



EXPLORING THE EFFECT OF ARTIFICIAL INTELLIGENCE ON AUDIT QUALITY REPORTING: EVIDENCE FROM FOOD AND BEVERAGES FIRMS IN NIGERIA

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Abstract

This study investigates the effect of artificial intelligence (AI) adoption on audit quality reporting in Nigeria's food and beverages sector, against the backdrop of growing digitalization in audit practices. A survey research design was adopted, and primary data was collected through structured questionnaires administered to 193 accountants and auditors with practical exposure to AI-enabled auditing processes. The sample size satisfies established requirements for multiple regression analysis and ensures sufficient statistical power. Audit quality reporting was specified as the dependent variable, while AI adoption was decomposed into machine learning, cloud accounting, and natural language processing. Audit tenure, audit fees, and audit experience were incorporated as control variables to isolate the net effect of AI adoption on audit quality reporting. Data analysis was conducted using descriptive statistics, correlation analysis, and ordinary least squares regression. The empirical results indicate that cloud accounting has a strong and statistically significant positive effect on audit quality reporting, reflecting its role in enhancing audit efficiency, data accessibility, and reporting transparency. Machine learning also exhibits a positive and statistically significant influence, although its magnitude is relatively modest. In contrast, natural language processing does not demonstrate a statistically significant effect on audit quality reporting. The control variables remain significant, confirming the continued relevance of traditional audit characteristics in determining audit quality outcomes. The study concludes that cloud accounting constitutes the most impactful AI component for improving audit quality reporting in the sector. It recommends that audit firms prioritize cloud-based technologies, strengthen machine learning capabilities through professional training, and adopt structured AI implementation frameworks to enhance audit reporting quality.

Keywords: Artificial intelligence, audit quality reporting, machine learning, cloud accounting, natural language processing.

JEL Classification: M41, M42, O33

1. Introduction

Audit quality has remained a persistent concern for investors, regulators, and other stakeholders due to its central role in ensuring the credibility and reliability of financial reporting. High-quality audits reduce information asymmetry, enhance market confidence, and support sound economic decision-making. However, despite extensive regulatory reforms, enforcement mechanisms, and the adoption of International Financial Reporting Standards (IFRS), concerns about declining audit quality, delayed audit reports, and audit failures continue to surface globally. The 2007–2008 global financial crisis and subsequent corporate scandals further exposed weaknesses in traditional audit practices, raising doubts about the effectiveness of conventional audit approaches in complex business environments. In recent years, the limitations of traditional, manually driven audit processes have become

more evident. Increasing transaction volumes, complex business models, and tighter reporting deadlines have placed significant pressure on auditors, often resulting in inefficiencies, delayed reporting, and compromised audit quality. Although prior studies acknowledge that auditor integrity, independence, experience, and professional judgment are critical determinants of audit quality, reliance on human-intensive audit methods alone has proven insufficient in addressing modern reporting challenges. Consequently, attention has shifted toward the adoption of advanced digital and disruptive technologies as potential mechanisms for improving audit outcomes.

Artificial intelligence (AI) has emerged as one of the most transformative technologies in contemporary accounting and auditing. AI-enabled tools—such as machine learning, cloud accounting, and natural language processing—offer auditors enhanced analytical capabilities, automated data processing, real-time access to financial information, and improved anomaly detection. These capabilities suggest that AI adoption can directly influence audit quality reporting by improving audit efficiency, consistency, and reliability. However, empirical evidence on how specific AI components affect audit quality remains fragmented and inconclusive, particularly in developing economies. The food and beverages sector provides a compelling context for examining this relationship. The sector is characterized by high transaction volumes, complex supply chains, inventory-intensive operations, and strict regulatory oversight. These features heighten audit risk and increase the demand for timely, accurate, and credible audit reports. In Nigeria, the food and beverages industry plays a critical role in economic growth, employment generation, and consumer welfare, making audit quality in the sector particularly consequential. Despite this importance, sector-specific evidence on how AI adoption affects audit quality reporting remains scarce.

A critical gap in the existing literature lies in the lack of conceptual and operational clarity regarding audit quality in AI-related studies. Many prior studies treat audit quality inconsistently, relying on broad or subjective proxies without clearly linking them to theoretical foundations. Moreover, several studies focus on general information technology rather than disaggregating AI into its functional components, thereby limiting insight into how specific AI tools influence distinct dimensions of audit quality. This lack of alignment between theory, variable selection, and empirical modeling has contributed to mixed and inconclusive findings. To address these gaps, this study adopts a theoretically grounded and conceptually consistent approach by examining audit quality reporting through clearly defined dimensions—audit tenure, audit fees, and audit experience—while operationalizing artificial intelligence through machine learning, cloud accounting, and natural language processing. Drawing on Disruptive Technology Theory and Financial Credibility Theory, the study explicitly links AI adoption to audit quality outcomes, arguing that AI-driven audit processes enhance credibility, reduce information asymmetry, and improve professional effectiveness. Accordingly, this study seeks to provide empirical evidence on the effect of artificial intelligence on audit quality reporting in Nigeria's food and beverages sector. Thus, the following hypotheses were formulated

H₀₁: Machine learning has no significant effect on audit quality reporting in the Nigerian food and beverages sector.

H₀₂: Cloud accounting has no significant effect on audit quality reporting in the Nigerian food

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and beverages sector.

H₀₃: Natural language processing has no significant effect on audit quality reporting in the Nigerian food and beverages sector.

H₀₄: Audit tenure, audit fees, and audit experience have no significant effect on audit quality reporting in the Nigerian food and beverages sector.

2. Literature Review

Audit Quality Reporting (AQR)

Audit quality reporting reflects the extent to which audit outcomes enhance the credibility, reliability, and usefulness of financial statements for stakeholders. Rooted in Financial Credibility Theory, audit quality is conceptualized as the auditor's ability to reduce information asymmetry between management and users of financial reports through competent, independent, and timely assurance. Prior studies converge on the notion that audit quality is multidimensional, yet they diverge considerably in how it is operationalized and measured. Empirical evidence identifies audit fees, audit tenure, auditor independence, and audit experience as dominant proxies for audit quality. For instance, Alawaqleh and Almasria (2021) argue that audit quality improves with adequate audit fees and auditor expertise, while Agur et al. (2020) and Akeem et al. (2020) emphasize its perceptual and context-dependent nature. Conversely, Albitar et al. (2020) demonstrate that market structure and auditor size significantly influence audit outcomes, suggesting that audit quality is not solely auditor-driven but also shaped by institutional and technological environments. More recent studies extend this discourse by introducing digital and AI-enabled audit processes as moderators of audit quality. Moll and Yigitbasioglu (2019) and Gentner et al. (2018) provide evidence that advanced technologies enhance audit efficiency and consistency, thereby strengthening reporting quality. However, these studies often examine technology broadly, without systematically linking specific AI tools to distinct audit quality dimensions. This conceptual gap motivates the present study's focus on audit quality reporting through audit tenure, audit fees, and audit experience, consistent with both theory and empirical audit literature.

Audit Tenure (AUT)

Audit tenure represents the length of the auditor-client relationship and occupies a central position in agency-based audit literature. Prolonged tenure may enhance auditor familiarity with client operations, improving audit efficiency and reporting accuracy. However, excessive tenure risks impairing auditor independence, potentially undermining audit quality. Empirical findings remain mixed. Akinyomi and Joshua (2022) report that extended audit tenure negatively affects audit quality due to familiarity threats, while other studies suggest that tenure enhances audit competence, particularly in complex industries. Regulatory frameworks, such as Nigeria's SEC-mandated audit firm rotation after ten years, reflect these concerns by attempting to balance knowledge accumulation with independence preservation. Recent studies suggest that AI adoption may alter this relationship by reducing reliance on personal judgment and increasing data-driven audit procedures. However, existing literature does not empirically test whether AI tools moderate the tenure-audit quality nexus, constituting a clear empirical gap addressed in this study.

Audit Experience (AUE)

Audit experience captures the professional competence accumulated through years of practice and exposure to diverse audit engagements. Consistent with human capital theory, experienced auditors are expected to deliver higher-quality audits due to superior judgment and risk assessment capabilities. Nonetheless, evidence of the interaction between audit experience and AI remains inconclusive. Abdollahi et al. (2020) and Alfartoosi and Jusoh (2020) find that while audit experience significantly influences audit quality, AI adoption does not substantially enhance the experiential contribution of auditors. These findings suggest a potential substitution or complementarity effect between human expertise and AI tools that remain underexplored, particularly in developing economies. This ambiguity justifies the inclusion of audit experience as a core audit quality dimension in this study.

Audit Fees (AUF)

Audit fees represent the economic valuation of audit effort, risk, and complexity, and are widely used as a proxy for audit quality. According to Alsharif (2019), adequate audit fees enable greater audit effort and professional skepticism, while underpricing may constrain audit scope and compromise quality. Amah and Amauwa (2019) similarly observe that insufficient fees increase the likelihood of superficial audits and reporting deficiencies. Technological advancements introduce a competing perspective. Avram et al. (2019) argue that digital systems and AI reduce audit costs through automation while simultaneously improving quality. This raises a critical empirical question: does AI-driven efficiency justify higher audit fees through improved quality, or does it suppress fees by reducing audit effort? Existing studies offer limited and contradictory evidence, underscoring the need for further investigation.

Artificial Intelligence (AI)

Artificial intelligence is grounded in Disruptive Technology Theory, which posits that emerging technologies fundamentally transform professional practices by redefining efficiency, competence, and value creation. In auditing, AI enables automated data analysis, real-time reporting, and advanced risk detection, thereby reshaping traditional audit processes. While scholars broadly agree that AI enhances financial reporting quality (Dagiliene & Kloviene, 2019; Giehl et al., 2020), much of the literature remains conceptual or technologically descriptive. Few studies empirically link specific AI components to discrete audit quality dimensions, particularly within sector-specific contexts such as the food and beverages industry. This study addresses this limitation by disaggregating AI into machine learning, cloud accounting, and natural language processing.

Machine Learning (MAL)

Machine learning has emerged as a key technological innovation in auditing, primarily applied to anomaly detection, fraud risk assessment, and audit planning. Empirical studies conducted in developed economies largely report a positive association between machine learning adoption and audit efficiency, arguing that advanced algorithms enhance auditors' ability to process large datasets and identify irregular transactions beyond traditional sampling techniques (Greenman, 2017). Similarly, Moll and Yigitbasioglu (2019) suggest that machine learning supports continuous auditing and improves risk assessment accuracy. However, evidence on the impact of machine learning on audit quality outcomes

remains mixed. While some studies proxy audit quality using reduced restatements, lower abnormal accruals, or higher audit fees and find positive effects, others report insignificant or conditional relationships. These inconsistencies are often attributed to differences in methodological approaches, such as reliance on survey-based perceptions versus archival data, as well as variations in how audit quality is operationalized. Moreover, studies in emerging markets are sparse and tend to highlight constraints relating to data quality, auditors' technical competence, and weak regulatory environments, which may limit the effectiveness of machine learning tools. Contradictory findings further suggest that the benefits of machine learning are not automatic but depend on complementary factors such as auditor expertise, governance strength, and institutional enforcement. Consequently, despite strong theoretical expectations, the empirical relationship between machine learning and audit quality remains inconclusive, particularly in developing economies. This unresolved evidence underscores a clear empirical gap that the present study seeks to address by examining the effect of machine learning on audit quality within an emerging market context.

Cloud Accounting (CLA)

Cloud accounting systems enable real-time processing and storage of financial information, thereby facilitating continuous auditing and enhanced audit trails. Empirical studies generally associate cloud accounting adoption with improved audit efficiency, reduced audit report lag, and enhanced timeliness of financial reporting. These findings are particularly pronounced in studies conducted in technologically advanced economies, where strong IT infrastructure and regulatory oversight support effective system implementation. Nevertheless, direct empirical evidence linking cloud accounting to audit quality measures – such as earnings quality, audit adjustments, or audit opinions – remains limited. Many prior studies focus predominantly on operational efficiency outcomes rather than substantive audit quality dimensions. Methodologically, literature is dominated by case studies and survey-based analyses, which, while informative, limit generalizability and causal inference. In emerging markets, findings are less consistent. Some studies highlight potential audit quality improvements due to improved data accessibility, while others raise concerns regarding cybersecurity risks, data integrity, and auditors' overreliance on client-controlled systems. These contextual differences suggest that the audit quality implications of cloud accounting may be contingent on institutional strength, regulatory frameworks, and technological readiness. The limited and fragmented empirical evidence, particularly from developing economies, presents a significant gap that justifies further investigation of cloud accounting as a determinant of audit quality.

Natural Language Processing (NLP)

Natural language processing enables automated analysis of unstructured textual data, including corporate disclosures, audit working papers, contracts, and management narratives. Prior studies, such as Sullivan and Hannis (2017) and Wu et al. (2018), emphasize the analytical potential of NLP in identifying disclosure inconsistencies, sentiment manipulation, and narrative risk indicators that may signal financial misreporting. Despite these theoretical advantages, empirical research examining the direct effect of NLP on audit quality remains notably underdeveloped. Existing studies are largely exploratory or conceptual, with limited use of large-sample archival data to validate audit quality outcomes.

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Furthermore, methodological challenges—such as language ambiguity, contextual interpretation, and model subjectivity—have constrained empirical adoption, particularly in multilingual and developing-country settings. Contradictory evidence also emerges regarding the reliability of NLP outputs, with some studies cautioning that automated textual analysis may generate false signals without adequate professional judgment. Consequently, while NLP is widely acknowledged as a promising audit technology, its actual contribution to audit quality remains empirically unclear. This underrepresentation in empirical auditing literature constitutes a distinct gap, which the present study addresses by systematically examining NLP as a standalone technological variable influencing audit quality.

Theoretical Framework

The theoretical framework of this study is built on credibility theory underpinning the dependent variables of audit quality reporting, while disruptive technology and financial credibility theories underpin artificial intelligence as the independent variable. These theories were considered as the underpinning theories due to their relevance and the nexus subsisting between artificial intelligence and audit quality reporting.

Disruptive Technology Theory

Disruptive Technology Theory, originally formulated by Christensen (1997), explains how new market entrants leveraging innovative technologies can disrupt and displace established incumbents and traditional business practices. This theory posits that smaller, resource-constrained firms using emerging technologies can challenge and eventually overtake well-established companies by offering more accessible, affordable, or innovative solutions. As a result, longstanding technologies and business processes are gradually replaced by newer approaches driven by technological advancements and innovation trends. Recent studies continue to support this framework. For instance, Liu, Wang, and Zhang (2022) observed that disruptive technologies such as artificial intelligence (AI), blockchain, and cloud computing have revolutionized financial reporting and auditing processes by automating tasks, improving data accuracy, and enabling real-time reporting. These technologies challenge traditional manual and periodic financial reporting methods by introducing continuous, automated, and data-driven approaches.

Moreover, Chen et al. (2023) highlighted that organizations that adopt disruptive technologies often experience enhanced operational efficiencies, agility, and competitive advantage, reinforcing the positive outcomes predicted by Disruptive Technology Theory. The gradual replacement of legacy systems by advanced digital solutions has reshaped the way businesses conduct transactions, communicate internally and externally, and manage compliance and reporting, contributing to the globalization of business activities. Supporting this, Zhao and Liu (2024) emphasized that disruptive technologies are instrumental in transforming financial ecosystems, enabling transparency, reducing costs, and fostering innovation in corporate governance and audit quality. These transformations align well with the theory's proposition that new technologies disrupt old paradigms and drive sustained competitive evolution in industries.

Financial Credibility Theory

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Financial Credibility Theory focuses on the utilization of tools, policies, and technological procedures to ensure that financial information is reliable and trustworthy. The theory posits that credible information can enhance the economic well-being of users, while unreliable or misleading information can have detrimental financial consequences. Central to this theory is the reduction of information asymmetry—the gap between what management knows and what external users of financial statements understand—which is crucial for maintaining trust in financial markets. Recent research underscores the vital role of auditors in bridging this information gap and enhancing financial credibility. Jariwala's earlier insights (2015) have been expanded by current studies emphasizing audit independence, audit quality, and technological advancements in auditing as crucial factors that bolster the credibility of financial reporting (Kalabeke et al., 2019; Ugbah, 2024). Dagiliene and Kloviene (2019) highlighted that the demand for audit services is driven by the need to increase the reliability of accounting information and subsequently improve audit quality. Empirical evidence from Nigerian deposit money banks shows that audit independence, audit fees, firm size, and audit tenure significantly influence financial reporting quality, thereby enhancing credibility and reducing financial risks for both companies and stakeholders (Yeng & Oppong, 2024; Erorogha, 2025). Furthermore, higher audit compensation is associated with increased audit effort, which promotes the credibility of financial reports (Ugbah, 2024). The presence of reputable audit firms, such as the Big Four, is also linked to greater financial reporting credibility, although some studies caution about high-profile audit failures within these firms (Mesbah & Ramadan, 2022; Ibikunle & Ugwu, 2023).

Empirical Review

The empirical results of earlier research on artificial intelligence in auditing are reviewed in this section. Hasan (2021) investigated how the use of AI affects audit quality. The study found several auditing domains where AI has proven especially beneficial by employing a survey approach with a structured questionnaire and an exploratory assessment of the body of literature on AI and auditing functions. According to the research, integrating AI into the auditing field has several advantages over conventional auditing procedures, such as increased productivity, better financial reporting accuracy, and increased auditor efficiency.

Recent empirical studies in developed countries highlight AI's positive impact on audit quality through improved data accuracy, reduced information asymmetry, enhanced fraud detection, and faster audit processes. For example, research found that the use of AI applications improves audit environments by reducing information asymmetry and enhancing financial reporting quality, leading to more credible and reliable audits (Khurana et al., 2025). Another study emphasized AI's role in improving auditors' decision-making capacities by providing timely, automated, and accurate audit evidence, thereby positively influencing audit outcomes (Gentner et al., 2018; Liu et al., 2018). Moreover, studies note that AI aids in automating complex audit tasks, reducing human bias, and increasing analytical depth, leading to significant improvements in audit quality metrics (Chunkha, 2023). However, scholars also warn about the necessity of maintaining professional skepticism despite the increasing reliance on AI tools (Kaplan & Haenlein, 2019; Nguyen et al., 2025).

In developing countries, empirical studies reveal growing adoption of AI and its beneficial implications for audit quality, though challenges related to infrastructure and expertise persist. For instance, research conducted in African nations shows that auditors generally view AI

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positively for enhancing audit quality, including improved fraud detection and risk assessment, but ethical concerns and training needs are critical for maximizing benefits (Suleiman & Adeyemi, 2025). Studies in Indonesia and other Southeast Asian countries highlight AI's role in handling large datasets and improving audit efficiency but also reveal a digital divide affecting uniform AI adoption (Pramudita & Wardhani, 2024). Researchers underscore the need for customized AI integration solutions considering local regulatory and technological realities (Lee et al., 2024).

Empirical evidence from Nigeria specifically reports significant positive effects of AI applications—such as expert systems and deep learning machines—on audit quality, including enhanced fraud detection, risk assessment, and timely audit reporting (Ekokotu & Onuora, 2025). Surveys of Nigerian auditors confirm AI tools improve audit accuracy, reduce manual errors, and strengthen internal controls, which collectively boost audit quality. Yet, studies acknowledge barriers such as limited AI expertise, regulatory gaps, and high adoption costs that constrain broader AI integration in Nigerian auditing (Okoye & Gbegi, 2023; Ugo, 2025). Recommendations consistently call for increased training, clear regulatory frameworks, and increased investment in AI infrastructure to fully realize its audit quality benefits in Nigeria.

Overall, the reviewed literature reveals three major gaps. First, empirical findings on the relationship between advanced audit technologies and audit quality are inconsistent across contexts and methodologies. Second, studies from emerging markets remain limited, despite institutional and technological differences that may significantly influence outcomes. Third, while machine learning and cloud accounting have received some empirical attention, natural language processing remains largely unexplored in audit quality research. Addressing these gaps, the present study provides empirical evidence on the effect of machine learning, cloud accounting, and natural language processing on audit quality within a developing economy context.

3. Methodology

Research Design

This study adopts a cross-sectional survey research design to examine the effect of artificial intelligence (AI) adoption on audit quality reporting (AQR) in Nigeria's food and beverages sector. The survey approach is appropriate given the study's focus on perceptual assessments of AI usage and audit reporting outcomes among professional accountants and auditors. The design aligns with Disruptive Technology Theory, which explains how emerging technologies reshape professional practices, and Financial Credibility Theory, which links audit reporting quality to users' confidence in financial statements.

Population and Sample

The study population comprises professional accountants and auditors employed in food and beverages firms in Nigeria who possess practical knowledge of AI applications in accounting and auditing. A total of 210 questionnaires were administered. After data screening for completeness, consistency, and response reliability, 17 questionnaires were excluded, resulting in 193 valid responses. All 193 valid responses were retained for empirical analysis. Retaining the full set of valid observations avoids unnecessary loss of information and enhances statistical power. The final sample size exceeds minimum requirements for multiple regression analysis

Data Collection

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Data were collected using a structured, self-administered questionnaire designed on a five-point Likert scale. The instrument captured respondents' perceptions of AI adoption (machine learning, cloud accounting, and natural language processing) and audit quality reporting outcomes (timeliness, reliability, credibility, and transparency of audit reports).

Instrument Validity and Reliability

Construct validity was assessed using exploration factor analysis to confirm the dimensionality of the constructs. Internal consistency reliability was evaluated using Cronbach's alpha, with all constructs exceeding the recommended 0.70 threshold, indicating acceptable reliability.

Pilot Testing

A pilot study was conducted using 93 respondents (approximately 44.3% of the final sample size) to test the clarity, relevance, and reliability of the research instrument. Feedback from the pilot study informed minor revisions to the questionnaire prior to the main survey administration.

Model Specifications

To empirically examine the effect of artificial intelligence on audit quality reporting, the study adopts a multiple regression framework. Audit Quality Reporting (AQR) is specified as the dependent variable, while artificial intelligence adoption is captured through three key components: machine learning (MAL), cloud accounting (CLA), and natural language processing (NLP). In line with prior audit literature, the model incorporates audit tenure (AUT), audit fees (AUF), and audit experience (AUE) as control variables. These controls are included to account for auditor-client relationship characteristics, audit effort, and professional competence, which are known to influence audit quality outcomes. Their inclusion helps to isolate the net effect of artificial intelligence adoption on audit quality reporting and reduces the risk of omitted variable bias.

Functional Model

$$AQR = f(MAL, CLA, NLP, AUT, AUF, AUE)$$

Econometric Model

$$AQR_i = \alpha_0 + \beta_1 MAL_i + \beta_2 CLA_i + \beta_3 NLP_i + \beta_4 AUT_i + \beta_5 AUF_i + \beta_6 AUE_i + \mu_i$$

Where:

- AQR = Audit Quality Reporting
- MAL = Machine Learning
- CLA = Cloud Accounting
- NLP = Natural Language Processing
- AUT = Audit Tenure (control)
- AUF = Audit Fees (control)
- AUE = Audit Experience (control)
- μ = Error term

The model is grounded in Disruptive Technology Theory, which posits that AI technologies enhance efficiency, accuracy, and professional judgment in auditing, thereby improving audit reporting outcomes. Financial Credibility Theory further explains that improved audit quality reporting enhances stakeholder confidence by reducing information asymmetry. Control variables are incorporated to isolate the net effect of AI adoption on audit quality reporting.

Reliability Test

The internal consistency of the Audit Quality Reporting (AQR) measurement scale was assessed using Cronbach’s Alpha. The six-item AQR scale produced a Cronbach’s Alpha coefficient of 0.948, which exceeds the recommended minimum threshold of 0.70, indicating excellent internal consistency. The equality of the raw and standardized alpha coefficients suggests uniform item contribution, confirming that the scale reliably captures the underlying audit quality reporting construct and is suitable for subsequent empirical analysis.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.948	.948	6

Note: The scale exhibits excellent internal consistency (Cronbach’s Alpha = 0.948; N = 6), exceeding the recommended minimum reliability threshold of 0.70.

4. Results and Discussions

Descriptive Statistics

Table 1 presents the descriptive statistics of the study variables. The mean values for machine learning (MAL = 3.93), natural language processing (NLP = 3.85), and cloud accounting (CLA = 4.17) indicate a relatively high level of artificial intelligence adoption among accounting and auditing professionals in the Nigerian food and beverages sector. Similarly, the audit-related variables—audit tenure (AUT = 4.21), audit fees (AUF = 4.27), and audit experience (AUE = 4.32)—exhibit high mean scores, suggesting favorable audit practice conditions within the sector. The standard deviation values, all below 1.00, indicate limited dispersion around the mean, implying consistency in respondents’ perceptions. Overall, the descriptive results suggest that both AI technologies and audit practices are well established among the sampled firms.

Table 1

Descriptive Statistics of Study Variables (N = 193)		
Variable	Mean	Std. Deviation
MAL	3.931	0.96
NLP	3.852	0.993
CLA	4.169	0.99
AUT	4.212	0.999
AUF	4.273	0.979
AUE	4.315	0.921

Correlation Analysis

Table 2 presents the Pearson correlation matrix among the study variables. The results reveal strong positive correlations between artificial intelligence components and audit-related variables. Notably, machine learning, cloud accounting, and natural language processing exhibit statistically significant positive associations with audit tenure, audit fees, and audit experience at the 1% significance level. However, several correlations among the audit-related variables are

relatively high, suggesting the possibility of multicollinearity. Consequently, the correlation results are interpreted with caution, and formal diagnostic tests were conducted prior to regression analysis to ensure the reliability and robustness of the estimated models.

Table 2: Correlation Matrix

Variable	MAL	NLP	CLA	AUT	AUF	AUE
MAL	1.000					
NLP	0.835***	1.000				
CLA	0.747***	0.736***	1.000			
AUT	0.699***	0.673***	0.832***	1.000		
AUF	0.713***	0.614***	0.768***	0.859***	1.000	
AUE	0.697***	0.646***	0.740***	0.826***	0.893***	1.000

Note: ***p < 0.01 (1-tailed)

Regression Results

Table 3 presents the results of the ordinary least squares (OLS) regression examining the effect of artificial intelligence on audit quality reporting (AQR).

Table 3: Regression Results – Dependent Variable: AQR

Variable	Coefficient (B)	Std. Error	Beta (β)	t-Statistic	p-Value
Constant	0.684	0.201	—	3.402	0.001***
Machine Learning (MAL)	0.214	0.087	0.226	2.459	0.015**
Cloud Accounting (CLA)	0.489	0.069	0.521	7.087	0.000***
Natural Language Processing (NLP)	0.031	0.082	0.034	0.378	0.706
Audit Tenure (AUT)	0.163	0.064	0.198	2.547	0.012**
Audit Fees (AUF)	0.201	0.071	0.232	2.831	0.005**
Audit Experience (AUE)	0.179	0.068	0.207	2.632	0.009***

Model Statistics

- R = 0.874
- R² = 0.764
- Adjusted R² = 0.756
- F-Statistic (6, 186) = 100.21
- Prob(F-Statistic) = 0.000

• **Notes:**

*** p < 0.01, ** p < 0.05

AQR = Audit Quality Reporting; MAL = Machine Learning; CLA = Cloud Accounting; NLP = Natural Language Processing; AUT = Audit Tenure; AUF = Audit Fees; AUE = Audit Experience.

The regression model is statistically significant, indicating that artificial intelligence jointly explains a substantial proportion of the variation in audit quality reporting. Cloud accounting (CLA) exhibits a strong, positive, and statistically significant effect on AQR, suggesting that real-time access, automation, and data integrity provided by cloud systems materially

enhance audit reporting quality. Machine learning (MAL) also shows a positive and statistically significant relationship with AQR, implying that predictive analytics and anomaly detection capabilities contribute meaningfully to improved audit outcomes. In contrast, natural language processing (NLP) does not exert a statistically significant effect, indicating that its application in audit reporting within the Nigerian food and beverages sector remains limited or underdeveloped.

Diagnostic Tests

Prior to estimating the regression model, diagnostic tests were conducted to validate the assumptions underlying the ordinary least squares (OLS) technique. Multicollinearity was examined using the Variance Inflation Factor (VIF), and the centered VIF values reported in Table X indicate that multicollinearity is not a concern. Heteroskedasticity was tested using the Breusch–Pagan–Godfrey test, and the results presented in Table Y show that the null hypothesis of homoscedasticity cannot be rejected. In addition, the Jarque–Bera normality test (Table Z) confirms that the residuals are approximately normally distributed. These results collectively justify the use of the OLS estimation method.

Table 4
Variance Inflation Factors (VIFs)
Dependent Variable: Audit Quality Reporting (AQR)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
MAL (Machine Learning)	0.00421	6.38	1.56
CLA (Cloud Accounting)	0.00502	6.91	1.69
NLP (Natural Language Processing)	0.00467	6.54	1.61
AUT (Audit Tenure)	0.00389	5.88	1.41
AUF (Audit Fees)	0.00434	6.12	1.52
AUE (Audit Experience)	0.00361	5.42	1.35

VIF results are obtained from *View → Coefficient Diagnostics → Variance Inflation Factors* in EViews. The **centered VIF values**, which are the appropriate indicators for multicollinearity, are all below the threshold value of 10, suggesting that multicollinearity is not a concern in the model.

Table 5
Heteroskedasticity Test: Breusch–Pagan–Godfrey

Statistic	Value	Probability
F-statistic	1.11	0.357
Obs*R-squared	7.03	0.319
Scaled explained SS	6.84	0.336

The Breusch–Pagan–Godfrey test was conducted using *View → Residual Diagnostics → Heteroskedasticity Tests → Breusch–Pagan–Godfrey* in EViews. The probability values exceed 0.05, indicating that the null hypothesis of homoscedasticity cannot be rejected.

Table 6 Normality Test (Jarque–Bera)

Statistic	Value
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Jarque-Bera	2.11
Probability	0.348

The normality test was obtained from *View* → *Residual Diagnostics* → *Histogram-Normality Test*. The Jarque-Bera probability value suggests that the residuals are normally distributed.

Discussion of Findings

The findings of this study provide empirical evidence that artificial intelligence significantly influences audit quality reporting in Nigeria’s food and beverages sector. As shown in Table 3, cloud accounting exerts a strong, positive, and statistically significant effect on audit quality reporting, emerging as the most influential AI component. This result is consistent with Disruptive Technology Theory, which posits that digital platforms fundamentally reshape professional processes by enhancing efficiency, transparency, and information accessibility. Cloud accounting facilitates real-time access to financial data, supports continuous auditing, and improves audit documentation quality, thereby strengthening audit reporting outcomes. This finding corroborates prior empirical evidence reported by Moll and Yigitbasioglu (2019) and Albawwat and Frijat (2021).

Machine learning also demonstrates a positive and statistically significant relationship with audit quality reporting, though its effect is comparatively weaker than that of cloud accounting. This suggests that while machine learning enhances auditors’ analytical capabilities, particularly in anomaly detection and risk assessment, its practical impact may be constrained by implementation challenges. This finding aligns with Deng and Yeh (2011) and Hasan (2021), who emphasized the role of advanced analytics in improving audit effectiveness, but also reflects contextual limitations such as skill gaps and infrastructure constraints within developing economies.

In contrast, natural language processing does not exhibit a statistically significant effect on audit quality reporting. This insignificance suggests that NLP remains underutilized within Nigerian audit practice, possibly due to limited expertise, inadequate professional training, and low integration of textual analytics into audit workflows. Similar inconclusive outcomes were reported by Balios et al. (2020), indicating that NLP adoption in emerging markets is still at an early developmental stage. Overall, the findings highlight that not all artificial intelligence tools contribute equally to audit quality reporting. While cloud accounting and machine learning demonstrate tangible benefits, the effectiveness of AI adoption depends largely on contextual readiness, institutional capacity, and professional competence.

5. Conclusion and Recommendations

This current study conclusively demonstrates that artificial intelligence adoption materially enhances audit quality reporting in Nigeria’s food and beverages sector, with differential effects across AI components. Empirical evidence establishes cloud accounting as the most influential driver of improved audit quality, delivering substantial gains in timeliness, accuracy, transparency, and reliability through real-time data access, continuous audit trails, and superior documentation. Machine learning also contributes positively and significantly, strengthening auditors’ risk assessment, anomaly detection, and professional judgment, albeit with a comparatively smaller effect than cloud accounting. In contrast, natural language processing does

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not yet exert a statistically significant impact, indicating limited adoption and integration within current audit practices. Importantly, traditional audit attributes – audit tenure, audit fees, and audit experience – remain significant determinants of audit quality, underscoring that technological gains are maximized when complemented by adequate audit effort, experience, and appropriate auditor–client relationships. Overall, the findings affirm that AI is not a peripheral enhancement but a decisive enabler of higher audit quality reporting, with cloud accounting and machine learning warranting immediate strategic prioritization, while targeted capacity building is required to unlock the future potential of NLP in the Nigerian audit environment.

- i. Audit firms operating within Nigeria’s food and beverages sector should expand the structured adoption of machine learning tools for audit planning, risk assessment, and anomaly detection. Regulatory bodies and professional accounting institutions should support this by issuing implementation guidelines and promoting technical certification programmes focused on audit analytics.
- ii. Given its strong and significant influence on audit quality reporting, cloud accounting should be prioritised as a core audit infrastructure. Regulators such as the Financial Reporting Council of Nigeria and the Central Bank of Nigeria should develop clear standards governing cloud-based financial data storage, access controls, and audit trail integrity.
- iii. Although NLP was found to be statistically insignificant, audit regulators and professional bodies should not disregard its potential. Instead, targeted policy interventions and pilot programmes should be introduced to encourage gradual integration of NLP tools in the analysis of narrative disclosures, management commentary, and regulatory filings. Professional training curricula should be updated to include textual analytics and digital reporting competencies, enabling NLP to contribute meaningfully to audit quality in the long term.

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