Intelligent Automation and Sustainable Performance of Deposit Money Banks in Nigeria: A Critical Review of the Roles of Operational Efficiency, Employee Adaptability and Organizational Agility

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Abstract
Intelligent automation is revolutionizing banking from digitization of consumer transactions to integration of robotic process automation, artificial intelligence, analytics, and connected workflows. Deposit money banks in Nigeria are making efforts in this regard to cut down costs, improve service quality, manage fraud, and cope up with competition from digitally minded financial service companies. But acquisition of technologies does not mean sustainable performance. This paper aims to critically assess how intelligent automation may affect the sustainable performance of deposit money banks in Nigeria in terms of finance, operations, people, and institutions. In this regard, this paper takes the form of a narrative and conceptual review where the focus is primarily on Nigerian literature but using international literature to draw theory and context comparison. The review finds out that there are three major interrelated explanatory mechanisms such as operational efficiency, adaptive capacity of employees, and organizational agility. With automation, banks can achieve faster, accurate, scalable, compliant, and supported decisions. On the other hand, these benefits can be hampered by incompatibility with legacy systems, lack of data, security risks, high cost of implementation, resistance from employees, skill mismatches, and poor governance. Using socio-technical systems theory, task-technology fit theory, resource-based view, dynamic capability theory, and human capital theory, this article presents a conceptual understanding of intelligent automation in the context of socio-technical organizational capabilities rather than being just a technology. This study pinpoints some

conceptual ambiguity, short-sightedness about performance, weak indicators of automation maturity, and lack of longitudinal studies in Nigerian banking literature.

Keywords: *artificial intelligence; deposit money banks; employee adaptability; intelligent automation; operational efficiency; organisational agility; sustainable performance*

1.0 Introduction

Automated banking has developed from the use of computers and office procedures through to the adoption of electronic means, software robots, artificial intelligence, and data-driven decision-making. Automated teller machines (ATMs), point of sale (POS) devices, online banking, and mobile applications have revolutionized the way customers conduct their transactions in terms of access to financial services, whereas recent innovations have automated tasks like reconciliations, fraud detection, onboarding customers, credit rating, and compliance reporting (Ghandour, 2021; Maček et al., 2020; Polireddi, 2024). Automation has become increasingly important for Nigerian deposit money banks owing to the pressure of cost reduction, improved service delivery, preventing fraud and competing with fintech companies (Ashiru et al., 2023; Madugba et al., 2021; Mohammed, 2025). However, the benefits of automation depend on the level of integration of technology with people and processes (Acemoglu & Restrepo, 2019; Alqararah et al., 2025). The existing research on Nigeria mainly focuses on electronic banking and financial innovation and does not mean that there has been intelligent automation that involves AI, RPA, analytics, and human management (Kawai et al., 2023; Mgbada et al., 2024; Nwakoby et al., 2020).

Performance measurement of banks tends to focus mainly on profitability. However, sustainable performance involves reliability, trustworthiness, competence, compliance, adaptability, and resilience (Alqararah et al., 2025; Bui & Duong, 2025; Uddin & Barai, 2026). While automation increases productivity and eliminates tedious tasks, it may also bring about cybersecurity threats, job insecurity, and competence gaps if the adoption process is improperly done (Chen & Li, 2024; Nazareno & Schiff, 2021). For this reason, it is important for employees to be adaptable since they need to learn new skills and work together with the intelligent system (Annisa et al., 2024; Hussain et al., 2026). In addition, organizational agility is equally important since organizations have to use technology in the right way and allocate their resources in response to changes (Teece et al., 1997). In the same vein, the theory of Task–Technology Fit shows that automation will yield the best results only when technology abilities match the needs of particular tasks (Goodhue & Thompson, 1995). Therefore, intelligent automation does not guarantee performance improvement per se but depends on such factors as task fit, process optimization, adaptability of employees, organizational agility, and proper governance (Alqararah et al., 2025; Hamid & Eledum, 2026). Although there are many studies of digital banking, few of them are devoted to advanced intelligent automation and sustainable bank performance in Nigeria directly. This study is concerned with the effects of intelligent automation on sustainable bank performance paying special attention to organizational and human capabilities. The study therefore examines the following objectives:

1.To examine the nature, scope and evolution of intelligent automation in deposit money banks.
2.To assess critically intelligent automation relationship with the sustainable performance of Nigerian deposit money banks.
3.To examine the explanatory roles of operational efficiency, employee adaptability and organisational agility while identifying research gaps and future directions.

2.0 Literature Review
2.1 Conceptual Review
2.1.1 Concept of Intelligent Automation
Intelligent automation can be defined as the combination of various technologies, such as robotic process automation (RPA), artificial intelligence (AI), data analytics, and digital workflows, that help automate simple tasks and make complicated decisions. Contrary to the traditional automation, the former technology is capable of analyzing the information and recognizing the patterns to assist people in making decisions (Ghandour, 2021; Polireddi, 2024). For instance, in the banking industry, intelligent automation can be used to carry out activities, which include transaction processing, fraud detection, customer onboarding, credit assessment, reconciliation, and regulatory reporting. While RPA is used to automate repetitive and rule-based processes, AI helps with predicting, analyzing, and recognizing patterns (Ahmet Unal & Bolukbas, 2021; Mamede et al., 2023). In this way, these technologies may help to decrease processing time, minimize errors, and save money (Alqararah et al., 2025; Baffour Gyau et al., 2024).
However, intelligent automation is not only about replacing employees with machines. The implementation of the technology depends on such aspects as process design, system integration, data quality, employee skills, and human involvement (Goodhue & Thompson, 1995; Hussain et al., 2026). Additionally, automation can influence the role of an employee by decreasing repetitive activities and increasing the requirements for skills related to using technologies and analysis (Acemoglu & Restrepo, 2019). Thus, intelligent automation can be considered as both technology and organizational capability.

2.1.2 Customer-Facing Automation
Customer-oriented intelligent automation is represented by chatbots, virtual assistants, personalized marketing, digital onboarding, and automated service recommendations. Intelligent automation may improve interactions between customers and companies, customize services, increase their accessibility, and decrease the number of routine tasks for employees (Gerling & Lessmann, 2024; Ghandour, 2021; Polireddi, 2024). Hence, intelligent automation may lead to increased operational efficiency and better customer experience. However, customers may become disappointed in the case when intelligent systems fail to cope with complex and uncommon requests. In such cases, human intervention becomes inevitable (Ghandour, 2021).
Automated credit evaluation is another area where intelligent automation may be used efficiently. The use of artificial intelligence and fintech will help banks to make their decisions faster and make financial services more accessible (Kayed et al., 2024; Polireddi, 2024; Shiyyab et al., 2023). At the same time, the poor design of algorithm may lead to biased and wrong decisions. For that reason, banks have to ensure data quality, fairness, and human intervention when using automated credit systems (Gerling & Lessmann, 2024; Ghandour, 2021).

2.1.3 Back-Office Automation
Intelligent automation within the back office includes transaction reconciliation, reporting for compliance purposes, document management, audit, KYC verification, and HR management. The reason why some of these tasks could be automated is the fact that they are repetitive in nature and rule-based, making them ideal for RPA implementation, and such automation could improve the efficiency, effectiveness, and reliability of the processes (Ahmet Unal & Bolukbas, 2021; Choi et al., 2021; Horvat et al., 2025). On the other hand, automation should be based on the right task selection, standardization of the process, and proper workflow design (Huang & Vasarhelyi, 2019;

Maček et al., 2020; Mamede et al., 2023). Automation could help to eliminate mistakes, reduce time required for execution, and increase efficiency (Chibole & Ondara, 2025; Hussain et al., 2026). However, poor infrastructure, legacy systems, and non-compatible technologies could increase costs (Bostrom & Heinen, 1977; Durigan Junior et al., 2024). In this regard, the benefits of automation in the back office depend on the proper digital infrastructure and process redesign.

2.1.4 Decision-Support Automation

Through the use of artificial intelligence and predictive analytics, the banking industry is able to recognize fraud, risks, and make decisions based on analyzing large quantities of information and patterns that might be invisible using conventional techniques (Ghandour, 2021; Polireddi, 2024; Shiyyab et al., 2023). However, these technologies become most efficient when they supplement rather than replace human expertise especially in complex lending decisions, customer complaints, and regulatory decisions (Gerling & Lessmann, 2024; Goodhue & Thompson, 1995). Thus, human intervention is required in cases when the decision involves significant financial or client impact.
Automation transforms work rather than displacing workers. While some repetitive activities may be automated, employees may develop new tasks in areas such as monitoring of systems, data management, exceptional circumstances, and clients' support (Acemoglu & Restrepo, 2019; Chen & Li, 2024). Therefore, training of employees, technological literacy, and organizational assistance are key factors for successful collaboration between humans and technology (Annisa et al., 2024; Hussain et al., 2026; Przegalinska et al., 2025).

2.1.5 Evolution of Banking Automation

The evolution of the automation process in banking institutions has been gradual and progressive starting from manual data keeping to more integrated systems. Computerization made the storage and processing of information better, and office automation made documentation, payroll, communications, and reports be done digitally (Osakwe & Ezeaku, 2022). ATMs, electronic payments, internet banking and mobile banking moved many services of customers outside the branch offices making the use of the mentioned technology have connections to the operational and financial performance in Nigeria (Amaduche et al., 2020; Kawai et al., 2023; Madugba et al., 2021). With the rise of fintech and open banking the automation process went even further introducing application programming interfaces (APIs) allowing banks and third parties to exchange information and provide services that are integrated together. However, this brings up new issues related to data security, third-party risk and accountability (Durigan Junior et al., 2024; Lin, 2025). Robotic process automation (RPA) is yet another stage where software robots do routine tasks like data entry, reconciliations, report generation, and document processing (Ahmet Unal & Bolukbas, 2021; Choi et al., 2021; Mamede et al., 2023).
Intelligent automation includes such things as fraud detection, credit scoring, predictions, pattern recognition, and customer services by using AI (Ghandour, 2021; Gerling & Lessmann, 2024; Polireddi, 2024). The intelligent automation is created with the help of RPA, AI, analytics, digital workflow, APIs and human judgment. In Nigerian banks all these stages usually exist simultaneously. For example, a bank can have state-of-the-art mobile banking system but still use legacy systems and manual processes in the back office. Thus, just the presence of digital technologies is not an indication of high automation maturity but the level of integration of such technologies into the banking processes.

2.1.6 Sustainable Performance of Deposit Money Banks

Sustainable performance of a bank involves sustainability of its profitability, efficiency, adaptability, and trustworthiness in addition to meeting needs of customers, employees, regulators, and other stakeholders (Alqararah et al., 2025; Bui & Duong, 2025). This term is not restricted to profitability only. Financial performance includes profitability, income and cost efficiency. Return on assets, return on equity, and profit after tax are some of the useful measures of financial performance. However, such measures do not cover up the long-term consequences of investments made in technology. Empirical findings suggest that fintech, artificial intelligence, and digital transformation positively influence bank's profitability and efficiency although results are context-driven (Ashiru et al., 2023; Baffour Gyau et al., 2024; Citterio et al., 2024; Ren et al., 2024). Operational performance involves processing time, accuracy, productivity, availability, and reliability. Intelligence automation can help improve these dimensions through reducing the need for repetitive activities, standardization of processes and increased flow of information (Chibole & Ondara, 2025; Huang & Vasarhelyi, 2019; Mamede et al., 2023). However, operational efficiency does not imply sustainable performance.

It is also necessary to consider issues of financial stability and risk management. Digital technologies can be helpful for enhancing liquidity creation, risk management, fraud detection, and regulatory process although they might generate certain risks related to cybersecurity, data and models (Ghandour, 2021; Huynh, 2025; Uddin & Barai, 2026). Therefore, proper governance and risk controls are important to ensure financial stability. Customer trust and experience also play an important role. Digital banking is helpful for improving customers' experience and increasing their access to financial services although failures of the system, fraud and poorly designed automated decisions can deteriorate customers' trust (Amaduche et al., 2020; Gathu & Njenga, 2021; Gerling & Lessmann, 2024). Lastly, the capabilities of employees and resilience of the organization are important for sustainable performance. Employees have to be trained properly and should have enough technological capabilities to work with automation technology while banks have to have the ability to sustain technology disruptions and cyber-attacks (Annisa et al., 2024; Hussain et al., 2026).

2.1.7 Intelligent Automation and Bank Performance

According to the reviewed literature, the introduction of digitalization, fintech, and intelligent technologies is expected to boost bank performance. Nonetheless, it is worth noting that their impact is not uniform and instant. Positive, ambiguous, as well as non-linear links between digital transformation and performance are found in the literature in relation to Europe, China, and other developing countries (Alqararah et al., 2025; Citterio et al., 2024; Ren et al., 2024; Xiang & Jiang, 2023; Yuan et al., 2025). Artificial intelligence can improve risk assessment, detection of frauds, and targeting of clients, whereas RPA reduces repetitive work and increases process standardization (Baffour Gyau et al., 2024; Horvat et al., 2025; Maček et al., 2020). Nonetheless, it is necessary to mention that AI, RPA, fintech, and electronic banking are distinct technologies and cannot be confused. As for Nigeria, researches usually claim that there is a positive link between electronic banking, financial innovation, IT investment and bank performance (Ashiru et al., 2023; Madugba et al., 2021; Mgbada et al., 2024; Nwakoby et al., 2020; Salawu & Abolarin, 2025). Nevertheless, none of them is able to reveal the impact of enterprise-wide intelligent automation independently. The variations in findings might be explained by the differences in bank sizes, types of technologies applied, strategy of implementation and capabilities of organizations. For example, mobile banking enhances accessibility, RPA automates repetitive processes, whereas

artificial intelligence is aimed at supporting more complicated decisions. The timing of introduction and maturity of technologies also matters. Initial costs of purchasing software, employee training, enhancing cybersecurity and processes improvement may decrease the performance before getting the benefits (Alqararah et al., 2025; Bui & Duong, 2025). Moreover, there is the evidence of a U-shaped connection between fintech and profitability, which means that technologies may have different impacts at various stages of adoption (Yuan et al., 2025). Successful automation requires not only having digital tools but also their integration into work processes and capabilities of employees (Choi et al., 2021; Hussain et al., 2026; Mamede et al., 2023). In addition, new risks might arise due to introduction of technologies, namely cybersecurity threats, bad quality of data, vendor lock-in and improper algorithms that decrease the benefits of adoption (Alqararah et al., 2025; Durigan Junior et al., 2024; Ghandour, 2021). Besides, the employees may oppose such changes because of their impacts on roles and fear of job loss if they are not provided with training and organizational support (Acemoglu & Restrepo, 2019; Chen & Li, 2024; Nazareno & Schiff, 2021).

2.1.8 Operational Efficiency as an Explanatory Mechanism

Efficiency refers to the way in which banks make use of their resources to provide quality services. It can be measured using indicators such as processing time, transaction costs, error rates, productivity of employees, availability of service, and resource utilization. RPA may improve efficiency by automating repetitive operations like data transfer, transactions reconciliation, and reports generation, while AI assists in operations that require pattern identification, such as fraud detection and document processing (Chibole & Ondara, 2025; Delagrammatikas et al., 2025).

Intelligent automation improves efficiency because it changes the way operations are done and information flows within the bank. These changes can result in less resource use, reduced processing time, and reduced error rates, thus resulting in cost control and improvement in the delivery of service (Kawai et al., 2023; Ndome et al., 2026). Nevertheless, its effectiveness depends on task-technology fit. RPA fits into predictable, voluminous, and rule-based operations, whereas AI works with reliable data and continuous monitoring. Task selection poorly done can result in increased manual corrections instead of increasing efficiency (Choi et al., 2021; Mamede et al., 2023). Efficiency considerations must not be limited to merely reducing processing time and cost. Too much automation can jeopardize service quality, the well-being of employees, or even customers' trust. Thus, this review defines efficiency as not only a mechanism but also an intermediate dimension of sustainable performance in the bank.

2.1.9 Employee Adaptability and Human–Technology Collaboration

Adaptability of the workforce is the capability and willingness of the employees to learn, adapt, and perform under changing technologies, roles, and conditions. Adaptability is defined by the employees' digital competence, self-efficacy, openness to change, problem-solving skills, and ability to work with automation technologies (Annisa et al., 2024; Chen & Li, 2024; Hussain et al., 2026). Adaptability is crucial during the digital transformation because the skills of the employees need to be constantly updated due to changes in technologies and roles (Acemoglu & Restrepo, 2019; Hamid & Eledum, 2026). Automation technologies can make the employees more productive and give them the opportunity to spend more time solving problems and responding to customer needs and professional judgment (Ahmet Unal & Bolukbas, 2021; Chibole & Ondara, 2025; Mamede et al., 2023). However, in order for this benefit to materialize, there should be proper training and job redesign. Otherwise, the lack of skills and support will lead to the burden

of work, increased workloads and even resistance, and concerns about job security (Chen & Li, 2024; Nazareno & Schiff, 2021). Therefore, the efficient cooperation of humans and technology requires the automation of volume and routine tasks whereas complex, ambiguous, and sensitive issues require attention of the employees (Przegalinska et al., 2025).

In addition, the adaptability of the workforce cannot be considered the responsibility of the employees only. Banks should give the training, support communication, and give the opportunity to develop the necessary competencies (Annisa et al., 2024; Hussain et al., 2026). This aspect is especially important for Nigeria because the gap between digital training can affect the employees' attitudes to technological changes (Amaduche et al., 2020; Kawai et al., 2023). Thus, the sustainable automation should be associated with the investments in technologies, which will be matched with reskilling and proper change management. From the conceptual point of view, the adaptability of the workforce can play the role of antecedent, moderator, mediator, and outcome of automation. The existing adaptability can help with the adoption of the technology, but automation can contribute to the development of the skills of the employees. Moreover, adaptability can affect the extent of the impact of automation on performance (Annisa et al., 2024; Hamid & Eledum, 2026).

2.1.10 Organisational Agility as an Explanatory Mechanism

Organizational agility refers to a financial institution's ability to recognize changes, make timely decisions, allocate resources and react to changing circumstances (Alqararah et al., 2025). The digital transformation can help to achieve organizational agility through flexible processes and responsive attitude to the changes in the market, technology and regulation (Bui & Duong, 2025; Hamid & Eledum, 2026). Intelligent automation is expected to facilitate this process by providing real-time information, making predictions, and accelerating workflows, thus helping banks to deal with changing customers' needs, fraud detection problems, and reporting (Ghandour, 2021; Polireddi, 2024; Mamede et al., 2023). However, technology is not enough to develop organizational agility. Banks will also need good leadership, competent employees, coordination across functions, and adaptive decision-making structure (Alqararah et al., 2025). In terms of the dynamic capabilities approach, banks need to sense the opportunities and threats, exploit them by making proper investments, and reconfigure resources and processes to ensure effectiveness (Teece et al., 1997). Intelligent automation can help banks with these tasks, yet organizations will need to have a capability to select appropriate processes and use innovative technologies successfully (Choi et al., 2021; Ahmet Unal & Bolukbas, 2021). Hence, the relationship between intelligent automation and organizational agility can be mutual. On one hand, agile banks will be able to adopt automation successfully, and on the other hand, successful automation can contribute to organizational agility through improved information management, flexibility of processes, and responsiveness (Alqararah et al., 2025; Hamid & Eledum, 2026). The Nigerian studies confirm that the introduction of technologies can impact the performance of banking institutions; however, the results of the research need to be analyzed in the context of Nigerian deposit-taking banks (Amaduche et al., 2020; Kawai et al., 2023; Mgbada et al., 2024). Thus, organizational agility can be considered as a strategic capability which affects the way how intelligent automation leads to the sustainability of bank performance. It can serve as an antecedent, mediator, moderator or outcome, but all these roles should be stated clearly and examined empirically.

2.2 Theoretical Review

2.2.1 Socio-Technical Systems Theory

Theory of Socio-Technical Systems (STS) becomes the most important theoretical base for the research. The theory postulates that organizational performance depends on proper coordination between social and technological systems, and not on technology alone (Bostrom & Heinen, 1977). In the context of banking, this means that the technologies, such as AI, RPA and automated workflows should be supported by proper processes, employee competences and organizational structure (Alqararah et al., 2025; Bui & Duong, 2025).

Technical system is related to IT, digital technologies, AI, RPA, data infrastructure and automation, while the social system includes people, jobs, communications, hierarchy and culture within an organization. Thus, intelligent automation will be able to result in better performance only in case these components are combined in a proper way. For example, RPA will allow achieving better performance in terms of speed and precision of operations but its benefits will be minimized if the employees do not have adequate skills to use and control the technology or the processes are not changed (Ahmet Unal & Bolukbas, 2021; Hussain et al., 2026; Mamede et al., 2023).

STS theory is relevant to the research since automation will change the jobs of employees and organizational processes. Although employees will enjoy reduced amount of monotonous work, they might face with changes in their jobs or skill requirements, as well as concerns about job losses (Acemoglu & Restrepo, 2019; Annisa et al., 2024; Chen & Li, 2024). Thus, sustainable performance requires consideration of technological capabilities and human aspects. That is why STS theory is quite suitable to explain the relationship between intelligent automation, employee adaptability and organizational agility and their impact on sustainable bank performance.

2.2.2 Task–Technology Fit Theory

According to Task-Technology Fit (TTF) Theory, the success of the use of technology in performing particular tasks is attributed to technology being able to meet the needs of those tasks (Goodhue & Thompson, 1995). Thus, the effectiveness of intelligent automation will depend not only on how advanced the technology itself is but also on the extent to which the intelligent automation fits certain bank tasks. For instance, in the banking industry, activities that are repetitive and based on rules like data entry, transaction matching, reporting and compliance checks are appropriate for RPA application (Ahmet Unal & Bolukbas, 2021; Choi et al., 2021; Mamede et al., 2023). On the other hand, there are bank tasks, like handling customer complaints, building relationships and making credit decisions, that require human decision-making. Although AI will be helpful in these activities, it cannot substitute the work of humans in case of ambiguous tasks and exception cases (Ghandour, 2021; Polireddi, 2024). Thus, Task Technology Fit Theory offers an insight into the potential of intelligent automation in improving efficiency and employee performance. Where the technology matches the tasks of the workers, it is capable of reducing their routine workload, increasing the speed and leading to better results (Przegalinska et al., 2025). However, the theory focuses on fewer aspects like organizational change, employee adaptability, and transformation compared to others, suggesting that TTF Theory can complement another theory in this respect.

2.2.3 Dynamic Capabilities Theory

According to the Dynamic Capabilities Theory, organizations change and reconfigure their resources to ensure efficiency in the changing environment (Teece et al., 1997). This theory is based on three major activities: sensing opportunities and threats, exploiting opportunities, and

reconfiguration of resources and processes. It is important to consider this theory because banks are continuously faced with changes in technology, customers' demands, regulations, and competition. They need to sense valuable technologies, incorporate them into their activities and seek continuous process improvements (Alqararah et al., 2025; Bui & Duong, 2025). Therefore, organizational agility is very important for banks because it allows them to respond promptly, re-design processes and re-allocate resources. In this regard, it is important to understand that intelligent automation is a continuous process. Continuous technological updates, continuous workflow design, and development of the required employee competencies are necessary for ensuring sustainable performance (Ren et al., 2024; Hussain et al., 2026). Dynamic Capabilities Theory offers an excellent framework for understanding how organizational agility can be turned into sustainable bank performance through intelligent automation. However, it is not sufficient because of the relatively weak focus on employee experience. Thus, this theory works well when supported by other theories.

3.0 Methodology

This paper applies the methodological approach of critical narrative and conceptual review. It uses the set of peer-reviewed articles, academic chapters, proceedings, theses, and relevant academic reports available on the topics of electronic banking, fintech, office automation, RPA, AI, digital transformation, bank performance, operational efficiency, employees, and organizational agility. Literature has been categorized based on the concepts, Nigerian context, theory development, and the ability of each piece to explain relationships or contradictions. More weight was put on those sources which studied the issue of advanced automation, had a clear understanding of technology-related concepts, or used rigorous methodologies. Nigerian sources have been selected for setting the context of banking. Other African, emerging economies, European, and Chinese sources have been considered for evaluating the transportability of the explanations offered.

This methodology allows synthesizing the information comprehensively but entails the limitations inherent to such an approach. First of all, narrative reviews do not provide the reproducibility of systematic reviews and aggregated results of meta-analysis. Secondly, the set of reviewed articles differ in technologies, performance measures, banking settings, and levels of analysis. Hence, the conclusions will be stated as critical interpretations and theoretical propositions.

4.0 Review Discussion

4.1 Comparative Evidence

Research from Ghana, Kenya, and Tanzania shows that electronic/mobile banking could influence bank performance, customer access, and financial behaviors (Boateng & Nagaraju, 2020; Gathu & Njenga, 2021; Kazimoto, 2020; Mutisya & Atheru, 2019). Though these pieces of research contribute to regional comparisons in Africa, they mostly cover digital tools instead of intelligent automation integration. Research from Jordan, Egypt, and Gulf countries correlates the digital capacity of banks with their performance conditional on regulatory and capital environment (Alqararah et al., 2025; Al-Shouha et al., 2024; Khalil, 2026; Omar & Ibrahim, 2025). The findings above emphasize the relevance of the regulatory and organizational context, yet the market structures are different and hence cannot be applied to the Nigerian market directly.

In Europe, the research proves profitability of digital transformation; the studies done in the EU explore the changing nature of the relationship between fintech, artificial intelligence, and the banking sector (Citterio et al., 2024; Siminică et al., 2025). It should be acknowledged that European banks have better infrastructure and more sophisticated data governance mechanisms,

and therefore they face fewer implementation issues. The research in China proves heterogeneity, increased profit efficiency and potential nonlinearity (Ren et al., 2024; Xiang & Jiang, 2023; Yuan et al., 2025). Hence, the examples show that digital investments might have delayed and/or threshold effects. Nevertheless, the technological landscape and scale in China differs greatly from that in Nigeria. Therefore, the international research proves only the conditionality: technology is important but the results depend on the bank size, infrastructure, regulation, workers' skills, customers' readiness and macroeconomic stability.

4.2 Selected Evidence on Intelligent Automation and Bank Performance

Table 1. Selected Evidence on Intelligent Automation and Bank Performance

Author(s) and year	Country/context	Technology examined	Performance outcome	Method/design	Principal contribution	Key limitation
Ashiru et al. (2023)	Nigerian deposit money banks	Financial innovation	Financial performance	Not reported in supplied information	Establishes Nigerian digital-finance context	Does not isolate intelligent automation
Baffour Gyau et al. (2024)	Banking sector	AI innovation	Financial performance	Not reported	Connects AI innovation with bank finance	Contextual transfer to Nigeria remains uncertain
Citterio et al. (2024)	European banks	Digital transformation	Profitability	Empirical design; details not supplied	Assesses whether digital transformation is profitable	Developed-market context
Hamid and Eledum (2026)	Islamic banking	Digital transformation	Employee performance	Mediation design indicated by title	Connects agility with employee performance	Not specific to Nigerian deposit money banks
Kawai et al. (2023)	Kaduna State, Nigeria	Electronic banking	Operational performance	Not reported	Provides Nigerian operational evidence	Electronic banking is not intelligent automation
Madugba et al. (2021)	Nigerian deposit money banks	Electronic banking	Financial performance	Empirical design; details not supplied	Examines Nigerian financial outcomes	Narrower technology construct
Mamede et al. (2023)	Banking	RPA	Process efficiency	Lean process approach	Links process diagnosis with RPA	Does not establish long-term bank sustainability

Mgbada et al. (2024)	Nigerian deposit money banks	Technological innovation	Financial performance	Study period: 2010–2021	Provides longitudinal financial context	Technology categories may be aggregated
Ndome et al. (2026)	Nigerian deposit money banks	Electronic banking	Operational costs	Not reported	Examines an efficiency-related outcome	Does not directly test AI or RPA
Przegalinska et al. (2025)	Workplace organisations	Collaborative AI	Organisational performance	Not reported	Integrates resource and task-fit perspectives	Not banking- or Nigeria-specific
Ren et al. (2024)	Chinese banks	Digital transformation	Profit efficiency	Empirical design	Demonstrates efficiency implications	Institutional context differs from Nigeria
Salawu and Abolarin (2025)	Nigerian deposit money banks	IT investment	Financial performance	Trend analysis indicated by title	Highlights investment-performance relationship	IT spending does not reveal automation maturity
Shiyyab et al. (2023)	Banking	AI adoption	Bank performance	Not reported	Directly links AI adoption and performance	Nigerian relevance requires testing
Uddin and Barai (2026)	Selected Asian economies	Fintech adoption	Risk, efficiency and stability	Panel-data design	Uses multidimensional outcomes	Fintech is broader than intelligent automation
Yuan et al. (2025)	Chinese commercial banks	Fintech	Profitability	Non-linear model indicated	Identifies a U-shaped relationship	Does not directly measure intelligent automation

As it is shown from the table below, there are no grounds for the drawing of one conclusive statement due to various differences in technologies, performance measures, and environments. Specifically, when it comes to electronic banking and financial innovations, Nigerian evidence seems rather strong; however, it does not apply to the integration of artificial intelligence and robotics.

4.3 Integrated Critical Discussion

Proposed Pathway

The proposed pathway is:

Intelligent automation → operational efficiency, employee adaptability and organisational agility → sustainable bank performance.

The relationship between intelligent automation and sustainable bank performance is not necessarily a linear one. Intelligent automation could help boost the efficiency of tasks that are

repetitive and standardized in the context of banking (Ahmet Unal & Bolukbas, 2021; Choi et al., 2021; Mamede et al., 2023). However, costs of implementation, cyber security, and the reaction of employees might reduce this impact (Ghandour, 2021; Nazareno & Schiff, 2021). Moreover, the effectiveness of technology implementation depends on the extent to which technology is integrated into the processes and resources of organizations (Alqararah et al., 2025; Bui & Duong, 2025). Organizational agility and employee adaptability can affect this process. Those employees who have knowledge and self-efficacy to use new technology can promote its implementation and improve performance, whereas organizational agility helps organizations to use their opportunities related to technology and change the processes (Annisa et al., 2024; Hussain et al., 2026; Teece et al., 1997). Leadership commitment is equally important because the successful implementation of technology requires the strategy, the participation of employees, proper data governance and cyber security as well as technology itself (Alqararah et al., 2025; Bui & Duong, 2025; Polireddi, 2024). Resources of organizations can also affect the effectiveness of technology implementation. Large banks usually have enough financial and technological resources, but the complexity of organizational structure might make it harder to integrate technology. Small banks can be faster in making changes, but they often face resource limitations (Barney, 1991; Alqararah et al., 2025). Also, capital adequacy can determine the capacity of banks to invest in technology and deal with the risks associated with it (Khalil, 2026). The regulation can facilitate responsible innovation and increase compliance requirements and costs of implementation (Ghandour, 2021; Polireddi, 2024). Despite the fact that the literature on Nigeria shows the relation of electronic banking, technological innovation, IT investment, and performance of banks, most studies focus on regular digital banking without intelligent automation using AI and RPA (Amaduche et al., 2020; Kawai et al., 2023; Mgbada et al., 2024; Salawu & Abolarin, 2025). Thus, the literature review showed the absence of knowledge about the interaction of intelligent automation, employee adaptability, and organizational agility and their influence on sustainable bank performance in Nigerian deposit-money banks. This research gap will be filled in by analyzing not only the influence of intelligent automation on performance, but also organizational and individual factors which determine this influence.

4.4 Research Gaps and Future Agenda

Conceptual and Measurement Gaps

Electronic banking, fintech, digital transformation, artificial intelligence (AI), and robotic process automation (RPA) are commonly perceived as similar technologies in Nigerian literature despite the distinct differences between them (Amaduche et al., 2020; Ashiru et al., 2023; Mgbada et al., 2024). It is essential to clearly define the technology being researched in future studies and consider its level of development, integration, and use (Choi et al., 2021; Alqararah et al., 2025).

Sustainable Bank Performance

The performance of banks is often measured mainly by focusing on profitability rather than efficiency, resiliency, customer confidence, cyber security, compliance, and competency of employees (Ghandour, 2021; Ren et al., 2024; Uddin & Barai, 2026). There is a need for using more comprehensive measures of sustainable performance in the literature along with addressing whether efficiency is considered as output or input.

Geographical and Contextual Gaps

Studies related to AI and RPA in Nigeria's banks are relatively few compared to the international literature. The Nigerian literature mainly focuses on electronic banking and technological innovations generally (Amaduche et al., 2020; Kawai et al., 2023; Mgbada et al., 2024). There is also a need for more research in various banks, regions, and among different employees.

Methodological Gaps

Many of the existing studies use cross-sectional data, and this affects negatively the possibility to examine the changes in the effects of automation over time (Alqararah et al., 2025; Ren et al., 2024). Longitudinal, panel and multilevel research is needed for the exploration of time lags, non-linear effects and connections between different outcomes (Annisa et al., 2024; Hussain et al., 2026).

Human and Governance Issues

However, automation carries the possibilities to boost productivity, as well as the potential for adverse consequences for employment security, skill mismatches, technology anxiety, and wellbeing in general (Acemoglu & Restrepo, 2019; Chen & Li, 2024; Nazareno & Schiff, 2021). Hence, future studies need to focus on the issues of reskilling, job redesign, and human-AI collaboration, in addition to algorithmic bias, data protection, cyber security, and responsibility questions (Ghandour, 2021; Polireddi, 2024). A look at the reasons behind failures or abandonments of the automation projects would also add to that knowledge base.

4.5 Theoretical Contributions

The following are the five contributions made by the review. First, it redefines intelligent automation as socio-technical capacity instead of being an independent technology. Second, it distinguishes between efficiency and sustainable performance of banks as an independent concept. Third, it recognizes adaptability of the employees as human capital and not solely holding workers responsible for that. Fourth, it defines organizational agility as being bidirectional, both being enabled and created by automation. Fifth, it presents a Nigerian model that challenges the deterministic nature of technology and performance.

4.6 Implications of the Study

Managerial Implications

The banking industry needs to begin engagement with process analysis and task-technology fit. The rule-based and high-throughput tasks tend to be more suitable for robotic process automation (RPA) application than high-risk AI-driven tasks that require explanations and oversight.

Technology deployment should be part of the process redesign, employee involvement, and reskilling programs. Performance metrics should encompass not only financial performance but also operations, human resources, customer, and resiliency metrics. Phased deployment allows banks to detect the cost implications, unintended effects, and capability deficiencies before scaling up. Data governance and cybersecurity should be built in at the onset. In addition, banks need to provide just and reasonable transition programs for new or replaced jobs. Employees are more adaptable to change if they have good information, training, and participation possibilities.

Policy and Regulatory Implications

The Central Bank of Nigeria in conjunction with other stakeholders should champion automation responsibly through the setting up of standards for auditability, data management, cybersecurity, third-party risks, and operational resilience. Automated decision making related to creditworthiness and customer access should be accompanied by appropriate explanations, reviews, and means of redress. Data protection agencies should make clear the roles of all parties in situations where banks use technology suppliers. Training facilities in the financial services sector as well as relevant professional organizations should develop competence in AI governance, data analytics, cybersecurity, and human-machine interactions.

The regulatory approach must remain proportionate, encouraging innovation without letting banks pass the buck to machines or suppliers. Regulations should also take account of employee transitions and reskilling, as automation is people-dependent.

4.7 Conclusion

Intelligent automation encompasses much more than electronic banking as it involves integration of robotic process automation (RPA), AI, analytics, connected processes, and oversight in banking operations. The effect of intelligent automation on sustainable performance is driven by operational, human, and strategic levers. Although operational efficiency plays an important role, speed and cost savings do not guarantee sustainable performance in itself. Adaptability of employees makes effective use of technologies possible, while organizational agility helps banks to adjust processes and react to changes. These two elements can affect adoption of automation and also be developed through automation. Research from Nigeria focuses mostly on electronic banking and innovations in finance rather than on advanced technologies like RPA and AI. Hence, there is no substantial evidence about the impact of intelligent automation on sustainable performance in deposit money banks. Further research should focus on fit between technology, task, people, processes, and governance.

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