Article

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DIGITAL FORENSICS, DATA ANALYTICS AND PUBLIC SECTOR AUDIT IN NIGERIA

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Abstract
The increasing complexities of financial transactions and the rise in fraudulent activities in Nigeria's public sector necessitate the integration of digital forensics and data analytics in public sector audits. Traditional auditing methods often fall short in identifying sophisticated fraudulent schemes, making it imperative to adopt advanced technological solutions. This study examines the role of digital forensic tools and data analytics in improving audit quality, detecting fraud, and enhancing accountability in Nigeria's public sector. By leveraging these technologies, auditors can analyze large datasets more efficiently, uncover hidden patterns, and detect anomalies indicative of financial misconduct. A structured questionnaire was designed and distributed to a diverse group of audit professionals, forensic accountants, and government financial officers to collect primary data. The study employed reliability and validity tests, including Cronbach's alpha and factor analysis, to ensure the consistency and robustness of the data. The statistical analysis involved descriptive statistics, regression analysis, and structural equation modeling (SEM) to assess the relationships among key variables. Findings from the study indicate that the adoption of digital forensics and data analytics significantly enhances fraud detection, promotes financial transparency, and strengthens overall public financial management. The study underscores the need for increased investment in digital forensic tools, comprehensive training programs for audit professionals, and stricter enforcement of audit regulations to curb fraudulent activities. Policymakers and government institutions must prioritize integrating these technological advancements into audit practices to safeguard public funds and improve financial accountability. Future research should explore emerging forensic techniques and their applicability in different sectors.

Keywords: Digital Forensics, Data Analytics, Public Sector Audit, Fraud Detection, Audit Quality.

Introduction

The public sector in Nigeria has been consistently plagued by financial mismanagement, fraud, and corruption, raising serious concerns about accountability and governance (Transparency International, 2023). According to the Nigerian Extractive Industries Transparency Initiative (NEITI, 2022), the country loses billions of dollars annually to corruption in public financial management. Traditional audit methodologies, which rely on manual verification and periodic reviews, have proven insufficient in addressing these systemic fraud schemes (Hilal et al, 2022). As fraudulent transactions become more sophisticated and technology-driven, there is a pressing need to integrate modern forensic auditing techniques to enhance transparency and accountability (Elumilade et al, 2021). Traditional audit techniques, including financial statement reviews and compliance-based assessments, often fail to detect fraudulent activities concealed through complex accounting manipulations (Halteh & Tiwari, 2023). The

limitations of these conventional approaches became evident in the recent Nigeria Social Investment Program (NSIP) financial mismanagement case, where auditors struggled to track misappropriated funds due to a lack of forensic tools (Worlu, 2024). Moreover, the growing reliance on digital transactions and electronic financial records has rendered manual audits ineffective in identifying hidden patterns of financial irregularities (Appelbaum et al, 2017).

Research shows that fraudsters leverage advanced digital tools such as AI-driven money laundering schemes, falsified financial records, and cyber fraud, making traditional audit techniques inadequate (Adeyemo & Obafemi, 2024). Without the ability to analyze large datasets and detect anomalies in real time, government auditors often uncover fraudulent activities only after significant financial losses have occurred (Bello et al, 2023). Digital forensics and data analytics have emerged as transformative tools in detecting and preventing financial fraud. Digital forensics involves the extraction, examination, and interpretation of electronic data, helping auditors uncover concealed transactions and unauthorized modifications in financial systems (Slonopas, 2024). This forensic approach is crucial in Nigeria, where government officials often alter digital financial records to obscure illicit activities (Ewa, 2022). Similarly, data analytics leverages advanced machine learning models and statistical techniques to identify irregular financial transactions (Bello et al., 2023). By utilizing big data and AI-driven algorithms, forensic auditors can analyze large volumes of financial data in real-time, reducing the risk of fraudulent activities going undetected (Onatuyeh et al, 2023). The application of predictive analytics in financial audits enables the identification of fraudulent patterns before they result in substantial financial losses (Singh et al, 2019).

Several government initiatives have demonstrated the potential of digital forensic tools in improving financial accountability. First of all, The Treasury Single Account (TSA) initiative has significantly reduced financial leakages by centralizing public revenue into a single account. Digital forensic tools have been used to track suspicious transactions and prevent unauthorized withdrawals (Kushnirenko & Kharatishvili, 2023). Secondly, under Integrated Payroll and Personnel Information System (IPPIS), digital analytics have been instrumental in detecting ghost workers and fraudulent payroll activities, saving the government billions in fraudulent salary payments (Ugada & Eze, 2024). Thirdly, the Nigerian Customs Service Digital Forensic Unit applies forensic auditing to identify import duty fraud and tax evasion schemes, enhancing revenue generation (Abdulkarim, 2023). Despite these successes, challenges remain, including insufficient forensic auditing expertise, lack of technological infrastructure, and resistance from corrupt public officials (Anakwue, 2024). Addressing these obstacles requires increased investment in training forensic auditors, strengthening legal frameworks, and ensuring government-wide adoption of forensic auditing techniques (Aliyu & Hussaini, 2024).

This study aims to examine how digital forensic tools and data analytics enhance public sector audits in Nigeria. It seeks to highlight the effectiveness of modern forensic techniques in detecting fraud, improving financial accountability, and strengthening governance structures (Raji et al., 2023). By collecting and analyzing primary data evidence, the research contributes to ongoing discussions on the adoption of forensic auditing in the Nigerian public sector.

Literature Review

Digital Forensics in Public Sector Auditing

Digital forensics has emerged as a pivotal component in public sector auditing, offering advanced methodologies to detect and prevent fraudulent activities. This discipline encompasses the systematic examination of electronic records, including forensic data recovery, network security analysis, and digital evidence authentication, to uncover illicit financial behaviors (Akinbi, 2023). The integration of digital forensics into auditing processes has been shown to enhance fraud

detection and bolster financial accountability (Babaniyi, 2024). Traditionally, forensic accounting relied heavily on manual data examination. However, with the rapid advancement of digital technologies, there has been a significant shift towards incorporating digital forensic techniques. This transition is crucial for addressing sophisticated financial crimes such as fraud, extortion, money laundering, and tax evasion (Fatima & Shabiany, 2024). The modern approach to forensic accounting now integrates investigative skills with digital forensics, enhancing fraud risk assessment and internal control systems (DePaul University, 2024).

The convergence of forensic accounting and digital forensics has led to more robust fraud detection mechanisms. Forensic accountants utilize digital forensic techniques to enhance fraud detection and investigation, thereby strengthening internal control systems. Advancements in artificial intelligence (AI), blockchain, and cloud computing have further bolstered these efforts, enabling real-time analysis of financial data to detect anomalies and enhance transaction security and transparency (Babaniyi, 2024).

The advent of AI and machine learning has revolutionized the field of digital forensics in auditing. These technologies facilitate the analysis of vast amounts of financial data, enabling the detection of patterns and anomalies indicative of fraudulent activities. For instance, machine learning algorithms can process complex datasets to identify irregularities that may not be apparent through traditional auditing methods (Wikipedia, 2023). Additionally, blockchain technology offers a decentralized and immutable ledger system, enhancing the security and transparency of financial transactions, which is crucial in forensic investigations (Demirkan et al., 2020). Despite the benefits, integrating digital forensics into public sector auditing presents challenges. These include the need for specialized skills, the complexity of analyzing large datasets, and the evolving nature of digital financial crimes. Moreover, ensuring the admissibility of digital evidence in legal proceedings requires adherence to stringent protocols and standards (Wikipedia, 2023).

In summary, the integration of digital forensics into public sector auditing represents a significant advancement in combating financial fraud. By leveraging technological innovations such as AI, blockchain, and data analytics, auditors can enhance their capabilities in detecting and preventing fraudulent activities. However, addressing the associated challenges necessitates ongoing investment in training, technological infrastructure, and the development of comprehensive legal frameworks to support the effective use of digital forensics in auditing.

Data Analytics in Fraud Detection

The rapid advancement of technology has transformed the landscape of fraud detection, particularly through the integration of data analytics. By leveraging artificial intelligence (AI), machine learning (ML), and big data techniques, organizations can analyze vast amounts of financial data to detect irregularities and predict fraudulent activities. This section delves into the empirical literature from 2019 to 2024, highlighting the key techniques—predictive analytics, anomaly detection, and risk assessment—used in forensic auditing. Predictive analytics involves using historical data to forecast potential future fraudulent activities. Machine learning models, such as logistic regression, decision trees, and neural networks, are commonly employed to identify patterns associated with fraud. For instance, a study by Isangediok and Gajamannage (2022) investigated various ML techniques for fraud detection under imbalanced classes, emphasizing the importance of optimizing these models to enhance precision and reduce false positives.

In the telecommunications sector, Pratihar et al. (2023) developed a self-adaptive data mining technique combined with big data technologies to detect fraud efficiently. Their approach demonstrated high accuracy in identifying fraudulent activities, showcasing the potential of predictive analytics in complex datasets.

Anomaly detection focuses on identifying deviations from established patterns, which may indicate fraudulent behavior. Unsupervised learning methods, such as clustering and outlier

detection algorithms, are often utilized in this context. For example, the Isolation Forest algorithm has been applied effectively to detect anomalies in credit card transactions, distinguishing fraudulent activities by identifying rare patterns that differ significantly from legitimate ones (Wikipedia, 2023). In the public sector, Novita and Anissa (2022) examined the role of data analytics in detecting fraud. Their findings suggest that the application of data analytics positively influences the identification of fraudulent activities, thereby enhancing the effectiveness of public sector audits.

Risk assessment involves evaluating the likelihood of fraudulent activities within an organization. Data analytics facilitates this process by analyzing historical data to identify risk factors and predict potential fraud. For instance, a study by Ayinla et al. (2024) explored the integration of data analytics in accounting fraud detection, highlighting its pivotal role in identifying and preventing fraudulent activities. Similarly, Jing et al. (2024) introduced a benchmark containing structured datasets designed for customer-level fraud detection. This resource enables comprehensive evaluation of machine learning models, facilitating a deeper understanding of their strengths and weaknesses in predicting fraudulent activities.

Despite the advancements in data analytics for fraud detection, several challenges persist. One significant issue is the imbalance in datasets, where fraudulent transactions are vastly outnumbered by legitimate ones. This imbalance can lead to models that are biased towards non-fraudulent cases, reducing their effectiveness. Techniques such as Synthetic Minority Over-Sampling Technique (SMOTE) and Generative Adversarial Networks (GAN) have been employed to address this issue by generating synthetic data to balance the datasets (Isangediok & Gajamannage, 2022).

Another challenge is the dynamic nature of fraudulent activities. Fraudsters continually adapt their methods, necessitating that fraud detection models be regularly updated to remain effective. The integration of streaming data analytics allows for real-time monitoring and detection, enabling organizations to respond promptly to emerging threats. For example, Vivek et al. (2023) proposed an ATM fraud detection system using streaming data analytics, demonstrating the efficacy of real-time fraud detection mechanisms.

The application of data analytics in fraud detection varies across different sectors. In the financial industry, AI-driven fraud detection systems have been developed to safeguard against fraudulent transactions. A comparative study by Pratihar et al. (2023) evaluated the efficacy, scalability, and adaptability of AI-based fraud detection mechanisms across financial, insurance, and healthcare sectors, highlighting the advancements in machine learning algorithms and anomaly detection techniques.

In the public sector, data analytics has been utilized to detect fraudulent activities within government institutions. For instance, a study by Novita and Anissa (2022) examined the effect of using data analytics on indications of fraud for public sector examiners in Indonesia, concluding that data analytics positively influences fraud detection in the public sector. The integration of advanced technologies such as AI and ML in data analytics is expected to further enhance fraud detection capabilities. Future research may focus on developing more sophisticated models that can adapt to evolving fraud patterns and integrating various data sources to improve detection accuracy. Additionally, addressing challenges related to data privacy and ethical considerations will be crucial in the continued advancement of data analytics in fraud detection.

Public Sector Audit and Accountability

Public sector audits are pivotal in ensuring financial discipline, optimizing resource utilization, and enforcing compliance with regulatory frameworks within governmental entities. In Nigeria, the effectiveness of these audits is often compromised by challenges such as weak internal controls, inadequate forensic tools, and pervasive corruption. This literature review delves into the role of public sector audits in promoting accountability and transparency, examines the inherent challenges within the Nigerian context, and explores empirical studies that shed light on these issues.

Public sector audits serve as mechanisms to uphold accountability and transparency in governmental operations. They provide independent assessments of financial statements, ensuring that public resources are managed in accordance with established laws and policies (Avortri et al., 2025). Through financial, performance, and compliance audits, these evaluations aim to detect inefficiencies, mismanagement, and potential fraud, thereby fostering trust among citizens and stakeholders (Agbata et al., 2022).

In the Nigerian context, the significance of public sector audits has been underscored by various studies. For instance, Appah et al. (2021) investigated the effects of public sector audits, good governance, and financial transparency on financial accountability within the Rivers State Civil Service. The study concluded that robust audit practices, coupled with good governance and transparency, significantly enhance financial accountability in the public sector. Other empirical studies have explored the dynamics of public sector audits and accountability. Boldbaatar et al. (2019) examined how improved resource governance through transparency impacts accountability. The findings suggested that enhancing transparency mechanisms leads to better governance outcomes, which is applicable to the Nigerian context. Egbunike and Egbunike (2017) conducted an empirical examination of challenges faced by internal auditors in Nigeria's public sector. They identified issues such as lack of independence and non-compliance with regulations as significant impediments to effective auditing. Appah et al. (2021), while investigating the effects of public sector audits, good governance, and financial transparency on financial accountability, concluded that these factors collectively promote accountability in Nigeria's public sector.

Chukwunedu (2011) explored the challenges of public sector audits as effective accountability tools in Public-Private Partnership (PPP) arrangements in Nigeria. The author identified inadequate independence of SAIs, poor accounting environments, and lack of executive capacity as major challenges. Agu et al (2024) examined the impact of public sector auditing in promoting accountability and transparency in Nigeria. The findings highlight that effective auditing practices are essential for reducing corruption and enhancing public trust. Olukoya (2024) published an investigative report which revealed that the Nigerian agency responsible for cleaning up oil pollution in the Niger Delta failed to achieve its objectives due to incompetence and corruption, underscoring the need for effective audit mechanisms. Furthermore, Edheku et al. (2022) examined the relationship between public sector audits and public financial management in Nigeria, emphasizing the role of audits in financial fraud control and enhancing internal control quality. In conclusion, public sector audits are indispensable for promoting accountability, transparency, and financial discipline within Nigeria's public sector. While challenges such as weak internal controls, inadequate forensic tools, and corruption persist, implementing the strategies outlined above can significantly enhance the effectiveness of public sector audits. It should be noted that all these empirical studies underscore the critical role of robust audit practices in strengthening governance and ensuring the optimal use of public resources.

Methodology

Research Design

This study employs a quantitative research design, deploying structured questionnaires to gather primary data from forensic accountants, auditors, and financial officers within Nigeria's public sector. This approach facilitates the collection of measurable and comparable data, enabling statistical analysis to identify patterns and relationships among variables. By focusing on professionals directly involved in financial oversight, the study aims to obtain insights into the effectiveness of forensic accounting practices and internal controls in fraud prevention. The structured questionnaire ensures uniformity in responses, enhancing the reliability and validity of the findings. Similar methodologies have been effectively utilized in previous research to assess the impact of forensic accounting on fraud detection in Nigeria's public sector.

Sample and Data Collection

In this study, a purposive sampling technique was employed to select 200 respondents. This non-probabilistic method involves deliberately choosing participants based on specific characteristics relevant to the research objectives, ensuring that the sample is information-rich and pertinent to the study's focus. The questionnaire administered (see Table 1) encompassed sections on digital forensic tools, data analytics applications, and audit effectiveness. These sections were designed to gather comprehensive insights into the utilization of technological tools in auditing processes and their impact on audit quality and efficiency.

Table 1
Questionnaire

S/N	Question	Response Scale
1	How frequently do you use digital forensic tools in auditing?	1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Frequently, 5 = Very Frequently
2	To what extent do you believe data analytics enhances fraud detection?	1 = No Impact, 2 = Low Impact, 3 = Moderate Impact, 4 = High Impact, 5 = Very High Impact
3	How effective are digital forensic tools in identifying financial irregularities?	1 = Not Effective, 2 = Slightly Effective, 3 = Moderately Effective, 4 = Effective, 5 = Highly Effective
4	To what extent does data analytics improve public sector audit quality?	1 = No Impact, 2 = Low Impact, 3 = Moderate Impact, 4 = High Impact, 5 = Very High Impact
5	How often does your organization invest in digital forensic technologies?	1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Often, 5 = Always
6	How well-trained are public sector auditors in using data analytics?	1 = Not Trained, 2 = Slightly Trained, 3 = Moderately Trained, 4 = Well-Trained, 5 = Highly Trained
7	What challenges hinder the adoption of digital forensics in public sector auditing?	Open-ended response
8	To what degree has digital forensics improved financial accountability?	1 = No Improvement, 2 = Slight Improvement, 3 = Moderate Improvement, 4 = Considerable Improvement, 5 = High Improvement
9	How reliable are forensic auditing tools in detecting financial fraud?	1 = Not Reliable, 2 = Slightly Reliable, 3 = Moderately Reliable, 4 = Reliable, 5 = Highly Reliable
10	How would you rate the impact of data analytics on audit efficiency?	1 = No Impact, 2 = Low Impact, 3 = Moderate Impact, 4 = High Impact, 5 = Very High Impact

Source: Field Survey, 2024.

Reliability and Validity Tests

Cronbach's alpha assesses internal consistency, indicating how closely related a set of items are as a group. An alpha value of 0.70 or higher is generally considered acceptable, reflecting sufficient internal consistency for basic research (Nunnally, 1978). Values above 0.80 are deemed good, while those above 0.90 may suggest redundancy among items. In addition, factor analysis was employed to assess construct validity, ensuring that questionnaire items accurately measured the intended variables.

This statistical method identifies underlying relationships between observed variables, confirming that grouped items effectively represent specific constructs. By analyzing patterns among questionnaire responses, factor analysis validates that the instrument measures the theoretical constructs it purports to assess. (Hair et al., 2020).

Data Analysis and Findings

Descriptive Statistics

Table 2
Result of Descript Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
Digital Forensics Usage	4.2	0.8	2	5
Data Analytics Usage	4.5	0.7	3	5
Audit Effectiveness	4.1	0.9	2	5
Fraud Detection	4.3	0.85	3	5

Source: SPSS 20.0 Output, 2025.

The table presents descriptive statistics summarizing key variables related to digital forensics, data analytics, audit effectiveness, and fraud detection in public sector audits. The mean values indicate high utilization and perceived importance of these tools, with data analytics showing the highest average usage (4.5). Standard deviations range from 0.7 to 0.9, suggesting moderate variation in responses. The minimum and maximum values (2–5 or 3–5) show that perceptions are generally positive. The respondent profile (60% auditors, 25% forensic accountants, 15% government financial officers) suggests that insights are drawn from professionals directly involved in financial oversight and fraud detection.

Reliability and Validity Results

Table 3
Result of Reliability Test

Variable	Cronbach's Alpha
Digital Forensics	0.85
Data Analytics	0.88
Audit Effectiveness	0.81
Fraud Detection	0.83

Source: SPSS 20.0 Output, 2025.

The table presents reliability and validity results using Cronbach's Alpha, a measure of internal consistency. All variables—Digital Forensics (0.85), Data Analytics (0.88), Audit Effectiveness (0.81), and Fraud Detection (0.83)—show high reliability, as values above 0.7 are generally considered acceptable for research. The overall reliability score of 0.85 indicates strong consistency among the survey items. This suggests that responses are stable and dependable, reinforcing the validity of the instrument used. High Cronbach's Alpha values imply that the constructs measured in the study are reliable for assessing the role of digital tools in audit effectiveness and fraud detection.

The factor analysis table presents key tests assessing data suitability for factor extraction. The Kaiser-Meyer-Olkin (KMO) value of 0.78 indicates adequate sampling adequacy, as values above 0.7 are generally acceptable for factor analysis. Bartlett's Test of Sphericity is significant ($p < 0.05$), confirming that the correlation matrix is not an identity matrix, meaning factor analysis is appropriate. These

results validate the structure of the data, supporting the identification of underlying constructs within the study variables. This ensures that digital forensics, data analytics, audit effectiveness, and fraud detection can be grouped into meaningful factors for further analysis.

Table 4
Result of Reliability (Sampling Adequacy and Sphericity) Test

Test	Value
Kaiser-Meyer-Olkin (KMO)	0.78
Bartlett's Test of Sphericity	$p < 0.05$

Source: SPSS 20.0 Output, 2025.

Regression Analysis

Table 5
Result of Regression Analysis

Independent Variable	Dependent Variable	Beta ($\hat{I}^2$)	Coefficient	p-value	Significance
Digital Forensics	Fraud Detection	0.65		0.01	Significant
Data Analytics	Audit Effectiveness	0.72		0.01	Significant

Source: SPSS 20.0 Output, 2025.

The regression table provides statistical evidence supporting the impact of digital forensics and data analytics on fraud detection and audit effectiveness.

H1: Digital forensics significantly improves fraud detection in Nigeria's public sector audits. The regression analysis reveals a significant positive relationship between digital forensics and fraud detection ($\beta = 0.65$, $p < 0.01$), confirming that increased use of digital forensic tools improves fraud detection in Nigeria's public sector audits. The low p-value (< 0.01) indicates strong statistical significance, reinforcing the reliability of this finding.

H2: Data analytics enhances audit effectiveness in Nigeria's public sector. The results demonstrate that data analytics significantly enhances audit effectiveness ($\beta = 0.72$, $p < 0.01$). The higher beta coefficient suggests a stronger predictive power, meaning data analytics plays a crucial role in improving the quality, efficiency, and reliability of audits.

These findings validate the hypotheses that both digital forensics and data analytics contribute significantly to improving financial oversight and fraud prevention in public sector audits. The significant relationships indicate that organizations implementing these tools are likely to experience more effective fraud detection and auditing processes, reinforcing the importance of technology-driven approaches in financial governance.

Structural Equation Modeling (SEM)

Table 6
Result of SEM

Fit Index	Value	Threshold
CFI	0.91	>0.90 (Good Fit)
RMSEA	0.05	<0.08 (Acceptable)
SRMR	0.04	<0.05 (Good Fit)

Source: SPSS 20.0 Output, 2025.

The Structural Equation Modeling (SEM) table presents key model fit indices confirming the robustness of the proposed framework. The Comparative Fit Index (CFI) = 0.91 exceeds the >0.90 threshold, indicating a good model fit. The Root Mean Square Error of Approximation (RMSEA) = 0.05 falls below the <0.08 threshold, showing an acceptable level of error. Similarly, the Standardized Root Mean Square Residual (SRMR) = 0.04 is below the <0.05 threshold, further supporting a good model fit.
These results validate the structural relationships between digital forensics, data analytics, audit quality, and fraud detection, reinforcing their predictive power. SEM analysis, conducted using AMOS software, confirms that the hypothesized relationships hold in the data, supporting the significant role of digital tools in enhancing public sector audits. The model's strong fit suggests that digital forensics and data analytics are essential for improving financial oversight and fraud prevention efforts.

Discussion

The integration of digital forensics and data analytics has emerged as a pivotal strategy for enhancing transparency and fraud detection in Nigeria's public sector audits. These tools enable the systematic examination of electronic records and the identification of anomalies, thereby strengthening the integrity of financial reporting and accountability mechanisms. The challenges impeding implementation though few in number, are quite significant. They include:

i. Lack of Skilled Personnel: The effectiveness of digital forensics hinges on the availability of professionals with specialized expertise. However, Nigeria faces a shortage of adequately trained forensic accountants and auditors, limiting the capacity to detect and prevent fraudulent activities effectively.
ii. Inadequate Forensic Infrastructure: Robust technological infrastructure is essential for implementing digital forensic techniques. Many public sector institutions in Nigeria lack the necessary tools and technologies, hindering the efficient analysis of digital evidence.
iii. Resistance to Change: The adoption of new technologies often encounters resistance from personnel accustomed to traditional methods. This reluctance can impede the integration of digital forensics and data analytics into existing audit processes, thereby affecting the overall effectiveness of fraud detection initiatives.

Conclusion and Recommendations

This study highlights the transformative role of digital forensics and data analytics in public sector audits. The Nigerian government should invest in advanced forensic tools, provide continuous training for auditors, and strengthen regulatory enforcement to enhance financial accountability.

Certain policy recommendations are put forward here. They include:

i. Capacity Building: Investing in the education and training of auditors and accountants is crucial. Developing specialized programs in digital forensics can equip professionals with the necessary skills to navigate complex financial data and detect irregularities.
ii. Infrastructure Development: Allocating resources towards the acquisition of advanced forensic tools and technologies is imperative. Establishing dedicated forensic laboratories within public sector institutions can facilitate the effective examination of digital evidence. This also includes adoption of AI-driven forensic tools and real-time data analytics.
iii. Change Management: Implementing comprehensive change management strategies can address resistance. This includes engaging stakeholders, demonstrating the benefits of digital forensics, and fostering a culture that embraces technological advancements.
iv. Regulatory Framework: Strengthening of audit laws to mandate forensic audits in public financial management.

By addressing these challenges through targeted strategies, Nigeria can enhance the effectiveness of digital forensics and data analytics in public

sector audits, thereby promoting greater transparency and reducing the incidence of fraud.

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