Transforming Accounting System With Blockchain Technology Implementation

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Article Info	Abstract
	Introduction: The increasing need for transparency and accountability in financial reporting has highlighted significant shortcomings in traditional accounting systems, particularly data manipulation and fraud. This research explores the potential of blockchain technology, a decentralized ledger introduced through Bitcoin, as a transformative solution to these issues. **Research Methods:** This study uses a qualitative descriptive design because this study describes the details and interprets the initial data, symptoms and phenomena obtained during the study. This study is a qualitative study using a library research approach. **Results:** The findings demonstrate that blockchain can significantly improve data reliability through its key features, including immutability, decentralization, transparency, and enhanced security. Furthermore, blockchain offers operational efficiencies in financial reporting, mainly through transaction automation, real-time auditability, and cost reduction. **Conclusion:** This study finds that Blockchain provides data reliability assurance through an immutable and distributed system, minimizing the risk of data manipulation or fraud.

INTRODUCTION

Transparency in accounting is a critical element that supports trust and accountability in financial reporting. However, many traditional accounting systems still face data manipulation and fraud issues that can harm stakeholders. A study by the Association of Certified Fraud Examiners (ACFE) shows that companies lose about 5% of their annual revenue due to fraud, reaching a global total loss of $4.5 trillion in 2019. (Association of Certified Fraud Examiners, 2020).
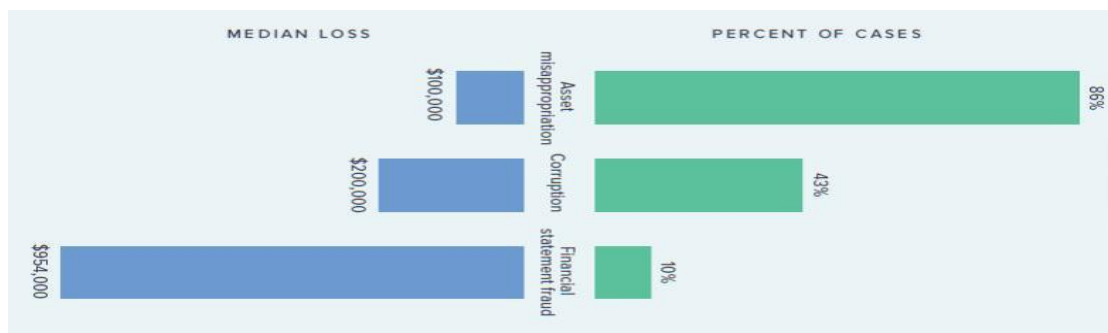
Picture 1. Fraud Category

Based on Figure 1, there are 3 main categories of fraud. First is asset misuse, which involves employees stealing or misusing the organization's resources, with the highest percentage of 86%. However, this scheme tends to cause an average loss of USD 100,000 per case. On the other hand, in the financial statement fraud scheme, the perpetrator intentionally causes material misstatements or omissions in the organization's financial statements; it is the most minor standard fraud scheme (10%). With the lowest percentage, this fraud scheme causes the highest financial losses, an average of USD 954,000 in each case. The third category, namely corruption, is in the middle regarding frequency and financial loss. This scheme occurs in 43% of cases and causes an average loss of USD 200,000 (Association of Certified Fraud Examiners, 2020). This condition emphasizes the need for technology to increase accounting transparency and integrity.

Blockchain, a distributed ledger technology introduced through Bitcoin by Satoshi Nakamoto in 2008, has gained widespread attention as a potential solution to increase transparency in accounting (Nakamoto, 2008). Blockchain offers an immutable and verifiable record of transactions by a network of computers, making it virtually impossible to manipulate. The technology enables transparent and auditable record-keeping in real-time, which is a significant breakthrough in mitigating fraud risks.

Research shows that blockchain adoption in accounting can provide many benefits, including increased operational efficiency and reduced audit costs. According to a 2020 Deloitte report, blockchain implementation can reduce operational costs by up to 30% by automating verification and audit processes (Deloitte, 2020). In addition, blockchain can reduce the time required for audits, increasing the efficiency and speed of financial reporting.

However, despite its great potential, blockchain implementation in accounting has challenges. Technical issues such as scalability and interoperability, as well as regulatory barriers and adoption by stakeholders, are significant obstacles that must be overcome. Research by Peters and Panayi (2016) identified that proper regulation and collaboration between stakeholders are needed to maximize the benefits of blockchain technology in the financial system (Peters & Panayi, 2016).

Companies that have adopted blockchain technology have reported significant improvements in data transparency and reliability. For example, Walmart uses blockchain to track its food supply chain, which has increased the speed and accuracy of tracking from days to seconds (Kamath, 2018). This shows that blockchain can positively change various operations and data management aspects.

Against this backdrop, this article explores how blockchain technology can revolutionize accounting transparency. The analysis will focus on the blockchain mechanism and the benefits it offers. Through a literature study approach, this article seeks to provide comprehensive insights into the potential and challenges of blockchain implementation in improving accounting transparency.

RESEARCH METHOD

This study uses a qualitative descriptive design because this study describes the details and interprets the initial data, symptoms, and phenomena obtained during the study. This study is a qualitative study using a library research approach. In collecting research data with a literature review, this study is limited to library collection sources and does not require outdoor studies (Creswell, John W, 2018). The data used in this study is secondary data.

RESULT AND DISCUSSION

Data Reliability Improvement

Blockchain provides an immutable record of transactions, improving accounting data's reliability and integrity (Han et al., 2023). Blockchain can significantly improve data reliability in an accounting context in several key ways:

Immutability

Blockchain is known for its main characteristics, immutability, or the inability to change data once it has been recorded. Immutability is a property that ensures that data stored in a blockchain cannot be changed, deleted, or modified without consensus from the entire network. With the distributed ledger system used by blockchain, immutability ensures that every transaction or data entry entered into the blockchain is permanent, creating an audit trail resistant to manipulation. In this paper, we will discuss how immutability in the context of blockchain technology can significantly improve data reliability, as well as why this property is the foundation for increasing transparency, security, and accountability in various applications that use blockchain (Adeola Olusola et al., 2024).

A blockchain is essentially a decentralized network consisting of blocks of data that are cryptographically linked together. Each block contains a record of transactions that the

network has validated. Blockchains use consensus algorithms, such as proof of work (PoW) or proof of stake (PoS), to ensure that most network participants or nodes have verified new transactions added to the blockchain (Furlonger, D., 2020).

Once a transaction is included in a block, it is "locked" through a cryptographic hashing mechanism. Each block has a unique hash that includes information from the previous block so that each block is linked to each other, forming a chain of blocks (blockchain) (Arwin et al., 2023). Modifications or changes to one block will cause changes in the hash of that block and all subsequent blocks, which the entire network will immediately detect. This fundamental principle of immutability makes blockchains so resistant to manipulation.

Immutability ensures that data entered into the blockchain is final and cannot be changed without consensus from the majority of the network. In a centralized environment, data reliability is often compromised by the potential for fraud, internal manipulation, or human error. With blockchain, any unauthorized changes to data are immediately visible and challenging to make without knowing the entire network (Kitsantas & Chytis, 2022).

1. Data Security and Integrity

    The immutability of blockchain significantly increases data security and information integrity. When data is recorded in the blockchain, it is protected by cryptographic hashing and the network's decentralization. No central authority or single entity has complete control over the blockchain, so the chances of data manipulation by internal or external parties are minimal (Pimentel & Boulianne, 2020). The distributed ledger system used by blockchain requires consensus from most nodes to verify and approve transactions, making every transaction or data stored more secure.

    With no single entity having complete control, the risk of insider attacks is reduced. Even when an attacker tries to modify or falsify data, the change will be immediately visible to the entire network because each block has a unique hash associated with the previous block. Attempting to change one block would require changing all subsequent blocks, which is very difficult to do without controlling the majority of nodes in the network. In a financial context, this means that transactions recorded in the blockchain are reliable and free from manipulation (Rahmawati & Subardjo, 2023).

2. Audit Trail and Verification Capabilities

    With its immutability, blockchain provides a tremendous advantage in transaction recording and verifiable audit trails. In traditional systems, audits are often lengthy and time-consuming, involving manual review of various financial and administrative records. Additionally, centralized systems have the potential for data manipulation or loss of information due to system failures or human error (Judijanto et al., 2024).

    With blockchain, every transaction is recorded permanently and transparently, allowing third parties, such as auditors or regulators, to verify the authenticity and accuracy of transactions at any time without requiring direct access to the company

or organization's systems. Any interested party can independently verify Every transaction on the blockchain, creating a more transparent and reliable system. (Bellucci et al., 2022).

Immutability also ensures that the records can be traced back to their origin, creating a transparent and immutable audit trail. This is especially useful in the financial context, where data transparency and accuracy are critical to ensuring regulatory compliance and stakeholder trust.

3. Prevention of Fraud and Data Manipulation

Data fraud and manipulation are significant issues in many sectors, including finance, healthcare, and logistics. In centralized systems, data records can be altered by internal parties with access to the system or compromised by external attacks. However, with the immutability that blockchain provides, the risk of fraud is drastically reduced (Maffei et al., 2021).

In blockchain, every recorded transaction is protected by robust cryptographic mechanisms, and requires consensus from the majority of the network to be verified. This makes it nearly impossible for individuals or groups to alter data without detection. Even if someone does attempt to falsify data, the changes are immediately visible because blockchain creates an audit trail that cannot be erased or manipulated (Liu et al., 2024).

By reducing the potential for data manipulation, blockchain creates a more secure and trustworthy environment for transactions and data recording. This is especially relevant in finance and accounting, where the reliability of information is critical to maintaining public trust and corporate integrity.

While immutability in blockchain offers many benefits, there are some challenges and limitations to consider:

1. Scalability

One of the biggest challenges facing blockchain, especially in public networks like Bitcoin or Ethereum, is the issue of scalability. Since every node in the network must verify and store a complete copy of the entire blockchain, the ever-increasing data size can cause speed and storage capacity issues (Liu et al., 2024). This can impact the performance and efficiency of the blockchain system, especially as the network grows to a large scale.

2. Regulation and Compliance

While blockchain offers transparency and immutability, there are challenges regarding regulation. Some industries, especially banking and finance, are subject to strict regulations that require companies to control their data, including the ability to delete or change records under certain circumstances (Kalabukhova & Tokareva, 2022). The immutability of blockchain can conflict with these requirements, creating legal and regulatory challenges.

3. Energy and Cost

Blockchain networks that use consensus algorithms like proof of work require significant computing resources to verify and record transactions. This process is very energy-intensive and can incur high financial and environmental costs. While some blockchains use alternatives such as more efficient proof of stake, this issue remains a concern, especially for large-scale adoption (Smith & Castonguay, 2020).

Immutability in blockchain technology is one of the most essential characteristics and contributes significantly to increasing data reliability. With its immutable nature, blockchain offers a more secure, transparent, and tamper-resistant record system, making it ideal for use in industries requiring high data integrity and trustworthiness.

Despite some scalability, regulation, and cost challenges, blockchain's potential to improve data reliability is undeniable. In an increasingly decentralized and digitally connected environment, blockchain, with its immutability, offers an invaluable solution to maintain data security and integrity in the future.

Every transaction or data entry entered into the ledger is permanent and cannot be changed. Each block added to the blockchain is cryptographically encoded and linked to the previous block, creating a chain of blocks that cannot be manipulated without the knowledge and consent of the entire network. This means that once data is entered into the blockchain, no single entity can change it without changing the entire chain of blocks, making it extremely difficult to forge data (Tanjung & Wati, 2023).

Decentralization

One of the most significant aspects of blockchain that has attracted attention is decentralization, which is believed to improve the reliability of accounting data significantly. Decentralization refers to the distribution of control and authority across a network, meaning no single entity can control or manipulate the system. In traditional accounting systems, financial data is usually recorded in a central authority, such as a company or financial institution, which makes the system vulnerable to human error, manipulation, or cyberattacks. With blockchain, data is stored across multiple independent nodes in the network, so any changes or additions to data require consensus from most participants. (Abad-Segura et al., 2021). This paper aims to analyze how decentralization in blockchain technology can significantly improve the reliability of accounting data, as well as the benefits and challenges faced in implementing this technology in an accounting context.

In traditional accounting systems, data is managed centrally. Typically, a particular company or institution manages, stores, and verifies accounting data. Although many efforts are made to maintain the reliability of this data through internal audits and controls, centralized systems still have a fundamental weakness: the potential for data manipulation by internal or external parties. Human error, fraud, and cyberattacks can affect the integrity of centralized accounting systems, resulting in a loss of confidence in financial statements (Garanina et al., 2022).

Blockchain introduces a new paradigm by distributing the storage and verification of data across the network through independent nodes. Each node in the blockchain network has a complete copy of the ledger, which contains all previously recorded transactions. When a new transaction is recorded, the network requires a consensus from most nodes to validate and add it to the blockchain. No single entity has complete control over the system, significantly reducing the risk of data manipulation.

In the context of accounting, this decentralization means that each financial transaction is recorded and stored by multiple parties that are independent of each other, making the record-keeping more reliable and tamper-proof (Dai & Vasarhelyi, 2017). Suppose someone tries to modify or manipulate accounting data on one node. In that case, the network will immediately reject the change because the data stored on the other nodes remains consistent and unchanged. Thus, decentralization increases the reliability of accounting data by providing a higher level of security against data manipulation.

One of the core features of blockchain technology is the distributed ledger. In this system, every transaction made within the network is recorded in a digital ledger that is stored in parallel by all nodes in the network. In traditional accounting systems, a single entity or organization usually manages the ledger, and a third party carries out the auditing process to ensure that the ledger is not manipulated or misused (Pimentel & Boulianne, 2020). However, with blockchain, verifying and recording transactions is automated through a consensus mechanism supported by cryptography.

In the context of accounting, this distributed ledger brings several significant advantages. First, every financial transaction recorded in the blockchain is transparent and traceable. This transparency allows auditors and other interested parties to access the necessary information without requiring direct access to the company's systems. All verified transactions cannot be changed or deleted, which makes accounting data more reliable and difficult to manipulate.

Second, with decentralization, blockchain also minimizes the risk of system failures that often occur in centralized systems (Bellucci et al., 2022). In centralized accounting systems, server failures or cyber attacks on the central server can result in data loss or corruption of financial records. However, in blockchain, because every node in the network maintains a copy of the ledger, the failure of one node will not affect the integrity of the data on other nodes. This drastically increases data resilience and reduces the risk of losing critical information.

1. Decentralization and Security of Accounting Data

    Accounting data security is critical in maintaining the integrity of financial statements and stakeholder trust in the company. Decentralization in blockchain offers a much higher level of security than traditional systems. Since there is no single point of failure in a decentralized system, the risk of a successful cyberattack targeting the entire network is shallow. Each node operates independently, and an attempt to compromise data on one node will not impact the entire system (Abad-Segura et al., 2021).

In addition, blockchain technology uses highly sophisticated cryptographic encryption to protect every transaction made within the network. Every transaction recorded in the blockchain is protected by a cryptographic hash, which serves as a unique fingerprint for each data block (Al-Zaqeba et al., 2022). Any changes to previous transactions will change the hash, making it immediately detectable by the network. This makes the blockchain system highly resistant to data manipulation.

In accounting, this cryptographic protection ensures that every financial data recorded is authentic and cannot be illegally altered. With a consensus mechanism that requires a majority of nodes to agree on every change, blockchain ensures that multiple independent parties validate every accounting transaction before it is recorded. This reduces the possibility of errors or fraud in recording transactions.

2. Decentralization and Accountability in Financial Reporting

In financial reporting, accountability is an essential factor that must be maintained to maintain the trust of stakeholders, including investors, creditors, and regulators. In traditional systems, accountability is often hampered by the complexity of audit procedures and internal controls that are time-consuming and vulnerable to manipulation. Decentralization in blockchain offers a more efficient solution to improve accountability in financial reporting (Abdennadher et al., 2022).

Since every transaction in the blockchain is recorded permanently and transparently, auditors or external parties can easily track and verify the transaction's validity without requiring direct access to the company's system. This transparent and immutable audit trail ensures that every recorded transaction can be traced back to its origin, creating higher accountability than traditional systems.

In addition, decentralization also allows stakeholders to verify data independently. In this context, the company is no longer the only party responsible for presenting financial data to investors or regulators. Instead, third parties can access the records stored in the blockchain and conduct their verification, which increases confidence in the financial statements presented.

3. Decentralization, Compliance, and Regulation

In business and finance, regulatory compliance is an essential factor that every company must meet. However, centralized systems often face challenges in maintaining regulatory compliance due to their closed nature and difficulty in real-time auditing. With its decentralized and transparent nature, blockchain offers a better solution to maintaining regulatory compliance (Liu et al., 2024).

By permanently recording every transaction on the blockchain, companies can ensure that they comply with all reporting requirements set by regulators. Auditors or regulators can easily access data stored on the blockchain to verify the company's compliance with applicable regulations. In addition, by automating the verification process through a consensus mechanism, blockchain reduces the risk of human error that can lead to non-compliance with regulations.

However, although decentralization in blockchain offers many benefits for compliance, there are challenges in integrating this technology with existing regulatory frameworks (Garanina et al., 2022). Some regulators are still skeptical about the application of blockchain in financial reporting, especially regarding who is responsible for data validation and how the data is interpreted. Therefore, there needs to be further discussion between companies, regulators, and technology developers to ensure blockchain can be implemented effectively without violating existing regulations.

4. Blockchain's Potential to Transform Traditional Accounting Systems

The decentralization offered by blockchain technology has the potential to change traditional accounting systems fundamentally. In traditional systems, recording transactions often require multiple layers of control and verification to ensure data reliability. However, with blockchain, this process can be simplified by relying on consensus reached by independent nodes in the network.

This speeds up the reporting process and reduces the costs associated with audits and internal controls. With blockchain, companies can automate the audit process through distributed ledger technology, significantly reducing the need for time-consuming and resource-consuming manual audits (Maffei et al., 2021).

In addition, decentralization in blockchain also allows the development of real-time financial reporting models, where financial statements can be generated and verified continuously without waiting for traditional audit cycles. This provides greater transparency to investors and other stakeholders and allows them to make faster and more informed decisions based on accurate information.

Transparency and Auditability

Transparency and auditability are two key pillars that set blockchain technology apart from traditional record-keeping systems. Transparency in blockchain refers to the ability of all network participants to view and access recorded transaction data. In contrast, auditability refers to the ability to trace and verify every transaction made within the network, from origin to validation. In the context of blockchain, transparency is realized through a distributed ledger that is open to access by all nodes in the network, allowing every change or new transaction to be recorded and reviewed by all network participants (Kalabukhova & Tokareva, 2022).

In traditional systems, transparency and auditability are often limited by a company's internal controls and limited access to the record-keeping system. Companies that use centralized accounting systems have complete control over transaction recording and financial reporting. Therefore, transparency is often limited to annual audits or third-party reviews, which do not cover all transaction details. In blockchain, the entire process of recording and validating transactions is open to review by all network participants, creating a much more transparent system than centralized systems.

Auditability in blockchain allows external parties, such as auditors, to verify transactions and internal parties, such as management and shareholders, to monitor and trace transactions more efficiently. Every transaction recorded in the blockchain is protected by cryptographic mechanisms so that any changes to the transactions that have been recorded will be immediately detected by the network (Maffei et al., 2021). Thus, blockchain creates an environment where audits are more accessible to perform and more accurate and reliable.

1. Transparency in Blockchain and Increasing the Reliability of Accounting Data

One of the most significant contributions of blockchain to the reliability of accounting data is its transparency. In a blockchain system, every transaction in the network is recorded as a cryptographically encrypted block and added to the blockchain. Every node in the network has access to a complete copy of the blockchain, meaning that most nodes must approve any changes or additions to data through a consensus process before they can be added to the blockchain (Bonsón & Bednárová, 2019)

In the context of accounting, this transparency provides two main benefits. First, because all network participants have access to the same data, no party can hide or manipulate financial information without being known by others. Every transaction recorded in the blockchain can be seen and verified by all parties participating in the network, creating a more transparent system than traditional accounting systems.

Second, transparency in blockchain also allows stakeholders to monitor the company's financial performance in real time. In traditional systems, financial reports, such as quarterly or annual reports, are usually prepared and presented periodically. However, with blockchain, stakeholders can directly record and view every transaction, allowing them to make faster and more informed business decisions based on accurate and up-to-date data (Sari, 2024).

In addition, the transparency provided by blockchain can also help reduce the risk of fraud and data manipulation. In traditional systems, companies or financial institutions can manipulate their accounting data to provide a better picture of their financial performance. However, with blockchain, data manipulation becomes very difficult because the network must verify every transaction before it is recorded. All participants in the network have the exact copy of the blockchain, so any attempt to change the data will be immediately detected and rejected by the network.

2. Auditability in Blockchain and Its Relevance to Accounting

Auditability in blockchain refers to the ability to trace and verify every transaction recorded on the network. In accounting, auditability is very important because it ensures that all financial transactions can be accessed and examined by auditors or other interested parties.

One of the main advantages of auditability in blockchain is that all transactions recorded on the network are permanent and cannot be changed. Each block in the blockchain contains a cryptographic hash that ties it to the previous block, creating an

unbreakable chain of transactions (Garanina et al., 2022). If someone tries to change or manipulate the data in the block, this cryptographic hash will change, immediately detected by other nodes in the network. Thus, blockchain creates an audit trail that cannot be changed or deleted, ensuring the integrity of the recorded accounting data.

In traditional systems, the audit process is often time-consuming and requires much effort to verify every transaction made by a company. Auditors must access the company's internal records and check whether all transactions have been recorded correctly and whether the financial statements reflect the financial performance (Bellucci et al., 2022). This process is time-consuming and prone to human error or data manipulation by internal parties.

Blockchain eliminates many of these challenges by providing a transparent and verifiable audit trail by all parties. Auditors can access transaction records stored in the blockchain and trace the origin of each transaction from recording to validation. Because the network verifies all transactions before being recorded, auditors can be confident that the data they examine is accurate and has not been manipulated.

3. Blockchain Application in Accounting Audit Process

Applying blockchain in the accounting audit process can significantly change how audits are conducted. The traditional audit process often involves reviewing physical documents and manually verifying data presented by the company. However, blockchain can automate and simplify this process through a distributed ledger that auditors and other stakeholders can access (Peters & Panayi, 2016).

In blockchain, every transaction made is permanently recorded in the network, which creates an audit trail that cannot be changed or deleted. Auditors no longer need to manually verify each transaction because the network has verified all transactions recorded in the blockchain through a consensus mechanism. Thus, blockchain allows auditors to focus on more critical areas, such as risk analysis and financial performance assessment.

In addition, blockchain also allows for real-time audits. In the traditional system, audits are usually conducted after the accounting period, so auditors can only assess a company's financial performance based on past data (Sari, 2024). However, with blockchain, auditors can access real-time transaction data and verify it whenever necessary. This allows companies to detect problems faster and reduce the risk of errors or fraud in financial reporting.

One of the main benefits of transparency and auditability provided by blockchain is increased stakeholder trust in the financial statements presented by the company. In the traditional system, stakeholders, such as investors and creditors, must rely on financial statements prepared by the company and audited by a third party. While audits provide a higher level of confidence in the reliability of financial statements, this process is still susceptible to manipulation and human error (Tanjung & Wati, 2023).

With blockchain, stakeholders can directly access transaction records stored on the network and independently verify the validity of the data. This creates more transparency than traditional systems, allowing stakeholders to make better and faster decisions based on accurate data.

In addition, transparency and audibility in blockchain can also help improve compliance with financial regulations (Dai & Vasarhelyi, 2017). In many jurisdictions, companies are required to comply with various rules and regulations in their financial reporting. Blockchain can help companies comply with these rules by providing a transparent audit trail accessible to regulators. Regulators can access transaction data directly from the blockchain and verify that the company has met all applicable requirements.

Enhanced Security

One of the most fundamental aspects of blockchain security is using advanced cryptography to protect the data recorded on the network. Cryptography is a technique used to secure information through algorithms that transform data into an unreadable format by unauthorized parties. Every transaction that occurs on the blockchain is encrypted before it is recorded on the network so that only parties with the relevant cryptographic keys can read and validate the information (ALSaqa et al., 2019).

In the context of accounting, using this cryptographic system provides a more robust layer of security than traditional systems. In centralized accounting systems, a company's financial data is usually stored on a server vulnerable to cyber-attacks. If hackers infiltrate the system, the data can be changed or deleted without the knowledge of authorized parties (Garanina et al., 2022). In contrast, every transaction is encrypted and recorded in a blockchain in sequentially linked blocks. Each block contains a cryptographic hash of the previous block, so if someone tries to change the data in one block, the entire blockchain will show that there has been a change, and the network will immediately reject the transaction.

This creates a much more secure and reliable system for recording accounting data. Companies can be more confident that their data will not be easily compromised or changed by unauthorized parties from inside or outside the organization. This cryptographic-based security protects against the risk of fraud in financial reporting.

1. Protection Against Cyber Threats: Blockchain as a Security Solution in the Digital Age

    With the increasing threat of cyberattacks on the global financial system, data security has become an increasingly pressing issue for businesses. Attacks such as data theft, ransomware, and identity theft have caused significant financial losses worldwide. In this increasingly digital environment, blockchain technology offers a powerful solution to protect accounting data from such threats (Smith & Castonguay, 2020).

    Blockchain provides an additional layer of security against cyberattacks because it is based on a distributed network and advanced cryptography. As discussed earlier, blockchain's decentralization and consensus mechanisms make it more

difficult for hackers to gain control of the system and manipulate data. In addition, the immutability of blockchain also ensures that recorded data cannot be changed or deleted by any party, making it more secure from malicious attacks.

In the context of accounting, a company's financial data stored on the blockchain will be protected from various cyber threats (Adeola Olusola et al., 2024). Companies can be more confident that their data is secure and will not be easily infiltrated by outsiders. This also assures stakeholders that the financial information reported is accurate and not affected by manipulation or cyberattacks.

Enhanced security offered by blockchain technology contributes significantly to increasing the reliability of accounting data. Blockchain can protect financial data from internal and external threats by using advanced cryptography, decentralization, consensus mechanisms, immutability, and smart contracts. This increases trust in the accounting system and creates a safer and more reliable environment for recording financial transactions.

Efficiency in Financial Reporting Process

Blockchain opens up the potential to improve overall operational efficiency in the financial reporting process. Blockchain can provide efficiency in the financial reporting process through several mechanisms, namely:

1. Transaction Automation

    Blockchain enables financial transactions to be executed automatically using smart contracts. Smart contracts are computer codes programmed to automatically execute and negotiate or guarantee the performance of a contract or transaction when specified conditions are met. For example, vendor payment can be made automatically when goods' delivery conditions are met. This eliminates the need for intermediaries or manual processes, significantly reducing the time and costs involved in the financial reporting process (Tanjung & Wati, 2023).

2. Real-Time Auditability

    All parties involved can verify and access Data in the blockchain in real-time. When all transactions are recorded in a distributed ledger, audits can be performed without waiting for the end of the reporting period. Auditors can access the necessary information at any time and verify the validity of transactions directly, reducing the time required for traditional audit processes (Bonsón & Bednárová, 2019).

3. Operational Cost Reduction

    Blockchain implementation in financial reporting can reduce operational costs associated with administrative processes and data management. By automating the process of verifying and validating transactions, companies can reduce costs associated with the personnel and infrastructure required to run traditional manual processes. For example, using blockchain in the supply chain has significantly saved logistics and administrative costs (Pratiwi, 2022).

4. Improved Accuracy and Speed

With transactions recorded automatically and in real-time, blockchain increases accuracy and speed in preparing financial reports. Delays or errors in reporting can be minimized because data stored in the blockchain is transparent and accessible to verify. This reduces the time required to prepare financial reports and corrects errors in manual processes (Sari, 2024).

Increasing Transparency and Accountability

Blockchain can significantly improve transparency and accountability in various contexts, including accounting and finance, in several key ways. First, Blockchain uses technology that allows every transaction or data entry to be recorded in a linked, cryptographically encoded block (Ahmad et al., 2022). Each block added to the blockchain cannot be changed without consensus from most nodes in the network. This creates an unimpaired and automatically verified audit trail accessible to all parties involved (WIjayanti et al., 2022).

Next, it is related to public transparency. Blockchain is a distributed ledger accessible to all parties connected to the network. The information recorded in the blockchain is not hidden or accessible only to certain parties (ALSaqa et al., 2019). Instead, the data is publicly available for anyone to verify. In the context of accounting and finance, this transparency increases trust and reduces doubts that stakeholders such as investors, auditors, and regulators may have (Smith & Castonguay, 2020).

Blockchain supports smart contracts, computer codes that execute automatically when specified conditions are met. Smart contracts not only automate the transaction process but ensure that all parties comply with the agreement without needing an intermediary or intermediary (Spanò et al., 2022). This increases accountability as all contractual conditions must be automatically complied with, reducing the risk of non-compliance or ambiguity. In many industries, including banking and finance, regulatory compliance is critical to maintaining reputation and avoiding legal sanctions. Blockchain can help ensure this compliance by recording every transaction and operation in a way that can be independently verified and transparent. This facilitates more efficient auditing and monitoring by regulatory authorities, reducing the risk of regulatory violations (Spanò et al., 2022).

CONCLUSION

Blockchain implementation has been proven to increase transparency in financial recording and reporting. This technology provides data reliability assurance through an immutable and distributed system, minimizing the risk of data manipulation or fraud. Blockchain also has significant potential to improve companies' operational efficiency, especially in transaction automation and verification processes. Using smart contracts can reduce third-party involvement and speed up contract fulfillment, reducing overall administrative costs. In an increasingly regulated environment, blockchain can facilitate

regulatory compliance with transparent record-keeping and high audibility. This helps companies comply with applicable standards and regulations without sacrificing operational efficiency.

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