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Robotic Technologies and Financial Reporting Models in the 21st Century

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Abstract: The necessity for the implementation of robotic automation in accounting and financial services arises from a continuous demand for an accounting and finance system that can effectively and adequately handle extensive accounting and financial tasks within the accounting and financial industry. This need is driven by the objective of aligning with global accounting practises. The broad objective of this study is to investigate the impact of robotic technologies on financial reporting models in the 21st century in Nigeria. Specifically, this study evaluated the impact of digitalized structured data, Data governance and Transactional and standardized services on financial reporting models in Nigeria. The study employed a survey research design. Primary data were collected via a survey. To satisfy the test of hypotheses of the study, the study made use of ordinary least square regression to examine the impact of robotic technologies on financial reporting models in Nigeria. The population consist of all listed firms on the Nigeria Stock exchange as at 2022. Hence, purposive sampling techniques was adopted to sample 10 listed firms that have significantly adopted technologies and artificial intelligence in their operation and whose market capitalisations are significant. The collected data was analysed using SPSS statistical package. In essence, the regression analysis suggests that, in the Nigerian context, the incorporation of robotic technologies measured by Digitalized Structured Data, Data Governance, and Transactional and Standardized data significantly influences financial reporting models in the 21st century. While Digitalized Structured Data shows a nuanced impact with a positive unstandardized coefficient, Data Governance and Transactional and Standardized data emerge as robust contributors to the positive variance in the Financial Reporting Model. The regression analysis, quantitatively supports the empirical findings by emphasizing the positive impact of Digitalized Structured Data, Data Governance, and Transactional and Standardized data on financial reporting models. The analysis provides statistical evidence of the significance of these dimensions in explaining the variance in financial reporting outcomes. This study concludes that robotic technologies has a significant effect on financial reporting models in Nigeria. The study recommendation is that organizations that are looking to improve their financial reporting models should consider investing in robotic technologies. Robotic technologies can help to automate many of the tasks involved in financial reporting, which can free up time for accountants to focus on more complex tasks. Additionally, robotic technologies can help to improve the accuracy and consistency of financial reporting data

Keywords: Robotic technologies, Financial reporting models, Data Governance, Transactional and Standardized data

1.0 INTRODUCTION

1.1Background to the Study

The world is living in an age characterised by the prominence of Artificial Intelligence, also known as Robotics. Robotics technology (RT) is capable of gathering, manipulating, and interpreting financial data derived from various Information Technology applications and systems. This technology effectively automates these repetitive processes, relieving accountants from their burden. This allows the accounting personnel to transition into the role of strategic accountants. The use of robotic technology in managing routing activities traditionally performed by accountants has resulted in a certain degree of emancipation for accountants, enabling them to pursue a more elevated objective within the financial sector, namely the analysis and interpretation of financial data to enhance company decision-making (Egiyi & Chukwuani, 2021). Real-time (RT) technology is the most recent advancement in a series of Finance and Accounting software applications aimed at enhancing operational effectiveness and enhancing the precision of data (Egivi & Chukwuani, 2021). Real-time (RT) technology expands the automated capabilities of Enterprise Resource Planning (ERP) systems beyond the scope of application programming interfaces (APIs) and basic object access protocol. These technologies facilitate the integration of ERP systems with many other IT applications. According to Egiyi and Chukwuani (2021), the time required to establish connections between these systems is significantly reduced by RT, from weeks to a few days.

Therefore, numerous accounting firms operating globally are endeavouring to implement robotics in accounting operations due to its advantageous outcomes. These include the elimination of laborious and challenging accounting tasks, allowing accountants to focus on providing efficient consultancy services (Ashoka, Abhishek & Divyashree, 2019). The primary aim of using robots is to streamline intricate human operations via the use of artificial intelligence (AI). The use of robotic technology for regulatory compliance, surveillance, data quality evaluation, and fraud detection is being seen in both public and private sector companies, as stated in a paper by the Financial Stability Board (Ashoka, Abhishek & Divyashree, 2019). In contemporary times, there is a clear and conspicuous shift in commercial organisations towards computerised systems for accounting and reporting operations. This transition marks a departure from traditional paper-based journals and ledger patterns, facilitated by the advent of computers and its integration with robotics technology. The field of robotics technology has distinct characteristics like as self-management, self-tuning, self-configuration, self-diagnosis, and self-healing, which contribute to the facilitation of accounting processes (Ashoka, Abhishek, & Divyashree, 2019).

The primary objective of financial reporting is to provide stakeholders with dependable, precise, and prompt financial information necessary for making informed choices pertaining to the operations of a bank (Abed, Nazimah Mostafa, Hossam, Maha, & Elina 2022). The primary purpose of financial reporting is to effectively convey financial information to users, enabling them to make well-informed and unbiased choices. Financial reports play a crucial role in guiding consumers who depend on them for making informed and unbiased decisions. In recent years, there has been a significant technological change in the realm of company operations. The impact

of this transition has resulted in procedural modifications across diverse industries, affecting a range of firms (Quinto & Emmanuel, 2022).

1.2 Statement of Problem

Today marks a significant day whereby corporate organisations are actively pursuing technological advancements to effectively provide products and services in an efficient way. However, it should be noted that not all departments within commercial organisations have embraced the use of technology. In many organisations, the accounting and auditing departments mostly rely on paper-based systems. The manual accounting and auditing processes conducted on paper need significant human resources, time, and energy, resulting in increased costs. This is mostly due to the repetitive nature of clerical activities involved, which inherently poses challenges in achieving a high level of accuracy (Abhishek & Divyashree, 2019). The accounting and auditing function has significant importance alongside the primary activities of a corporation since it assesses the integrity of these operations and provides a comprehensive and accurate representation of the firm's financial state. According to Abhishek and Divyashree (2019), conventional accounting and auditing continue to encounter many challenges, including the reliance on paper-based processes that are time-consuming, the complexity associated with maintaining books of accounts, and the use of a checklist approach for verifying business and financial transactions.

The necessity for the implementation of robotic automation in accounting and financial services arises from a continuous demand for an accounting and finance system that can effectively and adequately handle extensive accounting and financial tasks within the accounting and financial industry. This need is driven by the objective of aligning with global accounting practises (Aslani, 2020; Kotarba, 2018). Over the course of time, there have been endeavours to enhance accounting and financial procedures via technology advancements, which have been seen as a revolution by several accounting theorists. This pursuit aims to achieve the highest level of value generation in the area of accounting and finance. According to Alfandi and Seckiner (2022), the transition from human-based accounting and financial services to those performed by robots is seen as a potential threat to human employment. Various studies have observed that the implementation of Robotic Process Automation in accounting and finance systems has the capacity to reduce job opportunities for humans. Additionally, there is a perception that the integration of robots in accounting and finance represents a new era of competition between humans and robots. However, some scholars argue that robotic accounting and finance systems are designed to address limitations in the human workforce, ultimately aiming to enhance employee and customer satisfaction (Fernandez & Aman, 2018; Jedrzejka 2019). Hence, the primary objective of this research is to examine the correlation between robotics technology and financial reporting models within the realm of business and financial information.

1.3 Research Objectives

The broad objective of this study is to investigate the impact of robotic technologies on financial reporting models in the 21st century in Nigeria. Specifically, this study

i. Evaluate the impact of digitalized structured data on financial reporting models in Nigeria

- ii. Investigate how Data governance affect financial reporting models in Nigeria
- iii. Assess the relationship between Transactional and standardized services and financial reporting models in Nigeria

1.4 Significance of the Study

The study on robotic technologies and financial reporting models in the 21st century is significant for stakeholders, government, policymakers, academia, and management. It offers potential benefits in terms of efficiency, accuracy, cost savings, and informed decision-making for businesses and management. Policymakers can leverage the findings to ensure regulatory compliance and understand the economic impact, while academia gains educational opportunities and research insights. Finally, stakeholders and investors benefit from improved trust, transparency, and reliable financial data.

2.0 LITERATURE REVIEW

2.1 Conceptual Framework and Clarifications

According to the objective of this study, the conceptual model may be constructed. This model shows the relationship between robotic technologies and financial reporting models in Nigeria. The conceptual framework is a breakdown of the variables of the problem under study. There are two main variables in the study. Financial reporting model was the dependent variable and Robotics technology was the independent variable. The Robotics technology was proxy by digitalized structured data, Data governance and Transactional and standardized services while proxy for the dependent variable is financial reporting model.



Figure 1: Conceptual View of Robotics technology and Financial reporting model

Source: Researcher adaptation, 2023

2.1.1 Financial Reporting

The accounting practises implemented and maintained by a firm serve as the fundamental basis for financial reporting. According to Tri Wahyuni et al. (2020), the process involves the identification, collection, and evaluation of all financial transactions inside the firm. The firm processes all transactions in accordance with the prevailing accounting standards and regulations (Bhasin, 2015). Accounting standards serve as the fundamental framework inside the accounting system, defining the optimal methodologies for accounting and reporting (Briloff, 1972). In the event that accounting information incorporates inconsistent measurements, unreliable estimates, or faked transactions, it is quite likely that the resulting financial statements will be inaccurate, incomplete, and deceptive. According to Mamo (2014), there exists a number of instances when individuals have been deceived for prolonged durations due to financial reports that did not accurately provide pertinent and applicable facts about the organisation. The desired attributes of financial reporting are a product of the collaborative efforts of accounting professionals and established standards (Korutaro Nkundabanyanga et al., 2013). The Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) collaborate in order to resolve anomalies and issues pertaining to their own frameworks. According to Bini et al. (2015), the collaboration and establishment of a unified structure are expected to enhance the quality and usefulness of financial reporting requirements. The utility of financial reporting lies in its ability to facilitate impartial and well-informed decision-making via the provision of relevant information. The usefulness of financial reporting may be assessed based on its alignment with consumer expectations or its ability to rectify analyst positioning (Qian et al., 2015).

2.1.2 Financial reporting models

Financial reporting models refer to the structured frameworks and guidelines used by organizations to prepare and present their financial information to external stakeholders, primarily investors, creditors, and regulatory bodies. These models encompass a range of accounting principles, standards, and practices that dictate how financial data is recorded, summarized, and disclosed in financial statements. One of the most widely recognized financial reporting models is the Generally Accepted Accounting Principles (GAAP) in the United States. GAAP sets the standard for financial reporting and provides a consistent and uniform approach to how businesses report their financial results. The Financial Accounting Standards Board (FASB) is the authoritative body responsible for developing and maintaining these principles. For example, the revenue recognition principles introduced under Accounting Standards Codification (ASC) 606 offer a structured approach to recognizing revenue in financial statements, contributing to transparency and comparability of financial information (FASB, 2022).

In an international context, the International Financial Reporting Standards (IFRS) represent another prominent financial reporting model. IFRS is developed and maintained by the International Accounting Standards Board (IASB) and is used by companies in many countries around the world. IFRS aims to harmonize financial reporting practices and provide a consistent basis for comparing financial statements across different regions and industries (IASB, 2022). These financial reporting models are essential for various reasons. They ensure the transparency and accuracy of financial information, which is crucial for investors and creditors in making informed decisions. Additionally, they help regulators monitor compliance and enforce accounting standards to maintain market integrity and protect investors' interests (Kieso, Weygandt, & Warfield, 2019). Financial reporting models like GAAP and IFRS play a fundamental role in shaping the way organizations prepare and present their financial information. They provide the foundation for reliable and consistent financial reporting, benefiting investors, creditors, and the broader business community.

2.1.3 Robotic Technologies

The phrase 'Robotic Technologies (RT)' gained prominence in the early 2000s. The concept of Robotic Process Technologies (RPT) may first evoke the notion of a tangible robot carrying out human tasks. However, it is important to clarify that RPT refers to a software configuration that effectively substitutes human involvement in task execution (Willcocks, Lacity, & Craig, 2015). Robotic technologies, also known as robotics, encompass a broad field of engineering and technology that focuses on the design, construction, operation, and use of robots. Robots are programmable machines or mechanical devices equipped with sensors, actuators, and artificial intelligence (AI) algorithms that enable them to perform various tasks autonomously or semiautonomously (Siciliano & Khatib, 2008). These robots come in diverse forms and serve numerous purposes. They can be found in manufacturing, healthcare, agriculture, space exploration, logistics, and many other industries. Robotic technologies have evolved significantly in recent years, leading to robots that are more versatile, capable, and accessible than ever before. One of the key characteristics of robotic technologies is their ability to interact with the physical world. Sensors, such as cameras, lidar, and touch sensors, enable robots to perceive their environment, while actuators, such as motors and grippers, allow them to manipulate objects and perform tasks. The integration of AI and machine learning in robotics further enhances their ability to make decisions, learn from experience, and adapt to changing situations (Khatib, 2016).

Robotic Technologies (RT) refers to software that utilises Artificial Intelligence (AI) and exhibits machine learning (ML) skills in order to effectively manage jobs that are characterised by their large volume, frequent occurrence, and repetitive nature. Robotic Process Automation (RPA) offers a way of substituting human labour, so enabling the completion of manual activities with enhanced efficiency and reliability. One intriguing aspect of this phenomenon is its ability to replicate human approach to task execution via the utilisation of established programmes, data manipulation, and communication initiation with other systems, all facilitated by pre-existing user interfaces (Mangu & Rahul, 2018). The use of robotics in an organisation may enhance its competitiveness by reallocating human resources to more intricate duties and providing access to more precise reports. These factors together contribute to the overall growth and advancement of the firm. Robotic technologies are a multidisciplinary field that encompasses the design, development, and application of robots. Robots, in this context, are versatile machines with the capability to perform tasks autonomously or semi-autonomously by following preprogrammed instructions or responding to environmental cues. These machines can take various forms, from traditional industrial arms to mobile robots, drones, and even soft robots designed to mimic natural organisms (Kumar et al., 2019).

2.1.4 Robotics in Accounting

Lacity and Willcocks (2015) opined that RT is an easy-to-configure system where system users running business operations can execute them without programming and users can be trained to independently automate the process in just a few weeks. Based on these definitions, in this study, RT is defined as a business process automation system that uses software tools to interact with existing applications and replace humans. With the advent of computers in the arena of the accounting information system, there has been a drastic change from paper-journals and ledgers to computer-based formats. The accounting information of a business house is being stored in the accounting databases (Ashoka, Abhishek & Divyashree 2019). In these storehouses of the database, only specific accounting transactions are maintained. As a consequence, these systems are not meeting the specific needs of the stakeholders (decision-makers) of the business. Therefore, there is a need to apply a certain type of intelligence into accounting database, which helps to eradicate the flaws of the traditional system. So, one approach to solve this problem is to integrate robotics (AI) into the accounting database, which meets the needs of decisionmakers. The RT software that replaces this person is best suited to being called a "swivel chair" where people take input from a set of systems (eg. e-mails), processes the input, and then puts the output into a record system (eg. ERP) (Willcock et al 2015). RT interface with all customer payment portals, which enables easy integration with ERP and legacy systems. RT automatically create invoices together with the billing documentation and send or upload it to the customer's portal in a few seconds or minutes, not days or weeks.

i. Robotic Technologies in Financial Reporting

Robotic technologies (RT), commonly referred to as Robotic Process Automation (RPA) in the context of financial reporting, have brought significant transformations in how financial data is collected, processed, and reported. RPA involves the use of software robots or "bots" that can automate repetitive and rule-based financial tasks. These bots can mimic human actions, interact with various software systems, extract data, perform calculations, and generate financial reports automatically (Deloitte, 2021). The integration of RT in financial reporting models enhances the efficiency and accuracy of the entire process. Bots can swiftly gather data from multiple sources, validate it for accuracy, and generate reports in a standardized format, reducing the risk of human error and ensuring consistent reporting (Jones, 2023). Additionally, RT can facilitate the reconciliation of financial statements. This capability is especially valuable for organizations dealing with complex financial data from multiple sources (Deloitte, 2021). In financial reporting, RPA bots offer several advantages:

- 1. **Efficiency**: RPA bots work tirelessly and swiftly without the need for breaks, resulting in accelerated reporting cycles. They can complete tasks in a fraction of the time it would take a human, improving overall operational efficiency (Smith, 2020).
- 2. Accuracy: Bots follow predefined rules and algorithms meticulously, minimizing the risk of human error. This increased accuracy in data collection and reporting can lead to more reliable financial statements (Brown, 2018).

- 3. **Cost Savings**: By automating routine financial reporting tasks, organizations can reduce labor costs and allocate human resources to more strategic and value-added activities (Deloitte, 2021).
- 4. **Data Standardization**: RPA ensures consistent data processing and report formatting, resulting in standardized and easily comparable financial reports (Smith, 2020).

Issues and Challenges of Robotics Technologies in financial Reporting:

While robotic technologies offer substantial benefits in financial reporting, there are challenges and considerations to be aware of. These include:

- 1. **Data Security**: As financial data is increasingly processed and stored digitally, organizations must prioritize robust cybersecurity measures to protect sensitive financial information from data breaches and cyber threats (Smith, 2020).
- 2. Algorithm Accuracy: Ensuring the accuracy of the algorithms and data used in financial reporting is crucial. Errors in programming or incorrect data inputs can have significant financial implications (Brown, 2018).
- 3. **Human Oversight**: While automation is valuable, human oversight remains essential to validate the results produced by RPA and address exceptional cases that may not fit standard processes (Deloitte, 2021).

The integration of robotic technologies into financial reporting models has significantly improved efficiency, accuracy, and regulatory compliance. It streamlines data collection, processing, and reporting, leading to more reliable financial statements. However, organizations must address cybersecurity and data accuracy concerns to fully leverage the benefits of these technologies.

ii. Digitalized structured data

Digitalized structured data plays a crucial role in the context of robotic technologies, particularly in the realm of automation and robotic process automation (RPA). These technologies heavily rely on structured data, and the integration of structured data with robotic technologies offers several advantages. Digitalized structured data, in the form of structured documents, databases, spreadsheets, and other machine-readable formats, serves as the input for many robotic processes. This data is easily consumable by robotic technologies, as it follows a consistent and predefined format (Iansiti & Lakhani, 2020). For example, in financial reporting, structured data from accounting systems, spreadsheets, and databases can be seamlessly integrated into RPA workflows, enabling automated data extraction, validation, and reporting (Jones, 2023).

The use of digitalized structured data improves the efficiency and accuracy of robotic technologies. Robots can process structured data more rapidly and with minimal errors, compared to unstructured or semi-structured data (Smith, 2020). This results in faster execution of tasks and higher data accuracy, which is essential in various industries, including finance, where precision is critical (Brown, 2018). Digitalized structured data facilitates the automation of end-to-end workflows. By integrating structured data from various sources, robotic technologies can streamline processes, reducing the need for manual intervention (Deloitte, 2021). This is

particularly evident in supply chain management and logistics, where structured data from inventory systems, order databases, and shipping records can be integrated to automate order fulfilment and inventory management (Jia et al., 2018).

In financial reporting, structured data is the backbone for creating financial statements, such as income statements, balance sheets, and cash flow statements. The ability of robotic technologies to seamlessly process structured financial data from various sources, such as accounting software and databases, streamlines the financial reporting process. This results in significant time savings and a reduced risk of data errors (Brown, 2018). Structured data serves as a foundation for data analytics, which is pivotal in making data-driven decisions. By leveraging structured data, robotic technologies can generate real-time reports and dashboards, offering organizations valuable insights for decision-making. In finance, this is particularly important for assessing the financial health of a company, identifying trends, and making strategic choices (Smith, 2020).

iii. Data governance

Data governance is a critical aspect of managing and maintaining data in the context of robotic technologies. It involves the establishment of policies, procedures, and practices to ensure the quality, integrity, security, and compliance of data within an organization. As data plays a fundamental role in the functioning of robotic technologies, proper data governance is essential. Data governance ensures that the data used by robotic technologies is of high quality and accuracy. This is vital because robots rely on data to make decisions and perform tasks. Any errors or inconsistencies in the data can lead to faulty automation processes (DAMA International, 2009). Data governance also addresses the security of data. Robotic technologies often involve the processing of sensitive financial information. Proper governance practices ensure that data is protected from unauthorized access, breaches, and cyber threats, maintaining the confidentiality and integrity of financial data (Zhu, 2018). Many organizations use multiple systems and sources for financial data. Data governance helps in integrating data from various sources and systems, making it accessible and consistent for robotic technologies to work with. This integration is crucial for the efficiency and effectiveness of automation (Watson, 2019).

Financial reporting is subject to strict regulations and standards. Data governance ensures that data used by robotic technologies adheres to these regulations. It provides the framework for data management practices that support compliance with accounting standards and financial reporting requirements (Robinson, 2011). Data governance encompasses data lifecycle management, which includes data creation, storage, usage, and disposal. In the context of robotic technologies, this ensures that data is available when needed and securely archived or deleted when no longer required, aligning with data privacy regulations (DAMA International, 2009). Proper documentation of data structures and metadata is a part of data governance. This documentation is essential for robotic technologies to understand and work with data effectively. It enables efficient data extraction, transformation, and loading (ETL) processes, which are fundamental to automation (Zhu, 2018). Data governance defines data ownership and accountability structures in place to ensure responsible data handling and decision-making (Robinson, 2011). Data governance, as it relates to robotic technologies in financial reporting, serves as the foundation for ensuring data quality, security, compliance, and

effective data management. It provides the structure and guidelines necessary to enable the seamless and accurate functioning of robots in the financial reporting process. Given the increasing reliance on automation in this field, robust data governance is essential for maintaining the integrity and reliability of financial data.

iv. Transactional and standardized services

Transactional and standardized services are central to the application of robotic technologies, particularly in the realm of Robotic Process Automation (RPA). These services encompass tasks and processes that are rule-based, repetitive, and require a high level of accuracy. Robotic technologies, such as RPA bots, are well-suited for handling these services. Transactional services involve routine tasks that typically revolve around the processing of data and transactions. These tasks often require minimal decision-making and are highly repetitive. RT bots excel at handling transactional services as they can mimic human actions in navigating software applications and databases to execute transactions. For instance, RT bots can be programmed to process invoices, validate purchase orders, reconcile financial records, or update customer information in a database (Deloitte, 2021). They perform these tasks with speed and precision, reducing the risk of errors and improving efficiency. The application of RPA in transactional services not only streamlines processes but also allows human employees to focus on more complex and value-added activities, ultimately enhancing operational efficiency and reducing costs (Smith, 2020).

Robotic technologies, particularly RPA, excel in handling transactional and standardized services. They are designed to perform repetitive, rule-based tasks with speed and precision, reducing the risk of errors and improving efficiency. This automation allows human workers to focus on more complex and strategic activities while ensuring consistency and compliance in various industries, including financial reporting. In the context of financial reporting, standardized services often pertain to report generation. This includes the creation of financial statements, balance sheets, income statements, and other reports that must adhere to strict formatting and regulatory standards. Robotic technologies can automate the generation of these reports, ensuring consistency and compliance with accounting regulations (Smith, 2020). Transactional and standardized services are at the core of how robotic technologies, particularly Robotic Process Automation (RPA), are transforming various industries, including finance and beyond. These technologies bring speed, accuracy, scalability, and consistency to these services, offering numerous benefits, from cost savings to regulatory compliance and transparency. Understanding how robotic technologies optimize transactional and standardized services is vital for organizations seeking to leverage automation to improve their operations and financial reporting processes.

Based on the above, the following hypothesis were formulated:

H₀₁: There is no significant relationship between digitalized structured data and financial reporting models in Nigeria

- Ho2: Data governance has no significant impact on financial reporting models in Nigeria
- H₀₃: There is no significant relationship between Transactional and standardized services and financial reporting models in Nigeria

2.1.5 Relationship between Robotic Technologies and Financial Reporting Models

The impact and relationship between robotic technologies and financial reporting models in the 21st century have been profound. As businesses and industries have embraced automation and artificial intelligence, the integration of robotic technologies into financial reporting processes has revolutionized how financial data is collected, analysed, and reported. This has significant implications for efficiency, accuracy, and decision-making in the financial sector. Robotic technologies, such as robotic process automation (RPA), have greatly enhanced the efficiency of financial reporting. RPA automates routine and repetitive tasks, such as data entry, validation, and reconciliation, which were previously time-consuming and error-prone when done manually. For instance, RPA can extract financial data from various sources, perform calculations, and generate reports with minimal human intervention. This reduces the risk of human error and accelerates the reporting process, enabling companies to produce financial reports faster and more reliably (Jones, 2020).

Additionally, the relationship between robotic technologies and financial reporting models extends to data analysis. Advanced algorithms and machine learning enable automated analysis of large datasets, allowing for the identification of trends, anomalies, and insights that might be missed by human analysts. These technologies have the potential to provide more accurate financial forecasts and support data-driven decision-making, ultimately leading to improved financial performance (Smith, 2019). Furthermore, the integration of robotic technologies into financial reporting models has also enhanced regulatory compliance. Automation ensures that financial reports are generated in a consistent and standardized manner, reducing the risk of noncompliance with accounting standards and regulations. Additionally, it allows for real-time monitoring and auditing, helping companies quickly identify and rectify any discrepancies or issues (Johnson, 2021).

However, it is essential to note that the impact of robotic technologies on financial reporting models is not without challenges. As companies rely more on automation, there are concerns about the potential loss of jobs in traditional finance roles. There is also a need for ongoing human oversight to ensure that the algorithms and data used in financial reporting are accurate and unbiased (Brown, 2018). The relationship between robotic technologies and financial reporting models in the 21st century is transformative. Automation and AI-driven processes have significantly improved the efficiency, accuracy, and compliance of financial reporting. While challenges exist, the overall impact is positive, as it enables businesses to make more informed decisions and adapt to the rapidly evolving financial landscape.

2.2 Theoretical Review

2.2.1 Theory of Task-technology fit (TTF)

This theory of TTF was propounded by Googhue and Thompson in 1995, to explain the utilization of technology to intended users on the anticipated tasks' requirements in other words; it advocates a means of quantifying the effectiveness of technology in a structured system, by assessing the relationship between the robotics and the tasks the technology aims to support (Chinedu-Chiejine & Owa 2023). The aim of TTF theory was to add to the body of knowledge on

technology implementation as well as usage of various technologies in a system. This theory appears to be widely recognized and often use to justify the application of technology in a system especially in the aspect of literature. Therefore, this theory relates to robotic process automated accounting and finance services in the Nigerian listed firms. This study therefore is hinge on TTF theory since it appears to have better theoretical disposition which explains and supports RPAAFs in aspect and extent to which robotic processes automation add value to organizational systems when the system eventually harnesses the organizations' tasks and the proposed accounting and finance technologies which is usually structured alongside with the organizations' business activities (Systems' processes) (Chinedu-Chiejine & Owa 2023). This compatibility would determine the effect on the performance and how robotic process automation system would be improve accounting and finance services. Mamudu and Lamido (2017), noted that industrial robots adoption and implementation poses potentially as a new highly paying jobs.

2.3 Review of Related Empirical Studies

Meiryani, Dava, Felicia, and Dezie (2023), provide a comprehensive examination of the advantages and significance of robotic process automation in the domains of accounting and business, supported by both theoretical frameworks and empirical findings. The study used a descriptive research approach, which included the collection of comprehensive data from a variety of literature sources. Robotic Process Automation (RPA) refers to a software or technological solution that facilitates the effective and expeditious execution of business operations by enabling software to conduct them. In order to mitigate worker mistakes, empirical findings indicate that robotic process automation (RPA) is a programme or system that may assist organisations in accounting and business operations, such as using technology/systems to disseminate messages to a large number of clients.

In their study, Chinedu, Chiejine, and Owa (2023), examined the impact of robotic process automation on accounting and financial services inside Nigerian listed companies. This research draws inspiration from a range of current literature pertaining to the use of industrial robots in the field of accounting and finance. It aims to address the prevailing misunderstandings and ambivalent attitudes surrounding this topic. The presence of these misunderstandings has resulted in a state of uncertainty and indecisiveness about the acceptance, adoption, and deployment of robots in accounting and finance services among Nigerian listed corporations. This research reveals, among other findings, the need of addressing the ambivalent views regarding the transition from human labour operations to a robotic labour force in accounting and financial services. To effectively handle this paradigm shift, a comprehensive strategy is required. Moreover, there are other inherent advantages associated with the use of industrial robots in the accounting and financial sector. The acceptability, adoption, and deployment of robotic process automation in accounting and finance among Nigerian listed corporations are now in their early phases.

In their study, Sethibe and Naidoo (2022), used the Unified Theory of Acceptance and Use of Technology (UTAUT) framework to examine the determinants that influence the adoption of robotics technology in auditing practises by organisations. The research used a quantitative approach, including a survey of 37 questionnaires and two semi-structured interview questions. The study included a total of 59 individuals who were professional auditors and 26 individuals

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who were not auditors but were engaged in auditing activities in South Africa. The findings of the research indicate that the adoption of robots in the auditing profession is significantly influenced by performance expectation and conducive circumstances. The use of robots in auditing is hindered by major constraints such as insufficient training, data quality issues, and limited investment in robotics technology. Potential important facilitators of robotics technology in the auditing profession are managerial support, effective change management methods, and proficient technical abilities. The study's result may be characterised by two main points. The integration of the performance management system and the business case for robots inside the auditing process should be closely aligned with the responsibilities and duties of auditors.

The study conducted by Joydeep and Rao (2021), elucidated the underlying principles of robotic process automation (RPA) and its implications on accounting procedures. This review study provides suggestions for future research endeavours. A comprehensive examination of the existing literature, including both prior study and the latest scholarly sources, was undertaken in order to identify areas where more research is needed. The findings of the research indicate that RPA has the capacity to automate accounting operations, leading to the potential replacement of accountants by robotic techniques for a substantial amount of their tasks. This phenomenon will result in a decrease in the quantity of entry-level accounting positions.

In his study, Dariusz (2019), tries to elucidate the underlying principles of robotic process automation (RPA), its implications for the field of accounting, and proposes potential avenues for further research. A comprehensive examination of existing scholarly works and current authoritative sources has been undertaken in order to identify areas of inquiry that have not yet been addressed. The findings provide valuable information into the characteristics of the accounting reform. The use of Robotic Process Automation (RPA) has significant promise in the automation of accounting procedures, leading to the projection that robots would assume a substantial portion of accountants' responsibilities.

In their study, Dahlia and Aini (2018), conducted an analysis on the influence of Robotic Process Automation (RPA) on Global Accounting Services (GAS) by using the theoretical framework of institutional logic. This research employs a comprehensive case study methodology inside a prominent multinational business services organisation specialising in worldwide accounting services. The research findings indicate that the use of RPA technology has substantial effects on both individuals and organisations, leading to transformative changes and a decrease in workload, thus resulting in a reduction in workforce size. However, the implementation of novel technological advancements inside the organisational framework engenders superfluous rivalry between human beings and automated machines. While it is true that RPA technology has the potential to address several challenges related to human factors, such as disciplinary concerns, employee productivity, and human resource deficiencies, it is important to note that tasks requiring advanced analytical capabilities cannot be entirely substituted by robots and need human involvement.

2.4 Gap in the Literature

Prior studies primarily draw upon international and generic literature to discuss the adoption of RPA in accounting and business. However, they do not delve into the unique challenges and

opportunities that Nigerian firms may face when implementing RPA which is gap addressed in this study. It is essential to understand how the Nigerian regulatory environment, workforce dynamics, and specific industry needs impact the adoption and outcomes of RPA in the country. The studies provide a broad perspective on RPA's potential impact on accounting and auditing. However, there is a lack of industry-specific analysis, particularly for sectors that are significant in the Nigerian economy. Lastly, review of empirical study reveals that prior studies have been focused on investigating the operational elements of robotics process automation and robotics within the field of accounting. Moreover, a considerable number of studies have heavily depended on knowledge-based expert systems for the purpose of conducting literature reviews, sometimes without sufficient empirical data to support their claims. It is worth mentioning that there is a significant lack of scholarly study pertaining to the impact of robotics technology on financial reporting models in the academic, research, and accounting spheres. Hence, the primary objective of this research is to examine the correlation between robotics technology and financial reporting models within the realm of business and financial information. This investigation will primarily focus on the impact of these factors on various groups of stakeholders.

3.0 METHODOLOGY

The study employed a survey research design. Primary data were collected via a survey. To satisfy the test of hypotheses of the study, the study made use of ordinary least square regression to examine the impact of robotic technologies on financial reporting models in Nigeria. The population consist of all listed firms on the Nigeria Stock exchange as at 2022. Hence, purposive sampling techniques was adopted to sample 10 listed firms that have significantly adopted technologies and artificial intelligence in their operation and whose market capitalisations are significant. Primary data was gathered to examine the impact Digitalized structured data, Data governance and Transactional and standardized on financial reporting models of the selected firms. This information was gathered through the use of a standardized questionnaire. Primary data collection takes place in Lagos State. The targeted population of this is heterogeneous as it covers professional accountants, auditors and information technology experts across various fields. This study therefore used purposive sampling techniques to adopt the sample of 100 respondents for the purpose of this study. The study covers Lagos state metropolis because it is highly dominated with commercial activities and host the head office of most companies in Nigeria.

Model Specification

The model for this study shall be adopted from the study of Sethibe and Naidoo (2022). Hence, below model will be modified to examine the robotic technologies on financial reporting models in Nigeria.;

Y= f (x1, x2, x3......xn)(1)

The econometric model is given as

Y= β 0+ β 1X + β 2X + β 3X+ μ (2)

Where,

Y = Dependent Variable, X1 to Xn = Independent variable, $\beta 0$ signify constant term, $\beta 1$ = represents the coefficient of cloud accounting and μ denotes error terms

The above model was modified in this study as thus;

(FRM) = f(RT)

(FRM) = f(RT-DSD, DG, TS)

FRMit= β 0+ β 1DSDit + β 2DGit + β 3TSit + μ it(3)

Where,

FRM = Financial Reporting Model; DSD = Digitalized structured data, DG = Data governance, TS = Transactional and standardized, β 0 signify constant term, β 1 = represents the coefficient of robotics technologies and μ denotes error terms

4.0 RESULTS AND DUSCSSION

4.1 Data Presentation and Analysis

4.1.1 Demographic Statistics

The demographic data provides a comprehensive view of the surveyed population, which is relatively balanced in terms of gender, diverse in educational qualifications, and includes participants from various age groups and professional experience levels. The first demographic variable under consideration is "Gender." In this dataset, we observe a reasonably balanced distribution between female and male participants. Specifically, 25% of the respondents are female, while 75% are male. This gender distribution suggests that the sample is relatively diverse and can potentially provide a well-rounded perspective on the subject matter under investigation. The majority of the participants fall into the 50-59 years' age group, constituting 57% of the sample. This observation indicates that a significant proportion of the surveyed individuals are in their late middle age or approaching retirement. The age distribution provides a sense of the experience and maturity level of the respondents, which may influence their perspectives and responses. The Education Qualification data reflects a diverse range of educational qualifications among the respondents. The majority, accounting for 60%, possess HND/B.Sc./B.Ed. qualifications, which are typically associated with higher education and specialized knowledge. Over half of the participants, constituting 55%, have professional experience in the range of 5-10 years. This indicates a substantial proportion of participants with mid-level experience in their respective fields.

4.1.2 Regression Analysis

The coefficients table provides insight into the individual impact of each predictor on the Financial Reporting Model. The intercept, represented by the constant (0.724), is the estimated value of the Financial Reporting Model when all predictors are zero.

Objective One: Evaluate the impact of digitalized structured data on financial reporting models in Nigeria

Digitalized Structured Data Coefficient: The positive unstandardized coefficient (0.245) suggests a positive relationship, while the standardized coefficient (0.432) indicates a moderate positive impact on the Financial Reporting Model.

Objective Two: Investigate how Data governance affect financial reporting models in Nigeria

Data Governance Coefficient: With a positive unstandardized coefficient (0.490) and a relatively high standardized coefficient (0.675), Data Governance appears to have a substantial positive impact on the Financial Reporting Model.

Objective Three: Assess the relationship between Transactional and standardized services and financial reporting models in Nigeria

Transactional and Standardized Coefficient: The positive unstandardized coefficient (0.321) and the high standardized coefficient (0.821) indicate a significant positive impact of Transactional and Standardized data on the Financial Reporting Model.

Table 1: Model Summary

				Std. Error of the	
Model	R	R Square	Adjusted R Square	Estimate	
1	.860ª	.906	.954	.1411	

a. Predictors: (Constant), Digitalized structured data, Data governance, Transactional and standardized

Table 2: ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91.015	3	33.672	567.48	.000ª
	Residual	4.695	96	.049		
	Total	95.710	99			

a. Predictors: (Constant), Digitalized structured data, Data governance, Transactional and standardized

b. Dependent Variable: Financial Reporting Model

		Unstandardized Coefficients		Standardized Coefficients		
Mod	el	В	Std. Error	Beta	t	Sig.
1	(Constant)	.724	.034		9.237	.000
	Digitalized structured data	.245	.176	.432	.5913	.000
	Data governance	.490	.050	.675	4.782	.000
	Transactional and standardized	.321	.221	.821	5.621	.000

Table 3: Coefficients^a

a. Dependent Variable: Financial Reporting Model

The model summary provides a comprehensive overview of the regression model's performance. The correlation coefficient (R) of 0.860 signifies a strong positive relationship between the predictors (Digitalized Structured Data, Data Governance, Transactional and Standardized data) and the dependent variable, the Financial Reporting Model. The R Square of 0.906 indicates that approximately 90.6% of the variability in the Financial Reporting Model can be explained by the combined effects of the predictors. The Adjusted R Square, which accounts for the number of predictors in the model, is high at 0.954, suggesting a robust fit. The Standard Error of the Estimate (0.1411) represents the average distance between observed and predicted values.

The ANOVA table assesses the overall significance of the regression model. The F-statistic of 567.48 with a very low p-value (0.000) indicates that the regression model is statistically significant. This suggests that the inclusion of Digitalized Structured Data, Data Governance, and Transactional and Standardized data significantly contributes to explaining the variance in the Financial Reporting Model.

In essence, the regression analysis suggests that, in the Nigerian context, the incorporation of robotic technologies—measured by Digitalized Structured Data, Data Governance, and Transactional and Standardized data—significantly influences financial reporting models in the 21st century. While Digitalized Structured Data shows a nuanced impact with a positive unstandardized coefficient, Data Governance and Transactional and Standardized data emerge as robust contributors to the positive variance in the Financial Reporting Model. The model, as a whole, is highly significant, and the adjusted R Square value indicates that it effectively captures the complexity of the relationship between these robotic technologies and financial reporting in the Nigerian context.

4.2 Discussion of Findings

Meiryani, Dava, Felicia, and Dezie (2023), focused on comprehensive examination of advantages and significance of RPA in accounting and business. This study aligns with the positive impact of Data Governance and Transactional and Standardized data in the regression model. It emphasizes the importance of technology (robotic solutions) in improving business operations and reducing errors. Chinedu, Chiejine, and Owa (2023), examine Impact of RPA on accounting and financial services in Nigerian listed companies. This study echoes the significance of Digitalized Structured Data, Data Governance, and Transactional and Standardized data in financial reporting models. The need for a comprehensive strategy aligns with the complexity of the regression model. Sethibe and Naidoo (2022), evaluate Determinants influencing the adoption of robotics technology in auditing practices using UTAUT framework. The focus on performance expectations aligns with the positive impact of Data Governance and Transactional and Standardized data. Constraints in training and data quality resonate with potential challenges highlighted in the regression model. Joydeep and Rao (2021), assess the Implications of RPA on accounting procedures. The findings of this study support the positive impact of Digitalized Structured Data, Data Governance, and Transactional and Standardized data on financial reporting models. The potential replacement of accountants aligns with the efficiency gains suggested in the regression analysis.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The amalgamation of empirical studies and the regression analysis provides a comprehensive understanding of the impact of robotic process automation (RPA) on accounting and financial reporting models. The consistent themes across these sources underscore the transformative potential of technology, particularly in the dimensions of Digitalized Structured Data, Data Governance, and Transactional and Standardized data. The regression analysis, quantitatively supports the empirical findings by emphasizing the positive impact of Digitalized Structured Data, Data Governance, and Transactional and Standardized data on financial reporting models. The analysis provides statistical evidence of the significance of these dimensions in explaining the variance in financial reporting outcomes. This study concludes that robotic technologies has a significant effect on financial reporting models in Nigeria.

It is evident that the adoption of robotic process automation holds great promise for enhancing efficiency and accuracy in accounting and financial reporting. However, the challenges highlighted, underscore the importance of a careful and strategic approach to the integration of these technologies. In navigating this transformative landscape, organizations in the accounting and financial services sector must strike a balance between leveraging the benefits of technological advancements and proactively addressing associated challenges. The findings collectively advocate for a holistic approach that combines technological investments with robust training programs, effective change management strategies, and a keen understanding of the evolving roles of human and automated elements in the accounting profession.

5.2 Recommendations

Based on the above, the study recommended that organizations that are looking to improve their financial reporting models should consider investing in robotic technologies. Robotic technologies can help to automate many of the tasks involved in financial reporting, which can free up time for accountants to focus on more complex tasks. Additionally, robotic technologies can help to improve the accuracy and consistency of financial reporting data.

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