ARTIFICIAL INTELLIGENCE (AI) AND THE PERFORMANCE OF COMMERCIAL BANKS IN NIGERIA
(EMPIRICAL EVIDENCE FROM SELECTED COMMERCIAL BANKS IN CALABAR, CROSS RIVER STATE)

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Abstract

The study critically examines the effect of Artificial Intelligence (AI) on the performance of commercial banks in Nigeria. The objectives of the study were: i. to investigate the extent to which artificial intelligence adoption by commercial banks enhances the competitive advantage of banks in the Nigerian banking system. ii. to determine the extent to which artificial intelligence enhances the operational efficiency of banks in Nigeria. iii. to ascertain the challenges associated with the adoption of artificial intelligence in the banking operation. iv. to investigate the extent to which artificial intelligence prevent or reduces fraudulent activities in Nigerian commercial banking system. The study formulated four research questions and hypotheses in line with the objectives of the study. Five Commercial banks were selected as samples for the study which included: Zenith Bank, Access Bank, Ecobank, First Bank of Nigeria and United Bank for Africa (UBA). the population of the study was made up of 366 staff drawn across the aforementioned banks in Calabar. The sample size of the study was made 191 staff arrived through the application of Taro Yamane formula. The simple random sampling technique was deployed to access respondents of the study. Statistically, Regression analysis technique was used to analyze the primary date of the study. The finds revealed that; Artificial intelligence significantly enhance the competitive advantages of commercial banks in Nigeria, Artificial Intelligence significantly affect the operational efficiency of financial institutions in Nigeria, there are significant challenges associated with the adoption of Artificial intelligence in financial institutions in Nigeria and that Artificial intelligence significantly enhances the prevention of fraudulent activities in Nigerian commercial banks. The researcher recommended that with the current global financial awareness of clients the adoption of AI is essential for financial institution to stay competitive. Secondly, to ameliorate the challenges associated with the adoption of AI, Financial institutions should invest more on state-of-the-art information and communication technology equipment and train personnel to man the equipment. the researcher concluded that the is need for financial institutions to effectively integrate AI in their operations if there must stay competitive with their global allies.

Key words: Artificial Intelligence, Financial Institution, Organization, Information and Communication Technology (ICT), and Performance.

1.0 Introduction

The world of business is evolving, businesses are gradually integrating into more

Information and Communication Technology (ICT) operations to enable them with stand market competition in their beat for value creation. (Mohammed, 2019). The banking industry today has almost adopted it operations in all segment into machine learning operations otherwise called Artificial Intelligence, this range from account automation and operations to customers care services, account receivable and account payables etc. (Bhardwaj, Singh and Kumar, 2020). Jain (2019) opined that this era of internal exploration is surely considered as the fasted period in human history. This technological revolution is shaping the dynamism of business operations which is strategically positioning multinational organizations which are momentarily developing their business landscape to fit in the changing environmental circumstances in the best interest of their clients Budhwur, Malik, De Silva and Thevisuthan, (2022).

Thevisuthan et al, (2022) identified that in almost all industries in the world, and in all sectors of organizational operations, there are clear evidence of the application of Artificial Intelligence (AI), this include but not limited to human resources management, finance, production, marketing and administration. In the last decade, according to Garbuio and Lin, (2018) there have been a triggered growth of Artificial Intelligence operation in multinational organizations globally. The Nigerian Business landscape has not been left out of the technology revolution, the drivers for customer satisfaction, better quality service delivery, operational efficiency and the maximization of profit and market share index of listed companies has witnessed the

full adoption of AI in firms considered to the Information Technology complained.

Elegunde and Osagie (2020) acknowledge that Artificial intelligence is complementing work processes, employee operations in Nigerian banking system.

1.2   Statement of the problem
Technology and e-business operations which supposedly would have served as mediating driver for economic and social cultural transformation of the banking sector in Nigeria is today considered as a thread to advancement of financial institution owing to fraudulent practices facilitates by the adoption of AI in the banking sector. Prior to the last two decades before the wake of the millennium, financial institutions across the country was operating manually thus reducing the prevalence of internet fraud which has today becomes the order of the day in Nigerian banks. On the other hand, with the adoption of Artificial Intelligence (AI) in Nigerian financial institution, the debate as to whether its integration has enhanced banking efficiency and operations, customer satisfaction, competitive advantage, reduction of internet fraud etc. has remain questionable and debatable. A survey of Nigeria banks particularly in Cross River State as a case in point, shows that the adoption of AI is still very low, not just due to employee sabotage but because the needed environment to make it a success in every sector of the economy, vis-avis, improve power (electricity) supply, favorable technological environment through space satellite transmission, required training etc. are not made available. This underscores the need for the adoption of AI in banks which this study seeks to justify.

1.3 Objectives of the study

The following are the objectives of the study:

1. To investigate the extent to which artificial intelligence adoption by commercial banks enhances the competitive advantage of banks in the Nigerian banking system.
2. To determine the extent to which artificial intelligence enhances the operational efficiency of banks in Nigeria.
3. To ascertain the challenges associated with the adoption of artificial intelligence in the banking operation.
4. To investigate the extent to which artificial intelligence prevent or reduces fraudulent activities in Nigerian commercial banking system.

1.4 Research questions

The following are the research questions the researcher seeks to answer in the cause of the research:

1. To what extent does artificial intelligence adoption by commercial banks enhances the competitive advantage of banks in the Nigerian banking system?
2. To what extent does artificial intelligence enhance the operational efficiency of banks in Nigeria?
3. What are the challenges associated with the adoption of artificial intelligence in the banking operation?
4. To what extent does artificial intelligence prevent or reduces fraudulent activities in Nigerian commercial banking system?

1.5. Research Hypotheses

The following are the formulated hypotheses of the study stated in their null format

H_{o1} - Artificial intelligence does not significantly enhance the competitive advantages of commercial banks in Nigeria.

H_{o2} - Artificial Intelligence do not significantly affect the operational efficiency of financial institutions in Nigeria.

H_{o3} - There are no significant challenges associated with the adoption of Artificial intelligence in financial institutions in Nigeria.

H_{o4} - Artificial intelligence does not significantly enhance the prevention of fraudulent activities in Nigerian commercial banks.

1.6 Scope and significance of study

This paper covers Artificial Intelligence and operations of banks in Nigeria. It covers researchers related to AI and business sustainability, AI and operational efficiency, AI and Fraud detection in banks, AI and business competitive advantage. The study shall be significant to other scholars across the globe as it will serve as a verifiable source of added knowledge to the knowledge bank on Artificial Intelligence and the development of financial institutions. It will also serve as a very cognate reference material for research scholars interested on the subject.

1.0 Review of related literature
2.1. Conceptual framework
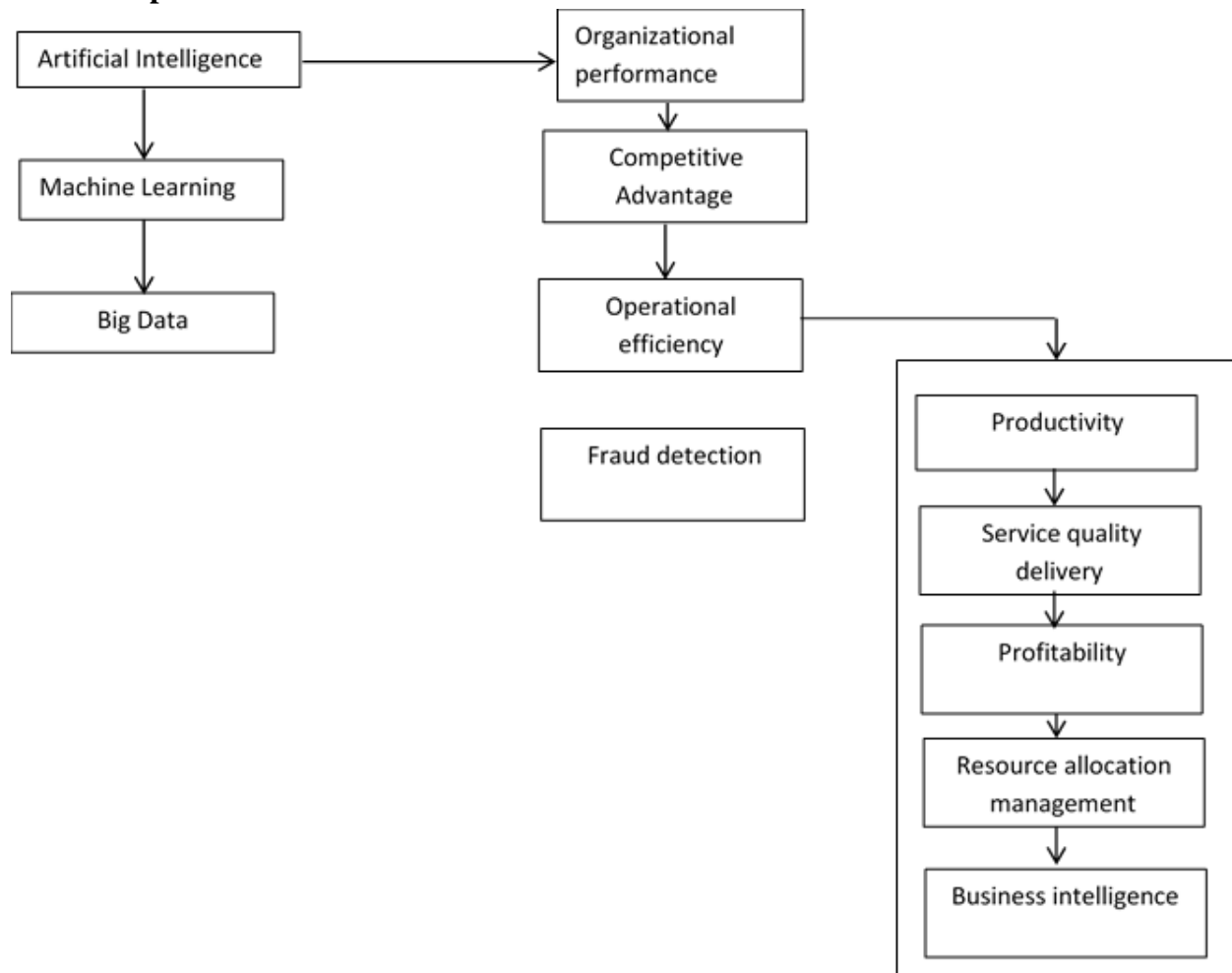
Conceptual framework developed by the researcher –Ogar, (2023).

2.1.1 Concept of Artificial Intelligence (AI)

Mohammed (2019) opined that AI sometimes called Machine Intelligence is intelligence demonstrated by machines in contrast to natural intelligence displayed by humans and other animals. Artificial intelligence addresses the crucial question of what knowledge is required in any aspect of thinking, how should that knowledge be presented, and how should that knowledge be used. Mohammed, (2019) further stated that Artificial Intelligence (AI) is a branch of computer sciences. It involves developing computer program to complete tasks which would otherwise require human intelligence. AI algorithms can tackle learning, perception, problem-solving, language-understanding and or logical reasoning. Caner and Bhatti (2020) identified AI trait to includes being capable of predicting and adopting, makes decisions on its own, conditions learning, forward looking and capable f of motion and perception.

Artificial Intelligence is the ability of a computer program to learn and think. Everything can be considered Artificial intelligence if it involves a program doing something that we would normally think would rely on the intelligence of a human.

2.1.3 Advantages of AI in financial industry

Write, (2020) stated that the general benefit of Artificial (AI) is the replicates decisions and actions of human without human short comings such as fatigue, emotion and limited time. Machines driven by AI technology are able to perform consistent repetition actions without getting tired. Yawalkar (2019) posited that Artificial Intelligence (AI) enhances stream living, saving time, eliminating biases, and automating repetitive tasks.

The advantages of Artificial intelligence applications are enormous and can revolutionize any professional sector. Let's see some of them

1) Reduction in Human Error: The phrase "**human error**" was born because humans make mistakes from time to time. Computers, however, do not make these mistakes if they are programmed properly. With Artificial intelligence, the decisions are taken from the previously gathered information applying a certain set of algorithms. So, errors are reduced and the chance of reaching accuracy with a greater degree of precision is a possibility.

2) Takes risks instead of Humans: This is one of the biggest advantages of Artificial intelligence. We can overcome many risky limitations of humans by developing an AI Robot which in turn can do the risky things for us. Let it be going to mars, defuse a bomb, explore the deepest parts of oceans, mining

for coal and oil, it can be used effectively in any kind of natural or man-made disasters.

3) Available 24x7: An Average human will work for 4–6 hours a day excluding the breaks. Humans are built in such a way to get some time out for refreshing themselves and get ready for a new day of work and they even have weekly offed to stay intact with their work-life and personal life. But using AI we can make machines work 24x7 without any breaks and they don't even get bored, unlike humans.

4) Helping in Repetitive Jobs: In our day-to-day work, we will be performing many repetitive works like sending a thanking mail, verifying certain documents for errors and many more things. Using artificial intelligence, we can productively automate these mundane tasks and can even remove "**boring**" tasks for humans and free them up to be increasingly creative. In banks, we often see many verifications of documents to get a loan which is a repetitive task for the owner of the bank. Using AI Cognitive Automation, the owner can speed up the process of verifying the documents by which both the customers and the owner will be benefited.

5) Digital Assistance: Some of the highly advanced organizations use digital assistants to interact with users which saves the need for human resources. The digital assistants also used in many websites to provide things that users want. We can chat with them about what we are looking for. Some chatbots are designed in such a way that it's become hard to determine that we're chatting with a chatbot or a human being. We all know that organizations have a customer support team that needs to clarify the doubts and queries of the customers. Using AI the organizations can set up a Voice bot or Chatbot which can help customers with all their queries. We can see many organizations already started using

them on their websites and mobile applications.

6) Faster Decisions: Using AI alongside other technologies we can make machines take decisions faster than a human and carry out actions quicker. While taking a decision human will analyze many factors both emotionally and practically but AI-powered machine works on what it is programmed and delivers the results in a faster way.

7) Daily Applications: Daily applications such as Apple's **Siri**, Window's **Cortana**, Google's **OK Google** are frequently used in our daily routine whether it is for searching a location, taking a selfie, making a phone call, replying to a mail and many more. Around 20 years ago, when we are planning to go somewhere we used to ask a person who already went there for the directions. But now all we have to do is say "**OK Google** where is Visakhapatnam". It will show you Visakhapatnam's location on google map and the best path between you and Visakhapatnam.

8) New Inventions: AI is powering many inventions in almost every domain which will help humans solve the majority of complex problems. Recently doctors can predict breast cancer in the woman at earlier stages using advanced AI-based technologies.

As every bright side has a darker version in it. Artificial Intelligence also has some disadvantages.

1) High Costs of Creation: As AI is updating every day the hardware and software need to get updated with time to meet the latest requirements. Machines need repairing and maintenance which need plenty of costs. It's creation requires huge costs as they are very complex machines.

2) Making Humans Lazy: AI is making humans lazy with its applications automating the majority of the work. Humans tend to get **addicted** to these inventions which can cause a problem to future generations.

3) Unemployment: As AI is replacing the majority of the repetitive tasks and other works with robots, human interference is becoming less which will cause a major problem in the employment standards. Every organization is looking to replace the minimum qualified individuals with AI robots which can do similar work with more efficiency.

4) No Emotions: There is no doubt that machines are much better when it comes to working efficiently but they cannot replace the human connection that makes the team. Machines cannot develop a bond with humans which is an essential attribute when comes to Team Management.

5) Lacking Out of Box Thinking:
Machines can perform only those tasks which they are designed or programmed to do, anything out of that they tend to crash or give irrelevant outputs which could be a major backdrop.

2.2. Theoretical framework
The study is anchored on **Diffusion of Innovation Theory** propounded by E. M Rogers in 1962. The theory was anchored on the assumption that over time, a product or an idea gain popular momentum and diffuse or spread through a social system. With the socio-economic preconditions and consequences of the introduction of Artificial Intelligence, and in line with the advancement in digital technology, which is today adopted in commercial banks globally, this theory has remained relevant and

considered suitable for this paper. This is because, the innovation of artificial intelligence (AI) has diffused from one region of the world to another thus impacting on service delivery even in the banking sector.

2.3. Empirical review

Budhwur, Malik, De Silva and Thevisuthan, (2022) in United Kingdom (UK) conducted a study titled: 'Artificial Intelligence-challenges and opportunities for international HRM; a review and research agenda. They employed a systematic literature review approach in collecting and evaluating researches related to the study. They reviewed a total of 607 papers on AI and HRM, with a final sample of 70 papers. They recommended robust conceptual and empirical research in keeping up with the dynamic changes of technology advancement and changing business environment.

Similarly, in India, Ghimire, Thapa, Jha, Adhikari and Kumar (2021) conducted a study titled; Accelerating Business Growth with Big Data and Artificial Intelligence. The paper x-rayed the importance of AI in the growth of businesses. Being a conceptual paper, a review of nine scholarly reviews was done in various areas of Business analytics. Their result revealed that AI plays a vital role in tackling problems in business world. However critically, the paper fell short of demonstrating empirically how AI has impacted on the world of business. There was no statistical model or measurement tool to prove their assertions. There was also no clear evidence of any plausible recommendation in the paper.

In Turkey, Setiawan, Carahere, Koti Ogumnola, Jalil Chakravarhi, Rajest, Regin and Singh (2021) in their paper titled, the Artificial Intelligence and inventory effect of

Banking Industrial performance, aimed at ensuring that banks productivity fluctuates when Banks artificial intelligence programme cannot integrate effectively and reliable. The survey combined both qualitative and quantitative methods in data collection and analysis statistically, regression analysis was applied and their finding revealed that AI programs in banks had a greater financial performance secondly it was revealed that there is a positive relationship between inventory management artificial intelligence and financial performance. The key pitfall of the study was that, there was a clear-cut recommendation in the study.

Caner and Bhatti, (2020) conducted a study titled; A Conceptual framework on Defining Business Strategy for Artificial Intelligence in Cyprus. The aim of their study was to develop a conceptual framework on defining AI business strategy through a systematic literature review (SLR) of research conducted between 2015 and 2019. The paper also covered major elements of AI in Business like, abilities and limitations of AI, economics and AI, business functions and AI, workforce and AI, industries and AI, and regulations and ethics of AI on defining AI business strategy. Being a theoretical paper, they studied 400 AI firms from 19 industries that uses AI in nine business function across China, their findings revealed that marketing and sales and supply chain management and manufacturing functions constitute the greatest potential value implementing AI. They recommended that a collaboration approach of technical and management skills is needed for the successful implementation of AI.

In Sweden, Reim, Astron and Eriksson, (2020) carried out a study titled; Implementation of Artificial Intelligence

(AI): A Road-map for Business Model innovation. The aim of the paper was to provide deeper understanding of AI and how it can be used as a catalyst for business model innovation. Being a conceptual review paper, the result of their finding suggested four steps when implementing AI: (1) understanding AI and organizational capabilities needed for digital transformation, (2) understanding current BM, potential for BMI and business ecosystem role, (3) develop and implement AI and (4) reach organizational acceptance and develop internal competences.

Yawalkar, (2019) in India conducted a similar study titled; A study of Artificial Intelligence and its Role in Human Resource Management. The core objective of the paper was to examine the role of AI in Human Resource department and understand the challenges in HR department. The paper was descriptive in nature; secondary data were used from published materials on AI. His finding revealed that AI is been used in HR department in the areas of recruitment, selecting, hiring, analyzing performance, collecting data regarding to employees, providing real time information, and providing accurate information. The pitfalls of the paper were that, the paper didn't demonstrate scholarship in application of any statistical measurement for AI, study had no plausible recommendations, no clear population and sample size of study and the study fell short of critical arguments.

Chukwudi, Echefu, Boniface and Victoria (2018) in a similar study in Nigeria titles, Effect of Artificial Intelligence on the performance of Accounting Operations among Accounting firms in South East Nigeria aimed at examining the effect of artificial intelligence on the performance of accounting operations among Accounting firms in south east Nigeria. They applied descriptive research design among 185 accountants and managers of accounting firms in Anambra, and Enugu. It was discovered that AI positively influence the performance of accounting functions. They recommended that accountants and accounting firms should continually improve their knowledge. Regarding AI as that will enhance accounting functions, banks in Calabar metropolis namely Zenith Bank, Access Bank, EcoBank, First Bank and United Bank for Africa (UBA). The sample size of the study is 191 staff arrived through the application of Taro Yarmane formula structured online close ended questionnaire were deployed to source for primary data used for the study analysis. Statistically, Regression analysis techniques was used to test the hypothesis of the study at 95% degree of accuracy.

3.0. Methodology

The paper adopted descriptive research survey design philosophy. The paper adopted a quantitative approach in data handling and interpretations through the adoption of deductive reasoning approach. The study population was made of 366 staff drawn from five commercial banks. The investment on state-of-the-art information and communication technology equipment and trained personnel were considered as enhancement tools for fraud detection and prevention. Financial intelligence operations in the area of AI was considered as a way to consolidate the system to curb fraudulent practices and encrypt cyber data to protect client from fraudsters.

4.0 Results

Table 1: Artificial intelligence has enhanced the growth, potentials of firms across the globe

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	103	76.9	76.9	76.9
	D	21	15.7	15.7	92.5
	A	10	7.5	7.5	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 2: Through AI companies can access the market functions for growth and development

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	18	13.4	13.4	13.4
	D	101	75.4	75.4	88.8
	A	15	11.2	11.2	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 3: AI enhances business validity in terms of operations such as production efficiency, inventory management Etc which enhances business growth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	22	16.4	16.4	16.4
	D	15	11.2	11.2	27.6
	A	97	72.4	72.4	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 3: AI enhances investment post folio analysis which enhances the chances of business growth and development in terms of investment options

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	103	76.9	76.9	76.9
	D	19	14.2	14.2	91.0
	A	12	9.0	9.0	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 5: AI improves the chances of competitive advantage of businesses across the globe

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	21	15.7	15.7	15.7
	D	99	73.9	73.9	89.6
	A	14	10.4	10.4	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 6: Through AI operations, firms are able to vary their operations which gives them added advantage over their business competitors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	22	16.4	16.4	16.4
	D	16	11.9	11.9	28.4
	A	96	71.6	71.6	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 7: Firms practicing AI technology are more innovative and creative which them strategic advantages

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	103	76.9	76.9	76.9

		Frequency	Percent	Valid Percent	Cumulative Percent
	D	19	14.2	14.2	91.0
	A	12	9.0	9.0	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 8: The adoption of AI operations in modern organizations has significantly imperialized on the operations of human resources in organizations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	18	13.4	13.4	13.4
	D	102	76.1	76.1	89.6
	A	14	10.4	10.4	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 9: AI is gradually replacing human resources in organizations as most of the jobs formally done by human being are today done by robots and computer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	21	15.7	15.7	15.7
	D	17	12.7	12.7	28.4
	A	96	71.6	71.6	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 10: AI significantly improve the proficiency of employees in organizations. This improve the performance of human resources in organizations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	104	77.6	77.6	77.6
	D	18	13.4	13.4	91.0
	A	12	9.0	9.0	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 11: Through AI business profitability ratio are improved through proper financial management operations.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	20	14.9	15.0	15.0
	D	99	73.9	74.4	89.5
	A	14	10.4	10.5	100.0
	Total	133	99.3	100.0	
Missing	System	1	.7		
Total		134	100.0		

Source: Ogar, 2023 with SPSS Version 25

Table 12: AI enhance proper financial coordination I firms which impact on business financial appropriation thus improving profitability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	21	15.7	15.7	15.7
	D	17	12.7	12.7	28.4
	A	96	71.6	71.6	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 13: The viable Options of AI application in the area of post folio analysis enhances business profitability chances.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	101	75.4	75.9	75.9
	D	19	14.2	14.3	90.2
	A	13	9.7	9.8	100.0
	Total	133	99.3	100.0	
Missing	System	1	.7		
Total		134	100.0		

Source: Ogar, 2023 with SPSS Version 25

Table 14: Firms which has properly integrated AI in their operations render more quality services to them clients other than competitors.

		Frequency	Percent	Valid Percent	Cumulative Percent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	23	17.2	17.2	17.2
	D	98	73.1	73.1	90.3
	A	13	9.7	9.7	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 15: AI helps to reach customers across the globe with short line thus improving the service delivery opportunities.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	20	14.9	14.9	14.9
	D	19	14.2	14.2	29.1
	A	95	70.9	70.9	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 16: AI operations enhances logistics management between clients and companies thus improving service delivery.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	102	76.1	76.1	76.1
	D	18	13.4	13.4	89.6
	A	14	10.4	10.4	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 17: The application of AI in business today has tremendously improve marketing of firm's products and services across the globe

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	22	16.4	16.4	16.4
	D	99	73.9	73.9	90.3
	A	13	9.7	9.7	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 18: Advertising expenditure and other promotion demand of firms adopting AI have been reduced and improved consequently.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	21	15.7	15.7	15.7
	D	19	14.2	14.2	29.9
	A	94	70.1	70.1	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

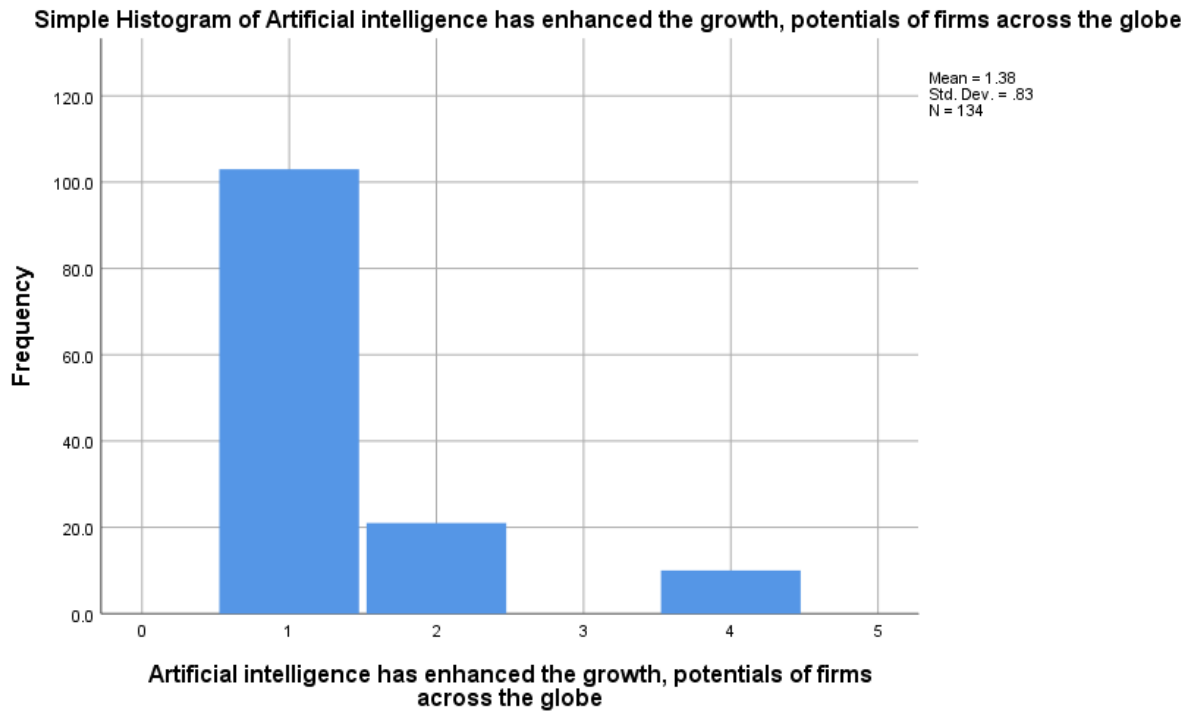Table 19: AI has enhances opportunities for new market development for firms practicing AI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	101	75.4	75.4	75.4
	D	19	14.2	14.2	89.6
	A	14	10.4	10.4	100.0
	Total	134	100.0	100.0	

Source: Ogar, 2023 with SPSS Version 25

Table 20: AI operation adopted by financial institution is enhancing the chances of fraud prevention and improvement of security.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	23	17.2	17.3	17.3
	D	96	71.6	72.2	89.5
	A	14	10.4	10.5	100.0
	Total	133	99.3	100.0	
Missing	System	1	.7		
Total		134	100.0		

Source: Ogar, 2023 with SPSS Version 25

Simple Histogram of Artificial intelligence has enhanced the growth, potentials of firms across the globe

Source: Ogar, 2023 with SPSS Version 25

4.1 Test of hypotheses

4.1.1 Research hypotheses

The following are the formulated hypotheses of the study stated in their null format

H_{o1} - Artificial intelligence does not significantly enhance the competitive advantages of commercial banks in Nigeria.

H_{o2}- Artificial Intelligence do not significantly affect the operational efficiency of financial institutions in Nigeria.

Ho3- There are no significant challenges associated with the adoption of Artificial intelligence in Financial institutions in Nigeria.

H_{o4}- Artificial intelligence does not significantly enhance the prevention of fraudulent activities in Nigerian commercial banks.

Hypothesis one

H_{o1} - Artificial intelligence does not significantly enhance the competitive advantages of commercial banks in Nigeria.

H_{o1} - Artificial intelligence significantly enhance the competitive advantages of commercial banks in Nigeria.

Variables entered/removed[a]

Model	Variables Entered	Variables Removed	Method
1	AI and Competitive Advantages	.	Enter

a. Dependent Variable: AI Financial institutional performance
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.484ᵃ	.234	.229	1.81719

a. Predictors: (Constant), AI and Competitive Advantages

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	133.454	1	133.454	40.414	.000ᵇ
	Residual	435.890	132	3.302		
	Total	569.343	133			

a. Dependent Variable: AI Financial institutional performance
b. Predictors: (Constant), AI and Competitive Advantages

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1	(Constant)	6.030	.894		6.743
	AI and Competitive Advantages	.515	.081	.484	6.357

a. Dependent Variable: AI Financial institutional performance

Hypothesis Two

H$_o$- Artificial Intelligence does not significantly affect the operational efficiency of financial institutions in Nigeria.

H$_1$- Artificial Intelligence significantly affect the operational efficiency of financial institutions in Nigeria.

AI and operations of banks

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AI enhances Operational Efficiency[b]	.	Enter

a. Dependent Variable: AI Financial institutional performance

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.074[a]	.005	-.002	2.07115

a. Predictors: (Constant), AI enhances Operational Efficiency

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.106	1	3.106	.724	.396[b]
	Residual	566.237	132	4.290		
	Total	569.343	133			

a. Dependent Variable: AI Financial institutional performance

b. Predictors: (Constant), AI enhances Operational Efficiency

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1	(Constant)	12.504	1.047		11.948
	AI enhances Operational Efficiency	-.087	.103	-.074	-.851

a. Dependent Variable: AI Financial institutional performance

Hypothesis three

Ho- There are no significant challenges associated with the adoption of Artificial intelligence in Financial institutions in Nigeria.

H_1- There are significant challenges associated with the adoption of Artificial intelligence in Financial institutions in Nigeria

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AI Challenges	.	Enter

a. Dependent Variable: AI Financial institutional performance

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.272[a]	.074	.067	1.96750

a. Predictors: (Constant), AI Challenges

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.665	1	40.665	10.505	.002[b]
	Residual	507.110	131	3.871		
	Total	547.774	132			

a. Dependent Variable: AI Financial institutional preformance

b. Predictors: (Constant), AI Challenges

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		

1	(Constant)	14.076	.764		18.417	.000
	AI Challenges	-.227	.070	-.272	-3.241	.002

a. Dependent Variable: AI Financial institutional performance

Hypothesis Four

H$_o$- Artificial intelligence does not significantly enhance the prevention of fraudulent activities in Nigerian commercial banks.

H$_1$- Artificial intelligence significantly enhances the prevention of fraudulent activities in Nigerian commercial banks.

AI and fraud detection

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	AI enhances the chances of Fraud Detection^b	.	Enter

a. Dependent Variable: AI Financial institutional performance

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.736^a	.541	.537	1.39014

a. Predictors: (Constant), AI enhances the chances of Fraud Detection

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	296.110	1	296.110	153.227	.000^b
	Residual	251.224	130	1.932		
	Total	547.333	131			

a. Dependent Variable: AI Financial institutional performance

b. Predictors: (Constant), AI enhances the chances of Fraud Detection

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1	(Constant)	6.451	.438		14.713
	AI enhances the chances of Fraud Detection	.938	.076	.736	12.378

a. Dependent Variable: AI Financial institutional performance

5.0 Discussions

The summary of the statistical interpolation of the research work showed that artificial intelligence has enhanced the growth potentials of firms across the globe as demonstrated in table 1, in table 2, through AI, companies can now access market functions for growth and development, through AI, business validity in terms of operations such as productivity, production efficiency, inventory management, etc. has been enhanced, as depicted in table 3. Between table 4, 5, 6 and 7 AI operations has significantly improved the competitive advantages of firms in the financial system. From table 8-10, it was evident that AI application in institutions has enhanced the viability of Human Resource in organization. Table 11-13 demonstrated that firms in recent times that adopt AI operations significantly managed their financial operations more efficiently, which has enhanced their profitability. Form table 14 to 20, it was clearly depicted that AI significantly improved competitive advantage of firms, enhanced their chances of new market development and improved their cyber security which helped them in fraud detection and management.

6.0 Conclusion

The development of technology and the adoption of Artificial Intelligence in business operations has significantly impacted on the operations of multinational institutions. Therefore, the need for the integration of AI in corporate business organizations should be holistically considered.

7.0. Recommendations

Below are the recommendations of the researcher:

1. With the current global awareness of clients, the adoption of AI is essential for financial institutions, to stay competitive.

2. To ameliorate the challenges associated with the adoption of AI, Financial institutions should invest more on state-of-the-art information and communication technology equipment and train personnel to man the equipment.

3. For smoother operations in the banking floor, banks in Nigeria should begin the integration of robotics in banking activities as it is in other western countries where robots now render hands free services to clients in real time.

4. Finally, for fraud detection and prevention financial intelligence operations in the area of AI should be consolidated to curb fraudulent practices and encrypt cyber data to protect client from fraudsters.

8.0 Suggestions for further studies

The researcher hereby advances that other researchers in the field of business research should investigate other aspect of AI applications in the world of business and finance such as AI and business modulation, AI and Business Automation, AI and risk management AI and cultural diversity management, etc.

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