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Potentials of blockchain technology application in accounting and financial reporting

Potencijali primene blokčejn tehnologije u računovodstvu i finansijskom izveštavanju

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Abstract

Blockchain technology has caused a significant boom in academic and professional circles, becoming a central topic of discussion in the fields of business process modernisation, transparency, privacy, and data security. In the accounting field, this technology can bring revolutionary changes through the automation of record-keeping, the immutability of financial records, and the transparent exchange of data among all participants, thereby enhancing trust and efficiency in accounting practices. However, it also introduces challenges related to reduced employment opportunities in this profession and new skill requirements that the profession must adapt to. This paper discusses the characteristics of blockchain technology, its potential aspects and domains of application in accounting activities and financial reporting, the benefits and limitations of its implementation, and the changes it may bring to accounting practices and overall business operations. Additionally, the paper presents a conceptual system for the implementation of financial reporting and the automation of accounting activities through the application of smart contracts.
Keywords: *blockchain technology, accounting, financial reporting, efficiency*

Sažetak

Blokčejn tehnologija izazvala je pravi bum u naučnim i stručnim krugovima, postavši centralna tema diskusija u oblasti modernizacije poslovnih procesa, transparentnosti, privatnosti i sigurnosti podataka. U oblasti računovodstva, ova tehnologija može da donese revolucionarnu promenu kroz automatizaciju evidencije, neizmenljivost finansijskih zapisa i transparentnu razmenu podataka između raznovrsnih učesnika, čime se podiže nivo poverenja i efikasnosti u računovodstvenim praksama, ali i da kreira nove izazove u pogledu smanjenja zapošljavanja u ovoj struci i postavi nove zahteve koji su u pogledu potrebnih veština stavljaju pred ovu profesiju. U radu se raspravlja o karakteristikama blokčejn tehnologije, mogućim aspektima i oblastima njene primene u računovodstvenim aktivnostima i finansijskom izveštavanju, prednostima i ograničenjima u primeni ove tehnologije i promenama koje ova tehnologija može da donese za računovodstvene prakse i uopšteno poslovanje preduzeća. Dodatno, u radu je predstavljen koncept sistema za realizaciju finansijskog izveštavanja i automatizaciju računovodstvenih aktivnosti kroz primenu pametnih ugovora.
Ključne reči: *blokčejn tehnologija, računovodstvo, finansijsko izveštavanje, efikasnost*

1. Introduction

Blockchain technology (hereinafter BT) is a revolutionary, decentralized, and distributed computing protocol used for digitally storing information across a large number of computers or nodes (Kitsantas et al., 2019). It is a value transfer protocol that can be applied in various value-related fields (Zhang & Zhu, 2022), such as accounting and finance. Blockchain technology (BT) was first introduced by Haber & Stornetta (Haber & Stornetta, 1991) in the early 1990s as a mechanism for digital timestamping, hashing, and chronologically linking data. With the expansion of its application domains and usage, this technology has undergone numerous modifications and is now regarded as a solution for the identification, registration, distribution, and tracking of digital entities

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(Kayikci & Khoshgoftaar, 2024). This technology protects data integrity by eliminating centralization, as the distribution of the transaction ledger across different nodes and the use of consensus mechanisms ensure that any data modification requires the approval of the majority of nodes, thereby making data manipulation nearly impossible.

The European Union considers blockchain a key technology for enhancing innovation, increasing efficiency, and strengthening transparency in financial transactions and data management. The EU has adopted the Blockchain Strategy, which includes promoting this technology to achieve sustainability, building a Pan-European blockchain for public services, increasing funding for innovation and research, enhancing legal certainty and improving the regulatory framework, developing blockchain in collaboration with the community, supporting skill development in blockchain technologies, and fostering interoperability and standardization (Damvakeraki, 2023).

The decision-making process is based on financial and non-financial information. Financial information is a product of accounting as an information system. "Accounting information systems are continuously upgraded, apart from other types of information systems" (Knežević et al., 2012, p. 63). Financial reports are the crown of the accounting information system (Mitrović, A., Milašinović, M., 2019; Srebro et al., 2021), as they reflect the performance of organizations and the effectiveness of managerial decisions. They provide a comprehensive overview of an organization's financial health, operational efficiency, and strategic direction, serving as a key tool for stakeholders to assess past achievements, current standing, and prospects.

After the introduction, the remaining part of the paper deals with the consideration of blockchain technology, after which the impact of blockchain technology on accounting and financial reporting is pointed out. Examples of potential applications of blockchain technology in financial reporting and accounting are given in the fourth chapter of the paper, while the fifth chapter indicates challenges in the application of blockchain technology in financial reporting and accounting. The conclusions are provided at the end of the paper.

2. About blockchain technology

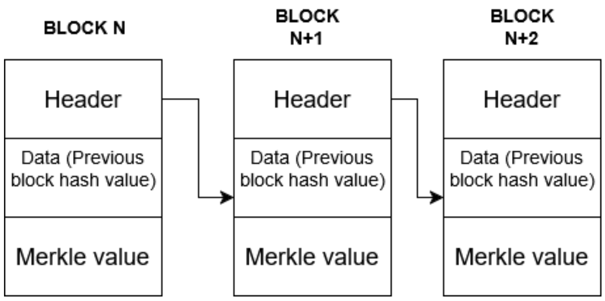
BT belongs to the broader family of Distributed ledger technology (DLT) systems, which are networks in which all nodes have a copy of the database, from which data can be read and written by individual nodes when a consensus among them is reached regarding the execution of a write operation. Unlike DLT systems, which may or may not be based on peer-to-peer (P2P) networks, BT is fundamentally built on this paradigm, where a P2P network refers to distributed software platforms consisting of nodes that enable users to share computing resources (Fox, 2001). Users connect their computers to a P2P network by linking them to all other computers in the network, granting them equal rights and responsibilities as other nodes. BT technology involves a distributed network of independent users and "full nodes," which are networked computers participating in the platform. These nodes verify all transactions before transaction data is added to the ledger, perform mining processes in certain blockchain implementations, and store verified data following parameters defined by the blockchain algorithm. In BT, records are stored in a dedicated registry that maintains a copy of all active network nodes, ensuring that all transactions are replicated across the P2P network.

DLT systems differ in terms of (1) network type, (2) consensus mechanism, and (3) ledger structure. BT systems add two additional characteristics that are not necessarily present in all DLT systems: (4) transfers and (5) resources (Ibañez et al., 2021). Regarding network type, DLT systems are categorized into public and private systems. Public DLT systems are permissionless networks where any party can access the network, view transactions, create transactions, and participate in block validation. The most well-known examples of BT-based public platforms are Bitcoin and Ethereum. Public blockchain networks use a fee mechanism to charge for their services. These fees cover transaction processing, validation, and network maintenance costs and are usually paid in the network's native cryptocurrency (e.g., ETH for Ethereum or BTC for Bitcoin). In such DLT systems, the consensus mechanism is more complex than in private systems to prevent malicious actors from creating multiple identities and influencing the modification of the transaction ledger (Duong et al., 2018). Private DLT systems are networks with restricted access, controlled by a single entity or a group of entities, providing faster validation due to a lower number of transactions on the platform, simpler consensus mechanisms through voting principles, and customization to meet an organization's specific needs. In these platforms, participants are known, there is already an established level of trust among them, and their relationships, rights, and obligations are predefined through legal agreements and off-chain contracts (Dashkevich et al., 2024). Private blockchain networks require either building a dedicated infrastructure or using platforms such as Hyperledger, Corda, or Quorum.

The consensus mechanism is a key element in a blockchain network, as it enables all participants (nodes) to agree on the accurate and valid state of the network without the need for a centralized authority. The consensus mechanism verifies whether a block meets the network's rules, checks for invalid or duplicate transactions within the block, ensures the block contains the correct hash value of the previous block, and more. This mechanism allows decentralized nodes to prevent the addition of invalid blocks to the blockchain, ensures that all nodes have the same copy of the blockchain, and, in cases where multiple nodes generate blocks simultaneously, determines which block will be accepted as part of the blockchain. In the Proof-of-Work (PoW) consensus mechanism, used by Bitcoin, miner nodes utilize computing resources to solve cryptographic puzzles, such as finding a hash value that meets specific criteria. The first node to find the solution earns the right to add a new block to the network and is rewarded, usually in cryptocurrency. The blockchain network adjusts the difficulty of these problems to ensure that blocks are added to the chain at regular time intervals. To protect the blockchain from attacks, the PoW mechanism enforces the idea of resource utilization by requiring participants to perform computational work to validate and add new blocks to the blockchain. Proof-of-Stake (PoS) is a consensus mechanism that selects validators to confirm transactions and add blocks to the blockchain based on their stake—the amount of cryptocurrency they have deposited in the network. PoS is designed as an energy-efficient and scalable alternative to PoW systems. In this system, the network randomly selects validators for transaction verification, with their chances being proportional to the amount they have staked. The Ethereum cryptocurrency transitioned from PoW to PoS in 2018 to prevent further node attrition from the network due to increasing mining difficulty and the decreasing probability of generating income through mining.

Regarding the structure of the transaction ledger (Mori, 2016), the blockchain transaction ledger consists of a chain of blocks that contain multiple transactions. The records include various types of transactions, such as goods exchanges, securities issuance, clearing activities, operations related to smart contracts, or data records collected through Internet of Things (IoT) technology (Wu et al., 2019). Each block in the blockchain encompasses a series of transactions that occurred at a specific point in time. Blocks are successively added to the blockchain, forming a continuously growing collection of records in which cryptographically secured data structures represent blocks linked in the form of a linked list (Kayikci & Khoshgoftaar, 2024). Each node in the network stores a copy of the entire blockchain, meaning that storage requirements increase as the number of recorded transactions on the platform grows. The structure of the blockchain chain is presented in the Figure 1.

Figure 1. Blocks in the Blockchain Chain



Source: Authors

The elements of blocks vary depending on the blockchain platform, meaning that the blocks used by Ethereum and Bitcoin platforms differ (Vujčić et al., 2018). In general, each block includes the following elements: (1) data representing a sequence of characters that is stored, (2) a unique identifier, (3) the hash value of the previous block's header, and (4) the hash value of the given block—a fingerprint of the specific data stored in the block (Kayikci & Khoshgoftaar, 2024), along with additional data such as the unique record identifier and the previous block's hash value. Blocks contain a header that includes metadata about the block, such as its name, version, a pointer to the previous block, a timestamp, a unique number, bits, and the Merkle root, while the body of the block consists of transactions and the number of transactions (Sheth & Dattani, 2019). Since each block contains the hash value of the previous block, modifying any block requires replacing all subsequent blocks, making it significantly harder to alter older records compared to newer ones. The Merkle value, or Merkle root, is a cryptographic hash that represents the root node of a Merkle tree—a data structure used to organize and verify information within a blockchain block, ensuring the consistency of the dataset. The Merkle tree combines all transactions in a block into a unique Merkle value, enabling quick verification of whether a specific transaction is part of a block without requiring validation of the entire block. Some systems, instead of hash values, use Tangle, a Directed Acyclic Graph (DAG), where transactions are organized as nodes in a graph, and each node must confirm two previous transactions before it is validated. Examples of DLT systems that utilize this method include Ripple and IoTA.

BT enables the execution of transfers or, more broadly, transactions. These transfers can be simple or more complex, depending on the functionalities provided by the platform (Faccia & Petratos, 2021). For example, the Ethereum platform allows the creation and management of smart contracts. The final characteristic of BT relates to resources being transferred, which can include cryptocurrencies or tokens. These resources can be digital or physical assets with a digital representation.

A typical blockchain transaction process includes the following steps:

1) Transaction initiation: The user signs the transaction using their private key, proving their identity. The transaction contains information such as the sender's address, the recipient's address, the amount being transferred, and the sender's digital signature. However, it does not include details about the identities of the sender and recipient.
2) Transaction validation: The transaction is transmitted to the P2P network, where its validity is checked. This may involve verifying the authenticity of the signature, the availability of funds, ensuring there is no double-spending and other checks.
3) Adding to the mempool: If the transaction is valid, it is added to the blockchain's memory pool, known as the mempool, where unconfirmed transactions are stored.
4) Block formation: Validators (or miners in a Proof-of-Work (PoW) system) select valid transactions from the mempool and group them into a block.
5) Block validation: Once the block is formed, all transactions within it undergo additional verification to ensure they comply with network rules.
6) Adding the block to the blockchain: When the majority of nodes reach a consensus on the block's validity (e.g., by solving a mathematical problem in PoW or through stake verification in Proof-of-Stake

(PoS)), the block is added to the blockchain. Only after being added to the blockchain are the transactions within it considered confirmed.

Smart contracts are automated, programmable agreements that execute on a blockchain network when predefined conditions are met. They are programmable software modules that enable decentralized automation of complex workflows and agreements between different parties (Christidis & Devetsikiotis, 2016). Smart contracts implemented using blockchain technology can automate and enforce compliance with accounting practices and policies (Bonsón & Bednárová, 2019). For example, in a blockchain system implemented by a company, if revenue is recognized only when an invoice is confirmed, goods are delivered, and payment confirmation is received, a smart contract can record revenue in a dedicated ledger or within a company's revenue records only when these conditions are met. A limitation of smart contracts is the memory limit for their implementation, which varies depending on the blockchain platform. For instance, Ethereum smart contracts are limited to 24KB of code, Solana uses external storage on accounts with higher limits, while private blockchain networks do not have strict limitations and often rely on external databases.

3. The impact of blockchain technology on accounting and financial reporting

Existing accounting and auditing practices are characterized by high costs, extensive labour, and significant time investment (Handayanto et al., 2024). In recent years, accounting, auditing, and financial reporting have been undergoing digital transformation due to the emergence of new technological solutions that can significantly enhance business practices in these domains. Blockchain is a modern technology with the potential to substantially transform business processes and, consequently (Mekić et al., 2018; Ostojić et al., 2024), impact fundamental processes related to financial control, accounting, auditing, and reporting (Schmitz & Leoni, 2019; Liu et al., 2021). Implementing this technology enables a transition from double-entry bookkeeping, the traditional accounting system where every transaction is recorded on two accounting sides—debit and credit—to triple-entry bookkeeping, which adds a cryptographically secured record stored on the blockchain to the traditional double-entry system (Cai, 2021). Weigand et al. (2020) state that this accounting system provides greater transparency, higher accuracy, lower costs, and improved precision in financial reports. Wu et al. (2019) argue that BT can significantly enhance the relevance, faithful representation, comparability, and other aspects of accounting information. Once transaction data is entered into the blockchain, all network participants have access to the same version of the data, reducing the need for multiple reconciliations across different databases. This is particularly relevant for inter-organizational transactions, where different entities such as banks, auditors, and suppliers typically maintain separate databases that require reconciliation. BT lays the foundation for developing an accounting ecosystem where managers, accountants, business partners, and investors can collaborate in verifying transactions and providing relevant evidence for multi-layered validation (Dai & Vasarhelyi, 2017).

The inherent immutability provided by blockchain facilitates tamper-resistant creation and maintenance of transactional records, enhancing the reliability and integrity of accounting data. At the same time, the increased transparency enabled by blockchain reduces information asymmetry among stakeholders (Centobelli et al., 2022). This technology helps minimize expectation gaps between auditors, financial statement users, and regulators (Rozario & Thomas, 2019). Companies can use blockchain as a platform for voluntarily disclosing financial and non-financial information promptly, serving as a positive signal that helps them build trust with stakeholders (Yu et al., 2018).

Furthermore, the inherent immutability of records and decentralization provided by blockchain offers a foundation for developing functionalities to detect manipulations or unauthorized modifications of records, limiting inadequate and unethical accounting practices as well as financial fraud (Andersen, 2016). One of the revolutionary aspects of blockchain's application in accounting information systems relates to real-time auditing, which allows for the rapid detection of anomalies and ensures system integrity (Mingming, 2020). Rückeshäuser (2017) defines accounting fraud as the intentional preparation and dissemination of accounting records with direct or indirect involvement of top management. Traditional accounting systems largely rely on centralized authority and are susceptible to manipulation by management. The same author concludes that distributed ledger technology (DLT) and blockchain provide structural protection against fraudulent activities through decentralized consensus mechanisms.

The application of blockchain technology has the potential to enhance operational efficiency in accounting and auditing practices and could have implications for the traditional role and required skills of accountants (Dyball & Seethamraju, 2022). The comprehensive nature of blockchain records allows for real-time audit activities, making them less prone to human errors and intentional oversights (Bonsón & Bednárová, 2019). Karajović et al. (2019) go so far in their predictions as to suggest that the evolution of blockchain technology could completely lead to the elimination of the accounting profession. On the other hand, Bellucci et al. (2022) state that while the automation of certain routine tasks in accounting and auditing processes can be achieved through blockchain technology, areas such as systematic evaluation, risk assessment, predictive auditing, and fraud detection may gain increased attention and importance, allowing the accounting profession to survive by adapting its skill set and knowledge in performing accounting tasks.

Rozario and Vasarhelyi (2018) emphasize that smart contracts can facilitate the execution of external audit processes by automating the transaction reconciliation process, which saves time and significantly reduces the risk of human errors. However, in this context, it should be noted that it is unlikely that every transaction will be audited using blockchain smart contracts and subjected to automated data reconciliation. Complex accounting entries, such as fair value estimates or accounting measurements like impairment testing of assets, require the expertise and human judgment of accountants and auditors. Smart contracts can be programmed to assess the bankruptcy risk and credit risk of companies (Dai & Vasarhelyi, 2017) based on the history of contracts made, payments, and payment delays.

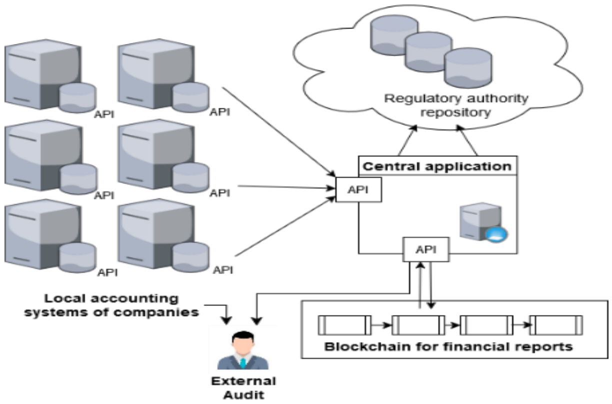
The integration of BT into enterprise ERP (Enterprise Resource Planning) systems can lead to the transformation, optimization, and automation of business operations within organizations (Tapscott & Tapscott, 2016). BT is used to integrate finance within the supply chain, synchronizing payment systems, enabling automated fund flow, monitoring processes, and automatically closing accounting periods based on smart contracts (Liu et al., 2023). According to Dasaklis et al. (2021), the integration of BT and ERP systems enhances the optimization and trust in data exchanged between organizations, particularly when it comes to financial transactions. Papathanasiou et al. (2020) state that the application of BT simplifies financial monitoring and management, especially when blockchain is integrated with ERP or other external systems. Although many authors support the coexistence of accounting information systems, whether independently or within ERP systems, there is a lack of significant research on the specific applications of these technologies integration, which would provide evidence for this hypothesis (Faccia & Petratos, 2021).

4. Examples of potential applications of blockchain technology in financial reporting and accounting

In the context of ensuring the integrity of accounting data, the limitation of this technology is that blockchain has a data structure that does not allow for the storage of large amounts of data, due to data replication across all nodes within the network. Increasing the allowed volume of data that can be stored within the blockchain would exponentially increase the computational demands on the network and slow down its performance. Therefore, in implementations involving blockchain technology, accounting data and financial reports need to be stored in external systems. Additionally, blockchain systems are not optimized for directly searching records that are tied to senders and recipients, so data stored on a blockchain network must be replicated in separate systems with data storage optimized for searches. In this context, blockchain technology can be applied to enhance the integrity of accounting data and financial reports, and to control the timeliness of the preparation and submission of financial reports through the implementation of a hybrid system. This system combines BT for verification and data security, while accounting data and financial reports themselves can be stored in external systems for data processing and storage at the level of individual companies and/or the relevant regulatory authority. Within such infrastructure, it is possible to implement a unified national blockchain system, where, through a unified republic application, data from external accounting systems of companies would be submitted. The hashed values of automatically generated financial reports from the external accounting systems of companies, along with metadata such as creation date, submission date, period the report covers, company identifier, and report type, would be recorded, ensuring the integrity of the accounting data within these financial reports. In such a technological solution, whose model is presented in Figure 2, the data entry on the centralized blockchain could include the following steps:

1) Generation of financial reports: The company's accounting system automatically or semi-automatically generates financial reports based on accounting data in a standardized electronic format (such as JSON or XBRL).
2) Preparation of data for submission: Hash value calculation in the local accounting system using a cryptographic algorithm and the addition of metadata.
3) Communication with the central application: Sending data via API (such as REST API, GraphQL, or similar protocols), which includes hash values, metadata, and optionally, financial reports if they are stored at the regulatory institution level.
4) Verification by the central application: At this stage, the central application receives the API request, verifies the sender's identity using API keys or digital certificates, checks the validity of the data format and structure, and optionally records the company's financial reports in a centralized repository.
5) Data entry on the blockchain by the central application: The blockchain stores the hash values and key metadata. The central application uses the API provided by the blockchain solution for data entry (such as JSON-RPC (JSON Remote Procedure Call), Web3.js or Ether.js, which are libraries for working with blockchain networks like Ethereum, or Hyperledger Fabric SDK, which is an API for interacting with private blockchain networks).
6) Feedback to the company regarding the receipt and recording of data on the blockchain: The confirmation includes a unique record ID on the blockchain.

Figure 2. Diagram of the system for enhancing integrity and control in financial reporting

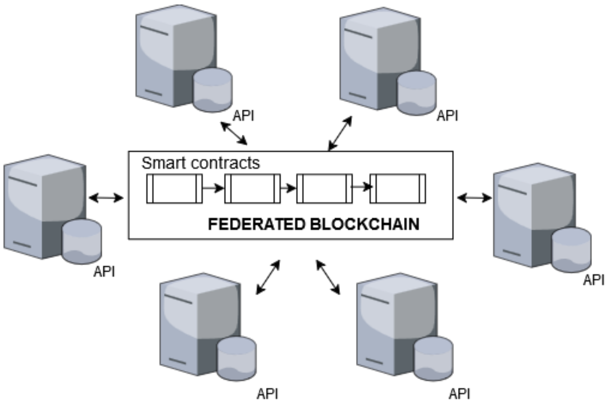


Source: Authors

In addition to the API for entering data into the blockchain, the centralized application also implements an

API for collecting data from the blockchain. This represents a user interface that allows inspectors and regulatory agencies to gain direct access to submitted financial reports and the recorded hash values from the blockchain network. The centralized application, which would be implemented at the level of state or other regulatory authorities, can apply algorithms to identify companies that have failed to submit financial reports within the prescribed timeframe, automatically notify them, and generate aggregate reports on the regularity of financial report submissions. This automated implementation would shorten the periods within which financial reports are submitted and increase the level of control over accounting activities, financial reporting, and business operations. In the context of inspection and control procedures in such an implementation, inspectors can, during field inspections, use a specially developed application to locally generate hash values for available accounting data and compare the obtained hash values with those stored on the blockchain network for a given company. If these values match, the data is authentic. If the data does not match, there is a basis to suspect that data manipulation has occurred.

Figure 3. Diagram of the system for executing smart contracts between partner companies



Source: Authors

The use of smart contracts in business can bring numerous advantages, particularly in terms of automation, transparency, and accuracy of accounting procedures. Through the integration of blockchain for executing smart contracts and external accounting systems, automatic transaction recording can be ensured in these systems when a transaction is completed. Smart contracts can be programmed to generate and emit events after the completion of certain activities, such as transactions, fulfilment of agreed conditions triggering payments within the contract, or the charging of interest due to delays in payments as specified by the smart contract. In such an implementation, the abstract model which is presented in Figure 3, a node connected to the blockchain collects data from the blockchain, and within the external system, an API (using libraries like Web3.js and Ethers.js) can be implemented to listen for events on the blockchain. The blockchain node provides an interface (such as a JSON-RPC API) through which this API can access blockchain data. After collecting data on new relevant transactions, the data is formatted and sent via an API (such as REST or GraphQL) to the external accounting system, like an ERP system or accounting software, which records the data on new transactions, such as revenue and expenses. Similarly, functionality can be ensured for the automatic generation and payment of invoices, whereas in payment systems, after the product is delivered, the external supplier system that delivers the product sends a notification to the blockchain system with the smart contract about the delivery of goods. The smart contract generates a notification for the external vendor system to create an invoice based on this and records the change of state within the contract. The external vendor system sends the invoice data to the smart contract, which then notifies the buyer of the invoice and can store the hash value of the invoice and its metadata on the blockchain network. After the invoice is paid by the buyer, upon receiving the payment realization notification, if the payment is not made in the platform's cryptocurrency, the smart contract generates a change in the state of the contract's realization.

The implementation of blockchain technology in financial reporting could potentially lead to a revolution in executing accounting activities and financial reporting, through the development of unique platforms for all participants, including companies, auditors, and regulatory authorities across different countries and economic sectors, according to groups of companies that adhere to unified accounting norms and standards. Within such platforms, all monetary flows of companies would be executed via smart contracts, and these platforms would integrate blockchain with smart contracts and a unified accounting and reporting software for companies subject to a unified system of norms, which would be hosted at the level of the companies themselves. This software could provide high automation in detecting anomalies in accounting data, identifying fraud, and generating financial reports.

5. Challenges in the application of blockchain technology in financial reporting and accounting

There is a possibility that blockchain technology may fail, as has happened with other technological solutions, where new accounting solutions proved unreliable (Pflueger et al., 2024). Taking the example of e-invoices, where the degree of adoption in B2B, B2C, and B2G implementations was determined by the efforts and pressures from regulatory bodies (Linh & Phuong, 2020), despite the clear benefits they bring, it can be expected that the application of blockchain technology in accounting practices will be essential for the wider usability of this technological solution. Rückeshäuser (2017) emphasizes that there are challenges regarding the adjustment of legal frameworks and mechanisms, the technical complexity of blockchain systems, and the need for pervasive understanding and trust in such systems. The same author points out that BT cannot detect fraudulent transactions if these transactions were fraudulent from the outset, thus the ability of this technology to prevent fraud is often overestimated. The immutability of data on a blockchain platform does not mean that the entered data is accurate. The application of BT in financial accounting could lead companies to construct transactions to achieve desired accounting outcomes. This might shift the focus of external auditors from detecting accounting items to analyzing the justification and authenticity of business events and transactions (Yu et al., 2018).

BT is not suitable for storing and searching large volumes of data without significant advancements in computing technology regarding storage capacities, processing capabilities, and scalability mechanisms. Therefore, it requires the existence of external infrastructure to store large and detailed accounting data, which significantly increases the costs of developing and maintaining such infrastructure, as well as the technical expertise needed to work with this technology. One of the limitations of applying this technology relates to the costs and complexities associated with connecting a larger number of business entities within a single platform (Sinha, 2020). In the context of the accounting profession, significant investments are required in staff training to work with this technology and in the development of accounting methods that are generally adapted to new technologies. In addition, BT is not entirely secure and is vulnerable to a range of different types of attacks, such as DDoS attacks, double spending, Sybil attacks, attacks on private keys, balance attacks, and other types of attacks (Singh et al., 2021).

6. Conclusion

Although there has been a significant interest in blockchain technology in scientific circles over the past decade, and many theoretical studies view this technology as a universal solution that will completely transform business operations, including accounting practices and financial reporting, where it is seen as a potential future global standard for conducting accounting activities, BT is not a solution that offers global answers to most of the current weaknesses in business process implementation. It can only be one segment of a broader digital ecosystem based on modern technologies aimed at improving business processes. While this technology has very useful characteristics, such as decentralized data storage and validation, ensuring data integrity, it also suffers from a range of limitations, such as limitations related to storage capacity, data searchability, platform scalability, limitations concerning the ability to implement business logic on the blockchain itself, and the security of this technology. Its wider implementation is contingent upon several additional conditions, with the foremost being those related to the establishment and development of legal frameworks in various areas of its application, such as the validity of contracting and fulfilment of contractual obligations, tax collection, and others. This is also demonstrated by the significant imbalance between the number of scientific papers addressing this technology from a theoretical standpoint, its potential, and possible impacts on business, including accounting practices, and the number of papers evaluating specific solutions in the implementation of this technology to solve particular business problems, especially in the field of accounting activities. However, given that this is a developing technology, it can be expected that shortly, with advancements in the integration of this technology with other technological solutions, such as technologies for storing and processing Big Data, ERP systems, and advanced methods in data analysis and automation, such as machine learning and artificial intelligence, this technology will become one of the significant elements of the infrastructure for creating a globally connected and standardized accounting system, enabling secure, transparent, fast, and efficient business operations at an international level.

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