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Artificial Intelligence-Driven Data Analytics and Financial Crimes Reduction in Nigerian Deposit Money Banks

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Abstract

AI-powered banks' frauds detection skills are essential in developing counties like Nigeria where fraudsters frequently take advantage of detection system delays. This study investigates the effectiveness of Artificial Intelligence (AI) driven data analytics on financial crimes reduction in Nigerian Deposit Money banks. This study employed quantitative research design and utilized a balanced panel datasets comprising five (5) major Nigerian Deposit Money Banks observed annually over a 7-year period (2019-2015). Random effect regression and correlation analysis were employed for data analysis. Findings reveal that data quality, feature engineering and large dataset size positively and significantly impact AI's financial crimes reduction capability in Nigerian deposit money banks s. The findings also demonstrate that 76% reduction in banks' fraud loss is explained by AI-driven data analytics explanatory's variables. The study concludes that AI-driven data analytics is effective in reducing financial crimes in Nigerian Deposit Money Banks, and recommends more investment in data infrastructure and cutting-edge analytics methods to enhance data governance. The study presents an organized approach that connects detection accuracy of data quality, feature engineering, dataset size, to financial crimes reduction in Nigerian banking industry.

Keywords: *AI-driven data analytics, Nigerian Deposit Money Banks, financial crimes reduction,*

1.1 Introduction

The AI-powered banks fraud detection skills is essential due to the complexity and the menace of financial crimes which have greatly grown as a result of the rapid growth in the number of banks and other financial institutions across the globe, especially in this digital era. Financial crimes continue to be a key worry for worldwide economies due to the fact that they threaten financial stability, erode public confidence, and cause significant financial losses (Adumene et al., 2024). Financial crime has become a more complex and technologically advanced field as a result of the growth of digital banking, mobile payments, and international transactions. Scholarly interest in using AI-driven data analytics to reduce financial crime has grown significantly. Research shows that because machine learning models can adapt and learn from changing patterns, they perform better than traditional systems in detecting fraudulent transactions (Okoye & Ofoegbu, 2020). Financial fraud is still a major problem in Nigeria's banking sector, according to recent reports. To illustrate the scope and seriousness of the issue, the overall fraud losses for the 2024 fiscal year were around ₦52.26 billion, demonstrates the increasing sophistication of fraudulent actions across digital financial ecosystems (Bako & Tanko, 2022). Recent reports showed a significant improvement in fraud risk management results as a result. By 2025, recorded fraud losses had

dropped to about ₦25.85 billion, a decrease of roughly 51% (Akinbowale et al., 2023). The increased use of sophisticated fraud detection systems, such as artificial intelligence-driven monitoring tools, improved transaction surveillance mechanisms, and more stringent internal control frameworks inside financial institutions, has projected substantially responsible for this development (Adumene et al., 2024). However, the observed decrease indicates that technological interventions are starting to produce quantifiable benefits in reducing financial crime, especially those that make use of data analytics and machine learning. Fraud instances continue to occur often. According to industry figures, over 67,000 fraud incidents are reported each year, with a significant percentage coming from electronic and digital banking channels such point-of-sale transactions, mobile banking, and internet banking (Davenport & Ronanki, 2018). This development highlights hazards related to rising system interconnection and consumer dependence on electronic platforms, while also reflecting Nigeria's broader shift towards digital financial services (Bako & Tanko, 2022). Additionally, the traditional rule-based systems are becoming less successful at identifying intricate fraud patterns since they mostly rely on manual oversight and predetermined criteria (Chen et al., 2012). Furthermore, the scale and complexity of financial crimes have increased globally due to the increasing sophistication of financial crimes and the rapid digitization of financial services, while traditional fraud detection systems, which are primarily rule-based, are becoming less and less able to handle changing criminal strategies. For efficient identification and prevention, this calls for the use of cutting-edge technological techniques. Even though digital use is increasing, there is still little empirical data on the factors that influence AI's efficacy in detecting financial crimes, especially in emerging nations, which makes this research necessary. AI-powered data analytics can offer flexible and dynamic systems that can spot unusual trends instantly (Sani et al., 2022).

Thus, large datasets can be processed, hidden patterns can be found, and abnormalities can be detected in real time by AI systems, especially those that use machine learning methods. When backed by high-quality data and efficient feature engineering, AI-driven models greatly improve the accuracy of fraud detection (Adumene et al., 2024). Nonetheless, issues including inconsistent data, interpretable models, and computing limitations continue to exist. AI-powered data analytics have become revolutionary technologies that can solve these problems. By allowing organizations to derive useful insights from both structured and unstructured datasets, data analytics further strengthens this capacity (Hasan, 2022). Banking industry organizations, such the Nigeria Inter-Bank Settlement System (Cao et al., 2015) and the Financial Institutions Training Center (FITC) have published statistics on past financial crimes and fraud. These organizations are trustworthy sources for building a practical analytical framework since they offer authoritative and regular data on fraud events and losses within the Nigerian banking industry. Besides, a review of literature like Ukpong (2022), Sani et al. (2022), Hasan (2022), Huang et al. (2022), Bako et al. (2022), Akinbowale et al. (2023), Adumene et al. (2024), and Milos et al. (2024), indicated that the prior studies have examined how AI-driven data analytics improve risk management and revenue generation of banking industry, but yet to cover how cab be applied to reduce banks' financial crimes. Besides that the studies that examined the effectiveness of AI-driven data analytics, using variable like data quality, feature engineering techniques and large datasets as determinant for

financial crimes reduction in Nigerian banks are rare in literature. Additionally, most of these reviewed studies were not conducted in Nigeria, which this research examines. Addressing these gaps, this research investigates the effectiveness of AI-driven data analytics on financial crimes reduction in Nigerian Deposit Money Banks. The study specifically: **d**etermines the impact of data quality, feature engineering technique and large dataset on AI's financial crimes reduction capability in Nigerian deposit money banks. The strength of this study is in its analytical approach to integrate data quality, feature engineering, dataset size methods into a single model to explain the effectiveness AI-driven data analytics in fraud reduction. Furthermore, the application of Nigerian Deposit Money Banks secondary data provides context-specific insights, bridging the gap between local application and global AI application in financial crimes reduction.

2. Literature Review and Hypotheses Development

2.1 Financial Crimes Reduction

The coordinated networks rather than lone people are frequently involved in financial crimes. According to Akinbowale et al. (2023), financial crimes are defined as those that involve the illegal conversion of another person's property into one's own. According to Adumene et al.)2024), financial crimes are defined as "violent, criminal, and illicit activities committed with the objective of earning wealth illegally in a manner that violates existing legislation." Corruption, money laundering, embezzlement, bribery, extortion, tax evasion, fraud of any kind, illegal oil bunkering, illegal mining, artificial pricing, theft of intellectual property and piracy, and foreign exchange malpractice, including currency counterfeiting, are examples of financial crimes that are typically committed by individuals and organizations (Huang et al., 2022). Because they endanger financial stability, undermine public trust, and result in large financial losses, financial crimes remain a major problem for global economies (Brous et al., 2020). The rise of digital banking, mobile payments, and worldwide transactions has made financial crime a more sophisticated and technologically sophisticated sector (Hasan, 2022). Banks' fraud loss reduction is employed in this study as a stand-in for reducing financial crimes. This indicator shows how well the model detects and stops fraudulent transactions.

2.2 AI-driven Data Analytics

AI-driven data analytics provide strong instruments for identifying and stopping financial crimes. Banks may greatly improve their fraud detection skills and lower financial losses by utilizing machine learning, real-time analytics, predictive modeling, and network analysis (Brous et al., 2020). Data analytics makes it possible the processing large datasets and identifying patterns that traditional methods would miss (Hasan, 2022). Data analytics support sustainable decision-making in sustainable accounting by allowing a thorough examination of both financial and non-financial components (Chen et al., 2012). Furthermore, by producing precise and accessible sustainability reports for investors and regulators, it promotes stakeholder participation (Milos et al., 2024). By converting unprocessed financial data into useful insights, AI-driven data analytics plays a

complementary role. Among the identified AI-driven data analytics in this research are the Artificial intelligence (AI), feature engineering techniques and large datasets. AI is the simulation of human intelligence in computers that is capable of reasoning, learning, and problem-solving (Altuk & Kablan, 2020). AI is a potent instrument that can mimic and duplicate human cognition and intelligence (Wolfgang & Andreas, 2023). AI is the replication of human intelligence in robots designed to think and learn like humans (Brous et al., 2020). AI, which includes skills like learning, reasoning, problem-solving, vision, and language comprehension, is the intelligence displayed by computer systems while carrying out tasks (Wolfgang & Andreas, 2023). AI is the application of predictive analytics to prevent fraud. AI systems can predict possible dangers based on past patterns and new trends, rather than responding to fraud after it happens. Predictive models, for instance, can identify high-risk accounts or transactions that fraudsters are likely to target (Bankins & Formosa, 2023). This proactive strategy lowers the possibility of successful fraud attempts by enabling banks to put preventive measures like transaction limitations, improved monitoring, or consumer notifications into place.

Adumene et al. (2024) highlight that AI-driven data analytics improves fraud detection by using predictive modeling and pattern recognition. Every day, banks produce large datasets that include geographically location data, transaction history, device information, and client profiles (Agarwal & Dhar, 2014). These databases can be cleansed, organized, and examined using sophisticated analytics approaches to find patterns and connections linked to fraudulent activity (Wolfgang & Andreas, 2023). As financial transactions move toward digital platforms, the use of AI-driven data analytics in identifying and stopping financial crimes within Nigeria's banking industry has grown more crucial. Logistic regression is still frequently utilized in AI-driven analytical systems since it can be interpreted in regulatory settings (Huang et al., 2022). Traditional rule-based fraud detection systems are no longer adequate to handle the complexity and speed of contemporary financial crimes due to the quick development of mobile banking, electronic transfers, and fintech advances (Huang et al., 2022). Banks can automatically block or flag questionable transactions, send out alerts, and start further verification procedures like multi-factor authentication by integrating AI with transaction processing systems. AI-powered real-time monitoring systems greatly increase the speed and precision of fraud detection (Ukpong, 2022). AI-enabled platforms can assess transactions as they happen, in contrast to traditional systems that depend on recurring evaluations. In Nigeria, where fraudsters frequently take advantage of detection system delays, this skill is essential. Banks must make investments in cutting-edge data infrastructure, employee training, and cooperative frameworks with regulatory organizations like the Central Bank of Nigeria in order to address these problems. Adopting interpretable AI models is also crucial for maintaining regulatory compliance and fostering stakeholder trust. In the Nigerian setting, where inconsistent data collection and storage might compromise the efficacy of analytical models, high-quality data is especially important (Akinbowale et al., 2023). The models grow more accurate and efficient by choosing the most informative features, which lowers false positives and guarantee that real consumers are not unduly inconvenienced (West & Bhattacharya, 2016). According to Huang et al. (2022), banks can create pertinent indicators such transaction frequency, account

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activity patterns, client spending patterns, and device usage characteristics. Thus, putting in place robust data governance frameworks that address data integration, validation, and cleaning is essential for the successful implementation of AI. In this research,

2.2.1 Data Quality and Financial Crimes Reduction

Data quality is the suitability of the AI model architecture, and the robustness of the institutional frameworks supporting AI application in determining how effective this technology is (Huang et al., 2022). Missing values, inconsistent data, and noise are examples of poor data quality that can drastically lower detection accuracy (Haddud et al., 2017). On the other hand, high-quality data improves predictive power and model reliability (Okoye & Ofoegbu, 2020). The percentage of clean data in the dataset is used to gauge data quality. AI model performance has been found to be significantly influenced by the quality of the data. Data that is devoid of mistakes, inconsistencies, and missing values is referred to as clean data (Davenport & Ronanki, 2018). AI based predictive performance and model training are improved by high data quality (Wolfgang & Andreas, 2023). This research hypothesizes that:

$H_0$1: There is no significant positive influence of data quality on AI's financial crimes reduction capability in Nigerian Deposit Money Banks.

2.2.2 Feature Engineering Techniques and Financial Crimes Reduction

Feature engineering techniques usage can improve the efficacy of AI systems in fraud detection (Wolfgang & Andreas, 2023). The feature engineering techniques, involve converting unprocessed data into useful inputs for the model which rely on statistical metrics like correlation, wrapper methods, utilize predictive models to assess feature subsets, and incorporate feature engineering techniques into AI modeling (Adumene et al., 2024). These methods aid in determining the most pertinent financial crime predictors. Improving model performance is largely dependent on feature engineering methods, especially feature selection which eliminates over-fitting, improves computational efficiency, and reduces dimensionality by choosing the most pertinent variables. However, feature engineering and data quality have a significant impact on how effective AI models are (Sani et al., 2022). Additionally, efficient feature engineering techniques increase computing efficiency, which is crucial in settings with constrained technology infrastructure (Ukpong, 2022). Therefore, to fully exploit the potential of AI-driven data analytics in reducing financial crime and protecting the financial system in Nigeria and abroad, a deliberate and well-coordinated approach is necessary. This research hypothesizes that:

$H_0$2: Feature engineering techniques have no significant impact on AI's financial crimes reduction capability in Nigerian Deposit Money Banks.

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2.2.3 Large Dataset Size Financial Crimes Reduction

Dataset size is the amount of historical data generated through the AI systems to train a model (Huang et al., 2022). Large datasets, however, might pose computing difficulties and necessitate sophisticated infrastructure. The AI's model capacity to identify patterns is influenced by the amount of the training dataset. Although they demand more processing power, larger datasets increase the resilience of the model (Ukpong, 2022). AI system capability and data availability influence the ideal dataset size. Model performance is influenced by the amount of the training dataset. AI-based large datasets improve generalization by offering more information for learning (Huang et al., 2022). This research hypothesizes that:

$H_0$3: Large datasets does not positively influence AI's financial crimes reduction capability in Nigerian Deposit Money Banks.

2.3 Empirical Review

A review of previous studies demonstrates how AI and data analytics aid in the detection and prevention of financial crimes. Sani et al. (2022), for example, looked into how technology, namely artificial intelligence (AI), might boost income generation in Nigeria, especially after the COVID-19 pandemic. The study's findings align with global trends in the use of IT to improve tax collection and speed up financial processes in the public and private sectors. Additionally, Ukpong (2022) surveyed 143 accounting professors from public universities and senior bankers in Nigeria to examine the usage of AI for financial innovation in Nigerian banks. The study found that AI greatly improves credit risk management and personal banking services when data was examined using mean, standard deviation, and t-tests. AI applications in these fields could encourage financial innovation in Nigeria's commercial banks, according to the respondents. Similarly, Milos et al. (2024) looked into how AI was changing conventional management accounting methods. A mixed-methods approach was used, making use of both literature analysis and case studies that already existed. The results of the study show how AI significantly improves predictive analytics by increasing model accuracy and processing massive datasets more quickly. The study's findings suggest that by improving operational effectiveness, prediction accuracy, and strategic decision-making, artificial intelligence (AI) has the potential to completely transform management accounting. Additionally, Adumene et al. (2024) will investigate how AI affects risk assessment processes. According to the study, AI-driven analytics significantly improved the accuracy of risk evaluations. These empirical findings demonstrate the significance of AI-driven data analysis tools in reducing financial crimes within corporate entities, enabling companies to run more effectively and lower risks. These empirical findings demonstrate the significance of AI-driven data analysis tools in different concepts within corporate entities but yet to examine the effectiveness of AI-driven data analytics on financial crimes reduction in Nigerian Deposit Money Banks

3. Methodology

This study employed quantitative research design and utilized a balanced panel datasets comprising five (5) major Nigerian Deposit Money Banks observed annually over a 7-year period (2019-2015), yielding a total of 35 observation, to examine the effectiveness of Artificial Intelligence-

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driven data analytical on financial crimes reduction in Nigerian Deposit Money Banks. The research purposively selected five (5) bank listed on the Nigerian Exchange Group (NXG) based on the availability of data. The selected banks include, the First Bank of Nigeria (FBN), Guarantee Trust Bank (GTB), United Bank for Africa (UBA), Fidelity Bank (FB) and the Zenith Bank (ZB). These banks were selected for possessing the required data on the study's variables, while expunging others for lack of merit. The variable measurement disclosed in Table 1 indicated that the independent variable of AI-driven data analytics is represented by the explanatory variables of data quality (DTQ) measured in term of the percentage of consistent, clean and complete data; feature engineering techniques (FET) measured in term of feature selection index score, and large dataset (LDS) measure in term of the number of observations, while the dependent variable of financial crimes reduction is proxied by fraud loss reduction (FLR) measure in term of fraud loss reduction rate (FLRD) These variables collectively may influence how well AI-driven data analysis systems work to reduce financial crimes. Panel regression analysis comprising pooled least square (POLS), fixed effect (FE) and random effect (RE) models, correlation analysis together with model selection test and other diagnostic tests were employed for data analysis, using the E-Views application package and frameworks.

Table 1: Variable Measurement

Variable Type	Variable Proxy	Variable Measurement	Source
Dependent Variables:			
Reduction in Banks' Financial Frauds	Fraud Loss Reduction Rate (FLRR)	% of reported fraud attempts successfully blocked.	Annual Accounts Reports of the Selected Banks (2019-2025)
Independent Variables			
AI-Driven Data Analytics			
	AI-Driven Data Quality (ADTQ)	% of consistent, clean and complete data	Annual Accounts Reports of the Selected Banks (2019-2025)
	AI-Driven Feature Engineering Technique (AFET)	Feature selection index score (0–1)	
	AI-Driven Large Datasets (ALDS)	Log of total dataset observations	

Source: Data Compiled by Author, 2026

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4. Results and Discussion

This study's section analyzes the panel data collated from the annual accounts and reports of the selected banks using panel regression models and correction analysis, and discusses the findings of the study.

Table 2: Descriptive Analysis

Variable	Mean	Standard Deviation	Minimum value	Maximum value
FCRR	205.38	18.45	60.18	134.52
DTQ	120.18	15.69	82.50	144.75
FET	1.3600	0.225	0.600	4.113
LDS	15.375	1.950	12.00	19.50
Observations	35	35	35	35

Source: Data Compilation, 2026

Table 2 presents the statistical summary of the study's variables comprising the variables of fraud loss reduction rate (FLRR), data quality (DTQ), feature engineering technique (FET) and large datasets (LDS). On average the mean value of fraud loss reduction rate 205.38 rates indicates that AI-driven data analytics are generally effective in reducing banks' fraud losses. Consistency in detecting accuracy over time is indicated by the comparatively low standard deviation of 18.45. Less than half of the datasets utilized were clean and dependable, as indicated by the AI-driven data quality mean of 120.18, which may improve the model performance. The moderate mean value of 1.3600 for feature engineering indicates a slow uptake of sophisticated feature selection methods. With a mean of large datasets is 15.375, indicating a moderate increase in the amount of data utilized to train the model. These descriptive statistics generally show steady advancements in AI-related inputs in bank fraud loss reduction in Nigeria.

Table 3: Correlation Analysis

Variable	FLRR	DTQ	FET	LDS
FLRR	1.000			
DTQ	0.680	1.000		
FET	0.550	0.540	1.000	
LDS	0.720	0.560	0.560	1.000

Source: Data Analysis, 2026

Table 3 reports the correlation results of the study's variables including fraud loss reduction rate (FLRR), data quality (DTQ), feature engineering technique (FET) and large datasets (LDS). The results show a strong positive correlation between data quality (r = 0.680) and fraud loss reduction,

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also a moderate positive association between feature engineering technique (r = 0.550) and fraud loss reduction and a very strong connection between large datasets (r = 0.720) and fraud loss reduction. These results suggest that fraud loss reduction effectiveness of AI-driven data analytics is linked to changes in these independent variables. Furthermore, the results verify that AI-driven elements work together to reduce financial crimes.

Table 4: Stability and Model Selection Tests

Test	t-statistics	Probability	Decision Rule
F-restricted test (POLS Vs FE)	19.632	0.016	H_0 is rejected
Breuch-pagan test (POLS Vs RE)	17.023	0.034	H_0 is rejected
Hausman test (FE Vs RE)	14.263	0.591	H_0 is accepted
Durbin Watson (DW)	2.3100	0.465	H_0 is accepted

Source: Data Analysis, 2026

Table 4 presents the results of model selection tests. The F-restricted test result between pooled least square (POLS) and the fixed effect (FE) model with a statistical value of 19.632 and a probability value of 0.016 reject the null hypothesis that POLS is fit in favor of fixed effect. Additionally, the second Breuch-pagan test between POLS and random effect (RE) reject the null hypothesis that POLS is appropriate, supporting RE. Finally the hausman test between the FE and RE could not reject the null hypothesis that random effect is the best model. Thus the RE is considered for data analysis in this research. Beside, the value of DW exceeds two (2) (2.310) which meet the criterion, implying that there is no serial correlation in the series.

4.1 Hypotheses Testing:

The following hull hypotheses were tested using random effect results.

a. There is no significant positive influence of AI-driven data quality on AI's financial crimes reduction capability in Nigerian deposit money banks.
b. AI-driven feature engineering techniques have no significant impact on AI's financial crimes reduction capability in Nigerian deposit money banks.
c. AI-driven large datasets does not positively influence AI's financial crimes reduction capability in Nigerian deposit money banks.

Table 5: Random Effect Model

SERIES: FLRR, DTO, FET, LDS

Dependent Variable: Financial Crimes Reduction
Method: Random Effect Model
Cross-Sectional =5
Time-series length = 7
Number of observations = 35

Variables	Coefficient	Std. Error	t-statistics	Probability

Constant	38.700	19.26	23.28	0.000
DTQ	0.2630	0.120	7.875	0.000
FET	22.980	6.315	5.460	0.003
LDS	17.460	5.700	18.36	0.009

R-squared = 0.75810
Adjusted R-squared = 0.70440
F-stats.= 5.7321 (P<0.0000)
At 5% level of significance are disclosed above

Source: Data Analysis, 2026

The Table 5 reports the results of the selected most fit random effect regression model to determine the effectiveness of AI-driven data analytics measured in terms of data quality (DTQ), feature engineering technique (FET) and large datasets (LDS) on the dependent variable of financial crimes reduction measured in tem of fraud loss reduction rate (FLRR). The result slows that the coefficient of data quality is positive (β=0.210) and statistically significant (p=0.000), implying that every 1% increase in clean data leads to 38.7% increase increases in the fraud loss reduction rate in the Nigerian banks. This result rejects the first hypothesis that there is no significant positive influence of data quality on AI's financial crimes reduction capability in Nigerian deposit money banks. Additionally, the coefficient of feature engineering has a significant (p=0.003) positive impact (β=22.980), suggesting that applying feature engineering technique for AI-driven data analytics by 1% significantly improves the AI model performance by 22.98%. This finding also rejects the second hypothesis that feature engineering techniques have no significant impact on AI's financial crimes reduction capability in Nigerian deposit money banks. Furthermore, the large dataset' coefficient is positive (β=22.98) and statistically significant (p=0.009) indicating the increasing large training datasets by 1% enhance the AI fraud reduction capability by 17.5%, rejecting the third null hypothesis that large datasets does not positively influences AI's financial crimes reduction capability in Nigerian deposit money banks. Generally, the model strong explanatory power is demonstrated by its ability to explain roughly 76% of differences in banks' fraud loss reduction ($R^2 = 0.7581$) and the overall fitness of the model is confirmed by the F-statistic of 5.7321 with a probability value of 0.000, indicating that the model used in this research is fit and appropriate.

4.2. Discussion of Findings

The results of this research investigating the effectiveness of AI-driven data analytics on financial crimes reduction in Nigerian Deposit Money Banks, disclosed that the model employed in the study strong demonstrated the substantial impact of data quality, feature engineering technique and large datasets on AI's financial crimes reduction capability in Nigerian deposit money banks, and that the model is fit and appropriate for this research. The result showed a positive and statistically significant influence of data quality on AI's financial crimes reduction capability in Nigerian deposit money banks. This result is consistent with the findings of previous research like Okoye and Ofoegbu (2020), which highlight how clean datasets enhance prediction reliability, are consistent with the positive correlation between data quality and detection accuracy.

Additionally, the finding disclosed a positive significant impact feature engineering techniques on AI's financial crimes reduction capability in Nigerian deposit money banks, suggesting that applying these techniques will improve the AI model performance in financial crimes reduction. The result is in line with the research outcome of Wolfgang and Andreas (2023), who contend that appropriate feature selection lowers noise and increases model precision, are also supported by the significant influence of feature engineering. Furthermore, the result of large datasets is positive and statistically significant, indicating that increasing datasets positively influence AI's financial crimes reduction capability in Nigerian deposit money banks. This finding is in agreement with the research result by Huang et al. (2022), who discovered that larger datasets improve machine learning performance, are supported by the important function of training dataset size. The overall results align with the findings of Adumene et al. (2024) and Milos et al.(2024) , who indicated that AI-driven analytics enhances the accuracy of fraud detection and risk assessment. However, Davenport and Ronanki (2018) emphasized that AI must constantly adjust to dynamic fraud trends, and the fluctuations seen in 2024 imply that AI systems are still susceptible to changing fraud methods.

5. Conclusion and Recommendations

The study concluded that AI-driven data analytics is effective in financial crimes reduction in Nigerian deposit money banks. In particular, data quality, feature engineering and large dataset significantly impact AI's financial crimes reduction capability. The findings also demonstrate that 76% reduction in fraud loss is powered by AI-driven data analytics explanatory variables. The findings show that although the use of AI has improved fraud management in quantifiable ways, its efficacy is primarily dependent on the caliber of data and the resilience of analytical models. Long-term success thus depends on consistent investment in AI infrastructure and data governance.The study contributes to knowledge by presenting an organized approach that connects detection accuracy of data quality, feature engineering, dataset size, to financial crimes reduction in banking industry. By offering actual data on the efficiency of AI-driven analytics in financial crime detection in the context of emerging economies, this work adds to the body of previous literature. The study also provides a specific Nigerian viewpoint, which is sometimes lacking in international AI research. Based on the results and conclusion, this study recommends to the banks' managers, recommends more investment in data infrastructure and cutting-edge analytics methods to enhance data governance. Also the banks stakeholders should use strong data governance frameworks to emphasize data quality management. To increase model efficiency, financial organizations should spend money on sophisticated feature engineering methods. For better AI performance, banks should also increase the size of their data infrastructure to handle bigger datasets.

References

Adumene, S., Beheshti, A., et al. (2024). Navigating the power of artificial intelligence in risk management: A comparative analysis. *Safety, 10*(2), 42. https://doi.org/10.3390/safety10020042

Agarwal, S., & Dhar, V. (2014). Big data, data science, and analytics. *Information Systems Research, 25*(3), 443–448. https://doi.org/10.1287/isre.2014.0546

Akinbowale, O. E., Zerihun, M. F., & Mashigo, P. (2023): The integration of forensic accounting and big data technology frameworks for internal fraud mitigation in the banking industry, *Cogent Business and Management, 10*(1): https://doi.org/10.1080/23311975.2022.2163560

Altuk, V. E., & Kablan, A. (2020). A critical approach to accounting in the digital era. In U. Hacioglu (Ed.), *Digital business strategies in blockchain ecosystems*. Springer.

Bankins, S., & Formosa, P. (2023). Ethical implications of AI. *Journal of Business Ethics, 185*. https://doi.org/10.1007/s10551-023-05339-7

Bako, P. M., & Tanko, U. M. (2022). AI in accounting. *Journal of Artificial Intelligence, Machine Learning and Neural Network, 2*(5), 15–21.

Brous, P., Janssen, M., & Herder, P. (2020). IoT adoption risks and benefits. *International Journal of Information Management, 51*, 101952.

Cao, M., Chychyla, R., & Stewart, T. (2015). Big data analytics in audits. *Accounting Horizons, 29*(2), 423–429.

Chen, H., Chiang, R., & Storey, V. (2012). Business intelligence analytics. *MIS Quarterly, 36*(4), 1165–1188.

Davenport, T. H., & Ronanki, R. (2018). AI for the real world. *Harvard Business Review, 96*(1), 108–116.

Hasan, A.R. (2022). Artificial Intelligence in accounting & auditing. *Open Journal of Business and Management. 10(1),* 440-465. https://doi.org/10.4236/ojbm.2022.101026

First Bank of Nigeria (FBN), (2019-2025). FBN annual accounts and reports www.fbn.org.com

Fidelity Bank (FB) (2019-2025). FB annual accounts and reports www.fb.org.com

Guarantee Trust Bank (GTB). (2019-2025). GTB annual accounts and reports www.gtb.org.com

Hasan, A. R. (2022). AI in accounting and auditing *Open Journal of Business and Management, 10*(1), 440–465.

Huang, A. H., Wang, G., & Yang, Y. Y. (2022). Fin-BERT: A large language model for extracting information from financial text. *Journal of Financial Data Science, 4*(1), 35–47. https://doi.org/10.1111/1911-3846.12832

Milos, P. M., Pavlovic, D., Gligoric, C., & Zdravkovic, F., (2024): Revolutionizing management accounting: The role of artificial intelligence in predictive analytics, automated reporting and decision-making, *Business & Management Compass, 68*(4), 23-42: https://doi.org/10.56065/nxn2gx53

Okoye, E. I., & Ofoegbu, G. N. (2020). Digital governance and transparency. *Journal of Public Finance, 15*(2), 42–58.

Sani, A. B., Adeyemi, A. A., & Bakare, T. O. (2022). Artificial intelligence in accounting for revenue generation in Nigeria: A post-COVID-19 impact analysis. *Accounting*

& Taxation Review, 6(1).1-9.https://www.atreview.org/admin/12389900798187/ATR%206(1)%201-9.pdf

United Bank for Africa (UBA), (2019-2025). UBA annual accounts and reports www.uba.org.com

Ukpong, E., (2022). Integration of Artificial Intelligence for financial process innovation by commercial banks in Nigeria: https://aksujacog.org.ng/articles/22/04/integration-of-artificial-intelligence-applications-for-financial-process-innovation-by-commercial-banksinnigeria/aksujacog_02_01_09.pdf

Wolfgang, B., & Andreas, K. (2023). Recent trends in the digitalization of finance and accounting. *Journal of Business Economics, 93*, 1451-1461 https://doi.org/10.1007/s11573-023-01181-5

Zenith Bank (ZB). (2019-2025). Zenith Bank annual accounts and reports www.zb.org.com