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ARTIFICIAL INTELLIGENCE AND FRAUD DETECTION OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

The study examined the impact of artificial intelligence on fraud detection of listed deposit money banks in Nigeria. Fraud detection was used as dependent variable while deep learning machine and machine learning solution were used as proxies to the independent variable of artificial intelligence. The period for the study is 2025. The study employed correlational research design through a survey where data were collected via a self-administered questionnaire from listed deposit money banks in Kaduna state. Out of the 14 Listed Deposit money Banks in Nigeria, 10 banks were selected based on simple random sampling technique. Regression analysis was used to analyse the data collected. The regression indicate that deep learning machine is positively and significantly impacting fraud detection among deposit money bank. Similarly, it was observed that machine learning solution has no relationship with fraud detection. The study recommends that huge investment in acquisition of deep learning machine should be ensured in order to boost fraud detection and protection in credit issuing and assessment in order to improve corporate performance of banks.

Keywords: artificial intelligence, fraud detention, deep learning machine, machine learning solution, listed deposit money bank

1. Introduction

The financial system serves as a fundamental pillar of any economy, playing a crucial role in facilitating financial intermediation. This intermediation ensures that funds flow efficiently from savers to borrowers, thereby fostering optimal resource allocation that contributes to economic growth and advancement. Within this system, the banking sector is particularly vital due to its substantial impact on the trajectory and scale of economic development. Kajola, et al. (2019) highlight that banks are pivotal in promoting economic growth by serving as intermediaries that direct funds from surplus units to those in need, thus financing viable and productive ventures.

Despite the significant regulatory controls in Nigeria's banking sector, instances of fraud have alarmingly risen, becoming one of the most critical challenges facing this banking industry. Oseni (2006) noted that the relentless presence of fraud within the

banking sector has reached a level that threatens to undermine the trust and confidence of essential stakeholders. The escalating rates of fraud could jeopardize the survival of financial institutions and the overall effectiveness of the banking industry. Historical corporate scandals, such as those involving Enron, WorldCom, Global Crossing, and Tyco, exemplify the devastating consequences of fraud, leading to the loss of billions in shareholder value and a decline in both investor and public trust in financial markets (Peterson & Buckhoff, 2004; Rezaee et al., 2004; Brody & Pacini, 2006).

Fraud is defined as the exploitation of one's professional position for personal gain, through the deliberate misuse or misappropriation of an organization's resources (ACFE, 2002). Furthermore, Kasum (2007) indicates that the prevalence of fraud in Nigeria's banking sector is so pervasive that employees at all levels are often implicated, regardless of their position. The negative repercussions of fraud on the nation demand immediate action, as recent years have seen a significant escalation in fraudulent activities that also impact the banking sector (Enofe et al., 2017). Such fraudulent actions have detrimental effects on both developing economies and individual investors.

Essentially, fraud involves secretly diminishing an asset's value for personal gain. Nipion (2015) notes that fraud manifests in various forms and can result in serious consequences, such as bankruptcy, inflation, increased crime, lower per capita income, and unemployment, ultimately undermining a nation's economic framework.

To counteract fraud, organizations implement detection mechanisms aimed at offering alerts or proof of fraudulent activities. Effective internal controls stand as one of the most robust deterrents against dishonest behavior and misconduct. Employing both preventative and detective internal controls can significantly enhance the efficacy of any fraud risk management initiative (Josiah, Samson & Akpeti, 2012). It is essential for fraud detection techniques to remain flexible and adaptable, evolving in response to shifts in the risk landscape.

The advent of artificial intelligence technologies has introduced groundbreaking opportunities for improving the operations of investigative firms and financial institutions, which harness these innovations to bolster processes and operational efficiency. Artificial intelligence technologies, including machine learning and deep learning, are increasingly utilized to monitor, identify, and address financial misconduct. In this study, artificial intelligence is positioned as a key variable in assessing its role in detecting financial fraud within Nigeria's listed deposit banks.

Accenture (2018) characterizes artificial intelligence as a computational system capable of perceiving, understanding, acting, and learning from its environment. This includes systems that analyze received information and take actions informed by that analysis, continuously improving through learning experiences. The application of machine learning algorithms has become a vital tool in detecting irregularities. Deep learning and machine learning technologies are employed for tasks such as credit risk evaluation and assessing cybersecurity risks. This study investigates whether artificial intelligence has effectively enhanced fraud detection practices among Nigeria's listed deposit banks. It appears that professionalism and ethical standards within the banking sector have been significantly compromised.

Over time, banks have suffered substantial losses in asset quality and integrity, primarily due to the actions of fraudsters, many of whom are bank employees (The Association of Certified Fraud Examiners, 2014). The Nigerian Deposit Insurance

Corporation (2014) reports that the rise in anticipated and actual losses from fraud stems largely from a surge in online banking, Automated Teller Machine scams, and fraudulent funds transfers, alongside insider fraud. A major fraud event can disrupt an organization's financial health and severely tarnish its reputation, posing grave risks to stakeholders and investors.

According to a report by Financial Institution Training Centre (2023, a staggering 276.98% increase in fraud case amounts within financial institutions during Q2 2023, compared to Q1, rising from N2.58 billion to N9.75 billion. Although reports of fraud involving outsiders decreased by 6.40% from the previous quarter, staff-related fraud saw a rise of 22.22%, climbing from 72 cases to 88. Additionally, fraud related to bank branches skyrocketed by 1834.88%, increasing from N361.2 million to N6.99 billion. According to Oluwakemi Abimbola (2023), customers expressed 117% more complaints regarding the management of their financial transactions, with grievances increasing from 3,156,704 to 6,865,217 across financial sector.

Studies on artificial intelligence and fraud detection in the banking sector in developed as well as developing countries, focused on reducing operational costs, combating fast-paced market competition, expanding reach of the unbanked, increasing speed in handling complex business. It highlights the overwhelming importance and essential role of artificial intelligence in improving accuracy, convenience, transactions, fraud detection and credit risk assessment. For example, Eneh et al. (2023), Choi and Lee (2018), Mytnyk et al. (2023), Dayyabu et al., (2023), Poudel and Dhungana (2022), Ikhsan et al. (2022), Oboh (2023), Richman (2019), Shittu (2020), and Yujie (2023) did not establish a clear, direct and quantitative link between artificial intelligence and fraud detection using the combination of variables used in this study as to the best of the researcher's knowledge. Therefore, is need for an empirical study in Nigeria that considers the combination of the variables of deep learning machine and machine learning solution in order to address variable inclusion gap.

Also, machine learning theory is used to underpin the link among the variable of this research in order to address theoretical gap in this study. From the review of relevant literature on artificial Intelligence most studies were focused on conceptual frameworks and exploratory literature reviews, exploratory Survey, and conceptual frameworks, and are mostly expressed in qualitative form. For example, Alarfaj et al. (2022), Lakshmi and Kavilla (2018), Minastireanu and Mesnita (2019) utilized the quantitative form of research, based on that descriptive, correlation, and regression analysis alongside robust tests like normality test are carried out. Furthermore, the review of literatures such as Lakshmi and Kavilla (2018), Reddi et al. (2023) and Yujie (2023) indicate that most research was for other countries other than in Nigeria and their findings may not be applicable in Nigeria due to differences in code of governance practice and differences in technology software used for example.

This study will add to the body of knowledge and will also fill the existing gaps by examining the impact of artificial intelligence on fraud detection of listed deposit money banks in Nigeria. The research questions of the study include:

i. To what extend does deep learning machine significantly affect fraud detection of listed deposit money banks in Nigeria.
ii. To what extent does machine learning solution significantly affect fraud detection of listed deposit money banks in Nigeria.

Nevertheless, while the main objective is to examine the impact of artificial intelligence on fraud detection, specific objectives of this study are to:

i. Investigate the effect of deep learning machine on fraud detection of listed deposit money banks in Nigeria.
ii. Investigate the effect of machine learning solution on fraud detection of listed deposit money banks in Nigeria.

Furthermore, the study formulated hypotheses which are stated in a null form:

H_{01}: Deep learning machine has no effect on fraud detection of listed deposit money banks in Nigeria.

H_{02}: Machine learning solution has no effect on fraud detection of listed deposit money banks in Nigeria.

2. Literature Review

Conceptualisation

Fraud detection

According to Bank Administration Institute (1989), employees, customers, in conjunction with others within and outside the Bank can commit fraud. Frauds are not new in banks; they are as old as the industry itself. Fraud has been classified in various ways and using various parameters. Also, Idolor (2010), defines fraud as a conscious and deliberate action by a person or group of persons with the intention of altering the truth or fact for selfish personal gains, and it has now become the most single veritable threat to the growth of banking industry.

According to Kanade (2021) *f*raud detection is defined as a process that detects scams and prevents fraudsters from obtaining money or property through false means. Fraud is a serious business risk that needs to be identified and mitigated in time. Fraud detection involves identifying fraud as quickly as possible once it has been perpetrated. Fraud detection methods are continuously developed to defend criminals inadapting to their strategies. In general, the objectives of fraud detection

Deep Learning Machine

Deep learning is used as one of the proxies in this study**.** Deep learning machine is a branch of machine learning that make use of machine learning functionality, and moves beyond its capabilities. Deep learning algorithm is interpreted as a layered structure that replicate the structure of the human brain Dietmar (2023). According to Quinio et al. (2017), deep learning is based on creating deep neural networks with several hidden layers, where the layer closest to the data vectors, learns simple features, while the higher layers learn higher level features.

Machine Learning solution

Machine learning solution (MLS) is used as one of the proxies in this study. Machine learning solution empowers the machine to "learn" without explicit programming. This learning process is accomplished by machine itself through collecting data, analyzing data, and making predictions (Wang et al, 2019). According to Afiouni (2019), machine learning is a subset of AI that is capable of learning from data and making predictions and /or decisions without human dictated rules.

Jibril (2020) posited that term cyber security has many different definitions but could be summarized as the field of computer systems and data protection, both in

hardware and software, as well as protection from misleading guidance that is provided by digital and physical services. Simply put, cyber security is the application of technologies, processes, and controls to protect systems, networks, programs, devices and data from cyber-attacks. Amitha et al. (2021) suggested that deep learning machine is a class of machine learning which performs much better on unstructured data.

Empirical Review

Machine Learning Solution and Fraud Detection

Yujie (2023) examined credit card fraud detection by using machine learning and deep learning. The study explored different deep learning and machine learning models. Logistics regression was used to analyze the dataset. Secondary data was used for the dataset for fraud detection containing credit card transactions made by European cardholders in 2013.The finding revealed that credit card is significant problem that affects both financial institutions and individuals worldwide. Deep learning machine and machine learning solution has shown also to detect and prevent credit card fraud. Deep learning machine and machine learning solution models which are borderline smote, decision trees, random forest and neural networks also helps to detect credit card fraud.

The study of Komakula and Jagadeeshwa (2023) examined an exploration of deep learning algorithm for fraud detection using spark platform. The study compares the performance of deep learning approaches for credit card detection with other machine learning algorithms. Secondary sources of data were utilized. The dataset used were European card data, small card data and tall card data. All 3 data sets in the study were labeled with a class of value of 0 indicating no fraud and a class of value of 1 indicating fraud. The findings revealed that deep learning algorithm has influence on the fraud detection.

Akindutire et al. (2023) examined the impact of Bank verification number on fraud prevention and detection in Nigeria. Descriptive and regression analyses were conducted using data from respondents in the Nigerian Banking sector. The result of analysis indicated that bank verification number does not significantly affect the detection and prevention of fraudulent practices in Nigerian banking system. The study concluded that bank-related factors such as average customer size, total deposit and staff strength had significant impact on the effectiveness of BVN in preventing fraud in Nigerian banking.

Dayyabu et al. (2023) the application of artificial intelligence techniques in credit card fraud detection in Malaysia: A quantitative study. The independent variable used in the study was artificial intelligence techniques and the dependent variable was credit card fraud detection. Primary data was used in this study, the data acquired from 100 respondents across the accounting and finance industry using SPSS. Regression analysis, pearson correlation coefficient and reliability analysis was conducted. The finding revealed that artificial intelligent techniques machine learning, data mining and fuzzy logic have a significant positive relationship with credit card fraud detection. The study concluded that artificial intelligence provides experts with better accuracy and efficiency in detecting fraudulent transactions.

Poudel and Dhungana (2022) examined artificial intelligence for energy fraud detection in Nepal. The period of the study covered was from 2009-2011, secondary data was use in this study, the time series energy usage data were collected from various energy sector. The data consists of 5000 residential household and 600 business consumers. The

data was retrieved from Irish social science data archive centre. The analysis was carried using regression analysis, comparative analysis as well as performance metric. The findings of the study revealed that artificial intelligence which is machine learning and deep learning machine has significant influence on the fraud detection energy firms.

Choi and Lee (2018) examined an artificial intelligence approach to financial fraud detection under IoT environment in Korea. The independent variable used was artificial intelligence approach using deep learning and machine as the determinant of AI, while dependent variable was fraud detection. Experimental research design was used, based on real financial data in Korea. The financial fraud method using machine learning and deep learning methodology from 2016-2018.The finding shows that machine learning has the higher fraud detection rate as compare to deep learning machine.

Richman (2019) examines the impact of artificial intelligence on financial sector in Nigeria. The study adopted the qualitative approach. The findings shows that artificial intelligence has revolutionized, and this will unlock significant opportunities that would transform retail lending, product design, and the overall banking model to the mass market. Also, the findings revealed that developments in machine learning are opening the way for advanced applications. Data on which the amount of data is set to grow even faster in Financial Industry, since Artificial Intelligence is fed by data.

Deep Learning Machine and Fraud Detection

Buyuktepe et al. (2023) examined food fraud detection using explainable artificial intelligence. Food fraud detection was the independent variable and dependent variable was explainable artificial intelligence (XAI). This study covers numerous use cases of food fraud risk prediction using explainable artificial intelligence techniques, such as LIME, SHAP and WIT. Secondary data was used in this study. The dataset was retrieved from the Rapid Alert System for Food (RASSF) and Feed system and economically motivated adulteration database (EMA). The game theory was use to underpin the study. The study scope was from 2005-2015.The finding shows that explainable AI tools can provide information to interpret the model and result of deep learning and also data source EMA and RASSF has greatest impact on the model's prediction. The adoption of artificial intelligence helps to reduce food supply chain fraud.

Manyo et al. (2023) examined the effect of fraud on commercial banks' performance in Nigeria. The study utilizes secondary sources of data extracted from the Nigerian Deposit Insurance Corporation (NDIC) Annual Report and CBN Statistical Bulletin from 1994 to 2020. Statistical methods such as descriptive analysis, Pearson correlation and OLS regression techniques were employed in the evaluation of the data. The result of the hypotheses revealed number of fraud cases as deep learning had a positive and significant impact on bank performance while the total number of staff involved in fraud was found to be negative and significant on deposit money banks performance in Nigeria.

Mytnyk et al. (2023) examined application of Artificial Intelligence for Fraudulent Banking Operations Recognition in Ukarine. This study focuses on machine learning algorithms as a tool well suited for analyzing and recognizing online banking transactions. The study also details various methods for improving detection accuracy, i.e., handling highly imbalanced datasets, feature transformation, and feature engineering. Secondary data and experimental research design were used in this study as well regression analysis.

The finding shows that deep learning increases the accuracy of detecting fraudulent transactions.

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Akpanobong and Essien (2022) explored the integration of artificial intelligence (AI) in optimizing financial services and driving innovation among commercial banks in Nigeria. The study focused on two key variables: AI applications for fraud detection and enhancing personalized banking experiences. A sample of 143 participants, drawn from a total population of 174, included accounting lecturers from public universities in Akwa Ibom State as well as bank managers, operational staff, and key personnel from commercial banks in Uyo, Akwa Ibom State. Using a descriptive survey research design, the study relied on a researcher-developed questionnaire named the "Artificial Intelligence Adoptions for Financial Process Innovation Questionnaire" (AIAFPIQ). Data were analyzed using statistical methods such as mean, standard deviation, and t-test analysis. The findings highlighted that deep learning technologies could effectively support fraud detection and create personalized banking experiences. Additionally, responses from experts (bankers and accounting lecturers) indicated no significant differences in their views on the adoption of AI for these purposes in promoting financial process innovations. The study recommended that banks adopt AI systematically, not merely as a competitive tool but as part of a comprehensive business strategy.

Theoretical Framework

Machine Learning Theory

In 1959, Arthur Samuel pioneered the study of artificial brain power. He described machine learning as "the study that gives computers the ability to learn without being explicitly programmed." This theory holds that a machine has to be intelligent and responsive in a manner that cannot be differentiated from that of a human being. He argued that machine learns from the past experiences (input data) and makes future predictions. In order to perform the task, the system learns from the data-set provided.

According to Avrim (2014), Machine Learning Theory also has a number of fundamental connections to other disciplines. This is dependent on the specific needs to which machine learning model can be put in order to optimize performance especially in fields that requires data to be interpreted and acted upon. The machine learning theory suits the deep learning and machine learning solution, banks can use machine learning model to analyze real time data on the basis of the most recent transactions, current market conditions, and relevant current events.

To access to semi-structured sources such as mobile phone usage, text message activities, social media usage and activity to enhance the rating precision of loans.it can help banking institutions withstand cyber-attacks, prevent data leaks, and ensure maximum security of their operations. Thereby enabling institutions to mitigate regulatory sanction and improve profitability. This theory will underpin or explain the deep learning and machine learning solutions.

3. Methodology

The study employed a survey research design with the objective of gathering relevant and firsthand information essential for a thorough investigation and analysis. To achieve this, a survey method was utilized for data collection, specifically through a self-administered questionnaire. Data was obtained from deposit money banks in Kaduna State to facilitate quick responses, minimize delays, and ensure the acquisition of firsthand information pertaining to the research.

Conducted in Nigeria, the study focuses on quoted deposit money banks listed on the Nigerian Exchange Group between 2012 and 2023. The selection of this sector is based on the critical role that deposit money banks play as intermediaries between depositors and borrowers in Nigeria. The population of the study comprises 14 listed deposit money banks that were registered on the Nigerian Exchange Group as of December 31, 2023.

To refine the study's focus, a purposive sampling technique was applied to select 10 of the quoted banks from the total population as the sample size. The data collected was then analyzed using various statistical methods, including descriptive statistics, correlation matrix analysis, and regression analysis, to derive meaningful insights and conclusions from the findings.

Reliability

Reliability occurs when a set targeted item is set and met more than once there after giving the same result or outcome (Salkind, 2012). Therefore, in testing reliability there are diverse approaches of testing reliability, though, the most popular approach used by many researchers is Cronbach‘s alpha coefficient for testing the inter item reliability and consistency (Sekaran & Bougie, 2010). The approach shows the level of consistency with a particular construct. The approach considered 0.50 as the average reliability coefficient while a coefficient of 0.70 or more than shows that the instrument achieved a high reliability standard (Hair et al., 2010; Nunnally, 1978; Sekaran & Bougie, 2010). The result of the reliability test is presented below from the Statistical Package for the Social Sciences (SPSS) software. The Cronbach's alpha for the variables of the study ranged between 0.50 and 0.85. Therefore, all the variables had reliability within the required threshold.

Pilot study Cronbach's alpha

Table 1

Items Reliability Test Result (Cronbach's alpha)

Variable	Number of Items	Cronbach's
Alpha		
Fraud detection	8	0.79
Deep learning machine	6	0.66
Machine Learning solution	4	0.59

Source: Field Survey (2024)

4. Results and Discussion

Response Rate

The survey was conducted in 2024. The data were collected from deposit money banks in Kaduna State, Nigeria. To allow for clarification and avoid unnecessary delay, the researcher administered the questionnaires personally. To further increase the response rate, personal visits, phone calls and SMS were used as a means of reminding the respondents. Given the above efforts, 150 questionnaires were returned from the 165 questionnaires that were personally administered to the respondents. Thus, this yielded a response rate of 91%. Hence, 146 questionnaires were used for further analysis, which gave a valid response rate of 91%.

Table 2

Response Profile

Response Rate	
Questionnaires administered	170
Questionnaires not returned	(20)
Questionnaires returned and Usable questionnaires	150
Response rate (150/170)	92%
Valid response rate (150/170)	92%

Source: Field Survey (2024)

Missing Value Test

Missing data value occurs when a respondent either intentionally or unintentionally fail to provide answer for one or more questions. The challenge of missing data value cannot be completely rule out (Hair et al 2010). Threshold of 5% was set to guide the decision of the test. Thus, the study performed missing value test to identify and correct missing data, using the respective average value. The result of the missing value test of the study is shown below.

Table 3

Missing Value Analysis

Univariate Statistics			
Items	**No**	**Count**	**Missing Percent**
Fraud detection	146	26	.03
Deep learning machine	146	7	.01
Machine Learning solution	146	4	.004

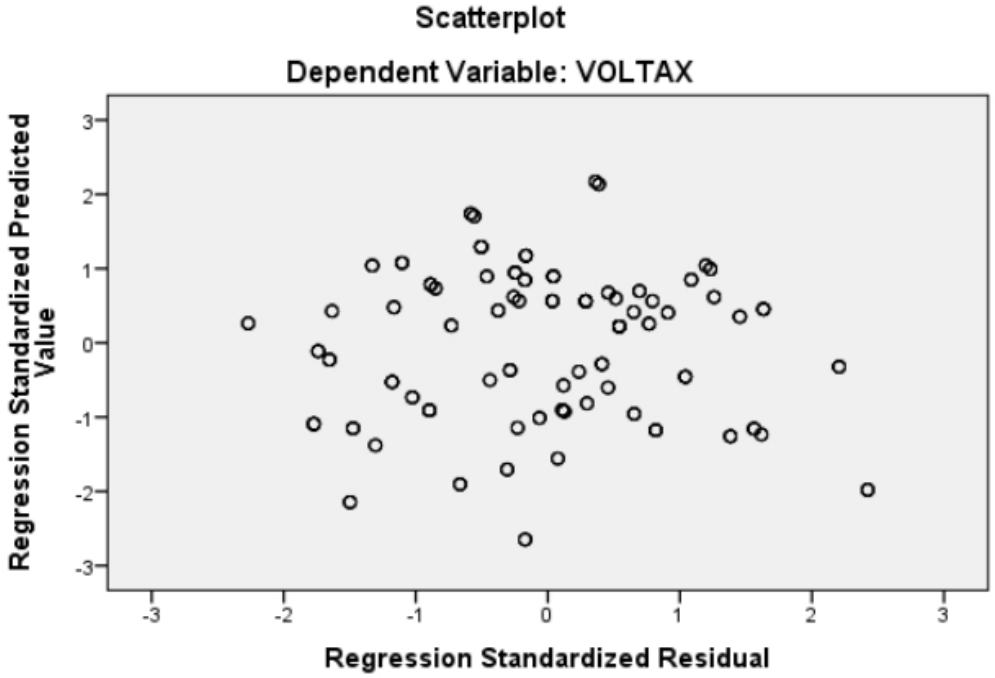
Source: Field Survey (2024)

The above table 4.1 shows the result of missing value analysis. Out of the 9,198 points only 37points were found to be missing which represents 0.95%. Hence, the results of the missing value analysis clearly show that the percentage of the missing points fall below the threshold of 5%. The case of missing data was treated using the mean (average value) to replace the missing data as a rule of thumb.

Outliers Test

Outlier is a response that is excessively different from the other responses. The existence of outlier can distort statistical result and make generalization impossible. The cases were treated in this study using D2. It was calculated using mean linear regression method in SPSS based on the identified 2 items of this study. Hence, 2 items from the study represent the degree of freedom in the Chi-square table with $p < 0.001$, so the threshold is 70, which means that any case with a D2 value of 70 and above should be removed. Though, four cases were found to be outliers who were remove before the analysis as they represent multivariate outliers.

Figure 1: Scatter Plot



Normality Test

The testing of normality is better done with a graphical method so as to ascertain the normality of the data collected as deposited by Field (2009), it is better checked using graphical method instead of skewness and kurtosis of any data. Therefore, this study will not be an exception it employs graph to checked the normality since is one of the fundamental assumptions of regression analysis. The result of the normality test of the study is shown below. Hence, the data of this study meet the assumptions of normality.

Figure 2: Histogram

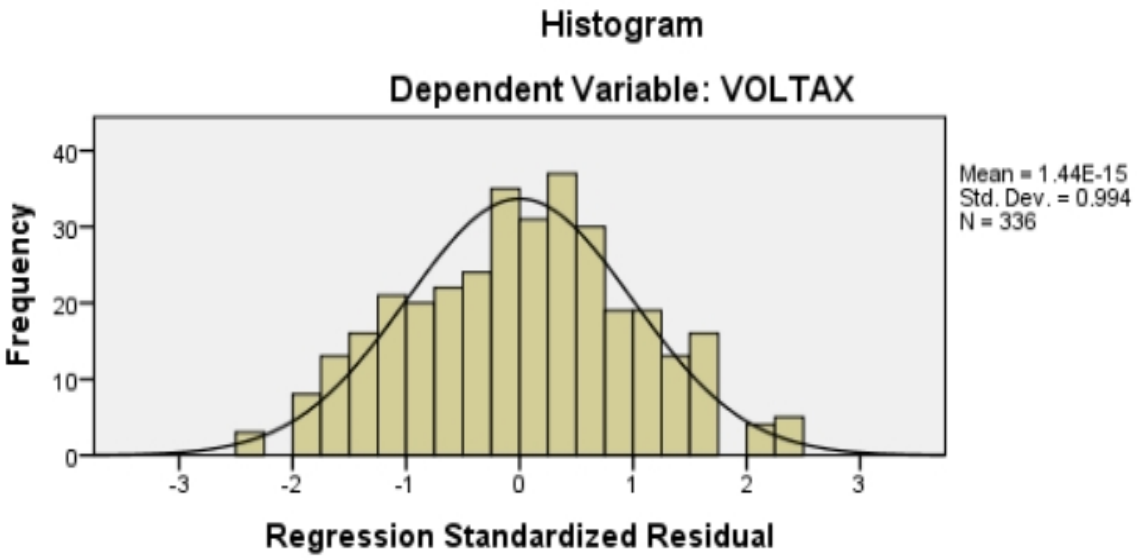


Table 4

Demographic Information of the Respondents

Category	Frequency (N = 170)	Percentage(Total = 100)
Gender		
Male	87	62.1
Female	59	37.9
No response	20	0.0
Qualification		
Doctoral degree	2	1.37
Master degree	37	25.3
Bachelor degree or equivalent	101	69.2
Diploma or A - level or equivalent	6	4.1
GCE or O - level or equivalent	0	0.0
No response	20	0.0
Deposits money banks		
1 - 5 years	0	0.0
6 - 10 years	0	0.0
11 - 15 years	0	0.0
16 Above years	137	93.8
No response	20	6.2
Industry		
Stanbic IBTC Bank	16	11.0
Sterling Bank	13	8.9
Guarantee Trust Bank	21	14.4
Fidelity Bank	14	9.6
Zenith Bank	15	10.3
First Bank	19	13.0
Access Bank	17	11.6
UBA Bank	15	10.3
Wema Bank	6	4.1
FCMB Bank	11	7.5
Others	0	0.0
No response	20	0.0
Position		
Chief Executive Officer	0	0.0
Managing Director	3	2.1
Manager/Accountant	127	87.0
Others	10	6.8
No Response	20	4.1

Source: Field Survey (2024)

The table 4 depict that, about 62.1% of the respondents were male and 37.9% as female. This is a fair representation of both genders. In terms of the educational qualification of the respondents, majority of the respondents are bachelor 's degree or its equivalent with 69.2%, 25.3% with master's degree, followed by 4.1% for diploma holders, 1.37% and finally 0.0% from GCE holder's respondents' responses, it's clear that they have acquired reasonable level of education that would help provide useful and relevant information to success of the study.

From the demographic data above, it shows that 93.8% of Banks have been in existence for 16 and years, while 6.2% Banks owners did not indicate their years of existence.

Also, result shows that Stanbic Bank accounted for 11.0%. Sterling Bank accounted for 8.9%, GTB accounted 14.4%, while Fidelity Bank 9.6%, Zenith Bank 10.3%, First Bank 13.0%, Access Bank 11.6%, UBA Bank account for 10.3%, while Wema Bank account for 4.1% and finally from the banks FCMB accounted for 7.5%.

The positions of the responding officers were not left out it was also considered in Table 4 that the questionnaires were administered to the manager/accountant and managing directors. Where does with the higher percentage were the manager/accountant with about 87.0%, others account for 6.8% while managing directors account for 2.1%, and finally about 4.1% did not disclosed their position.

Data Analysis

Table 5

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
FRDICT	146	2.13	4.75	3.7495	.58120	-.669	.201	-.316	.399
DLMR	146	2.00	5.00	3.7225	.70523	-.772	.201	.114	.399
MLS	146	2.00	5.00	3.5931	.69663	-.421	.201	-.377	.399
Valid N (listwise)									

Source; field survey (2024)

Note a mean above 3.0 indicate accepted, mean below 3 indicate unaccepted and finally mean = 3.0 is undecided. The descriptive statistics is where minimum, maximum, mean, and standard deviation of the data for the variables used in the study are presented below. Table 5 above Indicates that fraud dictation has a mean value of 3.75 with a standard deviation of 0.58, and a minimum and maximum value of 2.13 and 4.75 respectively. This shows that statements measuring fraud dictation have a mean value of 3.75, which is within the threshold according to Pearson (1920). This implies from the response of the respondents above that, chances of dictation fraud using artificial intelligence is high when properly use among deposit money banks in Nigeria; this is because the mean value is above 3.00 which is the bench mark set for the study.

Table 5 shows that deep machine learning has a mean value of 3.74 with a standard deviation of 0.58, and a minimum and maximum value of 2.13 and 4.75 respectively. This

implies from the response of the respondents above that, deep learning machine is highly effective in detecting fraud among deposit money banks in Nigeria; this is because the mean value is above 3.00 which is the bench mark set for the study.

Table 5 also reveals that machine learning solution has a mean value of 3.72, with a standard deviation of 0.70, and the minimum and maximum value of 2.00 and 5.00 respectively. This suggested that machine learning solution is highly effective in detecting fraud among deposit money banks in Nigeria; this is because the mean value is above 3.00 which is the bench mark set for the study.

Correlation

Table 6

Correlation Analysis

	FRDICT	**DLMR**	**MLS**
FRDICT	1		
DLMR	427**	1	
MLS	.393**	.431**	1

Source; field survey (2024)

The correlation matrix in Table4.2 above, which depicts the relationship between the independent variables (deep learning machine & machine language solution), and the dependent variable (fraud detection), and the relationship between the independent variables themselves. The study further adopt a threshold according to Pearson (1920) where a range from 0.1 to 0.3 will be treated as a weak relationship while 0.3 to 0.5 is average and 0.5 to 1 is treated as a strong relationship. The result depicts above considers the relationship between fraud detection as dependent variable and all the independent variables used in the study, also test the individually relationship between the variables and jointly the relationship between the independent variable and the dependent variables of the study among deposit money banks in Nigeria.

From the above result it shows a positive relationship that exist between fraud detection (FD) and Deep learning machine (DLM) has a positive moderate relationship with fraud detection (FD) as derive by the correlation coefficient of 0.43. Likewise, there is an average positive and relationship between fraud detection (FD) and machine learning solution with a coefficient of 0.39 Machine learning solution (MLS) with Deep learning machine (DLM) with a correlation coefficient of 0.43 which all shows an average relationship.

Regression Analysis

Table 7

Regression Result

R=0.571 N=146

R^2=0.326 **F Statistics 17.055** **P value = .000**

Adjusted R Square =0.307 **STD Errow of the estimate = 0.48385**

	B	Errow	Beta	T-values	P-values
(Constant)	1.588	0.287		5.429	0.000
DLMR	0.175	0.067	0.212	2.630	0.009
MLS	0.144	0.079	0.172	1.829	0.069

Source; field survey (2024)

The R^2 value which stands as one of the major coefficients of determination, in structural model evaluation used in this study (Hair et al., 2014; Henseler et al., 2009). Which indicates a model fit for a quantitative dependent variable and measures how strongly the independent variables come together and relate to the dependent variable, R^2 will also measure and check how fit is the data in the model developed by this study, and will also report the significant relationship of each of the variable. for this study R^2 will be calculated as the total variance less unexplained variance, and the value of R^2 ranges between 0% to 1%, significant level as the threshold, which mean that anything above 1% significant level will be rejected.

From the Table 7, the result indicates that value of the R^2model which is the coefficient of determination is approximately 0.33 this signifies that all independent variables used in the study explained 33% of the variation in the fraud detection among deposit money banks in Kaduna state the remaining 67% were explained by other factors that influence fraud detection among deposit money banks that were not captured by the model of this study. F statistics resolved from the ANOVA shows value of 53.350 and correspondent p- value 0.000 at 1% significant level. This signifies that the model is fit; variables were properly selected and combined in the study.

The regression model in Table 7 indicated that deep learning machine has a coefficient value 0.212 and P value 0.009. This signified that deep learning machine is positively and significantly impacting fraud detection among deposit money bank. This means that the deep learning machine is effective in assessing customer's credit worthiness, credit and debit card fraud detection. This is in line with machine learning theory by freeman (1999).

From the Table 7 it was observed that machine learning solution has a coefficient value 0.172 and P value 0.069. This shows that machine learning solution is positively but not significant in detecting fraud. Which means that machine learning solution needs to be giving more attention in terms of detecting fraudulent activities which include cyber-attack, customer's information leakage and management inefficient, with effective machine learning solution fraud can easily be detected. Which also support the Stakeholders theory by freeman (1999)

Policy Implication of the Findings

The result of this study has policy implications especially for the owners and managers of deposit money banks and corruption agencies such as Economic and Financial

Crime Commission (EFCC) DSS and other government anti-corruption agencies. The result of this study shed light on the explanatory variables that have an important effect in explaining the explained variable (fraud detection) among deposit money banks in Kaduna State of Nigeria. Deep learning machine were found to have a significant impact on fraud detection. Similarly, Finally, machine learning solution was found to be positive but not significant which means it does not help in detecting fraud among deposit money banks in Kaduna State.

5. Conclusions and Recommendations

This study in which the researcher investigated the effect of artificial intelligence on firm growth using 10 deposit money banks quoted in Nigeria Exchange Group. The study posit that all the independent variables used for this study. Deep Learning Machine (DLM), Machine Learning Solution (MLS) were tested. The result therefore concludes that Deep Learning Machine (DLM) significantly affects fraud detection of deposit money banks in Nigeria, and Machine Learning Solution (MLS) result depicts insignificant effects on fraud detection of deposit money banks in Nigeria.

Based on the findings and conclusion drawn, the following recommendations are made for managers/ owners of listed deposit money banks in Kaduna State, Nigeria so as to ensure improvement on fraud detection measures

Deep learning machine shows positive and a significant on fraud detection which is used to interpret large amount of data such as risk assessment of loans at a quicker pace. Banks are encouraged to use the right personal so as to improve on preventing and detecting fraud.

Machine learning solution shows insignificant from the above results indicates that, machine learning which is used for making predictions and /or decisions without human dictated rules should be giving priority because it will go a long way in detecting fraud.

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