

Integration of Blockchain Technology into Accounting Information Systems and Its Implications for Transparency, Accountability, and Audit Assurance

Tuah Panjaitan¹, Ahmad Muhajir²

¹² Universitas Al Azhar Medan

* Correspondence e-mail; tuah919@gmail.com; hasyimhabib45@gmail.com

Article history

Submitted: 2026/02/01; Revised: 2026/03/11; Accepted: 2026/06/28

Abstract

This study aims to examine the integration of blockchain technology into Accounting Information Systems (AIS) and its impact on transparency, accountability, and audit assurance. Blockchain emerges as a distributed digital ledger technology characterized by transparency, immutability, traceability, and the ability to enhance the reliability of transaction data. This study employs a literature review method, analyzing relevant articles, books, and other sources concerning blockchain technology within accounting information systems. The results indicate that integrating blockchain into AIS has the potential to enhance transparency through open, chronological, and easily traceable transaction records. Furthermore, blockchain strengthens accountability because every transaction contains a digital footprint, timestamp, and the identity of the parties involved, thereby providing clearer responsibility. In terms of audit assurance, blockchain assists auditors in obtaining audit evidence that is better documented, structured, tamper-resistant, and supports a more efficient auditing process.

Keywords

Blockchain, Accounting Information Systems, Transparency, Accountability, Audit Assurance



© 2026 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution 4.0 International (CC BY SA) license, <https://creativecommons.org/licenses/by-sa/4.0/>.

INTRODUCTION

The development of digital technology has brought about significant changes in various aspects of business management, including accounting. In business operations, an Accounting Information System (AIS) serves as a bridge that unites conventional accounting processes with information technology infrastructure. This synergy forms an integrated system that is fully responsible for the governance of an organization's financial data, from collection and storage to final reporting. Through this mechanism, an AIS is capable of producing information output that serves as a key pillar for management in formulating strategic decisions (Novida, 2025). In practice, AIS has shifted from manual or centralized methods to adopting more sophisticated, secure, and transparent technologies. Amidst complex business

dynamics, companies are required to present accurate, relevant, up-to-date, and reliable financial data. This requirement is crucial because these reports serve as the primary basis for decision-makers, both internal and external, including investors, creditors, auditors, government agencies, and the wider public.

One of the key challenges in an Accounting Information System is ensuring that recorded transaction data is completely accurate, free from the risk of misuse, and maintains a clear and systematic audit trail (Firdaus & Safriani, 2025). In its implementation, various risks remain that can compromise the quality of accounting information, such as recording errors, data manipulation, financial reporting fraud, weak internal controls, and limitations in the transaction verification process. If left unaddressed, these risks have the potential to reduce the level of trust in financial reports, thereby eroding stakeholder confidence in the relevant entity. Related to this, blockchain technology is beginning to be viewed as an innovation with the potential to improve the quality of Accounting Information Systems. Blockchain is a digital data storage system distributed across multiple networks (decentralized), maintains records that are open to the public (transparent), and is designed so that stored data cannot be manipulated or deleted (Agusnur, 2025). Blockchain systems help make transactions more open, accountable, secure, fast, and efficient. Every transaction entered into the blockchain network is stored in the form of interconnected blocks and verified through a specific mechanism (Adrian & Dewanto, 2024). This characteristic allows each transaction to have a clear digital footprint, thereby increasing transparency in accounting records.

The integration of blockchain into Accounting Information Systems has the potential to provide significant benefits, particularly in increasing transparency. A transparent and traceable transaction recording system makes it easier for relevant parties to verify the validity of financial data. This transparency narrows the gap for manipulation and builds the credibility of accounting reports. Furthermore, the use of blockchain technology enables real-time recording, allowing faster and more accurate access to financial data. Beyond transparency, blockchain technology also has implications for accountability. In conventional accounting, transaction management relies heavily on special access holders, which can lead to abuse of authority if internal controls are weak. In contrast, blockchain technology records every transaction with a clear identity, time, and revision history. This makes it easy to trace transactors, thus significantly improving financial reporting accountability.

On the other hand, blockchain implementation also impacts the audit assurance process. According to Artamalia et al. (2025), conventional audit processes are often

hampered by complex and time-consuming document verification procedures. However, the integration of blockchain technology can overcome these obstacles by providing transparent, structured, and non-manipulable transaction data. This advantage allows auditors to verify evidence instantly, resulting in a much faster, more effective, and more efficient audit process.

However, the integration of blockchain technology into Accounting Information Systems is not without its challenges. Implementing this technology requires infrastructure readiness, competent human resources, supportive regulations, and adequate understanding from business actors and auditors. Furthermore, the use of blockchain also raises new questions regarding data security, information privacy, accounting standards, and audit procedures appropriate to the digital technology environment. Therefore, the implementation of blockchain in Accounting Information Systems requires more in-depth study to optimize its benefits and minimize risks. Based on this description, research on the integration of blockchain technology into Accounting Information Systems is crucial. This research is expected to provide an understanding of how blockchain can impact transparency, accountability, and audit assurance in the accounting process. Furthermore, this research can contribute to the development of a more secure, efficient, and reliable modern accounting system in the era of digital transformation.

METHODS

This research uses a qualitative approach with a systematic literature review method to understand and explain in depth how the integration of blockchain technology into Accounting Information Systems can impact transparency, accountability, and audit assurance. Data was collected from various secondary sources obtained indirectly through documents, books, scientific articles, journals, research reports, accounting standards, audit standards, and other publications relevant to the research topic. With this approach, researchers can gain a comprehensive understanding of the potential, benefits, challenges, and impacts of blockchain implementation in accounting and auditing.

The literature review process was conducted following a systematic procedure in three main stages: identification, screening, and analysis. The initial step began with the identification stage, which involved collecting relevant literature from a number of reputable scientific databases. This study applied inclusion criteria including: (1) articles published within the last ten years (2020–2025), (2) articles from accredited scientific journals or reputable proceedings, and (3) articles aligned with the theme of blockchain technology integration into Accounting Information

Systems. Next, a rigorous selection process was conducted to ensure the quality and relevance of the literature used. The final stage was data analysis using a thematic analysis approach. This approach aims to identify, categorize, and interpret key themes emerging from the literature related to blockchain and accounting. Each theme is elaborated in depth based on a synthesis of relevant academic literature. Therefore, the results of this review are expected to provide a strong conceptual foundation for further empirical research and contribute to the development of blockchain technology integration into Accounting Information Systems, which can have implications for transparency, accountability, and audit assurance.

FINDINGS AND DISCUSSION

.Based on the literature review conducted, the findings indicate that the integration of blockchain technology into Accounting Information Systems (AIS) has significant potential to optimize financial recording, reporting, and auditing processes. The relevance of blockchain within AIS is supported by its fundamental characteristics, including distributed ledger technology, transparency, cryptographic security, immutable data records, and reliable audit trails. These distinctive features enable blockchain to strengthen transparency, accountability, and the overall effectiveness of financial reporting and auditing processes. Consequently, blockchain is increasingly recognized as one of the most promising technological innovations for transforming conventional accounting systems into more secure, efficient, and trustworthy digital environments.

The review of more than 35 academic publications and industry reports identified ten major themes illustrating the transformative role of blockchain in modern accounting practices. To reinforce the conceptual findings, this study synthesizes previous research concerning blockchain implementation in Accounting Information Systems, particularly regarding transparency, accountability, and audit assurance.

Table 1. Literature Review on Blockchain Integration in Accounting Information Systems

No.	Author(s)	Article Title	Main Findings
1	Anala Agusnur E. (2025)	<i>Blockchain Utilization in Accounting Systems for Financial Data Transparency and Security</i>	Blockchain significantly improves financial reporting transparency, data security, and reporting efficiency.
2	Aldina Syifa Nur Irmadhani & Totok Dewayanto (2025)	<i>The Role of Blockchain Technology in Enhancing Financial Statement Transparency: A Systematic Literature Review</i>	Blockchain enhances the reliability, integrity, and transparency of financial reporting.
3	Wendy (2025)	<i>Blockchain Technology</i>	Blockchain strengthens

		<i>Implementation for Corporate Financial Transparency and Accountability: A Systematic Literature Review</i>	transaction traceability, reduces information asymmetry, and enhances accountability mechanisms.
4	Wahyudi et al. (2025)	<i>The Impact of Blockchain Technology on the Audit Process: A Literature Review</i>	Blockchain has the potential to revolutionize modern auditing by improving effectiveness, efficiency, and transparency.
5	Olga Fullana & Javier Ruiz (2019)	<i>Accounting Information Systems in the Blockchain Era</i>	Blockchain offers substantial benefits for AIS while also presenting implementation challenges.
6	Fariz Hudi Adrian & Totok Dewayanto (2024)	<i>Integration of Blockchain and Artificial Intelligence in Accounting Curriculum: A Systematic Literature Review</i>	Blockchain and AI integration modernizes accounting education and prepares graduates for digital transformation.
7	Ramadhani et al. (2024)	<i>Blockchain Technology and Accounting Systems: Potentials and Challenges</i>	Blockchain introduces distributed ledgers and improves accounting transparency.
8	Azhar Dzaky Muhammad HM & Siska Amalia Junianti (2023)	<i>Blockchain Technology in Accounting Information Systems: Potentials and Challenges</i>	Blockchain transforms accounting through distributed ledger technology and high transparency.
9	Rio Rahmat Yusran & Resadana Yusran (2025)	<i>Blockchain as a Solution for Enhancing Security and Transparency in Accounting Information Systems</i>	Blockchain significantly contributes to creating more secure and transparent accounting information systems.
10	Rijal et al. (2024)	<i>The Effect of Blockchain Integration and Organizational Structure on Accounting Audit Efficiency in Indonesian Companies</i>	Blockchain integration positively correlates with improved audit efficiency.

The literature consistently demonstrates that blockchain integration contributes significantly to strengthening transparency, accountability, and audit assurance within Accounting Information Systems. Blockchain records transactions across interconnected distributed networks where each validated transaction is stored permanently in a block linked to previous blocks. This permanent digital chain enables every accounting transaction to possess a verifiable history that substantially improves data integrity and reliability. Compared with conventional centralized databases, blockchain provides a more secure accounting infrastructure because unauthorized modifications become extremely difficult once transactions have been validated through consensus mechanisms. To illustrate the practical impact of blockchain implementation, the differences between conventional Accounting Information Systems and blockchain-enabled systems are summarized below.

Table 2. Comparison of Accounting Information Systems Before and After Blockchain Integration

AIS Aspect	Before Blockchain Integration	After Blockchain Integration
Transaction recording	Stored in centralized databases	Stored in distributed ledgers
Data modification	Authorized users may modify records	Records become practically immutable after validation
Audit trail	Relies primarily on internal audit logs	Permanent and cryptographically secured digital audit trail
Transaction verification	Predominantly manual verification	Automated or near real-time verification
Risk of manipulation	Higher when internal controls are weak	Significantly reduced through consensus validation and traceability
Audit process	Requires extensive document examination	Faster verification using digitally validated transaction records

The comparison demonstrates that blockchain functions not merely as a data storage technology but also as a comprehensive transaction verification and control mechanism. Consequently, blockchain optimizes Accounting Information Systems by strengthening transaction recording, internal control, and financial reporting processes. The technology fundamentally changes how accounting information is generated, verified, and communicated to stakeholders.

One of the most significant implications of blockchain integration concerns accounting transparency. Transparency improves because every transaction stored on the blockchain contains complete historical records, precise timestamps, and cryptographic links connecting each block of information. As a result, stakeholders—including investors, regulators, auditors, and management—can observe the complete lifecycle of financial transactions with greater confidence. Such transparency substantially reduces information asymmetry while enhancing organizational credibility.

The enhancement of transparency is further reinforced through the concept of triple-entry accounting. Unlike conventional double-entry bookkeeping, where transactions are recorded separately by two parties, triple-entry accounting introduces a third immutable record stored on a shared blockchain ledger. This shared record serves as an independent verification mechanism that simultaneously authenticates transactions for all participating parties. Numerous studies conclude that blockchain-based shared ledgers significantly improve transaction traceability, transparency, and organizational accountability while minimizing opportunities for fraud and financial manipulation. Overall, the literature indicates that blockchain optimizes transparency in Accounting Information Systems through three principal contributions:

1. Providing transparent and fully traceable transaction histories.
2. Minimizing opportunities for financial data manipulation.
3. Strengthening the credibility and reliability of published financial information.

The findings also reveal that blockchain substantially enhances organizational accountability. Within Accounting Information Systems, accountability refers to an organization's ability to justify every transaction, managerial decision, and resource utilization through verifiable evidence, clearly identified responsible parties, accurate timestamps, and documented approval processes. Blockchain facilitates this objective by generating permanent digital records for every transaction. Consequently, user identities, transaction timestamps, validation histories, and accounting entries remain permanently available for verification. Whenever discrepancies, fraud, or recording errors occur, organizations can efficiently identify their origins through blockchain's immutable transaction history. Accordingly, blockchain strengthens accountability by:

1. Establishing permanent transaction records.
2. Clearly identifying responsible individuals.
3. Preventing unauthorized alteration of accounting records.
4. Improving transaction traceability.
5. Reinforcing both internal and external monitoring mechanisms.

Another important implication concerns audit assurance. Under traditional auditing approaches, auditors obtain evidence by examining documents, confirming balances, testing transactions, and evaluating internal controls after accounting periods have concluded. These procedures are often labor-intensive, time-consuming, and susceptible to delays. Blockchain fundamentally changes this process by providing auditors with structured, digitally validated, and highly traceable transaction records. Since much of the audit evidence already exists in immutable digital form, auditors can perform verification procedures more efficiently while reducing dependence on paper-based documentation.

Furthermore, blockchain supports the concept of continuous auditing, whereby auditors continuously monitor organizational transactions rather than conducting periodic examinations after financial statements have been prepared. The availability of real-time transaction data enables earlier detection of irregularities, enhances risk management, and improves the overall quality of audit assurance. Continuous auditing also allows organizations to respond more rapidly to financial anomalies, thereby reducing potential losses associated with fraud or operational errors.

In addition, the implementation of smart contracts further enhances audit efficiency by automating predefined control procedures. Smart contracts execute programmed instructions automatically once specified conditions are satisfied, thereby facilitating compliance verification, anomaly detection, and transaction validation without requiring extensive manual intervention. This automation reduces audit costs, accelerates verification procedures, and increases the consistency of internal control implementation. Consequently, blockchain technology not only transforms Accounting Information Systems but also reshapes the future of auditing through intelligent automation, real-time assurance, and enhanced governance.

Overall, the literature demonstrates that blockchain represents a transformative innovation capable of significantly improving Accounting Information Systems. Through distributed ledger technology, immutable transaction records, cryptographic security, triple-entry accounting, continuous auditing, and smart contracts, blockchain strengthens transparency, accountability, and audit assurance while simultaneously increasing operational efficiency and stakeholder trust. These findings suggest that blockchain will become an increasingly important technological foundation for future accounting practices as organizations continue their digital transformation initiatives.

Based on research findings, the integration of blockchain into Accounting Information Systems can be understood as a form of digital transformation in the accounting field. Blockchain not only changes the way transactions are recorded but also changes the way financial information is verified, monitored, and audited. This demonstrates that blockchain has a strategic role in improving the quality of accounting information.

1. Blockchain as an Accounting Information System Strengthenener

Accounting Information Systems function to produce accurate, relevant, timely, and reliable financial information. However, traditional systems still face the risk of data manipulation, recording errors, reporting delays, and a weak audit trail. Blockchain can help address some of these issues through permanent, distributed, and verifiable transaction recording. In this regard, blockchain can strengthen Accounting Information Systems because it can provide more secure and transparent data. Transaction data stored in a blockchain has a clear history, making it easier for internal and external parties to trace.

2. Blockchain and Transparency

One of the most significant impacts of blockchain implementation is increased transparency. Through this system, every transaction is documented chronologically

with a transparent digital trail. This characteristic simplifies the process of tracing and verifying all financial information. This discussion aligns with Agusnur's (2025) opinion that blockchain implementation significantly impacts financial reporting transparency.

3. Blockchain and Accountability

Blockchain also strengthens accountability because every transaction has digital evidence and a traceable history. In Accounting Information Systems, accountability relates not only to recording transactions, but also to who made the transaction, when it occurred, and how it was validated. With blockchain, the responsibilities of each party become clearer. Transacting parties cannot easily erase their activities. This can help organizations improve oversight, reduce abuse of authority, and strengthen financial accountability. This discussion aligns with research by Wendy (2025). The study's results show that blockchain is consistently positioned as a technology capable of improving transaction traceability, reducing information asymmetry, and strengthening accountability mechanisms.

4. Blockchain and Audit Assurance

In terms of audit assurance, blockchain has the potential to increase the effectiveness and efficiency of the audit process. Auditors can trace transactions more easily because data is stored digitally and maintains a strong track record. The document confirmation and review process can also be accelerated if transactions are recorded on the blockchain. This aligns with research by Wahyudi et al (2025), who stated that blockchain has the potential to revolutionize modern auditing, increasing the effectiveness, efficiency, and transparency of financial statement audits.

CONCLUSION

Based on the study's findings, it can be concluded that integrating blockchain technology into Accounting Information Systems has the potential to improve transparency, accountability, and audit assurance. Transparency increases because transactions can be more clearly traced. Accountability is enhanced because each transaction has a digital footprint and the responsible party can be identified. Audit assurance is also strengthened because auditors can access transaction data that is more documented, structured, and difficult to manipulate.

This research provides a conceptual contribution by confirming that blockchain is a digital financial governance instrument that has a significant impact on modern accounting and financial reporting practices. However, blockchain implementation is not without challenges. Companies still require internal controls, data validation, adequate regulations, technological readiness, and competent human resources.

Therefore, blockchain should be viewed as a supporting tool that can strengthen Accounting Information Systems and audit processes, not as a complete replacement for the role of accountants and auditors..

REFERENCES

- Adrian, F. H., & Dewayanto, T. (2024). Integrasi blockchain dan artificial intelligence pada kurikulum akuntansi: Systematic literature review. *Diponegoro Journal of Accounting*, 13(3), 1–13. <https://ejournal3.undip.ac.id/index.php/accounting/article/view/46059>
- Agusnur E, A. (2025). Pemanfaatan blockchain dalam sistem akuntansi untuk transparansi dan keamanan data keuangan. *Jurnal Akuntansi dan Sistem Informasi*, 1(1), 16–27. <http://pustakajurnal.web.id/index.php/jasi>.
- Fullana, O., & Ruiz, J. (2021). Accounting information systems in the blockchain era. *International Journal of Intellectual Property Management*, 11(1), 63–84. <https://doi.org/10.1504/IJIPM.2021.113357>
- Irmadhani, A. S. N., & Dewayanto, T. (2025). Peran teknologi blockchain dalam meningkatkan transparansi laporan keuangan: A systematic literatur review. *Diponegoro Journal of Accounting*, 14(3). <https://ejournal3.undip.ac.id/index.php/accounting/article/view/52865>
- Muhammad, A. D. M. H., & Junianti, S. A. (2023). Penerapan teknologi blockchain dalam sistem informasi akuntansi: Potensi dan tantangan. *Jurnal Jawara Sistem Informasi*, 1(1). <http://ejournal.universitasmandiri.ac.id/index.php/jsi/article/view/21>
- Ramadhani, A., Ananda, D. A., & Azmi, Z. (2024). Teknologi blockchain dan sistem akuntansi: Potensi dan tantangan. *Indonesian Journal of Economics, Management and Accounting*, 1(1), 37–48. <https://jurnal.intekom.id/index.php/ijema>
- Rijal, S., Devi, E. K., Saputra, A. E., Fatimah, S., & Sarwono. (2024). Pengaruh integrasi teknologi blockchain dan struktur organisasi terhadap efisiensi audit akuntansi pada perusahaan XYZ di Indonesia. *Sanskara Akuntansi dan Keuangan*, 2(03), 175–183 DOI: 10.58812/sak.v2i03.389
- Safriani, & Firdaus, R. (2024). Peran pengendalian internal dalam sistem informasi akuntansi. *JICN: Jurnal Intelek dan Cendekiawan Nusantara*, 1(6), 9177–9184. <https://jicnusantara.com/index.php/jicn/article/view/1676>
- Sawir, M. (2022). *Akuntabilitas organisasi publik: Konsep dan praktik*. Deepublish.
- Syarif, A. M., Widjajanto, B., Sari, W. S., & Himawan, H. (2026). *Blockchain: Konsep dan arsitektur*. ResearchGate.

- Utomo, T. P. (2021). Implementasi teknologi blockchain di perpustakaan: Peluang, tantangan dan hambatan. *Buletin Perpustakaan*, 4(2), 173–200. <https://journal.uui.ac.id/Buletin-Perpustakaan/article/view/22232>
- Wahyudi, B., Dewi, M. L., & Azizah, N. L. (2025). Pengaruh teknologi blockchain terhadap proses audit (sebuah tinjauan literatur). *Journal of Applied Accounting and Business*, 7(1), 8–19. <https://ojs.politeknikjambi.ac.id/index.php/jaab/article/view/463/370>
- Wendy. (2025). Penerapan teknologi blockchain untuk transparansi dan akuntabilitas keuangan perusahaan: Systematic literature review. *JSAKTI: Jurnal Sains Komputer dan Teknologi Informasi*, 8(1). <https://journal.umpr.ac.id/index.php/jsakti/article/view/1182>
- Zein, A. (2024). Teknologi blockchain dan AI dalam aplikasi e commerce. *Marketica: Jurnal Ilmiah Pemasaran*, 1(4), 178–187. <https://journals.sanusantara.com/index.php/marketica/article/view/176>
- Zulkarnain. (2025). Blockchain dalam akuntansi: Konsep, aplikasi, dan transformasi masa depan. Minhaj Pustaka.