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## **DISTRIBUTED LEDGER TECHNOLOGY (DLT) AND COST MINIMIZATION OF DEPOSIT MONEY BANKS IN ENUGU STATE.**

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**Abstract:** *The study examined the distributed ledger technology (DLT) and cost minimization of Deposit Money banks in Enugu State. The specific objectives are to: Examine the relationship between Distributed Network and Infrastructure Costs and Ascertain the relationship between Smart Contracts and Enhanced Fraud Detection of Deposit Money banks in Enugu State. The total population for the study was two hundred and sixty seven (267). The study made use of the whole due to its small number. A survey design was adopted for the study. Instrument used for data collection was the questionnaire and interviews. Two hundred and fifty two (252) copies of questionnaire were properly completed and returned. Data was presented and analyzed by mean score and Z – test was used to test the hypotheses with Statistical Software (SPSS). The findings indicated that Distributed network had significant positive relationship with infrastructure costs;  $Z(10.142, P. <.05)$  and Smart contracts had significant positive relationship with enhanced fraud detection of deposit money banks in Enugu State,  $Z(10.709, P. <.05)$ . The study concluded that Distributed network and Smart contracts had significant positive relationship with infrastructure costs and enhanced fraud detection of deposit money banks in Enugu State. The study recommended among others that Deposit Money Banks (DMBs) should break the monolith: move core systems to micro-services and (where appropriate) server less and adopt a disciplined hybrid multi-cloud strategy as FinTech case study, shifting to micro-services plus AWS Lambda cut compute spend and halved deployment time.*

**Keywords:** *Distributed Ledger Technology (DLT), Cost minimization, Distributed Network and Infrastructure Costs, Smart Contracts & Enhanced Fraud Detection*

## **INTRODUCTION**

### **1.1 Background of the study**

Fundamental to the business of banking is the need to manage risk. Banks' long-term stability and trustworthiness, as well as regulation, supervision, market discipline and civil and criminal enforcement all incentivize strong risk management (Paige & Smith, 2024). The anticipation of cost reduction as one of the key prospects of the cashless banking policy suggests that all the benefit of cashless policy would ultimately improve bank's performance, in terms of profitability (Arinze-Emefo and Ibrahim, 2023). Cost management practices are important to the success of organizations. Digital ledger technology, with its decentralized and secure nature, is seen as a promising tool for recording, storing, and sharing transaction information, thereby eliminating the need for intermediaries and ensuring transparent, tamper-proof transactions. DLT offers the opportunity for harmonization of technology across all the core platforms (Faster payment council, 2025).

DLT refers specifically to the technological infrastructure and protocols that enable the simultaneous access, validation and updating of records that characterize distributed ledgers. It works on a computer network spread over multiple entities, locations or nodes. Unlike traditional databases, distributed ledgers have no central data store or administration functionality (Barney, Troy and Pratt, 2025). Cost management in banking should be a deliberate and continuous process aimed at driving sustainability and strategic benefits. Maximising productivity is key to cost reduction in banking (Infosys, 2025). DLT technologies are relatively new and complex, requiring a certain level of technical knowledge and expertise to fully comprehend and exploit their potential.

Huibers, (2024) asserts that the distributed ledger technology (DLT) underlying the payment system is being applied successfully by financial institutions and is likely to have important implications for the future of money and banking. Decentralised ledgers have the potential to bring many benefits to the financial industry, such as reduced costs, improved efficiency, and increased transparency. However, they also present some regulatory challenges. Huibers, (2024) asserts that the distributed ledger technology (DLT) underlying the payment system is being applied successfully by financial institutions and is likely to have important implications for the future of money and banking. By reducing non-essential expenses and streamlining operations, banks can achieve higher profits and maintain long-term stability. This allows them to become more competitive in the market and effectively serve their customers.

### **1.2 Statement of problem**

Decentralised ledgers have the potential to bring many benefits to the financial industry, such as reduced costs, improved efficiency, and increased transparency. However, they also present some regulatory challenges. By reducing non-essential expenses and streamlining operations, banks can

achieve higher profits and maintain long-term stability. This allows them to become more competitive in the market and effectively serve their customers.

The global banking industry is under increasing pressure to modernize its infrastructure to meet the demands of digital transformation, heightened security requirements, and the need for more transparent operations. However, the integration of digital ledger technology into existing banking systems remains a complex challenge as a result of poor distributed network and unclassified contract. Inadequately designed DLT systems may suffer frequent crashes or delays in transaction processing.

Incompatibility with legacy systems and other banks' infrastructure can result in bottlenecks and failures in interbank operations. Poor implementation or management of Distributed Ledger Technology (DLT) in Deposit Money Banks (DMBs) can lead to a range of negative consequences across operational, financial, reputational, and regulatory domains. These problems also lead to high infrastructure costs and unenhanced fraud detection in deposit money banks. Hence, the need to examine distributed ledger technology and cost minimization in deposit money banks.

### **1.3 Objectives of the study**

The aim of the study was to examine distributed ledger technology (DLT) and cost minimization of Deposit Money banks in Enugu State. The specific objectives are to:

- i. Examine the relationship between Distributed Network and Infrastructure Costs of Deposit Money banks in Enugu State
- ii. Ascertain the relationship between Smart Contracts and Enhanced Fraud Detection of Deposit Money banks in Enugu State

### **1.4 Research Questions**

The study made use of the following research questions

- i. What is the relationship between Distributed Network and Infrastructure Costs of Deposit Money banks in Enugu State
- ii. To what extent is the relationship between Smart Contracts and Enhanced Fraud Detection of Deposit Money banks in Enugu State

### **1.5 Statement of hypotheses**

The study hypothesis include the following

- i. Distributed network has relationship on infrastructure costs of deposit money banks in Enugu State
- ii. Smart contracts have relationship with enhanced fraud detection of deposit money banks in Enugu State.

## **2.0 Review of Related Literature**

### **2.1 Conceptual Review**

#### **2.1.1 Distributed ledger technology**

Distributed ledger technology (DLT) is the technological infrastructure and protocols that allow simultaneous access, validation, and record updating across a networked database (Nevil & Clemon, 2024). It is a digital system for recording transactions where data is replicated and shared across a network of computers, instead of a single, centralized database. Distributed ledgers have been around for decades but have become more well-known, researched, used, and developed since Bitcoin was introduced. Distributed ledger technology (DLT) in the banking system is a digital system for recording the transaction of assets in which the transactions and their details are recorded in multiple places at the same time (Barney, Troy and Pratt, 2025). Banks used DLT to facilitate sharing payments-related information across financial institutions. DLT has been viewed as a potential platform for the next generation of payment systems, enhancing the integration and the reconciliation of settlement accounts and their ledgers (Shabsigh, Khiaonarong and Leinoneh, 2020) DLT is simply a new way to record and maintain information without relying on a centralized system or party. It functions like a shared Excel spreadsheet.

### **2.1.2 Components of distributed ledger technology used in the study**

#### **2.1.2.1 Distributed network**

Distributed network, also known as a decentralized network or peer-to-peer network, is a type of network architecture where computing resources and data are spread across multiple nodes, usually across various geographical locations, that work together as a single network (Nord, 2025). Distributed network is a network architecture where computing resources and data are spread across multiple nodes, typically in different physical locations, that work together as a single network. Chen, Murry & Ecker, (2023) opined that the word "distribution" has several meanings in the financial world, most of them pertaining to the payment of assets from a fund, account, or individual security to an investor or beneficiary. In deposit Money Banks (DMBs), a "distributed network" refers to the various channels and systems through which banks deliver their services to customers, encompassing both physical and digital infrastructure. distribution generally refers to the disbursement of assets from a fund, account, or individual security to an investor (Chen, Murry & Ecker, 2023).

#### **2.1.2.2 Smart Contract**

Smart contract is a computer program or a transaction protocol that is intended to automatically execute, control or document events and actions according to the terms of a contract or an agreement. The objectives of smart contracts are the reduction of need for trusted intermediators, arbitration costs, and fraud losses, as well as the reduction of malicious and accidental exceptions (Martin and Boris, 2019). Smart contracts are a new architecture for program design, deployment and operation developed in recent years with the rise of blockchain technology. Smart contract technology has successfully solved the problem of difficult blockchain application development by supporting more powerful programming languages and run-time environments and allowing developers to develop

arbitrary value exchange-related applications on it. . The development of blockchain technology provides a good operational basis for smart contracts, which can play an important role on the blockchain. With the rapid development of blockchain platforms such as bitcoin, smart contracts have a good opportunity for development. However, smart contract applications are still at an early stage of development, with relatively little relevant research, and the applicable scenarios of smart contracts in practical applications are not rich enough (Tian and Junhua, 2023).

### **2.1.3 Cost minimization**

Cost minimization in deposit money banks involves identifying and implementing strategies to reduce operational expenses while maintaining or improving service quality and profitability. Cost efficiency is very important in this new age since profitability continue to shrink and new business is becoming almost impossible (Alabi, Adebisi and Fatimehin, 2020). Cost management practice influence financial performance. However, banks should ensure routine training, seminars for their staffs on new and modern cost management practice to enhance effective cost control and cost reduction leading to financial performance; Management should adopt cost management practice that focus on cost control and cost reduction (Eneisik, 2021).

### **2.1.4 Components of cost minimization used in the study**

#### **2.1.4.1 Infrastructure costs**

The term infrastructure operating costs refers to the costs of continuing to provide the infrastructure after the initiative has commenced operation. The primary infrastructure operating cost is maintenance. For cost estimation purposes, it is useful to split infrastructure operating costs into time-related and usage-related costs. It is also the cost of auxiliaries, cost of land, site development charges and other civil works, transportation charges, cost of evacuation up to interconnection point. Infrastructure costs, including salaries, wages, other overheads, and technology investments, significantly impact the cost of funds and profitability of deposit money banks. The financial infrastructure is the core in the financial system and is a precondition of its functioning. The financial infrastructure is made up of technical systems through which payments are made and transactions with financial instruments are handled (SVERIGES, 2024)

#### **2.1.4.2 Enhanced fraud detection**

Enhanced fraud detection leverages AI and machine learning (ML) to identify patterns and anomalies in large datasets, enabling faster and more accurate detection of fraudulent activities. Fraud, (2025) defined enhanced fraud detection also known as advanced fraud detection as the use of modern technologies and sophisticated models to identify and prevent fraudulent activities in a more precise and efficient manner than traditional methods. This scientific approach aims to swiftly detect, prevent and respond to every type of fraud that could harm businesses, especially in the finance sector like banks and credit unions.

## **2.2 Theoretical Review**

The study is underpinned on the contingency theory

### **The Contingency Theory**

Contingency theory was propounded by Fred Edward Fiedler in the year 1964, contingency theory is an organizational theory which state that there no one best way to lead an organization or to make decision and that the optimal course of action depend upon the internal and external situation. The contingency theory to cost management practice is based on the premise that there is no universally appropriate cost management practice systems that applies equally well to all firms in all circumstances (Emmanuel, Otley & Merchant, 1990). This suggests that the particular features of an appropriate costing technique will depend upon the specific circumstances in which firms must find it. How effective the design of a costing technique is depends on that ability to adapt to changes in external circumstances and internal factors in order to assist manager in achieving goals. Contingency theory suggests that the need for efficient organizational structures, processes and competent costing system is contingent on organizational and environmental characteristics. This forces influence changes in the structure and cost management practice such as Activity Based Costing, target and standard costing, leads to enhances firm performance (Cagwin & Bouwman, 2002; Drury & Tayles 2005). Therefore, banks should have already evaluated cost management practice to be adopted in term of emergence.

## **2.3 Empirical Review**

### **2.3.1 Distributed Network and Infrastructure Costs of Deposit Money banks in Enugu State**

Odum, Odum and Chukwu (2017) Technological Infrastructure Investments and Financial Performance of Banks in Nigeria. This study investigated the effects of Money Deposit Banks" investments in technological infrastructure on financial performance in Nigeria. The study was built under the usage of technology and Unified Theory of Acceptance framework. To obtain answers to the research questions and to test the hypotheses formulated, data were obtained from annual reports of banks listed on the floor of the Nigeria Stock Exchange (NSE). Quantitative research design was employed. Data obtained were analysed using descriptive statistics, Pearson correlation analysis, and percentage change trend analysis. Hypotheses testing were done using linear regression analysis. The results from the analyses revealed that investments in technological infrastructure is positively and significantly correlated with net interest income, electronic business income, and customers' deposits; but was positively and insignificantly correlated with net profit after tax. The study concludes that investments in technological infrastructure positively influence the financial performance of banks in Nigeria.

Fogge (2019) Comparative Analysis of Technical, Allocative and Cost Efficiency of Nigerian Deposit Money Banks. This paper investigated the consistency of technical, allocative and cost efficiency of deposit money banks in Nigeria over the period 2010 to 2017 using non-parametric, data envelopment analysis (DEA) techniques. Among others, the results suggested moderate consistency between cost and technical efficiency and higher allocative efficiency scores rankings. Based on these findings, the paper concluded that the efficiency levels of the sector were relatively strong, implying that as financial deepening improved, and the sector's ability to finance real activity grew stronger; further improving banking habits and the efficiency of intermediation. However, technical inefficiency was the major source of inefficiency, which calls for managerial development in order to scale up the efficiency levels.

Adesola and Uket (2020) Deposit Money Banks Services and Economic Growth in Nigeria. This study examined the impact of deposit money banks services on the growth of the Nigerian economy. The study was specifically meant to examine the impact of aggregate banks credits, aggregate banks deposits and effect of interest rates spread on the growth of the Nigerian economy. To achieve these objectives, Time series data were collected from the CBN statistical Bulletin using the desk survey method from 1984 to 2017. The data were analyzed using various econometrics techniques such as the descriptive statistics test, the augmented Dickey-Fuller (ADF) unit root test, correlation matrix, and Autoregressive Distributive Lag (ARDL) Model. Findings from the analysis showed that, there is an insignificant short and long run effects of aggregate banks credits on the growth of the Nigerian economy. It also revealed insignificant short and long-run effects of aggregate banks deposits on the growth of the Nigerian economy and furthermore, insignificant short and long-run effects of interest rates spread on the growth of the Nigerian economy.

Eneisik (2021) examined Cost Management Practice and Financial Performance of Listed Deposit Money Banks in Nigeria. Competitive business environment require efficient financial management which underscore the significant of adopting cost management practice to enhance cost control and cost reduction. This study empirically investigated the relationship between cost management practice and financial performance of listed Deposit Money Banks in Nigeria. Cost management practice is proxied by activity based costing, target costing and standard costing while financial performance is proxied by profit before tax. The population of the study consists of 15 listed deposit money banks in Nigeria. The study adopts judgmental sampling techniques to select 10 banks as sample size for the study. The study adopts methodological triangulation research methodology. Primary data was obtained through a five-point likert scale structured designed questionnaire to elicit response from the respondent. Secondary data was obtained from annual financial report of listed Deposit Money Banks in Nigeria from 2010 – 2018. Hypotheses were tested using Ordinary Least Square Regression statistical tool with the aid of E-view 10 econometric statistical software. The

finding shows that activity based costing had significant impact on profit before tax. Evidence shows that target costing had negative impact on profit before tax.

Arinze-Emefo and Ibrahim (2023) Cashless Banking and Performance of Deposit Money Banks. Cashless banking has gained popularity over the years, with the increasing adoption of digital payment methods, such as mobile payments, internet banking, and electronic fund transfers. This trend has significant implications for the banking industry, particularly deposit money banks, which rely on deposits as a primary source of funding. The purpose of this study is to examine the relationship between cashless banking and the performance of deposit banks. The study employs a quantitative research method. The quantitative component involves the use of secondary data from financial statements of deposit banks for a period of five years (2016-2020). The financial performance indicators to be analyzed include return on assets (ROA), return on equity (ROE), net interest margin (NIM), and cost-to-income ratio (CIR). The data collected from the quantitative components was analyzed using thematic statistical techniques. The findings will provide insights into the impact of cashless banking on the performance of deposit banks and the factors that influence this relationship. The study's results will be useful to deposit banks, policymakers, and other stakeholders in the banking sector as they make decisions on the adoption and implementation of cashless banking.

Sowunmi, Manga and Oriakpono (2024) studied Distributed Ledger Technology and Financial Reporting Integrity in Nigerian Quoted Banks: A Study on Error Reduction and Enhanced Transparency. Afri study investigated the effect of distributed ledger technology (DLT) factors on eliminating financial reporting errors (FREs) in quoted Nigerian banks. Using an exploratory survey design, data was collected from 300 employees of 14 quoted banks involved in financial reporting. DLT factors of public, private, hybrid, and blockchain were examined as independent variables affecting the dependent variable of FRE elimination. Descriptive analysis showed that all DLT types were perceived as highly effective for error reduction. Correlation analysis revealed strong positive relationships between DLT factors and FRE mitigation. Regression modeling found that hybrid DLT had the largest impact on error elimination, followed by private, public, and blockchain DLT. Together, the DLT factors explained 98.1% of the variance in FRE reduction. The results statistically established the significant positive effects of DLT factors on eliminating prevalent FREs like principle, omission, entry, disclosure, and reversal errors.

### **2.3.2 Smart Contracts and Enhanced Fraud Detection of Deposit Money banks in Enugu State**

Prasad, Kumar, Boddapati and Manikanth (2023) Enhancing Performance of Financial Fraud Detection Through Machine Learning Model. Despite attempts to reduce it, financial fraud continues to be a major problem in many industries, including healthcare, banking, and insurance. Traditional

fraud detection techniques, which are often manual, are inefficient, time-consuming, and costly. As a result, methods that use AI and ML have been implemented to improve fraud detection procedures. This study examines the application of ML algorithms for credit card fraud detection using a dataset consisting of 284,807 transactions made by European cardholders in 2013, out of which 492 were fraudulent. Preprocessing steps, including Label Encoding, SMOTE for handling class imbalance, and PCA for feature reduction, were applied to the dataset. On the training dataset have applied ML based classification models like DT, SVM, and ANNs were employed to evaluate their performance. The models were assessed using accuracy, precision, and recall as key metrics. The ANN model emerged as the best-performing model, achieving 98.41% precision, 98.69% accuracy, and 98.98% recall, outperforming both Decision Trees and SVM. This study highlights the effectiveness of ML models, particularly ANNs, in improving financial fraud detection

Musiliu, Mlanga and Oriakpono (2024) Distributed Ledger Technology and Financial Reporting Integrity in Nigerian Quoted Banks: A Study on Error Reduction and Enhanced Transparency. This study investigated the effect of distributed ledger technology (DLT) factors on eliminating financial reporting errors (FREs) in quoted Nigerian banks. Using an exploratory survey design, data was collected from 300 employees of 14 quoted banks involved in financial reporting. DLT factors of public, private, hybrid, and blockchain were examined as independent variables affecting the dependent variable of FRE elimination. Descriptive analysis showed that all DLT types were perceived as highly effective for error reduction. Correlation analysis revealed strong positive relationships between DLT factors and FRE mitigation. Regression modeling found that hybrid DLT had the largest impact on error elimination, followed by private, public, and blockchain DLT. Together, the DLT factors explained 98.1% of the variance in FRE reduction. The results statistically established the significant positive effects of DLT factors on eliminating prevalent FREs like principle, omission, entry, disclosure, and reversal errors.

Umawadee, Wirapong, Tossapon and Iam-On (2024) Enhancing Fraud Detection in Banking using Advanced Machine Learning Techniques. This study demonstrates the effectiveness of advanced machine learning techniques in detecting fraudulent activities within the banking industry. We evaluated the performance of various models, including LightGBM, XGBoost, CatBoost, vote classifiers, and neural networks, on a comprehensive dataset of banking transactions. The CatBoost model exhibited the highest accuracy in identifying fraudulent instances, showcasing its superior performance. The application of diverse sampling and scaling techniques significantly improved fraud detection accuracy, emphasizing their crucial role in the process. Furthermore, the incorporation of the CatBoost ensemble method substantially enhanced the efficiency of fraud identification. Our findings underscore the potential of these advanced machine-learning approaches in mitigating financial losses and ensuring secure transactions, ultimately bolstering trust and security in the

banking sector. Future research directions include refining the CatBoost model's hyper parameters, adapting to evolving fraud patterns, and integrating real-time data for enhanced responsiveness.

Hafez, Hafez, Saleh, El - Mageed and Abohany (2025) systematic review of AI-enhanced techniques in credit card fraud detection. The rapid increase of fraud attacks on banking systems, financial institutions, and even credit card holders demonstrate the high demand for enhanced fraud detection (FD) systems for these attacks. This paper provides a systematic review of enhanced techniques using Artificial Intelligence (AI), machine learning (ML), deep learning (DL), and meta-heuristic optimization (MHO) algorithms for credit card fraud detection (CCFD). Carefully selected recent research papers have been investigated to examine the effectiveness of these AI-integrated approaches in recognizing a wide range of fraud attacks. These AI techniques were evaluated and compared to discover the advantages and disadvantages of each one, leading to the exploration of existing limitations of ML or DL-enhanced models. Discovering the limitation is crucial for future work and research to increase the effectiveness and robustness of various AI models. The key finding from this study demonstrates the need for continuous development of AI models that could be alert to the latest fraudulent activities.

#### **2.4 Summary and Gap in Empirical Review**

The studies done were carried outside Distributed Ledger Technology (DLT) and cost minimization of Deposit Money banks in Enugu State and did not focus to best of my knowledge on the Distributed Network and Infrastructure Costs; Smart Contracts and Enhanced Fraud Detection of Deposit Money banks in Enugu State. Most of the studies reviewed analysed their data through A purposeful sampling technique, Descriptive statistics and appropriate inferential statistics, Multiple sampling technique, Partial Least Square Structural Equation Modeling (PLS-SEM), Multiple Regression Analysis (MRA) method, Simple linear regression and Pearson correlation coefficient (r) while the present study made use of Z - test to test the hypotheses. Therefore, the study aimed at filling this research gap by evaluating the Distributed Ledger Technology (DLT) and cost minimization of Deposit Money banks in Enugu State.

#### **3.0 Methodology**

The study was based on the three (3) selected banks within Enugu metropolis with high number of staff and long years of establishment namely: Union Bank, Access Bank and Zenith bank. The total population for the study was two hundred and sixty seven (267). The study made use of the whole due to its small number. A survey design was adopted for the study. Instrument used for data collection was the questionnaire and interviews. Two hundred and fifty two (252) copies of questionnaire were properly completed and returned. That gave 94 percent response rate. The validity of the instrument was tested using content analysis and the result was good. The reliability was tested using the Pearson correlation coefficient (r). It gave a reliability co-efficient of 0.82 which was also good. Data was

presented and analyzed by mean score (3.0 and above agreed while below 3.0 disagreed) and Z – test was used to test the hypotheses with aid of Special Package for Statistical Software (SPSS).

**4.0 Data Presentation**

**Table 4.1.1: Responses on the relationship between Distributed Network and Infrastructure Costs of Deposit Money banks in Enugu State**

		5	4	3	2	1	ΣFX	-	SD	Decision
		SA	A	N	DA	SD		X		
1	Banks adopting decentralized systems can scale their infrastructure without incurring the heavy costs associated with traditional data centers.	520 104 41.3	160 40 15.9	186 62 24.6	52 26 10.3	20 20 7.9	938 252 100.0	3.72	1.310	Agree
2	Distributed networks may require a high initial investment in technology, and hardware expenses make them economically viable for banks economically viable for banks.	612 153 60.7	160 40 15.9	45 15 6.0	46 23 9.1	21 21 8.3	884 252 100.0	4.12	1.332	Agree
3	Decentralized systems allow banks to achieve a greater return on investment (ROI) by reducing recurring infrastructure expenses.	615 123 48.8	160 40 15.9	141 47 18.7	26 13 5.2	29 29 11.5	971 252 100.0	3.8 5	1.379	Agree
4	Distributed cloud-based systems enable banks to scale up their infrastructure dynamically as needed, without large capital expenditures on physical resources.	675 135 53.6	272 68 27.0	45 15 6.0	22 11 4.4	23 23 9.1	1037 252 100.0	4.12	1.259	Agree
5	Distributed networks, particularly for compliance tracking and reporting, reduces regulatory compliance costs and the need for large compliance departments.	805 161 63.9	204 51 20.2	12 4 1.6	36 18 7.1	18 18 7.1	1075 252 100.0	4.27	1.232	Agree
<b>Total Grand mean and standard deviation</b>								<b>4.016</b>	<b>1.3024</b>	

**Source: Field Survey, 2025**

Table 4.1.1, 144 respondents out of 252 representing 57.2 percent agreed that Banks adopting decentralized systems can scale their infrastructure without incurring the heavy costs associated with traditional data centers with the mean score of 3.72 and standard deviation of 1.310. 193 respondents representing 76.6 percent agreed that Distributed networks may require a high initial investment in technology, and hardware expenses make them economically viable for banks with mean score of 4.12 and standard deviation of 1.332. 163 respondents representing 64.7 percent agreed that Decentralized systems allow banks to achieve a greater return on investment (ROI) by reducing recurring infrastructure expenses with mean score of 3.85 and standard deviation of 1.379. 203 respondents representing 80.6 percent agreed that with Distributed cloud-based systems enable banks to scale up their infrastructure dynamically as needed, without large capital expenditures on physical resources with mean score of 4.12 and standard deviation of 1.259. 212 respondents representing 84.1 percent agreed that Distributed networks, particularly for compliance tracking and reporting, reduces regulatory compliance costs and the need for large compliance departments with a mean score of 4.27 and standard deviation 1.232

**Table 4.1.2: Responses on the relationship Smart Contracts and Enhanced Fraud Detection of Deposit Money Banks in Enugu State**

		5	4	3	2	1	ΣFX	-	SD	Decision
		SA	A	N	DA	SD		X		
1	Smart contracts automatically verify and execute transactions once pre-set conditions are met, reducing the potential for fraudulent manual interventions or errors	540 108 42.9	316 79 31.3	9 3 1.2	78 39 15.5	23 23 9.1	966 252 100.0	3.83	1.364	Agree
2	Smart contracts enable the detection of complex fraud patterns, such as account takeover or identity theft, by setting up parameters for acceptable behaviors	620 124 49.2	348 87 34.5	12 4 1.6	22 11 4.4	26 26 10.3	1028 252 100.0	4.08	1.269	Agree
3	There is Embedding of fraud detection algorithms in smart contracts, banks can automate responses to fraudulent activities,	745 149 59.1	336 84 33.3	9 3 1.2	12 6 2.4	10 10 4.0	1112 283 100.0	4.41	.943	Agree

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4	Smart contracts prevent the possibility of double-spending by enforcing strict rules about how and when funds are transferred, ensuring that transactions are fully verified before execution	645 129 51.2	384 96 38.1	12 3 1.2	22 11 4.4	13 13 5.2	1076 252 100.0	4.26	1.049	Agree
5	Smart contracts prevent double-spending, a common issue in digital transactions, by ensuring that funds are only used once according to the conditions programmed into the contract.	445 89 35.3	416 104 41.3	12 3 1.2	72 36 14.3	20 20 7.9	965 283 100.0	3.82	1.274	Agree
<b>Total Grand mean and standard deviation</b>								<b>4.08</b>	<b>1.1798</b>	

## Source: Field Survey, 2025

Table 4.1.2, 187 respondents out of 252 representing 74.2 percent agreed that Smart contracts automatically verify and execute transactions once pre-set conditions are met, reducing the potential for fraudulent manual interventions or errors with the mean score of 3.83 and standard deviation of 1.364. 211 respondents representing 83.7 percent agreed that Smart contracts enable the detection of complex fraud patterns, such as account takeover or identity theft, by setting up parameters for acceptable behaviors with mean score of 4.08 and standard deviation of 1.269. 233 respondents representing 92.4 percent agreed that there is embedding of fraud detection algorithms in smart contracts, banks can automate responses to fraudulent activities with mean score of 4.41 and standard deviation of .943. 225 respondents representing 89.3 percent agreed that with Smart contracts prevent the possibility of double-spending by enforcing strict rules about how and when funds are transferred, ensuring that transactions are fully verified before execution with mean score of 4.26 and standard deviation of 1.049. 193 respondents representing 76.6 percent agreed that Smart contracts prevent double-spending, a common issue in digital transactions, by ensuring that funds are only used once according to the conditions programmed into the contract with a mean score of 3.82 and standard deviation 1.274

**4.2 Test of Hypotheses**

**4.2.1 Hypotheses One: Distributed network has relationship on infrastructure costs of deposit money banks in Enugu State**

**One-Sample Kolmogorov-Smirnov Test**

	Banks adopting decentralized systems can scale their infrastructure without incurring the heavy costs associated with traditional data centers.	Distributed networks may require a high initial investment in technology, and hardware expenses make them economically viable for banks.	Decentralized systems allow banks to achieve a greater return on investment (ROI) by reducing recurring infrastructure expenses.	Distributed cloud-based systems enable banks to scale up their infrastructure dynamically as needed, without large capital expenditures on physical resources.	Distributed networks, particularly for compliance tracking and reporting, reduces regulatory compliance costs and the need for large compliance departments.	
N	252	252	252	252	252	
Uniform Parameters <sup>a,b</sup>	Minimum	1	1	1	1	
	Maximum	5	5	5	5	
Most Extreme Differences	Absolute	.413	.607	.488	.556	.639
	Positive	.079	.083	.115	.091	.071
	Negative	-.413	-.607	-.488	-.556	-.639
Kolmogorov-Smirnov Z	6.551	9.638	7.748	8.819	10.142	
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	

a. Test distribution is Uniform.

b. Calculated from data.

**Decision Rule**

If the calculated Z-value is greater than the critical Z-value (i.e  $Z_{cal} > Z_{critical}$ ), reject the null hypothesis and accept the alternative hypothesis accordingly.

**Result**

With Kolmogorov-Smirnon Z – value ranges from  $6.551 < 10.142$  and on Asymp. Significance of 0.000, the responses from the respondents as display in the table is normally distributed. This affirms

the assertion of the most of the respondents that Distributed network had significant positive relationship with infrastructure costs of deposit money banks in Enugu State

**Decision**

Furthermore, comparing the calculated Z- value ranges from  $6.551 < 10.142$  against the critical Z- value of 0.000 (2-tailed test at 95 percent level of confidence) the null hypothesis were rejected. Thus the alternative hypothesis was accepted which states that Distributed network had significant positive relationship with infrastructure costs of deposit money banks in Enugu State

**4.2.2 Hypotheses Two: Smart contracts have relationship with enhanced fraud detection of deposit money banks in Enugu State.**

**One-Sample Kolmogorov-Smirnov Test**

	Smart contracts automatically verify and execute transactions once pre-set conditions are met, reducing the potential for fraudulent manual interventions or errors.	Smart contracts enable the detection of complex fraud patterns, such as account takeover or identity theft, by setting up parameters for acceptable behaviors,	Embedding fraud detection algorithms in smart contracts, banks can automate responses to fraudulent activities,	Smart contracts prevent the possibility of double-spending by enforcing strict rules about how and when funds are transferred, ensuring that transactions are fully verified before execution.	Smart contracts prevent double-spending, a common issue in digital transactions, by ensuring that funds are only used once according to the conditions programmed into the contract.	
N	252	252	252	252	252	
Uniform Parameters <sup>a,b</sup>	Minimum	1	1	1	1	
	Maximum	5	5	5	5	
Most Extreme Differences	Absolute	.492	.587	.675	.643	.516
	Positive	.091	.103	.040	.052	.079
	Negative	-.492	-.587	-.675	-.643	-.516
Kolmogorov-Smirnov Z	7.811	9.323	10.709	10.205	8.189	
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	

a. Test distribution is Uniform.

b. Calculated from data.

### **Decision Rule**

If the calculated Z-value is greater than the critical Z-value (i.e  $Z_{cal} > Z_{critical}$ ), reject the null hypothesis and accept the alternative hypothesis accordingly.

### **Result**

With Kolmogorov-Smirnon Z – value ranges from  $7.811 < 10.709$  and on Asymp. Significance of 0.000, the responses from the respondents as display in the table is normally distributed. This affirms the assertion of the most of the respondents that **Smart contracts had significant positive relationship with enhanced fraud detection of deposit money banks in Enugu State.**

### **Decision**

Furthermore, comparing the calculated Z- value ranges from  $7.811 < 10.709$  against the critical Z- value of 0.000 (2-tailed test at 95 percent level of confidence) the null hypothesis were rejected. Thus the alternative hypothesis was accepted which states that **Smart contracts had significant positive relationship with enhanced fraud detection of deposit money banks in Enugu State.**

### **4.3 Discussion of Findings**

From the result of hypotheses one, the calculated Z- value ranges from  $6.551 < 10.142$  against the critical Z- value of 0.000 which implies that Distributed network had significant positive relationship with infrastructure costs of deposit money banks in Enugu State. In the support of result in the literature review, Eneisik, (2021) examined Cost Management Practice and Financial Performance of Listed Deposit Money Banks in Nigeria. The finding shows that activity based costing had significant impact on profit before tax. Evidence shows that target costing had negative impact on profit before tax. Sowunmi, et al., (2024) studied Distributed Ledger Technology and Financial Reporting Integrity in Nigerian Quoted Banks: A Study on Error Reduction and Enhanced Transparency. Regression modeling found that hybrid DLT had the largest impact on error elimination, followed by private, public, and blockchain DLT. Together, the DLT factors explained 98.1% of the variance in FRE reduction. The results statistically established the significant positive effects of DLT factors on eliminating prevalent FREs like principle, omission, entry, disclosure, and reversal errors.

From the result of hypotheses two, the calculated Z- value ranges from  $7.811 < 10.709$  against the critical Z- value of 0.000 which implies that Smart contracts had significant positive relationship with enhanced fraud detection of deposit money banks in Enugu State. In the support of result in the literature review, Umawadee, et al., (2024) conducted a study on enhancing Fraud Detection in Banking using Advanced Machine Learning Techniques. The application of diverse sampling and scaling techniques significantly improved fraud detection accuracy, emphasizing their crucial role in the process. Furthermore, the incorporation of the CatBoost ensemble method substantially enhanced the efficiency of fraud identification. Hafez, et al., (2025) conducted a study on systematic review of

AI-enhanced techniques in credit card fraud detection. The key finding from this study demonstrates the need for continuous development of AI models that could be alert to the latest fraudulent activities.

### **5.0 Summary of Findings**

- i. Distributed network had significant positive relationship with infrastructure costs of deposit money banks in Enugu State,  $Z(10.142, P. <.05)$
- ii. Smart contracts had significant positive relationship with enhanced fraud detection of deposit money banks in Enugu State,  $Z(10.709, P. <.05)$

### **5.1 Conclusion**

The study concluded that Distributed network and Smart contracts had significant positive relationship with infrastructure costs and enhanced fraud detection of deposit money banks in Enugu State. Distributed Ledger Technology (DLT), such as blockchain, is a digital system that records transactions across multiple computers in a decentralized and tamper-proof way. In the deposit money banks, DLT offers significant potential for cost minimization by streamlining operations and improving transparency. DLT enables peer-to-peer transactions, reducing reliance on middlemen (e.g., clearing houses), thereby lowering transaction fees and settlement costs. Real-time processing of transactions reduces delays and the associated operational costs of reconciliation and error correction and the immutable and transparent nature of DLT minimizes the risks and costs of fraud, data breaches, and cyberattacks. Overall, the adoption of DLT helps deposit money banks enhance efficiency, reduce operational costs, and improve service delivery, positioning them for long-term profitability and innovation.

### **5.2 Recommendations**

- i. Deposit Money Banks (DMBs) should break the monolith: move core systems to micro-services and (where appropriate) server less and adopt a disciplined hybrid / multi-cloud strategy as FinTech case study, shifting to micro-services plus AWS Lambda cut compute spend and halved deployment time.
- ii. Banks should adopt a permissioned DLT layer and make every high-risk banking workflow a smart-contract workflow, because transactions are written to a shared, append-only ledger that multiple nodes validate, a fraudulent entry cannot be inserted or altered without immediate consensus failure, giving auditors a tamper-proof trail.

### **REFERENCES**

- Adebisi Adesola, Uket Ewa, (2020). Deposit Money Banks Services and Economic Growth in Nigeria, *International Journal of Finance and Accounting*. 9(2), 31-41. doi: 10.5923/j.ijfa.20200902.02.

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---

Alabi A. W., Adebisi A. J. and Fatimehin K. (2020). Influence of Cost Efficiency on Performance of Nigerian Listed Deposit Money Banks. *Journal of Economics, Finance and Management Studies*. ISSN(print): 2644-0490, ISSN(online): 2644-0504 3 (12) DOI: 10.47191/jefms/v3-i12-09 Page No.- 276-289

Arinze-Emefo, I. and Ibrahim, U. (2023). Cashless Banking and Performance of Deposit Money Banks. *Open Journal of Business and Management*, 11, 3194-3212. doi: 10.4236/ojbm.2023.116174.

Barney, N., Troy S. and Pratt M. K. (2025). Distributed ledger technology (DLT) <https://www.techtarget.com/searchcio/definition/distributed-ledger#:~:text=Distributed%20ledger%20technology%20has%20the,reduce%20the%20cost%20of%20transactions>.

Chen J., Murry C. & Ecker J., (2023). Distribution: Definition in Finance, Types, and Examples  
DoI:10.32479/ijefi.16613

Eneisik G. E., (2021). Cost Management Practice and Financial Performance of Listed Deposit Money Banks in Nigeria. *Journal of Accounting and Financial Management* E-ISSN 2504-8856 P-ISSN 2695-2211. 7, 2. [www.iiardpub.org](http://www.iiardpub.org)

Faster payment council (2025). The Role of Digital Ledger Technology in Core Banking Functions.

Fogge A., (2019). Comparative Analysis of Technical, Allocative and Cost Efficiency of Nigerian Deposit Money Banks. *Central Bank of Nigeria Economic and Financial Review* Volume 57/1 March 2019 59

Huibers, F. (2024). Distributed Ledger Technology and the Future of Money and Banking: Banking is Necessary, Banks Are Not. *Bill Gates 1994. Accounting, Economics, and Law: A Convivium*, 14(2), 213-249. <https://doi.org/10.1515/ael-2019-0095> IIARD – International Institute of Academic Research and Development Page 1

Infosys B., (2025). Cost reduction strategies in banking BPM. <https://www.infosysbpm.com/blogs/banking/banking-cost-reduction.html#:~:text=Improve%20workplace%20productivity,goals%2C%20and%20eliminate%20redundant%20processes>. *Journal of Accounting and Financial Management* E-ISSN 2504-8856 P-ISSN 2695-2211 Vol 7.

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---

Martin F. and Boris P. P (2019). Smart Contracts (in German). Mohr Siebeck. ISBN 978-3-16-156911-1. JSTOR [j.ctvn96h9r](https://www.jstor.org/stable/2696969).

Musiliu S. B., Mlanga S., Oriakpono A. E., (2024). Distributed Ledger Technology and Financial Reporting Integrity in Nigerian Quoted Banks: A Study on Error Reduction and Enhanced Transparency. *African Journal of Accounting and Financial Research*, 7(4),16-35

Nevil S. and Clemon D., (2024). Distributed Ledger Technology (DLT): Definition and How It Works. <https://www.investopedia.com/terms/d/distributed-ledger-technology-dlt.asp>

Nord V., (2025). distributed network <https://nordvpn.com/cybersecurity/glossary/distributed-network/>

Olabode, O. O., and Ojo, A. K., (2024). “Enhancing the Detection of Debit Card Fraud Detection Using Logistic Regression and Random Forest Techniques”. *Journal of Advances in Mathematics and Computer Science* 39(10), 74-83. <https://doi.org/10.9734/jamcs/2024/v39i101936>.

Ononiwu M. I., Onwuzulike O. C., Shitu K., (2024). Comparative analysis of cost management strategies in banks: The role of operational improvements in the US and Nigeria. *World Journal of Advanced Research and Reviews*, 23(03), 492–507

Paige P. P. and Smith J., (2024) Distributed Ledger Technology: A Case Study of the Regulatory Approach to Banks’ Use of New Technology. <https://bpi.com/distributed-ledger-technology-a-case-study-of-the-regulatory-approach-to-banks-use-of-new-technology/>

Prasad G., Kumar H., Boddapati V. N., and Manikanth, B., (2023). Enhancing Performance of Financial Fraud Detection Through Machine Learning Model. *Journal of Contemporary Education Theory & Artificial intelligence*. DOI:10.47991/2996-4954/JCETAI-101

Shabsigh G., Khiaonarong T., and Leinonen H., (2020). Distributed Ledger Technology Experiments in Payments and Settlements.

Sowunmi, Mlanga and Oriakpono, (2024). Distributed Ledger Technology and Financial Reporting Integrity in Nigerian Quoted Banks: A Study on Error Reduction and Enhanced Transparency. *African Journal of Accounting and Financial Research* 7(4), 16-35 DOI:10.52589/AJAFR-D4MTG09N

Sveriges R., (2024). The financial infrastructure. <https://www.riksbank.se/en-gb/financial-stability/the-financial-system/the-financial-infrastructure/#:~:text=The>

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%2ofinancial%20infrastructure%20is%20the,with%20financial%20instruments%20are%20ha  
ndled.

Tian M., and Junhua C., (2023). Smart Contract in block chain. D. Qiu et al. (Eds.): ICBBEM 2022, AHIS 5, pp. 868–875, 2023. [https://doi.org/10.2991/978-94-6463-030-5\\_86](https://doi.org/10.2991/978-94-6463-030-5_86)

Umawadee D., Wirapong C., Tossapon B., and Iam-On N., (2024). Enhancing Fraud Detection in Banking using Advanced Machine Learning Techniques. International Journal of Economics and Financial Issues 14(5):177-184