Original Research

Volume 5, Issue 2, pp 120-131, September, 2023

ACHIEVERS JOURNAL OF SCIENTIFIC RESEARCH

Open Access Publications of Achievers University, Owo

Available Online at www.achieversjournalofscience.org

Artificial Intelligence Impact in Revolutionizing the Nigerian Banking Industry: An Assessment of Selected Deposit Money Banks in Abuja

Okoliko, E.O. [1], Ayetigbo, O.A.[1]*, Ifegwu, I.J.[2], and Chidiebere, N.U.[1]

[1]Department of Business Administration, National Open University of Nigeria, Jabi, Abuja.
[2]Department of Entrepreneurial Studies, National Open University of Nigeria, Jabi, Abuja.

Corresponding Author's E-mail: oayetigbo@noun.edu.ng

Submitted: July 12, 2023, Revised: August 25, 2023, Accepted: September 02, 2023, Published: September 28, 2023

ABSTRACT

This study assessed the impact of artificial intelligence on the performance of selected deposit money banks in FCT, Abuja, Nigeria. A cross-sectional descriptive research design was adopted by the researcher through the use of a structured questionnaire designed for this purpose. The study population comprises the employees of five (5) selected deposit money banks within the FCT metropolis in Abuja, Nigeria, which totaled 135 employees. The study adopted the use of census since the population was relatively minimal. Statistical Package for Social Sciences (SPSS Version, 22) was used to run the results of the multiple regression analysis to achieve the objectives of this study. Findings from this study showed that the adoption of Artificial Intelligence positively and significantly enhances efficiency, effectiveness, and productivity, improves customer satisfaction, and enhances the overall performance of the selected deposit money banks in FCT, Abuja, Nigeria. Hence, the study concluded that deposit money banks have the potential to bring significant benefits to their firms and customers by leveraging (AI) to improve customer experience, better understand customer needs, enhance competitiveness, and manage risk. The study recommended appropriate digital education for customers and employees of the selected deposit money banks in FCT, Abuja, Nigeria to enjoy some of the gains brought about by the use of Artificial Intelligence to enhance competitive advantage and outperform their competitors.

KEYWORDS: Artificial Intelligence; Deposit Money Banks; Nigeria; Organizational Performance

1. Introduction

The rapid evolution of artificial intelligence (henceforth AI) brings enterprises more business opportunities (Hughes *et al.*, 2020; Obschonka and Audretsch, 2020; Shareef *et al.*, 2021). Artificial intelligence is the machines (programs) that operate in the simulation of human intelligence (Łapińska *et al.*, 2021) in technologies, such as machine learning, data mining, natural language processing, image recognition (Khalid, 2020). Artificial intelligence can bring efficiency gains, cost savings, product quality improvements, customer service improvements, customer satisfaction, efficiency, effectiveness, productivity, and profitability (Bag *et al.*, 2021c). While there is excellent potential for artificial intelligence (AI) to improve the performance of an organization (Mikalef and Gupta, 2021), there are also significant challenges to these companies applying AI (Yu *et al.*, 2021). Businesses can utilize AI to improve the customer service experience by offering more appropriate recommendations and less costly options (Payne *et al.*, 2021).

The potential of Artificial Intelligence (AI) to reshape our future has attracted vast interest among the public, government, and academia in the last few years. As in every other sector of life, the banking industry will be affected, perhaps in a

profound way (Bates *et al.,* 2020; DeMartini and Benussi, 2017). The monetary base and the issuance of money across countries of the world are exponentially growing and capital movements and cash flows particularly to emerging countries via risk capital funds, business angels, and non-bank financial institutions; microfinance, mobile operators boosted new entrepreneurship, SMEs, and most of all innovation and more researches in companies and industries (Dirican, 2015).

Many studies appear in the literature that has observed the impact of AI on business performance (Denicolai *et al.,* 2021; Mikalef and Gupta, 2021). These studies were conducted across countries of the world to examine the impact of AI on industries, such as banking and finance (Huynh *et al.,* 2020), manufacturing (Bag *et al.,* 2021c), automated retailing (Pillai *et al.,* 2020), logistics (Chien *et al.,* 2020), marketing (Keegan *et al.,* 2022), coaching services (Kim *et al.,* 2021b), and customer relationship management (Chatterjee *et al.,* 2021a), among other areas. The nexus between Artificial intelligence (AI) and the performance of deposit money banks (henceforth DMBs) in Nigeria is becoming increasingly important as the banking sector continues to evolve. Studies have shown that AI has the potential to transform the way DMBs operate and provide services to their customers (Huynh *et al.,* 2020; Bag *et al.,* 2021c; Pillai *et al.,* 2020; Chien *et al.,* 2020; Keegan *et al.,* 2022).

Studies in the literature have also shown that AI can help DMBs to better understand their customers' needs and preferences by analyzing vast amounts of data, AI algorithms can identify patterns and trends that would be impossible for humans to detect, which tend to help DMBs to tailor their products and services to better meet the needs of their customers and achieve cost-effectiveness and convenience (Haque, 2013; Kwarteng, 2015; Huynh *et al.,* 2020; Bag *et al.,* 2021c; Pillai *et al.,* 2020; Chien *et al.,* 2020; Keegan *et al.,* 2022). Some other studies have linked e-banking and quality-of-service delivery (Agboola, 2003; Uppal, 2011). Choudhury and Bharttachargee, (2016) in their study opined that electronic banking had a strong positive impact on customer loyalty. There is mixed and inconclusive opinion in the literature as to the nexus between AI and business performance, most of these studies found a positive association between the adoption of AI and bank performance (Ho and Ko 2008; Haque, 2013; Kwarteng, 2015). Very few studies have been conducted to examine the impact of AI on business performance, especially within the context of deposit money banks in Nigeria (Oluwagbemi *et al.,* 2011; Agboola, 2003). A more recent study by Elegunde, and Osagie, (2020) also showed that Artificial Intelligence complements the work process in selected deposit money banks in Ikeja Lagos State, Nigeria, and that machine-aided tasks ease operations in banks in Nigeria. To the best of our knowledge, no known study has been carried out the examine the influence of AI on the organizational performance of deposit money banks in the FCT Abuja metropolis. In lieu of the above, it is instructive to assess the impact of AI on the performance of five selected deposit money banks in FCT, Abuja metropolis, Nigeria. The paper is organized as follows: apart from the introductory aspect in Section 1, Section 2 provides a review of the literature on the relationship between AI and the performance of selected deposit money banks in FCT, Abuja Metropolis. Section 3 discusses the methodology; Section 4 discusses the results. Section 5 concludes the paper.

2.0 The Literature Review

This section reviews relevant theories on the nexus between AI and business performance. The section comprises of conceptual review, theoretical and empirical review as follows:

AI refers to the development of computer systems that can perform tasks that typically require human intelligence, such as virtual perception, speech recognition, decision-making, and language translation. AI has become increasingly popular in business as it helps organizations to improve their performance, reduce costs, and enhance customer satisfaction (Elegunde, and Osagie, 2020). Studies have shown that AI can contribute to business performance in various ways. Firstly, AI could help organizations to automate routine and repetitive tasks, freeing up employees to focus on more

complex and creative work. Secondly, AI could provide insights and recommendations based on vast amounts of data, enabling organizations to make more sound and informed decisions. Thirdly, AI could also help organizations to improve their products and services by identifying areas for improvement and suggesting new features or enhancements (Haque, 2013; Kwarteng, 2015; Huynh *et al.,* 2020; Bag *et al.,* 2021c; Pillai *et al.,* 2020; Chien *et al.,* 2020; Keegan *et al.,* 2022). Several theories explaining the nexus between AI and business performance including resource-based theory, dynamic capabilities theory, and institutional theory were reviewed in this study.

Firstly, the resource-based theory opined that firms that possess unique and valuable resources can achieve a competitive advantage over their rivals. The RBV believes that essential resources determine firm performance (Barney, 1991; Chatterjee *et al.,* 2021b). Resources can be tangible and intangible assets within an organization (Mikalef and Gupta, 2021). AI can be considered a valuable resource that can enhance the firm's competitiveness by improving its ability to process and analyze large amounts of data. By leveraging AI, firms can gain insights into their operations, customers, and market trends that can lead to better decision-making and improved performance (Ghasemaghaei, 2021; Mikalef and Gupta, 2021).

According to this theory, valuable, rare, inimitable, and irreplaceable resources can build a competitive advantage by creating value and improving firm performance (Barney, 1991; Ghasemaghaei, 2021). Such an advantage can persist over a long period (Bag *et al.,* 2021c). Businesses can raise the value of their resources because the combined value of the complementary resources is higher than the sum of each resource (Ghasemaghaei, 2021; Mikalef and Gupta, 2021).

Also, the dynamic capabilities theory proponent's theory suggests that firms that are able to adapt and respond to changing environments are more likely to achieve superior performance. The early proposition of dynamic capabilities states that it has a direct relationship with a firm's performance (Teece *et al.,* 1997). Additionally, Zollo and Winter (2002) define the direct relationship between firm performance and dynamic capabilities and emphasized that if the firm has no dynamic capability in the changing environment, the superiority and the survival of the firm will remain temporary. This has been supported by Teece (2007) whereby the development of dynamic capabilities is to identify the sources of a firm's competitive advantage at the enterprise level and it is determined by the firm success or failure.

AI could help firms develop dynamic capabilities by enabling them to quickly process and analyze data to identify emerging trends and opportunities. By using AI to identify and respond to changes in the market, firms can stay ahead of their competitors and improve their overall performance. Haque (2013) in his study of alternative banking channels found that the growth of digital banking platforms was due to cost-effectiveness and convenience received as a result of investment in technologies and innovations which have in turn enhanced the activities of the deposit money banks. Kwarteng (2015) explored the relationship between electronic banking and customer service delivery in Kumasi, Ghana taking a sample of 69 bank customers and 29 staff from three branches of deposit money banks (DMBs) using purposive sampling techniques. The study found that branch banking was the customer's preferred channel of delivery in spite of the high level of awareness of banking services and the long queues associated with branch banking, but when digital banking was an option ATM channel was the preferred choice.

Agboola (2003) in his study of the link between e-banking and quality of service delivery by technology-compliant DMBs in Nigeria took a sample of 90 customers from six (6) different banks within the Lagos metropolis and found that the introduction of e-banking produced drastic changes in both the service delivery techniques and the range of products offered. Uppal (2011) while analyzing the growth of infotech in various banking groups in India, studied public and private sector banks and also foreign banks in India and the study revealed that private sector banks and foreign banks have deployed IT applications for effective service delivery while the public sector banks still engage in brick-and-mortar banking operations. Choudhury and Bharttachargee (2016) examined the relationship between banking channels and

customer loyalty while using a survey method to sample 400 employees selected through a stratified sampling method. Their study was measured based on the ease of use of e-banking service delivery channels, its usefulness, cost-savings, and self-control, while loyalty was measured in terms of attitudinal loyalty and behavioral loyalty. Their study revealed that electronic banking had a strong positive impact on customer loyalty. Oluwagbemi, Abah, and Achimugu (2011) examined how the adoption of information technology impacted the banking industry in Nigeria. Their findings revealed that IT adoption fundamentally transformed the content and quality of banking service delivery thereby strengthening the competitiveness of Nigerian banks.

Jeong and Yoon (2013) examined major influencers of mobile banking adoption using a sample of 165 respondents in Korea. They observed that the quality of mobile banking services which was measured by their perceived usefulness, ease of use, credibility, and self-efficacy has a strong impact on customers' disposition to mobile banking adoption. Similarly, Ho and Ko (2008) also found a strong positive effect of self-service technology characteristics like ease of usage, usefulness, cost savings, and self-control on customers continued use of Internet banking facilities. They observed that these attributes create value for customers and thereby enhance their readiness to engage in self-service delivery channels for their transactions. Akanbi, Ayodele, and Adedipe (2014) studied factors that influence customer retention to use Internet banking among students of a private university in Nigeria with a sample size of 357 respondents purposively selected from three (3) Faculties of the institution of learning. Their findings revealed the perceived ease of use, capability, perceived usefulness, trialability, and compatibility as influencers of Internet banking adoption among students.

A more recent study conducted by Elegunde and Osagie, (2020) examined Artificial Intelligence and Employee Performance in the Nigerian Banking Industry, in Ikeja Lagos State, Nigeria. The study used a Cross-sectional descriptive research design. Primary data was to elicit information for this study. The population of the study was the entire employees of six (6) selected banks operating in Lagos State, Nigeria, which totaled 127 staff. The findings from the study showed that Artificial Intelligence complements work processes in banks in Nigeria and that machine-aided tasks ease operations in banks in Nigeria. Finally, after an extensive review of the theoretical literature, this study hinged on the resource-based theory, and the following research questions and hypotheses were stated for the study:

Research Questions

i. To what extent does the adoption of (AI) improve the efficiency of the selected deposit money banks in FCT Abuja Metropolis.?
ii. What is the implication of (AI) on customer satisfaction amongst deposit money banks in Nigeria?

Research Hypotheses

H_{01}: Rapid advances in (AI) do not lead to the efficiency of the selected deposit money banks in FCT Abuja Metropolis.

H_{02}: The adoption of (AI) has no significant impact on the level of customer satisfaction amongst the selected deposit money banks in FCT Abuja Metropolis.

3.0 Methodology

The study examined the impact of Artificial Intelligence (AI) and the performance of selected deposit money banks in the FCT Abuja metropolis. A structured questionnaire was designed by the researcher for the purpose of this study. The survey adopted the use of a 5-point Likert scale rating strongly agreed-5, agreed-4, uncertain-3, disagree-2, strongly disagree-1. Five (5) banks operating within the FCT Abuja metropolis were the target population of this study. The population of this selected deposit money bank totaled 135. Hence, the study adopted a census since the population is relatively minimal, this implies that the population was considered as the sample size. A census has been observed to be more attractive for small populations for example a population of about 200

or less. This method was supported by Singh and Masuku, (2014). The study purposively selected Guaranty Trust Bank Plc, First Bank Plc, ECO Bank Plc, Zenith Bank Plc, and Union Bank Plc within the Central area of the Federal Capital Territory Abuja Nigeria. The rationale for selecting the banks is to compare the impact of the adoption of (AI) on the performance of both old and new-generation banks in the metropolis. The questionnaire was divided into three main parts, Section A contains the demographic information of the respondents, Section B contains information on the adoption of Artificial Intelligence, and Section C contains information about the performance of the selected deposit money banks in FCT Abuja Nigeria. The questionnaire on the adoption of AI was adapted from the work of Jadhav, (2021). The adoption of AI is the independent variable which was measured by Relative Advantage (RA) represented by five items and Compatibility (CP) by four items respectively. Furthermore, organizational performance was also captured using seven items.

Also, a reliability test was conducted using Cronbach Alpha to test the internal consistency and stability of the research instruments used by the researcher and it returned a Cronbach Alpha coefficient of 0.773 as shown below, which is acceptable reliability and is an indication that the test result will be consistent over time. Multiple regression analysis was used to analyze data in other to achieve the objectives of this study.

Reliability Statistics

Cronbach's Alpha	No of Items
.773	23

Model Specification

The performance of the selected deposit money banks in Abuja Nigeria is a function of the adoption of Artificial Intelligence. This model was stated mathematically as follows:

ORG_PER = f(AI) ……. 1

ORG_PER = f (RADV, COMPT)……...2

$$ORG_{PER} = \alpha_0 + \beta_{1RADV} + \beta_{2COMPT} + e \quad \ldots 3$$

Where: ORG_PER = Organizational Performance
AI = Artificial Intelligence
a = Constant term
β = coefficient of the independent variable
RADV = Relative advantage of the adoption of AI
$COMPT$ = Compatibility
$e = error$ term

4.0 Data Presentation and Analysis

The demographic characteristics of 130 respondents analyzed in this study are presented in Table 1 above. A total of 135 questionnaires were administered to the respondents but only 130 were correctly filled and returned and this formed the bases of this analysis. The results indicated that male respondents accounted for 46% (60) of the sample, while female respondents accounted for 54% (70). These findings suggest that there is a greater representation of females in the sampled deposit money banks compared to males. For age, the majority (54%) of the respondents fall within the age group of 18-30 while 31% (40) of respondents were within the 31-40 age group, while the minority were in the above 40 age group, with only 15% (20) of the sample. This implies that the older you become the less productive, and unattractive an employee is to the banking industry this is because banks always want to engage young, energetic, and productive employees who can contribute meaningfully to the growth and increased productivity of their organization. Additionally, in terms of marital status, the majority of the respondents were single with 70 individuals, accounting for 54% of the total sample while married individuals comprised 46% of the sample with 60 respondents. Finally, the educational characteristics of the respondents were examined, revealing that 60 respondents comprising 46%, have OND, while 50 respondents, representing 39% have HND/BSC. Also, 15% representing 20 respondents have a master's degree.

Table 1: Section A: Demographic Information of Respondents

Variable	Item	No. of Response	Frequency (%)
Gender	Male	60	46%
	Female	70	54%
	Total	**130**	**100**
Age of the respondents	18-30 years	70	54%
	31-40 years	40	31%
	40 years and above	20	15%
	Total	**130**	**100**
Current Educational program	OND	46	46%
	HND/B.Sc.	50	39%
	Master's degree	20	15%
	Total	**130**	**100**
Marital Status	Single	70	54%
	Married	46	46%
	Total	**130**	**100**

Source: Field Survey, (2023)

4.1 Data Analysis

4.1.1 Hypotheses Testing

Hypothesis 1

H_{01}: Rapid advances in (AI) do not lead to the efficiency of the selected deposit money banks in FCT Abuja Metropolis.

Table 2 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.476[a]	.227	.215	.556

a. Predictors: (Constant), Relative Advantage, Compatibility,

Table 3 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.429	2	5.714	18.481	.000[b]
	Residual	38.959	126	.309		
	Total	50.388	128			

a. Dependent Variable: Efficiency

b. Predictors: (Constant), Relative Advantage, Compatibility,

The model summary table above shows the contribution of the predictor artificial intelligence to the dependent variable organizational performance. The R^2 value of 0.227 (22.7%) indicates the percentage of variation in the dependent variable organizational performance (OP) that can be explained by the independent variable Artificial Intelligence (AI).

The ANOVA table above shows the assessment of the regression model which predicts the dependents variable's significance. This test the null hypothesis to determine its statistical significance, the F value and P value is used to determine this. The result of the model in the table above indicates that the regression model statistically and significantly predicts the outcome since the p-value of 0.000 < 0.05 and the F observed18.481>Fcritical3.09 the null hypothesis is therefore rejected.

Table 4 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.242	.431		2.883	.005
	RA5	.448	.081	.436	5.547	.000
	CP4	.184	.088	.164	2.093	.000

a. Dependent Variable: Efficiency
b. Predictors: (Constant), Relative Advantage, Compatibility
Level of significance: *P < 0.05.

Table 4 above, shows the coefficients results of a multiple regression analysis where organizational performance is the explained variable and artificial intelligence (AI) is the explanatory variable. This shows the impact of AI adoption on organizational performance. Measures of Artificial Intelligence (AI) are Relative Advantage (RA), and Compatibility (CP), while measures of organizational performance efficiency, customer satisfaction, and profitability. A unit increase in Relative Advantage (RA) will lead to an increase of 44.8% in the organizational performance of the selected deposit money banks. This result shows a positive and statistically significant association between Rapid advances in (AI) and the performance of the selected deposit money banks in the FCT, Abuja metropolis. This result is statistically significant at a 5% level of significance. Furthermore, a unit increase in Compatibility (CP) will lead to an increase of 18.4% in the organizational performance of the selected deposit money banks. The result also shows a positive and significant relationship between Rapid Advances in (AI) and organizational performance. This result is statistically significant at a 5% level of significance. This implies that a positive adoption of (AI) will help to enhance the performance of selected deposit money banks in Nigeria.

Hypothesis 2

H_{02}: The adoption of (AI) has no significant impact on the level of customer satisfaction amongst the selected deposit money banks in FCT Abuja Metropolis.

Table 5 Model Summary[b]

ModeL	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.440[a]	.194	.181	.680

a. Predictors: (Constant), Compatibility, Relative Advantage

The model summary table above shows the contribution of the predictor Artificial intelligence to the dependent variable organizational performance. The R^2 value of 0.194 (19.4%) indicates the percentage of variation in the dependent variable organizational performance (OP) that can be explained by the independent variable Artificial Intelligence (AI).

Table 6 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.991	2	6.996	15.135	.000[b]
	Residual	58.241	126	.462		
	Total	72.233	128			

a. Dependent Variable: Customer Satisfaction
b. Predictors: (Constant), Compatibility, Relative Advantage

The ANOVA table above shows the assessment of the regression model which predicts the dependents variable's significance. This test the null hypothesis to determine its statistical significance, the F value and P value is used to determine this. The result of the model in the table above indicates that the regression model statistically and significantly predicts the outcome since the p-value of 0.000 < 0.05 and the F observed15.135>Fcritical3.09 the null hypothesis is therefore rejected.

Table 7 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.457	.492		2.958	.004
	CP3	.434	.081	.427	5.337	.000
	RA3	.163	.106	.124	1.549	.000

a. Dependent Variable: Customer Satisfaction
b. Predictors: (Constant), Compatibility, Relative Advantage
Level of significance: *P < 0.05.

The result from Table 7 above, showed the coefficients of the multiple regression analysis that explained the association between the adoption of (AI) on customer satisfaction amongst the selected deposit money banks in FCT Abuja Metropolis. The construct of (AI), Compatibility (CP), and Relative Advantage (RA) were used to proxied the impact of Artificial Intelligence (AI), while customer satisfaction was used as a measure of organizational performance. This result shows that a unit increase in compatibility (CP) will lead to an increase of 43.4% in customer satisfaction which is a measure of organizational performance. This result shows a positive and significant association between the adoption of (AI) and organizational performance. The result is statistically significant at a 5% level of significance. Moreso, a unit increase in Relative Advantage (RA) will also lead to an increase of 16.3% in customer satisfaction. The result is also statistically significant at a 5% level of significance. This implies that a positive change in Artificial Intelligence (AI) could help enhance customer satisfaction, increase profitability, and enhance the performance of selected deposit money banks in the FCT metropolis of Abuja Nigeria.

4.1.2 Discussion of Findings

The findings from hypothesis One which tested the null hypothesis Rapid advances in (AI) do not lead to the efficiency of the selected deposit money banks in FCT Abuja Metropolis was achieved using a multiple regression analysis. The result obtained revealed that the independent variable Artificial Intelligence contributes 22.6% to the variation of the dependent variable Organizational Performance. This result also indicated that the regression model statistically, and significantly predicts the outcome since the p-value of 0.000 <

0.05 and the F observed 18.481>Fcritical 3.09 which was enough to reject the null hypothesis and submit that rapid advances in (AI) significantly improve the efficiency of the selected deposit money banks in FCT Abuja Metropolis. This finding is synonymous with the findings of (Choudhury and Bharttachargee, 2016; Elegunde, and Osagie, 2020). The study of (Choudhury and Bharttachargee, 2016) found that electronic banking had a strong positive impact on customer loyalty. A more recent study conducted by Elegunde, and Osagie, (2020) found a positive and significant relationship between AI and Employee performance in the Ikeja metropolis, Nigeria.

Furthermore, hypothesis two of the study state that the adoption of (AI) has no significant impact on the level of customer satisfaction amongst the selected deposit money banks in FCT Abuja Metropolis and was tested using multiple regression analysis. The result obtained revealed that the independent variable Artificial Intelligence contributes 19.4% to the variation of the dependent variable Organizational Performance. This result also indicates that the regression model is statistically, and significantly predicts the outcome since the p-value of 0.000 < 0.05 and the F observed 15.135> Fcritical 3.09 the null hypothesis is therefore rejected. The study found that rapid advances in Artificial Intelligence (AI) significantly enhance customer satisfaction in the selected deposit money banks in FCT Abuja Metropolis. These findings imply that the rapid adoption of (AI) by new and old-generation deposit money banks within the FCT metropolis improves the efficiency, effectiveness, customer satisfaction, profitability, and performance of deposit money banks in Abuja Nigeria. This finding is in consonant with the study of (Ho and Ko 2008; Haque, 2013; Kwarteng, 2015). In a similar way, the finding also supports the work of Agboola (2003) which found that the introduction of e-banking produced drastic changes in both the service delivery techniques and the range of products offered. The result also aligns with the study of Oluwagbemi, Abah, and Achimugu (2011) which opined that IT adoption fundamentally transformed the content and quality of banking service delivery thereby strengthening the competitiveness of Nigerian banks.

5.1 Conclusion and Recommendations

AI has increasingly become important for organizations to create business value and achieve a competitive advantage. However, many AI initiatives fail even though time, effort, and resources have been invested. There is a lack of a coherent understanding of how AI technologies can create business value and what type of business value can be expected. This study re-examined the relationship between the adoption of artificial intelligence and the performance of selected deposit money banks within the FCT metropolis of Abuja Nigeria. We employed multiple regression analysis to analyze the relationship between the adoption of artificial intelligence and organizational performance. After establishing strong reliability among the items of the variables, which shows a strong internal consistency of the research instrument, the estimated results showed that there is a positive and significant relationship between the adoption of (AI) and the organizational performance of DMBs. The study concluded that Artificial intelligence positively impacts efficiency, customer satisfaction, profitability, and competitive advantage, outperforms competitors, and enhances the performance of deposit money banks in Nigeria.

Based on the above, the study recommends the following. Firstly, the management of the deposit money banks in Nigeria should implement AI-powered chatbots or virtual assistants to handle customer inquiries, provide personalized recommendations, and assist with basic transactions. This improves customer service availability and response time while reducing costs. Secondly, the stakeholders in the banking industry should also leverage AI to analyze customer data, preferences, and behaviors to offer personalized product recommendations, tailored marketing campaigns, and customized pricing, and this will, in turn, improve customer satisfaction and loyalty. Finally, the study recommended appropriate digital education for customers and employees of the selected deposit money banks in FCT, Abuja, Nigeria to enjoy some of the gains brought about by the use of Artificial Intelligence to enhance

competitive advantage and outperform their competitors.

References

Agboola, A. A. (2003). Impact of electronic banking on customer services in Lagos, Nigeria. *Journal of Social Sciences*, 7(1), 27-36.

Akanbi, P.A., Ayodele, T. D., & Adedipe, O. A. (2014). An investigation in some factors influencing the intention to use internet banking among undergraduates in Nigeria. *Research of Finance and Accounting*, 5(8), 1-10.

Bag, S. Gupta, S. Kumar, A. & Sivarajah, U. (2021). An Integrated Artificial Intelligence Framework for Knowledge Creation and B2B Marketing Rational Decision Making for Improving Firm Performance. *Ind. Mark. Manag.*, 92, 178–189.

Barney, J. (1991). Firm resources and sustained competitive advantage. *J. Manag*. 17, 99–120. doi: 10.1177/014920639101700108

Bates, T., Cobo, C., Mariño, O., & Wheeler, S. (2020). Can artificial intelligence transform higher education? *International Journal of Educational Technology in Higher Education*. https://doi.org/10.1186/s41239-020-00218-x

Chatterjee, S., Rana, N. P., Tamilmani, K., & Sharma, A. (2021a). The effect of AI-based CRM on organization performance and competitive advantage: an empirical analysis in the B2B context. Ind. Mark. Manag. 97, 205–219. doi: 10.1016/j.indmarman.2021.07.013

Chatterjee, S., Chaudhuri, R., & Vrontis, D. (2021b). Does data-driven culture impact innovation and performance of a firm? An empirical examination. *Ann. Oper. Res.* 1–26. doi: 10.1007/s10479-020-03887-z

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies. *Int. J. Prod. Res.* 58, 2730–2731. doi: 10.1080/00207543.2020.1752488

Choudhury, D., & Bhattachargee, D. (2016). Role of e-banking delivery channel in developing loyalty: a study of salaried employees. *Hind Business Review*, 2(2), 65-72.

Demartini, C., & Benussi, L. (2017). Do Web 4.0 and Industry 4.0 Imply Education X.0? IT Pro, 4–7.

Denicolai, S., Zucchella, A., & Magnani, G. (2021). Internationalization, digitalization, and sustainability: are SMEs ready? A survey on synergies and substituting effects among growth paths. *Technol. Forecast. Soc. Chang.* 166:120650. doi: 10.1016/j.techfore.2021.120650

Dirican, C. (2015). The impacts of robotics, artificial intelligence on business and economics. *Procedia Social and Behavioural Sciences*, 195, 564-573.

Elegunde, A.F., & Osagie, R.O. (2020). Artificial Intelligence Adoption and Employee Performance in the Nigerian Banking Industry. *International Journal of Business and Administration* 4(4), 189-205.

Ghasemaghaei, M. (2021). Understanding the impact of big data on firm performance: the necessity of conceptually differentiating among big data characteristics. *International Journal of Information and Management.* 57:102055. doi: 10.1016/j.ijinfomgt.2019.102055

Haque, S. Z. (2013). Alternate channels of banking, Internship Report, BRAC Univ. Bus. Sch. http://dspace.bracu.au.bd:8080/xmlui/bitstream/handle/10361/2867/09204002.pdf?sequence=1. Accessed on 21st March 2023.

Ho, S-H., & Ko, Y-Y. (2008). Effects of self-service technology on customer value and customer readiness: The case of internet banking. *Internet Research*, 18(4), 427-446.

Hughes, L., Dwivedi, Y. K., Rana, N. P., Williams, M. D., & Raghavan, V. (2020). Perspectives on the future of manufacturing within the industry 4.0 era. Prod. Plan. Control 33, 138–158. doi: 10.1080/09537287.2020.1810762 Huynh, T. L. D., Hille, E., and Nasir, M. A. (2020). Diversification in the age of the 4th industrial revolution: The role of artificial intelligence, green bonds and cryptocurrencies. *Technol. Forecast. Soc. Chang.* 159:120-188. doi: 10.1016/j.techfore.2020.120188

Huynh, T. L. D., Hille, E., & Nasir, M. A. (2020). Diversification in the age of the 4th industrial revolution: The role of artificial intelligence,

green bonds and cryptocurrencies. Technol. Forecast. Soc. Chang. 159:120188. doi: 10.1016/j.techfore.2020.120188

Jadhav, D. (2021). *Understanding Artificial Intelligence Adoption, Implementation, and Use in Small and Medium Enterprises. A Ph.D. Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy Management*. Walden University.

Jeong, B-K., & Yoon, T. E. (2013). An empirical investigation of customer acceptance of mobile banking services. *Business and Management Research*, 2(1), 31-40.

Keegan, B. J., Canhoto, A. I., & Yen, D. A. W. (2022). Power negotiation on the tango dancefloor: the adoption of AI in B2B marketing. *Ind. Mark. Manag.* 100, 36–48. doi: 10.1016/j.indmarman.2021.11.001

Khalid, N. (2020). Artificial intelligence learning and entrepreneurial performance among university students: evidence from malaysian higher educational institutions. *J. Intell. Fuzzy Syst.* 39, 5417–5435. doi: 10.3233/ JIFS-189026

Kim, J. H., Kim, M., Kwak, D. W., & Lee, S. (2021b). Home-tutoring services assisted with technology: investigating the role of artificial intelligence using a randomized field experiment. *J. Mark. Res.* 59, 79–96. doi: 10.1177/00222437211050351

Kwarteng, P. A. (2015). The effect of electronic banking on customer service delivery in Kumasi Metropolis. Unpublished Thesis, Kwame Nkrumah University of Science and Technology. Accessed 21st March, 2023. http://ir.knust.edu.gh/bitstream/123456789/8585/1/PRINCE%20ADIYIA%20KWARTENG.pdf

Łapińska, J., Escher, I., Górka, J., Sudolska, A., & Brzustewicz, P. (2021). Employees' Trust in Artificial Intelligence in companies: the case of energy and chemical Industries in Poland. *Energies* 14:19-42. doi: 10.3390/en14071942

Mikalef, P. & Gupta, M. (2021). Artificial Intelligence Capability: Conceptualization, Measurement Calibration, and Empirical Study on Its Impact on Organizational Creativity and Firm Performance. *Information Management* 58, 103-434.

Obschonka, M., & Audretsch, D. B. (2020). Artificial intelligence and big data in entrepreneurship: a new era has begun. *Small Bus. Econ.* 55, 529–539. doi: 10.1007/s11187-019-00202-

Oluwagbemi, O., Abah, J., & Achimugu, P. (2011). The impact of information and communication technology in banking industry. *Journal of Computer Science and Engineering,* 7(2), 63-67.

Payne, E. H. M., Peltier, J., & Barger, V. A. (2021). Enhancing the value co-creation process: artificial intelligence and mobile banking service platforms. J. *Res. Interact. Mark.* 15, 68–85. doi: 10.1108/JRIM-10-2020-0214

Pillai, R., Sivathanu, B., & Dwivedi, Y. K. (2020). Shopping intention at AI-powered automated retail stores (AIPARS). J. Retail. Consum. Serv. 57:102207. doi: 10.1016/j.jretconser.2020.102207

Shareef, M. A., Kumar, V., Dwivedi, Y. K., Kumar, U., Akram, M. S., & Raman, R. (2021). A new health care system enabled by machine intelligence: elderly people's trust or losing self-control. *Technological Forecasting and Social Change* 162:120-334. doi: 10.1016/j.techfore.2020.120334

Singh, A. S. and Masuku, M. B. (2014). Sampling Techniques & Determination of Sample Size in Applied Statistics Research: An Overview. *International Journal of Economics, Commerce and Management* 2(11), 1-22.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.

Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfundations of (sustainable) enterprise performance. Strategic Management Journal, 28, 1319-1350.

Uppal, R. K. (2011). E-delivery channels in banks: A fresh outlook. *Researchers World-Journal of Arts Science and Commerce*, 11(1), 178-188.

Yu, J. & Moon, T. (2021). Impact of Digital Strategic Orientation on Organizational Performance through Digital Competence. *Sustainability*, 13, 9766

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organizational Science,* 13, 339-351.