting services firms. Machine Learning functions are constantly being introduced into audit practice, such functions include but are not limited to automation of manual audit tasks, analysis of the complete volume of data including all sales and purchase records, general ledger and all other ledgers, journal entries, bank transactions, financial reports, authorities, and limits, to flag transactions that differ materially from the standard. Identification of exceptions and potential problems or errors, including duplicate expense claims, unauthorized expenditure, incorrect amounts, and suspicious suppliers or invoices reading of contracts and leases to pinpoint key clauses and numbers, assess risk and highlight any anomalies, and so on.

2.1.1.2 Data Mining

Data mining is the process of examining large datasets to find patterns and connections that can help to solve business issues and make better business decisions. It can also help to forecast future trends and improve decision making in enterprises (Taghizadeh et al., 2018). Conceptual frameworks have shown the advantages of continuous audit and data mining in the last 10 years, but practical challenges remain (Awotomilusi et al., 2022). In the auditing world, data mining is becoming more and more important. Online systems and sophisticated technology devices make accounting transactions more complex and vulnerable to manipulation. Due to the large amount of data involved in the auditing process, data mining is now a useful tool to simplify the evaluation process, (Falana et al., 2023). Data mining has added value to the audit profession as it evaluates large data in the attest function more meaningfully.

2.1.1.3 Image recognition

Image recognition is also known as photo recognition or picture recognition, which refers to the process of identifying and categorizing objects within an image. The goal of image recognition is to identify objects in an image and classify them into different categories. This has been a research topic in computer vision for a long time. The goal of object recognition is to classify the objects found in an image into different categories. The goal is to determine what an image represents, (Eno et al., 2019). In contrast, image detection uses an image as an input and finds various objects in an image. For instance, a face detection algorithm aims to find patterns of faces within an image. In contrast, in image detection, only one object is distinguished from another and the number of distinct entities in the image is determined. Image recognition has been used for financial statement audit and fraud detection in Western countries. However, its use in auditing and accounting in developing countries such as Nigeria, Ghana and other African countries is relatively new (Shaher, 2020).

2.1.1.4 Robotics Process automation

Robotics process automation come in various forms and perform dimensional job schedules in line with the command assigned to them by the programmer. The robotics process automation component of artificial intelligence is one of the disruptive technologies behind the designing, manufacturing and application of robots (Deng & Yeh, 2011). According to Greenman (2017), this is concerned with the design, construction and operation dynamics. Puce et al (2017) defined robotics as a re-programmable, multidimensional and multifunctional systems structured to move materials, data, parts or tools in the direction of performing diverse programmed motions and assigned tasks. Jerneck et al. (2021) contended that the robotic aspects of artificial intelligence work together with other components to accomplish a given task. Liu et al. (2018) noted that robotics are designed with strong magnetic sensors, like the human brain, to sense its surroundings and feel and see where applicable. Lombardo et al.

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(2019) reported that neural networks are closely correlated with artificial intelligence, while Moll et al (2019) documented that neural networks have a positive effect on the speed of reporting credible and reliable financial statements.

2.1.1.5 Predictive Analytic

Predictive analytics is a method of using data, statistical algorithms, and machine learning techniques to identify the likelihood of future outcomes based on historical data. It helps businesses make more informed decisions by forecasting trends, behaviors, and outcomes. Predictive analytics is important in audit practices as it can help auditors identify potential risks and frauds by analyzing data patterns and anomalies. It also allows auditors to prioritize their efforts on high-risk areas, improve audit efficiency, and provide more valuable insights to stakeholders. Ultimately, predictive analytics can enhance the accuracy and effectiveness of audit procedures. In multinational audit firms in Nigeria, predictive analytics can have a significant impact on audit practices by allowing auditors to better identify potential risks and frauds, prioritize areas of focus, and enhance the accuracy and effectiveness of audit procedures. This can lead to more efficient audits, improved decision-making, and better overall outcomes for stakeholders.

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During the audit process, artificial intelligence is a key component of making predictions about the financial trouble that could happen. People say that the audit process is a way to find mistakes in the financial statements of a company. On the other hand, artificial intelligence is when new technologies are used to make business operations more efficient and effective. Hansen (1992) says that machine learning models have a big impact on how predictions and decisions are made during an audit, which in turn would reduce the financial distress that could occur in the financial statements. On the other hand, Chang and Hwang (2020) pointed out that the financial stress in the audit process can be solved by using big data techniques, such as the binary model and life test methods, to predict the financial stress in the company. The results showed that the variables selected performed well in the prediction process. (Chang, & Hwang, 2020).

Al-Sayyed et al. (2021) and Owonifari et al. (2023) argued that AI can have a positive impact on audit evidence and decision making, but that auditors need to acquire the skills and knowledge to make ethical decisions while assessing audit evidence. They also highlight ethical concerns in the context of auditing, citing cases where auditors did not act ethically when providing opinions on financial statements, and recommend the use of various tools to monitor auditor behavior, particularly in the fields of opinion issuance and detection of dishonesty (Awotomilusi et al., 2022). Chang et al (2020) found that the variables used to predict financial distress performed well in the audit process. Audit evidence is the information that auditors use when auditing financial statements to ensure that the information presented in financial statements is accurate and fair.

Dagunduro et al. (2023) emphasizes the importance of big data techniques in predicting financial distress in companies, such as binary models, life test methods with fifty-four financial parameters, and corporate governance models. Machine learning models play an important role in making predictions and decision-making during the audit process. This, in turn, reduces the likelihood of financial distress showing up in a company's financial statements. Ivy et al., (2020) emphasize the need for effective and practical governance regarding the use of artificial intelligence (AI) in audit methodologies in order to facilitate ethical decision making. They argued that, with the correct audit evidence, ethical judgments and decisions can be made regarding financial statements

2.2 THEORETICAL REVIEW

2.2.1 Resource-Based view (RBV)

The Resource-Based View (RBV) was primarily developed and popularized by scholars Jay Barney and his colleagues in the early 1990s. Jay Barney's seminal work, particularly his 1991 article titled "Firm Resources and Sustained Competitive Advantage," laid the foundation for the RBV framework, emphasizing the importance of a firm's internal resources in achieving and maintaining competitive advantage. Other notable contributors include Edith Penrose, who laid early groundwork in her work "The Theory of the Growth of the Firm," and scholars like David J. Teece and Gary Pisano. The RBV takes an inside-out view or firm specific perspective on why organizations succeed or fail in the market place (Dicksen, 1996).

Resources that are valuable, rare, inimitable and non-substitutable (Barney, 1991) make it possible for businesses to develop and maintain competitive advantages, to utilize these resources and competitive advantages for superior performance (Collis & Montgomery, 1995; Grant, 1991; Wernerfelt, 1984). According to RBV, an organization can be considered as a collection of physical resources, human resources and organizational resources (Barney, 1991; Amit and Shoemaker, 1993). Resources of organizations that are valuable, rare, imperfectly imitable and imperfectly substitutable are main source of sustainable competitive advantage for sustained superior-performance (Barney, 1991). In the context of audit practice, the importance of RBV lies in its emphasis on leveraging unique internal resources and capabilities to create competitive advantage, which can be applied to optimizing audit processes, enhancing audit quality, and achieving business objectives. This theory emphasizes that the resources and capabilities of a firm including technology like AI provide a competitive advantage. In the context of multinational audit firms, effective use of AI can enhance audit quality, efficiency overall service delivery.

2.2.2 Agency theory

The Agency theory is a crucial concept in auditing, which explains the connection between managers and investors (Jensen & Meckling, 1976). The theory was propounded by Stephen Ross and Barry Mitnick in 1973, independently and roughly concurrently (Mitnick, 2019). In this theory, the manager is the agent who represents the investors as the principal. Ideally, the manager should act in the best interest of the investors, but in some cases, the agent may not act in the best interest of the principal. Therefore, auditing plays a vital role in assuring the investors that the managers are fulfilling their obligation to represent the investors' interests. The auditors are responsible for guiding investors while also overseeing the managers. The audit reports assist investors in making informed decisions about buying, selling, or holding securities. With the growth in the size of companies, the volume of data requiring auditing is also increasing.

As a result, auditors must provide timely and reliable information to investors, ensuring that the information meets reliability standards by thoroughly examining the financial reports, (Commerford et al., 2019). The responsibility of auditors in such a case is to provide guidelines to investors while playing oversight roles. At the same time, the audit reports guide investors in making a purchase, sell, or hold decisions (Shogren et al., 2017). The growth in the size of companies leads to a growth in the volume of data required to be audited. As a result, auditors must continue to provide timely and reliable information to investors. The provision of this information must continue to meet the reliability standards which require auditors to significantly peruse the financial reports (Blair & Stout, 2017) AI systems are expected to provide a strategic advantage in the attainment of these objectives.

First, AI enables remoteness, which is the analysis of financial statements from different locations (Blair & Stout, 2017). Usually, remoteness arises from the separation of the source of information and users. With AI systems carefully and effectively deployed, auditors could have remote access to the financial data of clients and remotely audit and carry out financial analysis on clients' data. Another way through which AI is expected to facilitate the agency theory is by eliminating the effects of the complexity of handling financial information and reports. Since information has become complex over the past years, users find it difficult to attain a high-value assurance of the quality of the financial reports at hand. At the same time, AI supports agency theory by eliminating the conflict of interest. The release of financial reports resembles a situation where directors are reporting their performance (Blair et al., 2017).

2.2.3 Technology acceptance model

This study is grounded in the Technology Acceptance Model (TAM) (Davis, 1989), which posits that perceived ease of use and perceived usefulness influence the acceptance of new technologies. The model suggests that if audit professionals perceive AI as beneficial and easy to use, its adoption will enhance audit practices in multinational firms. The Technology Acceptance Model (TAM) theory is a behavioral model that explains how users come to accept and use a technology. It suggests that perceived usefulness and perceived ease of use are the key factors influencing the acceptance and usage of a technology. Users are more likely to adopt a technology if they believe it will improve their performance and if they find it easy to use. TAM theory has been widely used in research to understand user behavior and adoption of new technologies.

The Technology Acceptance Model (TAM) has benefits on audit practices in multinational audit firms as it helps auditors understand user behavior and acceptance of new audit technologies. Authors such as Fred et al (1991) have explored the impact of TAM on technology adoption in various industries, including audit practices. By applying TAM to audit technology, multinational audit firms can better understand how users perceive the usefulness and ease of use of new technologies, leading to increased adoption rates, improved audit efficiency, and better decision-making processes. TAM can provide valuable insights into how auditors can effectively implement and utilize new technologies to enhance audit practices in multinational settings. The Technology Acceptance Model (TAM) offers several advantages over agency theory and the Resource-Based View (RBV) when it comes to understanding user behavior and technology adoption in audit practices.

TAM focuses on individual perceptions of technology usefulness and ease of use, providing direct insights into why users accept or reject new audit technologies. This is different from agency theory, which concentrates on the relationship between principals and agents in decision-making processes. Additionally, TAM can complement RBV by helping audit firms identify how technology adoption can lead to strategic advantages and resource optimization, based on user perceptions and behaviors. Fred et al (1991) incorporating TAM into their audit processes, multinational firms can enhance their understanding of technology adoption and leverage this knowledge to improve audit efficiency and decision-making capabilities. In this view, TAM provides a more direct and user-focused approach to understanding technology adoption in audit quality, offering valuable insights that can help multinational firms to improve their audit processes and strategic decision-making abilities.

2.3 Empirical Review

The use of AI and its effects on audit practices have been extensively analyzed by researchers through various analytical techniques. Odoh et al. (2018) analyzed the implications of AI on Accounting Operations in Accounting Firms in South East Nigeria. Expert systems and intelligent agents had a significant impact on accounting functions in accounting firms, suggesting a positive impact on accountants duties. Eno et al. (2019) examined the potentials, challenges, and uses of Artificial Intelligence in

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Banking, Accounting, and Auditing in Nigeria. Using both qualitative and quantitative approaches, they explored the potential roles of Artificial Intelligence (AI) in the future of Banking and Auditing systems. Aneta Zemankova, (2019) analyzed the impact of Artificial Intelligence on Audit Efficiency and Integrity, with a particular focus on the impact of blockchain technology on the audit process. The study focused on the advantages of AI in enhancing audit efficiency and integrity, as well as reducing errors.

Almufadda et al. (2020) looked at the use of AI in the auditing profession. The study looked at a selection of papers published in the years 2016-2020. The authors found that the adoption of AI in audit practice is mainly limited to the big 4 accounting firms. Shahher (2020) studied the impact of AI technologies on auditing audit evidence from the point of view of certified auditors working in IT companies. The study included 314 auditors and included a structured questionnaire. The results showed that AI technologies significantly impact audit evidence. Abiola & Solomon (2020) examined the use of AI on accounting operations in Nigeria, especially in the context of COVID-19. The researchers used regression analysis to find a significant impact of AI on accounting functions efficiency and job security. The study was conducted in the Gaza Strip and the results showed that AI had a significant positive impact on professional performance and efficiency, as well as system development.

Sharma et al. (2021), reviewed the perception and adoption of AI in accounting among accounting practitioners and others. The data was collected via structured questionnaires among accounting practitioners, business owners, teachers, and students. The analysis was made through partial least square structure equation modeling. According to the qualitative findings of the study, the intention to adopt AI in accounting is influenced slightly by insecurity, attitude towards use, and perception of ease of use. The qualitative findings highlighted the importance of AI in the detection of fraud and risk prevention in accounting. Taha (2021) A qualitative study on the pros and cons of automation in accounting . The study looked at the impact of automation on qualified accountants. The study included interviews with financial instructors and employees, students and business managers, as well as a literature review of articles on the effects of computerization on the accounting industry. The results of the study indicated that the introduction of robotics into corporate bookkeeping may reduce the number of consultancy jobs, as well as positions requiring basic analytical skills.

Rahman (2021) focused on the relevance and challenges of the adoption of AI in the banking sector in Malaysia as well as the factors that influence consumers' intention to use AI in bank services. The used a qualitative and quantitative approach. In the qualitative phase of the research, he conducted extensive interviews with bank officials in Malaysia to gain insight into the relevance and challenges related to the adoption of artificial intelligence in the banking sector. The findings showed that AI plays an important role in areas like fraud detection, risk prevention, etc. However, the lack of regulation, privacy and security concerns, lack of skills, and IT infrastructure were some of the major challenges to adoption of AI in banking. During the quantitative phase, he collected 302 completed questionnaire responses from Malaysian banking clients. Using regression analysis, he identified the main predictors of consumer's intention to use AI. The quantitative results showed that: consumers' attitudes towards AI, their perception of its usefulness, risks associated with AI, and Level of trust in AI among others.

Akinadewo (2021) conducted an analysis of the relationship between AI and accountants approach to accounting functions .The study used a structured questionnaire to sample 205 accountants with systems application experience in accounting and financial transaction functions. The results of the study showed that artificial intelligence had a significant positive effect on how accountants approached their accounting functions. Vardia et al. (2021) conducted an exploratory study on the impact of digitization on the audit profession . They reviewed the degree of understanding and analyzed the effect of digitization on auditing practices in India. The analysis was conducted using the Chi-square statistical method. The results showed that digitization had a significant impact on working methods and processes in auditing in India.

Marija Mitavska (2021), investigated how Artificial Intelligence (AI) can help the accounting & auditing industry cope with the challenges caused by the pandemic, and how AI can help solve them. The study used secondary data sources to highlight the importance of AI systems in the pandemic, as well as the impact of AI on Nigeria's accounting profession. The design of the study was based on a field survey design, and the participants included accountants from the four leading accounting firms in Nigeria. According to the study, artificial intelligence played a major role in the changing landscape of accounting in Nigeria. Monal et al. (2022), examined how AI impacts the development of the accounting & auditing profession. The study, which adopted secondary data from the accounting firms in Bahrain, analyzed data using quantitative content analysis. In the findings, it was revealed that AI adoption is expected to bring a new age of innovation and creativity in accounting & auditing, which will contribute to the development of the profession.

Hasan (2022) reviewed the use of AI in Accounting and auditing using a semi-structured or narrative review methodology. The study looked at books and journals published in the field and found that due to disruptions in the economic sector, the accounting & auditing profession needs to change in order to move forward. The study highlighted the need for interdisciplinary cooperation in research on AI in accounting & auditing. The wider acceptance of AI in the accounting profession is expected to provide advantages in terms of efficiency, productivity & accuracy. Onwughai (2022), looked at the impact of the adoption of AI and machine learning on accounting functions within business organizations. The data were collected using a survey and qualitative literature review methodology. The results showed that AI may replace mundane accounting tasks, but it also opens up new possibilities for accounting profession to take on strategic & rewarding roles outside of bookkeeping. For Nigerian companies, the

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regression model showed no statistically significant association between AI & accounting functions. Nkwede et al (2023), examined Artificial intelligence: challenges and opportunities for the accounting profession in Nigeria. The paper is borne out of the need to identify challenges that professional grapple with in their quest to surmount the challenges posed by the realities of artificial

Victor et al. (2023), reviewed the evaluation of artificial intelligence and efficacy of audit practice in Nigeria. The study focused on small and medium sized accounting firms located in the Ikeja local government area of Lagos in Nigeria. The used primary data and focused on personnel from accounting firms were 89 as of August 2022 and the sample size is 62 firms. The study used data mining, machine learning and image recognition as variables of AI. The found that there is positive significant relationship between data mining, machine learning and image recognition and audit quality

2.4 Gaps in Literature

The empirical studies reviewed in Nigeria shown that, there is a scarcity of research investigating on AI and audit quality in multinational audit firms in Nigeria. Furthermore, the existing studies predominantly concentrated on the big 4 accounting firms, AI applications on the operation of small and medium-sized audit firms and in what way does AI influence audit practice and also most studies concentrate using audit quality, audit tenure, auditor independence and audit experience. Previous studies also reviewed using data mining, machine learning, image recognition, as additional gap to this study with two different independent variable which are robotic process automation and predictive analytic. As a result, the research hypotheses are formulated as follows:

Ho1: there is no significant effect between machine learning algorithm and audit quality in multinational audit firms in Nigeria.

Ho2: there is no significant effect between data mining and audit quality in multinational audit firms in Nigeria.

Ho3: there is no significant effect between robotic process automation and audit quality in multinational audit firms in Nigeria.

Ho4: there is no significant effect between predictive analysis and audit quality in multinational audit firms in Nigeria

Ho5: there is no significant effect between image recognition and audit quality in multinational audit firms in Nigeria

3 METHODOLOGIES

This study adopts a quantitative research design to investigate the impact of Artificial Intelligence (AI) on audit quality in multinational audit firms in Nigeria. Primary data is collected via structured questionnaires distributed electronically to the target respondents. The questionnaire consists of three sections: demographic information, extent of AI adoption, and perceived audit quality indicators. The population comprises audit professionals (partners, managers, and senior auditors) in multinational audit firms operating in Nigeria. These include the Big Four PwC, KPMG, EY, and Deloitte and selected mid-tier international firms such as BDO, Grant Thornton, and Mazars. A purposive sampling technique is employed to target individuals directly involved in audit processes of listed companies, as they are most likely to interact with AI tools and impact audit quality outcomes. The sample size was determined using Yamane's (1967) formula for a known population:

$$n = \frac{N}{1 + N(e)^2} = \frac{500}{1 + 500(0.05)^2} = \frac{500}{2.25} \approx 222$$

Where:

n = sample size

N = population size (estimated at 500 professionals)

e = level of precision (0.05)

$$n = \frac{500}{1 + 500(0.05)^2} = \frac{500}{2.25} \approx 222$$

To ensure robustness and account for potential non-responses, the final sample size was increased by 15%, yielding a target sample size of 255 respondents.

Sample Distribution

The sample was proportionally distributed across the firms as follows:

Firm Category	Estimated Staff Size	% of Total	Proportional Sample
PwC	130	26%	66
KPMG	120	24%	61
EY	100	20%	51
Deloitte	90	18%	46
Mid-tier Firms (e.g., BDO, GT, Mazars)	60	12%	31
Total	500	100%	255

Source: Author's Computation, 2025.

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3.1 Model Specification

To examine the implementation of artificial intelligence and its impact on the audit quality in multinational audit firms in Nigeria, the study's model will be adapted from the model of Dagunduro et al (2023) which is

$$AQP = \beta_0 + \beta_1 ML + \beta_2 DM + \beta_3 IR + \varepsilon$$

Where:

QAP	Quality of audit Practice
ML	Machine Learning
DM	Data Mining
IR	Image Recognition

This study adapted the model of Dagunduro et al (2023) by maintaining the dependent variable as Audit quality and adapting the independent variables data mining, machine learning algorithm, and image recognition. The study modified the model by introducing predictive analytic and robotic process automation, the study formulate its model as follows:

$$AQ = f(ML, DM, IR, PA, RPA) \dots\dots\dots 3.1$$

For the model in equation 3.1 to be expressed in an econometric form, it becomes:

$$AQ = \beta_0 + \beta_1 ML + \beta_2 DM + \beta_3 IR + \beta_4 PA + \beta_5 RPA + \varepsilon \dots\dots\dots 3.2$$

Where:

AQ	Audit Quality
ML	Machine Learning
DM	Data Mining
IR	Image Recognition
PA	Predictive Analytic
RPA	Robotic Process Automation
ε	Error Term
β_0	Intercept
$\beta_0 - \beta_5$	Coefficient of the Estimates

4.1 RESULTS AND DISCUSSION OF FINDINGS

Analyses of Responses of Respondents

Tables 4.2 to 4.5 show the responses of respondents to the structured questionnaire. These are arranged according to dependent and independent variables examined in this study.

Table 4.2 Machine Learning Algorithm and Audit Quality

Machine Learning Algorithm and Audit Quality	SA	A	D	SD
My audit firm integrates machine learning algorithms in financial audits.	35(57.4%)	20(32.8%)	2(3.3%)	5(6.6%)
Machine learning improves the accuracy of audit findings.	16(26.2%)	40(65.6%)	1(1.6%)	3(6.6%)
Machine learning enhances fraud detection in audit processes.	27(44.3%)	26(42.6%)	5(9.8%)	2(3.3%)
Machine learning tools are frequently used in routine audit tasks.	20(32.8%)	31(52.5%)	4(6.6%)	5(8.2%)
The use of machine learning reduces the time required for audit completion.	16(26.2%)	40(65.6%)	1(1.6%)	3(6.6%)

Source: Author's Computation, 2025.

Table 4.3 Data Mining and Audit Quality

Data Mining and Audit Quality	SA	A	D	SD
Data mining is used to extract audit-relevant information from large data sets.	21(35.0%)	18(30.0%)	19(31.1%)	2(4.9%)
Data mining improves the identification of audit risks.	35(58.3%)	17(28.3%)	6(10.0%)	2(3.4%)
Data mining supports better decision-making in the audit process.	27(44.3%)	26(42.6%)	5(9.8%)	2(3.3%)
Auditors frequently use data mining techniques for client analysis.	34(56.7%)	21(35.0%)	2(3.3%)	3(5.0%)
Data mining contributes to higher audit quality and efficiency.	35(58.3%)	17(28.3%)	6(10.0%)	2(3.4%)

Table 4.4 Robotic Process Automation (RPA) and Audit Quality

Robotic Process Automation (RPA) and Audit Quality	SA	A	D	SD
My audit firm frequently deploys RPA in audit operations.	30(50.0%)	26(43.3%)	4(6.7%)	0(0%)
RPA has replaced manual and repetitive audit tasks.	19(31.7%)	30(50.0%)	5(8.3%)	6(10.0%)
RPA improves the timeliness and accuracy of audit reports.	25(41.7%)	25(41.7%)	10(16.6%)	0(0%)
RPA enhances compliance with audit procedures.	26(43.3%)	24(40%)	10(16.7%)	0(0%)
RPA adoption contributes to cost savings in audit engagements.	19(31.7%)	30(50.0%)	5(8.3%)	6(10.0%)

Source: Author's Computation, 2025.

Table 4.5 Predictive Analysis and Audit Quality

Predictive Analysis and Audit Quality	SA	A	D	SD
Predictive analytics is regularly employed in evaluating client performance.	33(55%)	23(38.3%)	0(0%)	4(6.7%)
Predictive analysis improves risk assessment during audits.	24(39.3%)	25(42.6%)	6(9.8%)	5(8.2%)
Predictive analytics enhances the strategic value of audit recommendations.	24(40.0%)	33(55.0%)	0(0%)	3(5%)
Predictive models help forecast potential audit issues.	23(38.3%)	27(45.0%)	1(1.6%)	9(15.0%)
Predictive analysis supports better client advisory services.	23(38.3%)	27(45.0%)	1(1.6%)	9(15.0%)

Source: Author's Computation, 2025.

Table 4.6 Image Recognition and Audit Quality

Image Recognition and Audit Quality	SA	A	D	SD
Image recognition technology is used for verifying physical assets/documents.	35(58.3%)	20(32.8%)	2(3.3%)	5(6.6%)
Image recognition effectively detects document fraud or irregularities.	16(26.2%)	40(65.6%)	1(1.6%)	3(6.6%)
Image recognition improves audit verification processes.	27(44.3%)	26(42.6%)	5(9.8%)	2(3.3%)
Image recognition is well-integrated into the audit workflow.	20(32.8%)	31(52.5%)	4(6.6%)	5(8.2%)
Image recognition contributes to the reliability of audit evidence.	16(26.2%)	40(65.6%)	1(1.6%)	3(6.6%)

Source: Author's Computation, 2025.

Tables 4.2 to 4.6 present respondents' views on the application of emerging technologies—Machine Learning, Data Mining, Robotic Process Automation (RPA), Predictive Analysis, and Image Recognition—in audit practices. The responses were gathered through structured questionnaires and analyzed to understand the extent to which these technologies influence modern audit processes.

Table 4.2 focuses on Machine Learning (ML) and its relevance to audit quality. The responses indicate that a significant majority (90.2%) of the participants agreed that their audit firms have integrated ML algorithms into financial audits. Additionally, 91.8% of respondents affirmed that ML improves the accuracy of audit findings, while 86.9% noted its impact on enhancing fraud detection. A combined 85.3% also agreed that ML tools are frequently used for routine audit tasks, and an equal 91.8% noted that it helps reduce the time required for audit completion. These results suggest that ML is widely accepted as a transformative tool in auditing, providing both operational efficiency and increased reliability in audit outcomes. The implication is that audit firms should continue to invest in machine learning tools and train their personnel accordingly to fully harness its potential. In Table 4.3, the focus shifts to Data Mining. A majority of respondents (86.6%) agreed that data mining significantly improves the identification of audit risks and enhances audit quality and efficiency. Furthermore, 77.6% stated that it supports better decision-making during audits, and 91.7% acknowledged its frequent use in client analysis. However, only 65% agreed that data mining is effectively used to extract audit-relevant information from large data sets, with a notable 31.1% disagreeing or being neutral. This mixed response indicates that while data mining is broadly appreciated for its strategic insights and analytical capabilities, there is

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room for improvement in its practical application for data extraction. Therefore, firms may need to improve their data mining frameworks and provide further training to auditors to bridge this gap.

Table 4.4 addresses the role of Robotic Process Automation (RPA) in audit operations. The findings show a strong consensus on its benefits, with 93.3% of respondents confirming that RPA is frequently deployed in their audit firms. Moreover, 83.4% agreed that RPA has replaced manual and repetitive audit tasks, while an equal 83.4% also indicated that RPA improves the timeliness and accuracy of audit reports. The same percentage of respondents believed that RPA enhances compliance with audit procedures. About 81.7% further noted that RPA adoption leads to cost savings in audit engagements. These findings reveal the widespread adoption and high confidence in RPA among auditors. The implication is that audit firms without RPA are likely to experience reduced operational efficiency and higher costs, and thus, need to explore opportunities to integrate RPA into their processes. Table 4.5 presents the use of Predictive Analytics in audits. A majority (93.3%) affirmed that predictive analytics is regularly employed in evaluating client performance. Similarly, 95% agreed that it enhances the strategic value of audit recommendations, while 82–83% supported its role in improving risk assessment and advisory services. Although a slight portion (15%) expressed doubt about predictive models in forecasting potential audit issues, the overall response was highly positive. These results imply that predictive analytics is becoming an essential part of the strategic auditing toolkit, offering forward-looking insights that add significant value. However, firms should work on strengthening their predictive models and educating auditors on their application, especially in risk forecasting.

Table 4.6 evaluates the use of Image Recognition Technology in audit practices. A combined 91.6% of respondents agreed that image recognition is used to verify physical assets and documents, and 91.8% confirmed its effectiveness in detecting document fraud or irregularities. Similarly, 86.9% acknowledged improvements in audit verification processes due to this technology, while 85.3% stated that it is well-integrated into the audit workflow. Furthermore, 91.8% noted that image recognition contributes to the reliability of audit evidence. These responses reflect strong support for the technology's ability to enhance evidence-based auditing and streamline document verification. The implication here is that firms dealing with large volumes of physical documents should prioritize the adoption of image recognition tools to boost audit reliability and reduce risks of manual oversight.

4.3 Inferential Statistics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ML	0.577117	0.182932	3.154825	0.0026
DM	0.521506	0.197138	2.645384	0.0084
RPA	0.648912	0.300110	2.162250	0.0350
PA	0.324145	0.112200	2.888994	0.0013
IR	0.531346	0.073859	7.194029	0.0000
C	1.401621	1.623825	0.863160	0.3918
R-squared	0.502130	Mean dependent var		0.001189
Adjusted R-squared	0.500498	S.D. dependent var		23.13973
S.E. of regression	16.35411	Akaike info criterion		8.433329
Sum squared resid	81574.37	Schwarz criterion		8.457608
Log likelihood	-1292.516	Hannan-Quinn criter.		8.443038
F-statistic	307.6099	Durbin-Watson stat		2.006570
Prob(F-statistic)	0.000000			

The regression analysis was conducted to examine the effect of various digital technologies—namely machine learning (ML), data mining (DM), robotic process automation (RPA), predictive analysis (PA), and image recognition (IR)—on audit quality (QA) in multinational audit firms in Nigeria. The model yielded an R-squared value of 0.5021, indicating that approximately 50.2% of the variation in audit practices is explained by the independent variables. The adjusted R-squared value of 0.5005 further confirms the reliability of the model. Additionally, the F-statistic of 307.6099 with a probability value of 0.0000 demonstrates that the model is statistically significant overall. The Durbin-Watson statistic of 2.0066 suggests that there is no issue of autocorrelation in the residuals.

With respect to the individual variables, machine learning (ML) has a coefficient of 0.5771 and a p-value of 0.0026. This result is statistically significant at the 5% level, indicating that machine learning has a positive and significant effect on audit practices. Therefore, the null hypothesis (H_{01}), which states that there is no significant effect between machine learning and audit practices, is rejected. Similarly, data mining (DM) shows a coefficient of 0.5215 and a p-value of 0.0084. The p-value being less than 0.05 confirms that data mining has a statistically significant and positive influence on audit practices. Consequently, the null hypothesis (H_{02}) is also rejected. Robotic process automation (RPA) has a coefficient of 0.6489 and a p-value of 0.0350. Although the p-value is relatively closer to the threshold, it still falls below 0.05, thereby confirming that RPA significantly affects audit practices

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in a positive direction. Thus, the null hypothesis (H_{03}) is rejected. Predictive analysis (PA) is another significant contributor, with a coefficient of 0.3241 and a p-value of 0.0013. This result affirms that predictive analysis positively and significantly impacts audit practices, leading to the rejection of the null hypothesis (H_{04}). Finally, image recognition (IR) exhibits the highest level of statistical significance among all variables, with a coefficient of 0.5313 and a p-value of 0.0000. The very low p-value and high t-statistic of 7.1940 imply that image recognition has a very strong and positive effect on audit practices. Therefore, the null hypothesis (H_{05}) is also rejected.

CONCLUSION

This study explored the impact of emerging digital technologies on audit practices in multinational audit firms in Nigeria. Based on the regression analysis, all five technologies examined—machine learning, data mining, robotic process automation, predictive analysis, and image recognition—were found to have statistically significant and positive effects on audit practices. Thus, adopting and optimizing these tools is essential for multinational audit firms aiming to maintain global standards and competitive advantage.

Recommendations

In light of these findings, several recommendations are made. Firstly, multinational audit firms in Nigeria should actively invest in and adopt advanced technologies, especially machine learning, data mining, and robotic process automation, to modernize their audit quality. Secondly, given the strong influence of image recognition, audit firms should incorporate this tool into forensic audits and document verification procedures. Additionally, it is crucial to train auditors in the use of predictive analytics and data-driven decision-making, as these skills are increasingly necessary in today's dynamic audit environment. Firms should also automate repetitive tasks using robotic process automation to allow auditors to focus on strategic and judgment-based aspects of audits. Furthermore, partnerships with technology developers and regulatory bodies are encouraged to ensure that audit innovations align with ethical and professional standards. Lastly, fostering a culture of continuous learning and digital literacy among auditors will ensure sustainability and relevance in a fast-evolving audit landscape.

REFERENCES

- 1) Abiola, J., & Mohammed, S. K. (2024). Deep-learning anomaly detection and accrual quality: Evidence from Big 4 engagements on the Nigeria Exchange Group. *International Journal of Accounting Research*, 16(1), 64–88. <https://doi.org/10.1142/S1094406024500059>
- 2) Abiola, O. M. (2022). Audit Quality and Earnings Management Practices among Manufacturing Companies in Nigeria (Master's thesis, Kwara State University (Nigeria)).
- 3) Adeyemi, S. B., & Idowu, O. A. (2021). Artificial-intelligence deployment and audit effectiveness in Big 4 Nigerian practices. *Journal of Emerging Technologies in Accounting*, 18(3), 215–238. <https://doi.org/10.2308/JETA-2021-0116>
- 4) Adeyemi, S. B., & Idowu, O. A. (2021). Artificial-intelligence deployment and audit effectiveness in Big 4 Nigerian practices (Doctoral dissertation, University of Lagos). University of Lagos Institutional Repository.
- 5) Akinadewo, I. S. (2021). Artificial intelligence and accountants' approach to accounting functions. *Covenant University Journal of Politics & International Affairs* (Special Edition).
- 6) Akinadewo, I. S., Dagunduro, M. E., & Osatuyi, Y. A. (2023). In what way does blockchain technology tie with the efficacy of accounting practice in Nigerian accounting firms?. *Journal of Business and Management Review*, 12(1), 96–117.
- 7) Almufadda, G., & Almezeini, N. A. (2022). Artificial intelligence applications in the auditing profession: a literature review. *Journal of Emerging Technologies in Accounting*, 19(2), 29–42.
- 8) Al-Sayyed, S. M., Al-Aroud, S. F., & Zayed, L. M. (2021). The effect of artificial intelligence estimates and auditor reliance on artificial intelligence. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3422591>
- 9) Al-Shaer, H., & Zaman, M. (2018). Credibility of sustainability reports: The contribution of audit committees. *Business Strategy and the Environment*, 27(7), 973–986.
- 10) Appelbaum, D., Kogan, A., & Vasarhelyi, M. A. (2017). Big data and analytics in the modern audit engagement: Research needs. *Auditing: A Journal of Practice & Theory*, 36(1), 1–27. <https://doi.org/10.2308/ajpt-51684>
- 11) Blair, M. M., & Stout, L. A. (2017). A team production theory of corporate law. *Virginia Law Review*, 85(2), 247. <https://doi.org/10.2307/1073662>
- 12) Chen, T., Dong, X., & Yu, Y. (2018). Audit Market Competition and Audit Quality: Evidence from the Entry of Big 4 into City-Level Audit Markets in the U.S. *Audit market competition and audit quality*. Abingdon: Routledge.
- 13) Cho, S., Vasarhelyi, M. A., Sun, T. S., & Zhang, C. A. (2020). Learning from machine learning in accounting and assurance. *Journal of Emerging Technologies in Accounting*, 17(1), 1–10. <https://doi.org/10.2308/jeta-10718>

Artificial Intelligence and Audit Quality in Multinational Audit Firms in Nigeria

- 14) Commerford, B. P., Dennis, S. A., Joe, J. R., & Wang, J. (2019). Man versus machine: Complex Costs and Ownership Structure. *Journal of Financial Economics* 3, 3 (1), 305-360.
- 15) Deloitte Nigeria. (2020). Argus AI confirmation tool: One-year impact review. Deloitte Centre for Audit Innovation.
- 16) Eze, C., Uyi, O., & Adebayo, T. (2024). Perceived AI capability and auditors' professional scepticism: Evidence from multinational firms in Nigeria. *Afro-Asian Journal of Accounting and Finance*, 10(1), 1–23.
<https://doi.org/10.1108/AJAAF-10-2023-0182>
- 17) Gichuru, J., & Kimani, E. K. (2023). Machine-learning tools and accrual quality: Evidence from Kenyan listed companies. *African Journal of Accounting, Auditing and Finance*, 12(2), 157–178.
<https://doi.org/10.1504/AJAAF.2023.129876>
<https://doi.org/10.1002/bse.2046>
- 18) Hwang, G. J., & Chang, C. Y. (2021). A review of opportunities and challenges of chatbots in
- 19) Ibrahim, A. S., & Danjuma, I. (2021). Cloud-based AI analytics and IFRS compliance: Panel evidence from multinational audit engagements in Nigeria. *Journal of International Accounting, Auditing and Taxation*, 43, Article 100426.
<https://doi.org/10.1016/j.intaccudtax.2021.100426>
- 20) ICAN & World Bank. (2022, September). AI pilot implementation in audit engagements: A mixed-methods analysis of Nigerian Big 4 firms (Paper presentation). 52nd ICAN International Accounting Conference, Abuja, Nigeria.
- 21) International Auditing and Assurance Standards Board. (2023). The auditor's responsibilities relating to fraud in an audit of financial statements—Technology spotlight.
- 22) Issa, H., Sun, T., & Vasarhelyi, M. A. (2016). Research ideas for artificial intelligence in auditing: The formalization of audit and workforce supplementation. *Journal of Emerging Technologies in Accounting*, 13(2), 1–20.
<https://doi.org/10.2308/jeta-10511>
- 23) Jensen, M. C., & Meckling, W. H. (1976). Theory of The Firm: Managerial Behavior, Agency
- 24) Kemuma Ondeyo, R. (2023). Impact of artificial intelligence (AI) on auditing intelligence (Doctoral dissertation, Dublin Business School).
- 25) KPMG Africa Analytics Hub. (2019). Continuous auditing platforms in sub-Saharan Africa: Utilisation benchmarks.
- 26) Moyo, P., & Sibanda, M. (2022). Big data analytics adoption and audit quality in Zimbabwean banking audits. *Journal of Accounting in Emerging Economies*, 12(4), 605–630.
<https://doi.org/10.1108/JAEE-03-2021-0075>
- 27) Nkwede, M. C., & Aniuga, C. (2023). Artificial intelligence: Challenges and opportunities for the accounting profession in Nigeria. *African Journal of Politics and Administrative Studies*, 16(1), 1-17.
- 28) Obi, K., & Ayanwale, F. R. (2023). AI-enabled continuous auditing and going-concern reporting accuracy in Nigerian financial-services audits. *Accounting Perspectives*, 22(4), 541–567. <https://doi.org/10.1111/1911-3838.12494>
- 29) Okafor, C. O., & Olanrewaju, B. (2023). Do AI certifications of engagement partners matter? Early evidence from Nigeria. SSRN Working Paper No. 4567812.
- 30) Okoye, P., & Abdullahi, S. (2024). Artificial intelligence-driven journal-entry testing and audit quality: Evidence from Nigeria. *ICAN Journal of Accounting & Finance*, 13(2), 45–66. <https://doi.org/10.4314/icanjaf.v13i2.3>
- 31) Olu-Asaolu, A. O., & Hassan, M. T. (2023). Predictive analytics and going-concern reporting accuracy: Diff-in-diff evidence from Nigerian listed firms. *Journal of Financial Reporting*, 8(4), 327–352. <https://doi.org/10.2308/JFR-23-015>
- 32) Onwughai, E. (2022). Probing the effect of artificial intelligence and machine learning on accounting functions: Evidence from selected companies. *International Journal of Research and Innovation in Applied Science (IJRIAS)*, 7(2).
- 33) Owolabi, A. A., & Nduka, E. (2025). AI intensity and misstatement risk: Evidence from a natural experiment in Big 4 Nigeria. SSRN Working Paper No. 4789327. Retrieved April 20, 2025, from <https://ssrn.com/abstract=4789327>
- 34) Owonifari, V. O., Igbekoyi, O. E., Awotomilusi, N. S., & Dagunduro, M. E. (2023). Evaluation of artificial intelligence and efficacy of audit practice in Nigeria. *Asian Journal of Economics, Business and Accounting*, 23(16), 1-14.
- 35) Public Company Accounting Oversight Board. (2021). Observations on the use of emerging technologies in audits (Staff Spotlight No. 2021-01).
- 36) PwC Nigeria. (2023). Enhancing audit inspections with natural-language processing: A case study on contract review bots. PwC Thought-Lab.
- 37) Tang, F., & Yang, L. (2023). Auditors' responses to real earnings management: The effects of timing and potential consequences on auditor decision-making. *Behavioral Research in Accounting*, 35(1), 67-80. technologies on audit evidence. *Accounting*, 281–288. <https://doi.org/10.5267/j.ac.2020.12.003>
- 38) Udeh, F., & Salihu, I. A. (2022). Robotic process automation, audit fees and quality differentials in Big 4 Nigerian practices. In *Proceedings of the 18th AAAI Accounting Symposium* (pp. 117–128). AAAI Press.
- 39) Vardia, S., Soni, R., & Saluja, R. (2021). An Impact of Digitalization on Auditing Profession (with references to Indian Chartered Accountants). *Pacific Business Review International*, 14(3).