

Chapter 6

Auditing the Blockchain

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ABSTRACT

Information systems audit is the procedure of gathering and assessing data to determine whether an information system protects assets, upholds data integrity, successfully reaches organizational goals, effectively uses resources, and reviews business continuity plans. In this study, the IS audit framework by ISACA has been extended to information systems built on the blockchain technology or to systems integrated with a blockchain component. Blockchain is a relatively new technology, and its applications are being explored in different fields today. In fact, blockchain applications are being explored for improving the IS audit process. As such, the authors have explored the principles of audit and the blockchain itself in this chapter.

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AUDITING THE BLOCKCHAIN

What is the Blockchain?

The blockchain is a peer-to-peer system of records used to transact value, not limited to money, without the need for trusted intermediaries like banks or brokers (Singhal, Dhameja, & Panda, 2018). It is a shared, replicated, and permissioned ledger that offers features such as consensus, provenance, immutability, and finality (Andolfatto, 2018). While the concept of a ledger is not new, the implementation of blockchain in a decentralized and distributed network is innovative, enabling efficient, verifiable, and permanent transactions among multiple parties (Iansiti & Lakhani, 2017). These features provide a higher level of security compared to traditional ledgers (Hofmann, Wurster, & Böhmecke-Schwafert, 2017).

How Does the Blockchain work?

The blockchain stores transactions in blocks, which are linked together based on cryptography rules. The process involves:

- a) An active node in the decentralized network generates a transaction request.
- b) Other nodes validate the request through a process called mining, where they collaboratively solve a computationally intense mathematical problem.
- c) The first node or cluster to solve the problem broadcasts the solution to other miners for confirmation.
- d) Once confirmed, the transaction is added to a block, timestamped, and linked to the previous block (Zamani, He, & Phillips, 2018).

Blockchain Use Cases

Blockchain technology has experienced significant growth and is now an integral part of various industries, including:

- a) **Cryptocurrency:** Blockchain enables borderless transactions and helps enforce regulations against fraudulent activities (Sigalos, 2022).
- b) **Logistics & Supply Chain (e.g., Maersk):** Blockchain integration, like TradeLens, addresses regulatory requirements and compliance while serving multiple governments and business needs (Jensen, Hedman, & Stefan, 2019).
- c) **Art (NFTs):** Ownership and copyright issues arise with non-fungible tokens, questioning who owns them (Chinlund & Gordon, 2021).

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