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The Concept of Blockchain-Based Triple Entry Accounting In Indonesia

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Abstract

The business world, particularly in accounting and financial reporting, is undergoing significant disruption due to the emergence of blockchain technology. By implementing blockchain technology, critical company information becomes more integrated and transparent. However, in Indonesia, the development of blockchain, both in concept and practice, has been slow. This paper aims to examine the blockchain-based triple entry accounting concept that is present and emerging in Indonesia through a literature review approach. The literature review was conducted via Google Scholar using the keywords "triple entry accounting" and "blockchain accounting," resulting in 15 relevant articles from Indonesian journals for further study. The stages of the literature review include identification, manual screening, reading titles, keywords, abstracts, and publications. The results indicate that Indonesia has the potential to implement blockchain-based triple entry accounting to enhance transparency, reduce fraud, and improve tax administration efficiency. This study also provides regulatory implications, suggesting that the government should develop standardized guidelines for the application of blockchain technology in the accounting sector.

Keywords: Accounting Technology; Blockchain; Tax Administration; Triple Entry Accounting; Transparency

Abstrak

Dunia bisnis, khususnya dalam bidang akuntansi dan pelaporan keuangan, mengalami disrupsi signifikan akibat munculnya teknologi blockchain. Dengan penerapan teknologi blockchain, informasi penting dalam perusahaan menjadi lebih terintegrasi dan transparan. Namun, di Indonesia, perkembangan konsep dan praktik blockchain masih berjalan lambat. Penelitian ini bertujuan untuk mengkaji konsep triple entry accounting berbasis blockchain yang ada dan sedang berkembang di Indonesia melalui pendekatan literature review. Kajian literatur dilakukan melalui Google Scholar dengan kata kunci "akuntansi triple entry" dan "akuntansi blockchain", menghasilkan 15 artikel dari jurnal-jurnal Indonesia yang relevan untuk dikaji lebih lanjut. Tahapan literature review meliputi identifikasi, penyaringan manual, pembacaan judul, kata kunci, abstrak, dan publikasi artikel. Hasil penelitian ini menunjukkan bahwa Indonesia memiliki potensi untuk menerapkan triple entry accounting berbasis blockchain guna meningkatkan transparansi, mengurangi tingkat kecurangan, dan memudahkan administrasi perpajakan. Penelitian ini juga memberikan implikasi regulasi yang mendorong pemerintah untuk mengembangkan standardisasi penerapan teknologi blockchain dalam sektor akuntansi.

Kata Kunci: Akuntansi Tiga Entry; Administrasi Pajak; Blockchain; Teknologi Akuntansi; Transparansi

Introduction

Indonesia has demonstrated a strong commitment to adopting *Industry 4.0* technologies, as evidenced by the launch of the "Making Indonesia 4.0" roadmap in 2018. This roadmap focuses on key sectors, including food and beverages, textiles, automotive, chemicals, and electronics, alongside ten cross-priority sectors designed to drive industrial transformation (Yunus, 2021). Technologies such as *cyber-physical systems*, the Internet of Things (IoT), *Big Data*, and *cloud computing* play central roles in this transformation, offering the potential to enhance operational efficiency and improve the global competitiveness of Indonesian industries (Hadi, 2020; Zhao & Chen, 2023). In this context, the implementation of more advanced technologies like blockchain is becoming increasingly relevant, particularly in strengthening accounting and financial reporting systems where transparency, security, and efficiency are critical components.

Blockchain, defined as a decentralized and immutable digital ledger, facilitates secure and transparent transaction recording without reliance on intermediaries. In the realm of accounting, blockchain signifies a fundamental shift from the traditional double-entry system to a blockchain-based triple-entry system. The double-entry accounting system, which has served as the cornerstone of financial record-keeping for centuries, relies on independent ledgers maintained by individual entities, which are vulnerable to errors and fraudulent activities. In contrast, blockchain-enabled triple-entry accounting introduces a third, immutable ledger entry that is recorded on a decentralized, neutral platform, thereby enhancing data integrity and minimizing opportunities for fraud (Cai, 2021).

However, the adoption of *Industry 4.0* technologies in Indonesia, especially in the field of accounting, faces significant challenges, particularly for small and medium-sized enterprises (SMEs). SMEs, which form the backbone of the Indonesian economy, require technological solutions that can boost their operational performance and improve their competitiveness in global markets. Blockchain technology, with its capacity to create decentralized and secure accounting systems, holds immense potential to support SMEs in enhancing financial transparency and reducing the risks of errors and fraud in bookkeeping processes (Malik et al., 2022; Rahardjo & al., 2023). Furthermore, blockchain technology can streamline the external audit process, as all transactions are automatically recorded in a tamper-proof manner, resulting in more accurate and trustworthy data (Hartoyo et al., 2021; Khawaja & Javidroozi, 2023).

This research is crucial because blockchain is not only a technological innovation but also a revolutionary solution to the traditional double-entry accounting system, which has been the foundation of financial record-keeping for centuries. The introduction of blockchain-based *triple entry accounting* adds a third, immutable entry to every transaction through a neutral, decentralized ledger, ensuring that each transaction is verified and permanently recorded, thus enhancing transparency and reducing the potential for fraud (Cai, 2021)). In Indonesia, where the development and application of blockchain technology in accounting are still in their infancy, adopting blockchain could significantly improve corporate governance and public accountability by providing a more robust framework for financial reporting (Hartoyo et al., 2021).

For large corporations, the integration of blockchain with existing accounting systems could facilitate more efficient and cost-effective audits by external auditors, as transaction data stored on the blockchain is immutable and can be accessed in real-time, eliminating the need for manual verification processes (Lardo et al., 2022). This would not only streamline operations but also enhance the reliability of financial statements, which is critical for maintaining stakeholder trust in corporate governance. In the context of tax administration, blockchain offers even greater potential. By requiring the

registration of asset ownership and financial transactions on a blockchain, Indonesia could drastically improve tax compliance and reduce tax evasion, as all transactions would be transparently recorded and easily verifiable by tax authorities (Lubis & Pratama, 2023).

From an academic perspective, the study of blockchain and *triple entry accounting* is highly relevant given the limited research on these topics in developing countries, including Indonesia. Much of the existing literature focuses on blockchain applications in developed countries, while studies on its adoption in emerging markets remain scarce (Pattanayak et al., 2023). This paper seeks to fill this gap by offering a comprehensive literature review on the potential of blockchain technology in the Indonesian accounting and tax sectors. It also aims to provide a conceptual framework that can guide future research and inform policy development.

Practically, this paper provides significant implications for both policymakers and industry practitioners. For policymakers, the findings highlight the need for clear regulatory standards that support the implementation of blockchain technology in accounting and financial reporting. By establishing these standards, the Indonesian government can promote the wider adoption of blockchain, thereby enhancing transparency, reducing fraud, and improving the overall efficiency of financial systems. For industry practitioners, especially those in large corporations and SMEs, the adoption of blockchain technology presents an opportunity to streamline accounting processes, reduce operational risks, and strengthen financial integrity.

The application of blockchain technology in Indonesia's tax administration system also holds considerable potential. As the country moves toward digitalization, integrating blockchain into the tax system could lead to more transparent and efficient tax reporting processes, enabling tax authorities to track transactions in real time and reduce administrative burdens. This, in turn, would improve tax compliance, increase state revenue, and contribute to a more equitable and sustainable economic system (Malik et al., 2022; Setyowati et al., 2022).

Blockchain technology was introduced by Nakamoto in 2008 as the foundation of Bitcoin. Today, blockchain has found diverse applications across various scientific fields including accounting and financial reporting. In the realm of accounting, blockchain facilitates accurate asset ownership transfer and ledger management. It is considered a distributed ledger or financial technology (Han et al., 2023) (Garanina et al., 2022). According to Gietzmann & Grossetti (2021), blockchain can be described as:

> A blockchain is an open and permissionless distributed peer-to-peer system of ledgers that utilizes a software algorithm, called distributed consensus protocol, to validate and permanently (immutability) store every transaction in a timely ordered chain of blocks. Each block contains a set of valid transactions connected together by cryptographic algorithms such that the system maintains its integrity over time.

Blockchain exhibits several key features including transparency, decentralization, immutability, resistance to tampering, robust authentication, synchronized network operations and consensus (Han et al., 2023) (Yermack, 2017). This agreement is achieved through smart contracts in which each party holds control over digital transactions. Smart contracts represent the most revolutionary use of blockchain technology as they enhance transparency for all involved parties while lowering contract expenses. All validations within blockchain transactions can be executed without physical documentation.

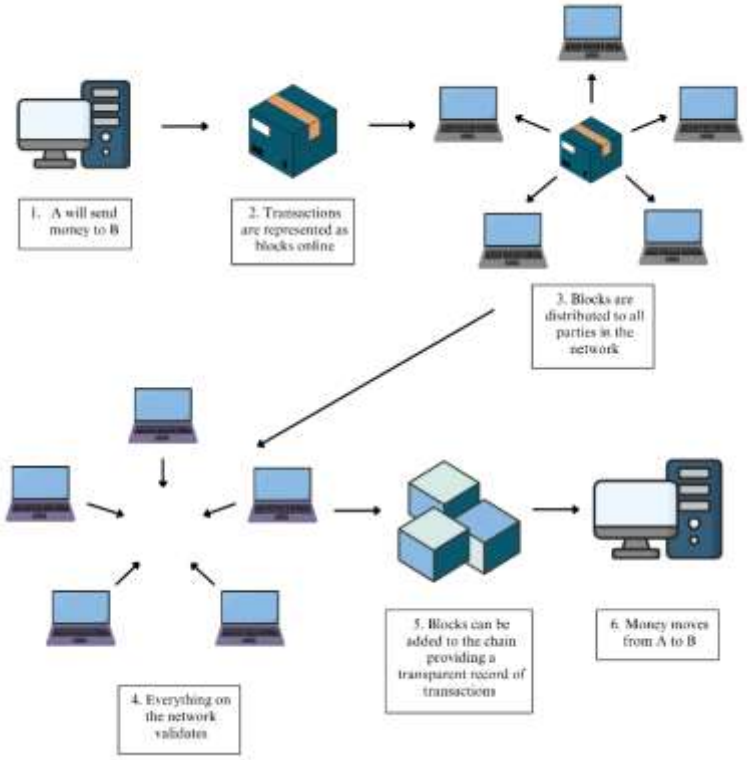

Figure 1. How Blockchain Works
Source: Adopted from Alsalmi et al. (2023)

Previous technological advancements have acknowledged the significance of SQL, but blockchain sets itself apart from traditional distributed SQL systems by incorporating an authority system through smart contracts. Unlike distributed SQL, blockchain operates without centralized control. In this decentralized structure, the verification process for transactions is not centrally managed (Gietzmann & Grossetti, 2021). This characteristic empowers companies utilizing blockchain in their accounting information systems to mitigate the risk of fraud (Garanina et al., 2022). Furthermore, transaction traffic flow within a blockchain network is transparent and meticulously authorized. In a broader sense, blockchain categories can be classified into three: public blockchain, private blockchain, and federated blockchain (a combination of public and private) (Alsalmi et al., 2023). Public blockchain implies integration of every company along the supply chain. Private blockchain refers to the restriction of blockchain technology within a specific company. Figure 1 illustrates the general functioning of blockchain technology. One goal of accounting is to accurately document financial transactions in order to furnish comprehensive information about an organization's activities and financial position to stakeholders (Maiti et al., 2021). The current accounting systems include single entry accounting (SEA) and double entry accounting (DEA), with the emerging development being triple entry accounting (TEA). A comparison of these three systems can be found in table 1.

Table 1. Difference Between SEA, DEA, and TEA

	SEA	DEA	TEA
Entry	Records of financial transactions	Records of financial transactions by debit and credit into different accounts	Signature (transaction confirmation)
Self-checking mechanism	Nothing	Account balance	Advanced checking

General ledger control	Internal	Internal and external (audit)	Distributed
Economic organization	Traditional (no separation between owner and business entity)	Corporation (separate business entity from its owners)	Platforms and ecosystems (combination between different business entities)
Focus	Cash-based accounting	Accrual-based accounting	Real time-based accounting
Technology infrastructure requirements	Low	Medium to high	high

(Source: Adopted from Maiti et al., 2021)

SEA is still commonly utilized in small businesses due to its simplicity, but it has several limitations that make it unsuitable for large companies. Unlike SEA, DEA offers higher accuracy as it operates on an accrual basis and is enforced by global accounting standards. However, despite its widespread use among large corporations, DEA also possesses notable weaknesses such as low transparency, inadequate quality control, and the inability to provide real-time information for business operations (Maiti et al., 2021). Additionally, the implementation of the DEA system necessitates strict standard operating procedures and a time-consuming audit process.

That is why the concept of TEA was developed. In a TEA system, when one party initiates a transaction and the other party approves it, the "joint" ledger operator will then validate it. TEA can fulfill an organization's requirement for insight into future financial status based on the present circumstances. Going forward, accounting practice could implement three case models as outlined in table 2.

Table 2. Potential of Future Accounting Practices

Case 1	Case 2	Case 3
Advanced DEA based accounting software	A combination of blockchain and TEA	Combination of blockchain and TEA with disruptive technology

(Source: Adopted from Maiti et al., 2021))

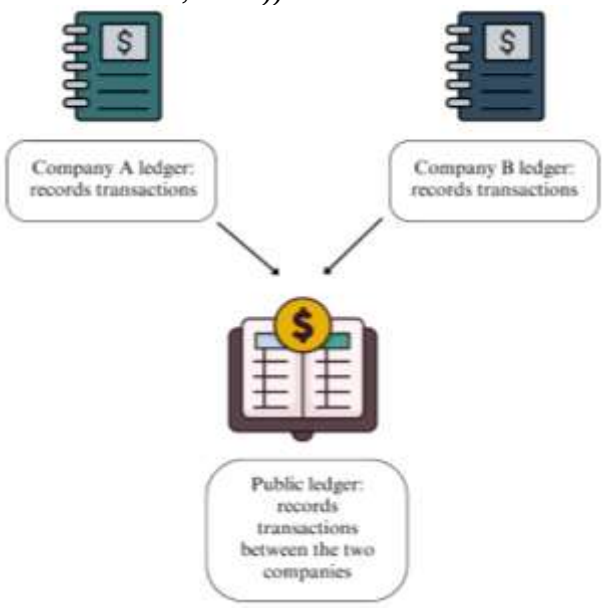

Figure 2. Triple Entry Accounting
(Source: Adopted from Maiti et al., 2021)

Method

This paper explores the concept of triple entry accounting in Indonesia through a literature review. The search for articles was conducted using Google Scholar and the keywords "akuntansi triple entry" (triple entry accounting) and "akuntansi blockchain" (blockchain accounting), focusing on Indonesian sources to examine locally developed concepts. The search was conducted on June 5, 2024. Despite the multitude of search results in Google Scholar, manual screening was necessary to identify articles specifically addressing triple entry accounting and/or blockchain accounting among them. Out of the initial pool of thousands, only 27 articles were found to be relevant to triple entry accounting after manual screening. These 27 were further narrowed down based on their suitability for this paper's objectives, resulting in a study selection of 15 articles published in Indonesian journals. Among these selected articles, it was observed that while all discuss some aspect related to triple entry accounting or blockchain technology, five do not exclusively focus on triple entry but include mentions of it as part of their content. The remaining ten directly delve into topics concerning both triple entry accounting and blockchain technology; split evenly between publications in English and Indonesian languages.

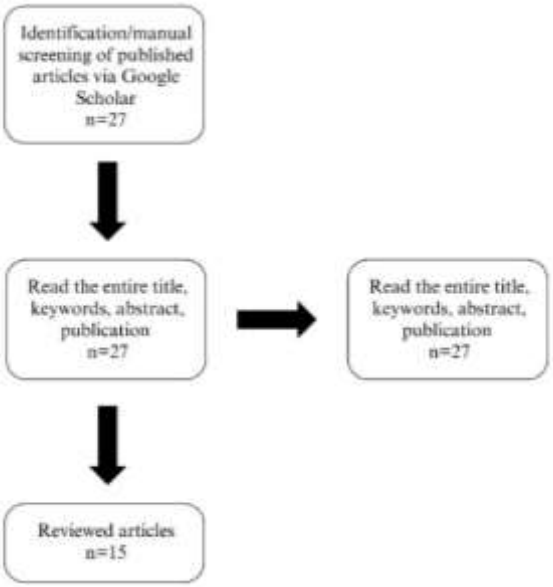

Figure 3. Stages of Literature Review
Source: Adopted from Han et al. (2023)

The process or stages of the literature review carried out in this paper were adopted from (Han et al., 2023), as can be seen in Figure 3. Based on the study process, 5 major themes were found, namely: (1) traditional triple entry; (2) blockchain as an integrated database; (3) blockchain-based triple entry; (4) blockchain for auditing and control; and (5) blockchain for tax administration (see Table 3).

Table 3. Themes in Blockchain-Based Triple Entry Accounting

Themes	References
Traditional triple entry	(Akib, 2019) (Mokoginta et al., 2017) (Surjono & Firdaus, 2017) (Yulistia et al., 2017) (Suwandi, 2016)
Blockchain as an integrated database	(Ahmad et al., 2022) (Amirya, 2022) (Bandaso et al., 2022) (Hartoyo et al., 2021) (Setyowati et al., 2022) (Wibowo & Christian, 2021)

Blockchain-based triple entry	(Ahmad et al., 2022) (Amirya, 2022) (Bandaso et al., 2022) (Hartoyo et al., 2021) (Mahaini et al., 2022)
Blockchain for auditing and control	(Ahmad et al., 2022) (Amirya, 2022) (Bandaso et al., 2022) (Septiawan & Fartika, 2022) (Wibowo & Christian, 2021)
Blockchain for tax administration	(Lubis & Pratama, 2023) (Setyowati et al., 2022)

(Source: Processed Data)

Result and Discussion

1. Traditional Triple Entry

In the context of regional government accounting in Indonesia, the term "triple entry" is frequently used. However, it does not refer to blockchain-based triple-entry accounting recorded on a distributed ledger using trebit, but rather to entries made into the budget book (Akib, 2019) (Mokoginta et al., 2017) (Surjono & Firdaus, 2017) (Suwandi, 2016) (Yulistia et al., 2017). The system in use is actually a double-entry system where only cash transactions are recorded by the cash holder in the budget book (Bandaso et al., 2022). These entries reflect chronological transaction records within a framework that incorporates elements of blockchain technology.

This method of documenting in the budget record is mandated by local regulations and is considered a triple-entry system despite not being ledger-distributed (Akib, 2019). This claim of triple-entry appears in at least five published papers found through Google Scholar searches, all conveying the same meaning as explained above. Despite the differences between the budgeting system and financial accounting, it does not constitute triple entry when recorded in the budget book. The budget book does not function as a distributed or public ledger, engaging with contemporary discussions about technological advancements would help to further our understanding of these discrepancies.

2. Blockchain As An Integrated Database

Blockchain can be defined as an accounting information system, as evidenced by the nomenclature employed by various scholars. For instance, Hartoyo et al., (2021) refer to it as a global ledger, while Wibowo & Christian (2021) utilize the term distributed ledger and Ahmad et al., (2022) employ the designation public ledger. Blockchain can be considered an accounting information system technology, as it is capable of tracking the entirety of a company's business activities in real time. The implementation of blockchain as the data center of an accounting system will result in a reduction of data errors, due to the enhanced reliability of the system in comparison to paper-based evidence. Furthermore, the utilization of blockchain technology in supply chain systems can lead to a decrease in reconciliation activities between companies, as the database is integrated Hartoyo et al., (2021). In the context of financial reporting, blockchain can guarantee the integrity of input data and prevent any manipulation. Additionally, all data entered into the blockchain is automatically identified in the event of any changes.

While blockchain can indeed perform calculations in real time, this does not imply that it is capable of executing all accounting processes. The integration of blockchain with other technologies can enhance the functionality of the accounting system. To illustrate, blockchain is only effective in recording data, with input being conducted through the ERP system (Hartoyo et al., 2021) (Setyowati et al., 2022). Consequently, blockchain can be utilized as a database in the form of a distributed ledger. When employed as a database, blockchain technology is highly beneficial, particularly for large companies with numerous divisions.

At the time of writing, Indonesia has not yet adopted blockchain technology on a widespread basis. To date, only a limited number of companies have utilized this technology. One notable example is Tokoin, a platform that employs blockchain (Amirya, 2022) (Hartoyo et al., 2021). Tokoin assists with the resolution of issues faced by MSMEs, specifically in the following areas: (1) the creation of a digital identity for MSMEs; (2) the facilitation of access to funding for MSMEs; (3) the promotion of the growth of MSMEs in order to facilitate the formation of business partnerships. Tokoin is able to facilitate this by providing the technological infrastructure necessary to manage transaction data. All transactions conducted via the Tokoin platform are stored digitally in the digital ledger. Were there to be a greater number of platforms like Tokoin, integrated with one another and with MSMEs throughout Indonesia, the implications for the Indonesian business world would be significant. In addition to Tokoin, blockchain technology has been employed by PT Bank Central Asia Tbk (BCA) and PT Pos Indonesia, as well as in a tax application service designated as Online Tax (Ahmad et al., 2022). At BCA, blockchain is utilized within the internal system to expedite payment transactions by streamlining the intricacies of back-office transactions. Subsequently, at PT Pos Indonesia, a giro service designated as Digiro.in was developed.

The advent of blockchain technology is poised to exert a gradual yet profound influence on the domain of accounting. The accounting profession will undoubtedly benefit from this blockchain technology (Hartoyo et al., 2021). Despite the extensive development and pervasive use of this technology in Indonesia, it still necessitates human operation and the expertise of accountants to analyze data in accordance with the requirements of interested parties. The sophistication of an accounting system notwithstanding, the input of transactions into an ERP system, for instance, is a task that can only be performed by humans. Once this has been done, the data is then recorded automatically into the blockchain (Ahmad et al., 2022) (Hartoyo et al., 2021). While blockchain offers numerous advantages as a database technology, its implementation in Indonesia is not without challenges. One significant hurdle is the need for a substantial storage system, as well as the expertise of professionals to implement it effectively (Bandaso et al., 2022).

Legal and regulatory constraints represent a significant barrier to blockchain adoption in Indonesia. Current regulations do not provide clear guidelines for integrating blockchain into accounting and financial reporting systems, hindering its widespread use. Additionally, infrastructure readiness and uneven technology adoption present challenges, especially in rural and underdeveloped regions. High implementation costs further impede adoption among SMEs, which form the backbone of Indonesia's economy. Policymakers need to address these challenges by introducing regulatory frameworks that support blockchain adoption, improving infrastructure, and providing financial incentives to encourage SMEs to adopt this technology.

3. Blockchain-Based Triple Entry

The following serves to illustrate the concept of triple-entry recording, which has become a popular example in scientific articles. Bob provides services to Alice for the sum of $100. Alice makes a payment of $100 to Bob. In the event that a double-entry system is employed, the transaction would be recorded as a debit of $100 to the cash account for Bob and a corresponding credit of $100 to the cash account for Alice. In the event of an audit, the auditor will verify the transaction and confirm with the bank the transactions carried out by Alice and Bob. This is due to the possibility that Alice did not record $100 in her ledger. In the event that Alice and Bob enter into a contract digitally (also known as a smart contract) when a transaction occurs, the smart contract will verify

and connect it to the blockchain. Subsequently, the computer program will transfer $100 to Bob. These payment transactions are recorded chronologically and permanently in the blockchain system (Bandaso et al., 2022) (Septiawan & Fartika, 2022).

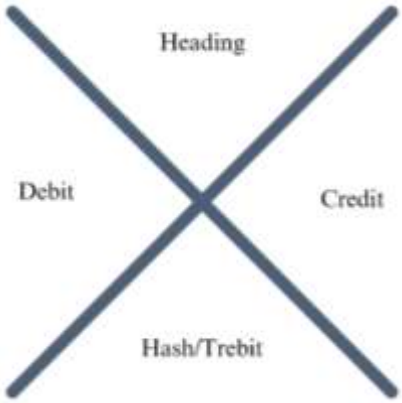

Figure 4. Form X Account in Triple Entry
(Source: Adopted from Ahmad et al. (2022))

In the double-entry recording system, there is no independent authority to supervise the recording process. This is in contrast to the triple-entry concept, which was first introduced by Yuji Ijiri (Ahmad et al., 2022)(Ahmad et al., 2022). The blockchain-based triple entry system is essentially analogous to the double entry system, with the exception of the incorporation of an additional trebit column derived from the smart contract authority. This trebit column facilitates the identification of the sources of both income and expenditure (Mahaini et al., 2022). The utilization of blockchain for triple entry encompasses a number of concepts, including the exclusive deployment of blockchain technology (1) and the integration of blockchain with enterprise resource planning (ERP) systems (Hartoyo et al., 2021). The latter represents a viable avenue for implementation in Indonesia, given that blockchain is employed solely as an integrated database, as the country's currency is not cryptocurrency.

The type of blockchain that can be used in Indonesia is private blockchain, which does not distribute information to parties outside the company (Hartoyo et al., 2021). This is in contrast to public blockchain, which is integrated with interested parties outside the company. Public blockchain technology can be used with a triple entry accounting system to increase the reliability of financial reporting. The triple entry accounting system requires authority over the transaction process from a neutral party, namely the blockchain. The triple entry system, which is integrated with external parties, will facilitate numerous processes in financial reporting. Transactions that have a minimum error rate, guaranteed authorization, and facilitate the audit process by external parties are input. Addressing these barriers requires collaboration between accounting bodies, technology providers, and policymakers. Accounting bodies must provide guidance on integrating blockchain into traditional accounting practices, while technology providers can develop cost-effective solutions tailored to local needs. Policymakers must establish clear regulatory standards and support infrastructure development to enable seamless adoption. Collaborative efforts are essential to ensure blockchain technology's integration into the Indonesian accounting landscape.

4. Blockchain For Auditing and Control

In the double-entry recording system, there are no cross signatures, in contrast to the triple-entry system. This lack of cross signatures allows for the potential for errors and fraud to occur, which must then be verified by the auditor. This is in contrast to the triple-entry system, where the signed public ledger will be distributed to the relevant

parties. This distribution of the signed public ledger reduces the possibility of errors and fraud (Ahmad et al., 2022). The utilization of blockchain as a general ledger provides users with transparency. In the blockchain, all records of transfers or transactions are stored in a continuous manner. This implies that all transactions are immutable and irrevocable, precluding the possibility of alteration or cancellation. Furthermore, the introduction of a transaction after the relevant time period is not feasible, thus rendering the detection of fraud or misappropriation a certainty (Rahmawati & Subardjo, 2023).

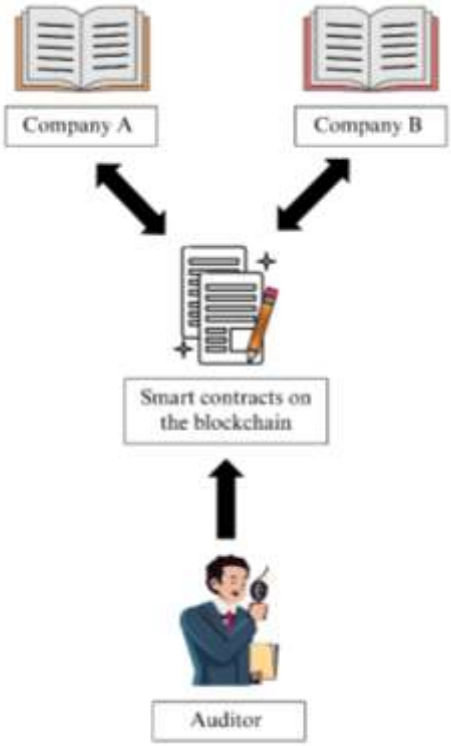

Figure 5. Transaction Recording with Blockchain
Source: Adopted from Rahmawati & Subardjo (2023)

Blockchain transaction records are only recorded if they align with the code embedded in the smart contract (Rahmawati & Subardjo, 2023). Consequently, auditors are required to solely verify the transaction records within the smart contract. As the number of companies engaged in a blockchain network increases, the probability of fraud diminishes. This results in enhanced operational efficiency within a supply chain due to the heightened transparency and reduced risk of fraud facilitated by blockchain technology.

The implementation of blockchain technology facilitates the implementation of a triple entry system, which offers a number of advantages. These include the ability to track transactions with greater ease, ensure timeliness, enhance transparency, and safeguard against any potential manipulation (Septiawan & Fartika, 2022). The implementation of this system will enable accountants to devote a greater proportion of their time to planning and assessment, thereby reducing the time previously spent on reconciliation and verification. Furthermore, it diminishes the time and financial resources required for an audit, particularly when auditing a large company. Consequently, this technology is well-suited to implementation in large companies with numerous internal divisions (Amirya, 2022) (Bandaso et al., 2022). The implementation of a distributed data system will result in a notable reduction in the costs associated with the financial audit process, particularly with regard to verification. This is due to the enhanced reliability of the data, which is of high integrity and therefore less susceptible to doubt among users of financial reports (Wibowo & Christian, 2021).

The adoption of blockchain technology in Indonesia necessitates a particular focus on data integrity concerns, in addition to considerations pertaining to implementation costs. It is imperative to guarantee the integrity of the data within the existing traditional system, as this will facilitate the transition to a blockchain-based triple entry system when the time comes. Furthermore, in order for audits to be conducted optimally in a triple-entry system, the existing accounting information system must be enhanced to integrate with blockchain technology. It is of the utmost importance that the government implement standardization for the utilization of blockchain technology, as has been done in Australia, India and China (Wibowo & Christian, 2021). If the implementation of blockchain technology commences with regulations, accounting and financial reporting systems will develop rapidly in accordance with the advancements of Industry 4.0.

5. Blockchain For Tax Administration

The functionality of the tax administration system can be enhanced through the integration of blockchain technology. This approach enables the system to operate in a transparent, efficient, and secure manner, ensuring integrity and reliability (Lubis & Pratama, 2023). A growing number of countries have adopted blockchain technology to modernize their tax administration systems. These countries include Brazil, Uruguay, and Argentina with b-CONNECT; Finland and Nigeria with Avant Smart Card and eNaira; Estonia with e-Estonia; Chile with SII; and Thailand with VRT Digital.

Blockchain technology has the potential to facilitate significant advancements in the field of tax administration, largely due to its inherent transparency. Blockchain technology has the potential to mitigate the level of tax avoidance. This is achieved by registering the Ultimate Beneficial Owner (UBO) or by registering asset ownership into the blockchain system. The registration of the Ultimate Beneficial Owner (UBO) will result in the permanent recording of transaction activity data on the blockchain (Setyowati et al., 2022).

The tax system is a policy instrument employed by the government for the purposes of redistributing income, stabilizing the economy and providing public goods (Amir et al., 2013). The majority of tax reporting systems in Indonesia continue to utilize the self-assessment principle, as exemplified by income tax. However, the integration of blockchain technology offers a promising avenue for enhancing the efficiency of the Indonesian taxation system, as previously outlined. Provided that the requisite infrastructure is in place, the government could implement a policy mandating all taxpayers to participate in the general ledger. This would facilitate the automatic monitoring of transactions, leading to an increase in state revenue, a reduction in economic inequality and a boost in economic growth.

Blockchain technology offers significant advantages for corporate governance, tax compliance, and public sector accounting. For corporate governance, blockchain enhances trust among stakeholders by providing transparent and tamper-proof financial records. In tax compliance, blockchain mitigates tax evasion through transparent recording of financial transactions, ensuring accuracy and reliability. For public sector accounting, blockchain streamlines processes for government projects by ensuring data integrity and reducing inefficiencies. These benefits underscore the transformative potential of blockchain in advancing Indonesia’s accounting and financial systems in alignment with Industry 4.0 developments.

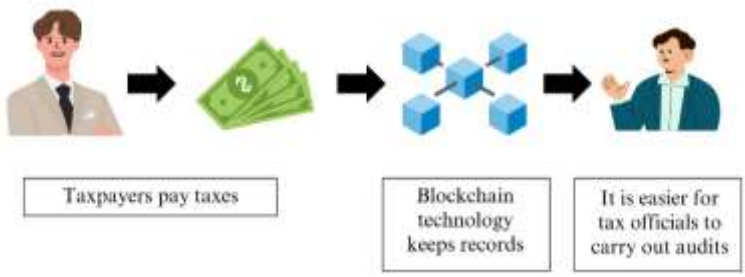

Figure 6. Blockchain-Based Tax Administration
Source: Adopted from Lubis & Pratama (2023)

Conclusion

The adoption of triple entry accounting based on blockchain technology holds significant potential for implementation in Indonesia, offering substantial benefits for both small and large enterprises. For small companies, a private blockchain can serve as an efficient solution to integrate with their supply chain, enhancing internal transparency and control. On the other hand, large corporations would benefit from utilizing public blockchain systems, as they not only support internal transparency but also facilitate external financial audits by providing immutable, real-time transaction data. The incorporation of blockchain technology minimizes the risks of recording errors and fraudulent activities, thereby improving overall corporate governance and internal controls. Moreover, blockchain's capabilities extend beyond corporate accounting into tax administration systems, offering a robust mechanism for modernizing these systems. By requiring the registration of beneficial ownership on the blockchain, the government can significantly improve tax compliance. This, in turn, simplifies the work of tax authorities and boosts state revenue by ensuring greater accountability and transparency in tax reporting. The integration of blockchain in the tax administration process will also allow for the automation of many compliance tasks, reducing administrative burdens and potential errors. The most crucial factor in achieving successful blockchain implementation in Indonesia lies in the development of regulatory frameworks and standardization. Government intervention is essential to create clear guidelines that define the application, governance, and oversight of blockchain technology in both accounting and tax systems. Establishing these standards will not only ensure consistency and reliability but will also encourage broader adoption of blockchain across various industries in Indonesia. Therefore, this paper underscores the need for comprehensive regulatory policies that can guide the integration of blockchain technology into the national economy, fostering a more transparent, efficient, and secure business environment.

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