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Artificial Intelligence as a Driver of Business Performance in the Nigerian Financial Services Sector

Amaihian Augusta Bosede
Department of Business Management,
School of Management and Social Sciences,
Miva Open University, Abuja, Nigeria.
augusta@miva.university

Harry Lydia Ineba Decster
Department of Business Administration,
School of Business and Social Sciences,
Landmark University, Omu-Aran, Kwara State, Nigeria.
ORCID: 0000-0002-1094-4377
harry.lydia@lmu.edu.ng

Oluwaseun Oluwadamilare Oluwasanmi
Department of Business Management,
School of Management and Social Sciences,
Miva Open University, Abuja, Nigeria.
https://orcid.org/0009-0009-3112-9900
oluwaseun@miva.university

Ilevbaoje Olohije Ruth
Email: olohijeilevbaoje@gmail.com
Department of Management,
University of Nigeria, Nsukka (Enugu Campus), Nigeria

Fred Ojochide Peter
Department of Business Management,
School of Management and Social Sciences,
Miva Open University, Abuja, Nigeria.
https://orcid.org/0000-0003-2167-8446
fred@miva.university

Abstract

This study investigated the impact of Artificial Intelligence (AI) on the performance of business in the Nigerian banks. The study was inspired by the proliferation of AI technologies among organizations that have identified enhancing their operational efficiency, decision-making, innovation, and customer service delivery as a key priority. In particular, the study explored how far AI is impacting business performance by integrating cutting-edge analytics, machine learning, automation, and data-driven processes. The research design used was quantitative and the data collected was structured questionnaires and a total of 305 employees were used. Data were analyzed using descriptive statistics (frequencies, percentages, mean scores) and regression analysis was used to check the correlation between

adoption of AI and business performance. The results showed that the adoption of AI in business workflows can have a major impact on business efficiency, employee productivity, service quality, and overall performance. The study found that AI is a strategic technological tool that improves the functioning of organizations and their competitiveness. It suggests that organisations invest in AI-powered systems, increase the digital skills of their workforce, and create supportive policies to enable efficient adoption of AI technologies for long-term business growth and performance.

Keywords: Artificial Intelligence (AI); Business Performance; Machine Learning; Automation; Organizational Efficiency; Decision Making; Banking Sector.

1.0 Introduction

Artificial Intelligence (AI) is one of the most impactful technologies of today's business world, especially in the banking sector. As financial services become more digitized and customer expectations and competition rise, banks are being forced to implement AI solutions to drive greater efficiency, customer satisfaction, and organizational performance. In today's dynamic and technological landscape, AI is playing an increasingly significant role in the banking industry by driving towards operational excellence, enhancing service delivery, and maintaining competitive edge. AI is no longer regarded as just a technological breakthrough but as a vital tool for improving the efficiencies of modern banking organizations.

Artificial Intelligence is the capability of a computer system or machine to carry out tasks that are normally done by human beings and involve learning, reasoning, problem-solving, decision making and pattern recognition. The concept of AI goes back to the 1950s with the groundbreaking research of Alan Turing and John McCarthy, and has since developed from basic rule-based systems to complex machine learning algorithms, neural networks, and predictive analytics technologies (Collins et al., 2021). The evolution of AI has led to the ability to analyze large volumes of data, create insights and enhance operational efficiency, as reported by Allioui and Mourdi (2023). In the banking industry, the use of AI technologies is becoming more commonplace in fraud prevention, credit risk assessment, risk management, customer relationship management and automated service provision.

The banking sector has seen significant enhancements in operational efficiency and productivity through AI-driven innovations.AI-driven innovations have significantly transformed the banking sector, boosting its operational efficiency and productivity. By automating repetitive tasks like transaction processing, account management, customer inquiries, and compliance monitoring, AI-powered systems minimize human error and cut down on operational costs. Javaid et al. (2022) states that AI helps organizations to run their operations smoothly, use resources efficiently and enhance productivity by enabling employees to concentrate on more strategic and value adding tasks. Additionally, AI analytics offer immediate insights that enable banking managers to make informed choices, manage risk, and plan strategically. These skills have helped drive the adoption of AI throughout financial institutions around the world.

Another area where AI is making a big mark in the banking sector is on employee productivity and organization effectiveness. Employees can undertake tasks more efficiently and correctly by using intelligent automation, decision-support systems and knowledge management platforms. The implementation of AI technologies can optimise workflows, boost collaboration, and promote better service delivery. According to Wamba-Taguimdje et

al. (2020), the use of AI has a positive impact on both the operational process and the whole organization's performance through the efficiency, effectiveness and value creation. Likewise, Enholm et al. (2022) argue that adopting AI in their business processes could enable organizations to enhance productivity and deliver better performance and outcomes.AI also plays a critical role in enhancing customer satisfaction and loyalty within the banking industry. Through applications such as chatbots, virtual assistants, personalized financial recommendations, and predictive analytics, banks can better understand customer preferences and provide tailored services. These technologies enable faster response times, improved service quality, and more personalized customer experiences. As a result, AI strengthens customer relationships, increases customer retention, and contributes to improved organizational performance. Furthermore, AI enables banks to anticipate customer needs and adapt their products and services to changing market demands, thereby enhancing competitiveness and long-term sustainability.

Despite the growing adoption of AI and its recognized benefits, many banks continue to face challenges associated with AI implementation. These challenges include inadequate technological infrastructure, limited technical expertise, high implementation costs, cybersecurity concerns, and resistance to organizational change. Additionally, while existing studies have established the potential benefits of AI adoption, empirical evidence on the extent to which AI influences operational efficiency, employee productivity, and customer satisfaction within the Nigerian banking sector remains limited. This gap in the literature highlights the need for further investigation into the role of AI in enhancing business performance within Nigerian financial institutions.Therefore, this study examines the role of artificial intelligence in enhancing business performance in the Nigerian banking sector. Specifically, the study focuses on operational efficiency and productivity, employee productivity, and customer satisfaction and loyalty as key dimensions through which AI influences organizational performance. By investigating these relationships, the study seeks to provide empirical insights that can assist banks in leveraging AI technologies to improve service delivery, operational effectiveness, competitiveness, and sustainable business growth.

2. Literature Review

2.1 Artificial Intelligence

In other words, Artificial Intelligence (AI) is the ability of a machine or computer system to learn, reason, solve problems and make decisions, which are typically human functions (Sarker, 2022). AI leverages massive amounts of data, sophisticated algorithms, and computing power to detect patterns, create insights, and assist with organizational decision-making (Zhou et al., 2017). AI's advancement over the years, however, has progressed from basic rule-based systems to the more complex machine learning, natural language processing, and intelligent automation, allowing businesses to enhance their efficiency, productivity, and service offerings.

In today's business world, AI is becoming a strategic asset to boost company performance. AI is becoming an indispensable tool for organizations looking to streamline repetitive tasks, optimize operations, gain insights into customer behavior, and guide strategic decision-making. Allioui and Mourdi (2023) state that AI technologies can help businesses use resources more efficiently, increase operational efficiency, and build sustainable competitive advantages. In the banking sector, AI applications like fraud detection systems, virtual assistants, predictive analytics, and automated customer support platforms have revolutionized banking operations and enhanced service.

2.1.1 Artificial Intelligence and Business Performance

As AI technologies become more prevalent in various industries, the connection between artificial intelligence and business performance has garnered significant scholarly interest. Business performance is the capacity of an organisation to meet its objectives efficiently, effectively, improve productivity, profitability, operational excellence and customer satisfaction. AI can help businesses improve their performance by automating routine tasks, making better decisions, providing better customer service, and boosting productivity for employees (Rahman, 2023).

Research indicates that companies that effectively incorporate AI systems have better performance results than those using traditional systems. According to Wamba-Taguimdje et al. (2020), AI has a positive impact on organizational performance by enhancing efficiency, cost reduction and innovation. Enholm et al. (2022) also assert that AI can help shape new business processes and optimize the use of resources to boost performance. One of the key areas in the banking sector where AI has made a significant impact is in customer service, where it helps streamline processes and improve the overall experience for customers. AI's contributions to the banking sector are multifaceted, with its impact particularly notable in customer service, which enhances customer experience and streamlines processes.

2.2 Artificial Intelligence Automation

AI automation is the process of using AI technologies in combination with automation technologies to automate tasks with little human interaction. AI automation has the power to learn from data, adapt to changes, and make intelligent decisions, unlike traditional automation. By leveraging technologies like machine learning and RPA, businesses can automate repetitive and time-consuming tasks, minimizing errors and boosting efficiency.

AI automation is used in the banking industry for transaction processing, fraud prevention, compliance checks, customer service, and account management. These applications have benefits of operational efficiency, lesser processing time, leaner operational cost and better service delivery. Therefore, AI automation can help companies to attain better business success and productivity levels.

2.3 Advanced Algorithms

Advanced algorithms are complex mathematical computational techniques that are used to assist in analyzing large amounts of information and make accurate predictions, classifications and recommendations. Many AI applications are based on these algorithms and help organizations handle massive amounts of data efficiently. With predictive analytics and data mining capabilities, sophisticated algorithms can help companies detect patterns, predict trends, and aid in strategic decision-making.

In the banking sector, sophisticated algorithms are implemented for credit scoring, risk analysis, customer segmentation, fraud detection, and investment management. These algorithms offer timely and precise data, which helps banks optimise their workflows, boost customer satisfaction, and fortify overall business performance.

2.4 AI Chatbots

AI chatbots are intelligent computer programs that use natural language processing (NLP) and machine learning (ML) to process human conversation and generate responses to customers' questions (Grudin& Jacques, 2019). These systems are capable of grasping

customer requests, giving them appropriate information, and resolving issues without involving human intervention.

AI chatbots are being increasingly adopted within the banking sector and are used to deliver customer support services 24/7, to answer common questions, to process service requests and enhance customer engagement. By enhancing responsiveness and service quality, AI chatbots contribute to customer satisfaction and loyalty, which are important indicators of business performance.

2.5 Operational Efficiency and Productivity (2.5)

Operational efficiency is the ability of an organization to effectively utilize its resources to accomplish desired results in the least amount of waste and cost. The other aspect of productivity is how effectively the organizational resources are converted to useful outputs. Measurement of operational efficiency and productivity is considered as a key measure of business performance (Taouab&Issor, 2019).

AI technologies boost operational efficiency by automating repetitive tasks, minimizing mistakes, optimizing workflow, and enabling quicker decision-making. AI aids in transaction processing, risk assessment, and customer service in banking to enhance productivity and efficiency.

2.6 Employee Productivity

Employee productivity is the efficiency and effectiveness with which employees accomplish their assigned duties and responsibilities. Employee performance is a key factor in the success of an organization, as it directly affects its operational and service outcomes.

By streamlining repetitive tasks, offering insights for decision-making, and enhancing information accessibility, AI technologies support employee productivity. Intelligent systems enable employees to concentrate on more strategic and value-adding activities, leading to increased productivity and organizational performance. Thus, companies that succeed in leveraging AI into their operations are likely to better achieve optimal employee performance.

2.7 Customer Satisfaction and Loyalty

Customer satisfaction refers to the extent to which a product or service meets or exceeds customer expectations, while customer loyalty reflects a customer's commitment to repeatedly patronize a particular brand or organization (Khan, 2013). Both concepts are important indicators of business performance because satisfied and loyal customers contribute to revenue growth, profitability, and long-term sustainability.

Artificial intelligence enhances customer satisfaction and loyalty through personalized services, rapid response systems, predictive recommendations, and improved customer support. In the banking sector, AI-powered chatbots, virtual assistants, and predictive analytics enable financial institutions to better understand customer needs and deliver superior service experiences. As a result, organizations that leverage AI effectively are more likely to strengthen customer relationships and improve business performance.

3.0 Methodology

This study used quantitative research design which is appropriate to collect measurable data and could be statistically analysed due to the use of structured questionnaire as the main instrument used in data collection. The population of the study was made up of the staff of

Zenith Bank Plc in different branches of the bank in Delta State, Nigeria with population size of 1280. Based on Yamane (1964) size formula for survey research, a sample of 305 respondents (about 24% of the population) was selected with a margin of error of 5%. A simple random sampling technique was used to improve the representativeness of the sample, such that all staff had an equal chance of being selected. The data were obtained from a structured questionnaire which had four sections, the first section A collected the demographic data of the respondents, and the other sections B to D collected the data on variables related to the study objectives. The responses were obtained on a 5-point Likert scale from strongly agree to strongly disagree. Content validity was achieved by the instrument and consistency checks were performed to achieve reliability and unbiased results. The statistical data collected were analyzed using Statistical Package for Social Sciences (SPSS) version 2019 with descriptive statistical technique to sum up and interpret the data collected. Ethical consideration was well observed during the study which included informed consent, confidentiality and anonymity of the respondents, secure handling of data and respecting the research process in terms of integrity and credibility of the study.

4.0 Result

The study examined the influence of artificial intelligence (AI) implementation on operational efficiency and productivity, employee productivity, and customer satisfaction and loyalty. Regression analyses were conducted to test the proposed hypotheses, and the results are summarized in Table 1.

Hypothesis	Independent Variable	Dependent Variable	R	R^2	β (Beta)	p-value
H01	AI Implementation	Operational Efficiency & Productivity	0.845	0.713	0.845	< 0.001
H02	AI Integration	Employee Productivity	0.935	0.874	0.935	< 0.001
H03	AI Implementation	Customer Satisfaction & Loyalty	0.743	0.552	0.743	< 0.001

The results indicate that AI implementation has a strong positive and statistically significant influence on operational efficiency and productivity, employee productivity, and customer satisfaction and loyalty. All hypotheses were statistically significant at $p < 0.05$, confirming that AI adoption plays a critical role in enhancing organizational performance outcomes in the banking sector.

5.0 Discussion of Findings

The results obtained from this study contribute to the body of knowledge on the impact of AI on various key performance indicators within the banking industry, which is consistent with the literature that highlights AI as a key enabler of digital transformation and organizational efficiency (Davenport & Ronanki, 2018; Huang & Rust, 2021).

Hypothesis One involved assessing the correlation between the use of AI and operational efficiency and productivity. The findings showed a highly significant and positive correlation ($\beta = 0.845$, $p < 0.001$) between the level of AI adoption and the level of operational efficiency and productivity, suggesting that the adoption of AI is directly related to the level of operational efficiency and productivity. This indicates that AI-based systems can boost workflow automation, minimize operational delays and streamline decision making within

banks. The result aligns with past studies that suggest that and AI can enhance the efficiency of processes by automating and intelligently processing data, which decreases human mistakes, and operational expenses (Brynjolfsson & McAfee, 2017; Ransbotham et al., 2020).

The second hypothesis focused on how the use of AI affects employee productivity. The results revealed a very strong and significant correlation ($\beta = 0.935$, $p<0.001$), suggesting that AI tools have a significant impact on employee performance. This can be partly explained by the way AI can decrease repetitive tasks, assist with task automation, and enable workers to concentrate on more substantial tasks. This finding aligns with the perspective of Wilson and Daugherty (2018), who argue that AI is a tool for augmenting human intelligence to make more informed decisions and make tasks more efficient.

The effect of implementing AI on customer satisfaction and loyalty was tested in Hypothesis Three. The results indicated that there is a positive and significant relationship ($\beta = 0.743$, $p < 0.001$), which implies that customer experience, responsiveness, and engagement are enhanced by AI-driven services. This indicates that AI technologies such as chatbots, personalized services, and predictive analytics contribute to higher customer satisfaction and loyalty in the banking sector. The results echo those of Huang and Rust (2021), who noted that AI can improve customer experience by providing personalized service and delivery times.

The findings of this study emphasize how AI can boost overall operational efficiency, improve employee productivity, and enhance customer satisfaction. The results highlight the transformative potential of AI in the banking sector, affirming that it is a crucial tool for enhancing organizational performance. In addition, the findings support the idea that digital transformation technologies and artificial intelligence are essential factors for competitiveness and service quality in today's financial institutions (Davenport & Ronanki, 2018; Ransbotham et al., 2020).

6. Conclusion

This study examined the influence of artificial intelligence (AI) implementation on operational efficiency and productivity, employee productivity, and customer satisfaction and loyalty in the banking sector. Based on the empirical findings, the study concludes that AI adoption has a statistically significant and positive effect on all three organizational performance indicators examined. Specifically, AI implementation strongly enhances operational efficiency by improving workflow automation and decision-making processes. It also significantly boosts employee productivity by reducing repetitive tasks and enabling employees to focus on more strategic functions. Furthermore, AI contributes meaningfully to customer satisfaction and loyalty through improved service delivery, personalization, and responsiveness.

7. Recommendations

Based on the findings of the study, the following recommendations are made:

The banks need to speed up the implementation of AI-based tools and systems like automation, predictive analytics, and chatbots to boost operational efficiency and boost customer service.

Financial institutions should commit to ongoing training and capacity development initiatives to ensure their staff members possess the essential skills and knowledge in digital and AI technologies needed to work with new technologies.

AI-powered customer service tools that boost personalization, response speed, and customer satisfaction and loyalty should be implemented by banks.

The use of AI technology should be embedded in the overall business strategy of financial institutions and not viewed as a separate technological solution to ensure the greatest possible contribution to productivity and corporate performance.

To support successful, secure, and sustainable AI implementation, management should make sure that supporting infrastructure, such as digital systems, cybersecurity, and data management, are in place.

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