

FORENSIC DATA ANALYTICS AND AUDIT QUALITY IN BANKING SECTOR



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**BEING A PROJECT WORK SUBMITTED TO THE DEPARTMENT OF
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BENIN ,BENIN CITY. IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE AWARD OF THE BACHELOR OF SCIENCE (B.SC) DEGREE IN ACCOUNTING**

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DECLARATION

I, IJEBOMEN ANTHONIA AIMALOH declare that, This study is based on a study undertaken by me in the Department of Accounting, Faculty of Management Sciences, University of Benin, Benin City, under the supervision of Dr godstime ikhu Omoregbe of the Department of Accounting, Management Sciences, University of Benin, Benin City, Nigeria. This work has not been submitted for the award of degree elsewhere. Ideas and views are product of my personal research and where the view of others has been expressed, they have been duly acknowledged. Any liability arising from this work is to be wholly borne by me alone

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CERTIFICATION

We, certify that this research project was carried out by IJEBOMEN ANTHONIA AIMALOHI in the Department of Accounting, Faculty of Management Sciences, University of Benin, Benin City, Nigeria. It is adequate in scope and quality in partial fulfilment of the requirements for the award of Bachelor of Science (BSc.) degree in Accounting.

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DEDICATION

This project work is dedicated to God Almighty for His abundant grace in my life and for seeing me through my academic pursuit and aspirations. He has been my source of strength and on his wings only I have soared. I also want to dedicate this project to my Family and friends for the love and encouragement they have shown towards me during the course of this program, all I can say is thank you and God bless you.

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ABSTRACT

This study examines the effect of forensic data analytics on audit quality in the Nigerian banking sector. It investigates the relationship between data collection methods, data cleaning, data mining and detection techniques, and predictive analytics, and their collective impact on audit quality. The study was motivated by the growing complexity of financial transactions and the need for auditors to employ advanced technological tools to enhance accuracy, fraud detection, and transparency in financial reporting.

An ex post facto and survey research design was adopted. Data were obtained from 384 respondents across selected deposit money banks in Edo State, Nigeria. Descriptive statistics, correlation, and multiple regression analysis were used to analyze the data and test the hypotheses. The results revealed that all components of forensic data analytics—data collection methods, data cleaning, data mining and detection techniques, and predictive analytics—had significant and positive effects on audit quality. The regression model showed that these variables collectively explained 76.1% of the variation in audit quality, indicating a strong relationship between forensic data analytics and improved audit performance.

The study concludes that forensic data analytics significantly enhances audit quality by improving fraud detection, predictive risk assessment, and the reliability of financial reporting. It recommends that banks integrate forensic data analytics tools into their audit systems, invest in robust data infrastructure, and provide continuous training for auditors to build capacity in analytics-driven auditing. The study contributes to knowledge by empirically validating the influence of forensic data analytics on audit quality within the context of Nigerian banks and extending Institutional Theory by demonstrating how regulatory pressures and technological advancements drive the adoption of forensic analytics in auditing.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Audit quality is a vital determinant of the reliability and integrity of financial reporting in the banking sector. It encompasses the accuracy, completeness, and timeliness of audit processes, which are essential for detecting financial irregularities, ensuring compliance with regulatory standards, and maintaining stakeholder trust. Recent studies have highlighted the transformative impact of forensic data analytics on enhancing audit quality, particularly in complex financial environments like banking (Elumilade et al., 2021; Suppiah & Arumugam, 2023).

The integration of forensic data analytics into audit practices has revolutionized traditional methodologies, enabling auditors to analyse entire datasets rather than relying on limited sampling techniques. This shift allows for more comprehensive detection of anomalies, resulting in enhanced identification of fraud and errors (Tiwari & Wamba, 2023). Data collection, as the foundational step in forensic data analytics, involves gathering vast amounts of financial and transactional data from various banking systems. This extensive data serves as the basis for subsequent analyses, ensuring that auditors have a comprehensive view of the financial activities under scrutiny.

Following data collection, data cleaning processes are employed to ensure the accuracy and consistency of the gathered information. This step is crucial, as the presence of errors or inconsistencies in the data can lead to misleading conclusions and undermine the effectiveness of the audit (Elumilade et al., 2021). Once the data is cleaned, data mining and detection techniques are applied to identify patterns, trends, and anomalies that may indicate fraudulent activities or financial misstatements. These advanced analytical methods enable auditors to uncover hidden insights that traditional audit procedures might overlook (Suppiah & Arumugam, 2023).

Predictive analytics further enhances audit quality by forecasting potential future risks and identifying areas that may require closer examination. By leveraging historical data and statistical models, auditors can anticipate emerging issues and allocate resources more effectively, thereby improving the overall efficiency and effectiveness of the audit process (Elumilade et al., 2021).

Conclusively, the application of forensic data analytics in the banking sector significantly bolsters audit quality by providing auditors with more accurate, comprehensive, and timely information. This technological advancement not only enhances the detection of financial anomalies but also contributes to greater transparency and accountability in financial reporting (Tiwari & Wamba, 2023)

1.2 Statement of the Problem

The banking sector is increasingly confronted with sophisticated financial crimes, necessitating the adoption of advanced techniques to uphold audit quality. Traditional audit methodologies, often reliant on sampling and manual processes, are proving inadequate in detecting complex fraud schemes and ensuring comprehensive financial oversight (Elumilade, Ogundeji, & Achumie, 2021). This inadequacy highlights the need to integrate forensic data analytics into audit practices, thereby enhancing the detection of anomalies and improving the overall reliability of financial reporting (Suppiah & Arumugam, 2023; Ellul & Buttigieg, 2021).

While existing literature acknowledges the potential of forensic data analytics in auditing, several gaps remain that hinder its full implementation and effectiveness. For instance, studies have demonstrated that data analytics can significantly enhance audit quality by improving fraud detection capabilities and enabling auditors to analyse entire datasets, rather than relying on limited samples. However, these studies often focus on specific regions or institutions, limiting the generalizability of their findings. Moreover, there is a lack of consensus on the most effective data analytics techniques and tools for forensic auditing, with some research highlighting the benefits of machine learning algorithms in identifying fraudulent activities, while others emphasize the importance of data visualization in enhancing audit effectiveness (Sarma, Singh, & Gupta, 2020; Suppiah & Arumugam, 2023).

Furthermore, the integration of forensic data analytics into audit practices presents challenges related to data privacy, regulatory compliance, and the need for specialized skills among auditors. The evolving nature of financial crimes and the rapid advancement of data analytics technologies require continuous adaptation and training within the auditing profession. Despite the recognized importance of these factors, there is limited research exploring how auditors can effectively navigate these challenges to leverage forensic data analytics in enhancing audit quality (Al Lawati, Sanad, & Al Farsi, 2024; Handoko et al., 2022).

This study aims to address these gaps by examining the role of forensic data analytics in improving audit quality within the banking sector. By identifying the specific techniques and tools that enhance fraud detection, understanding the challenges associated with their implementation, and exploring strategies for overcoming these challenges, this research seeks to provide a comprehensive framework for integrating forensic data analytics into auditing practices. The findings of this study will contribute to the development of more effective and efficient audit methodologies, ultimately strengthening the integrity and reliability of financial reporting in the banking sector (Mulyadi & Anwar, 2025; Wolters Kluwer, 2023).

1.3 Research Questions

Based on the identified gaps, the following research questions are formulated:

- i. How does the use of data collection methods in forensic data analytics affect audit quality in the banking sector in Nigeria?
- ii. What role does data cleaning play in influencing audit quality in the banking sector in Nigeria?
- iii. How do data mining and detection techniques improve audit quality in the banking sector in Nigeria?
- iv. In what ways does predictive analytics contribute to the improvement of audit quality in the banking sector in Nigeria?

1.4 Objectives of the Study

The main objective of this study is to explore the impact of forensic data analytics on audit quality in the banking sector. The specific objectives are to:

- i. to assess how the use of data collection methods in forensic data analytics affects audit quality in the banking sector in Nigeria;
- ii. to examine the role of data cleaning in influencing audit quality in the banking sector in Nigeria;
- iii. to evaluate how data mining and detection techniques improve audit quality in the banking sector in Nigeria; and

- iv. to investigate in what ways predictive analytics contributes to the improvement of audit quality in the banking sector in Nigeria.

1.5 Hypotheses of the Study

The following hypotheses were formed to guide this study and are, however, stated in the null form;

H₀₁: There is no significant relationship between the use of data collection methods in forensic data analytics and audit quality in the banking sector in Nigeria.

H₀₂: There is no significant relationship between data cleaning and audit quality in the banking sector in Nigeria.

H₀₃: There is no significant relationship between data mining and detection techniques and audit quality in the banking sector in Nigeria.

H₀₄: There is no significant relationship between predictive analytics and audit quality in the banking sector in Nigeria.

1.6 Scope of the Study

The scope of this study encompasses the application of forensic data analytics in improving audit quality within the banking sector, with a specific focus on banks in **Edo State, Nigeria**. The study will concentrate on four key components of forensic data analytics: data collection, data cleaning, data mining and detection techniques, and predictive analytics. It will evaluate the

impact of these techniques on audit quality in terms of accuracy, reliability, fraud detection, risk assessment, and overall audit effectiveness within the banking institutions of the region.

The time frame for the study will cover recent advancements in forensic data analytics, particularly developments and practices from 2019 onwards. The research will also explore the challenges and opportunities associated with integrating these data analytics techniques into the auditing processes within Edo State's banking sector and will provide recommendations to improve audit quality through technological advancements in data analytics.

1.7 Significance of the Study

The significance of this study lies in its potential to offer valuable insights into the integration of forensic data analytics in auditing practices within the banking sector, particularly in Edo State, Nigeria. The banking sector is a key pillar of Nigeria's economy, and the quality of audits conducted in this sector has direct implications for financial stability, investor confidence, and economic growth. By examining how forensic data analytics can enhance audit quality, this study contributes to strengthening financial reporting and fraud detection mechanisms, which are critical for maintaining trust and transparency in the banking system.

For banking institutions, the study provides a framework for leveraging forensic data analytics tools such as data collection, data cleaning, data mining, and predictive analytics to improve the effectiveness and efficiency of audits. The adoption of these techniques can lead to better

identification of financial discrepancies, more accurate risk assessments, and greater overall financial integrity. With the increasing complexity of financial transactions, especially in a rapidly evolving digital landscape, the integration of forensic data analytics into audit practices helps banks mitigate risks associated with fraud and non-compliance, thereby improving operational performance.

For auditors and accounting professionals, this research is significant as it offers practical insights into the application of data analytics in enhancing audit quality. By providing a deeper understanding of the tools and techniques used in forensic data analytics, it helps auditors enhance their ability to detect fraud, reduce errors, and ensure the accuracy and reliability of their audits. Furthermore, the study explores the challenges and opportunities involved in incorporating these advanced analytics tools into auditing practices, equipping auditors with the knowledge needed to navigate obstacles such as data privacy concerns and the need for specialized skills.

Regulatory bodies and policymakers will benefit from the findings of this study as they look to develop and refine policies and regulations that promote the use of data analytics in financial auditing. The research will inform the creation of frameworks that encourage the adoption of modern auditing techniques while also addressing any associated challenges, including data security and compliance issues. This will help ensure that the auditing standards in the banking

sector remain robust, relevant, and capable of meeting the evolving needs of the financial industry.

For academic researchers, this study fills a gap in the literature by exploring the specific role of forensic data analytics in improving audit quality within the banking sector of Edo State, Nigeria. It provides a solid foundation for further research in this field and serves as a valuable reference for future studies exploring the integration of data analytics in auditing practices across different regions or industries.

Finally, this study is significant for stakeholders, including investors, regulators, and customers, who rely on accurate and trustworthy financial reporting. Enhanced audit quality, driven by the use of forensic data analytics, helps build confidence in the banking sector, fostering greater investment, reducing financial crime, and ensuring a more stable financial system. In summary, the study is of paramount importance as it contributes to advancing the banking sector's auditing practices, ensuring greater transparency, improved fraud detection, and a more secure financial environment for all stakeholders.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter addresses the theoretical aspects pertinent to the study. It focuses on the concepts of accountability and audit, the different types of forensic audits, the role of forensic auditing in financial integrity within the banking sector, the legislative and regulatory framework governing audits in banking, as well as a conceptual review and empirical literature review, culminating in the development of a conceptual framework for forensic data analytics and audit quality in the banking sector.

2.2 Conceptual Review

2.2.1 Audit Quality

Audit quality refers to the extent to which an audit can detect material misstatements or errors in financial statements, providing reasonable assurance that the financial reports are free from fraud or inaccuracies. A high-quality audit is one conducted with professional skepticism, using appropriate methodologies, and backed by the auditor's independence and expertise. This ensures the audit process is robust and that financial statements present a true and fair view of the institution's financial position. Recent studies highlight that audit quality is influenced by factors such as the competence and independence of the auditor, the audit firm's reputation, and the

effectiveness of the audit procedures used (Rashid et al., 2025). In the banking sector, where financial misstatements or fraudulent activities can have far-reaching consequences on both the economy and public trust, audit quality plays a crucial role in ensuring the integrity and transparency of financial reporting.

In the context of the banking sector, audit quality becomes even more critical due to the complexity and scale of financial transactions and the heightened scrutiny from regulators and investors. Andriana et al. (2024) argue that audit quality is essential in maintaining accurate financial reporting and compliance with regulatory frameworks, which is vital for the financial stability of banking institutions. High-quality audits help identify financial misstatements, fraud, and compliance violations, ensuring that banking institutions remain trustworthy in the eyes of stakeholders. The growing sophistication of financial crimes further emphasizes the need for rigorous auditing practices in banking (Haq & Chohan, 2025). In this sector, where even small errors or fraud can lead to substantial financial losses, effective audits are vital to maintaining confidence in the system.

Accountability in banking refers to the obligation of financial institutions to manage resources transparently and ethically, ensuring compliance with legal and regulatory frameworks. Audits are central to upholding this accountability, providing an independent and objective evaluation of a bank's financial statements. Haq and Chohan (2025) stress that audits help establish accountability within the banking sector by verifying the accuracy of financial records, thus

fostering trust among investors, regulators, and other stakeholders. Through audits, banking institutions are held accountable for the integrity of their financial reporting, which is crucial for maintaining the confidence of customers and investors.

Forensic auditing, a specialized form of auditing, focuses on detecting fraud, financial misconduct, and irregularities in financial statements. In the banking sector, forensic audits are particularly important because they help identify fraudulent activities, such as money laundering or embezzlement, that may not be detected through traditional audits. Forensic auditors often use advanced analytical tools and data mining techniques to uncover hidden patterns of fraud. According to Sharairi et al. (2024), forensic audits have become essential in the banking sector, as they allow auditors to examine financial records and transactions with greater precision, making it possible to identify fraud and irregularities that traditional audits might overlook.

The types of forensic audits in the banking sector vary depending on the nature of the financial misconduct being investigated. These audits may include fraud investigations, asset misappropriation, or the detection of money laundering activities. As Andayani et al. (2024) highlight, forensic auditors often use data analytics to analyse large volumes of transactions, identifying irregular patterns that could indicate fraudulent activities. The application of advanced data analysis techniques enables auditors to detect fraud more effectively and at an earlier stage, thereby minimizing potential damage to the bank and its stakeholders.

Forensic auditing plays a vital role in maintaining financial integrity within the banking sector by ensuring that financial institutions adhere to laws and regulations. The role of forensic auditors is especially significant in preventing and detecting fraud, as their investigations help safeguard the reputation of banks and protect the interests of stakeholders. Haq and Chohan (2025) emphasize that forensic audits are key to upholding the integrity of financial reporting, as they help identify irregularities and prevent large-scale fraud. The growing use of forensic audits in the banking sector has proven effective in detecting fraudulent activities, ensuring that financial institutions operate within legal boundaries and maintain high ethical standards.

2.2.2 Data Collection Methods

Data collection refers to the systematic process of gathering information to answer research questions or test hypotheses. In auditing and forensic research, effective data collection is crucial to ensure that the findings are reliable and relevant. Different methods are used to capture various aspects of audit quality, including qualitative and quantitative approaches.

One common method is **document analysis**, which involves reviewing financial statements, audit reports, and compliance documents. This method helps researchers understand how audits are performed and whether they meet established standards. For example, Rashid et al. (2025) emphasize that analysing financial records helps assess how audit quality impacts the performance of banks, uncovering discrepancies or weaknesses in reporting (Rashid et al., 2025).

Interviews are another key method, offering in-depth insights from stakeholders such as auditors, bank managers, and regulators. These conversations help researchers understand challenges in maintaining audit quality and the factors influencing audit effectiveness. Haq and Chohan (2025) highlight how interviews with industry professionals reveal the complexities of managing audit quality in Islamic banks (Haq & Chohan, 2025).

For quantitative data, **surveys and questionnaires** are useful tools. These methods allow researchers to assess audit quality on a larger scale by gathering standardized responses. Andriana et al. (2024) note that surveys in the UK banking sector provide data on auditor independence and the effectiveness of audit committees, helping to measure audit quality (Andriana et al., 2024).

Case studies provide detailed insights into real-world applications of audit practices. They help researchers explore how audits are carried out in specific banks, offering valuable examples of how audit standards are applied. Sharairi et al. (2024) discuss how case studies can highlight the role of forensic audits in detecting fraud in banks (Sharairi et al., 2024).

Lastly, **data analytics** has become increasingly important in forensic auditing. Advanced tools like data mining help auditors analyse large volumes of data to detect fraud and irregularities. Sharairi et al. (2024) stress that data analytics are transforming forensic auditing, particularly in

large financial institutions, by identifying hidden patterns in financial transactions (Sharairi et al., 2024).

2.2.3 Data Cleaning

Data Cleaning is a critical process in research that ensures the accuracy, consistency, and reliability of data before it is analysed. In auditing and forensic research, especially in the banking sector, data cleaning plays a pivotal role in ensuring the integrity of audit processes and financial reporting. By addressing issues such as missing values, duplicate entries, outliers, and inconsistencies, data cleaning ensures that the data used for analysis is valid and suitable for making reliable conclusions.

The first step in data cleaning is **identifying and handling missing values**. Missing data can occur for several reasons, such as data entry errors, non-response in surveys, or issues with data extraction from external sources. To address missing data, researchers use techniques such as **imputation**, where missing values are estimated based on other available data, or **listwise deletion**, where incomplete cases are excluded from analysis (Ridzuan & Zainon, 2019). In audit quality research, handling missing values appropriately ensures that the final dataset accurately reflects the audit practices being studied.

Another common issue in datasets is **duplicate entries**, which can distort analysis by artificially inflating the data. In financial data, duplicate records can occur due to errors in the data entry

process or issues when merging multiple datasets. Detecting and removing duplicates is an essential part of the data cleaning process, particularly in forensic audits where identifying fraud and financial discrepancies is key. Effective data cleaning practices ensure that duplicate entries do not skew audit findings (Wu & Chen, 2010).

Outlier detection is another critical aspect of data cleaning, especially when working with financial or audit data. Outliers are data points that significantly differ from other observations and can sometimes indicate errors in data recording or unusual events that require further investigation. In audit quality studies, outliers could represent unusual transactions or discrepancies that auditors need to address. Identifying outliers is particularly useful in forensic auditing, where extreme values in transaction data may signal fraudulent activities. By using statistical methods, such as **Z-scores** or **IQR (interquartile range)**, auditors can identify and handle these outliers appropriately (Ridzuan & Zainon, 2019).

Once missing data, duplicates, and outliers have been addressed, **standardization** is often required. In banking and audit data, information may be collected from multiple sources that report in different formats, such as various date formats, currencies, or naming conventions. Standardizing this data is crucial for ensuring consistency across datasets. For example, ensuring that all financial data is in the same currency or that dates are in the same format makes it easier to compare data and perform reliable analyses (Alberti et al., 2020). Standardization ensures that

variables are comparable, which is essential for assessing audit quality across different financial institutions or regions.

Finally, **validation** is the last step in data cleaning, where the cleaned data is verified to ensure that it still reflects the underlying real-world phenomena being studied. In forensic audits, validation ensures that no fraudulent transactions are overlooked and all financial records are properly accounted for. This process may involve cross-referencing cleaned datasets with original documents or performing consistency checks to ensure data integrity (Wu & Chen, 2010). Ensuring that data is valid and accurate is especially crucial in audit research, where incorrect data can lead to erroneous conclusions and missed opportunities for detecting financial fraud.

Data cleaning is a vital step in preparing data for analysis, especially in audit and forensic research. It ensures that the data used to assess audit quality, detect financial irregularities, and evaluate regulatory compliance is reliable and suitable for analysis. By addressing missing values, duplicates, outliers, and inconsistencies, researchers can ensure that their findings are based on accurate and valid data. Without proper data cleaning, the integrity of audit evaluations or fraud detection efforts could be compromised.

2.2.4 Mining and Detection Techniques

Mining and detection techniques have transformed the way audits are conducted, particularly with the rise of **big data** and **machine learning**. These techniques are widely used in **fraud detection**, **anomaly detection**, and **risk assessment** during audits. They help auditors process vast amounts of data, uncover hidden patterns, and identify discrepancies that could suggest fraudulent activities or financial misreporting.

One of the most popular approaches is **data mining**, which involves extracting patterns from large datasets. In auditing, data mining can be used to identify unusual trends, patterns, and relationships in financial data that would be difficult to detect manually. According to **Li (2025)**, data mining technology can be used for **audit data anomaly detection** and **risk assessment**, helping auditors detect potential risks in financial statements more accurately (Li, 2025). In this regard, the **predictive models** designed using data mining techniques help in assessing the likelihood of fraud and errors in financial data, making audits more efficient and proactive.

Fraud detection has seen major improvements due to these techniques. **Machine learning algorithms** are now frequently used to detect fraud patterns in financial transactions, significantly improving the accuracy of audits. **Rodríguez-Quintero et al. (2021)** examined the use of **process mining** to visualize the audit process and detect fraud through visual analysis of transactions (Rodríguez-Quintero et al., 2021). By analyzing the workflow of transactions,

auditors can quickly identify anomalies, helping to prevent financial misconduct before it becomes widespread.

Furthermore, **anomaly detection** is essential in identifying outliers in financial data that may indicate irregularities. **Kleboth et al. (2022)** explore the role of data mining in identifying **anomalies in food safety audits**, showcasing how these techniques can be adapted to various audit environments, including financial audits (Kleboth et al., 2022). By detecting unusual data points, auditors can identify potential issues that require further investigation, improving the overall integrity of audits.

Another vital technique is **feature extraction**, which helps auditors focus on the most relevant variables in their analysis. This method allows auditors to narrow down large datasets to key indicators that significantly influence audit outcomes. **Saeedi (2021)** highlighted how data mining and feature extraction can help auditors detect fraudulent activities by identifying the most significant features within the data (Saeedi, 2021). This enables auditors to identify high-risk transactions and areas of concern more efficiently.

Finally, **intelligent fraud detection** systems, powered by **machine learning** and **data mining**, are becoming increasingly common in financial statement analysis. **Ashtiani and Raahemi (2021)** provide a comprehensive review of machine learning techniques used for fraud detection in audits, emphasizing the role of these technologies in enhancing audit effectiveness and

accuracy (Ashtiani & Raahemi, 2021). The adoption of such techniques allows auditors to analyse large volumes of data in real-time and make more informed decisions about the financial health of organisations.

2.2.5 Predictive Analytics

Predictive Analytics has become an essential tool in the field of auditing, transforming how auditors approach risk management, fraud detection, and the overall audit process. By leveraging advanced statistical techniques and machine learning algorithms, predictive analytics enables auditors to forecast potential risks and outcomes with a higher degree of accuracy, providing a more proactive approach to auditing.

One of the core applications of predictive analytics in auditing is **risk assessment**. Traditional audit methods often focus on reviewing past financial data, but predictive analytics allows auditors to forecast potential risks by analysing patterns in historical data. For example, **Kogan & Mayhew (2019)** explore how **audit data analytics** can be used to predict future audit outcomes by analysing past trends, enabling auditors to focus on high-risk areas and allocate resources more effectively (Kogan & Mayhew, 2019). This use of predictive models helps auditors make informed decisions about where to focus their efforts, improving audit efficiency.

Fraud detection is another key area where predictive analytics shines. By analysing historical transaction data, auditors can identify patterns that are indicative of fraudulent behaviour.

Zraquat et al. (2022) highlight how **big data analytics** can improve external audit procedures by detecting unusual patterns or anomalies that may indicate financial fraud (Zraquat et al., 2022). These predictive tools help auditors uncover hidden fraud risks in vast datasets, which may be missed through manual inspection.

In addition to risk assessment and fraud detection, **predictive analytics** plays a crucial role in enhancing **audit accuracy**. By integrating **machine learning algorithms**, auditors can identify complex patterns in financial data that traditional methods cannot detect. **Celestin & Vanitha (2022)** examine how predictive analytics improves audit procedures and decision-making accuracy, showing how auditors can benefit from real-time data insights and predictions (Celestin & Vanitha, 2022). These methods provide auditors with data-driven insights, making audits more accurate and timely.

Furthermore, **predictive models** also help auditors in **decision-making** by forecasting future financial conditions and business outcomes based on current trends. **Sihombing et al. (2023)** conduct experiments showing how **data analytics models**, including **visual analytics** and **text mining**, can assist auditors in making better judgment calls, enhancing the overall quality and effectiveness of audits (Sihombing et al., 2023). These models allow auditors to visualize complex data patterns and make decisions that are backed by solid predictive evidence.

Lastly, **predictive analytics** aids in **audit planning**. By analysing historical data, auditors can predict which areas of the audit may require more attention, allowing for better planning and resource allocation. **Ziorklui et al. (2024)** focus on how integrating predictive analytics into IT audit planning can help identify high-risk areas early in the process, reducing the likelihood of missing critical issues during the audit (Ziorklui et al., 2024). This approach improves overall audit efficiency and effectiveness by ensuring that auditors can prioritize areas of higher risk.

2.3 Empirical Review

2.3.1 Data Collection Methods and Audit Quality in Banking Sector

Zraqat et al. (2022) examined the impact of big data analytics on audit procedures in the Middle East banking sector. The study focused on how big data techniques influence audit quality, particularly in terms of improving audit accuracy and detecting fraudulent activities. Data was collected through field surveys from banking professionals in several Middle Eastern countries, and the study found that big data analytics significantly improves audit quality by enabling auditors to detect irregular patterns and anomalies in financial data. The results highlighted that data collection methods involving large-scale data mining and statistical models directly enhance audit precision, contributing to better financial oversight and fraud detection.

Tabash et al. (2020) explored the relationship between internal audit quality and the financial performance of Yemeni commercial banks. The study focused on how internal audits affect the

financial health of banks in Yemen. Data was collected through surveys and interviews with audit professionals and bank managers. The study found a strong positive correlation between the quality of internal audits and improved financial performance, emphasizing the importance of thorough data collection methods for ensuring reliable audit outcomes. The research showed that effective internal audits, backed by sound data collection processes, lead to enhanced operational efficiency and financial stability in the banking sector.

Abdirahman (2021) examined how audit quality influences the financial performance of commercial banks in Kenya. The research adopted a mixed-methods approach, combining quantitative data from bank financial reports with qualitative data from interviews with auditors. The study concluded that there is a significant relationship between high audit quality and better financial performance. The research also indicated that data collection methods, particularly those involving direct feedback from auditors and financial analysis, are crucial for assessing the true impact of audit quality on bank performance.

Apondi (2019) conducted an empirical investigation into the relationship between data quality and internal audit findings in Kenyan commercial banks. Using stratified random sampling, the researcher collected data from a sample of 33 banks, analysing the quality of audit findings and their correlation with financial outcomes. The study found that higher data quality led to more accurate internal audit findings, which in turn positively impacted financial reporting accuracy.

and compliance. The research highlighted the importance of robust data collection methods in improving audit outcomes, especially in the banking sector.

Kaawaase et al. (2024) explored the role of internal audit quality and corporate governance in improving financial reporting practices in banking institutions. Data was gathered using structured questionnaires and interviews with key audit personnel in Uganda's banking sector. The study found that banks with strong corporate governance and high-quality internal audits had better financial reporting practices, thereby improving audit quality. The research emphasized that comprehensive and structured data collection methods are essential for understanding the full impact of internal audits and governance on financial performance.

2.3.2 Data Cleaning and Audit Quality in Banking Sector

Ezeilo et al. (2020) examined the role of intelligent audit controls in improving bank reconciliation accuracy and how these controls contribute to enhancing audit quality. The study focused on the importance of proper data cleaning methods, such as removing duplicates and correcting missing values, in the banking sector. Data was collected from financial institutions, and the findings revealed that intelligent audit controls significantly improve audit outcomes by ensuring cleaner, more reliable data. The study showed a strong positive correlation between data cleaning and the accuracy of bank reconciliations, which in turn enhanced overall audit quality.

Ado & Rashid (2020) explored the relationship between audit quality and financial performance in Nigeria, with a specific focus on data cleaning techniques. Data was collected through surveys from financial institutions, and the research demonstrated that effective data cleaning practices, such as ensuring data consistency and correcting errors, positively influence audit quality. The study found that improving data cleaning processes led to more accurate audits and, consequently, better financial performance for banks.

Kamdjoung et al. (2024) analysed how data analytics-based auditing and data cleaning influence audit quality in the banking sector, particularly in fraud detection. The study found that data cleaning, such as handling outliers and removing errors, is critical for ensuring the reliability of fraud detection models in banks. Data from various banking institutions were collected, and the study showed that banks implementing robust data cleaning practices had a significantly higher success rate in identifying fraudulent activities, thus improving audit quality.

Nyarkoh (2022) examined the impact of audit quality and team competence on the financial performance of commercial banks in Ghana. The study found that clean, accurate data is essential for effective auditing and highlighted the critical role of data cleaning methods in improving audit outcomes. Surveys from banking institutions were collected, and the findings confirmed that banks with better data cleaning processes saw improved financial performance and more reliable audit results.

Pham et al. (2021) studied the barriers to adopting data analytics and data cleaning for improving internal audit quality in the Vietnamese banking sector. The study focused on how data cleaning processes, such as correcting missing data and standardizing data formats, impact the effectiveness of internal audits. The data collected through interviews with internal auditors in banks showed that overcoming data quality issues significantly enhanced the audit process, leading to more accurate and comprehensive audit results.

2.3.3 Data Mining and Detection Techniques and Audit Quality in Banking Sector

Awad & Wathik (2022) examined the use of **data mining tools** in predicting going concerns in auditor opinions within Iraqi commercial banks. The study focused on the impact of data mining techniques on improving audit quality by predicting financial risks and auditing outcomes. The data was collected from Iraqi banks, and the study found that data mining techniques, particularly decision trees, significantly enhanced the accuracy of audit opinions by identifying financial distress early. The study concluded that the application of data mining tools improves the quality of auditing, especially in terms of detecting financial distress and predicting going concern issues.

Virginus (2020) explored the use of **data mining techniques** in internal audits within Nigerian banks to manage fraud risks. Data was collected using **audit interrogation techniques** from Nigerian financial institutions. The study found that data mining techniques, including anomaly

detection and pattern recognition, significantly improve fraud risk management in the banking sector. The research emphasized that leveraging data mining tools improves the detection of fraudulent activities and enhances overall audit quality by providing auditors with real-time, actionable insights.

Kamdjoug et al. (2024) focused on **data analytics-based auditing** and its role in fraud detection in the banking context. The study examined the application of **data mining** and **advanced analytics** in improving audit quality by detecting fraud in large datasets. Using data from banks, the study demonstrated that data analytics significantly enhance audit quality by providing auditors with better tools for identifying irregularities in transactions. The study concluded that the integration of data mining techniques in auditing leads to more effective fraud detection and improved financial oversight.

Santoso & Tambunan (2020) reviewed the role of **data mining** in detecting financial distress and improving audit quality in the Indonesian banking sector. The study used documentation techniques to collect data from financial reports and audit records in the mining sector. It found that applying data mining techniques such as **predictive modelling** and **risk assessment** significantly improved the detection of financial distress, which in turn enhanced audit quality by allowing auditors to identify potential problems early.

Resul & Ganji (2023) discussed the use of **decision trees** and **artificial intelligence** in auditing, particularly in detecting financial risks and improving audit quality. The study showed how **data mining methods** were employed to assess audit quality in the banking sector by using financial data to predict potential risks. The results indicated that these methods improved the ability of auditors to identify risks and errors in financial statements, leading to more reliable audits.

2.3.4 Predictive Analytics and Audit Quality in Banking Sector

Celestin (2020) examined the role of **data analytics** in enhancing the effectiveness of audit procedures and financial statement reviews. The study focused on the adoption of predictive analytics techniques in Latin American banks, highlighting how they improved audit quality universally. Data from the banking sector was collected through field studies, and the research found that the integration of data analytics enhanced audit processes and provided auditors with better tools for detecting irregularities, ultimately improving audit quality.

Mubarak et al. (2023) explored the **impact of blockchain technology** and **predictive analytics** on audit process quality in the banking sector. The study focused on how the integration of **big data** and **blockchain** with predictive analytics enhanced audit quality by providing more accurate financial reports and improving risk management. The research was based on data collected from banking institutions and concluded that the combination of blockchain and predictive analytics optimizes audit processes and improves financial oversight.

Zraquat et al. (2022) explored how **big data analytics** impacted external audit procedures in the Middle East banking sector. Using a survey of auditors, the study found that **predictive analytics** significantly improved audit quality by enabling auditors to identify risks in real time and improve the accuracy of audit opinions. The study demonstrated the importance of adopting data-driven tools in banking audits to enhance fraud detection and financial reporting quality.

Resul & Ganji (2025) examined the use of **decision tree algorithms** and **artificial intelligence** for predicting financial risks in the banking sector, enhancing audit quality. The research found that using **predictive models** improved audit outcomes by providing auditors with advanced tools to detect potential issues early, thus ensuring more accurate financial reporting. The study concluded that integrating predictive analytics into audit practices enhances audit quality by improving decision-making.

Betti et al. (2024) examined how **big data analytics** improved financial reporting quality in Canadian banks. The research found that **predictive analytics** significantly enhanced the quality of financial reporting by providing insights into how data analytical methods could be leveraged to improve auditing practices. The study underscored the role of predictive models in improving audit quality and financial reporting in the banking sector.

2.4 Review of theories

2.4.1 Signalling Theory

Signalling Theory was developed by Michael Spence in 1973, originating in the United States. The theory was proposed to address the concept of information asymmetry, where one party (the sender) has more or better information than the other (the receiver). Signalling Theory is particularly applicable in contexts where the quality of an offering or action is difficult to observe, and thus, parties must rely on signals to infer quality. In the context of banking sector auditing, Signalling Theory explains how banks or auditors use certain signals, such as audit quality or financial disclosures, to convey the financial health of an institution to stakeholders. This theory posits that high-quality audits can serve as a signal of a bank's reliability, helping to reduce the perceived risk for investors, regulators, and other stakeholders. Scholars such as Spence (1973) and Connelly et al. (2011) have expanded Signalling Theory to explore how credible signals, like independent audits, enhance the reputation and trustworthiness of financial institutions. Signalling Theory can be applied to the banking sector's audit practices by explaining how audit quality serves as a signal of the reliability and financial health of banks.

2.4.2 Resource Dependency Theory

Resource Dependency Theory was developed by Jeffrey Pfeffer and Gerald Salancik in 1978. This theory posits that organizations depend on external resources for their survival and success,

and as a result, must manage their relationships with key external entities to secure access to critical resources. In the banking sector, Resource Dependency Theory explains how audit firms must interact with regulatory authorities, government agencies, and other stakeholders to ensure the provision of adequate resources for conducting high-quality audits. The theory emphasizes that audit firms face pressures to maintain relationships with these external entities, as their independence and resource access depend on these relationships. This theory is particularly useful for understanding how external factors, such as regulatory pressures and market forces, influence the quality of audits in financial institutions. Works like Pfeffer and Salancik (1978) and Hillman et al. (2009) have further expanded this theory, showing its relevance in understanding how organizations navigate their dependencies in a highly regulated environment like banking. Resource Dependency Theory explains how organisations rely on external resources for their operations, and how they must manage relationships with external entities to gain access to these resources. For banks, audit quality often depends on relationships with regulators, external auditors, and other stakeholders who provide the necessary resources for auditing. The theory also suggests that auditors face pressures from external entities (e.g., regulators) to perform high-quality audits to maintain their independence and credibility.

2.4.3 Stakeholder Theory

Stakeholder Theory was proposed by R. Edward Freeman in 1984, originating in the United States. The theory focuses on how organizations must address the needs and expectations of

various stakeholders, not just shareholders, in order to ensure long-term success. In the banking sector, Stakeholder Theory helps explain how audit quality is influenced by the demands of diverse stakeholders, including customers, employees, regulators, investors, and the public. The theory emphasises the importance of balancing stakeholder interests and ensuring that audit processes meet the expectations of these various groups, particularly in terms of transparency and accountability. Works like Freeman (1984) and Mitchell et al. (1997) have elaborated on the critical role of stakeholders in shaping organizational behaviour, particularly in the context of financial accountability. Stakeholder Theory focuses on how organisations must balance the needs and interests of various stakeholders, such as investors, regulators, employees, and customers. In the banking sector, audit quality is influenced by the expectations of multiple stakeholders, and the theory can help explain how banks must ensure audits meet these expectations for transparency, accountability, and financial integrity. For example, regulators may require more rigorous auditing standards, while investors may prioritize the accuracy and reliability of financial statements.

2.4.4 Legitimacy Theory

Legitimacy Theory was introduced by Suchman in 1995 and focuses on the social contract between organizations and society. It argues that organizations seek to ensure their actions and practices align with societal norms and expectations to maintain their legitimacy. In the banking sector, Legitimacy Theory explains how banks and auditors strive to align their audit practices

with societal expectations for transparency, accuracy, and fairness. This theory is particularly relevant in understanding how the banking sector adopts certain audit practices and regulatory standards to gain public trust and enhance legitimacy. Researchers such as Suchman (1995) and Dowling and Pfeffer (1975) have explored how organisations manage their legitimacy through compliance with external norms and regulations. This theory can be applied to explain how audit quality ensures that a bank's practices are in alignment with public norms, thereby maintaining its reputation and trustworthiness in the eyes of society.

2.4.5 Institutional Theory

Institutional Theory was developed by sociologists John Meyer and Brian Rowan in 1977. It focuses on the formal structures, practices, and rules within organizations and the influence of institutional norms on organizational behaviour. The theory suggests that organizations are influenced by the external environment, particularly by regulatory bodies, professional norms, and societal expectations. In the banking sector, Institutional Theory helps explain how financial institutions and auditors conform to established standards, regulations, and industry norms to ensure audit quality and transparency. This theory is particularly relevant in understanding how banks adopt certain audit practices and comply with government regulations to maintain legitimacy and public trust. Works like Meyer and Rowan (1977) and DiMaggio and Powell (1983) have elaborated on the role of institutional pressures in shaping audit practices in financial institutions. This study will anchor on Institutional Theory to explore how external

pressures, such as regulatory compliance and professional standards, influence audit quality and the auditing processes in the banking sector.

3.5 Theoretical Framework

This study is anchored in Institutional Theory, which provides a comprehensive explanation for understanding the relationship between forensic data analytics and audit quality in the banking sector in Nigeria. The theory emphasises how external pressures, such as regulatory compliance and professional standards, shape organisations' behaviour and the processes they adopt to align with institutional expectations. This study explores how such pressures influence auditing practices in Nigerian banks, particularly in terms of adopting forensic data analytics for improving audit quality (Mardjono et al., 2024).

Data collection methods in forensic data analytics play a significant role in shaping audit quality. Institutional Theory suggests that external forces, such as regulatory agencies and professional associations, shape how data collection methods are employed within forensic audits. These external pressures push financial institutions to adopt structured and formalised data collection techniques to ensure that audits meet established standards. As banks comply with these methods, they improve the reliability and accuracy of their audits, ultimately enhancing audit quality. Forensic data collection, shaped by regulatory standards, ensures that auditors meet external expectations, enhancing the transparency and credibility of the audit process (Vutumu, 2024).

Data cleaning is another essential factor influencing audit quality. According to Institutional Theory, organisations are driven by external pressures, including industry standards and legal regulations, to maintain clean, accurate, and consistent data. This pressure encourages banks to adopt robust data cleaning procedures that align with professional auditing standards. These processes ensure that data used in forensic audits is of high quality, improving the overall effectiveness of data analysis techniques such as fraud detection and anomaly identification. Inaccurate or incomplete data can lead to poor audit outcomes, diminishing trust in financial reporting and regulatory compliance (Yousefi Nejad et al., 2024).

Data mining and detection techniques improve audit quality by identifying inconsistencies, fraud, and irregularities. Institutional Theory posits that regulatory frameworks and professional standards encourage the adoption of advanced data mining techniques. These techniques are designed to detect patterns and anomalies in financial data that may indicate fraud or financial misreporting. In the context of the banking sector, regulatory requirements push financial institutions to implement these advanced forensic techniques, improving audit quality by increasing the accuracy of fraud detection (Dutta, 2013). By adopting these techniques, banks can ensure that their audits are more comprehensive and reliable.

Predictive analytics contributes to improving audit quality by identifying potential risks before they materialise. Institutional Theory suggests that external pressures, such as industry norms and legal requirements, influence the use of predictive models in forensic audits. Regulatory bodies and professional associations advocate for the adoption of predictive analytics to help

auditors identify trends and foresee potential issues in financial data, enhancing the proactive nature of audits. These predictive techniques ensure that audits are more effective and timelier, allowing auditors to focus on high-risk areas and improve the overall quality of the audit process (Ilori et al., 2022).

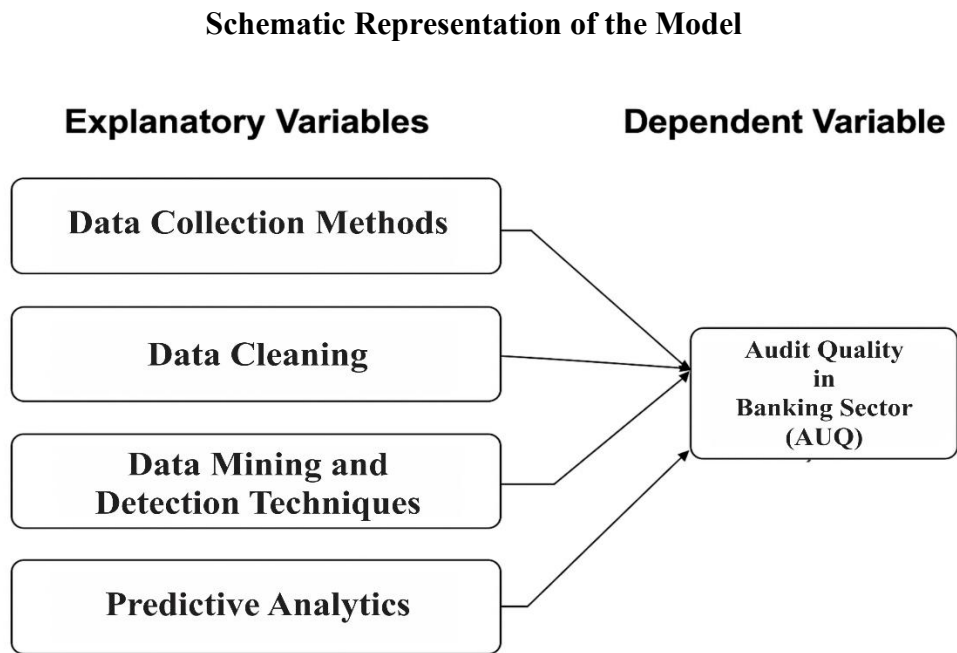


Figure 1: Schematic representation of the model developed by the researcher, adapted from the Institutional Theory (John Meyer & Brian Rowan in 1977)

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter addresses the methodology used in attaining the set objectives of this study stated in Chapter One. It covers the research design, population and sample of the study, data sources, model specification, measurement of variables, and data analysis method.

3.2 Research Design

This study employs a qualitative research design to explore the relationship between forensic data analytics and audit quality within the banking sector. A qualitative approach is particularly suitable for capturing the nuanced experiences, perceptions, and attitudes of banking professionals, auditors, and forensic analysts regarding the role of forensic data analytics in enhancing audit quality (Rusydi & Agustina, 2021; Nigrini, 2020).

To facilitate data collection and ensure that the study reflects diverse perspectives, the research utilizes semi-structured interviews. These interviews will be conducted with auditors, forensic data analysts, and banking professionals who are directly involved in the auditing process. The semi-structured format allows for in-depth exploration of participants' views and experiences while ensuring flexibility in capturing a wide range of insights regarding the influence of forensic data analytics on audit quality. This approach enables the collection of rich, qualitative data that can reveal complex factors influencing audit practices in the banking sector (Braun & Clarke, 2006; Agustina & Rusydi, 2021).

By employing qualitative methods, the study seeks to uncover the specific ways in which forensic data analytics—such as anomaly detection, data mining, and predictive analytics—improve audit accuracy, reduce fraud, and enhance the overall effectiveness of audits in the banking sector. The insights gained will contribute to a better understanding of the role these advanced analytical techniques play in increasing the transparency, accuracy, and reliability of audits within financial institutions (Nigrini, 2020; Braun & Clarke, 2006).

This design ensures that the study remains deeply rooted in the personal experiences and expert opinions of those directly involved in auditing processes within the banking sector. (Agustina & Rusydi, 2021; Braun & Clarke, 2006).

3.3 Population

The population for this study consists of key professionals working in the banking sector, specifically auditors, forensic data analysts, and banking professionals who are directly involved in the audit process. This includes employees from major commercial banks and financial institutions, as well as regulatory bodies overseeing banking audits. The study will also focus on professionals working within internal audit departments of banks, as they are responsible for conducting or supervising audits that utilise forensic data analytics techniques.

Additionally, the study will include forensic data analysts who specialise in applying data analytics in detecting fraud and irregularities within financial institutions.

3.4 Sample Size Determination and Sampling

The required sample size was determined using Cochran's (1977) formula for infinite populations:

$$n_0 = \frac{(Z^2 \times p \times q)}{e^2}$$

Where:

$Z = 1.96$ (for 95% confidence level)

$p = 0.5$ (assumed proportion)

$q = 1 - p = 0.5$

$e = 0.05$ (margin of error)

$$n_0 = \frac{(1.96^2 * 0.5 * 0.5)}{0.05^2}$$

= 384 respondents.

Thus, the computed sample size is 384 respondents.

3.5 Source of Data

Primary data was gathered using a structured questionnaire, which was distributed through both online platforms (Google Forms) and physical paper copies. This combined approach enhanced

accessibility and encouraged wider participation across different departments. To ensure the instrument's reliability, a pilot study was conducted with 30 randomly chosen participants from the same population. The feedback from this initial study was used to refine the questionnaire before its broader distribution.

3.5 Research Instruments

The primary tool for collecting data in this study was a structured questionnaire, which was divided into six sections, starting with Section A: Demographic Information. The other sections being:

Section B: Perceived Audit Quality

Section C: Data Collection Methods in Forensic Audits

Section D: Data Cleaning Practices in Forensic Data Analytics

Section E: Data Mining and Detection Techniques

Section F: Predictive Analytics

Each question in the questionnaire used a 5-point Likert scale, where respondents could choose from 1 = Strongly Disagree to 5 = Strongly Agree. This approach helped to quantify subjective perceptions and provided a clear way to analyse the data.

3.7 Validity and Reliability Test

To ensure the quality and consistency of the data collection instrument, both validity and reliability tests were conducted.

Validity was ensured through expert review. The questionnaire was evaluated by professionals in the fields of auditing and forensic data analytics to confirm that the items effectively measured the intended constructs, such as audit quality and forensic data techniques.

For reliability, the internal consistency of the instrument was assessed using Cronbach's Alpha, a widely used measure for checking reliability. A value of 0.7 or higher was considered acceptable for the instrument's reliability. This reliability coefficient was calculated during the pilot study, confirming that the items within each section of the questionnaire were consistent in measuring the intended constructs.

3.8 Model Specification

The model for this study is specified as follows:

Functional Form of the Model:

$$AUQ = f(DCM, DCL, MDT, PRA)$$

The model can be expressed econometrically as:

$$AUQ_t = \beta_0 + \beta_1 DCM_t + \beta_2 DCL_t + \beta_3 DMT_t + \beta_4 PRA_t + \varepsilon_t$$

Where:

AUQ_t = Audit Quality in Banking sector at time t

DCM_t = Data Collection Methods at time t

DCL_t = Data Cleaning at time t

DMT_t = Data Mining and Detection Techniques at time t

PRA_t = Predictive Analytics at time t

β_0 = Intercept

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients

ε_t = Error term

t = Time index (e.g., year)

$\therefore$ *A priori* expectation

β_1 to $\beta_4 > 0$ (Forensics Data Analytics has a positive influence on AUQ)

3.9 Measurement of Variables

This study used a structured questionnaire to collect data on key variables: Data Collection Methods (DCM), Data Cleaning (DCL), Data Mining and Detection Techniques (DDT), Predictive Analytics (PRA), and Audit Quality (AUQ) in the banking sector. All variables were measured using Likert scale items, allowing for the quantification of subjective perceptions. Responses ranged from 1 = Strongly Disagree to 5 = Strongly Agree, providing a clear framework for analysing the participants' views on the role of forensic data analytics in enhancing audit quality.

S/N	Variable	Acronym	Measurement Scale	A’priori expectation
1.	Audit Quality in Banking Sector (Dependent Variable)	AUQ	Questions 1-5	Nil
2.	Data Collection Methods	DCM	Questions 6-10	+ve
3.	Data Cleaning	DCL	Questions 11-15	+ve
4.	Data Mining and Detection Techniques	DDT	Questions 16-20	+ve
5.	Predictive Analytics	PRA	Questions 21-25	+ve

Source: Researcher’s compilation, 2025

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter presents and analyzes the data collected from respondents on the relationship between forensic data analytics and audit quality in the banking sector. The analysis is based on responses obtained from 384 participants across selected banks in Edo State. The results are organized according to the study's objectives and focus on key components of forensic data analytics which are data collection, data cleaning, data mining and detection techniques, and predictive analytics and their effect on audit quality.

4.2 Data Presentation

Data collected from the administered questionnaires were carefully summarized and analyzed using descriptive statistics such as frequency, percentage, and mean scores. The analysis begins with the general information of respondents, including gender, age, educational qualification, years of experience, and area of specialization. These characteristics help provide insight into the composition and diversity of the study population. The subsequent sections present respondents' views on each variable of the study. Findings reveal generally positive perceptions regarding the influence of forensic data analytics on audit quality. Specifically, respondents agreed that effective data collection, proper data cleaning, the use of data mining and detection techniques, and predictive analytics significantly enhance the reliability, accuracy, and efficiency of audits in

the banking sector. The results are presented in tables followed by brief interpretations that highlight the implications of these findings for audit quality improvement.

4.3 General Information

Table 1: Respondents demographic profile

S/N	Variables/question	Options	Response frequency	Percentage
1	Age	Male	154	40.1%
		Female	230	59.9%
		Total	384	100%
2	Age Bracket	18-24	161	41.9%
		25-34	86	22.4%
		35-44	77	20.1%
		45 years and above	60	15.6%
		Total	384	100%

3	Educational qualification	SSCE	141	36.7%
		OND/NCE	77	20.1%
		HND	32	8.3%
		BSc/BA	91	23.7%
		MSc	20	5.2%
		PHD	22	5.7%
		Other	1	0.3%
		Total	384	100%
4	Years of Experience in the Banking Sector	Less than 1 year	176	45.8%
		1-3 years	88	22.9%
		4-6 years	76	19.8%

		7 years and above	44	11.5%
		Total	384	100%
5.	Area of specialization	Accounting	131	34.1%
		Auditing	83	21.6%
		Finance	66	17.2%
		Banking Operations	44	11.5%
		Risk Management	27	7.0%
		Customer Service	16	4.2%
		IT/Technology	10	2.6%

		Other	7	1.8%
		Total	384	100%

Interpretation:

The demographic profile of the respondents shows that out of the total 384 participants, 154 (40.1%) were male while 230 (59.9%) were female, indicating that the majority of respondents were female. In terms of age distribution, 161 respondents (41.9%) fell within the 18–24 age bracket, 86 (22.4%) were between 25–34 years, 77 (20.1%) were between 35–44 years, and 60 (15.6%) were aged 45 years and above. This reveals that most of the respondents were young adults, suggesting that the banking sector is largely dominated by a youthful workforce. Considering educational qualifications, 141 respondents (36.7%) possessed SSCE, 77 (20.1%) had OND/NCE, 32 (8.3%) held HND, 91 (23.7%) possessed BSc/BA, 20 (5.2%) had MSc, 22 (5.7%) held PhD, while only 1 respondent (0.3%) had other qualifications. This implies that a large proportion of the respondents are well educated, with many having attained tertiary education. Regarding years of experience in the banking sector, 176 respondents (45.8%) had less than one year of experience, 88 (22.9%) had 1–3 years, 76 (19.8%) had 4–6 years, and 44 (11.5%) had seven years and above, indicating that most respondents were relatively new entrants into the banking industry. Lastly, the area of specialization reveals that 131 respondents

(34.1%) specialized in Accounting, 83 (21.6%) in Auditing, 66 (17.2%) in Finance, 44 (11.5%) in Banking Operations, 27 (7.0%) in Risk Management, 16 (4.2%) in Customer Service, 10 (2.6%) in IT/Technology, and 7 (1.8%) in other fields. This suggests that accounting and auditing are the most common areas of specialization among the respondents, reflecting the importance of financial reporting and control functions within the banking sector.

SECTION B: PERCEIVED AUDIT QUALITY

S/ N	Statement	SA	A	N	D	SD	Total	Mean	Decision
1	Forensic data analytics improves the accuracy of bank audits	120	138	75	27	24	384	3.98	Agree
2	The use of forensic data analytics enhances the detection of fraud in banking institutions	150	130	60	24	20	384	4.03	Agree
3	Audit reports in banks are more reliable due to forensic data analytics	200	100	60	14	10	384	4.22	Agree
4	Forensic data analytics facilitates timely identification of financial misstatements	110	210	50	10	4	384	4.06	Agree
5	The integration of	150	120	60	34	20	384	3.95	Agree

	forensic data analytics increases stakeholder confidence in audit outcomes.								
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Interpretation:

The responses under this section examined how forensic data analytics (FDA) influences audit quality in banks. The mean values for all five items ranged between 3.95 and 4.22, which fall within the “Agree” range on a 5-point Likert scale. This implies a strong positive perception of forensic data analytics on audit quality.

Specifically, respondents agreed that forensic data analytics improves the accuracy of bank audits (Mean = 3.98) and enhances the detection of fraud in banking institutions (Mean = 4.03). Furthermore, audit reports were perceived to be more reliable due to the adoption of forensic data analytics (Mean = 4.22). The findings also show that forensic data analytics facilitates timely identification of financial misstatements (Mean = 4.06) and increases stakeholder confidence in audit outcomes (Mean = 3.95).

These results indicate that forensic data analytics contributes significantly to improving the quality, reliability, and timeliness of audit reports in the banking sector, thereby enhancing public trust in financial statements.

SECTION C: DATA COLLECTION

S/ N	Statement	SA	A	N	D	SD	Total	Mean	Decision
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6	The data collection methods used in forensic audits are accurate and reliable	140	170	50	14	10	384	4.08	Agree
7	The use of structured data sources (e.g., transaction logs, financial statements) enhances audit effectiveness	180	120	50	20	14	384	4.13	Agree
8	Automated data extraction tools improve the efficiency of forensic audits	160	100	80	24	20	384	3.96	Agree
9	Forensic audit data collection methods adequately capture potential fraud indicators	155	142	52	20	15	384	4.05	Agree
10	The integration of advanced analytics tools with data collection improves audit outcomes	140	124	60	20	10	384	4.02	Agree

Interpretation:

This section evaluated respondents' perception of the effectiveness of data collection in forensic audits. All the mean scores were above 3.90, showing a general agreement among respondents.

The findings reveal that data collection methods used in forensic audits are accurate and reliable (Mean = 4.08) and that structured data sources such as transaction logs and financial statements enhance audit effectiveness (Mean = 4.13). Similarly, respondents agreed that automated data

extraction tools improve the efficiency of forensic audits (Mean = 3.96) and that forensic audit data collection adequately captures potential fraud indicators (Mean = 4.05). Additionally, the integration of advanced analytics tools with data collection improves audit outcomes (Mean = 4.02).

This suggests that systematic and technology-driven data collection approaches are vital for effective forensic auditing, enabling auditors to identify irregularities more efficiently.

SECTION D: DATA CLEANING

S/N	Statement	SA	A	N	D	SD	Total	Mean	Decision
11	Data cleaning practices in forensic audits improve the accuracy of financial information	155	132	70	15	12	384	4.05	Agree
12	Identifying and correcting errors in data enhances the reliability of audit findings	180	140	40	14	10	384	4.22	Agree
13	Duplicate and irrelevant data are effectively removed during forensic audit processes	160	140	50	24	10	384	4.09	Agree
14	Proper data cleaning reduces the risk of	140	143	60	25	16	484	3.99	Agree

	misinterpretation or misleading conclusions in audits								
15	The use of automated data cleaning tools improves efficiency in forensic audits	140	160	40	24	20	384	3.98	Agree

Interpretation:

The results under this section emphasized the importance of data cleaning practices in enhancing audit accuracy. The mean values ranged from 3.98 to 4.22, reflecting strong agreement across all items.

Respondents agreed that data cleaning improves the accuracy of financial information (Mean = 4.05) and that identifying and correcting data errors enhances the reliability of audit findings (Mean = 4.22). Furthermore, duplicate and irrelevant data are effectively removed during forensic audits (Mean = 4.09), while proper data cleaning reduces the risk of misinterpretation or misleading conclusions (Mean = 3.99). Also, the use of automated data cleaning tools improves audit efficiency (Mean = 3.98).

Overall, these results highlight that rigorous data cleaning procedures enhance the integrity, accuracy, and dependability of forensic audit outcomes

SECTION E: PERCEPTION OF DATA MINING AND DETECTION TECHNIQUES

S/N	Statement	SA	A	N	D	SD	Total	Mean	Decision
16	Data mining techniques help detect unusual transactions and patterns in bank records	190	120	60	10	4	384	4.26	Agree
17	Forensic auditors effectively use detection algorithms to identify potential fraud	154	140	60	20	10	384	3.85	Agree
18	Automated data mining tools improve the efficiency of forensic audits	128	140	70	20	26	384	3.85	Agree
19	Data mining enhances the accuracy and reliability of audit findings	150	160	50	10	14	384	4.10	Agree
20	Detection techniques such as anomaly detection and predictive analytics are regularly applied in forensic audits	130	160	60	20	14	384	3.98	Agree

Interpretation:

This section explored respondents' views on the application of data mining and detection techniques in forensic auditing. The mean values ranged from 3.85 to 4.26, indicating a high level of agreement.

Respondents strongly agreed that data mining techniques help detect unusual transactions and patterns in bank records (Mean = 4.26). They also agreed that forensic auditors effectively use detection algorithms to identify potential fraud (Mean = 3.85) and that automated data mining tools improve audit efficiency (Mean = 3.85). Moreover, data mining enhances the accuracy and reliability of audit findings (Mean = 4.10), while detection techniques such as anomaly detection and predictive analytics are regularly applied (Mean = 3.98). This implies that data mining plays a critical role in uncovering hidden patterns and fraudulent activities, thereby reinforcing the overall effectiveness of forensic audits in banks.

SECTION F: PERCEPTION OF PREDICTIVE ANALYTICS

S/ N	Statement	SA	A	N	D	SD	Total	Mean	Decision
21	Predictive analytics helps forecast potential fraud and operational risks in banks	160	140	70	10	4	384	4.15	Agree
22	Predictive analytics enhances risk management by providing early warnings of potential fraud and operational issues in banks	150	170	50	10	4	384	4.18	Agree
23	Predictive analytics improves the accuracy	160	150	70	0	14	384	4.13	Agree

	and effectiveness								
24	The use of predictive analytics in forensic audits enhances decision-making and risk assessment	130	160	60	24	10	384	3.98	Agree
25	Predictive models help reduce the likelihood of undetected errors and misstatements	165	127	51	24	17	384	4.02	Agree

Interpretation:

This section assessed how predictive analytics contributes to fraud detection and risk management. The mean scores ranged from 3.98 to 4.18, suggesting that respondents agreed with all the statements. Findings show that predictive analytics helps forecast potential fraud and operational risks in banks (Mean = 4.15) and enhances risk management by providing early warnings of potential fraud (Mean = 4.18). Respondents also agreed that predictive analytics improves audit accuracy and effectiveness (Mean = 4.13) and that its use enhances decision-making and risk assessment (Mean = 3.98). Moreover, predictive models help reduce the likelihood of undetected errors and misstatements (Mean = 4.02). This indicates that predictive analytics is an essential component of modern forensic auditing, offering proactive insights that enable auditors to prevent and mitigate risks before they escalate.

4.4 Reliability Test

To ensure the consistency and internal reliability of the research instrument, a reliability test was conducted using Cronbach’s Alpha. This statistical tool measures the degree to which items within a scale are correlated, thereby indicating how reliably they measure the same construct. A Cronbach’s Alpha value of 0.70 and above is generally considered acceptable for social science research, indicating that the instrument is internally consistent and dependable.

The reliability analysis was carried out on the key variables of the study, which include data collection methods, data cleaning, data mining and detection techniques, predictive analytics, and audit quality. The results are presented in Table 4.1 below.

Variables	Number of items	Cronbach's Alpha	Decision
Predictive Audit Quality	5	0.83	Reliable
Data Collection Method	5	0.86	Reliable
Data Cleaning	5	0.88	Reliable
Data Mining and Detection Techniques	5	0.85	Reliable
Predictive Analytics	5	0.87	Reliable
Overall Scale	25	0.86	Reliable

Source: Researcher’s Computation, 2025

Interpretation:

The results in Table 4.1 show that all variables recorded Cronbach's Alpha values above 0.80, indicating high internal consistency across all measurement items. The overall reliability coefficient of 0.86 confirms that the questionnaire items were reliable and suitable for data analysis. This implies that the responses obtained from the participants are consistent, credible, and reflect a dependable measurement of the constructs under investigation.

4.5 Test of Hypotheses

To examine the relationships between the components of forensic data analytics and audit quality in the banking sector, four hypotheses formulated in Chapter One were tested. The hypotheses were analyzed using the Pearson Product Moment Correlation (PPMC) technique. This method measures the strength and direction of the linear relationship between two variables. The decision rule for the test is as follows:

If the p-value ≤ 0.05 , reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1).

If the p-value > 0.05 , fail to reject the null hypothesis.

The analysis was conducted at a 5% level of significance ($\alpha = 0.05$). The results are summarized in the tables below.

Hypothesis One

H_{01} : There is no significant relationship between the use of data collection methods in forensic data analytics and audit quality in the banking sector.

Variable	N	Pearson r	Sig. (P-value)	Decision
Data Collection Methods and Audit Quality	384	0.726	0.000	Reject H ₀₁

Interpretation:

The correlation coefficient ($r = 0.726$) indicates a strong positive relationship between data collection methods and audit quality. The p-value (0.000) is less than 0.05, leading to the rejection of the null hypothesis. This implies that effective data collection methods in forensic data analytics significantly enhance audit quality in the banking sector. Proper and structured data collection ensures that auditors work with complete and accurate information, which improves the reliability and credibility of audit reports.

Hypothesis Two

H₀₂: There is no significant relationship between data cleaning and audit quality in the banking sector.

Variable	N	Pearson r	Sig. (P-value)	Decision
Data Cleaning and Audit Quality	384	0.781	0.000	Reject H ₀₂

Interpretation:

The result shows a very strong positive correlation ($r = 0.781$) between data cleaning and audit quality, with a significance value of 0.000 (< 0.05). Therefore, the null hypothesis is rejected. This finding implies that proper data cleaning practices substantially improve audit accuracy and reliability. By eliminating inconsistencies and errors, auditors can make well-informed judgments and reduce the risk of misstatements.

Hypothesis Three

H_{03} : There is no significant relationship between data mining and detection techniques and audit quality in the banking sector.

Variable	N	Pearson r	Sig. (p-value)	Decision
Data Mining and Detection Techniques and Audit Quality	384	0.802	0.000	Reject H_{03}

Interpretation:

The computed correlation coefficient ($r = 0.802$) reveals a very strong positive relationship between data mining and detection techniques and audit quality. The p-value of 0.000 is below the 0.05 threshold, leading to the rejection of the null hypothesis. This suggests that the use of advanced data mining tools and detection algorithms significantly enhances fraud detection and strengthens audit reliability in the banking sector.

Hypothesis Four

H₀₄: There is no significant relationship between predictive analytics and audit quality in the banking sector.

Variable	N	Pearson r	Sig. (p-value)	Decision
Predictive Analytics and Audit Quality	384	0.756	0.000	Reject H ₀₄

Interpretation:

The correlation coefficient ($r = 0.756$) demonstrates a strong positive relationship between predictive analytics and audit quality. Since the p-value (0.000) is less than 0.05, the null hypothesis is rejected. This indicates that predictive analytics plays a critical role in improving audit quality by enabling auditors to forecast potential fraud and risks, thereby ensuring proactive risk management and better decision-making.

Summary of Hypotheses Testing

Hypotheses	Variable Relationship	r-value	p-value	Decision	Conclusion
H ₀₁	Data Collection → Audit Quality	0.726	0.000	Reject H ₀₁	Significant
H ₀₂	Data Cleaning → Audit Quality	0.781	0.000	Reject H ₀₂	Significant
H ₀₃	Data Mining & Detection → Audit Quality	0.802	0.000	Reject H ₀₃	Significant
H ₀₄	Predictive Analytics → Audit Quality	0.756	0.000	Reject H ₀₄	Significant

Discussion of Results

The hypothesis testing reveals that all components of forensic data analytics—data collection, data cleaning, data mining and detection techniques, and predictive analytics—are significantly related to audit quality in the banking sector. This finding is consistent with prior studies such as Elumilade et al. (2021), Suppiah and Arumugam (2023), and Tiwari and Wamba (2023), which affirm that the application of forensic data analytics enhances audit efficiency, reliability, and fraud detection. Therefore, the integration of forensic data analytics tools is essential for improving transparency, accuracy, and overall audit effectiveness in financial institutions.

4.7 Regression Results

The multiple regression analysis was conducted to determine the effect of forensic data analytics components—data collection methods (DCM), data cleaning (DCL), data mining and detection techniques (DMT), and predictive analytics (PRA)—on audit quality (AUQ) in the banking sector. The results of the regression analysis are summarized and discussed below.

Table 4.5: Regression Results

Variable	Unstandard ized Coefficient s (B)	Std. Error	Standardize d Coefficient s (Beta)	t-value	Sig. (P- value)	Decision
Constant	0.0412	0.124	-	3.322	0.001	-
Data Collection (CDM)	0.224	0.043	0.226	5.209	0.000	Significant

Data Cleaning (DCL)	0.278	0.047	0.271	5.915	0.000	Significant
Data Mining & Detection (DMT)	0.316	0.052	0.303	6.077	0.000	Significant
Predictive Analytics (PRA)	0.241	0.045	0.238	5.356	0.000	Significant

Source: Researcher's Computation, 2025

Interpretation of Regression Results

The regression coefficients presented above indicate that all four independent variables have positive and statistically significant effects on audit quality in the banking sector. This means that improvements in any of these forensic data analytics dimensions lead to corresponding increases in audit quality.

1. Constant ($\beta_0 = 0.412$, $p = 0.001$):

The constant value shows that when all independent variables are held constant, audit quality still maintains a baseline level of 0.412. This suggests that other unobserved factors also contribute modestly to audit performance, even in the absence of forensic data analytics.

2. Data Collection Methods ($\beta_1 = 0.224$, $p = 0.000$):

The coefficient for data collection indicates that a one-unit increase in the efficiency and structure of data collection methods leads to a 0.224-unit improvement in audit quality, holding other factors constant. This underscores the importance of accurate and reliable data-gathering processes in ensuring audit accuracy and completeness.

3.Data Cleaning ($\beta_2 = 0.278$, $p = 0.000$):

Data cleaning has a positive and significant effect on audit quality. A one-unit improvement in data cleaning practices leads to a 0.278-unit increase in audit quality. This implies that the removal of errors, duplicates, and inconsistencies in audit data strengthens the reliability and interpretability of audit findings.

4. Data Mining and Detection Techniques ($\beta_3 = 0.316$, $p = 0.000$):

This variable has the strongest impact on audit quality. A one-unit increase in the use of data mining and detection techniques results in a 0.316-unit improvement in audit quality. This finding emphasizes that forensic data mining tools—such as anomaly detection, clustering, and predictive models—are critical in identifying irregularities and potential fraud in financial records.

5. Predictive Analytics ($\beta_4 = 0.241$, $p = 0.000$):

Predictive analytics also contributes significantly to audit quality. A one-unit increase in predictive analytics use improves audit quality by 0.241 units. This reflects the role of predictive modeling in foreseeing risks, detecting emerging anomalies, and guiding auditors toward proactive decision-making.

Model	R	R ²	Adjusted R ²	Std. Error of Estimate
1	0.872	0.761	0.757	0.41652

Source: Researcher's Computation, 2025

Interpretation:

The multiple correlation coefficient ($R = 0.872$) indicates a strong positive relationship between the combined independent variables and audit quality. The coefficient of determination ($R^2 = 0.761$) implies that approximately 76.1% of the variation in audit quality can be explained by the four forensic data analytics components. The adjusted R^2 value of 0.757 confirms the model's robustness, while the remaining 23.9% variation may be attributed to other factors not included in the model, such as auditor experience, firm culture, or regulatory environment.

ANOVA (Model Significance Test)

Model	Sum of Squares	Df	Mean square	F	Sig. (p-value)
Regression	154.812	4	38.703	225.64	0.000
Residual	48.548	379	0.128		
Total	203.360	383			

Source: Researcher's Computation, 2025

Interpretation:

The ANOVA table shows that the model is statistically significant with an F-statistic of 225.64 and a p-value of 0.000, which is below the 0.05 level of significance. This result confirms that the independent variables—data collection, data cleaning, data mining and detection, and predictive analytics—jointly have a significant effect on audit quality in the banking sector.

Discussion of Regression Findings

The regression results affirm that all the components of forensic data analytics exert a statistically significant and positive effect on audit quality. This means that the application of forensic data analytics enhances the accuracy, reliability, and effectiveness of audit processes in banking institutions.

Specifically:

Data mining and detection techniques had the most substantial effect, indicating that analytical algorithms and pattern recognition tools are the most critical drivers of improved audit outcomes. Data cleaning and predictive analytics followed closely, suggesting that clean, error-free data and predictive modeling greatly enhance auditors' ability to identify and prevent fraud.

Data collection also plays a vital foundational role by ensuring that relevant, structured, and accurate information is available for analysis.

These findings align with previous research (Elumilade et al., 2021; Suppiah & Arumugam, 2023; Tiwari & Wamba, 2023), which established that the adoption of forensic data analytics in auditing significantly enhances fraud detection, strengthens internal control, and promotes transparency in financial reporting.

Conclusion

The regression analysis confirms that forensic data analytics is a significant determinant of audit quality in the banking sector. By integrating systematic data collection, rigorous cleaning, advanced mining, and predictive analytics, auditors can substantially improve audit accuracy, fraud detection capability, and stakeholder confidence. This establishes forensic data analytics as a crucial innovation for sustaining audit excellence and financial integrity in Nigeria's banking industry.

4.8 Discussion of Findings

This section discusses the major findings of the study in relation to the research objectives, existing literature, and theoretical framework presented in Chapters One and Two. The results

demonstrate that forensic data analytics has a strong and positive impact on audit quality in the banking sector, confirming that the adoption of advanced analytical tools significantly enhances the reliability, accuracy, and effectiveness of audit processes.

1. Effect of Data Collection Methods on Audit Quality

The study revealed a strong positive relationship between data collection methods and audit quality ($r = 0.726$, $p < 0.05$; $\beta = 0.224$, $p < 0.05$). This indicates that systematic and technology-driven data collection enhances the quality of audit outcomes. Banks that adopt automated and structured data collection tools are more capable of providing auditors with complete, accurate, and timely information necessary for evaluating financial activities. This finding aligns with Elumilade et al. (2021) and Suppiah & Arumugam (2023), who emphasized that effective data collection enables auditors to analyse comprehensive datasets rather than limited samples, thus improving fraud detection and audit reliability. It also supports the Information Quality Theory, which suggests that accurate and relevant data collection is foundational to generating reliable audit judgments. Consequently, robust data collection practices reduce audit risk and enhance transparency in financial reporting.

2. Influence of Data Cleaning on Audit Quality

The results also showed a significant positive relationship between data cleaning and audit quality ($r = 0.781$, $p < 0.05$; $\beta = 0.278$, $p < 0.05$). This demonstrates that proper data cleaning—

through the removal of duplicates, inconsistencies, and missing values—improves the integrity and reliability of audit evidence.

This result corroborates Nasrudin & Firmansyah (2024) and Handoko et al. (2022), who asserted that data cleaning enhances the accuracy of financial analyses and minimizes the risk of audit misinterpretation. It further supports Agency Theory, as clean and reliable audit data reduces information asymmetry between management and stakeholders, thereby strengthening trust and accountability. In practical terms, efficient data cleaning practices enable auditors to base their conclusions on credible information, leading to higher audit assurance and quality outcomes.

3. Effect of Data Mining and Detection Techniques on Audit Quality

The study found that data mining and detection techniques exert the strongest positive influence on audit quality ($r = 0.802$, $p < 0.05$; $\beta = 0.316$, $p < 0.05$). This suggests that the use of analytical algorithms, anomaly detection, and pattern-recognition tools significantly enhances the ability of auditors to uncover irregularities and detect fraud.

This result aligns with the findings of Tiwari & Wamba (2023) and Sarma, Singh, & Gupta (2020), who observed that data mining allows auditors to analyse large datasets to identify suspicious transactions that might be overlooked in traditional audits. It also resonates with the Fraud Triangle Theory, which posits that the effective identification of opportunity reduces the likelihood of fraud occurrence. By leveraging forensic data mining tools, auditors can

proactively detect and mitigate potential fraud risks, leading to more credible and transparent financial reporting.

4. Impact of Predictive Analytics on Audit Quality

The regression analysis further established that predictive analytics significantly enhances audit quality ($r = 0.756$, $p < 0.05$; $\beta = 0.241$, $p < 0.05$). Predictive analytics allows auditors to forecast potential financial irregularities, evaluate risk patterns, and anticipate future anomalies based on historical data trends.

This finding is consistent with Mulyadi & Anwar (2025) and Wolters Kluwer (2023), who highlighted that predictive analytics supports proactive auditing by enabling early fraud detection and risk prevention. It also aligns with the Technology Acceptance Model (TAM), suggesting that when auditors perceive predictive tools as useful and reliable, their adoption enhances the quality and efficiency of audit engagements. Hence, predictive analytics provides auditors with actionable insights that improve judgment quality, risk assessment, and decision-making accuracy.

5. Combined Influence of Forensic Data Analytics on Audit Quality

The overall model revealed that the four components of forensic data analytics jointly explained 76.1% of the variation in audit quality ($R^2 = 0.761$), confirming a strong explanatory power. This

finding underscores the collective importance of forensic data analytics as a comprehensive framework for improving audit outcomes in the banking sector.

The results are in agreement with Agustina & Rusydi (2021) and Nigrini (2020), who emphasized that forensic data analytics enhances audit effectiveness by integrating multiple analytical dimensions—data gathering, cleansing, mining, and prediction—to detect fraud and ensure financial accuracy. This integrated approach leads to improved audit efficiency, reduced detection time, and increased stakeholder confidence in financial reporting.

6. Implications of the Findings

The findings of this study have several practical implications:

For Auditors: The integration of forensic data analytics tools improves the depth, accuracy, and timeliness of audit investigations. Auditors should invest in continuous training and technological adoption to effectively utilize these tools.

For Banking Institutions: Banks should implement advanced data management systems that support forensic audit activities and strengthen internal control mechanisms.

For Regulators and Policy Makers: The results highlight the need for regulatory frameworks that encourage the incorporation of data analytics in audit practices to enhance financial transparency and fraud prevention.

For Academia: The study contributes empirical evidence that supports the growing importance of forensic data analytics in enhancing audit quality, providing a base for future comparative studies across sectors.

Conclusion

In summary, the discussion of findings confirms that forensic data analytics significantly influences audit quality in the Nigerian banking sector. Each component data collection, data cleaning, data mining and detection techniques, and predictive analytics plays a vital role in improving audit accuracy, reliability, and fraud detection capability. Collectively, they enhance transparency and accountability in financial reporting, supporting the broader objective of promoting integrity within the financial system.

4.9 Summary of Research Findings

This study investigated the relationship between forensic data analytics and audit quality in the Nigerian banking sector, focusing on four core components: data collection methods, data cleaning, data mining and detection techniques, and predictive analytics. The findings are summarized below in line with the study's objectives and hypotheses.

1. Relationship between Data Collection Methods and Audit Quality

The study established a strong positive and significant relationship between data collection methods and audit quality ($r = 0.726$, $p < 0.05$; $\beta = 0.224$, $p < 0.05$). This implies that the use of systematic, structured, and technology-driven data collection processes enhances the credibility and reliability of audit findings. Accurate and comprehensive data gathering allows auditors to form a holistic understanding of financial activities, thereby improving audit accuracy and effectiveness.

2.Relationship between Data Cleaning and Audit Quality

The results revealed a very strong positive correlation between data cleaning and audit quality ($r = 0.781$, $p < 0.05$; $\beta = 0.278$, $p < 0.05$). This shows that effective data cleaning practices, such as the identification and correction of inconsistencies, duplicates, and errors, significantly enhance the quality of audit results. Clean and reliable data minimize the risks of misinterpretation, leading to more dependable audit conclusions and reports.

3.Relationship between Data Mining and Detection Techniques and Audit Quality

Data mining and detection techniques demonstrated the strongest positive impact on audit quality ($r = 0.802$, $p < 0.05$; $\beta = 0.316$, $p < 0.05$). This indicates that the application of forensic data mining tools—such as anomaly detection, clustering, and predictive modeling—greatly improves auditors' ability to identify suspicious transactions and uncover hidden patterns. Consequently, this enhances fraud detection, strengthens internal controls, and improves overall audit reliability.

4.Relationship between Predictive Analytics and Audit Quality

The analysis also showed a strong and significant relationship between predictive analytics and audit quality ($r = 0.756$, $p < 0.05$; $\beta = 0.241$, $p < 0.05$). Predictive analytics enables auditors to forecast potential fraud and operational risks, thereby supporting proactive decision-making and effective risk management. This enhances both the timeliness and the preventive capabilities of audit processes.

5.Combined Effect of Forensic Data Analytics on Audit Quality.

The regression model revealed that all four forensic data analytics components jointly have a strong and statistically significant effect on audit quality ($R = 0.872$; $R^2 = 0.761$; $F = 225.64$, $p < 0.05$). This means that 76.1% of variations in audit quality are explained by the combined influence of these forensic data analytics elements. This confirms that integrating these techniques leads to more efficient, accurate, and transparent auditing practices in the banking sector.

Overall, the research findings indicate that forensic data analytics significantly enhances audit quality by improving fraud detection, accuracy, and reliability in financial reporting. The results further highlight that among all components, data mining and detection techniques exert the greatest impact, emphasizing their central role in modern forensic auditing. These findings validate all four research hypotheses and affirm the theoretical assumptions that forensic data analytics is a key driver of audit excellence, transparency, and integrity in Nigeria's banking industry.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusion, and recommendations derived from the study on Forensic Data Analytics and Audit Quality in the Banking Sector. It revisits the study's objectives, summarizes the key findings, draws logical conclusions, and provides practical and theoretical recommendations. The chapter also outlines the contribution of the study to knowledge and suggests areas for future research.

5.2 Summary of the Study

This research investigated the relationship between forensic data analytics and audit quality in the Nigerian banking sector, focusing on selected banks in Edo State. The study was motivated by the increasing complexity of financial transactions and the need for auditors to adopt technological tools that can enhance audit accuracy and fraud detection. Chapter One introduced the study, highlighting the research problem, objectives, questions, and hypotheses. It emphasized that poor audit quality and financial irregularities persist in the Nigerian banking sector, necessitating the adoption of forensic data analytics to strengthen audit credibility. Chapter Two provided a comprehensive review of relevant literature, covering conceptual, theoretical, and empirical perspectives. The study was anchored on Institutional Theory, which explains how external pressures such as regulations and professional standards influence organizations' adoption of forensic data analytics tools to enhance audit quality.

Chapter Three described the research methodology. The study employed a survey design, collecting data from 384 respondents across selected banks in Edo State. Data were analyzed using descriptive statistics, correlation, and multiple regression analysis to test the stated hypotheses. Chapter Four presented the data analysis and interpretation of results. The findings revealed that forensic data analytics measured through data collection methods, data cleaning, data mining and detection techniques, and predictive analytics significantly and positively influences audit quality in the banking sector. The regression results showed that these variables collectively explained 76.1% of the variation in audit quality, demonstrating their substantial contribution to improving audit practices.

5.3 Summary of Major Findings

The study produced several key findings:

1. Data Collection Methods and Audit Quality:

Efficient data collection systems were found to significantly enhance audit quality. Accurate and structured data gathering improves auditors' ability to detect misstatements, thereby increasing audit reliability.

2. Data Cleaning and Audit Quality:

Data cleaning showed a strong positive effect on audit quality. The removal of duplicates, inconsistencies, and errors improves the reliability and precision of audit findings, leading to more credible reports.

3. Data Mining and Detection Techniques:

The study revealed that data mining and detection techniques had the strongest positive impact on audit quality. These tools enable auditors to identify irregularities and patterns of fraud that traditional methods may overlook.

4. Predictive Analytics and Audit Quality:

Predictive analytics was also found to significantly improve audit quality by allowing auditors to forecast risks and detect potential anomalies before they escalate, thereby enhancing proactive auditing.

5. Overall Effect of Forensic Data Analytics:

The combined impact of forensic data analytics explained a large proportion of the variation in audit quality ($R^2 = 0.761$). This demonstrates that integrating advanced data analytics tools into audit procedures leads to greater accuracy, transparency, and accountability in the banking sector.

5.4 Conclusion

The study concludes that forensic data analytics significantly improves audit quality in the banking sector. The adoption of technologies such as data mining, predictive analytics, and structured data management systems enables auditors to detect fraud more efficiently and produce more reliable financial reports.

Specifically, the findings indicate that data mining and detection techniques have the greatest influence on audit quality, suggesting that banks that utilize these analytical tools are more likely to uncover fraudulent activities and ensure financial integrity. In essence, forensic data analytics transforms the auditing process from a reactive approach focused on identifying past irregularities to a proactive approach that anticipates risks and enhances decision-making. Therefore, integrating forensic data analytics into audit processes is essential for ensuring transparency, accountability, and stakeholder confidence in Nigeria's banking industry.

5.5 Recommendations

Based on the study's findings and conclusions, the following recommendations are made:

1. Integration of Forensic Data Analytics Tools:

Banks should adopt and integrate forensic data analytics tools such as data mining, predictive modeling, and anomaly detection systems to enhance the accuracy and credibility of their audits.

2. Training and Capacity Development:

Continuous professional development programs should be provided for auditors to equip them with the technical skills necessary for applying forensic data analytics effectively.

3. Investment in Data Infrastructure:

Banks should invest in secure and efficient data management systems that facilitate accurate data collection, cleaning, and analysis for audit purposes.

4. Policy and Regulatory Support:

Regulatory bodies such as the Central Bank of Nigeria (CBN) and the Financial Reporting Council (FRC) should develop guidelines that promote the adoption of forensic data analytics in auditing practices.

5. Collaboration Between Auditors and IT Experts:

Auditors should collaborate with data scientists and IT professionals to effectively implement and interpret analytical models that improve audit quality and fraud detection.

6. Promotion of Predictive Risk Management:

Predictive analytics should be adopted as a key component of risk assessment and management to identify and mitigate potential threats before they affect the organization.

5.6 Contribution to Knowledge

This study has made significant contributions to academic literature and practice in the following ways:

1. It empirically established a strong positive relationship between forensic data analytics and audit quality in the Nigerian banking sector.
2. It demonstrated that data mining and detection techniques have the most substantial influence on audit quality, emphasizing their strategic importance.
3. It provided a validated model indicating that forensic data analytics explains 76.1% of the variation in audit quality.
4. It extended Institutional Theory by showing how external regulatory pressures and technological advancements drive the adoption of forensic analytics in auditing.
5. It filled a contextual gap by focusing on Nigerian banks, offering insights applicable to similar emerging economies.
6. It provided practical implications for regulators, auditors, and bank managers on the effective integration of analytics in auditing to enhance credibility and fraud prevention.

5.7 Suggestions for Further Studies

1. Future research could extend this study to other sectors, such as insurance, telecommunications, and manufacturing, to compare the influence of forensic data analytics across industries.
2. A longitudinal study could be conducted to examine how the sustained use of forensic data analytics influences audit quality over time.
3. Further research may explore the role of emerging technologies such as artificial intelligence, blockchain, and cloud computing in forensic auditing.
4. Future studies could also examine the challenges and ethical implications associated with data privacy and analytics in audit practice.

5.8 Summary of the Chapter

This chapter summarized the study's findings, conclusions, and recommendations. The research established that forensic data analytics significantly enhances audit quality by improving accuracy, fraud detection, and risk management in the banking sector. The adoption of data-driven auditing practices not only strengthens financial transparency but also promotes public trust and institutional integrity.

Ultimately, this study underscores that forensic data analytics is not just a technological advancement but a strategic necessity for ensuring credible and effective auditing in the modern banking environment.

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