LEVERAGING ROBOTIC PROCESS AUTOMATION FOR SUSTAINABLE PUBLIC FINANCIAL REPORTING IN NIGERIA

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ABSTRACT

Studies indicated that many foreign public institutions have successfully navigated Robotic Process Automation (RPA) technology to enhance their financial reporting practices. This study investigates how RPA could be leveraged to achieve sustainable public financial reporting in Nigeria. The study uses a survey design and employs primary data obtained from respondents via social media using a structured online questionnaire. A purposeful stratified sampling strategy was used to select 276 participants, which included 138 public financial experts and 138 IT specialists in the Nigerian public services. Means, frequency distribution and standard deviation were used for data analysis. Findings reveal a positive trend toward the integration of RPA technology into public financial reporting system in Nigeria. Most of the respondents believed there are institutional alignments in place to assist RPA integration. The study reveals that lack of political will and deficiencies in the infrastructure could skew the shift and jeopardize the efficacy and sustainability of automated systems. This research concludes that public sector in Nigeria demonstrates readiness in terms of awareness-raising and strategic planning. The study recommends that government should embark on capacity building as an institutional priority by establish a nationwide digital training center for public works on RPA in Nigeria.

Keywords: *Nigerian public sector, Robotic Process Automation, Sustainable Public Financial Reporting, Sustainable financial reporting.*

INTRODUCTION

Global financial reporting standards have undergone significant change since the introduction of smart technologies like robotic process automation (RPA). The Nigerian public financial reporting systems can now be improved due to emergency of many smart technologies especially the RPA. Financial experts utilize RPA, a relatively new technology, to handle internal business processes as well as tax and assurance work for clients (Wolfgang & Andreas, 2023). RPA is very different from traditional IT automation because it emphasizes its user-friendly interface and can interact with existing applications without requiring significant coding changes (Altuk & Kablan, 2020). RPA can also manage and transform complex financial reports, accountability procedures, and decision-making (Lopes et al., 2023). Routine financial procedures can be streamlined by RPA, which also automates repetitive tasks so that accounting professionals can focus on more strategic aspects of their work, such as decision-making and advisory services (Boydaş et al., (2023). The use of RPA would provide a revolutionary way to enhance Nigeria's public financial reporting systems. Enhanced fiscal discipline, sustainable reporting, and the development of government financial systems are all made possible by smart technologies (Ho et al., 2020).

Sustainable financial reporting process is a framework for bringing economy back to its previous splendor (Hoffman & Rodriguez, 2013). This practice serves as a basis for achieving accountability, corruption-free and good governance, in public organizations (Dumitru et al., 2023). It helps governments manage and distribute public funds efficiently. Important documents that summarize public accounts and financial conditions are financial reports (Chen et al., 2018). The Nigerian public sector (NPS) needs to implement intelligent technical measures to improve the accuracy, dependability, and transparency of the financial data given in these reports in order to establish sustainable financial reporting procedures. Smart technologies help government agencies manage their budgets, enhance the quality of public services, and produce transparent government financial reports that will meet accountability standards (Hoffman & Rodriguez, 2013).

Despite the fact that many Nigerian public organizations have completely switched from manual financial processes to simple computerized accounting systems, the use of cutting-edge technologies is still in its infancy and is only being applied to certain projects (Tiwari & Khan, 2020). Because public institutions primarily uses transactional reporting processes with limited focus on complex analytics and the use of sustainable financial reporting tools, the deployment of technology inside the agency has been marked by uneven growth (Altuk & Kablan, 2020). Besides, traditional financial reporting is too slow, prone to errors and unreliable to account for the complexity of the government financial system, (Okoye & Ofoegbu, 2020).

Studies disclosed that the public financial systems in emerging economies, such as Nigeria, have a low level of digital maturity. RPA adoption in the Nigerian public sector is still in its infancy, despite numerous documented successes in foreign economies such as the USA, India, Rwanda, Estonia, and South Africa, demonstrating the value of these technologies in enhancing financial reporting and management (Amiram et al., 2017). Nigeria still has a long way to go as statistics discloses that less than 25% of Nigerian government agencies are ready to implement smart

technologies, from early 2025 (Okoye & Ofoegbu, 2020). Public sector financial specialists are still honing their knowledge and abilities on the use of these cutting-edge technologies for financial reporting (Möller et al., (2020).

Based on the above background and research problems, this study asks the questions that: What are the current plans for integrating RPA technology into financial reporting across Nigerian government circle? What are the benefits of integration RPA technology with Enterprise Resource Planning (ERP) systems for sustainable public financial reporting in Nigeria? Major adoption barriers for public financial reporting in Nigeria? What are the barriers facing RPA integration into the public financial reporting systems in Nigeria? What is the road map for the successful integration of the RPA technology into public financial reporting systems in Nigeria?

This research broadly investigates how Robotic Process Automation (RPA) technology could be leveraged to achieve sustainable public financial reporting in Nigeria. Specifically, the study evaluates the current plans of integrating RPA technology into financial reporting system across Nigerian government circle; assesses the benefits of integrating RAP technology with the existing Enterprise Resource Planning (ERP) systems for sustainable public financial reporting in Nigeria; identifies the barriers facing RPA integration into the public financial reporting systems in Nigeria; and analyzes the road map for the successful integration of the RPA technology into public financial reporting systems in Nigeria

LITERATURE REVIEW

In governance, financial reporting is essential to accountability and transparency. Financial reporting is the process of updating stakeholders on financial status and performance while abiding by accounting and regulatory requirements (IFAC, 2022). Sustainable public financial reporting (SPFP) is the incorporation of environmental, social, and governance (ESG) information into traditional financial reports of government to provide the view of entities' long-term value creation and their impact on the planet and stakeholders (KPMG, 2023). SPFP is the practice that discloses both non-financial and financial data of governmental organizations in a standardized and transparent manner, reflecting government' performance, enhancing informed decisions and promoting national sustainability goals (Dumitru et al., 2023)

Robotic process automation (RPA) is a cutting-edge smart technology that safeguards, optimize, and automate financial transactions (Boydaş et al., (2023). Robotic practice Automation is the practice of employing software robots, or "bots," to automate repetitive, rule-based tasks that are typically performed by people (Ghorbani, 2019). RPA is a kind of automation technology where software robots mimic human behavior to perform repetitive tasks (Lopes et al., 2023). Accounting tasks, such as transaction processing and compliance reporting, can be handled by RPA (Guse & Mangiuc, 2022).

RPA is the digital workforce that never sleeps with a potential to significantly increase auditing efficiency and accuracy by automating repetitive tasks, and reduce human error, boosts productivity, and saves money when it connects with ERP systems (Edghiem et al., 2022). It is

advanced digital tools, software and systems that automate, optimize, and enhance financial processes (Jones 2019).

RPA is a clever tool that automates complex operations, boosting productivity and freeing up valuable human resources for more strategic uses (Sandy et al., 2022). Accountants can focus on more crucial tasks that require human judgment and experience by automating and managing routine tasks like data entry, reconciliation, and report preparation that formerly consumed a significant portion of their time. In environments where financial transparency and regulatory compliance are critical, RPA provides enhanced control over accounting processes through workflow standardization and adherence to established policies and procedures (Moraes et al., 2022).

Robotic Process Automation (RPA) has a number of important features that make it a useful instrument for contemporary companies. Its non-intrusive connection with existing systems is one noteworthy characteristic. Without requiring major changes to the underlying infrastructure, RPA bots can be used with current applications (Ghorbani, 2019). Additionally, RPA has the amazing ability to function flawlessly around-the-clock, guaranteeing dependable and constant task execution without being constrained by human working hours (Lopes et al., 2023). Another important benefit of RPA is its scalability, which enables companies to easily modify their automation capacity to meet changing demands. Lastly, by reducing human error and guaranteeing compliance, RPA greatly improves accuracy and adherence to defined procedures. (IMF, 2022).

There are a number of quantifiable benefits of using RPA in accounting. First of all, it results in notable cost reductions and increased production. This includes indirect cost savings from increased productivity, quicker turnaround times and more effective use of resources, as well as direct cost savings from lowering costs related to rework, data input errors, and manual labor (Lopes et al., 2023). Second, RPA promotes enhanced productivity by enabling accounting professionals to redirect their attention from repetitive duties to higher-value endeavors like analysis, strategic planning, and decision support because accountants may now focus on more strategic tasks instead of menial tasks like form filling, sorting, data entry, and text interpretation, this change also helps to boost employee happiness (Boydaş et al., (2023).

Furthermore, the existing Enterprise Resource Planning (ERP) systems like SAP, Oracle, and Microsoft Dynamics can be seamlessly integrated with Robotic Process Automation (RPA) technology, a potent tool in the accounting industry for automating a number of tasks, most notably transaction processing and compliance reporting (Edghiem et al., 2022). RPA significantly alters the way finance duties are carried out by using software bots to carry out repetitive work (Moraes et al., 2022). Public organizations and businesses can take advantage of this technology to their seamless compatibility by automating processes which the ERP system itself cannot effectively complete: the RPA can increase the functionality of ERP systems.

Also, the seamless interchange of data between ERP systems and other applications can be facilitated by RPA bots. Data entry, report generation, and other repetitive tasks that could be laborious or time-consuming within the ERP system can be automated with RPA bots. (Ghorbani, 2019). RPA bots may automatically collect data from a variety of systems, including spreadsheets,

CRM and ERP, expediting the process of preparing the data for analysis (Sandy et al., 2022). RPA bots may conduct the frequently time-consuming task of data migration accurately and effectively, reducing human error and effort when moving big datasets across databases or accounting systems. (Guse & Mangiuc, 2022). Additionally, RPA can also be used to automate bank reconciliation procedures, intercompany reconciliations (Jones 2019).

More so, by mimicking and evaluating how automated controls function within an organization's IT infrastructure, RPA provides objective proof of control efficacy in the context of automated control testing (Amiram et al., 2017). Data consistency may be ensured and the need for manual data processing can be decreased by programming these bots to extract data from one system and feed it into another (Sandy et al., 2022). RPA has the potential to completely transform invoice matching and processing by automating the whole invoice lifecycle, from receipt to payment. This will optimize accounts payable and lower the risk of fraudulent payments.

In addition, Payroll processing can even be automated, including data collection, pay slip creation, wage and deduction computations, and payroll tax processing. Beyond these particular domains, RPA can handle other repetitive operations like master data updates, tax filings, processing expenditure reports, data input, and financial report preparation. Additionally, through effective reconciliations, tracking of account balances and outstanding bills, cost management, auditing, risk assessment, cash flow statement analysis, financial forecasting, and planning, RPA helps to improve audit trails and compliance (Guse & Mangiuc, 2022). RPA guarantees improved accuracy in financial reporting, which leads to increased precision and fewer errors. Last but not least, RPA improves processing speed and efficiency, ensuring quick transaction processing and delivery inside a company (Sandy et al., 2022).

Therefore, Nigeria may greatly improve sustainable public financial reporting by utilizing robotic process automation (RPA) to foster accountability, accuracy, and transparency. The integration of RPA into public financial reporting will enable public sector organizations to automate repetitive and standard accounting processes including report preparation, data entry, and reconciliations. This lowers operational expenses and human error while also allowing financial experts to concentrate on more strategic work like sustainability planning and analysis. When correctly integrated, RPA guarantees timeliness and consistency in financial reporting, allowing public organizations to effectively fulfill their national and international reporting requirements (Lopes et al., 2023). Aligned with the more general objectives of sustainable development and governance, utilizing this new technology can help Nigeria's public financial system become more resilient, open and accountable.

Public finance departments can implement robotic process automation (RPA) by following a planned roadmap that includes several crucial steps. The department must first identify and evaluate suitable staff to be used for financial reporting automation ((Amiram et al., 2017) . After this important phase, it's critical to choose an RPA platform that fits the department's technological architecture and unique requirements. The RPA bots' actual design and development then takes center stage, necessitating meticulous preparation and implementation to guarantee that they faithfully do the intended jobs (IMF, 2022) Lastly, before the bots are implemented and incorporated into the live accounting activities, thorough testing is necessary.

These crucial strategies are required to successfully reduce any possible dangers related to the deployment of RPA. Firstly, to protect sensitive financial data and guarantee the dependability of the automated operations, stringent security measures and thorough testing are essential. Better control and the detection of any unforeseen problems in a controlled setting are made possible by a phased deployment strategy, in which automation is introduced progressively (Jones 2019) . Additionally, to ensure a seamless implementation and minimize disturbance within the accounting department, a clear and efficient change management approach is essential.

The potential impacts of smart technologies application on financial reporting efficiency and transparency have been emphasized in a number of studies. For instance, Edghiem et al. (2022) examined the RPA application in accounting during the Lebanese economic crisis. The study's findings demonstrated that RPA technologies could automate common accounting tasks which are especially important in situations when traditional accounting practices have been hampered by financial distress. RPA technologies are mostly used in this environment for data entry, transaction processing, and compliance reporting, helping businesses to remain accurate and efficient even in the face of economic volatility.

In a similar vein, Sandy et al. (2022) offered an accounting case study that illustrates the application of RPA in an actual telecom business. The study demonstrated significant improvements in processing accuracy and time by using a design science method to develop a process model that concentrated on RPA. This instance revealed RPA's revolutionary impact on accounting operations, showing how it may significantly enhance financial reporting and reduce errors in financial processes. Furthermore, Lopes et al. (2023) look into the adoption of RPA software by accounting experts. The study uncovered the RPA tools used in accounting for processing bills and payroll as well as those entailing analytical tasks like financial analysis and forecasting. The study came to the conclusion that the extent to which accounting professionals use these products is influenced by elements including user training, convenience, and insufficient infrastructures.

METHODS

The research adopted a quantitative survey research design to examine how to leverage RPA technology for sustainable public financial reporting in Nigeria. A structured questionnaire was used to collect primary data from respondents on the current plan by the government Ministries, Departments and Agencies (MDAs) have to fully integrate RPA into their financial reporting systems and to identify the barriers of its integration. The study also employed a deskstop literature review to know more about RPA technology and how it is used in financial reporting, including its benefits of integration with the existing ERP systems such as Microsoft Dynamics, Oracle and SAP in the Nigerian public sector.

A purposive stratified sampling technique was used to select 276 respondents, comprising 138 IT professionals and 138 public financial experts across the Nigerian government circle. The experienced financial and IT professionals in the Nigerian public sector helped construct the questionnaire. A structured online questionnaire based on a four-point Likert scale was used for

data collection. Statistical tools including mean, standard deviation were employed for analysis using SPSS. Ethical considerations such as respondent anonymity, voluntary participation, and data confidentiality were strictly observed.

DISCUSSION OF RESULTS

This section collates and analyzes primary data collected to generate and discuss findings.

Table 4.1: Cronbach's Alpha Reliability Test

		Cronbach's Alpha	N of Items	Total
Test		0.930	12	
Cases		Valid	276	100
		Excluded	0	.0
		Total	276	100
Threshold =**70%** (Boydaş et al., 2023)				

Source: *Data Compiled by Author, 2025*

Table 4.1 presents the results of reliability test using Cronbach's Alpha to evaluate the internal consistency of the measuring scale employed in the study. At 0.930, the calculated value is far higher than the generally used cutoff of 0.70. This shows a high degree of dependability, implying that the instrument's 12 items measure the same underlying construct and are very consistent. 276 valid responses 100% data completeness—with no missing or excluded cases served as the basis for the analysis. This makes the reliability result more credible.

Table 4.2: Response on Current plans for RPA Integration into Nigeria's Public Financial Reporting System

SN	Statement	Option					Mean	Std Dev.
		SA	A	SD	D	Total (%)		
1	Our agency has conducted a digital readiness evaluation to identify infrastructure and skills gaps for integrating RPA.	188 (68)	77 (28)	8 (3)	3 (1)	276 (100)	3.630	0.598
2	Clear guidelines exist for integrating RPA technology in our financial reporting systems	199 (72)	99 (20)	21 (8)	1 (4)	276 (100)	3.638	0.638
3	There is an established policy and institutional alignment supporting smart financial systems in our organization	208 (74)	61 (22)	8 (3)	4 (1)	276 (100)	3.678	0.604
4	Training and change management protocols are actively applied to support digital transformation in financial reporting	200 (73)	58 (21)	14 (5)	4 (1)	276 (100)	3.645	0.647
5	Our agency implements robust monitoring and evaluation mechanisms for RPA integration in financial reporting.	192 (70)	0 (0)	80 (29)	4 (1)	276 (100)	3.377	0.951

Source: *Data Generated by Author, 2025*

Table 4.2 reveals the opinions of the participants about the readiness and existing plans for incorporating Robotic Process Automation (RPA) into Nigeria's public financial reporting system. The results show that people are broadly in favor of adopting RPA, which suggests that important first steps are being taken. The majority of respondents (66%) strongly agreed, and 28% agreed, that their agencies have evaluated digital readiness to find talent and infrastructure needs for integrating RPA. This indicated broad agreement and little response variability, as evidenced by the high mean score of 3.630 and the low standard deviation (0.598).

In a similar vein, 20% of respondents agreed and 72% strongly agreed that there are explicit standards for incorporating RPA into financial reporting systems. With a mean score of 3.638 and a standard deviation of 0.638, this item once more demonstrated that participants agreed that organized planning frameworks for RPA adoption exist. The mean score was 3.678, with 74% strongly agreeing and 22% agreeing that there is an established policy and institutional alignment supporting smart financial systems. Among the items in Table 1, this had the highest mean, indicating that respondents believe their agencies are substantially in line with the goals of digital transformation.

Strong agreement was also expressed about training and change management, with 21% agreeing and 73% strongly agreeing that such procedures are in place to facilitate digital transformation. This item's mean score of 3.645 with a standard deviation of 0.647 indicates that workforce readiness activities are strongly and consistently recognized. However, there was a lower rating for the deployment of strong monitoring and assessment systems for RPA integration. With a somewhat lower mean of 3.377 and a greater standard deviation of 0.951, 70% strongly agreed and a significant 29% strongly disagreed. This illustrates that monitoring frameworks may not be applied consistently across agencies and shows a greater degree of disagreement.

Table 4.3: Response on RPA Full Integration Barriers in Nigerian Public Sector

SN	Statement	Option					Mean	Std Dev.
		SA	A	SD	D	Total (%)		
6	Lack of senior management support and political will for RPA integration.	24 (9)	11 (4)	199 (72)	42 (15)	276 (100)	2.062	0.734
7	The integration cost of RPA is a major constraint in our agency	218 (79)	13 (5)	41 (15)	4 (1)	276 (100)	3.612	0.790
8	Insufficient digital infrastructure (e.g., internet, power supply, IT systems) for RPA integrating	26 (9	63 (23)	183 (6)	4 (1)	276 (100)	2.402	0.678
9	Employees in our agency lack the necessary digital literacy for utilizing RPA system	49 (18)	0 (0)	233 (81)	4 (1)	276 (100)	2.341	0.782
10	Regulatory gaps is a barrier to RPA integration	188 (61)	71 (26)	13 (5)	4 (1)	276 (100)	3.605	0.649

| 11 | Data security is a concerned obstacle to RPA integration | 192 (70) | 70 (25) | 10 (4) | 4 (1) | 276 (100) | 3.630 | 0.628 |
| 12 | Resistance to change is also a problem to RPA integration | 203 (74) | 52 (19) | 17 (6) | 4 (1) | 276 (100) | 3.645 | 0.664 |

Source: *Data Generated by Author, 2025*

Table 4.3 reports the alleged obstacles to the complete implementation of RPA in the public sector of Nigeria. One significant obstacle was found to be a lack of political will and senior management support; only 9% of respondents strongly agreed with the statement that such support exists, while 72% strongly disagreed. According to the resultant mean, which was a low 2.062 with a standard deviation of 0.734, leadership commitment is generally thought to be insufficient. 79% of respondents strongly agreed that the cost of integrating RPA is a significant obstacle, making it a noteworthy limitation. This item's high mean (3.612) and standard deviation (0.790) highlight respondents' general concern about financial obstacles. The lack of adequate digital infrastructure was also noted; just 10% strongly agreed and 63% strongly disagreed that their agencies had the required infrastructure in place. With a standard deviation of 0.678 and a comparatively low mean score of 2.402, it was evident that there is still widespread agreement over the persistence of infrastructure issues.

One notable issue is the low level of digital literacy among staff members; 81% of respondents strongly disagreed that the workforce at their organization has the requisite abilities. With only 18% strongly agreeing, the mean and standard deviation were extremely low at 0.782. This draws attention to a critical human resource shortage that could seriously obstruct the implementation of RPA. With 68% of respondents strongly agreeing that regulatory gaps constitute a barrier, regulatory difficulties were also highlighted. This study's low mean score (0.649) and standard deviation (0.649) demonstrate a persistent belief that the legal and legislative frameworks currently in place are insufficient to facilitate RPA incorporation.

Data security concerns were also high, with 70% strongly agreeing that it is still a barrier, resulting in a mean score of 0.628 and a standard deviation of 0.628. This shows that stakeholders in the public sector continue to have serious concerns about data protection issues.

Finally, 74% strongly agreed and 19% agreed that resistance to change has an impact on RPA integration efforts, making it another significant hurdle. This item's mean score and standard deviation were 0.664 and 0.664, respectively, indicating a common worry about organizational inertia and resistance to implementing new technologies.

SUMMARY

This study investigated the importance of leveraging RPA technology for sustainable public financial reporting in Nigeria. The findings from the study show two sides to the story: on the one hand, there is a positive trend toward the adoption of robotic process automation (RPA) in Nigeria's public financial reporting system; on the other hand, there are long-standing institutional and structural obstacles that could impede or skew this shift. Most respondents believed that there are clear standards and institutional alignments in place to assist RPA integration, and the majority

admitted that their agencies have conducted assessments of digital readiness. This implies a respectable degree of strategic vision and fundamental readiness on the part of public financial institutions. Agencies' progressive stance toward future digital transformation is seen in their training and change management programs, which seem to be aligning them with the concepts of digital governance.

Nevertheless, the analysis also reveals a notable discrepancy between intent and implementation in spite of this preparedness. There is a lack of consistency in RPA oversight, as evidenced by the perception that key deployment enablers like strong monitoring and evaluation systems are used unevenly among institutions. Over time, this disparity could jeopardize the efficacy and sustainability of automated procedures. Furthermore, the obstacles found are especially instructive. One significant barrier was the lack of political will and top management backing, which may have resulted from a lack of awareness of the strategic advantages of RPA or from reluctance to challenge established bureaucratic structures. Agencies find it challenging to grow or maintain implementation due to financial constraints, especially when it comes to the high cost of RPA technologies.

The situation is made worse by deficiencies in the infrastructure, especially those linked to power and digital, as well as a conspicuous lack of digital literacy among public sector employees. These capacity shortages imply that operational readiness is still brittle even if policies may be in place on paper. Concerns about data security, legal shortcomings, and change aversion further highlight the intricate environment that RPA integration needs to take place in.

Practitioners need to understand that RPA-enabled digital transformation is a complex change management process rather than just a technical problem. Bes=cause of this reason, organizations ought to investing in long-term digital capacity building, securing top-level leadership commitment, institutionalizing change management procedures, and giving infrastructure modernization top priority as a precondition for automation are all important. This study gives academics a starting point for more research on automation in public governance. Future studies should compare implementation progress across different government tiers and sectors;

CONCLUSION

This research concludes that the public sector in Nigeria demonstrated considerable readiness especially in terms of awareness-raising and strategic planning. The study provides valuable and insightful information on the progress and challenges in integrating Robotic Process Automation into public financial reporting in Nigeria. However, there are still significant challenges in the areas of funding infrastructure, human resources, leadership and regulatory frameworks. RPA needs to be implemented with a thorough, well-funded, and inclusive national strategy if it is to become a revolutionary force in public financial governance.

This study is one of the first empirical studies that examined the preparedness of Nigeria's public sector financial systems for RPA integration. The study offers fresh perspectives on how public employees view automation and the factors that both facilitate and impede it. The research

establishes a basic framework for further scholarly investigation into automation, governance changes, and innovation in the public sector in emerging nations.

RECOMMENDATIONS

This study recommends that the policy makers should make RPA digital transformation benchmarks and vision statements necessary for agency executives to guarantee top-down commitment. They concerned stakeholders should incorporate designated RPA financing lines into national and sub-national budgets to complement grants from development partners. They should also develop a nationwide digital infrastructure with a special focus on ICT development initiatives in underprivileged communities to provide consistent access and automation capabilities. Government should embark on capacity building as an institutional priority by establish a nationwide digital training center for federal officials that offers courses in cyber-security, data ethics, and RPA.

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