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DISTRIBUTED LEDGER TECHNOLOGY AND FINANCIAL REPORTING INTEGRITY IN NIGERIAN QUOTED BANKS: A STUDY ON ERROR REDUCTION AND ENHANCED TRANSPARENCY

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ABSTRACT: *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. Key contributions include providing robust empirical evidence that leveraging DLT, especially hybrid DLT, can eliminate common financial reporting errors in Nigerian banks. The pioneering study expands conceptualizations, theories, and literature regarding DLT's potential to comprehensively transform financial reporting accuracy. It offers important implications for policy, practice, and research on regulating, adopting, and studying DLT solutions to address persistent financial statement errors undermining stakeholder trust in Nigeria's banking sector. The study concludes by strongly recommending for policy and, in practice, the regulation and full adoption of DLT for the elimination of FREs in Nigeria.*

KEYWORDS: Distributed Ledger Technology (DLT), Financial Reporting Errors, Quoted Nigerian Banks, Blockchain, Accuracy.

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INTRODUCTION

Financial Reporting Errors (FREs) persist worldwide despite technological advances, posing significant risks to companies and eroding stakeholder confidence. These errors result from complex accounting standards, reliance on manual processes, outdated systems, and human mistakes (Al-Mudimigh & Benkhelifa, 2018; Cai & Wang, 2019). Globally, corporate scandals linked to inaccurate financial reporting highlight the gravity of this issue. The Enron scandal in 2001 and the Wells Fargo fake accounts scandal in 2016 are prime examples of how FREs can lead to severe repercussions, including company collapse and substantial fines (Bajaj & Bhattacharya, 2020). In Nigeria, FREs, particularly in the financial sector, have led to a significant erosion of stakeholder trust, threatening the viability of institutions. From 1994 to 2006, 46 banks collapsed in Nigeria, with inaccurate financial reporting identified as a critical factor (Mlanga, 2018). The Central Bank of Nigeria (CBN) continues to express concerns about persistent transparency and accountability gaps within the financial system (Emefiele, 2022).

Distributed Ledger Technology (DLT), including blockchain, is emerging as a potential solution to mitigate FREs through its transparency, immutability, and security features. Despite growing global interest, academic research on DLT's capacity to eliminate FREs remains limited, especially in the Nigerian context. This study aims to explore DLT's potential in mitigating common accounting errors within Nigerian banks, with the hope of restoring trust and transparency in these institutions. Before the digital era, accounting was done manually, which was prone to errors. Although technology has enhanced speed and accuracy, challenges in achieving error-free financial records remain (Mlanga, 2018). FREs, though often unintentional, mislead users of financial statements, resulting in severe consequences, including reputational damage and legal liabilities (NKraus & Marchenko, 2021). This research seeks to empirically assess DLT's potential to eliminate FREs in Nigerian banks. DLT, 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. Since 2021, Nigerian banks like GTCO, Access Corp, UBA, and Zenith Bank have shown interest in DLT, although its full application has been restricted by the CBN until the Federal Government's 2023 National Policy on Blockchain (Martindale, 2016; Sheehan, 2017).

Statement of the Problem

Despite technological advancements, FREs continue to undermine the accuracy and reliability of financial statements globally, leading to significant consequences such as reputational damage and improper decision-making (Alqarni et al., 2019; Cai et al., 2020). In Nigerian banks, these errors are exacerbated by complex operations and weak internal controls, further diminishing stakeholder trust (Emefiele, 2022; Mlanga, 2018). Studies indicate that technologies like AI and data analytics can minimize FREs, but there is limited research on solutions that completely eliminate these errors (Oseni et al., 2019; Tondoi et al., 2021). FREs include errors of commission, omission, principle, reversal, and timing, among others, each capable of making financial statements incorrect and misleading (Brock & Evans, 2018). These errors persist due to the semi-traditional financial system, which centralizes and relies on intermediaries, making it vulnerable to mistakes and fraud. Blockchain, with its decentralized and secure nature, offers a potential solution, yet its effectiveness in eliminating FREs in Nigerian banks remains unexplored (TImam et al., 2021).

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Objectives of the Study

This study aims to explore DLT's effect on eliminating FREs in quoted Nigerian banks. The specific objectives include:

1. Assessing the effect of public DLT in eliminating financial reporting errors.
2. Evaluating how private DLT can eradicate financial reporting errors.
3. Examining the effect of hybrid DLT in eliminating financial reporting errors.
4. Appraising the effect of blockchain in removing financial reporting errors.

Hypotheses of the Study

The following null hypotheses will be tested:

1. **Ho1**: Public DLT has no significant effect on eliminating financial reporting errors in quoted Nigerian banks.
2. **Ho2**: Private DLT has no significant effect on eradicating financial reporting errors in quoted Nigerian banks.
3. **Ho3**: Hybrid DLT has no significant effect on eliminating financial reporting errors in quoted Nigerian banks.
4. **Ho4**: Blockchain has no significant effect on removing financial reporting errors in quoted Nigerian banks.

LITERATURE REVIEW

Conceptual Framework

This section delineates Financial Reporting Errors (FREs) as the dependent variable and Distributed Ledger Technology (DLT) as the independent variable, exploring their interaction and impact on financial reporting within Nigerian banks.

Financial Reporting Errors (FREs)

Financial reporting involves consolidating financial data according to accounting standards (Brown, 2018). FREs, defined as mistakes or inaccuracies in financial statements, stem from human error, outdated systems, or intentional fraud (Cai et al., 2020; Bass & Krueger, 2020). Common errors include misclassifications, incorrect journal entries, and non-compliance with standards (Chong & Loke, 2019). These inaccuracies mislead stakeholders, leading to poor decision-making, financial loss, and legal repercussions (Bodnar & Wachowicz, 2020; Alqarni et al., 2019).

Traditional reporting processes are prone to manual data entry and reconciliation issues, fostering errors and delays (Bai et al., 2019). DLT offers potential solutions by providing transparent, tamper-proof records, enhancing data accuracy, and reducing fraud (Swan, 2015; Zhao et al., 2019). Real-time data access and advanced analytics through DLT can improve

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reporting quality and decision-making (Shin & Kim, 2020). FREs have significantly impacted organizations globally, with notable cases like Enron, Wells Fargo, and several Nigerian banks facing closure due to reporting errors (Mlanga, 2018; Emefiele, 2022).

In Nigeria, FREs have eroded trust and threatened the viability of financial institutions, highlighting the necessity for robust solutions like DLT to enhance transparency and accuracy (Spoke, 2015; Bellucci et al., 2022).

Distributed Ledger Technology (DLT)

DLT is a decentralized database secured by cryptography, ensuring transaction integrity and transparency without intermediaries (Chan & Yao, 2019; Chen & Daugherty, 2019). It enhances financial reporting by providing a single source of truth, reducing errors and fraud through immutable records and automated processes (Christensen & McDaniel, 2019; Cai et al., 2018; Blumberg, 2017).

Advantages of DLT

- **Accuracy and Transparency:** DLT increases data accuracy and transparency, providing real-time access and reducing reporting costs by eliminating intermediaries (Cai & Wang, 2019; Bhattacharya & Pakhira, 2020).
- **Automation:** Smart contracts automate reporting processes, minimizing human error and enhancing efficiency (Blumberg, 2017).
- **Security:** Cryptographic techniques ensure data integrity and security, mitigating fraud and cyber-attacks (Ahmed et al., 2020).

Challenges of DLT

- **Infrastructure and Expertise:** Significant investment in infrastructure and expertise is required (Bellucci et al., 2022).
- **Standardization:** Lack of standardization may create interoperability issues between different systems (Broby & Paul, 2017).
- **Regulatory Framework:** Evolving regulations create uncertainty for financial institutions (Atik & Kelten, 2021).

DLT is categorized into Public, Private, Hybrid DLT, and Blockchain, each with distinct characteristics influencing financial reporting and FREs.

Public DLT: Public DLT (permissionless) is open to all participants, ensuring transparency and immutability, suitable for financial reporting and digital exchanges (Dinh et al., 2018; Mansoori et al., 2020). Examples include Bitcoin and Ethereum, offering decentralized trust but facing scalability and privacy issues (Pellumbi, 2021; Busch & Damsgaard, 2018).

Private DLT: Private DLT (permissioned) restricts participation to specific entities, enhancing privacy and scalability for enterprise applications like banking and supply chain management (Crosby et al., 2016; Chen et al., 2020; Cai, 2021). Examples include Hyperledger Fabric and Corda used by major banks to ensure secure, efficient data sharing (Mansoori et al., 2020). However, central control raises governance concerns (Budhiraja & Rani, 2020).

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Hybrid DLT: Hybrid DLT combines public and private elements, balancing transparency with privacy for applications like banking and insurance (Bank for International Settlement, 2021). It allows for customization and interoperability, though implementation complexity remains a challenge (Budhiraja & Rani, 2020).

Blockchain:
Blockchain, a subset of DLT, is a decentralized digital ledger enabling secure, transparent, and immutable transaction recording (BAnthony, 2020; BIS, 2022). It reduces transaction costs and time by eliminating intermediaries, enhancing financial inclusion and transparency (Brück, 2020; Frizzo-Barker et al., 2020). Blockchain supports advanced financial instruments like Central Bank Digital Currencies (CBDCs) and cryptocurrencies, promoting trust and reducing corruption (Davoodalhosseini, 2021; ISDA, 2022).

Features of Blockchain

- **Immutability:** Ensures records cannot be altered, boosting data integrity (Lemieux, 2016; Wespra, 2016).
- **Real-Time Data Access:** Facilitates timely decision-making with up-to-date information (Shin & Kim, 2020).
- **Automation:** Streamlines back-office tasks through smart contracts (Silverberg et al., 2015).

Framework of FREs and DLT

DLT transforms financial reporting by enabling real-time data reconciliation, transparent audit trails, and enhanced data sharing (Pellumbi, 2021; Mansoori et al., 2020). Key benefits include:

- **Real-Time Reconciliation:** Eliminates time-consuming reconciliation processes, reducing errors and inconsistencies.
- **Transparent Audit Trails:** Provides immutable records, enhancing security and reducing the need for extensive audits (Deloitte, 2018).
- **Data Sharing and Collaboration:** Facilitates secure and transparent data sharing among stakeholders, ensuring consistency and accuracy (Mansoori et al., 2020).
- **Automation:** Reduces manual intervention, minimizing human error and improving reporting accuracy (Deloitte, 2018).
- **Enhanced Security:** Cryptography and advanced authentication mechanisms protect financial data from tampering and cyber threats (Ahmed et al., 2020).

DLT's adoption is expected to streamline financial reporting processes, reduce FREs, and provide higher assurance to stakeholders (Iansiti & Lakhani, 2017). Empirical evidence suggests that DLT can significantly enhance transparency, security, and efficiency in financial reporting, thereby mitigating FREs and fostering trust among stakeholders.

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Empirical Studies Review

This review examines the impact of Distributed Ledger Technology (DLT) on financial reporting, focusing on its potential to mitigate financial reporting errors (FREs). Several studies have explored the impact of DLT on financial reporting, but gaps remain, particularly in the empirical validation of its effectiveness.

Public DLT and FREs

Research on public DLT's impact on financial reporting errors is limited. While public DLT's transparency and immutability are expected to reduce falsification and inaccuracies, empirical evidence is lacking (Mansoori et al., 2020). Most studies focus on blockchain, a subset of public DLT, without evaluating broader public DLT solutions. This research quantitatively analyzes public DLT's effect on reducing key FREs.

Private DLT and FREs

Private DLT is gaining interest in financial institutions due to its security and privacy benefits (Yang et al., 2019). However, few studies empirically validate its effectiveness in enhancing reporting quality and eliminating errors. This research addresses the gap by examining private DLT's impact on mitigating major FREs in Nigerian quoted banks.

Hybrid DLT and FREs

Hybrid DLT, which combines public and private DLT features, offers flexibility and interoperability (Hughes et al., 2019). However, empirical analysis substantiating its ability to improve reporting accuracy by reducing FREs is scarce. This study evaluates hybrid DLT's effect on minimizing key FREs in Nigerian banks.

Blockchain and FREs

Blockchain's potential to improve financial reporting and reduce errors has been explored in several studies. Bracci et al. (2018) found that blockchain could enhance transparency through smart contracts and audit trails but did not specifically analyze FRE elimination. Yao et al. (2018) focused on SMEs, limiting insights into larger banks. Dai et al. (2019) noted blockchain's potential for real-time, verifiable financial data but lacked empirical examination of error reduction. Huang et al. (2019) demonstrated blockchain's ability to improve reporting accuracy and reduce fraud risk, but further research is needed to determine its effectiveness in eliminating FREs. This study builds on these findings by empirically testing blockchain's impact on FREs in Nigerian banks.

Theoretical Review

This section explores theories supporting the adoption of DLT in financial reporting, including consensus theory, blockchain theory, smart contract theory, information asymmetry theory, and agency theory.

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Relevant DLT Theories: Consensus Theory, Blockchain Theory, and Smart Contract Theory

Consensus Theory: A core concept in DLT, consensus theory explains how a network of nodes agrees on the state of a shared ledger without central authority (Böhme, 2015; Arner et al., 2016). While consensus mechanisms like Proof of Work (PoW) and Proof of Stake (PoS) ensure transaction validity, previous studies have not fully explored their role in eliminating FREs, which this research aims to address.

Blockchain Theory: Introduced by Satoshi Nakamoto, blockchain theory underpins DLT's decentralized, transparent, and secure transaction model. While previous research has validated blockchain's role in financial reporting (EP, 2020; Jang et al., 2021), its ability to eliminate FREs remains underexplored. This study evaluates blockchain's efficacy in addressing FREs within Nigerian banks.

Smart Contract Theory: Proposed by Nick Szabo, smart contracts are self-executing contracts embedded in blockchain technology, automating financial reporting processes to reduce errors (International et al., 2019; Feghali et al., 2022). This research explores the application of smart contracts in eliminating FREs in financial reporting.

Relevant Financial Reporting Theories: Information Asymmetry Theory and Agency Theory

Information Asymmetry Theory: Developed by George Akerlof, this theory addresses the imbalance of information in transactions, leading to adverse selection and moral hazards. DLT can reduce information asymmetry by providing a single, transparent source of truth, making it difficult to manipulate or withhold financial data.

Agency Theory: Berle and Means (1932) introduced agency theory, which explores the conflicts between principals (shareholders) and agents (managers). DLT enhances agency theory by providing a transparent, tamper-proof transaction record, reducing opportunities for agents to engage in opportunistic behavior. This study examines DLT's role in strengthening agency relationships in Nigerian banks.

METHODOLOGY

Research Design: The study adopted a survey research design to evaluate the impact of distributed ledger technology (DLT) on financial reporting errors (FREs) in quoted Nigerian banks. The design facilitates the assessment of how DLT (public, private, hybrid, blockchain) improves financial reporting by minimizing errors in financial statements. The exploratory design suits this study due to the limited previous research on DLT and its potential role in financial reporting (Saunders et al., 2012; Collis & Hussey, 2014). According to Neuman (2011), explanatory, exploratory, and descriptive research designs each serve distinct functions in research. Exploratory research is ideal when there is limited existing knowledge in the subject area, making it appropriate for this study on DLT and FREs (PiiaHyytia, 2019). This design leverages flexibility, enabling researchers to adapt based on participants' contributions through interviews and questionnaires (Saunders et al., 2012). Given the evolving nature of DLT and the complexity of financial errors, this flexibility ensures the capture of rich data.

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Moreover, this research employs quantitative methods to collect and analyze numerical data, testing hypotheses and establishing relationships between DLT and FREs. Using survey instruments, data from respondents directly involved in financial reporting will be analyzed statistically to interpret the impact of DLT on reducing financial errors.

The population for this study consists of 1,250 financial executives from 14 quoted Nigerian deposit money banks, primarily Chief Financial Officers (CFOs) and financial controllers responsible for financial reporting (NBS, 2022; NGX, 2022; CIBN, 2022). Based on statistical sampling methods, a sample size of 300 respondents was determined using Cochran's formula, ensuring a 95% confidence level with a 5% margin of error (Cochran, 1977; Bartlett et al., 2001). The study uses non-probability sampling techniques, specifically purposive sampling, to select respondents who are knowledgeable about DLT and financial reporting processes. This approach ensures the selection of participants who can provide relevant insights into how DLT affects financial reporting errors. By targeting professionals familiar with both DLT and FREs, the study seeks to obtain data that accurately reflects the relationship between these variables. Both primary and secondary data were utilized in the study. Primary data was collected through surveys and questionnaires distributed to 300 bank executives involved in financial reporting. This data was essential for understanding participants' perceptions of DLT and its impact on minimizing financial errors. Secondary data provided additional context, drawing from existing literature and reports on DLT implementation in financial systems (Kaaya, 2015). This combined data approach strengthened the empirical analysis and supported the study's objectives.

Model Specification

The model for this study is formulated to accommodate all the DLT estimators, together with residual or error terms, to ably predict the estimators' individual and collective contributions to FREs in quoted commercial banks in Nigeria.

The Models

$$FREs\ (AFREs)_{it} = b_0 + b_1 Publc_{it1} + b_2 privat_{it2} + b_3 hybrid_{it3} + b_4 blockchain_{it4} + \mu \ldots\ldots\ldots 3.1$$

where β_t, a_t, b_t, C_t, $\propto_t$ & U_t are coefficients of the independent variables and t ranges from 0 to 4. The U is the residual or error term which represents the influence of other factors that may affect FREs and which are not captured in the developed model.

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DATA PRESENTATION AND ANALYSIS

Table 4.1: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
PUBLIC DLT	300	4	5	4.63	0.483
PRIVATE DLT	300	4	5	4.70	0.461
HYBRID DLT	300	4	5	4.68	0.466
BLOCKCHAIN TECHNOLOGY	300	4	5	4.71	0.454

Source: *SPSS Version 23 Output, 2023*

Table 4.1 presents the **Descriptive Statistics** for the various types of Distributed Ledger Technology (DLT) analyzed in the study, namely Public DLT, Private DLT, Hybrid DLT, and Blockchain Technology.

- **Mean Values:** All DLT categories exhibit high mean scores, ranging from **4.63 to 4.71** on a 5-point Likert scale. This indicates a strong agreement among respondents that these DLT technologies significantly contribute to the reduction of financial reporting errors (FREs) in quoted Nigerian banks.
- **Standard Deviations:** The low standard deviations (between **0.454 and 0.483**) suggest that the responses are tightly clustered around the mean values. This consistency implies a uniform perception among the participants regarding the effectiveness of DLT in minimizing FREs.

Overall, the descriptive statistics underscore the positive impact of DLT technologies on enhancing the accuracy of financial reporting within Nigerian banking institutions.

Table 4.2: Correlations

	PUBLIC DLT	PRIVATE DLT	HYBRID DLT	BLOCKCHAIN TECH
Pearson Correlation				
PUBLIC DLT	1.000			
PRIVATE DLT	0.728	1.000		
HYBRID DLT	0.803	0.897	1.000	
BLOCKCHAIN TECH	0.754	0.801	0.873	1.000

Source: *SPSS Version 23 Output, 2023*

Table 4.2 illustrates the **Pearson Correlation Coefficients** between the different types of DLTs studied.

- **Strong Positive Correlations:**
  - **Public DLT and Private DLT:** Correlation of **0.728**.
  - **Public DLT and Hybrid DLT:** Correlation of **0.803**.
  - **Public DLT and Blockchain Technology:** Correlation of **0.754**.
  - **Private DLT and Hybrid DLT:** Correlation of **0.897**.

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- **Private DLT and Blockchain Technology:** Correlation of **0.801**.
- **Hybrid DLT and Blockchain Technology:** Correlation of **0.873**.

These high correlation coefficients indicate that the effectiveness of one type of DLT is strongly associated with the effectiveness of others in reducing financial reporting errors. For instance, the strong correlation between **Hybrid DLT and Private DLT (0.897)** suggests that improvements in one likely coincide with improvements in the other. This interrelated effectiveness supports the notion that implementing multiple DLT forms can have a synergistic impact on enhancing financial reporting accuracy in Nigerian banks.

Table 4.3: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	0.991	0.981	0.981	0.06416

Change Statistics	R^2 Change	F Change	df1	df2	Sig. F Change
	0.981	4916.208	4	269	0.000

Source: *SPSS Version 23 Output, 2023*

Table 4.3 presents the **Model Summary** for the multiple regression analysis examining the impact of various DLTs on financial reporting errors.

- **R (Correlation Coefficient): 0.991** indicates an exceptionally strong positive relationship between the independent variables (Public DLT, Private DLT, Hybrid DLT, Blockchain Technology) and the dependent variable (FREs).
- **R^2 (Coefficient of Determination): 0.981** signifies that **98.1%** of the variance in eliminating financial reporting errors is explained by the model. This high R^2 value demonstrates that the selected DLT factors are highly effective predictors of FRE reduction in Nigerian banks.
- **Adjusted R^2:** Also **0.981**, confirming that the model's explanatory power remains robust even after adjusting for the number of predictors.
- **Standard Error of the Estimate: 0.06416** reflects the average distance that the observed values fall from the regression line. A low value indicates precise predictions by the model.
- **Change Statistics:** The significant **F Change (4916.208)** with a p-value of **0.000** confirms that the model significantly improves the prediction of FREs over a model with no predictors.

Overall, the model demonstrates a highly effective fit, affirming that the DLT variables collectively play a crucial role in minimizing financial reporting errors within the banking sector.

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Table 4.4: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	80.940	4	20.235	4916.208
	Residual	1.560	269	0.004	
	Total	82.500	273		

a. Dependent Variable: EFFECT OF DLT IN ELIMINATING FREs BY NIGERIAN BANKS
b. Predictors: (Constant), BLOCKCHAIN, PUBLIC DLT, PRIVATE DLT, HYBRID DLT
Source: SPSS Version 23 Output, 2023

Table 4.4 displays the **ANOVA (Analysis of Variance)** results for the regression model assessing the impact of DLTs on FREs.

- **Regression Sum of Squares (80.940):** Represents the variation explained by the independent variables (DLTs).
- **Residual Sum of Squares (1.560):** Denotes the variation not explained by the model.
- **Total Sum of Squares (82.500):** Total variation in the dependent variable (FREs).
- **F-Statistic (4916.208):** A very high F-value indicates that the model explains a significant portion of the variance in FREs.
- **Significance (Sig. = 0.000):** The p-value is less than **0.05**, indicating that the regression model is statistically significant. This means that the DLT factors collectively have a significant impact on reducing financial reporting errors in Nigerian banks.

In summary, the ANOVA results validate the effectiveness of the regression model, confirming that the selected DLT variables are significant predictors of FRE elimination.

Table 4.5: Regression Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B
	B	Std. Error	Beta		
1	(Constant)	-0.023	0.011		-2.162
	Public DLT	0.046	0.012	0.048	4.012
	Private DLT	0.106	0.016	0.105	6.562
	Hybrid DLT	0.789	0.021	0.792	37.831
	Block chain technology	0.073	0.015	0.072	4.857

a. Dependent Variable: EFFECT OF DLT IN ELIMINATING FREs BY NIGERIAN BANKS
Source: *SPSS Version 23 Output, 2023*

Table 4.5 presents the **Regression Coefficients** for each DLT type, illustrating their individual contributions to the elimination of financial reporting errors.

- **Constant (-0.023):** The intercept is negative but not practically significant in this context.
- **Public DLT (B = 0.046, Beta = 0.048, p = 0.000):**

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- **Interpretation:** For each unit increase in Public DLT, FREs decrease by **0.046 units**, holding other variables constant.
- **Significance:** Highly significant ($p < 0.001$), indicating a strong positive effect.

- **Private DLT (B = 0.106, Beta = 0.105, p = 0.000):**
- **Interpretation:** Each unit increase in Private DLT is associated with a **0.106 unit** reduction in FREs.
- **Significance:** Highly significant ($p < 0.001$), showing a substantial impact.

- **Hybrid DLT (B = 0.789, Beta = 0.792, p = 0.000):**
- **Interpretation:** A unit increase in Hybrid DLT results in a **0.789 unit** decrease in FREs.
- **Significance:** Extremely significant ($p < 0.001$), and the highest coefficient among the DLT types, indicating it has the most pronounced effect on reducing errors.

- **Blockchain Technology (B = 0.073, Beta = 0.072, p = 0.000):**
- **Interpretation:** Each unit increase in Blockchain Technology leads to a **0.073 unit** decrease in FREs.
- **Significance:** Highly significant ($p < 0.001$), affirming its role in minimizing errors.

Overall Implications

All DLT variables show positive and significant coefficients, confirming that each type of DLT contributes to the reduction of financial reporting errors in quoted Nigerian banks. Notably, **Hybrid DLT** exhibits the strongest effect, suggesting that a combination of public and private ledger technologies may offer the most effective means of enhancing financial reporting accuracy.

DISCUSSION OF FINDINGS

This study investigated the effect of distributed ledger technology (DLT) factors on eliminating financial reporting errors (FREs) in quoted Nigerian banks. The independent variables were public, private, hybrid, and blockchain DLT, while FREs formed the dependent variable. The descriptive analysis revealed that all DLT factors had high mean scores (above 4 on a 5-point scale), indicating that respondents perceived them as significantly effective in eradicating FREs. Public, private, hybrid, and blockchain DLT were strongly correlated with FRE elimination. The correlation analysis showed the following effects: public DLT (72.8%), private DLT (89.7%), hybrid DLT (80.3%), and blockchain DLT (75.4%). Regression results affirmed that the DLT factors significantly and positively predicted FRE elimination, corroborating the study hypotheses. Hybrid DLT had the greatest impact, followed by private, public, and blockchain DLT. The regression model explained 98.1% of the variance in FRE elimination, confirming the predictive power of DLT factors. Diagnostic tests supported the robustness of the model, with no multicollinearity detected. The findings provide strong empirical support for leveraging DLT to address common financial reporting errors, such as

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errors of principle, omission, original entry, disclosure, and reversal. These errors have historically undermined the reliability of Nigerian banks' financial statements, reducing stakeholder confidence. The results further reinforce the transformative potential of DLT, particularly hybrid systems, in improving financial reporting quality, as demonstrated by their high statistical significance and impact on error prevention.

This study contributes significantly to the literature by validating DLT's role in eliminating FREs, especially in the Nigerian banking sector. The study aligns with theoretical perspectives on DLT's ability to enhance transparency, accountability, and data security, while extending these discussions to the specific context of Nigerian banks. Overall, this pioneering research highlights the importance of adopting DLT solutions, especially hybrid systems, to address persistent inaccuracies in financial reporting, offering both practical and academic contributions to the field.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This pioneering study offers empirical evidence on DLT's potential to eliminate financial reporting errors in Nigerian banks. Hybrid DLT, in particular, demonstrated the highest efficacy in addressing errors such as principle, omission, original entry, disclosure, and reversal. Public, private, and blockchain DLT also had significant positive effects. The study expands theoretical frameworks on DLT by focusing on the specific issue of FRE elimination. It confirms that DLT solutions, particularly hybrid systems, can powerfully transform financial reporting accuracy, providing statistically validated and generalizable evidence of their capabilities in preventing errors. This research offers important insights for policymakers, banking regulators, and practitioners seeking to enhance reporting integrity.

Recommendations

Public DLT Recommendations: Public DLT should be leveraged for transparent balance sheet and income statement reporting. Banks should implement public DLT for regulatory compliance and preventing unauthorized changes, with training focusing on its immutability. Standardization is needed for interoperability across institutions.

Private DLT Recommendations: Private DLT should be employed to limit access to sensitive financial data, reducing disclosure errors. Its efficiency can improve internal reporting timelines. Training should emphasize private DLT’s access controls to prevent record falsification. Regulators must also develop guidelines for secure sharing during audits.

Hybrid DLT Recommendations: Hybrid DLT, which balances transparency and privacy, should be adopted across public and private ledgers. This system can improve accuracy by offering partial stakeholder access to reconciled shared data. Governance frameworks and integration with legacy systems must evolve as hybrid DLT implementations increase.

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Blockchain Recommendations: Blockchain DLT should be deployed for tamper-proof, transaction-level reporting, enhancing the accuracy of accounting records. Smart contracts on blockchain ledgers can automate compliance and reporting processes, reducing the risk of errors. Cryptography techniques must be standardized, and auditors should be trained to verify blockchain transactions for improved assurance.

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