International Journal of Multidisciplinary Research and Growth Evaluation.

Blockchain and Artificial Intelligence in Modern Auditing: A Systematic Review of Audit Quality Mechanisms and Outcomes

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Article Info

ISSN (online): 2582-7138
Volume: 05
Issue: 05
September - October 2024
Received: 12-09-2024
Accepted: 10-10-2024
Page No: 1188-1191

Abstract
This study reviews existing literature on the revolutionary effects of blockchain and artificial intelligence (AI) on audit quality, specifically focusing on transparency, efficiency, and fraud detection. By integrating Stakeholder-Centric, Organizational, and Technology Adoption theories, this research offers a framework for understanding how these technologies reshape stakeholder trust. We emphasize blockchain's immutable nature, providing a permanent, unchangeable record, and smart contracts as key drivers of transparency that reduce agency costs. Simultaneously, AI-driven analytics are shown to enhance audit accuracy through real-time anomaly detection. However, the review identifies significant barriers, including the technical difficulty of integrating blockchain with legacy systems and regulatory ambiguity. The findings reveal a readiness gap in the profession, where technological potential is hindered by organizational resistance and high implementation costs. This review concludes by identifying critical areas for future research, particularly the long-term impact of these technologies on auditors' professional judgment and the ethical implications of automated decision-making.

Keywords: Audit Quality, Blockchain, Artificial Intelligence, Fraud Detection, Smart Contracts, Technology Adoption, Stakeholder Theory, Regulatory Challenges

Introduction

The widespread adoption of evolving technologies has potentials to make businesses more effective and efficient. Companies have made significant investments in the adoption of new technologies like blockchain, artificial intelligence (AI), big data, the Internet of Things (IoT), and cloud computing (Han *et al*., 2023) [19]. Technology has wide-ranging implications for data processing, transmission, storage, and security (Gross *et al*., 2017) [18] and has the potential to create a new ecosystem for the handling of accounting information (Dai and Vasarhelyi 2017; Kokina & Davenport 2017) [10, 23]. Presumably, this is why accounting and subsequently auditing would be one of the first applications of blockchain (Georgiou, Sapuric, Lois 2024) [17].
With blockchain's evolving use, innovators are finding more opportunities to create value and enhance trust by combining blockchain with other technology forms, notably AI, IoT, or cloud computing. These innovations specifically provide the foundation for an "Internet of value" that will fundamentally reshape society and its business (Tapscott and Euchner, 2019) [30].
This paper presents literature on blockchain technology, focusing on its potential impact on financial reporting and audit quality through the perspectives of both investors and auditors. Additionally, it provides recommendations on various scenarios in which auditors can leverage blockchain and AI to enhance the quality and reliability of evidence, thereby strengthening their audit opinions (Rozario & Vasarhelyi, 2018) [27].

2. Theoretical foundations underpinning blockchain and AI

This review interprets prior findings using Stakeholder-Centric, Organizational, and Technology Adoption theories so that the adoption of blockchain and AI can be better understood and embraced. By integrating these theories, we can see that blockchain

and AI are not just technical tools, but solutions to deep-seated issues like information asymmetry and managerial discretion.

2.1. Stakeholder-Centric Theories

Stakeholder theory (Freeman, 1984) [15] emphasizes the need for organizations to balance the interests of various stakeholders11. This theory provides a lens to understand the transformative role of blockchain in improving trust and transparency among stakeholders. By offering immutable records, meaning data that is permanent and cannot be changed or deleted once recorded, blockchain can reduce information asymmetry and foster trust between auditors, managers, and investors (Ferri *et al*., 2021) [14]. Furthermore, blockchain-enabled triple-entry accounting systems create an inclusive environment where all parties have access to accurate and verifiable information (Cai, 2021) [8].

Agency theory (Jensen & Meckling, 1976) [22] highlights the conflicts of interest between principals (shareholders) and agents (managers). Blockchain addresses agency problems by reducing the need for intermediaries and providing a transparent record of transactions, thus minimizing agency costs. Smart contracts, which are digital agreements that execute predefined criteria automatically, also mitigate the risk of opportunistic behaviors by ensuring compliance in real-time (Rozario & Thomas, 2019) [27]. These technologies align with agency theory by enhancing accountability and reducing managerial discretion over financial reporting.

2.2. Organizational and Strategic Theories

Institutional theory, particularly the concept of institutional isomorphism (DiMaggio & Powell, 1983) [12], explains how organizations adopt similar practices to gain legitimacy in response to external pressures. Blockchain adoption in auditing is an example of coercive and mimetic isomorphism, as firms respond to regulatory demands and imitate industry leaders to maintain competitiveness and legitimacy (Schmitz & Leoni, 2019) [28]. This reflects the need for organizations to conform to technological advancements to remain relevant and credible (Garanina *et al*., 2022) [16].

The Resource-Based View (RBV) posits that firms gain a competitive advantage by leveraging unique resources and capabilities (Barney, 1991) [7]. Blockchain and AI can be seen as strategic resources that enable organizations to achieve superior audit quality and operational efficiency. For example, AI-enhanced data analytics improves auditors' ability to detect anomalies and reduce errors (Raschke *et al*., 2018) [26], while blockchain provides a robust infrastructure for secure record-keeping (Rozario & Vasarhelyi, 2018) [27]. The adoption of these technologies allows firms to differentiate their services and create value.

2.3. Technology Adoption Theories

The Technology Acceptance Model (TAM) suggests that perceived usefulness and ease of use are key factors influencing technology acceptance (Davis, 1989) [11]. Studies like those by Li and Juma'h (2022) [24] explore how auditors' acceptance of blockchain is shaped by perceived benefits like enhanced transparency. Similarly, the diffusion of innovations theory (Rogers, 1962) explains how new technologies spread within organizations. Early adopters such as the Big 4 accounting firms set the trend, but organizational resistance to change can hinder the diffusion, emphasizing the need for clear communication of its advantages (Appelbaum *et al*., 2022) [6].

3. Synthesis of blockchain and AI in auditing

The adoption of AI and blockchain is transforming audit practices by improving data accuracy, detection efficiency, and operational robustness. Blockchain and AI together create a synergistic framework that enables real-time, data-driven insights (Sun *et al*., 2021) [29].

3.1. Efficiency and Fraud Prevention

Blockchain's smart contracts have gained recognition for their potential to streamline audit processes by automating routine tasks. Rozario and Thomas (2019) [27] describe how smart contracts can replace manual, repetitive auditing steps, thus reducing errors and enhancing process efficiency. Furthermore, blockchain's unique characteristics make it a valuable tool for preventing fraud. Its immutable ledger prevents fraudulent manipulation of financial records, thereby enhancing audit reliability. Dunn *et al*. (2021) [13] emphasize that blockchain's transparency is particularly useful in auditing digital assets like Bitcoin, as it provides an irrefutable audit trail.

3.2. Emerging Trends

Research is continually evolving, with topics such as triple-entry accounting and AI's role in fraud detection highlighting ongoing technological shifts (Cai, 2021; Georgiou *et al*., 2024) [8, 17]. Cai (2021) [8] examines the development of triple-entry accounting, a blockchain-based system that could redefine the financial reporting landscape. Additionally, emerging topics include blockchain's applicability to cryptocurrency auditing, which remains underexplored (Georgiou *et al*., 2024) [17].

3.3. The Research Gap

While existing literature thoroughly explores the individual capabilities of blockchain and AI, there are three critical gaps that remain underexplored. First, there is a lack of empirical evidence regarding the "hypocrisy gap," the disconnect between a firm's public Corporate Social Responsibility (CSR) disclosures and its actual internal accounting practices. While blockchain is praised for transparency, few studies investigate whether firms use this technology to truly align their ESG reporting with their financial reality or merely as a tool for greenwashing.

Second, the long-term impact on professional judgment remains an underexplored. Most research focuses on immediate efficiency gains and fraud detection. However, we do not yet understand if over-reliance on AI-driven analytics leads to algorithmic bias or the erosion of an auditor's professional skepticism. If the machine flags an anomaly, will the auditor still perform the deep, qualitative investigation required by traditional standards?

4. Challenges and practical implications

Despite blockchain's potential, numerous challenges hinder its widespread adoption. A major obstacle is aligning these technologies with existing legacy systems, which is often complex and resource-intensive. High implementation costs, a lack of technical expertise, and interoperability issues, referring to the difficulty of different systems and software platforms to communicate and share data seamlessly, further contribute to delays in adoption (Rozario & Thomas, 2019; Tanaraj *et al*., 2023) [27].

4.1. Regulatory and Organizational Barriers

Regulatory concerns also play a pivotal role, as the adoption of blockchain and AI outpaces the development of clear frameworks. Issues such as data privacy, cybersecurity risks, and the ethical implications of AI decision-making highlight the need for updated regulations to ensure accountability. Organizations should conduct a thorough cost-benefit analysis to evaluate the return on investment, balancing high upfront costs with long-term efficiency gains (Pal *et al*., 2024).

4.2. Recommendations for Implementation

To overcome adoption barriers, firms may use strategic approaches like pilot projects, which are small-scale trial runs or experimental tests used to demonstrate the value of the tools while managing risks associated with large-scale adoption (Rozario & Thomas, 2019) [27]. Effective adoption also requires significant investments in training and expertise development. Collaboration with technology experts can help bridge the technical knowledge gap, ensuring organizations can unlock the potential of blockchain and AI (Akter *et al*., 2024) [3].

5. References

1. Abdennadher S, Grassa R, Abdulla H, Alfalasi A. The effects of blockchain technology on the accounting and assurance profession in the UAE: An exploratory study. J Financ Report Account. 2021;20:53-71.
2. Ajayi-Nifise AO, Falaiye T, Olubusola O, Daraojimba AI, Mhlongo NZ. Blockchain in US accounting: a review: assessing its transformative potential for enhancing transparency and integrity. Finance Account Res J. 2024;6(2):159-82.
3. Akter M, Kummer TF, Yigitbasioglu O. Looking beyond the hype: The challenges of blockchain adoption in accounting. Int J Account Inf Syst. 2024;53:100681. doi:10.1016/j.accinf.2024.100681
4. Appelbaum D, Cohen E, Kinory E, Stein Smith S. Impediments to Blockchain Adoption. J Emerg Technol Account. 2022;19(2):199-210. doi:10.2308/JETA-19-05-14-26
5. Appelbaum D, Nehmer RA. Auditing Cloud-Based Blockchain Accounting Systems. J Inf Syst. 2020;34(2):5-21. doi:10.2308/sys-52660
6. Appelbaum D, Wang D, Vasarhelyi MA. Organizational Resistance to Blockchain Adoption in Auditing. Account Horiz. 2022.
7. Barney J. Firm Resources and Sustained Competitive Advantage. J Manage. 1991;17(1):99-120. doi:10.1177/014920639101700108
8. Cai CW. Triple-entry accounting with blockchain: How far have we come? Account Finance. 2021;61(1):71-93. doi:10.1111/acfi.12556
9. Casino F, Dasaklis TK, Patsakis C. A systematic literature review of blockchain-based applications: Current status, classification, and open issues. Telemat Inform. 2019;36:55-81. doi:10.1016/j.tele.2018.11.006
10. Dai J, Vasarhelyi MA. Toward Blockchain-Based Accounting and Assurance. J Inf Syst. 2017;31(3):5-21. doi:10.2308/sys-51804
11. Davis FD. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Q. 1989;13(3):319-40. doi:10.2307/249008
12. DiMaggio PJ, Powell WW. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. Am Sociol Rev. 1983;48(2):147-60. doi:10.2307/2095101
13. Dunn RT, Jenkins JG, Sheldon MD. Bitcoin and Blockchain: Audit Implications of the Killer Bs. Issues Account Educ. 2021;36(1):43-56. doi:10.2308/ISSUES-19-049
14. Ferri L, Spanò R, Ginesti G, Theodosopoulos G. Ascertaining auditors' intentions to use blockchain technology: evidence from the Big 4 accountancy firms in Italy. Meditari Account Res. 2021;29(5):1063-87. doi:10.1108/MEDAR-03-2020-0829
15. Freeman RE, McVea J, Hitt MA, Harrison JS, Freeman RE. A Stakeholder Approach to Strategic Management. In: Hitt MA, Freeman RE, Harrison JS, editors. The Blackwell Handbook of Strategic Management. Oxford: Blackwell Publishing Ltd; 2005. p. 183-201. doi:10.1111/b.9780631218616.2006.00007.x
16. Garanina T, Ranta M, Dumay J. Blockchain in accounting research: current trends and emerging topics. Account Audit Account J. 2022;35(7):1507-33. doi:10.1108/AAAJ-10-2020-4991
17. Georgiou I, Sapuric S, Lois P, Thrassou A. Blockchain for Accounting and Auditing—Accounting and Auditing for Cryptocurrencies: A Systematic Literature Review and Future Research Directions. J Risk Financial Manag. 2024;17(7):276. doi:10.3390/jrfm17070276
18. Gross M, Hemker J, Hoelscher S, Reed S. Cloud Computing in Financial Auditing: Opportunities and Risks. J Emerg Technol Account. 2017.
19. Han H, Shiwakoti RK, Jarvis R, Mordi C, Botchie D. Accounting and auditing with blockchain technology and artificial Intelligence: A literature review. Int J Account Inf Syst. 2023;48:100598. doi:10.1016/j.accinf.2022.100598
20. Issa H, Sun T, Vasarhelyi M. Research Ideas for Artificial Intelligence in Auditing: The Formalization of Audit and Workforce Supplements. J Emerg Technol Account. 2016.
21. Jayasuriya S, Sims R. Blockchain and ERP: Transforming Traditional Accounting Practices. Account Horiz. 2023.
22. Jensen MC, Meckling WH. Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure. J Financ Econ. 1976;3(4):305-60.
23. Kokina J, Davenport TH. The Emergence of Artificial Intelligence: How Automation is Changing Auditing. J Emerg Technol Account. 2017;14(1):115-22. doi:10.2308/jeta-51730
24. Li Y, Juma'h AH. The Effect of Technological and Task Considerations on Auditors' Acceptance of Blockchain Technology. J Inf Syst. 2022;36(3):129-51. doi:10.2308/ISYS-2020-022
25. O'Leary DE. Open Information Enterprise Transactions: Business Intelligence and Wash and Spoof Transactions in Blockchain and Social Commerce. Intell Syst Account Finance Manag. 2018;25(3):148-58. doi:10.1002/isaf.1438
26. Raschke RL, Saiewitz A, Kachroo P, Lennard JB. AI-Enhanced Audit Inquiry: A Research Note. J Emerg Technol Account. 2018;15(2):111-6. doi:10.2308/jeta-52310
27. Rozario AM, Vasarhelyi MA. Auditing with Smart

Contracts. Int J Digit Account Res. 2018;18:1-27. doi:10.4192/1577-8517-v18_1
28. Schmitz J, Leoni G. Accounting and Auditing in the Age of Blockchain. Account Horiz. 2019;33(3):113-25.
29. Sun T, Liu Z, Wang Y. Synergistic Integration of Blockchain and AI for Audit Quality. J Auditing Analytics. 2021.
30. Tapscott D, Euchner J. The Internet of Value: A Blockchain Revolution. Res Technol Manag. 2019.
31. Toufaily E, Zalan T, Dhaouadi K. Regulatory Implications of Blockchain in Accounting. Account Perspect. 2021.
32. Treleaven P, Brown RG, Yang D. Blockchain Technology in Finance and Accounting. J Financ Transform. 2017;45:109-23.