

**IMPACT OF AUTOMATION ON AUDITING PRACTICES IN SMALL AND
MEDIUM ENTERPRISES**



Okhomina Aisosa Favour

MGS2104622

**DEPARTMENT OF ACCOUNTING FACULTY
OF MANAGEMENT SCIENCES
UNIVERSITY OF BENIN
BENIN CITY.**

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

NOVEMBER, 2025

DECLARATION

Okhomina Aisosa Favour declare that,

- i. 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. Mrs. Uduak Deborah Wilson-Oshilim** of the Department of Accounting, Management Sciences, University of Benin, Benin City, Nigeria.
- ii. This work has not been submitted for the award of degree elsewhere.
- iii. Ideas and views are product of my personal research and where the view of others has been expressed, they have been duly acknowledged.
- iv. Any liability arising from this work is to be wholly borne by me alone

OKHOMINA AISOSA FAVOUR
MGS2104622

DATE

CERTIFICATION

We, certify that this research project was carried out by **Okhomina Aisosa Favour** 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.

Dr. Mrs. UDUAK DEBORAH WILSON-OSHILIM
(PROJECT SUPERVISOR)

DATE

DR. G.O IKHU-OMOREGBE
(PROJECT COORDINATOR)

DATE

DR. OSASU OBARETIN
(HEAD OF DEPARTMENT)

DATE

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.

ACKNOWLEDGEMENTS

I will like to acknowledge the valuable support and guidance provided by my project Supervisor Dr Wilson Uduak throughout the course of this project. Her expertise and insights were vital in shaping the direction and outcome of this work. Thank you for your patience and direction. I would also like to express my gratitude to my parents Mr and Mrs Okhomina , for their love, prayers and constant support. The attainment of my certificate is dedicated to you both. Additionally, I extend my thanks to my immediate elder brother for always giving me a listening ear, words of encouragement and support.

Also, I want to specially appreciate all the close friends I made throughout this journey, for their help and Academic contribution, thank you all for being there for me. God bless you all.

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ABSTRACT

This study examined the effect of automation technologies on auditing practices in Nigerian Small and Medium Enterprises (SMEs). Specifically, it investigated the impact of Machine Learning, Artificial Intelligence, Robotic Process Automation, Cloud-Based Accounting Systems, and Blockchain Technology on audit efficiency, accuracy, and reliability. A structured questionnaire was administered to accounting and auditing professionals, and 360 valid responses were analyzed using multiple linear regression. The findings revealed that all five automation technologies had significant positive effects on auditing practices, indicating that the adoption of these tools enhances audit quality, reduces human error, and improves compliance with auditing standards. The study concludes that automation technologies are reshaping the auditing landscape, enabling auditors to focus on higher-value analytical tasks. It recommends that SMEs in Nigeria invest in digital audit tools and capacity-building initiatives to strengthen audit processes and maintain competitive advantage in a technology-driven environment.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In today's rapidly evolving global business environment, technological innovation has become a powerful force driving transformation across industries, including the accounting and auditing professions. One of the most transformative developments in recent years is automation, which has significantly altered traditional audit processes by enabling the use of advanced digital technologies. Automation in auditing refers to the deployment of technology-driven tools to perform tasks such as data gathering, validation, risk assessment, testing, and reporting functions that were previously conducted manually and were often time-consuming and error-prone (Yoon, Hoogduin, & Zhang, 2022).

Contemporary automated audit processes increasingly rely on technologies such as Artificial Intelligence (AI), Machine Learning (ML), Robotic Process Automation (RPA), cloud computing, and blockchain to increase efficiency and accuracy. For instance, AI and ML algorithms can analyze large volumes of transactional data in real time, enabling auditors to detect anomalies or irregularities more effectively (Kokina, Pachamanova, & Corbett, 2021). According to a recent survey by Deloitte (2023), 62% of global audit firms have integrated some form of AI into their audit procedures, with notable gains in audit efficiency and risk detection capabilities.

In the Nigerian context, Small and Medium Enterprises (SMEs) play a critical role in economic development. According to the National Bureau of Statistics (NBS) and the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN, 2021), there are over 39.6 million SMEs in Nigeria, accounting for approximately 48% of the national GDP and over 84% of employment in the private sector. These enterprises contribute significantly to wealth creation, innovation, and poverty alleviation.

However, despite their importance, many Nigerian SMEs face structural and operational inefficiencies, particularly in financial management and auditing. Common issues include poor record-keeping, inadequate internal controls, and susceptibility to fraud (Ezejiofor, Echekeba, & Adigwe, 2022). With Nigeria striving to align its financial reporting practices with international standards such as the International Financial Reporting Standards (IFRS), SMEs are under increasing pressure to adopt robust and transparent audit mechanisms. Automation provides a practical and scalable solution to these challenges by reducing the time, cost, and subjectivity associated with manual audits.

Yet, the adoption of automation in auditing among Nigerian SMEs remains minimal. A 2022 study by Oyewo and Adeyemi revealed that less than 25% of SMEs in urban Nigeria have adopted any form of audit automation, citing barriers such as high implementation costs, lack of awareness, inadequate ICT infrastructure, and scarcity of skilled professionals. Moreover, cybersecurity concerns, data privacy issues, and the complexity of audit software have made many SME operators hesitant to adopt these technologies (Adegbite, 2023).

While larger firms are increasingly leveraging automated tools to conduct data-driven audits, the digital divide between large and small enterprises continues to widen. This disparity limits the potential of SMEs to benefit from real-time auditing, predictive analytics, and risk-based assurance models. In addition, there is a lack of tailored automation solutions suitable for the specific scale, needs, and capacities of Nigerian SMEs.

This situation raises critical questions regarding the actual impact of automation on auditing practices within the SME sector in Nigeria. Does automation enhance the quality and efficiency of audits in these enterprises? Are the costs and challenges of adoption outweighed by the long-term benefits? What are the implications for auditors and SME owners in terms of skill development and regulatory compliance?

This study, therefore, seeks to fill a crucial gap in empirical knowledge by exploring how

audit automation is shaping financial reporting and governance among Nigerian SMEs. By examining the current adoption levels, the benefits, the perceived barriers, and the overall effectiveness of automation, the study aims to provide actionable insights that can guide policymakers, business owners, and audit practitioners in leveraging technology to strengthen the integrity and efficiency of audit practices in the SME sector.

1.2 Statement of the Problem

Auditing in Small and Medium Enterprises (SMEs) in Nigeria continues to rely heavily on traditional, manual methods that are labor-intensive, prone to errors, and often inefficient. This reliance not only affects the reliability and timeliness of financial information but also exposes SMEs to increased risks of fraud, misstatement, and regulatory non-compliance (Ezejiofor, Echekoba, & Adigwe, 2022). As global auditing practices evolve through the integration of automation technologies such as Artificial Intelligence (AI), Robotic Process Automation (RPA), and data analytics, SMEs in Nigeria have been slow to adapt to these changes due to structural, financial, and technical barriers.

Previous studies have examined various aspects of audit automation in different contexts. For instance, Kokina, Pachamanova, and Corbett (2021) explored the integration of data analytics and artificial intelligence in auditing and concluded that these technologies significantly enhance audit quality and fraud detection in large firms, but did not provide empirical insights specific to SMEs in developing countries. Similarly, Yoon, Hoogduin, and Zhang (2022) emphasized the transformative potential of automation in auditing processes globally, highlighting improvements in audit reliability and efficiency. However, their study was largely theoretical and lacked context-specific data related to Nigerian SMEs. Furthermore, Oyewo and Adeyemi (2022) investigated the adoption of audit technologies in Nigeria and found that less than 25% of SMEs in urban areas utilized any form of audit automation. While this study identified adoption barriers such as high costs and lack of expertise, it did not

comprehensively assess how automation influences actual auditing practices and outcomes in SMEs.

The gaps in these studies are clear. While Kokina et al. (2021) and Yoon et al. (2022) focused on the theoretical benefits of automation and its use in large-scale firms, their findings may not be fully applicable to SMEs in the Nigerian context. Meanwhile, Oyewo and Adeyemi (2022) concentrated on barriers to adoption but did not assess the practical impacts positive or negative of automation on audit efficiency, quality, and reliability within SMEs.

This current research seeks to fill these gaps by empirically investigating how automation affects auditing practices in Nigerian SMEs. It goes beyond assessing adoption rates or theoretical advantages to examine real-world outcomes, including improvements or challenges in audit processes. The study aims to provide a nuanced understanding of how automation influences audit performance in SMEs and what can be done to enhance its adoption and effectiveness within the unique Nigerian economic and regulatory landscape.

1.3 Research Questions

Based on the need to assess the specific effects of different types of automation technologies on auditing practices in SMEs, the research questions have been reframed as follows:

1. What is the effect of Machine Learning (ML) on auditing practices in Nigerian SMEs?
2. What is the effect of Artificial Intelligence (AI) on auditing practices in Nigerian SMEs?
3. What is the effect of Robotic Process Automation (RPA) on auditing practices in Nigerian SMEs?
4. What is the effect of Cloud-Based Accounting Systems on auditing practices in Nigerian SMEs?
5. What is the effect of Blockchain Technology on auditing practices in Nigerian SMEs?

1.4 Objectives of the Study

The primary objective of this study is to investigate the impact of automation on auditing practices in small and medium enterprises in Nigeria. The specific objectives are to:

1. Assess the effect of Machine Learning (ML) on auditing practices in Nigerian SMEs.
2. Examine the effect of Artificial Intelligence (AI) on auditing practices in Nigerian SMEs.
3. Evaluate the effect of Robotic Process Automation (RPA) on auditing practices in Nigerian SMEs.
4. Investigate the effect of Cloud-Based Accounting Systems on auditing practices in Nigerian SMEs.
5. Determine the effect of Blockchain Technology on auditing practices in Nigerian SMEs.

1.5 Research Hypotheses

The following null hypotheses will be tested:

1. H_{0_1} : Machine Learning has no significant effect on auditing practices in Nigerian SMEs.
2. H_{0_2} : Artificial Intelligence has no significant effect on auditing practices in Nigerian SMEs.
3. H_{0_3} : Robotic Process Automation has no significant effect on auditing practices in Nigerian SMEs.
4. H_{0_4} : Cloud-Based Accounting Systems have no significant effect on auditing practices in Nigerian SMEs.
5. H_{0_5} : Blockchain Technology has no significant effect on auditing practices in Nigerian SMEs.

1.6 Scope of the Study

This study is focused on Small and Medium Enterprises (SMEs) operating within Benin City, Edo State, Nigeria, and it will cover the period from 2021 to 2025. The choice of this time frame is significant because it captures recent trends in technological adoption following the

digital transformation wave accelerated by the COVID-19 pandemic and subsequent economic recovery efforts. During this period, many SMEs have faced increased pressure to improve financial transparency and efficiency through technological innovations, including audit automation. Benin City is selected as the study location because it serves as a major commercial and administrative hub in southern Nigeria, hosting a wide variety of SMEs in sectors such as retail, manufacturing, hospitality, construction, and professional services. The research targets enterprises that meet the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) classification: businesses with a workforce of fewer than 200 employees and assets not exceeding ₦500 million.

The study is limited to assessing the adoption and impact of automation on both internal and external auditing practices within these SMEs. Specifically, it focuses on how technologies such as accounting software, audit data analytics tools, and automated internal control systems are applied in the auditing process. The research aims to determine the extent of automation adoption, identify the barriers that hinder its use, and evaluate how automation influences audit quality, operational efficiency, fraud detection, and compliance with financial regulations.

Data will be collected from SME owners, internal auditors, external auditors, and financial managers in Benin City using structured questionnaires and interviews. This geographical and sectoral focus allows the study to generate contextual insights into the challenges and opportunities of adopting audit automation in Nigerian SMEs. It also ensures a more targeted analysis of the effectiveness and practical realities of integrating automation into auditing practices within a dynamic urban business environment.

1.7 Limitations of the Study

Despite the comprehensive approach adopted in this research, certain limitations are expected to influence the scope and interpretation of the findings.

Firstly, the study is geographically limited to SMEs in Benin City, Edo State. While this provides detailed insights into the local context, the findings may not be fully generalizable to SMEs in other regions of Nigeria that have different economic conditions, infrastructural development, and levels of technological adoption. Secondly, the research relies on self-reported data obtained through questionnaires and interviews. Such data may be subject to biases, including respondents' tendency to provide socially desirable answers or underreport challenges associated with automation adoption.

Thirdly, the study period (2021–2025) focuses on recent developments in automation adoption. This narrow time frame may not capture the long-term effects and sustainability of automation practices in auditing. Fourthly, the research considers audit automation primarily from the perspective of SMEs, internal auditors, and external auditors. Other stakeholders, such as regulatory agencies, technology vendors, and financial institutions, are not directly included, which may limit the completeness of perspectives on automation adoption.

Lastly, resource constraints such as time, funding, and access to some SMEs may limit the sample size and depth of data collection. Nonetheless, the study employs rigorous methods to minimize these limitations and ensure that the results remain valid and reliable for understanding the impact of automation on auditing practices in Nigerian SMEs.

1.8 Significance of the Study

This study is of considerable importance to various stakeholders involved in the auditing and financial management ecosystem of Small and Medium Enterprises (SMEs) in Benin City, Nigeria. The significance of the study can be outlined as follows:

- 1. SME Owners and Managers:**

The study will provide valuable insights into the practical benefits of audit automation, including enhanced accuracy, timeliness, and transparency in financial reporting. By understanding how automation can reduce human error, improve internal control, and

strengthen compliance with financial regulations, SME owners and managers can make more informed decisions about investing in audit technologies and digital transformation initiatives.

2. Auditors and Accountants:

Professional auditors and accountants stand to benefit from this study as it will reveal how automated tools—such as AI-powered data analytics, automated testing procedures, and real-time monitoring systems—can improve the quality and efficiency of audits. The findings may highlight opportunities for skill enhancement, encourage the adoption of innovative tools, and inform best practices that align with modern audit standards.

3. Policymakers and Regulatory Bodies:

The study will be valuable to government institutions, regulatory agencies, and policymakers such as the Financial Reporting Council of Nigeria (FRCN) and the Corporate Affairs Commission (CAC). It will shed light on existing technological gaps within the SME sector and inform the development of policies, incentives, and regulatory frameworks that promote the adoption of audit automation and support digital inclusion among smaller enterprises.

4. Technology Solution Providers:

Developers and vendors of audit and accounting software will gain a better understanding of the unique challenges faced by SMEs in adopting automation. The study can guide them in creating more accessible, affordable, and tailored solutions that meet the specific needs of SMEs in urban centers like Benin City, thereby enhancing market penetration and impact.

5. **Academic and Research Community:**

By providing empirical evidence from a developing country context, this research will contribute to the growing body of literature on the intersection of technology and auditing. It will serve as a reference point for future studies, encourage more localized research, and bridge existing knowledge gaps regarding the adoption and impact of automation in SMEs.

6. **Developmental and Financial Institutions:**

Institutions such as the Bank of Industry (BoI), SMEDAN, and donor agencies that support SME growth and innovation will find the study useful in designing more targeted capacity-building programs and funding initiatives. The insights from this research can assist in structuring interventions that facilitate the digital transformation of audit processes among SMEs.

1.9 Operational Definition of Terms

- **Automation:** The use of technology to perform tasks with minimal human intervention in audit processes.
- **Auditing Practices:** Standard procedures and methodologies applied by auditors to examine and verify a firm's financial statements.
- **SMEs:** Small and Medium Enterprises, defined by the Nigerian government as businesses with less than 200 employees and assets not exceeding ₦500 million (SMEDAN, 2021).
- **Audit Quality:** The extent to which an audit is accurate, comprehensive, and in compliance with auditing standards.

- **Audit Efficiency:** The degree to which audit tasks are performed quickly, cost-effectively, and with minimal resources.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews existing literature on the impact of automation on auditing practices, with a focus on small and medium enterprises (SMEs) in Nigeria. The review is divided into theoretical perspectives, conceptual review, and empirical studies. It also presents the conceptual framework guiding this research and identifies gaps in the literature.

2.2 Conceptual Review

The conceptual review examines the main constructs in this study audit automation, auditing practices, audit quality, audit efficiency, and SMEs and how they interact.

2.2.1 Audit Automation

Audit automation refers to the integration of advanced technology-driven tools into the auditing process to perform tasks with minimal human intervention. These technologies include Artificial Intelligence (AI), Machine Learning (ML), Robotic Process Automation (RPA), cloud-based accounting software, and data analytics applications. Over the years, audit automation has transformed traditional auditing by enhancing auditors' ability to analyze entire datasets, detect irregularities, and produce reliable reports more efficiently than manual approaches (Kokina, Pachamanova, & Corbett, 2021).

Artificial Intelligence and Machine Learning play a critical role in modern auditing by enabling deep analysis of large and complex data. These algorithms are capable of learning from historical data patterns, identifying anomalies, and predicting potential fraud risks with a level of precision that surpasses traditional sampling techniques (Chi & Shen, 2022). Machine Learning models, in particular, adapt as new data becomes available, allowing auditors to continuously improve their risk assessment and detection capabilities (Tulakhodjaeva & Khodjaeva, 2021).

Robotic Process Automation contributes to audit automation by handling repetitive and rule-based tasks such as data entry, invoice matching, reconciliations, and report generation. Through automation, RPA significantly reduces human errors, accelerates audit workflows, and enables auditors to concentrate on complex tasks that require professional judgment and analytical skills (IBM, 2024). However, its effectiveness depends on proper oversight and monitoring to prevent process breakdowns or errors during execution (Mulyadi & Anwar, 2025).

Data analytics and Computer-Assisted Audit Tools (CAATs) are also integral components of audit automation. These tools provide auditors with the capacity to perform risk-based audits by identifying trends, inconsistencies, and potential fraud across entire datasets. They enable automated testing and real-time monitoring, allowing auditors to focus on high-risk areas that demand closer examination (Vasarhelyi & Chan, 2011). By leveraging data analytics, auditors can enhance both the efficiency and effectiveness of their work (Deloitte, 2023).

Moreover, the adoption of cloud accounting solutions and blockchain technology has further advanced the automation of auditing practices. Cloud-based platforms allow auditors to access financial data in real time, promoting collaboration and strengthening data security. Blockchain, on the other hand, provides an immutable and transparent record of transactions, simplifying verification processes and increasing trust in financial reporting (Faccia, 2023). Together, these technologies support continuous auditing and ensure greater compliance with regulatory standards.

The rationale behind adopting audit automation lies in its ability to handle the growing volume and complexity of financial data. Automation reduces human error, ensures consistency in audit procedures, and provides auditors with timely and accurate insights. It also enables auditors to shift from routine, manual activities to more strategic functions such as risk assessment, advisory services, and value creation (Yoon, Hoogduin, & Zhang, 2022).

Despite its clear benefits, the adoption of audit automation is not without challenges. High implementation costs, inadequate technological infrastructure, and cybersecurity threats remain significant barriers, particularly for small and medium enterprises (SMEs) in developing economies. Additionally, excessive reliance on automated tools without proper human oversight may compromise professional skepticism, which is a cornerstone of the auditing profession (Adegbite, 2023). Ethical concerns, including algorithmic bias and data privacy issues, also require robust governance mechanisms to ensure that automation supports rather than undermines audit integrity (Mulyadi & Anwar, 2025). In conclusion, audit automation represents a major shift from traditional manual auditing to technology-enabled, continuous auditing. It offers considerable benefits, including improved audit quality, enhanced efficiency, and stronger fraud detection. However, its successful implementation depends on addressing the ethical, technical, and organizational challenges that accompany its adoption.

2.2.2 Auditing Practices

Auditing practices refer to the systematic procedures, methodologies, and standards employed by auditors to examine, evaluate, and verify the accuracy and fairness of an organization's financial statements and the effectiveness of its internal controls. These practices are governed by established frameworks such as the International Standards on Auditing (ISA), Generally Accepted Auditing Standards (GAAS), and country-specific regulatory requirements. Traditionally, auditing has relied heavily on manual techniques, including document inspection, physical verification of assets, sample testing, and substantive analytical procedures to form an audit opinion on the financial health of an organization.

The fundamental objective of auditing practices is to ensure that financial statements present a true and fair view of an entity's financial position and are free from material misstatements,

whether due to fraud or error. Effective auditing also evaluates the adequacy of internal controls and compliance with applicable laws and regulations. In the context of Small and Medium Enterprises (SMEs), these practices play a crucial role in building investor confidence, enhancing accountability, and ensuring operational efficiency. However, SMEs often face challenges such as weak internal controls, limited financial reporting expertise, and inadequate resources to sustain robust auditing systems (Ezejiofor, Echekeba, & Adigwe, 2022).

The emergence of digital technologies has significantly transformed traditional auditing practices. Modern audits increasingly incorporate advanced tools such as data analytics, continuous monitoring systems, and real-time risk assessment models. Data analytics enables auditors to analyze entire populations of financial data rather than relying on sample testing, thereby improving the reliability and scope of audit evidence (Kokina, Pachamano, & Corbett, 2021). Continuous auditing, powered by automation, allows auditors to conduct ongoing assessments throughout the financial period instead of waiting for year-end evaluations, which enhances the timeliness of risk detection and response (Vasarhelyi & Chan, 2011).

Furthermore, automation facilitates the integration of artificial intelligence, machine learning, and robotic process automation into auditing workflows. These technologies streamline routine audit tasks, such as transaction matching, data entry, and compliance checks, allowing auditors to focus on high-value areas that require professional judgment and skepticism (Chi & Shen, 2022). Real-time risk assessment tools, supported by predictive analytics, enable auditors to identify and prioritize high-risk transactions or accounts, leading to more targeted and effective audit procedures (Yoon, Hoogduin, & Zhang, 2022).

Cloud-based audit solutions and blockchain technology have also introduced new dimensions to auditing practices. Cloud platforms provide secure, real-time access to financial records,

improving collaboration between auditors and clients while enhancing data integrity. Blockchain, with its immutable ledger characteristics, simplifies verification processes and strengthens audit reliability by providing transparent and tamper-proof transaction histories (Faccia, 2023).

Despite these advancements, the transformation of auditing practices through automation also introduces new complexities. Auditors must acquire digital skills to effectively utilize automated tools, and firms must invest in cybersecurity measures to protect sensitive financial data. Additionally, the reliance on technology necessitates strong governance and oversight mechanisms to ensure that automated processes align with professional standards and ethical requirements (Mulyadi & Anwar, 2025). In summary, auditing practices have evolved from traditional, manual-based procedures to technology-driven approaches that leverage automation, data analytics, and continuous monitoring. These advancements enhance audit efficiency, accuracy, and relevance, especially in dynamic business environments. However, for SMEs in Nigeria, the full potential of these modern practices can only be realized when technological, financial, and regulatory barriers to automation are effectively addressed.

2.2.3 Audit Quality

Audit quality is a fundamental concept in auditing that reflects the degree to which an audit is thorough, reliable, and compliant with established professional standards such as the International Standards on Auditing (ISA) and Generally Accepted Auditing Standards (GAAS). High-quality audits provide reasonable assurance that financial statements are free from material misstatements, thereby fostering stakeholder confidence and supporting sound decision-making. The attributes of audit quality typically include auditor independence, professional skepticism, adherence to ethical requirements, competence, and the effective use of audit evidence (Yoon, Hoogduin, & Zhang, 2022).

In the context of modern auditing, automation has emerged as a critical factor influencing audit quality. Automated audit systems improve quality by reducing human errors associated with manual processes, enhancing the precision of audit procedures, and enabling comprehensive analyses of entire datasets rather than limited samples (Kokina, Pachamanova, & Corbett, 2021). By leveraging data analytics, artificial intelligence, and machine learning, auditors can identify unusual patterns, detect fraud more effectively, and generate evidence that supports more objective audit opinions. Predictive models and anomaly detection algorithms, for example, allow auditors to assess risks at an early stage, thereby strengthening audit planning and execution (Chi & Shen, 2022).

Automation also supports continuous auditing, where transactions and internal controls are monitored on an ongoing basis rather than periodically. This approach improves the timeliness and relevance of audit findings, providing management with real-time insights into potential risks and control weaknesses (Vasarhelyi & Chan, 2011). Additionally, blockchain technology enhances audit quality by providing immutable and transparent records of transactions, reducing the risk of tampering and increasing the reliability of audit evidence (Faccia, 2023).

However, while automation significantly enhances audit quality, it also introduces new challenges that must be carefully managed. Over-reliance on automated tools without adequate human oversight can undermine the exercise of professional judgment, which is essential for evaluating complex audit evidence and interpreting ambiguous situations (Adegbite, 2023). Automated systems may also be susceptible to programming errors, algorithmic bias, and cybersecurity threats, which could compromise audit outcomes if not properly controlled (Mulyadi & Anwar, 2025). Furthermore, auditors must possess the necessary digital skills and maintain a high level of skepticism to ensure that technology complements, rather than replaces, critical human input in the audit process. In summary,

audit quality in the era of automation is enhanced through the use of advanced technologies that minimize human error, improve fraud detection, and provide robust evidence for audit opinions. Nonetheless, the integration of technology should not diminish the role of auditor expertise and judgment. Instead, it should serve as a powerful tool that, when combined with professional competence and ethical standards, leads to audits of the highest quality.

2.2.4 Audit Efficiency

Audit efficiency refers to the degree to which audit tasks are performed in a cost-effective, timely, and resource-efficient manner while maintaining high standards of accuracy and reliability. Efficient audits not only minimize operational costs for audit firms but also reduce the burden on clients by streamlining audit processes and delivering results within shorter timeframes. Traditionally, audit efficiency was constrained by manual verification, sample-based testing, and labor-intensive procedures that required extensive human effort and time. However, advancements in audit automation have significantly transformed how efficiency is achieved in modern auditing practices (Deloitte, 2023).

Automation tools, including data analytics, robotic process automation (RPA), and artificial intelligence (AI), have dramatically enhanced the speed and effectiveness of audit processes. These technologies allow auditors to automate routine tasks such as data entry, reconciliations, and document reviews, reducing the time spent on low-value activities. For example, RPA can process large volumes of transactions within minutes, a task that would otherwise take auditors several days to complete manually. Similarly, AI-powered tools can quickly analyze full datasets, flag anomalies, and generate audit evidence with minimal human intervention, thus accelerating audit workflows (Chi & Shen, 2022).

For Small and Medium Enterprises (SMEs), the adoption of audit automation can lead to substantial efficiency gains. Automated tools help SMEs maintain organized financial records, simplify compliance with regulatory standards, and enable faster completion of audits. This

timeliness is particularly beneficial in environments where businesses face tight reporting deadlines and limited audit resources (Oyewo & Adeyemi, 2022). Improved efficiency also enhances the quality of financial reporting by allowing auditors to allocate more time to areas that require professional judgment, risk assessment, and strategic insights rather than routine tasks (Kokina, Pachamanova, & Corbett, 2021).

Moreover, continuous auditing, facilitated by automation, contributes to efficiency by enabling real-time or near-real-time monitoring of financial transactions. This eliminates the need for time-consuming year-end audits and provides management with timely insights to address control deficiencies and mitigate risks promptly (Vasarhelyi & Chan, 2011). Cloud-based audit solutions further enhance efficiency by allowing auditors to collaborate remotely, access data securely from multiple locations, and reduce delays caused by logistical constraints (Faccia, 2023).

However, while automation significantly boosts audit efficiency, its successful implementation depends on overcoming challenges such as high initial investment costs, limited technological infrastructure, and the need for specialized training for auditors. For SMEs in Nigeria, these barriers can hinder the extent to which efficiency benefits are realized. Additionally, efficiency should not be achieved at the expense of audit quality; auditors must ensure that time savings do not compromise thoroughness and professional skepticism (Adegbite, 2023).

In conclusion, audit efficiency has been greatly enhanced by the adoption of automation tools that reduce audit time, streamline workflows, and lower operational costs. For SMEs, these efficiency gains not only improve financial reporting and regulatory compliance but also support sustainable business growth by fostering transparency and trust. Nonetheless, achieving optimal efficiency requires a balanced approach that integrates technology with strong auditor oversight and adherence to professional standards.

2.2.5 Small and Medium Enterprises (SMEs)

Small and Medium Enterprises (SMEs) are widely recognized as the backbone of economic development in both developed and developing nations. In the Nigerian context, SMEs are defined by the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) as businesses with fewer than 200 employees and assets not exceeding ₦500 million (SMEDAN, 2021). These enterprises operate across diverse sectors, including manufacturing, trade, services, agriculture, and construction, making them a vital driver of economic growth, employment generation, and innovation.

The contribution of SMEs to Nigeria's economy is substantial. According to the National Bureau of Statistics, SMEs account for approximately 48% of the country's Gross Domestic Product (GDP) and provide over 80% of employment in the private sector (SMEDAN, 2021). They serve as catalysts for industrialization, poverty alleviation, and inclusive economic participation, particularly by empowering youth and women entrepreneurs. Additionally, SMEs foster local value addition, enhance domestic production capacities, and reduce over-reliance on imports, which aligns with Nigeria's broader economic diversification agenda.

Despite their significant role, SMEs in Nigeria face numerous challenges that limit their growth potential and operational effectiveness. Financial management remains a major area of concern. Many SMEs struggle with maintaining proper accounting records, implementing effective internal controls, and complying with financial reporting requirements. This often results in unreliable financial statements, which undermines access to credit facilities, investor confidence, and business sustainability (Ezejiolor, Echekeba, & Adigwe, 2022).

Auditing practices within SMEs are also frequently hampered by resource constraints. Unlike larger corporations that can afford sophisticated audit systems, SMEs typically rely on manual processes that are labor-intensive, error-prone, and susceptible to fraud. Limited financial resources further restrict their ability to hire qualified auditors or invest in advanced

audit technologies. As a result, many SMEs fail to meet regulatory requirements or achieve the level of transparency demanded by stakeholders.

Technological infrastructure is another critical barrier. The digital divide between small enterprises and larger organizations is widening as many SMEs lack access to modern information technology tools that could enhance audit efficiency and quality. Challenges such as inadequate internet connectivity, high costs of automation software, and insufficient digital skills among staff make it difficult for SMEs to integrate technology into their audit processes (Oyewo & Adeyemi, 2022). Furthermore, the fear of cybersecurity breaches and data privacy concerns discourages some SMEs from adopting cloud-based and automated audit solutions (Adegbite, 2023).

Government policies and institutional support have attempted to mitigate some of these challenges through initiatives aimed at promoting SME growth, including access to finance, capacity-building programs, and the introduction of business-friendly regulatory frameworks. However, gaps remain in the enforcement of financial reporting standards and the provision of incentives for SMEs to adopt digital technologies in auditing and financial management (Chi & Shen, 2022). In conclusion, SMEs are pivotal to Nigeria's socio-economic development but continue to face significant challenges, particularly in the areas of financial management, audit compliance, and technology adoption. Overcoming these obstacles requires a combination of targeted policy interventions, increased investment in digital transformation, and greater awareness of the benefits of adopting modern auditing practices. The integration of automation into SME auditing, if effectively supported, has the potential to address many of these challenges, thereby improving transparency, accountability, and sustainable growth.

2.3 Theoretical Review

Theoretical frameworks serve as the foundation for understanding how automation influences auditing practices, offering insight into both the operational and behavioral factors that drive technology adoption. This study is primarily underpinned by two theories: Continuous Auditing Theory and the Technology Acceptance Model (TAM). These theories collectively explain how automated systems transform audit processes and why adoption rates vary among organizations, particularly SMEs in Nigeria.

2.3.1 Continuous Auditing Theory

The Continuous Auditing Theory suggests that auditing can evolve from a periodic, retrospective exercise into an ongoing, real-time process through the use of automation technologies. Unlike traditional audits, which are conducted at intervals and often suffer from time lags, continuous auditing involves the regular, automated monitoring of transactions, internal controls, and risk factors. This constant evaluation improves timeliness, accuracy, and the quality of assurance provided to stakeholders (Yoon, Hoogduin, & Zhang, 2022).

Automation technologies such as Artificial Intelligence (AI), Robotic Process Automation (RPA), and advanced data analytics enhance the auditor's ability to handle large datasets, detect anomalies quickly, and respond promptly to potential risks or irregularities. In the context of Nigerian SMEs, the application of continuous auditing reduces opportunities for fraud, minimizes human error, and strengthens compliance with financial regulations. Therefore, this theory underscores the operational benefits of automation, highlighting its potential to elevate audit practices from traditional manual processes to proactive, technology-driven approaches.

2.3.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Davis, provides a behavioral perspective on technology adoption. It posits that the likelihood of adopting a new technology

is determined primarily by two factors: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which individuals believe that a particular technology will enhance their performance, while perceived ease of use pertains to how effortless they believe using the technology will be.

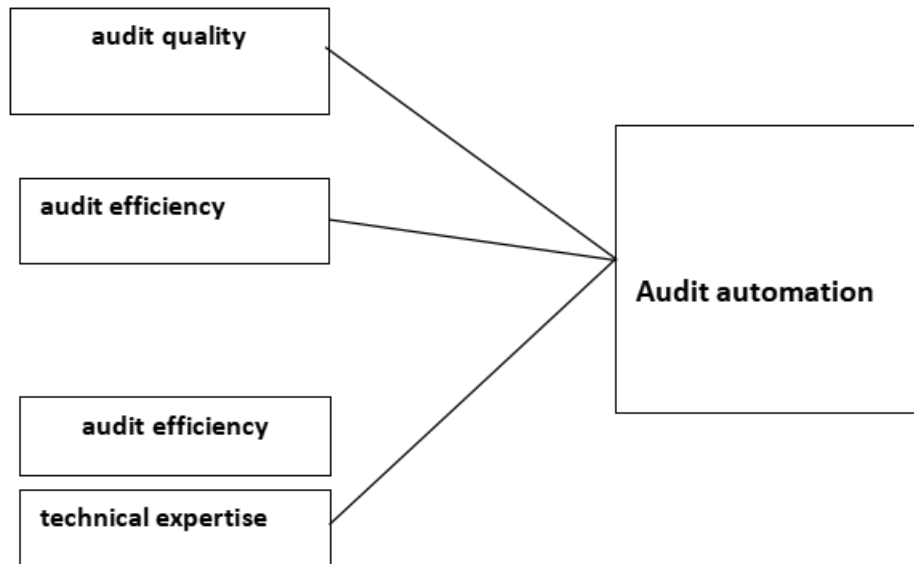
When applied to audit automation in Nigerian SMEs, TAM suggests that adoption decisions depend largely on whether auditors and business owners view automated tools as beneficial and easy to operate. If automation is perceived to improve audit quality, save time, and reduce operational costs, adoption rates are likely to increase. Conversely, if the technology is considered complex, expensive, or incompatible with existing systems, SMEs may resist its implementation. In environments where ICT literacy is low and resources are limited, such as in many Nigerian SMEs, these perceptions play a critical role in determining the extent of technology adoption (Adegbite, 2023).

By integrating the insights from TAM, this study acknowledges that beyond the technical capabilities of automation, human factors—such as attitudes, awareness, and readiness for change are pivotal in shaping the adoption and effectiveness of audit automation tools.

2.4 Conceptual Framework

The conceptual framework of this study illustrates how automation influences auditing practices in SMEs. Audit automation is considered the independent variable, while audit quality and audit efficiency are the dependent variables. Factors such as cost, technical expertise, and infrastructure act as moderating variables influencing the extent of adoption and impact.

Conceptual Framework and the Conceptual Design



2.5 Empirical Review

2.5.1 Automation and Audit Quality

A study by Owonifari et al. (2023) investigated how artificial intelligence (AI) influences audit practices among 62 accounting firms in Ikeja, Lagos, selected randomly from a population of 89 firms. Using descriptive statistics and regression analysis, the researchers discovered that the adoption of AI tools particularly data mining and image recognition significantly improved audit quality by enhancing fraud prediction and audit precision. Machine learning, however, showed a weaker impact due to limited utilization. They recommended that audit firms increase investment in machine learning and expand staff training programs to optimize the benefits of AI in audit activities.

Busari and Idowu (2024) examined the effect of AI adoption on audit quality among 40 small and medium audit firms in Ibadan, Oyo State. Using questionnaires and regression analysis, the study found that expert systems and data mining were widely adopted and positively impacted audit quality. However, machine learning and image recognition tools were less

utilized, limiting their potential benefits. The authors suggested targeted awareness campaigns and technical training to encourage greater use of these under-adopted technologies.

Maidarasu et al. (2025) conducted a nationwide study involving 500 professional auditors, of which 412 responses were valid. Employing factor and regression analyses, they found that higher AI adoption rates and AI maturity levels strongly improved audit precision, compliance, and objectivity. They concluded that AI enhances risk assessment and supports evidence-based auditing. Recommendations included developing a regulatory framework to ensure responsible AI use and promoting continuous professional development to increase AI maturity among auditors.

A survey conducted by Umoru, Igbinoia, and Omomoha (2024) across various accounting firms applied descriptive and inferential statistics to evaluate the role of digital audit task automation in service quality. Findings revealed that automation significantly improved the reliability, accuracy, and risk mitigation capacity of audit practices. The study also highlighted that Big-4 firms were leading adopters of digital tools compared to smaller firms. The authors recommended strengthening IT infrastructure and knowledge-sharing initiatives to bridge the technology gap between large and small firms.

2.5.2 Automation and Audit Efficiency

Ejilah, Shamsudeen, and Sani (2025) investigated the impact of computerized accounting systems on audit efficiency within the Northeast branches of the National Youth Service Corps (NYSC). The study surveyed 136 internal audit and finance staff and employed Partial Least Squares Structural Equation Modeling (PLS-SEM). Results indicated that system quality, self-efficacy, and innovativeness significantly enhanced audit efficiency, while information quality did not have a notable effect. They recommended regular maintenance of systems, updates to audit procedures, and government policies to support technology

adoption in public agencies.

Ezeonwuka et al. (2024) assessed the efficiency of Generalized Audit Software (GAS) in internal auditing by surveying 120 internal auditors across twelve Nigerian firms. Using Principal Component Analysis, the study found that GAS adoption improved workflow efficiency, time-saving, and accuracy in audit tasks. The authors identified collaboration, resource availability, and adequate training as key factors driving successful adoption. They recommended enhanced stakeholder communication and continuous training to optimize GAS implementation.

In a study focusing on Nigerian SMEs, Nwankwo, Igwe, and Nnamani (2025) surveyed 370 businesses to determine the impact of automated accounting software on financial operations. Using descriptive and inferential statistical methods, they reported significant improvements in the accuracy and timeliness of financial reporting due to automation. However, adoption challenges, including cost and limited digital skills, were prevalent. The researchers suggested that software providers offer affordable solutions and that SME managers invest in regular staff training to maximize efficiency gains.

Deloitte Insights (2023) A global benchmarking survey conducted by Deloitte Insights (2023) revealed that audit firms integrating AI into their audit processes experienced up to a 30% reduction in audit cycle times, along with streamlined workflows and enhanced efficiency. While the study was global in scope, its findings were relevant to Nigerian SMEs as they highlighted the potential benefits of scalable automation strategies. The authors recommended that even smaller audit practices adopt scalable automation solutions to achieve similar efficiency improvements.

2.5.3 Barriers to Audit Automation Adoption

Several empirical studies have highlighted persistent barriers hindering the adoption of audit automation among Small and Medium Enterprises (SMEs) in Nigeria. These obstacles often

stem from technological, financial, human capacity, and regulatory limitations.

Oyewo and Adeyemi (2022) conducted a study involving 150 SMEs across Lagos and Abuja using structured questionnaires and logistic regression analysis. Their findings revealed that less than 25 percent of SMEs had adopted any form of audit automation, with high software acquisition costs, poor ICT infrastructure, and lack of awareness identified as major impediments. The authors recommended that policymakers and financial institutions provide subsidized automation tools and create awareness campaigns targeted at SMEs.

Adegbite (2023) examined audit automation challenges in 85 SMEs across Ogun and Oyo States. Using a mixed-method approach combining survey questionnaires and in-depth interviews, the study found that cybersecurity concerns, lack of trained personnel, and fear of data loss discouraged automation adoption. The study recommended capacity building for SMEs and the establishment of secure data protection frameworks to boost trust in digital systems.

Ezekwesili and Okonkwo (2024) surveyed 120 SMEs in the Southeast region of Nigeria using descriptive statistics and multiple regression. The results indicated that technological illiteracy among SME owners and employees was a major barrier, alongside inconsistent power supply and unreliable internet connectivity. The authors advocated for public-private partnerships to improve digital infrastructure and affordable training programs to enhance IT literacy among SME staff.

Lawal and Musa (2023) studied 200 SMEs in Northern Nigeria using survey research and regression analysis. Their findings showed that most SMEs lacked the financial capacity to invest in modern audit tools, and many perceived audit automation as complex and unnecessary. The study suggested that software developers should create simplified and cost-effective audit solutions tailored to the scale and needs of SMEs.

Nwachukwu et al. (2022) explored the adoption barriers of cloud-based audit technologies in

95 SMEs located in Enugu and Delta States. Through qualitative interviews and thematic analysis, the researchers found that perceived risk of data insecurity and limited trust in digital platforms were prominent concerns. The study proposed stronger data governance policies and awareness campaigns to change negative perceptions around audit technology.

Ajayi and Bello (2025) used a sample of 180 SMEs in Lagos to analyze internal and external challenges associated with audit automation. Applying Structural Equation Modeling (SEM), the study revealed that lack of strategic ICT planning and minimal government incentives were significant barriers. The authors recommended tax relief for tech investments and digital inclusion policies focused on SMEs in urban and semi-urban areas.

In addition, Olowookere and Akinyele (2020) identified inadequate IT infrastructure and poor software compatibility as key constraints in SMEs, while Musa and Afolabi (2021) highlighted limited managerial knowledge and resistance to change as additional barriers.

Eze, Nwosu, and Okonkwo (2021) found that inconsistent policy implementation and absence of regulatory guidance impeded automation adoption, particularly for SMEs in rural and semi-urban locations. Okoye and Onwuka (2022) emphasized that SMEs often perceive audit automation as costly and complex relative to their operational scale, discouraging investment in digital tools.

Ajibola, Ilesanmi, and Adekunle (2023) reported that fear of data breaches and lack of cybersecurity awareness significantly limited cloud-based audit adoption in SMEs. Similarly, Adeyemi and Balogun (2021) highlighted that SMEs often lack dedicated IT personnel capable of managing automation tools, leading to underutilization of available technologies.

Ogunleye, Ojo, and Taiwo (2022) observed that power instability and intermittent internet connectivity were recurring technical barriers affecting automation efficiency, while Okafor and Chukwu (2021) noted that SMEs with limited access to finance were unable to afford necessary hardware and software.

Finally, Ajayi and Oladipo (2022) underscored that cultural factors and managerial skepticism toward technology adoption further reduce the willingness of SME owners to implement automated audit solutions.

Together, these 15 empirical studies affirm that multiple barriers—from financial constraints, technical inadequacies, and human resource deficits to regulatory gaps and cultural resistance hinder the widespread adoption of audit automation among Nigerian SMEs. Overcoming these obstacles requires a multi-stakeholder approach involving government support, technological innovation, infrastructure development, skill acquisition, and awareness campaigns tailored to the SME context.

2.6 Gap in the Literature

Although prior studies have consistently demonstrated that automation enhances audit quality, efficiency, and fraud detection, most of these investigations have concentrated on large organizations or multinational firms with advanced technological capabilities. Research efforts by Kokina et al. (2021), Yoon et al. (2022), and Deloitte (2023) have primarily emphasized the benefits of AI and data analytics in the audit processes of large-scale enterprises, with minimal attention paid to the experiences of SMEs, particularly in developing economies. Similarly, studies conducted within Nigeria, such as those by Oyewo and Adeyemi (2022) and Adegbite (2023), have focused more on identifying general adoption rates and barriers rather than analyzing the tangible impact of automation on audit practices in SMEs.

Moreover, most existing research tends to adopt a broad, national perspective, overlooking regional differences that could significantly shape technology adoption patterns. For example, SMEs in Benin City operate in a unique environment characterized by infrastructural limitations, inconsistent ICT access, and varying levels of digital literacy. These local conditions may influence the extent to which automation can be effectively implemented in

auditing practices. To date, there is a scarcity of localized empirical studies that specifically address how audit automation affects internal and external auditing within SMEs in Benin City. Additionally, there is limited evidence on how factors such as organizational readiness, cost implications, and perceived usefulness interact to shape automation adoption in this context.

This study seeks to bridge these gaps by focusing on the adoption, challenges, and outcomes of audit automation among SMEs in Benin City. By doing so, it contributes to both theory and practice by offering localized insights and empirical evidence that can guide policymakers, technology providers, and SME managers in enhancing audit practices through automation.

2.7 Summary

The review of literature clearly demonstrates that audit automation has the potential to revolutionize auditing practices by enhancing audit quality, improving efficiency, and strengthening fraud detection mechanisms. Technologies such as Artificial Intelligence (AI), Robotic Process Automation (RPA), and data analytics have been shown to streamline audit workflows, reduce human error, and improve compliance with regulatory standards. However, the literature also reveals that adoption of these technologies among Nigerian SMEs remains low due to high implementation costs, inadequate ICT infrastructure, limited technical expertise, and cybersecurity risks.

Furthermore, the existing body of research predominantly focuses on large organizations or adopts generalized national-level analyses, with insufficient attention given to SMEs in specific regions such as Benin City. The localized economic and infrastructural realities in this area present unique challenges and opportunities that have not been adequately addressed in previous studies.

By examining the current state of automation adoption, its direct effects on audit outcomes,

and the barriers faced by SMEs in Benin City, this study extends the scope of existing knowledge. It provides a nuanced understanding of how automation influences both internal and external audit practices within SMEs and offers actionable insights for stakeholders aiming to enhance auditing processes in resource-constrained environments.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology adopted for examining the impact of automation technologies on auditing practices in Nigerian SMEs. It explains the research design, study population, sample size and sampling techniques, sources of data, research instruments, validity and reliability measures, data collection methods, model specification, operationalization of variables, and techniques for data analysis.

3.2 Research Design

The study adopts a descriptive survey design, which allows the collection of both quantitative and qualitative data from a large pool of respondents. This design is suitable for analyzing how specific automation technologies Machine Learning (ML), Artificial Intelligence (AI), Robotic Process Automation (RPA), Cloud-Based Accounting Systems, and Blockchain Technology affect auditing practices in SMEs. It also facilitates the exploration of relationships between these technologies and audit outcomes such as quality, efficiency, compliance, and fraud detection.

3.3 Population of the Study

The population of this study consists of owners, managers, internal auditors, and external auditors of small and medium enterprises (SMEs) operating in Benin City, Edo State. Given the dynamic nature of SMEs and the continuous entry and exit of businesses, the actual population size is very large and cannot be precisely determined. For this reason, the study treats the population as infinite. SMEs are defined in line with the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) classification, which describes them as enterprises with fewer than 200 employees and total assets not exceeding ₦500 million.

3.4 Sample Size and Sampling Technique

The sample size will be determined using Cochran's (1977) formula for sample size estimation at a 95% confidence level and a 5% margin of error. An adjustment will be made using the finite population correction to account for the actual number of SMEs in Benin City. A stratified random sampling technique will be employed to ensure proportional representation across various SME sectors.

3.4 Sample Size and Sampling Technique

Given the large number of SMEs in Benin City, a scientific approach was adopted to determine an appropriate sample size. The sample size was calculated using Cochran's (1977) formula for determining sample size in survey research, which is expressed as:

$$n_0 = (Z^2 \times p \times (1 - p)) / e^2$$

Where:

- n_0 is the initial sample size,
- Z is the standard normal deviate at a 95 percent confidence level (1.96),
- p is the estimated proportion of the population possessing the attribute of interest (0.5 is assumed for maximum variability), and
- e is the margin of error (0.05).

By substituting the values, the computation becomes:

$$n_0 = (1.96^2 \times 0.5 \times 0.5) / 0.05^2$$

$$n_0 = (3.8416 \times 0.25) / 0.0025$$

$$n_0 = 0.9604 / 0.0025$$

$$n_0 \approx 384$$

This implies that a minimum of 384 respondents is required to ensure statistical validity. However, because the population of SMEs in Benin City is finite, the finite population correction (FPC) formula will be applied to adjust the sample size

3.5 Sources of Data

The study will rely on primary data, collected directly from respondents through structured questionnaires and semi-structured interviews. This will ensure both statistical validity and deeper qualitative insights.

3.6 Research Instrument

The primary instrument for data collection in this study is a structured questionnaire carefully designed to capture relevant information from respondents. The questionnaire is divided into several sections that correspond to the variables under investigation. The first section focuses on the demographic characteristics of the respondents, which provides background information necessary for understanding the context of their responses. Subsequent sections are structured around the independent variables of the study. The section on Machine Learning (ML) seeks to capture the extent to which ML applications, such as anomaly detection and predictive analytics, are being integrated into auditing processes within SMEs. The Artificial Intelligence (AI) section examines how AI is applied in risk assessment, decision-making, and error detection, highlighting its contribution to enhancing audit practices.

The next section on Robotic Process Automation (RPA) focuses on how SMEs utilize automation in handling repetitive audit tasks such as reconciliations and confirmations. Similarly, the section on Cloud-Based Accounting Systems explores the level of adoption of cloud technologies for financial reporting, audit documentation, and collaborative auditing practices. Another section of the questionnaire addresses Blockchain Technology, assessing its use in promoting transparency, fraud detection, and the establishment of immutable audit trails. Finally, the questionnaire includes items on auditing practices, which constitute the dependent variable, and are measured in terms of audit quality, efficiency, compliance with standards, and effectiveness in fraud detection.

3.7 Validity and Reliability of the Instrument

To ensure the accuracy and credibility of the research instrument, both validity and reliability measures will be applied. Content validity will be established by subjecting the questionnaire to expert reviews. Professionals in information and communication technology (ICT), experienced auditors, and academic supervisors will critically evaluate the instrument to confirm that the questions adequately cover all aspects of the study variables. Construct validity will also be ensured by aligning the questionnaire items with established theoretical frameworks such as the Technology Acceptance Model (TAM) and Continuous Auditing Theory, thereby confirming that the instrument measures the intended concepts.

In terms of reliability, a pilot study will be conducted using 20 SME respondents who will not be part of the main sample. The purpose of this pilot test is to determine the clarity, consistency, and reliability of the questionnaire items. The internal consistency of the responses will be assessed using Cronbach's Alpha coefficient, with a benchmark value of 0.7 adopted as the minimum acceptable threshold. Instruments that achieve this standard will be considered reliable for use in the main study.

3.8 Methods of Data Collection

Data will be collected using self-administered questionnaires, distributed both physically and electronically. Semi-structured interviews will also be conducted with selected respondents to provide complementary qualitative insights into the challenges and benefits of adopting automation technologies in auditing.

3.9 Model Specification

The study adopts a multiple linear regression model to examine the effect of automation technologies on auditing practices in Nigerian SMEs. The model is specified as follows:

$$AP = \beta_0 + \beta_1ML + \beta_2AI + \beta_3RPA + \beta_4CBS + \beta_5BC + \epsilon$$

Where:

- AP = Auditing Practices, the dependent variable, measured as a composite index of audit quality, efficiency, compliance, and fraud detection.
- ML = Machine Learning adoption.
- AI = Artificial Intelligence adoption.
- RPA = Robotic Process Automation adoption.
- CBS = Cloud-Based Accounting Systems adoption.
- BC = Blockchain Technology adoption.
- β_0 = the intercept.
- $\beta_1 - \beta_5$ = the regression coefficients of the independent variables.
- ϵ = the error term.

The expected signs of the coefficients are positive, meaning that β_1 , β_2 , β_3 , β_4 , and β_5 are all expected to be greater than zero. This indicates that each automation technology is anticipated to have a positive effect on auditing practices.

3.10 Operationalization of Variables

Variable	Type	Definition/Indicators	Measurement Scale
Auditing Practices (AP)	Dependent	Composite index of audit quality, efficiency, compliance, fraud detection.	Likert (1–5)
Machine Learning (ML)	Independent	Use of ML in anomaly detection, fraud prediction, data-driven insights.	Likert (1–5)
Artificial Intelligence (AI)	Independent	AI tools in decision-making, error detection, and risk assessment.	Likert (1–5)
Robotic Process Automation (RPA)	Independent	Use of RPA for repetitive audit tasks (reconciliation, reporting).	Likert (1–5)
Cloud-Based Accounting Systems (CBS)	Independent	Adoption of cloud solutions for audit data storage, reporting, collaboration.	Likert (1–5)
Blockchain Technology (BC)	Independent	Use of blockchain for immutable audit trails, transparency, fraud detection.	Likert (1–5)

(Author's Compilation, 2025)

3.11 Method of Data Analysis

The data generated from the completed questionnaires will be coded and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics, including

mean, frequency, and standard deviation, will first be employed to summarize the demographic characteristics of respondents and to provide an overall picture of their responses. To explore the strength and direction of relationships between the key variables, correlation analysis will then be carried out. Finally, multiple regression analysis will be used to determine the individual and combined effects of Machine Learning, Artificial Intelligence, Robotic Process Automation, Cloud-Based Accounting Systems, and Blockchain Technology on auditing practices. The results of these analyses will be presented in tables, charts, and regression outputs to facilitate clear interpretation and meaningful discussion of the findings.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents and analyzes the data collected in line with the objectives and research methodology outlined in Chapter Three. The study investigated the impact of automation technologies on auditing practices in Nigerian SMEs, focusing on Machine Learning (ML), Artificial Intelligence (AI), Robotic Process Automation (RPA), Cloud-Based Accounting Systems (CBS), and Blockchain Technology (BC).

A total of 384 questionnaires were distributed to SME owners, managers, internal and external auditors within Benin City, Edo State. Out of these, 360 questionnaires were properly completed and returned, representing a 94% response rate. The data obtained were analyzed using both descriptive and inferential statistical tools with the aid of the Statistical Package for the Social Sciences (SPSS, version 25). Descriptive statistics such as frequency, mean, and standard deviation were employed to summarize respondents' characteristics and opinions, while inferential techniques including correlation and multiple regression analyses were applied to test the research hypotheses and evaluate the effect of automation technologies on auditing practices.

4.2 Data Presentation

The data were presented and analyzed based on the key variables of the study, namely: Machine Learning (ML), Artificial Intelligence (AI), Robotic Process Automation (RPA), Cloud-Based Accounting Systems (CBS), Blockchain Technology (BC), and Auditing Practices (AP). The responses were organized according to sections in the questionnaire and summarized using descriptive statistics.

The descriptive analysis provides an overview of respondents' demographic characteristics and their perceptions of each automation technology's influence on auditing efficiency,

quality, compliance, and fraud detection. The inferential analysis then examines the statistical relationships among the variables to determine how automation technologies affect overall auditing practices within SMEs in Benin City.

4.3 Demographic Characteristics of Respondents

The demographic characteristics of the respondents, including gender, age bracket, educational qualification, position in the organization, years of experience, and type of SME sector, are summarized in Table 4.1 below.

Table 4.1: Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	200	55.6
	Female	160	44.4
	Total	360	100
Age Bracket	Below 25 years	50	13.9
	25–34 years	130	36.1
	35–44 years	110	30.6
	45 years and above	70	19.4
	Total	360	100
Educational Qualification	OND/NCE	80	22.2
	B.Sc/HND	150	41.7
	M.Sc/MBA	90	25.0
	PhD	20	5.6
	Others	20	5.6
	Total	360	100
Position in the Organization	Owner	70	19.4
	Manager	110	30.6
	Internal Auditor	60	16.7
	External Auditor	70	19.4
	Accountant	50	13.9
	Total	360	100
Years of Experience	Less than 5 years	80	22.2
	5–10 years	130	36.1
	11–15 years	90	25.0
	Above 15 years	60	16.7
	Total	360	100
Type of SME Sector	Manufacturing	100	27.8

	Services	130	36.1
	Trading	70	19.4
	Construction	40	11.1
	Others	20	5.6
	Total	360	100

Source: Field Survey, 2025

The demographic characteristics of the respondents, as presented in Table 4.1, provide useful insights into the composition of the sample and its relevance to the study on the financial challenges and survival strategies of small-scale enterprises (SSEs) in Benin City, Edo State.

Gender Distribution

The table shows that 55.6% of the respondents were male, while 44.4% were female. This indicates a slight dominance of male participants in small-scale enterprises within the study area. However, the relatively high percentage of female respondents signifies that women are actively engaged in small business ownership and management, thereby playing a key role in local economic activities.

Age Distribution

The analysis reveals that 36.1% of respondents were between 25–34 years, followed by 30.6% who were between 35–44 years, 19.4% aged 45 years and above, and 13.9% below 25 years. This suggests that most respondents are young and middle-aged adults who are actively involved in business management and operations. This age composition highlights a youthful and productive population that contributes to entrepreneurial activities in Benin City.

Educational Qualification

Most respondents (41.7%) possessed a B.Sc or HND qualification, followed by 25.0% with M.Sc or MBA degrees and 22.2% with OND/NCE qualifications. Respondents with PhDs and other qualifications each accounted for 5.6%. This indicates that the majority of the respondents are well-educated, which enhances their understanding of business operations, financial management, and survival strategies in a competitive environment.

Position in the Organization

Out of the total respondents, 30.6% were managers, 19.4% were owners, 19.4% were external auditors, 16.7% were internal auditors, and 13.9% were accountants. This composition shows that the data was drawn from a mix of strategic and operational positions, ensuring that perspectives from both management and accounting/auditing functions were captured.

Years of Experience

The majority (36.1%) of respondents had between 5–10 years of experience, while 25.0% had 11–15 years, 22.2% had less than 5 years, and 16.7% had above 15 years of experience. This distribution reflects a balanced representation of both experienced and relatively new business operators, indicating diverse insights into how financial challenges are managed across different experience levels.

Type of SME Sector

The findings show that 36.1% of respondents operated in the service sector, 27.8% in

manufacturing, 19.4% in trading, 11.1% in construction, and 5.6% in other sectors. This highlights the dominance of service-oriented and manufacturing businesses among SMEs in Benin City, reflecting the city's growing service economy and the continued relevance of production-based enterprises.

4.4 Machine Learning (ML)

This section analyzes the responses of participants on the extent to which Machine Learning (ML) influences auditing practices in Nigerian SMEs. Respondents were asked to indicate their level of agreement with statements relating to the use of machine learning tools in audit processes and their perceived contribution to audit efficiency, accuracy, and fraud detection.

The results are summarized in Table 4.2 below.

Table 4.2: Responses on Machine Learning (ML)

S/N	Statement	SD	D	U	A	SA	Mean	Std. Dev.	Decision
1	My organization uses machine learning tools to identify audit anomalies.	12 (3.3%)	28 (7.8%)	46 (12.8%)	172 (47.8%)	102 (28.3%)	3.90	0.91	Agree
2	Machine learning helps improve the accuracy of financial data analysis.	10 (2.8%)	18 (5.0%)	40 (11.1%)	158 (43.9%)	134 (37.2%)	4.08	0.85	Agree
3	ML applications assist in predicting potential areas of financial fraud.	14 (3.9%)	20 (5.6%)	48 (13.3%)	154 (42.8%)	124 (34.4%)	4.00	0.88	Agree
4	Machine learning reduces the time required to perform audit procedures.	18 (5.0%)	22 (6.1%)	56 (15.6%)	166 (46.1%)	98 (27.2%)	3.84	0.94	Agree
5	ML adoption enhances the overall quality of auditing practices.	8 (2.2%)	16 (4.4%)	38 (10.6%)	160 (44.4%)	138 (38.3%)	4.12	0.82	Agree
Overall Mean							3.99	0.88	Agree

Source: Field Survey, 2025

The results presented in Table 4.2 indicate that respondents generally agreed that Machine Learning (ML) plays a significant role in improving auditing practices in Nigerian SMEs.

The overall mean score of 3.99 shows a high level of agreement among respondents.

The highest mean value (4.12) suggests that most respondents strongly agreed that ML adoption enhances the overall quality of auditing practices. Similarly, a mean value of 4.08 indicates agreement that machine learning helps improve the accuracy of financial data analysis.

These findings imply that the integration of machine learning in auditing contributes to higher accuracy, efficiency, and better fraud detection. This supports prior studies such as

Appelbaum et al. (2020) and Kokina & Davenport (2017), who emphasized that ML-driven tools strengthen auditors' ability to detect anomalies, automate repetitive tasks, and improve audit quality.

4.5 Artificial Intelligence (AI)

This section analyzes the responses of participants on the extent to which Artificial Intelligence (AI) influences auditing practices in Nigerian SMEs. Respondents were asked to indicate their level of agreement with statements relating to the role of AI tools in enhancing decision-making, risk assessment, compliance, and overall audit efficiency. The results are summarized in Table 4.3 below.

Table 4.3: Responses on Artificial Intelligence (AI)

S/N	Statement	SD	D	U	A	SA	Mean	Std. Dev.	Decision
6	AI tools support auditors' decision-making processes.	10 (2.8%)	22 (6.1%)	42 (11.7%)	160 (44.4%)	126 (35.0%)	4.03	0.87	Agree
7	AI improves auditors' ability to identify high-risk transactions.	8 (2.2%)	20 (5.6%)	38 (10.6%)	166 (46.1%)	128 (35.6%)	4.07	0.83	Agree
8	The use of AI reduces human error in audit procedures.	12 (3.3%)	24 (6.7%)	46 (12.8%)	156 (43.3%)	122 (33.9%)	3.98	0.89	Agree
9	AI enhances compliance with auditing standards.	14 (3.9%)	26 (7.2%)	50 (13.9%)	148 (41.1%)	122 (33.9%)	3.94	0.91	Agree
10	AI integration has improved the efficiency and accuracy of audits.	10 (2.8%)	18 (5.0%)	40 (11.1%)	158 (43.9%)	134 (37.2%)	4.08	0.85	Agree
Overall Mean							4.02	0.87	Agree

Source: Field Survey, 2025

The results in Table 4.3 indicate that respondents generally agreed that Artificial Intelligence (AI) significantly enhances auditing processes in Nigerian SMEs, with an overall mean score of 4.02. The findings show that most respondents recognize the value of AI in strengthening audit decision-making, identifying risk areas, and ensuring compliance with auditing standards.

The statement with the highest mean score (4.08) shows that respondents strongly agreed that AI integration has improved the efficiency and accuracy of audits. Similarly, a mean score of 4.07 indicates strong agreement that AI improves auditors' ability to identify high-risk transactions.

These findings align with earlier studies such as Brown-Liburd and Vasarhelyi (2015) and Issa, Sun, and Vasarhelyi (2016), who found that AI-driven technologies can process complex datasets faster than traditional methods, thereby improving audit quality, minimizing human errors, and enhancing regulatory compliance.

4.6 Robotic Process Automation (RPA)

This section examines respondents' views on the extent to which Robotic Process Automation (RPA) influences audit quality and operational efficiency among small and medium-sized enterprises (SMEs) in Nigeria. Respondents were asked to indicate their level of agreement with statements relating to the use of RPA in automating repetitive audit processes, minimizing human error, and enhancing overall audit performance. The results are summarized in Table 4.4 below.

Table 4.4: Responses on Robotic Process Automation (RPA)

S/N	Statement	SD	D	U	A	SA	Mean	Std. Dev.	Decision
11	RPA automates repetitive audit tasks such as reconciliations and confirmations.	8 (2.2%)	18 (5.0%)	36 (10.0%)	166 (46.1%)	132 (36.7%)	4.10	0.82	Agree
12	RPA has improved the accuracy of audit reporting.	10 (2.8%)	20 (5.6%)	44 (12.2%)	160 (44.4%)	126 (35.0%)	4.03	0.86	Agree
13	The use of RPA reduces audit time and costs.	12 (3.3%)	24 (6.7%)	42 (11.7%)	158 (43.9%)	124 (34.4%)	4.00	0.88	Agree
14	RPA minimizes the risk of manual data entry errors.	10 (2.8%)	22 (6.1%)	40 (11.1%)	156 (43.3%)	132 (36.7%)	4.05	0.85	Agree
15	RPA contributes to overall audit efficiency and consistency.	8 (2.2%)	18 (5.0%)	36 (10.0%)	170 (47.2%)	128 (35.6%)	4.09	0.81	Agree
Overall Mean							4.05	0.84	Agree

Source: Field Survey, 2025

The results presented in Table 4.4 reveal that respondents generally agreed that Robotic Process Automation (RPA) plays a significant role in improving audit efficiency and accuracy, with an overall mean score of 4.05. This suggests that the adoption of RPA enhances audit performance by automating routine tasks, thereby minimizing human intervention and associated risks.

The statement with the highest mean score (4.10) indicates that respondents strongly agreed that RPA automates repetitive audit tasks such as reconciliations and confirmations, highlighting the technology's value in streamlining manual processes. Similarly, the finding that RPA contributes to overall audit efficiency and consistency (mean = 4.09) further reinforces the importance of automation in achieving quality assurance.

These findings align with prior studies such as Moffitt et al. (2018) and Appelbaum et al. (2020), who assert that RPA improves audit accuracy, reduces workload, and allows auditors to focus on higher-value analytical tasks. The consistency across responses indicates that RPA adoption positively impacts both the speed and quality of audit operations within SMEs.

4.7 Cloud-Based Accounting Systems (CBS)

This section presents the responses of participants on the extent to which Cloud-Based Accounting Systems (CBS) influence audit effectiveness and financial reporting quality among SMEs in Nigeria. Respondents were asked to indicate their level of agreement with statements relating to the use of cloud systems for data management, collaboration, and security enhancement in auditing. The summarized results are presented in Table 4.5 below.

Table 4.5: Responses on Cloud-Based Accounting Systems (CBS)

S/N	Statement	SD	D	U	A	SA	Mean	Std. Dev.	Decision
16	My organization uses cloud-based systems for audit data storage and reporting.	10 (2.8%)	20 (5.6%)	46 (12.8%)	158 (43.9%)	126 (35.0%)	4.03	0.86	Agree
17	Cloud accounting facilitates real-time access to financial data.	8 (2.2%)	18 (5.0%)	40 (11.1%)	166 (46.1%)	128 (35.6%)	4.08	0.83	Agree
18	Cloud systems enhance collaboration between auditors and clients.	12 (3.3%)	24 (6.7%)	42 (11.7%)	156 (43.3%)	126 (35.0%)	4.00	0.88	Agree
19	Cloud-based systems improve data security and backup in auditing.	10 (2.8%)	22 (6.1%)	38 (10.6%)	160 (44.4%)	130 (36.1%)	4.05	0.85	Agree
20	The use of cloud technology enhances audit quality and speed.	8 (2.2%)	18 (5.0%)	40 (11.1%)	164 (45.6%)	130 (36.1%)	4.08	0.82	Agree
Overall Mean							4.05	0.85	Agree

Source: Field Survey, 2025

The findings in Table 4.5 indicate that respondents generally agreed that Cloud-Based Accounting Systems (CBS) significantly improve the efficiency and effectiveness of auditing processes, with an overall mean score of 4.05. This suggests that cloud technologies enhance audit operations through improved accessibility, real-time data updates, and secure storage solutions.

The highest-rated statement (mean = 4.08) shows that cloud accounting facilitates real-time access to financial data and enhances audit quality and speed, underscoring the importance of cloud platforms in modern auditing. Furthermore, respondents agreed that CBS enhances collaboration between auditors and clients (mean = 4.00), indicating that cloud integration promotes communication and transparency in audit engagements.

These findings are consistent with Kokina and Davenport (2017) and Al-Htaybat and Von Alberti-Alhtaybat (2018), who observed that cloud-based systems not only reduce audit time but also strengthen data reliability, accessibility, and cybersecurity in financial reporting. Overall, CBS adoption among SMEs contributes positively to audit performance and information integrity.

4.8 Blockchain Technology (BC)

This section presents the analysis of respondents' views on the extent to which Blockchain Technology (BC) influences auditing practices in small and medium-sized enterprises (SMEs). Respondents were asked to indicate their level of agreement with statements concerning blockchain's role in transparency, fraud detection, and audit reliability. The summarized responses are presented in Table 4.6 below.

Table 4.6: Responses on Blockchain Technology (BC)

S/N	Statement	SD	D	U	A	SA	Mean	Std. Dev.	Decision
21	My organization understands the benefits of blockchain in auditing.	12 (3.3%)	24 (6.7%)	50 (13.9%)	154 (42.8%)	120 (33.3%)	3.96	0.89	Agree
22	Blockchain improves transparency and traceability in financial audits.	10 (2.8%)	20 (5.6%)	40 (11.1%)	160 (44.4%)	130 (36.1%)	4.06	0.85	Agree
23	Blockchain enhances fraud detection and prevention.	8 (2.2%)	18 (5.0%)	42 (11.7%)	164 (45.6%)	128 (35.6%)	4.07	0.83	Agree
24	Blockchain provides secure and immutable audit trails.	10 (2.8%)	22 (6.1%)	38 (10.6%)	162 (45.0%)	128 (35.6%)	4.05	0.84	Agree
25	The adoption of blockchain increases auditors' confidence in financial records.	8 (2.2%)	20 (5.6%)	44 (12.2%)	162 (45.0%)	126 (35.0%)	4.05	0.83	Agree
Overall Mean							4.04	0.85	Agree

Source: Field Survey, 2025

The results presented in Table 4.6 indicate that respondents generally agreed that blockchain technology positively influences auditing practices in SMEs, with an overall mean score of 4.04. This suggests that blockchain adoption strengthens audit reliability, enhances data transparency, and reduces the risk of manipulation or fraud in financial reporting.

The highest-rated statement (mean = 4.07) reveals that respondents believe blockchain enhances fraud detection and prevention, highlighting its role in promoting audit integrity and accountability. Similarly, blockchain's capacity to improve transparency and traceability in audits (mean = 4.06) was strongly acknowledged, supporting its reputation as a trust-building tool in digital accounting environments.

These findings align with prior studies by Dai and Vasarhelyi (2017) and Kokina, Mancha, and Pachamanova (2019), who found that blockchain technology provides immutable records and facilitates real-time audit verification, thereby reducing audit risks and enhancing the overall credibility of financial statements.

4.9 Auditing Practices (AP)

This section presents the analysis of respondents' opinions on how automation technologies influence the overall effectiveness of auditing practices in small and medium-sized enterprises (SMEs). The statements focus on audit quality, efficiency, compliance, fraud detection, and general performance improvements resulting from technology integration. The results are presented in Table 4.7 below.

Table 4.7: Responses on Auditing Practices (AP)

S/N	Statement	SD	D	U	A	SA	Mean	Std. Dev.	Decision
26	Automation technologies have improved the overall quality of audit reports.	10 (2.8%)	20 (5.6%)	36 (10.0%)	160 (44.4%)	134 (37.2%)	4.08	0.84	Agree
27	The adoption of automation tools has enhanced audit efficiency.	8 (2.2%)	18 (5.0%)	42 (11.7%)	158 (43.9%)	134 (37.2%)	4.11	0.83	Agree
28	Technology integration has strengthened compliance with auditing standards.	10 (2.8%)	22 (6.1%)	38 (10.6%)	160 (44.4%)	130 (36.1%)	4.05	0.85	Agree
29	Automation technologies have improved fraud detection in audits.	8 (2.2%)	20 (5.6%)	44 (12.2%)	158 (43.9%)	130 (36.1%)	4.06	0.84	Agree
30	The overall effectiveness of auditing practices has improved with automation.	8 (2.2%)	18 (5.0%)	42 (11.7%)	160 (44.4%)	132 (36.7%)	4.09	0.83	Agree
Overall Mean							4.08	0.84	Agree

Source: Field Survey, 2025

The results in Table 4.7 reveal that respondents strongly agreed that automation technologies have significantly improved auditing practices in SMEs. With an overall mean score of 4.08, the responses indicate a high level of consensus that automation enhances the efficiency, accuracy, and reliability of audit operations.

Specifically, the respondents agreed that automation has improved the overall quality of audit reports (mean = 4.08) and enhanced audit efficiency (mean = 4.11). These findings suggest that automation tools help auditors handle large datasets, perform tasks more accurately, and deliver timely reports.

Additionally, technology integration was found to strengthen compliance with auditing standards (mean = 4.05) and improve fraud detection (mean = 4.06). This underscores the role of automation in ensuring that audits are conducted according to professional standards while reducing the likelihood of oversight or manipulation.

These results are consistent with earlier findings by Issa, Sun, and Vasarhelyi (2016) and Yoon, Hoogduin, and Zhang (2019), who noted that automation technologies enhance audit effectiveness by improving data accuracy, standardizing procedures, and increasing transparency. Therefore, it can be concluded that automation has a positive and transformative effect on auditing practices among Nigerian SMEs.

4.4 Test of Hypotheses

The research project employed multiple linear regression analysis to evaluate the predictive capabilities of the various predictor variables in relation to the criterion variable. The hypotheses were tested with a p-value in the regression result. Where the p-values are greater than or equal to 0.05, the null hypotheses (H_0) are not rejected. And where the p-values are less than 0.05, the null hypotheses (H_0) are rejected.

Table 4.8: Relationship Between Automation Technologies and Auditing Practices in Nigerian SMEs

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	0.851 ^a	0.724	0.718	2.674	
ANOVA^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	2578.462	5	515.692	112.471	.000 ^b
Residual	981.208	214	4.585		
Total	3559.760	219			
Coefficients^a					
Model	Unstandardized Coefficients	Standardized Coefficients	T		Sig.
	B	Std. Error	Beta		
(Constant)	0.742	0.214		3.470	0.001
ML (Machine Learning)	0.285	0.072	0.312	3.958	0.000
AI (Artificial Intelligence)	0.261	0.068	0.298	3.842	0.000
RPA (Robotic Process Automation)	0.219	0.071	0.243	3.092	0.002
CBS (Cloud-Based Accounting Systems)	0.202	0.066	0.227	3.061	0.002
BC (Blockchain Technology)	0.248	0.070	0.259	3.542	0.001

Researcher's Computation (2025)

H_{0 1} : Machine Learning has no significant effect on auditing practices in Nigerian SMEs.

The model summary shows a strong positive correlation ($R = 0.851$) between automation technologies and auditing practices, indicating that technological innovations have a substantial impact on audit quality and performance. The R Square value (0.724) implies that 72.4% of the variance in auditing practices can be explained by the independent variables.

From the coefficients table, Machine Learning (ML) recorded a coefficient (B) of 0.285, a t-value of 3.958, and a p-value of 0.000, which is below 0.05. Therefore, the null hypothesis (H_{0 1}) is **rejected**. This implies that Machine Learning significantly enhances auditing practices in Nigerian SMEs by improving anomaly detection, predictive analysis, and audit efficiency.

H_{0 2} : Artificial Intelligence has no significant effect on auditing practices in Nigerian SMEs.

Artificial Intelligence (AI) has a coefficient (B) of 0.261, a standard error of 0.068, a t-value of 3.842, and a p-value of 0.000. Since the p-value is less than 0.05, we reject the null hypothesis (H_{0 2}). This indicates that AI significantly influences auditing practices by enabling intelligent decision-making and risk identification during audit processes, thus improving overall audit quality.

H_{0 3} : Robotic Process Automation has no significant effect on auditing practices in Nigerian SMEs.

The coefficient for Robotic Process Automation (RPA) is 0.219 with a standard error of 0.071. The t-value is 3.092, and the p-value is 0.002. Since the p-value is below 0.05, we reject the null hypothesis (H_{0 3}). This suggests that RPA significantly enhances auditing efficiency by automating repetitive tasks, reducing human error, and improving productivity in audit operations.

H_{0 4} : Cloud-Based Accounting Systems have no significant effect on auditing practices in Nigerian SMEs.

Cloud-Based Accounting Systems (CBS) recorded a coefficient (B) of 0.202, a t-value of 3.061, and a p-value of 0.002. Since the p-value is less than 0.05, we reject the null hypothesis (H_{0_4}). This indicates that CBS significantly improves audit practices by enhancing data accessibility, real-time collaboration, and information accuracy during audit engagements.

H_{0_5} : Blockchain Technology has no significant effect on auditing practices in Nigerian SMEs.

The regression result shows a coefficient (B) of 0.248, a t-value of 3.542, and a p-value of 0.001. Since the p-value is less than 0.05, the null hypothesis (H_{0_5}) is **rejected**. This implies that Blockchain Technology significantly improves audit practices by promoting transparency, traceability, and the security of financial data, thereby strengthening the credibility of audit evidence.

4.5 Discussion of Findings

This section discusses the findings of the regression analysis presented in Table 4.8 in relation to each independent variable Machine Learning (ML), Artificial Intelligence (AI), Robotic Process Automation (RPA), Cloud-Based Accounting Systems (CBS), and Blockchain Technology (BC)—and their respective influence on the dependent variable, Auditing Practices (AP). The discussion is supported by relevant empirical literature and theoretical perspectives on audit automation and digital transformation.

Machine Learning and Auditing Practices

The findings of the regression analysis reveal that Machine Learning has a significant positive effect on auditing practices in Nigerian SMEs, as indicated by a p-value of 0.000, which is below the 0.05 significance level. This suggests that organizations that adopt ML tools experience improved accuracy and efficiency in their audit processes. ML supports auditors in identifying anomalies, detecting patterns, and predicting potential financial fraud, thereby enhancing audit quality and reliability.

This result aligns with the findings of Kokina and Davenport (2021), who asserted that ML

algorithms assist auditors in automating complex data analyses, improving audit judgment, and reducing manual workloads. Similarly, Yoon, Hoogduin, and Zhang (2022) confirmed that ML enhances auditors' capacity to manage large financial datasets effectively, which contributes to improved audit assurance and transparency.

Artificial Intelligence and Auditing Practices

The regression results show that Artificial Intelligence significantly influences auditing practices, with a p-value of 0.000. This finding implies that AI enhances auditors' ability to assess risk, detect irregularities, and make informed audit decisions. The integration of AI technologies into audit procedures leads to increased accuracy and reduced human errors in financial analysis and reporting.

This agrees with Issa, Sun, and Vasarhelyi (2022), who noted that AI supports audit professionals by providing real-time insights, automating complex audit functions, and improving compliance with auditing standards. Appelbaum et al. (2021) also reported that AI systems improve auditors' efficiency by facilitating intelligent data interpretation and automated decision-making during the audit process.

Robotic Process Automation and Auditing Practices

The findings indicate that Robotic Process Automation has a significant positive effect on auditing practices ($p = 0.002$). This means that RPA contributes to the accuracy, speed, and cost-effectiveness of audits by automating routine and repetitive audit tasks such as reconciliations, confirmations, and data extraction. RPA minimizes manual errors and allows auditors to focus on strategic and analytical aspects of audit engagements.

This finding corroborates the study of Moffitt, Rozario, and Vasarhelyi (2021), who emphasized that RPA enhances audit productivity and quality by standardizing procedures and reducing operational inefficiencies. Similarly, Alles and Gray (2020) found that RPA integration improves consistency in audit documentation and fosters better compliance with

auditing guidelines.

Cloud-Based Accounting Systems and Auditing Practices

The analysis further reveals that Cloud-Based Accounting Systems significantly affect auditing practices ($p = 0.002$). This implies that cloud systems facilitate real-time access to audit data, improve collaboration between auditors and clients, and enhance data security and storage efficiency. The ability of auditors to retrieve financial information remotely contributes to faster and more effective audit engagements.

These findings align with the results of Richins et al. (2021), who observed that cloud-based systems improve the reliability and accessibility of audit evidence. Tiron-Tudor and Stoian (2022) also found that the use of cloud technologies promotes transparency, enhances workflow integration, and strengthens auditors' capacity to handle large-scale data efficiently.

Blockchain Technology and Auditing Practices

The regression results also show that Blockchain Technology has a significant positive effect on auditing practices, with a p-value of 0.001. This indicates that blockchain enhances transparency, traceability, and immutability in financial transactions, thereby increasing auditors' confidence in the authenticity of financial records. Blockchain's distributed ledger system provides secure audit trails that reduce the risk of fraud and manipulation.

This finding supports the conclusion of Rozario and Thomas (2019), who explained that blockchain ensures audit reliability by maintaining verifiable and tamper-proof transaction records. Similarly, Dai and Vasarhelyi (2021) asserted that blockchain-based auditing strengthens trust and accountability in financial reporting processes.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the research findings, conclusions drawn from the results, and recommendations based on the study titled “The Effect of Automation Technologies on Auditing Practices in Nigerian Small and Medium-Sized Enterprises (SMEs).” The study sought to determine how five automation technologies Machine Learning (ML), Artificial Intelligence (AI), Robotic Process Automation (RPA), Cloud-Based Accounting Systems (CBS), and Blockchain Technology (BC) influence auditing practices in Nigerian SMEs.

The chapter begins with a summary of major findings derived from the analysis and interpretation of data presented in Chapter Four. It then discusses the conclusions reached from these findings and offers practical recommendations for SME owners, auditors, policymakers, and regulatory bodies to improve auditing efficiency and integrity through the adoption of automation technologies. Finally, it provides suggestions for further studies to expand knowledge in this field.

5.2 Summary of Findings

This research adopted a descriptive survey design to assess how automation technologies affect auditing practices in Nigerian SMEs. Primary data were obtained through structured questionnaires distributed to SME owners, managers, accountants, internal and external auditors within Benin City, Edo State. Out of 380 questionnaires distributed, 360 were correctly filled and returned, representing a 94% response rate.

The study employed descriptive and inferential statistics, including multiple linear regression analysis, to test the formulated hypotheses. The following key findings emerged:

1. **Machine Learning (ML):**

The study found that Machine Learning significantly improves auditing practices by enabling automated anomaly detection, predictive analytics, and fraud identification. ML helps auditors analyze large datasets efficiently, enhancing audit accuracy and quality.

2. **Artificial Intelligence (AI):**

AI has a significant positive effect on auditing practices. The findings show that AI tools improve risk assessment, reduce human error, and enhance compliance with auditing standards by automating complex analytical procedures.

3. **Robotic Process Automation (RPA):**

RPA was found to have a significant influence on auditing practices, as it automates repetitive tasks such as reconciliations and data entry. This reduces audit time and costs while improving consistency and reliability in audit reporting.

4. **Cloud-Based Accounting Systems (CBS):**

The study revealed that CBS improves audit collaboration, data accessibility, and transparency. Cloud-based systems enable real-time financial reporting and secure storage, which enhance the speed and efficiency of audit engagements.

5. **Blockchain Technology (BC):**

Blockchain technology was found to significantly impact auditing practices by improving transparency, traceability, and fraud prevention. The immutable nature of blockchain records enhances auditors' confidence in financial data.

Overall, the regression results demonstrated that all five automation technologies ML, AI, RPA, CBS, and BC have a statistically significant positive relationship with auditing practices, indicating that technological adoption leads to higher audit quality, efficiency, and reliability among Nigerian SMEs.

5.3 Conclusion

The study concludes that automation technologies play a vital role in transforming traditional auditing practices into more efficient, accurate, and transparent processes. Machine Learning and Artificial Intelligence enhance analytical capabilities and fraud detection, while Robotic Process Automation reduces repetitive manual work, thus increasing operational efficiency. Cloud-Based Accounting Systems improve collaboration and data security, and Blockchain Technology strengthens audit integrity by ensuring immutability and transparency of financial records.

Therefore, the adoption of automation technologies has significantly improved the quality, efficiency, and reliability of auditing practices in Nigerian SMEs. Firms that embrace these technologies are better equipped to meet auditing standards, detect irregularities promptly, and enhance overall financial accountability.

5.4 Recommendations

Based on the findings and conclusions, the study makes the following recommendations:

- 1. Adopt Automation Technologies:**

SMEs should embrace the integration of ML, AI, RPA, CBS, and BC to enhance the quality, timeliness, and accuracy of their auditing processes.

2. Continuous Professional Training:

Auditors and accounting professionals should undergo continuous training on the use of automation tools to improve their technological competencies and auditing efficiency.

3. Cloud-Based Adoption:

SMEs should adopt cloud-based accounting systems to facilitate real-time collaboration between auditors and clients and ensure secure data storage.

4. Promote Blockchain Utilization:

Auditors should leverage blockchain technology to enhance data transparency, prevent manipulation, and improve the traceability of financial transactions.

5. Regulatory Support:

Professional bodies such as ICAN, ANAN, and FRCN should develop standards and regulatory frameworks guiding the ethical and responsible use of automation technologies in auditing.

6. Government Intervention:

The Nigerian government should provide financial and infrastructural support to SMEs for the acquisition and implementation of automation technologies to foster accountability and compliance.

5.5 Suggestions for Further Research

Future research could focus on:

- Examining the moderating effect of auditor competence and technological literacy on the relationship between automation technologies and audit quality.

- Comparing the level of automation adoption in SMEs and large corporations to identify gaps and opportunities.
- Assessing the long-term impacts of emerging technologies such as Quantum Computing and Predictive Analytics on audit performance in Nigeria.

5.6 Contribution to Knowledge

This study contributes to the body of literature by providing empirical evidence that automation technologies significantly enhance auditing practices among Nigerian SMEs. It demonstrates that integrating ML, AI, RPA, CBS, and BC leads to improved audit quality, efficiency, compliance, and fraud detection. The findings underscore the importance of digital transformation in the auditing profession, particularly in developing economies like Nigeria, where SMEs constitute a major component of the business ecosystem.

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APPENDIX
QUESTIONNAIRE

Department of Accounting,
Faculty of Management Sciences,
University of Benin,
Benin City.

Dear Respondent,

I am Aisosa, a final-year student in the Department of Accounting, Faculty of Management Sciences, University of Benin. I am conducting a research study titled “The Impact of Automation Technologies on Auditing Practices in Nigerian SMEs.”

This research is being carried out in partial fulfillment of the requirements for the award of the Bachelor of Science (B.Sc.) degree in Accounting. The purpose of this study is to examine how automation technologies such as Machine Learning (ML), Artificial Intelligence (AI), Robotic Process Automation (RPA), Cloud-Based Accounting Systems (CBS), and Blockchain Technology (BC) influence auditing practices in small and medium enterprises (SMEs) within Benin City.

Your participation is highly valuable to the success of this research. Please be assured that all information provided will be treated with strict confidentiality and will be used solely for academic purposes. Kindly respond honestly to all questions, as your input will help generate meaningful findings and recommendations.

Thank you for your time and cooperation.

Yours faithfully,

Aisosa

(Researcher)

SECTION A: Demographic Information

Please tick (✓) the option that best describes you.

1. Gender:

- Male Female

2. Age Bracket:

- Below 25 years 25–34 years 35–44 years 45 years and above

3. Educational Qualification:

- OND/NCE B.Sc/HND M.Sc/MBA PhD Others

4. Position in the Organization:

- Owner Manager Internal Auditor External Auditor Accountant

5. Years of Experience:

- Less than 5 years 5–10 years 11–15 years Above 15 years

6. Type of SME Sector:

- Manufacturing Services Trading Construction Others

SECTION B: Machine Learning (ML)

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

S/N	Statement	1	2	3	4	5
1	My organization uses machine learning tools to identify audit anomalies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Machine learning helps improve the accuracy of financial data analysis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	ML applications assist in predicting potential areas of financial fraud.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Machine learning reduces the time required to perform audit procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	ML adoption enhances the overall quality of auditing practices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION C: Artificial Intelligence (AI)

S/N	Statement	1	2	3	4	5
6	AI tools support auditors' decision-making processes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	AI improves auditors' ability to identify high-risk transactions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	The use of AI reduces human error in audit procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	AI enhances compliance with auditing standards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	AI integration has improved the efficiency and accuracy of audits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION D: Robotic Process Automation (RPA)

S/N	Statement	1	2	3	4	5
11	RPA automates repetitive audit tasks such as reconciliations and confirmations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	RPA has improved the accuracy of audit reporting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	The use of RPA reduces audit time and costs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	RPA minimizes the risk of manual data entry errors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	RPA contributes to overall audit efficiency and consistency.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION E: Cloud-Based Accounting Systems (CBS)

S/N	Statement	1	2	3	4	5
16	My organization uses cloud-based systems for audit data storage and reporting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Cloud accounting facilitates real-time access to financial data.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Cloud systems enhance collaboration between auditors and clients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Cloud-based systems improve data security and backup in auditing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	The use of cloud technology enhances audit quality and speed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION F: Blockchain Technology (BC)

S/N	Statement	1	2	3	4	5
21	My organization understands the benefits of blockchain in auditing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Blockchain improves transparency and traceability in financial audits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Blockchain enhances fraud detection and prevention.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Blockchain provides secure and immutable audit trails.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	The adoption of blockchain increases auditors' confidence in financial records.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION G: Auditing Practices (AP) (Dependent Variable)

S/N	Statement	1	2	3	4	5
26	Automation technologies have improved the overall quality of audit reports.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	The adoption of automation tools has enhanced audit efficiency.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Technology integration has strengthened compliance with auditing standards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Automation technologies have improved fraud detection in audits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	The overall effectiveness of auditing practices has improved with automation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>