

The Impact of Blockchain Technologies on Financial Reporting

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Abstract. Blockchain technology, one of the most widely discussed digital innovations of the past decade, is reshaping the conceptual foundations of financial reporting systems. This article systematically examines the impact of blockchain technology on the preparation, presentation, and audit of financial statements. The study employs a mixed-method approach that combines content analysis of scholarly literature published between 2019 and 2025, economic-statistical analysis of secondary quantitative indicators, and a comparative analysis of the traditional double-entry bookkeeping system with the blockchain-based triple-entry accounting model. The findings show that blockchain adoption can reduce operating costs by an average of 30% and cut transaction-processing time by up to 85%, while lowering the routine workload of accounting staff by approximately 50%. Global surveys conducted across the financial services sector indicate that more than 90% of sector leaders regard blockchain as a scalable and workable solution. The study further demonstrates that, alongside improvements in transparency, accuracy, and real-time reporting, blockchain implementation faces significant constraints, including regulatory uncertainty, technical integration difficulties, and a shortage of qualified personnel. The article concludes with practical recommendations for regulators, higher education institutions, and enterprises aimed at expanding the application of blockchain in accounting and financial reporting, and outlines directions for future research, including its potential application within the Azerbaijani and post-Soviet context.

Keywords: blockchain technology, financial reporting, triple-entry accounting, transparency, audit, digital transformation

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Blokçeyn texnologiyalarının maliyyə hesabatlarına təsiri

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Xülasə. Blokçeyn texnologiyası son onilliyin ən çox müzakirə olunan rəqəmsal innovasiyalarından biri kimi maliyyə hesabatlılığı sistemlərinin konseptual əsaslarını dəyişməkdədir. Bu məqalədə blokçeyn texnologiyasının maliyyə hesabatlarının hazırlanması, təqdim edilməsi və auditi proseslərinə təsiri sistemli şəkildə araşdırılır. Tədqiqatda 2019–2025-ci illər ərzində nəşr olunmuş elmi mənbələrin məzmun təhlili, ikincil statistik göstəricilərin iqtisadi-statistik təhlili və ənanəvi ikili yazılış sistemi ilə blokçeyn əsaslı üçtərəfli yazılış sisteminin müqayisəli təhlili metodlarından istifadə olunmuşdur. Əldə edilən nəticələr göstərir ki, blokçeynin tətbiqi əməliyyat xərclərini orta hesabla 30%, əməliyyatların emalına sərf olunan vaxtı isə 85%-ə qədər azaltmaq imkanı yaradır, mühasibat işçilərinin rutin əmək yükünü isə təxminən 50% aşağı sala bilər.

Maliyyə xidmətləri sektorunda aparılmış global sorğuların nəticələrinə görə, sektor liderlərinin 90%-dən çoxu blokçeyni geniş miqyaslı və işə yararlı həll hesab edir. Tədqiqat həmçinin blokçeynin şəffaflığı, dəqiqliyi və real vaxt rejimində hesabatlılığı artırmaqla yanaşı, tənzimləyici qeyri-müəyyənlik, texniki integrasiya çətinlikləri və ixtisaslı kadr çatışmazlığı kimi ciddi məhdudiyyətlərlə də üzləşdiyini ortaya qoyur. Məqalənin sonunda blokçeynin mühasibat uçotu və maliyyə hesabatlılığı sahəsində tətbiqinin genişləndirilməsi üçün praktiki tövsiyələr və gələcək tədqiqat istiqamətləri təqdim olunur.

Açar sözlər: blokçeyn texnologiyası, maliyyə hesabatlılığı, üçtərəfli mühasibat uçotu, şəffaflıq, audit, rəqəmsal transformasiya

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Introduction

In an era when digital technologies permeate every sector of the economy, blockchain technology has emerged as one of the central innovations driving the transformation of the financial sector and the accounting system. Originally developed to secure cryptocurrency transactions, this technology has today become a universal tool that shapes the conceptual foundations of financial reporting through its properties of the distributed ledger, immutability, and cryptographic security (Saheb et al., 2025; Dashkevich et al., 2024).

The traditional financial reporting model relies on centralized information systems, numerous intermediaries, and periodic reconciliation procedures (Imanova, 2025). This model is accompanied by a number of institutional problems — delayed reporting, human error, the risk of data manipulation, and the high cost of auditing. Major corporate accounting scandals in recent decades have undermined public trust in financial statements and have made it urgent to build a reporting system that is more transparent, traceable, and resistant to manipulation. Blockchain technology is regarded precisely as the alternative infrastructure capable of meeting this need (Tan & Low, 2019). The most fundamental conceptual innovation that blockchain brings to accounting is the complementing of the double-entry principle — used since the fifteenth century — with the concept of "triple-entry accounting." In this model, each transaction is confirmed not only by the traditional entries that both parties record in their own books, but also by a third, cryptographically sealed and immutable ledger entry. This approach significantly reduces the need for traditional auditing to verify the authenticity of a transaction and lays the groundwork for the practical application of the continuous audit model (Cai, 2021; Majumdar, 2021; Sunde & Wright, 2023).

In recent years, the volume of scholarly literature on this topic has grown rapidly. A bibliometric analysis of the Web of Science database covering 2013–2023 shows that more than 1,400 publications on blockchain and accounting have been recorded, and that the field, while still at an experimental stage, is maturing rapidly (Liu et al., 2024). Nevertheless, a systematic scholarly gap persists in existing research regarding the comprehensive impact of blockchain on financial reporting processes and its integration models with other digital technologies such as artificial intelligence and Big Data (Prokopenko et al., 2024; Saheb et al., 2025).

The purpose of this study is to comprehensively assess the impact of blockchain technology on the preparation and presentation of financial statements, to determine the qualitative and quantitative dimensions of this impact, and to identify the main barriers to its widespread adoption. The article consists of five parts. Following the introduction, the research methodology is presented; the findings are then illustrated and discussed with a table and figures; the discussion section compares the results with prior research and examines implications for the Azerbaijani context; and the final section summarizes the main conclusions and recommendations.

Methods

The study employs a mixed-method approach. This approach combines qualitative and quantitative analysis and is a methodology widely applied in comparable studies in the field of blockchain and accounting (Prokopenko et al., 2024). In the first stage, a search was conducted on the Scopus, Web of Science, ScienceDirect, MDPI, and Frontiers platforms using combinations of the keywords "blockchain", "financial reporting", "accounting", "triple-entry accounting" and "audit". Peer-reviewed scholarly articles, systematic literature reviews, and global survey reports from reputable international organizations (Deloitte) covering the period 2019–2025 were selected in accordance with the inclusion criteria. Works that did not directly address the relationship between blockchain and financial reporting, and that focused solely on cryptocurrency market price dynamics, were excluded from the scope of the study.

In the second stage, a content analysis of the selected sources was conducted, identifying the main thematic directions reflecting blockchain's impact on financial reporting (transparency, accuracy, timeliness, audit transformation, institutional adoption). In the third stage, secondary quantitative indicators obtained from academic publications and Deloitte's Global Blockchain Survey (cost reduction, transaction-time reduction, industry adoption rates) were systematized and interpreted using economic-statistical analysis methods. In the fourth stage, a comparative analysis of the traditional double-entry system and the blockchain-based triple-entry system was conducted across key parameters. Certain limitations of the study should be noted: the analysis is based mainly on secondary sources (published scholarly literature and survey reports), and no primary survey was conducted; since the majority of the empirical studies analyzed cover developed markets (the United States, China, and European Union countries), extrapolation of the findings to the post-Soviet space, including the Azerbaijani context, should be approached with caution.

1. Findings

1.1. Impact on the Qualitative Characteristics of Financial Statements

The analysis shows that blockchain technology has a direct impact on the four main qualitative characteristics of financial statements – transparency, accuracy/reliability, timeliness, and comparability. The distributed ledger architecture reduces information asymmetry and enhances the transparency of financial statements by giving all authorized participants simultaneous access to the same database (Saheb et al., 2025). The property of cryptographic immutability makes retrospective modification of recorded transactions practically impossible, which significantly strengthens the reliability of statements and their resistance to manipulation (Dashkevich et al., 2024).

Real-time reconciliation capability minimizes the need for the extensive end-of-period matching procedures required in traditional accounting systems and enhances the timeliness of financial statements (Tan & Low, 2019). Standardized smart-contract protocols facilitate the mutual comparison of financial data across different organizations, thereby enhancing the comparability of statements. Table 1 presents a comparative summary of the traditional accounting system and the blockchain-based system across key parameters.

Table 1

Comparison of the traditional accounting system and the blockchain-based system

Criterion	Traditional Accounting System	Blockchain-Based System
Recording method	Centralized, double-entry	Distributed, triple-entry
Alterability	Entries can be edited afterward	Cryptographically immutable
Third-party confirmation	Requires intermediaries such as auditors, banks, notaries	Confirmed by network participants through consensus
Reporting frequency	Periodic (monthly, quarterly, annual)	Near real-time
Audit trail	Reconstructed from documentation, time-consuming	Automatic, fully traceable per transaction
Error/fraud risk	High risk due to human factor	Reduced risk through smart-contract automation

Source. Compiled by the author based on Cai (2021); Tan & Low (2019); Sunde & Wright (2023).

1.2. Quantitative Indicators: Cost and Time Efficiency

The quantitative dimension of blockchain's impact on financial and accounting processes is confirmed by a growing body of empirical evidence in the academic literature. A comparative analysis conducted in the financial sector found that the adoption of blockchain solutions reduces operating costs by an average of 30% and transaction-processing time by up to 85% (Mohammad et al., 2025). In parallel, a bibliometric analysis of the integration of blockchain and accounting indicates that widespread adoption of this technology could automate approximately 50% of accountants' routine, repetitive labor functions, potentially generating savings of billions of dollars globally (Liu et al., 2024). Figure 1 presents a comparative view of these three indicators.

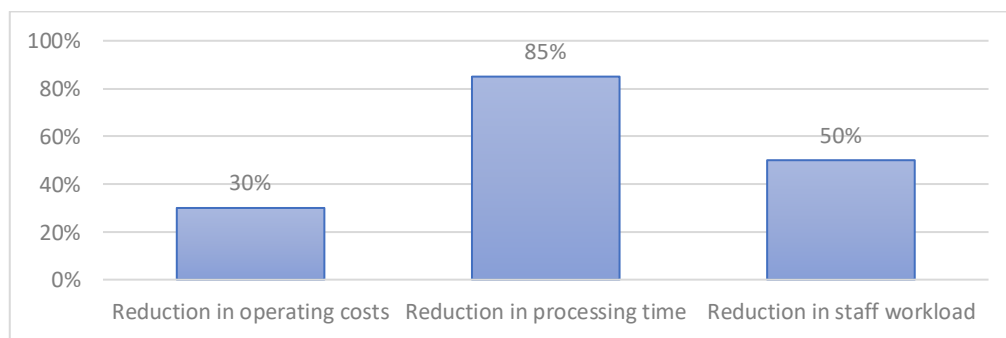


Figure 1

Quantitative impact of blockchain technology on financial-accounting processes

Source. Prepared by the author based on Mohammad et al. (2025); Liu et al. (2024).

These figures suggest that the economic effect of blockchain is not limited to qualitative improvement but also generates measurable financial efficiency. In particular, the 85% increase in transaction-processing speed — explained by the reduced number of intermediaries (banks, clearing houses) and the application of automated consensus mechanisms — is of particular importance for cross-border payments and multilateral supply-chain transactions.

1.3. Industry Adoption and Institutional Factors

To assess the institutional adoption of blockchain, the results of global surveys conducted in the financial services sector were analyzed. According to Deloitte's Global Blockchain Survey (2021), among "pioneer" organizations that have already applied the technology to production processes or integrated digital assets into their core business activities, 96% consider blockchain a scalable and widely accepted solution, 93% confirm the existence of a compelling business case for it, and another 93% report actively negotiating blockchain initiatives with business partners, suppliers, and customers (Deloitte, 2021). Figure 2 presents these indicators.

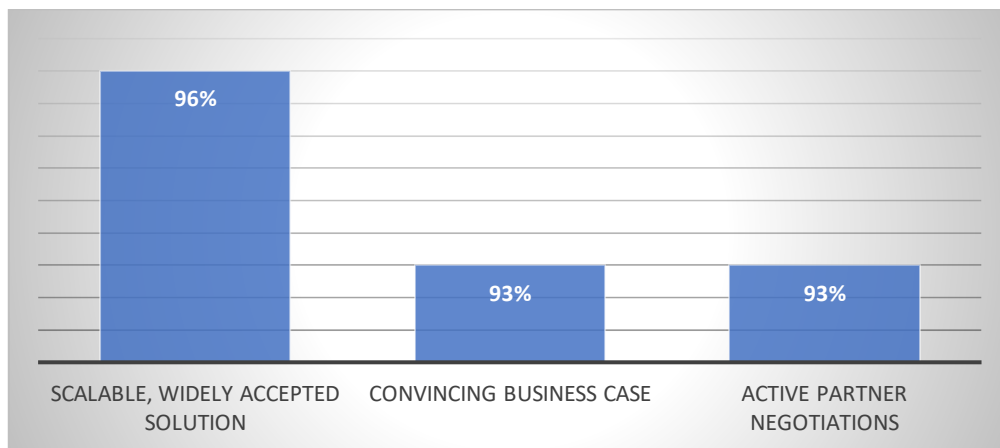


Figure 2

Institutional adoption of blockchain among financial-sector leader (Deloitte, 2021)

Source. Prepared by the author based on the Deloitte Global Blockchain Survey (2021).

These indicators show that attitudes toward blockchain among leading organizations in the financial services sector are already shifting from an experimental phase to institutional strategy. At the same time, this trend is supported by the active investment and platform-development activities of the "Big Four" audit firms (Deloitte, EY, KPMG, PwC) in applying blockchain technology to auditing — each of the "Big Four" firms has introduced blockchain-based audit and crypto-asset accounting solutions in recent years.

1.4. Transformation of Triple-Entry Accounting and the Audit Process

The triple-entry model, the conceptual innovation blockchain brings to accounting, has become a subject of systematic scholarly research in recent years (Cai, 2021; Majumdar, 2021). The practical application of this model fundamentally changes the audit process: instead of traditional sampling-based auditing, the recording of all transactions on the blockchain as "financial fingerprints" enables the practical application of continuous audit methodology (Sunde & Wright, 2023). Smart contracts contribute to reducing audit costs by enabling automatic verification of regulatory compliance, real-time reporting, and identity management.

A systematic literature review conducted by Kunariyah and Dewayanto (2025) further shows that blockchain's impact on financial reporting quality is not driven solely by technological factors but is also synergistically linked to the quality of corporate governance — for example, the presence of independent audit committees and the application of international accounting standards. In other words, the full realization of blockchain's potential benefits is only possible when combined with a strong corporate governance framework.

1.5. Evidence from the Real Sector

One study that empirically assesses blockchain's real impact on the quality of financial reporting examines the effect of a blockchain-based electronic invoicing system implemented at the municipal level in China since 2018. Using a difference-in-differences approach on a sample of companies listed on Chinese stock exchanges between 2016 and 2022, this study demonstrates that, following the adoption of the blockchain invoicing system, companies' accrual quality and earnings informativeness improved to a statistically significant degree, while instances of income shifting declined (Liao et al., 2025). This finding confirms that blockchain's contribution to corporate reporting outcomes is not merely theoretical but practical and measurable.

Discussion

The findings align with the existing scholarly consensus confirming that blockchain technology has a positive effect on the main quality criteria of financial reporting — transparency, reliability, and timeliness (Saheb et al., 2025; Dashkevich et al., 2024). From the perspective of agency theory, these results find a logical explanation: blockchain's distributed and immutable ledger architecture structurally reduces the information asymmetry between principals (investors, creditors, regulators) and agents (management), which in turn limits opportunities for earnings management — a thesis also confirmed by empirical research on the Chinese market (Liao et al., 2025).

At the same time, the quantitative indicators obtained (30% cost reduction, 85% time reduction, 50% workload reduction) show that blockchain is attractive not only in qualitative terms but also in cost-benefit terms. However, it is important to note that most of these indicators were obtained from large, technologically mature organizations; for small and medium-sized enterprises, initial infrastructure investment, a shortage of qualified personnel, and technical complexity may pose serious barriers (Prokopenko et al., 2024).

In practical terms, the study's findings are significant for several stakeholders. For accountants, blockchain technology necessitates a shift from the traditional transaction-recording function toward strategic data analytics and control functions. For auditors, the transition from sampling-based verification to continuous audit requires new methodological skills. For regulators, issues such as the accounting treatment of digital assets, the legal status of smart contracts, and the regulation of cross-border blockchain transactions create the need to develop new regulatory frameworks.

These findings are particularly relevant in the Azerbaijani context. As the country continues to develop its digital economy and gradually align its financial reporting with International Financial Reporting Standards (IFRS), piloting blockchain-based solutions in government agencies — particularly in tax administration and public procurement — as well as in the banking sector, can be regarded as a promising direction for enhancing reporting transparency. Nevertheless, progress in this direction first requires the development of an appropriate legal-regulatory framework and the training of a specialized workforce.

The study also identifies objective limitations to blockchain adoption. These include the high energy consumption of public blockchain networks, the tension between commercial confidentiality and transparency requirements, the difficulty of reconciling data-protection legislation (such as the "right to be forgotten") with the principle of immutability, and integration challenges with existing legacy information systems (Prokopenko et al., 2024; Basdekidou & Papapanagos, 2024). These factors highlight the importance of viewing blockchain not as a universal solution but as a technological tool to be applied contextually.

Conclusion

This study demonstrates that blockchain technology has a multifaceted impact on the financial reporting system. First, through distributed ledger, cryptographic immutability, and smart-contract mechanisms, the technology significantly enhances the transparency, reliability, and timeliness of financial statements. Second, blockchain adoption generates measurable economic benefits — a reduction in operating costs of up to 30%, a reduction in processing time of up to 85%, and a roughly 50% decrease in accounting workload. Third, institutional trust in blockchain among leading organizations in the financial services sector is high, indicating that the technology is moving from an experimental phase to a strategic application phase. Fourth, the blockchain-based "triple-entry accounting" model is a fundamental conceptual innovation that enables the transition from traditional sampling-based auditing to a continuous-audit paradigm.

Based on the analysis, the following practical recommendations are formulated. For regulators: developing a clear regulatory framework governing the accounting treatment of digital assets and the legal status of smart contracts, and supporting pilot projects on blockchain-based reporting. For higher education institutions: integrating blockchain technologies, digital audit methods, and cryptoasset accounting into accounting and finance education curricula. For enterprises: beginning with a comprehensive readiness assessment for blockchain adoption, gaining experience through phased pilot projects, and planning an integration strategy with existing information systems in advance (Prokopenko et al., 2024).

Several promising directions exist for future research: developing models for integrating blockchain with artificial intelligence and Big Data technologies, assessing the long-term economic outcomes of blockchain-based reporting, and conducting empirical research on the prospects for applying blockchain to public and private-sector financial reporting in post-Soviet countries, including Azerbaijan (Prokopenko et al., 2024; Saheb et al., 2025). Such research can make an important contribution to both theoretical literature and practical decision-making processes.

References

- Basdekidou, V., & Papapanagos, H. (2024). Blockchain Technology Adoption for Disrupting FinTech Functionalities: A Systematic Literature Review for Corporate Management, Supply Chain, Banking Industry, and Stock Markets. *Digital*, 4(3), 762–803. <https://doi.org/10.3390/digital4030039>
- Cai, C. W. (2021). Triple-entry accounting with blockchain: How far have we come? *Accounting & Finance*, 61(1), 71–93. <https://doi.org/10.1111/acfi.12556>
- Dashkevich, N., Counsell, S., & Destefanis, G. (2024). Blockchain Financial Statements: Innovating Financial Reporting, Accounting, and Liquidity Management. *Future Internet*, 16(7), 244. <https://doi.org/10.3390/fi16070244>
- Deloitte. (2021). *2021 Global Blockchain Survey: A new age of digital assets*. Deloitte Insights. <https://www2.deloitte.com/xs/en/insights/topics/understanding-blockchain-potential/global-blockchain-survey.html>
- İmanova, M. (2025). Bütçə təşkilatlarında maliyyə hesabatlılığının inkişafı və təkmilləşdirilməsi istiqamətləri. *Elmi Tədqiqat Beynəlxalq Elmi Jurnal*, 5(10), 58–63. <https://doi.org/10.36719/2789-6919/50/58-63>
- Imanova, M., Abbasov, T., & Musayev, A. (2025). Global Evolution of Artificial Intelligence: Navigating Ethics, Policy and Innovation for a Sustainable Future. *Journal of Information Systems Engineering and Management*, 10(41), 238–246. <https://doi.org/10.52783/jisem.v10i41s.7814>

- Jayasuriya Daluwathumullagamage, D., & Sims, A. (2020). Blockchain-Enabled Corporate Governance and Regulation. *International Journal of Financial Studies*, 8(2), 36. <https://doi.org/10.3390/ijfs8020036>
- Kunariyah, A., & Dewayanto, T. (2025). The role of blockchain and corporate governance in financial reporting quality: A systematic literature review. *Journal Akademi Akuntansi*, 8(1). <https://doi.org/10.22219/jaa.v8i1.38471>
- Liao, K., Lin, L., & Sun, Y. (2025). Blockchain adoption and corporate financial reporting quality. *Journal of Accounting and Public Policy*, 49, 107265. <https://doi.org/10.1016/j.jaccpubpol.2024.107265>
- Liu, C., Muravskiy, V., & Wei, W. (2024). Evolution of blockchain accounting literature from the perspective of CiteSpace (2013–2023). *Heliyon*, 10(11), e32097. <https://doi.org/10.1016/j.heliyon.2024.e32097>
- Majumdar, S. (2021). Emergence of Triple Entry Accounting in the Backdrop of Blockchain Technology: A Conceptual Study. *The Management Accountant Journal*, 56(11), 68–71. <https://doi.org/10.33516/maj.v56i11.68-71p>
- Mohammad, A. A., Chumak, O., Artemchuk, M., Khmeliuk, A., & Skrypnyk, S. (2025). Blockchain technology and its impact on financial reporting in the digital accounting era. *Journal of Theoretical and Applied Information Technology*, 103(10), 4149–4162. <https://doi.org/10.5281/zenodo.17257066>
- Prokopenko, O., Koldovskiy, A., Khalilova, M., Orazbayeva, A., & Machado, J. (2024). Development of blockchain technology in financial accounting. *Computation*, 12(12), 250. <https://doi.org/10.3390/computation12120250>
- Saheb, S. S., Chinnapareddy, V. K. R., Devalla, D., Charugulla, S., Chakka, N. B., & Raja Sekhar, K. (2025). Factors leading to the adoption of blockchain technology in financial reporting. *Frontiers in Blockchain*, 8, 1491609. <https://doi.org/10.3389/fbloc.2025.1491609>
- Sunde, T. V., & Wright, C. S. (2023). Implementing Triple Entry Accounting as an Audit Tool—An Extension to Modern Accounting Systems. *Journal of Risk and Financial Management*, 16(11), 478. <https://doi.org/10.3390/jrfm16110478>
- Tan, B. S., & Low, K. Y. (2019). Blockchain as the database engine in the accounting system. *Australian Accounting Review*, 29(2), 312–318. <https://doi.org/10.1111/auar.12278>
- Zhou, X., & He, M. (2025). Impact of Blockchain Technology on Financial Management and Accounting Practices. *Academic Journal of Science and Technology*, 18(2), 40–47. <https://doi.org/10.54097/ffyya64>