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Blockchain in accounting: A systematic review of financial reporting transparency and fraud mitigation in Indonesia

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ABSTRACT

The crisis of public trust due to massive financial scandals demands a fundamental transformation in financial reporting architecture. Blockchain technology has emerged as a transformative solution owing to its decentralization, real-time transparency, and immutability. This study aims to analyze the implementation of blockchain in enhancing accounting transparency through a Systematic Literature Review (SLR) using the PRISMA 2020 protocol. The analysis was conducted on 42 high-quality articles filtered from Scopus, Sinta, and Garuda databases (2016–2026) and evaluated using the JBI Critical Appraisal instrument. The findings reveal three main mechanisms through which blockchain enhances transparency: Triple-Entry Accounting (TEA), real-time audit automation, and the reduction of information asymmetry. TEA introduces a layer of cryptographic verification ("trebit/hash") for each transaction, ensuring data immutability and reliability. In addition, smart contracts significantly reduce agency costs by automating compliance processes (i.e., compliance by design). In Indonesia, this adoption momentum is strengthened by the issuance of the Crypto Asset Implementation Bulletin by DSAK IAI (October 2025) and Financial Services Authority or *Otoritas Jasa Keuangan* (OJK) regulations regarding asset tokenization (September 2025). However, challenges such as high investment costs, gaps in accounting competencies, and infrastructure limitations outside urban areas remain significant barriers. This study contributes to the literature by providing an integrated framework that links technological mechanisms, regulatory readiness, and implementation challenges. It also recommends the development of specific Audit Standards (SA) for on-chain digital evidence to accelerate the transformation of the national digital accounting ecosystem.

Keywords: accounting transparency; blockchain; IAI; OJK; PRISMA 2020; smart contracts; triple-entry accounting

1. INTRODUCTION

In recent years, the decline in trust in the global financial reporting system has become an increasingly crucial issue. This condition is marked by an increase in financial statement manipulation cases and the failure of the audit function in detecting increasingly complex fraudulent practices. The rapid development of digital technology indeed provides various conveniences and efficiencies in business processes, but on the other hand also opens new opportunities for fraud that are difficult to detect using conventional approaches (Prasasti et al., 2025; Syahronny & Dewayanto, 2024). Based on reports from the Association of Certified Fraud Examiners, financial statement fraud, although not dominant in number, generates the most significant financial losses compared to other types of fraud (Association of Certified Fraud Examiners, 2022; Association of Certified Fraud Examiners, 2024). This indicates that the problem of transparency in financial reporting is no longer incidental but has developed into a systemic issue.

In line with these conditions, the context in Indonesia also shows a concerning phenomenon. Various cases involving large companies indicate weaknesses in their internal control systems and financial reporting. The practices of financial statement engineering, irregularities in corporate management, and manipulation of financial information show that traditional audit mechanisms, which are still based on manual verification and sample testing, have not been able to keep up with the complexity of transactions in the digital era. This indicates that the risk of fraud is not only operational in nature but also involves decision-making by top management at a strategic level. Therefore, a new approach is needed to improve transparency while strengthening the accountability of financial reporting.

These problems can be conceptually explained from the perspective of agency theory, which emphasizes the existence of conflicts of interest between management as agents and owners as principals. The information imbalance between the two parties creates opportunities for opportunistic actions that can harm shareholders. In the context of digitalization, this information asymmetry becomes increasingly difficult to control because financial reporting systems are dominated by centralized mechanisms that are vulnerable to manipulation. This indicates that the problem of transparency is not only caused by technical factors but is also related to the structure of reporting systems that are not yet fully adaptive to technological developments (Zhang et al., 2022).

In response to these problems, blockchain technology is increasingly viewed as an innovative solution for improving the transparency and reliability of financial information. Through the concept of a distributed ledger, blockchain enables transaction recording to be carried out in a decentralized, permanent manner and can be verified by multiple parties simultaneously. These characteristics make every data change easily detectable, thereby minimizing the potential for manipulation of the data. In addition, the ability of blockchain to provide real-time audit trails offers opportunities to improve the effectiveness of auditing and monitoring processes. This indicates that the use of blockchain not only functions as a recording tool but also as a control mechanism capable of enhancing the integrity of financial information (Dai & Vasarhelyi, 2021; Yermack, 2023; Akter et al., 2024; Al-Dmour et al., 2024).

Furthermore, the application of blockchain in accounting has encouraged the emergence of the concept of triple-entry accounting, which complements the conventional recording system. This system adds one entry in the form of digital evidence stored in the blockchain network for transaction validation. With this mechanism, the verification process no longer depends solely on internal reconciliation but is based on a shared system that is transparent and accessible to all related parties. This indicates that the implementation of triple-entry accounting has the potential to create a single, consistent, and reliable source of data, thereby significantly reducing the risk of financial statement manipulation (Cai, 2021; Wang et al., 2024).

In Indonesia, regulatory developments support the integration of technology into the financial system. The Ikatan Akuntan Indonesia has initiated guidelines related to the accounting treatment of crypto assets, while the Otoritas Jasa Keuangan continues to strengthen the supervisory framework for the digital asset ecosystem through various recent regulations. This indicates that regulators have begun

to adapt to technological developments, particularly by encouraging transparency and protection for stakeholders (Otoritas Jasa Keuangan, 2024; Otoritas Jasa Keuangan, 2025).

However, the implementation of blockchain technology in accounting practices in Indonesia faces various obstacles. Limitations in technological infrastructure, low competence of human resources, and high implementation costs are the main barriers to the adoption process. In addition, the absence of uniform technical standards also causes the implementation of this technology to be suboptimal, especially in the small and medium-sized enterprise sector. This indicates that although blockchain has great potential, appropriate strategies are needed for effective implementation (Akter et al., 2024; Mediaty et al., 2025).

Despite the growing body of literature examining blockchain in accounting, most prior studies have tended to focus on conceptual discussions or isolated technological aspects, such as the potential of blockchain for auditing or financial reporting. Several existing review studies have synthesized these developments; however, they often emphasize global perspectives without adequately integrating regulatory readiness and implementation challenges within specific institutional contexts in the Global South.

Furthermore, few studies have systematically examined how blockchain mechanisms, such as Triple-Entry Accounting, smart contract-based auditing, and transparency enhancement, interact within a unified framework that links technological capability with governance implications. This indicates that the current literature remains fragmented, particularly in terms of connecting technological innovation with practical implementation and regulatory alignment.

In developing countries such as Indonesia, this gap is more pronounced. Existing studies rarely provide a structured synthesis that simultaneously considers technological mechanisms, regulatory developments and ecosystem readiness. As a result, the implications for national financial reporting systems are often generalized without sufficient context.

Therefore, this study contributes to the literature by providing a systematic and integrated review using the PRISMA 2020 protocol to bridge these gaps. Specifically, this study develops a conceptual framework that links blockchain mechanisms with transparency outcomes and implementation constraints, with particular emphasis on the Indonesian context.

Based on this background, this study aims to systematically examine the role of blockchain in enhancing financial reporting transparency, evaluate regulatory readiness in Indonesia, and identify the key challenges and strategies for implementation.

2. RESEARCH METHODOLOGY

This study employs a Systematic Literature Review (SLR) approach by adopting the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 protocol to identify relevant studies. This method was selected to obtain a comprehensive and structured understanding of the literature relevant to the research topic. An SLR was chosen because it can identify, evaluate, and synthesize research findings systematically, thereby producing findings that are more objective and scientifically accountable (Kitchenham et al., 2020).

The use of the PRISMA 2020 protocol in this study was based on its ability to improve the transparency and quality of systematic review reports. PRISMA 2020 provides guidance in the form of a systematic checklist as well as a study selection flow diagram, so that the process of identification, screening, and selection of literature can be carried out clearly and in a structured manner. This indicates that PRISMA functions not only as a reporting guideline but also as a methodological tool to minimize bias in the literature selection process (Page et al., 2021; Agustini & Mustakini, 2024).

This study was conducted in several stages. The first stage is literature identification, which involves conducting searches in scientific databases such as Google Scholar, Scopus, and ScienceDirect using keywords relevant to the research topic. The second stage was the screening process based on titles and abstracts to ensure alignment with the research focus. The third stage was the eligibility assessment by fully reading the articles that passed the previous stage. The final stage was the inclusion

of articles that met the criteria for further analysis. These stages indicate that the selection process was conducted gradually and systematically to obtain literature that is truly relevant and of high quality.

In addition, this study established inclusion and exclusion criteria to maintain the consistency and quality of the data sources. The inclusion criteria included articles published in reputable scientific journals, relevance to the topic of blockchain and financial reporting, and publication within a certain time range (for example, the last 5–10 years). The exclusion criteria included articles that were not peer-reviewed, not available in full text, or not directly relevant to the research focus. This indicates that the selection of literature was not conducted randomly but based on structured scientific considerations.

Furthermore, the data obtained from the selected articles were analyzed using a qualitative descriptive approach. The analysis process was carried out by grouping research findings based on main themes, such as financial reporting transparency, blockchain technology adoption, and implications for accountability. This indicates that the synthesis results are not only descriptive but also provide interpretations of patterns and relationships among variables found in the literature.

Thus, the use of the PRISMA 2020-based SLR method in this study is expected to produce a systematic, transparent, and reproducible review that can be replicated by other researchers in the future. In addition, this approach enables researchers to identify research gaps and provide relevant recommendations for future studies. In other words, this method not only collects literature but also produces a deeper and more structured understanding of the phenomenon under study.

2.1. Research Question Formulation (PICO Framework)

The research questions in this study were structured using the PICO (Population, Intervention, Comparison, Outcome) framework to ensure that the research focus remained directed and relevant. The PICO approach is widely used in systematic reviews because it provides clear boundaries for the research scope and improves accuracy in the literature search process (Eriksen & Frandsen, 2018) (see Table 1).

Table 1. Research PICO Framework

PICO Element	Specific Description
Population	Accounting Information Systems (AIS), corporate financial reporting, and SMEs in Indonesia
Intervention	Implementation of Blockchain, Smart Contracts, DLT, and Triple-Entry Accounting
Comparison	Traditional Double-Entry accounting systems and conventional periodic auditing
Outcome	Accounting transparency, data integrity, reduction of information asymmetry, and audit efficiency

2.2. Search Strategy and Data Sources

The literature search was conducted comprehensively using various reputable scientific databases at the international and national levels. The databases used include Scopus and Google Scholar for international literature, as well as the SINTA and GARUDA portals to capture research in Indonesia. The use of multiple sources aims to obtain broader perspectives and avoid publication bias, which focuses only on a single database (Kitchenham et al., 2020).

The search results were distributed across the databases as follows: Scopus (248 records), Google Scholar (286 records), ScienceDirect (102 records), SINTA (54 records), and GARUDA (34 records), resulting in a total of 724 records. This distribution indicates that the literature sources are relatively balanced between international and national databases, thereby enhancing the review’s comprehensiveness (see Table 2).

Table 2. Distribution of Initial Search Results by Database

Database	Number of Records
Scopus	248
Google Scholar	286
ScienceDirect	102

SINTA	54
GARUDA	34
Total	724

The distribution indicates that the majority of studies were sourced from international databases, particularly Google Scholar and Scopus, while national databases contributed to contextual relevance within Indonesia

The search keywords were designed using Boolean operators to improve search accuracy, namely: ((blockchain OR "distributed ledger" OR "smart contract") AND (accounting OR "financial report*" OR audit OR "triple entry")).

In addition, the publication time limit was set within the last ten years (2016–2026) to ensure that the literature used reflects the latest developments in blockchain technology, from its early phase to its implementation in financial regulation. This indicates that the literature search process was conducted systematically and is relevant to current research developments.

2.3. PRISMA 2020 Selection Stages

The selection process follows the four phases of the PRISMA 2020 information flow to filter articles from a large number into a credible dataset. First, identification. The initial data collection from all databases resulted in 724 records. Second, screening. The removal of duplicates using Zotero software resulted in 312 articles. Furthermore, title and abstract screenings were conducted to remove articles that were not relevant to the accounting context, resulting in 96 articles. Third, eligibility. Full-text analysis was conducted on 96 articles to ensure compliance with the inclusion criteria (focus on transparency, audits, and Indonesian regulations). During the eligibility stage, a full-text assessment was conducted on 96 articles. A total of 54 articles were excluded for the following reasons: lack of relevance to accounting (n = 21), insufficient methodological clarity (n = 17), and unavailability of full-text (n = 16). This exclusion process enhanced the transparency and reproducibility of the study selection procedure. Fourth, inclusion. The final stage resulted in 42 articles that met the methodological quality standards to be synthesized in the discussion.

2.4. Quality Assessment

Articles that passed the selection stage were evaluated for methodological quality using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist. This instrument was used to assess the validity of the research methodology, clarity of objectives, appropriateness of research design, and potential bias that may occur. Only articles with a minimum compliance score of 70% were included in the final synthesis were included (see [Table 3](#)).

Table 3. Summary of Quality Scores of 42 Articles (JBI Assessment)

JBI Score Range	Number of Articles	Eligibility Status
90% – 100%	18	Very Good (Low Risk of Bias)
75% – 89%	16	Good
70% – 74%	8	Fair (Accepted with Notes)
< 70%	0	Excluded

2.5. Study Selection Process and Reviewer Agreement

The study selection process was conducted by two independent reviewers to ensure objectivity and minimize any selection bias. Each reviewer independently screened the titles and abstracts of the identified articles based on predefined inclusion and exclusion criteria. Discrepancies between the reviewers were resolved through discussion and consensus. In cases where agreement could not be reached, a third evaluation was conducted to ensure consistency in the selection process. This approach indicates that the study selection procedure was systematic and controlled to enhance reliability and reproducibility.

2.6. Detailed Inclusion and Exclusion Criteria

To improve transparency and replicability, this study applied explicit inclusion and exclusion criteria. First, the inclusion criteria were: (a) peer-reviewed journal articles indexed in Scopus, SINTA, or recognized academic databases; (b) studies discussing blockchain in accounting, auditing, or financial reporting; (c) publications between 2016 and 2026; and (d) full-text articles. Second, the exclusion criteria included: (a) conference papers, opinion articles, and non-peer-reviewed sources; (b) studies unrelated to accounting or financial reporting; (c) articles with insufficient methodological clarity; and (d) duplicate records. This structured approach ensured that the selected literature was relevant, high-quality, and aligned with the research objectives.

2.7. Data Extraction Technique

The data extraction process in this study was conducted systematically to ensure that the information obtained from each article was analyzed consistently and in a structured manner. Data extraction was performed on all articles that passed the inclusion stage using a matrix format that had been designed in advance. This matrix serves as a tool to organize data to facilitate the process of identifying patterns and relationships among research findings.

The extracted data included several main components, namely research identity, research context, methods used, technology focus, and key findings related to financial reporting transparency. In addition, aspects related to the implications for auditing, accountability, and corporate governance were analyzed to enrich the interpretation of the research results.

The extraction process was conducted manually using Microsoft Excel to ensure systematic coding and consistency across all selected studies. Each article was then coded based on the main themes that emerged, enabling a systematic data grouping process. This indicates that data extraction serves not only as a process of information collection but also as a foundation for building a structured analytical framework.

Thus, the data extraction technique used in this study ensured that all relevant information was collected comprehensively and was well organized. This indicates that the subsequent analysis process is supported by a strong data foundation and can be justified scientifically.

As an illustration, the following data extraction matrix was presented (see [Table 4](#)).

Table 4. Data Extraction Matrix

No	Author & Year	Context/Country	Method	Technology Focus	Key Findings	Thematic Cluster
1	Dai and Vasarhelyi (2021)	Global	Conceptual	Blockchain, Audit	Improves real-time auditing	Audit
2	Cai (2021)	Global	Conceptual	Triple-Entry Accounting	Enhances data integrity and reduces manipulation	TEA
3	Wang et al. (2024)	Global	SLR	Blockchain	Improves transparency through distributed systems	Transparency
4	Zhang et al. (2022)	Global	Empirical	Blockchain	Reduces information asymmetry	Governance

The table presents a subset of the overall articles analyzed. The complete data extraction matrix covering all 42 articles was utilized in the analysis but is not fully displayed to maintain clarity of the presentation.

2.8. Data Synthesis Method

The extracted data were analyzed using a qualitative synthesis approach with *thematic analysis*. This approach was selected because it can identify patterns, relationships, and the main trends that emerge from the various research findings that have been collected.

The synthesis process was carried out by referring directly to the results of data extraction in the matrix, where each research finding was grouped into thematic clusters that had previously been identified. Based on the coding process, three main clusters were found to dominate the literature: the implementation of triple-entry accounting, audit automation based on smart contracts, and increased transparency through distributed ledger systems.

This indicates that the synthesis process was not conducted independently from the extraction stage but was directly integrated to ensure consistency between empirical findings and thematic classification. In other words, each theme generated in the analysis represents patterns that consistently appear across the various studies reviewed.

Furthermore, the results of this thematic grouping form the basis for the preparation of the results and discussion sections. For example, the triple-entry accounting cluster identified in the synthesis stage directly becomes the focus of discussing blockchain transparency mechanisms. Likewise, clusters related to audit automation and the reduction of information asymmetry serve as the basis for explaining how blockchain technology contributes to improving financial reporting quality.

Thus, there is a strong link between the data extraction process, thematic synthesis, and preparation of research findings. This indicates that this study does not merely present a summary of the literature but also builds a structured analysis based on consistent empirical patterns.

3. RESULTS AND DISCUSSION

3.1. Thematic Evaluation of 42 Articles: Transparency Mechanisms

Based on the selection results using the PRISMA 2020 protocol, 42 articles met the criteria for further analysis. The articles were analyzed using a thematic approach to identify the main patterns related to the role of blockchain in improving financial reporting transparency. The synthesis results show that there are three main clusters that consistently appear in the literature: the implementation of Triple-Entry Accounting (TEA), technology-based audit automation, and the reduction of information asymmetry. This indicates that blockchain acts as a supporting technology and a transformational mechanism in modern accounting systems.

While thematic classification provides a structured understanding of the literature, a deeper examination reveals both convergence and divergence among studies. Most studies consistently support the role of TEA in enhancing data integrity; however, there is variation in how its practical implementation is evaluated. Some studies emphasize their feasibility in controlled environments, while others highlight the integration challenges with existing accounting systems.

Similarly, although audit automation is widely recognized as a key benefit of blockchain, the extent to which it can replace traditional auditing remains debatable. Some studies argue that blockchain enables continuous auditing, whereas others suggest that auditor judgment remains essential, particularly in interpreting complex transactions and ensuring compliance.

These differences indicate that blockchain adoption is not a uniform solution but is highly dependent on organizational and institutional context.

3.1.1. Integration of Triple-Entry Accounting (TEA)

The results of the analysis show that approximately 35% of the articles emphasize the importance of the Triple-Entry Accounting (TEA) concept as a major innovation in blockchain-based accounting systems. TEA is viewed as a development of the traditional double-entry system by adding an additional entry in the form of cryptographic evidence stored within the blockchain network. This entry takes the form of a hash that is validated by all nodes so that each transaction has a digital trace that cannot be altered unilaterally (*immutability*).

These findings indicate that TEA can create a more transparent recording system that can be independently verified by multiple parties. Thus, the risk of financial statement manipulation can be significantly reduced because any change in data is immediately detected within the network (Cai, 2021;

Wang et al., 2024). This indicates that TEA not only improves recording accuracy but also strengthens trust among parties within the financial reporting system.

3.1.2. Real-Time Audit Automation

A total of 28% of the articles in this study discuss the utilization of blockchain to support a more efficient audit process through the use of smart contracts. This technology enables continuous auditing, where transactions can be verified automatically and in real time without having to wait for a specific audit period.

Several empirical studies show that the implementation of Distributed Ledger Technology (DLT) can significantly reduce reconciliation time, even by up to 90% in some industry implementation cases (Dai & Vasarhelyi, 2021). This indicates that the audit process is no longer reactive and can be conducted proactively and continuously.

In addition, audit automation reduces dependence on manual procedures that are prone to human error. Thus, operational efficiency increases, and the quality of audit results becomes more reliable. This indicates that blockchain has great potential for transforming the audit function from a merely periodic examination into an integrated monitoring system.

3.1.3. Reduction of Information Asymmetry

Furthermore, approximately 25% of the articles link blockchain implementation with increased transparency, which reduces information asymmetry. In the context of agency theory, information asymmetry is one of the main factors that drive opportunistic behavior by management.

Blockchain technology enables stakeholders, including investors, auditors, and regulators, to access transaction data in real time. With higher visibility, monitoring costs can be reduced, and opportunities for manipulation become smaller. Several studies have also shown that blockchain implementation contributes to improving Good Corporate Governance (GCG) practices because information becomes more open and accountable (Yermack, 2023).

This indicates that blockchain functions not only as a technological tool but also as a governance mechanism that can strengthen the relationship between management and shareholders. Thus, trust in financial reporting can increase significantly.

3.2. Synthesis of Findings and Implications

Based on these three main clusters, it can be concluded that blockchain significantly improves financial reporting transparency through three main mechanisms: immutable data validation, audit process automation, and increased information openness. This indicates that the integration of blockchain technology has the potential to overcome the weaknesses of traditional accounting systems that still rely on centralized control and manual verification.

However, a deeper analysis of the reviewed literature reveals that the effectiveness of blockchain implementation is highly contingent on contextual factors, particularly, organizational readiness, regulatory alignment, and technological maturity. Several studies have highlighted that while blockchain theoretically eliminates the possibility of data manipulation, in practice, vulnerabilities may still occur at the data input stage (garbage in, garbage out), which remains dependent on human integrity and internal controls.

In addition, there is divergence in the findings related to audit transformation. While some studies emphasize the efficiency gains from real-time auditing, others argue that the role of auditors is not eliminated but rather transformed into a more analytical and system-oriented function. This indicates that blockchain does not replace audits but reshapes their scope and competencies.

Furthermore, the literature shows that the reduction of information asymmetry is not automatically achieved solely through technology adoption. Transparency depends on governance design, access rights, and the engagement of stakeholders. Without proper governance mechanisms, blockchain systems may operate in a semi-closed environment.

Thus, this study highlights that blockchain should not be viewed as a standalone solution but as part of a broader digital governance ecosystem that integrates technology, regulation, and organizational capability. This finding strengthens the argument that successful implementation requires a holistic approach rather than purely technological adoption alone.

3.3. Evolution of Recording: Comparison of Double-Entry vs. Triple-Entry Accounting

To understand the transformation brought by blockchain technology in accounting systems, a fundamental comparison between the traditional and technology-based approaches is required. The conventional accounting system that has been used is based on the double-entry mechanism, which emphasizes internal balance between accounts. However, the development of blockchain technology has encouraged the emergence of a new paradigm through the concept of triple-entry accounting (TEA).

This indicates that the changes that occur are not only technical in nature but also touch on the philosophical aspect of accounting recording, namely, from a closed system to an open, distributed, and collectively verifiable system (see [Table 5](#)).

Table 5. Comparison of Traditional Accounting System vs. Blockchain

Indicator	Double-Entry (Traditional)	Triple-Entry (Blockchain)
Record Structure	Separate internal ledgers across entities	A single shared distributed ledger (DLT)
Verification	Manual and periodic reconciliation by humans	Automatic verification through network consensus
Data Integrity	Vulnerable to journal entry manipulation (window dressing)	Immutable (interconnected hash)
Audit Trail	Sample-based and retrospective	Full population and real-time
Main Characteristic	Focus on internal balance ($A = L + E$)	Focus on external digital transaction evidence (trebit)

Based on this comparison, it can be seen that the TEA system provides advantages in terms of transparency and data integrity because each transaction has digital evidence that cannot be modified. This indicates that blockchain can overcome the main weaknesses of traditional systems, particularly those related to data manipulation and the limitations of sample-based auditing ([Cai, 2021](#); [Wang et al., 2024](#)).

3.4. Analysis of Digital Accounting Regulations and Standards in Indonesia (2025)

The development of blockchain implementation in Indonesia has shown increasingly strong regulatory support in recent years. The involvement of regulators, such as the Indonesian Institute of Accountants and the Financial Services Authority, indicates that digital transformation in accounting has begun to be formally accommodated (see [Table 6](#)).

Table 6. Roadmap of Digital Accounting Regulations in Indonesia (2024–2025)

Regulator	Regulation/Standard	Impact on Transparency
DSAK IAI	Implementation Bulletin, Vol. 9 (Oct 2025)	Establishes classification of crypto assets as Inventory (PSAK 202) or Intangible Assets (PSAK 238) based on economic substance
OJK	POJK No. 27/2024 & No. 23/2025	Requires segregation of customer assets in crypto exchanges to prevent internal misuse
OJK	ICO Draft Regulation (Sept 2025)	Approval requirement for offerings above IDR 1 billion and transparency obligation in whitepapers
Government	Indonesia Digital Roadmap 2021–2024	Support for computing infrastructure and digital talent development for accountants

The issuance of the bulletin by the IAI in 2025 was an important milestone because it provided certainty in the accounting treatment of digital assets. This indicates that regulation has begun to move from the exploration stage to the implementation stage.

However, although the regulatory framework has been developed, its implementation still faces challenges in terms of industry readiness and standard harmonization. This indicates that the success of blockchain adoption depends not only on regulation but also on the readiness of the overall ecosystem.

While thematic classification provides a structured understanding of the literature, a deeper examination reveals both convergence and divergence among studies. Most studies consistently support the role of TEA in enhancing data integrity; however, there is variation in how its practical implementation is evaluated. Some studies emphasize their feasibility in controlled environments, while others highlight the integration challenges with existing accounting systems.

Similarly, although audit automation is widely recognized as a key benefit of blockchain, the extent to which it can replace traditional auditing remains debatable. Some studies argue that blockchain enables continuous auditing, whereas others suggest that auditor judgment remains essential, particularly in interpreting complex transactions and ensuring compliance.

These differences indicate that blockchain adoption is not a uniform solution but is highly dependent on organizational and institutional context.

3.5. Case Reflection: eFishery (2025) and PT Indofarma (2024)

To strengthen the relevance of the findings, this study reflects on several empirical cases in Indonesia related to failures in reporting and audit systems.

In the eFishery case (2025), large-scale revenue manipulation occurred through dual-reporting practices that were difficult to detect using traditional audit systems. If a blockchain system had been implemented, each transaction would have had a digitally validated external trace, making hidden data duplication impossible. This indicates that blockchain can increase transaction visibility and prevent manipulation from the initial recording stage.

Similarly, in the case of PT Indofarma (2024), corruption issues in procurement can be minimized through blockchain-based supply chain transparency. Each flow of funds can be tracked in real time by auditors and regulators. This indicates that blockchain technology has the potential to reduce mark-up practices and improve accountability in public financial management.

These findings are consistent with the literature stating that blockchain can improve transparency and corporate governance through an open and verifiable recording system (Yermack, 2023).

3.6. Strategic Challenges and Implementation Barriers

Although it has great potential, the implementation of blockchain in accounting systems in Indonesia faces various structural challenges (Table 7).

Table 7. Analysis of Adoption Barriers in Indonesia

Barrier Category	Detailed Description	Impact on Ecosystem
Infrastructure	Gap in internet connectivity and computing capacity outside Jakarta	Limits broad participation of SMEs in distributed networks
Competence	Shortage of accountants with expertise in algorithm auditing and cybersecurity	Accounting curriculum has not comprehensively integrated blockchain
Financial	Very high initial investment cost (Capex) for DLT system development	Limits access to technology only to large companies/conglomerates
Legal & Audit	Absence of specific Audit Standards (SA) recognizing on-chain evidence as primary evidence	Auditor uncertainty in providing opinions on blockchain-based systems

Based on the table, it can be seen that implementation barriers are not only technical in nature but also include human resource and regulatory aspects. This indicates that blockchain adoption requires a comprehensive cross-sectoral approach. In addition, the infrastructure gap between urban and regional areas is a major constraint to the widespread implementation of this technology. This indicates that, without equitable infrastructure support, the benefits of blockchain in improving transparency will only be experienced by a small number of large entities.

3.7. Practical Implications and Policy Recommendations

The findings of this study have several important practical implications for key stakeholders in the accounting and financial ecosystem, particularly in Indonesia.

First, the results indicate the need for regulators to develop specific audit standards that recognize blockchain-based evidence (on-chain data) as primary audit evidence. This includes the formulation of guidelines for auditing smart contracts and distributed ledger systems to ensure consistency and legal certainty in their use.

Second, for companies, particularly in the financial and banking sectors, the adoption of blockchain should be aligned with organizational readiness, including investment in digital infrastructure and integration with existing accounting information systems. Companies are also required to redesign their internal control systems to adapt to automated and real-time environments.

Third, for auditors and accounting professionals, there is a need to develop new competencies related to data analytics, blockchain architecture, and cybersecurity. This indicates that the future of the accounting profession will shift from traditional verification roles to analytical and advisory functions.

Fourth, for academia, the findings highlight the importance of integrating blockchain and digital accounting topics into the accounting curriculum. This is essential for preparing future professionals who can operate in a technology-driven financial environment.

Thus, this study emphasizes that the successful adoption of blockchain requires collaboration between regulators, industry, and educational institutions to build a sustainable digital accounting ecosystem.

3.8. Conceptual Model of Blockchain-Based Transparency

The synthesis of the findings from the 42 selected articles resulted in a conceptual model that explains the role of blockchain in enhancing financial reporting transparency. The model illustrates that blockchain technology, supported by Distributed Ledger Technology (DLT) and smart contracts, acts as the primary driver of transformation in accounting systems.

Through three main mechanisms, namely, Triple-Entry Accounting (TEA), real-time audit automation, and increased information transparency, blockchain enables the creation of a more reliable and verifiable financial reporting system. These mechanisms collectively contribute to improving transparency, data integrity, audit efficiency and corporate governance.

However, the model also highlights that the effectiveness of blockchain implementation is influenced by several moderating factors, including infrastructure readiness, human resource competency, financial capability, and regulatory support. This indicates that the successful adoption of blockchain depends not only on technological capability but also on ecosystem preparedness.

Thus, this conceptual model provides an integrated framework that connects technological innovation with practical implementation challenges, particularly in developing countries such as Indonesia (see Figure 1).

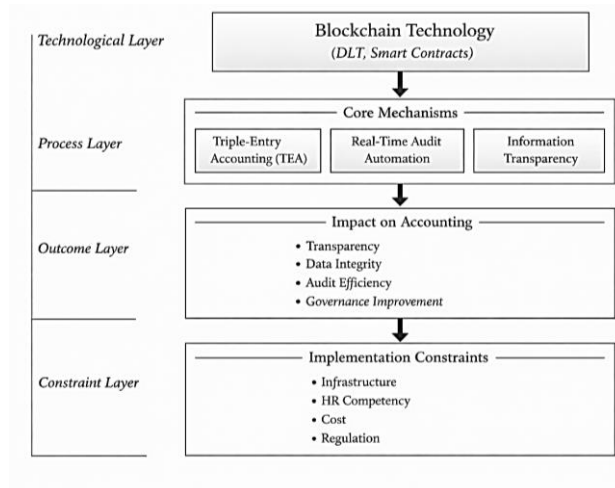


Figure 1. Blockchain-Based Financial Reporting Transparency Model

4. CONCLUSION

This study aims to systematically examine the role of blockchain technology in improving financial reporting transparency through a Systematic Literature Review (SLR) approach based on the PRISMA 2020 protocol. Based on the analysis of 42 selected articles, the findings indicate that blockchain significantly enhances transparency through three main mechanisms: the implementation of Triple-Entry Accounting (TEA), real-time audit automation, and the reduction of information asymmetry.

The results show that TEA enables the creation of a more transparent and verifiable recording system through cryptographic validation, which cannot be altered unilaterally. In addition, the use of smart contracts supports continuous auditing processes, allowing transactions to be verified automatically and in real time, thereby increasing efficiency and reducing human error. Furthermore, blockchain enhances information openness, which reduces information asymmetry and strengthens corporate governance practices.

However, despite its significant potential, the implementation of blockchain technology in Indonesia still faces several challenges, including infrastructure readiness, high investment costs, and limited human resource competencies. In addition, the absence of specific audit standards recognizing on-chain evidence as primary audit evidence remains a critical issue that must be addressed.

Therefore, this study concludes that blockchain is relevant from a theoretical perspective and has strong practical implications for transforming financial reporting systems towards greater transparency and accountability. This study also highlights the need for regulatory support, infrastructure development, and human capital improvement to accelerate the adoption of blockchain technology in the accounting ecosystem.

In terms of contribution, this study offers a structured synthesis that integrates technological mechanisms, regulatory developments, and implementation challenges within a single analytical framework. Unlike prior studies that tend to focus on conceptual or technological aspects in isolation, this study provides a more comprehensive perspective by linking blockchain adoption with governance and institutional readiness, particularly in the context of a developing country.

This study also identifies a critical research gap related to the lack of empirical validation of blockchain-based accounting systems in real-world organizational settings. Therefore, future research should explore empirical testing, case-based implementation, and hybrid models that integrate blockchain with existing accounting systems.

Ethical Approval

Not Applicable

Informed Consent Statement

Not Applicable

Authors' Contributions

ARH contributed to the conceptualization of the study, research design, systematic literature review process, data curation, formal analysis, interpretation of findings, and drafting of the manuscript. AMSH contributed to the development and validation of the methodology, including the PRISMA protocol, as well as the critical review of the literature selection process, supervision of the study, and revision of the manuscript. NAN contributed to data extraction, quality appraisal, synthesis of the reviewed studies, visualization of findings, and manuscript editing. All authors contributed substantially to the study and approved the final version of the manuscript.

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No potential conflict of interest was reported by the author(s).

Data Availability Statement

The data presented in this study are available on request from the corresponding author due to privacy reasons.

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