Global Financial Accounting Journal, Vol. 07, No. 01, April 2023
ISSN: 2655-836X
https://journal.uib.ac.id/index.php/gfa

Research Paper

TRIPLE-ENTRY ACCOUNTING BASED ON BLOCKCHAIN TECHNOLOGY: HOW CAN IT BE IMPLEMENTED IN INDONESIA?

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ABSTRACT

Purpose - This study focuses on finding solutions for Indonesian accountants to apply triple-entry accounting (TEA) based on blockchain technology (BT). The aim of this study is to raise the general level of understanding and awareness about Blockchain Technology (BT)-based Triple-Entry Accounting (TEA). Furthermore, this article explores the possibility of implementing BT-based TEA in Indonesia, which still uses the double-entry accounting (DEA) system in daily practice.
Research Method - This study used a qualitative methodology as a literature review and case study to analyze various academics' theories, attitudes, and opinions on TEA.
Findings - The TEA method has undergone extensive research worldwide and offers benefits far superior to the double-entry accounting system (DEA), which the accounting industry has employed for over five centuries. However, the absence of a legal framework in Indonesia and possible high recognition costs means that the implementation of a BT-based TEA in Indonesia has yet to start.
Implication - This research was conducted to help accountants, regulators, and business researchers know the role of BT in the potential implementation of TEA and the need to implement it to develop a new accounting system that provides better usability, security, and predictive functions than DEA. We also want to motivate more accounting researchers, accounting practitioners, accounting lecturers, and accounting regulators in Indonesia to get to know and further apply TEA based on BT in accounting practice. We hope this article can generate insights into the knowledge and insights on implementing the BT-based TEA system.

Keywords: Accounting, Accounting Technology, Blockchain Technology, Indonesia, Triple-Entry Accounting.

JEL code: M41, O33, E42

Article History	DOI : http://dx.doi.org/10.37253/gfa.v7i1.7467
Received : 15 February 2023	Web :
Revised : 28 March 2023	https://journal.uib.ac.id/index.php/gfa/article/view/7467
Accepted : 30 March 2023	

Citation
Sasongko, A. W., Sriwijianingsih, P., & Nugraha, F. K. (2023). Triple-Entry accounting based on blockchain technology: How can it be implemented in Indonesia? *Global Financial Accounting Journal, 7*(1), 45-56. http://dx.doi.org/10.37253/gfa.v7i1.7467

INTRODUCTION

Accounting is not a new thing. Archaeologists and researchers routinely find signs of accounting in the earliest civilizations when excavating (Saidu, 2014). For sure, we already know that accounting has evolved for thousands of years. Over a millennia-long accounting evolution, the double-entry accounting (DEA) system is the most popular accounting system used in general practice and has been used for more than 600 years (Cai, 2019). With its tenets and regulations as they are known today, accounting has just experienced rapid growth in the 20th century (Kitsantas, 2022). One of the main objectives of accounting is to record all financial activities and transactions to provide complete information to stakeholders about an entity's financial activities and financial situation (Maiti et al., 2021). However, until now, this primary accounting objective has not been fully achieved.

The DEA system was created to keep an accurate, comprehensive, verifiable, and controllable historical financial record (Sangster, 2016). This DEA system has helped many businesses to grow and operate efficiently. However, the long-standing implementation and widespread use of this DEA system still have not been able to completely resolve the inherent trust and transparency problems frequently encountered by users of financial reports from outside parties, such as shareholders and the government (Staszkiewicz, 2021). This is proof that the accounting problem of achieving its goals has not yet been fully resolved.

Technologies enabling entities to communicate or exchange information have developed rapidly in the last two decades. Technology may provide marginalized horizontal and downward stakeholders with new opportunities to actively participate in the processes of aid creation and hold more influential upward stakeholders accountable (Kuruppu, 2022). Blockchain Technology (BT) has become one of the most discussed technologies since it was invented in 2008 (Bonyuet, 2020). Financial transactions in this BT network are time-stamped by hashing them into an ongoing chain of records (Adam & Dzang, 2020). BT also allows many things to be transacted without using a third party to perform any validation tasks. Thus, many uses have been found for this technology, including the transfer or exchange of health records, traceability of data on food supply, and inventory or tracking of assets and ownership records.

We have known for a long time that the accounting profession is at the forefront of the profession in terms of adopting new technology (Carlin, 2019). As adopters of new technology currently, accountants have also implemented the latest technologies, such as the use of advanced accounting software used by accountants in an entity, modern audit software for public accountant work practices, also ERP (Enterprise Resources Program) software to assist the management accounting profession in its work practices. The use of the latest technology in carrying out the work of an accountant can certainly produce results that are much more effective and efficient than in previous years. The emergence of BT certainly presents the potential for technological development, which should be even greater, such as realizing truly real-time, fraud-free accounting and implementing triple-entry accounting (TEA) that can be done on a blockchain basis. Soon, BT developers must further improve the performance and reliability of the technology, and accountants must increase effort expectancy because these two things positively influence accountants' intention to use blockchain (Afifa et al., 2022).

Problem Identification

The implementation of TEA based on BT has not yet been widely adopted worldwide, despite the growing interest in these concepts. Academic studies and publications that clearly explain the implementation of TEA based on BT are still limited, as noted by (Ahmad et al., 2022). In Indonesia, while some companies have adopted BT, TEA implementation is not yet widespread. Thus, there is a need to explore the potential advantages of implementing TEA based on BT in Indonesia and to identify strategies that can assist accountants in successfully

implementing TEA based on BT in the rapidly changing business world. The exploration of potential advantages is important to identify the specific benefits that this approach can offer given Indonesia's unique economic and social context. The role of accountants is also crucial in driving the adoption of TEA based on BT and ensuring its successful implementation. As trusted advisors to businesses, accountants can play a key role in achieving this objective. By identifying the strategies for successful implementation, this research can help businesses stay competitive in the rapidly changing business environment while contributing to the broader academic discourse on TEA and BT.

Purpose of the Study

The main aim of this study is to raise the general level of understanding and awareness about BT-based TEA. Furthermore, this article tries to open the possibility of implementing BT-based TEA in Indonesia. We also want to motivate more accounting researchers, accounting practitioners, accounting lecturers, and accounting regulators in Indonesia to get to know and further apply TEA based on BT in accounting practice. We hope that this article can generate insights into the knowledge and insights on the implementation of the BT-based TEA system.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Double-Entry Accounting (DEA)

Indeed, historians and accounting experts continue to discuss the precise causes for the development and widespread use of DEA, as well as its origins and full impact on medieval commerce (Sangster & Santini, 2022). While it may be difficult to fully understand the role and impact of DEA in medieval commerce, its enduring legacy and importance in modern accounting practices are undeniable. DEA remains the foundation of modern accounting, and its principles continue to be applied in a wide range of industries and businesses around the world.

It is generally acknowledged that DEA provided an accurate and systematic method of recording financial transactions than the single-entry accounting (SEA) system that was prevalent before its emergence. The DEA system allowed for the recording of each transaction in two accounts, which ensured that debits and credits were always equal and provided a built-in system of error checking. This accuracy and reliability were particularly important in the modern marketplace, where long-distance trade and credit transactions were becoming more common. DEA facilitated the tracking of inventory, debts, and credits, which allowed for better decision-making and reduced the risks associated with financial transactions.

Triple-Entry Accounting (TEA)

The TEA theory investigates if an accounting trinity may be created with the two dimensions of accounting that now in use (Blommaert, 1995). TEA is not an absolute system that rejects DEA extensions; rather, it can be rationally expanded from DEA (Ijiri, 1982). Yuji Ijiri proposed the term TEA for the first time in 1986 (Hsieh, 2018). Ijiri argued that the double-entry accounting system only records changes in wealth through income earned during a period, but each income of one monetary unit may be obtained at a different rate (Ijiri, 1986). Ijiri uses the word "momentum" to convey the idea of "the rate at which income is earned." Money per period, such as the dollars per month, is used to gauge momentum. He also suggested a third-level entry that would record financial transactions using a group of accounts (debit, credit, and trebit). Trebit is designed to capture modifications in momentum.

In 2005 the term TEA or accounting returned to Ian Grigg's research. With Ian Grigg's experience in financial cryptography, Ian Grigg proposes a solution to overcome accidental errors and fraud in accounting. The solution to dealing with unintentional errors and fraud in

accounting is not the sole record of business transactions (Grigg, 2005). These cryptographically secured third-party entries can be recorded simultaneously with the recording of transactions between entities carried out by each entity. In this third entry, this validating input takes the debit records registered by one entity and the credits recorded by the counterparty entity. Grigg (2005) called this new recording method triple-entry accounting.

Blockchain Technology (BT)

Banking institutions have essentially become the sole source of confidence in online commerce to facilitate electronic payments. Although the system operates adequately for many transactions, the inherent weaknesses of the trust-based paradigm persist (Nakamoto, 2008). Satoshi Nakamoto created the blockchain system in 2008 with these problems in mind. Blockchain is a database for storing data. Blockchains can be supplied with any sort of data, even though the majority of blockchain applications currently contain just bitcoin and trading data. As its name suggests, blockchain stores data in grid frames, with each section linked to the one before it (Chowdhury, 2021).

Because data is stored in multiple points known as nodes, it is very difficult for hackers to steal or change data stored in thousands of nodes instantly, so blockchain provides excellent data security and reliability. Also, in blockchain, information flows on a peer-to-peer basis. This is very different from conventional database mechanisms, were information flows between servers and clients. Transactions are secured using cryptography, digital keys, and digital signatures (Ahluwalia et al., 2020). Decentralization of Blockchain ensures that no single entity controls the system, hence promoting security and transparency (Karajovic et al., 2019).

RESEARCH METHODOLOGY

Even though the goal of research is to develop theories that can explain and forecast the facts and events of this universe, quantitative positivism is still the dominant paradigm in accounting and financial research (Sudarma, 2010). Applying TEA worldwide is still very limited, especially in Indonesia. And one way to start our steps on a small rung of the ladder toward major changes in accounting practices in Indonesia is qualitative research such as this one.

This study used a qualitative methodology as a literature review and case study to analyse various academics' theories, attitudes, and opinions on TEA. Additionally, the nature of this research is descriptive. First, this research will be conducted utilizing a detailed review of previous studies focusing on blockchain-based triple-entry accounting (TEA). Second, we conduct case studies in a form of possible cases of future accounting practices. (Maiti et al., 2021) use this method and assert that this approach is the most effective for researching TEA based on blockchain technology because most accounting practices still employ the DEA system, and TEA based on blockchain technology has only a limited number of applications.

RESULTS AND DISCUSSION

Update on the Implementation of a BT-based TEA

Using BT, TEA produces a shared ledger that can be viewed within company networks. Using multi-party authenticated records, the blockchain's shared ledger may significantly increase transparency and trust (Cai, 2019; Carlin, 2019; Dai & Vasarhelyi, 2017; Schmitz & Leoni, 2019). Blockchain implementation in accounting practices has been studied and researched for quite a long time but has not been widely applied (Faccia & Petratos, 2021). Literature review regarding the application of blockchain to accounting practices in Indonesia is still very limited.

In his research Cai (2019) conducted a case study on the application of a blockchain-based TEA system in three different entities. According to his research, the scalability of blockchain is still a hurdle to effectively implementing the triple-entry accounting system in practice. Although there are still obstacles, the case studies discussed in the paper have shown great potential. These barriers may include regulatory issues, potential security threats, and uncertain return on investment.

Case Study Results

According to Verhoef et al. (2021), digital transformation occurs in three phases.: digitization, digitalization, and digital transformation. While business structures remain the same, digitization can be defined as the replacement of physical assets with digital ones. By adding digital capabilities to current business models, digitization's primary objective is to make them more effective. Business models are being digitalized by including specific new components (mainly new channels of interactions with customers). Digitalization is the use of both conventional and modern tools. The ratio of traditional to digital tools may vary. Business models are being disrupted because of digital transformation. It is the product of business models transitioning from their traditional stage to the digital level. Furthermore, this study argues that accounting practices in Indonesia could be any of these cases, according to research conducted by (Maiti et al., 2021).

Table 1. Possible Future Accounting Practice Examples

Case I - Digitization	Case II - Digitalisation	Case III - Digital Transformation
DEA-based sophisticated accounting software	TEA and blockchain implemented together	TEA and Blockchain aren't the only disruptive technology.

Source: Maiti et al. (2021)

Currently, accounting practice in the world uses a double-entry accounting system (Maiti et al., 2021). In a double-entry accounting system, transactions from two entities that carry out a financial transaction will result in a mechanism for recording financial transactions into two entries, better known as accounting journals. The input made by each of these entities will then be processed by the Accounting Information System of each entity and will finally produce financial reports. At the end of each period, the two financial statements of the two entities must also be audited by two independent public accounting firms if the two entities have public accountability, which requires their financial statements to be audited.

Case I: Digitization

DEA-based Sophisticated Accounting Software

Digital technology wouldn't alter the DEA principle due to accounting digitization (Maiti et al., 2021). During this time, a great deal of new accounting software will be created and put into use, helping to better register and control data. The role of accountants will be diminished through intelligent automation. The development of enabling technology will coexist with the dominance of the DEA principle. There would be no switch to TEA in this scenario because the DEA principle would be applied utilizing cutting-edge, disruptive technology. Businesses would continue to operate according to DEA principles, periodically update their technology, and include minimal blockchain data protection.

Companies in Indonesia already employ a variety of sophisticated accounting programs or Enterprise Resource Planning (ERP) programs based on the DEA, but these programs are unable to provide real-time insights into corporate activities. If firms continue to employ the DEA system, Ian Grigg's concept of accounting should no longer be private and remains unfulfilled. These deficiencies are crucial right now since businesses want to foster confidence

among their stakeholders and are interested in being transparent. To increase the good impacts for economic actors and the role of TEA in attaining it, it is vital to look to the future and how these advances might be employed together.

According to data from the Indonesian Blockchain Association, there are already several companies implementing blockchain technology in their operations, one of which is PT Bank Central Asia Tbk. This is very good, considering that blockchain technology is the most important thing in the potential application of TEA. Companies that have not implemented blockchain technology in their operations, on the other hand, have already implemented many of the latest technologies related to their accounting systems, although they still use the DEA concept. So, it can be concluded that in the present time, the implementation of sophisticated accounting software based on the DEA has occurred.

Blockchain has many potential implications for accounting practice. Researchers are already interested in this technology in addition to presenting the most recent accounting research on blockchain and new research directions: triple-entry accounting, unchangeability of transactions, automation of menial jobs that don't require judgment calls, the inclusion of cryptocurrencies in financial statements, value-chain management, social and environmental audits and reporting, and novel business models (Bellucci, 2022). But at this period, the use of blockchain technology and the switch to TEA are still not officially and clearly regulated by laws and Indonesian Accounting Standards (PSAK). These two topics are not mentioned at all in the Indonesian Institute of Accountants 2023 Agenda.

The DEA system and accounting technologies are still currently in use by businesses and industries in Indonesia. However, the transition to the TEA system is currently difficult, but it is a wonderful mental exercise (Maiti et al., 2021). Indonesian accountants are currently interested in BT and TEA, but the discipline still has a lot of work to do. Leading accounting firms should lend their expertise to this project because setting up regulations and standards for BT and TEA reporting would not be an easy task. Accounting professionals having a background in both business and finance would be valuable consultants for companies investigating these new technologies and searching for ways to grow (Alsaqa, 2019).

Case II: Digitalisation

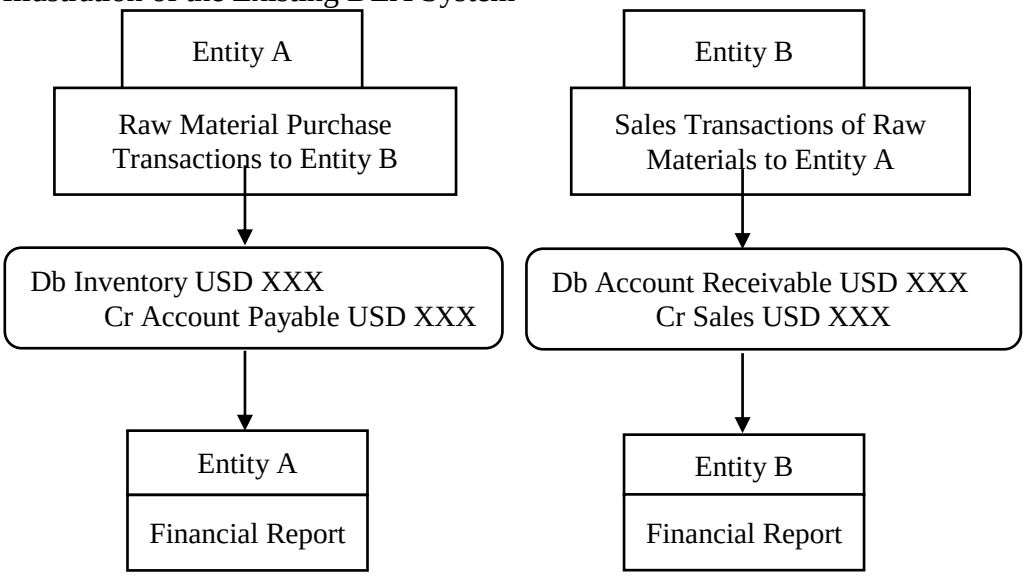
TEA and Blockchain Implemented Together

During this time**,** a combination of BT and TEA principles would be adopted by the companies in Indonesia. In accounting practice, it is always necessary to mitigate changes to the accounting system to produce integrated information and increase the intensity of public trust. In this case, TEA is here as a solution to solve these challenges (Mahaini et al., 2022). In such circumstances, Indonesian accounting practices are likely to start demonstrating advancements in TEA application. At this moment, a number of sizable businesses that are listed on the Indonesia Stock Exchange (IDX) have begun integrating BT into their daily operations. There is a chance that TEA adoption will be more advantageous in terms of accountability and public reporting, particularly in the banking sector, which has, of course, already used BT in its operations. The manufacturing industry will of course, also start implementing TEA in their business operations as a means of efficiency and effectiveness for their agency cost.

After technical advancement and development, blockchain will include a significant alteration of the current accounting system, changing the work of accountants and auditors as a result (Pedreño, 2021). The implementation of a hierarchical deterministic structure for an accounting book structure for commercial usage may be done in Indonesia using TEA. Chen (2021) introduced this hierarchical deterministic framework. To base the ongoing revolution over triple-entry accounting systems on blockchain infrastructure, these book structure designs are compliant with IFRS requirements and international accounting standards, similar to

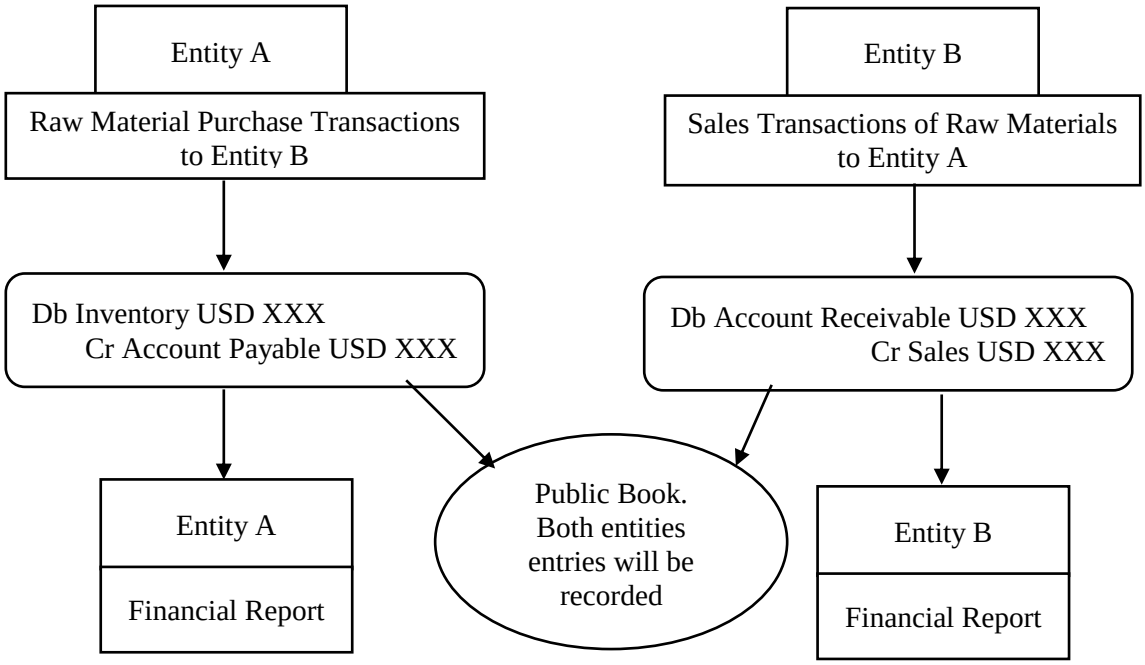
Indonesian accounting standards. Their research Chen (2021) also proposed a triple-entry accounting protocol and a π account (in this study, we refer to it as the "public book") that has superior visibility, readability, and efficiency than the T account while keeping the current accounting system.

Figure 1. Illustration of the Existing DEA System



Source: Data processed by researchers (2023)

Figure 2. Proposed Model to Implementing A BT-based TEA System



Source: Data processed by researchers (2023)

Companies applying TEA will typically benefit from lower agency costs, yet it's possible that these businesses will incur fewer expenses to hire a public accounting firm to

audit their financial statements on an annual basis. The execution of audit procedures will also be significantly simplified for public accounting firms. Public accounting firms, for instance, are not mandatory required anymore to do procedures involving external party confirmation, such as sending external bank confirmations, external confirmations of accounts receivable, and external confirmations of accounts payable, during this time. The auditor will be able to get all this data from the BT-based "public book" reliably. The auditing industry must embrace the benefits and difficulties that widespread implementation of TEA based on BT would bring (Fikri et al., 2022).

Case III: Digital Transformation

TEA and Blockchain Aren't the Only Disruptive Technology

At this point, the firm would implement several disruptive technologies in addition to Blockchain and TEA principles. In such circumstances, Indonesian accounting methods are likely to face numerous difficulties. The application of DEA in Indonesia also faces many complex challenges, such as the valuation, recognition, and disclosure of complex elements such as biological assets and intangible assets. The application of DEA in Indonesia still faces many challenges in the field of sharia accounting. Based on this experience, challenges in implementing TEA, of course, there will also be many challenges and obstacles.

For this reason, in this study, we try to summarise several similar studies that mention the potential impacts and obstacles in the future implementation of TEA, which we predict will appear in Indonesia as follows:

Table 2. Possible Impact and Challenges of Future Accounting Practice

Area	Impact	Challenges
Policy	• A new TEA policy supported by an adequate governance structure. • A policy that unites the public and commercial sectors in order to provide the necessary technical infrastructures for TEA implementation.	• Stakeholder adjustment to abrupt policy changes. • Informing stakeholders about a new policy and raising awareness of it.
Technology	• Developing human capital • Establishing standards for new technology adoption by all levels of stakeholders • Developing a phased implementation plan for TEA	• Achieving global synchronization of several solutions, including a global standard for accounting data, storage management, scalable blockchains, security, computing interfaces, and a long-term framework that oversees all of these modules with a successful global implementation strategy.
Stakeholders	• Accountant • IT experts • Governmental organizations • Businesses • Investors • Financial institutions • Accounting policymakers	• The stakeholder's common goal must be preferred over the self-specific goals for building trust.
Economic	• The economic impact, both immediate and long-term.	• Future occurrences could resemble the Covid-19 epidemic.

Investment	• All aspects.	• Investing in technical advancement is a lengthy and somewhat involved procedure.
Sustainability	• The 2030 Sustainability Agenda of the UN. • 17 sustainable development targets set by the UN (SDGs).	• Social Accounting makes information disclosures that go beyond DEA and TEA, such modern slavery disclosure. • Reporting that is integrated. • Accounting for sustainability.

Source: Maiti et al. (2021)

Discussion

Even though blockchain is still in its infancy, it will be advantageous when compared to the current ledger system. Blockchain can record the history of all transactions regardless of the type and provide an equal copy to all users on the network. The process can be said to be democratic because all the users on the network agree on the rules that govern the blockchain. Many blockchain networks allow the network to be segmented and private. The trick is to only allow the owner of certain digital signatures to access some information from the blockchain or even only be given minimal access, such as access to one transaction. On the blockchain network, transaction records are updated in real-time. And once a record is registered to the blockchain network, it cannot be modified. Thus, providing transaction records into the blockchain network will be permanently damaged. This will certainly increase data security confidence when compared to conventional server systems.

As in general accounting practices in the world, currently, all entities in Indonesia also use a accounting system or a DEA system (Ahmad et al., 2022). Good accounting practice is the recording of financial transactions that are free from material misstatements caused by errors or fraud. An approach that has been utilized in Indonesia to get sufficient assurance that financial statements are free from material misstatements brought on by error or fraud is financial statement auditing by public accountant firm. Real-time accounting using blockchain will drastically cut down on opportunistic managerial behaviour to use accounting tricks and value-eroding operations to influence reported earnings (Han et al., 2023).

The next solution that we can propose based on a lot of research is implementing a blockchain-based TEA system. The solution is the application of regulations for entities not to be the only party to record a business transaction. Automated third parties are also engaged to perform cryptographically secured "trebit" input on the blockchain network and can be recorded simultaneously with first party and second-party input (transactions between two entities) in inter-entity transactions. This third entry, known as "trebit", can contain information about debits recorded by one entity and credits recorded by the counterparty entity.

The needs and demands of the community have escalated along with the times, as well as stakeholders who consider that the financial report information provided at this time is also considered not to provide predictive information so that transactions in the near future make the output from the use of the double-entry accounting system not relevant enough nor real-time. Financial reports prepared using a double-entry accounting system will only present historical data, while stakeholders need financial information to make future decisions. This problem raises the triple-entry accounting system as a solution. Many studies have obtained the fact that blockchain-based triple-accounting can significantly improve the weaknesses of the double-entry accounting system. Therefore, in order to overcome technical, organizational,

and regulatory obstacles and effectively integrate into the financial system, it is necessary to create, standardize, and improve BT.

CONCLUSION AND SUGGESTION

The accounting profession in Indonesia is one of the front lines in terms of applying the latest technology in its work practices. The presence of a new technology called blockchain certainly opens opportunities for the accounting profession to create and further implement regulations that are better than current conditions. The TEA system has long been researched and presents advantages that are much better than the DEA system that has been used by the accounting profession for more than hundreds of years. Blockchain, which has begun to be implemented in several entities in Indonesia, supports the accelerated implementation of the TEA system, which provides usability, security, and better predictive functions than accounting.

So far, the TEA system is still limited to a concept due to a lack of understanding and knowledge of blockchain technology. Many entities in Indonesia, especially in the banking industry, have enormous potential to implement a blockchain-based TEA system because they already have a competitive advantage in technology when compared to other industries in Indonesia. However, the absence of a legal framework and the possible high cost of recognition mean that implementation of a blockchain-based TEA system has yet to start in Indonesia. At least until now.

This study was intended to inform accountants, policymakers, and academics about the importance of BT in the development of a new accounting system that performs better than DEA in terms of usability, security, and predictive capabilities. We also hope to inspire more Indonesian accounting authorities, practitioners, lecturers, and researchers to learn more about and implement BT in accounting. We hope that this paper will provide readers with new knowledge and ideas for applying the BT-based TEA system.

The study's main limitation is that, because the usage of BT-based TEA is still very limited, we have trouble coming up with an appropriate research strategy other than literature reviews and potential case studies, which are problems also shared by previous studies. Even though Yuji Ijiri predicted the potential of TEA about 50 years ago, research in this area is still quite limited. In order to broaden the range of study methods and approaches on this topic, the researcher believes that future research on the same topic will look for alternative methodologies.

REFERENCES

Abu Afifa, M. M., Vo Van, H., & le Hoang Van, T. (2022). Blockchain adoption in accounting by an extended UTAUT model: empirical evidence from an emerging economy. *Journal of Financial Reporting and Accounting*, *ahead-of-p*(ahead-of-print). https://doi.org/10.1108/JFRA-12-2021-0434

Adam, I. O., & Dzang A, M. (2020). Bridging the global digital divide through digital inclusion: the role of ICT access and ICT use. *Transforming Government: People, Process and Policy*, *15*(4), 580–596. https://doi.org/10.1108/TG-06-2020-0114

Ahluwalia, S., Mahto, R. v, & Guerrero, M. (2020). Blockchain technology and startup financing: A transaction cost economics perspective. *Technological Forecasting and Social Change*, *151*. https://doi.org/10.1016/j.techfore.2019.119854

Ahmad, A., Wahyuni, I. S., Istiqomah, L., Wulan, E., & Tiyas, W. (2022). Triple Entry Bookkeeping di Era Teknologi Blockchain: Suatu Kajian Literatur. *Jurnal Pendidikan Akuntansi (JPAK)*, *10*(3), 2722–7502.

Alsaqa, Z. H. (2019). The impact of blockchain on accounting information systems. *Journal of Information Technology Management*, *11*(3), 62–80. https://doi.org/10.22059/jitm.2019.74301

Bellucci, M. (2022). Blockchain in accounting practice and research: systematic literature review. *Meditari Accountancy Research*, *30*(7), 121–146. https://doi.org/10.1108/MEDAR-10-2021-1477

Blommaert, T. M. M. (1995). Additional Disclosure: Triple-Entry And Momentum Accounting The Administration Of Profit Drivers And Income Momentum Data To Improve Management Accounting System Information. *European Accounting Review*, *4*(3), 580–581. https://doi.org/10.1080/09638189500000036

Bonyuet, D. (2020). Overview and impact of blockchain on auditing. *International Journal of Digital Accounting Research*, *20*, 31–43. https://doi.org/10.4192/1577-8517-v20_2

Cai, C. W. (2019). Triple-entry accounting with blockchain: How far have we come? *Accounting and Finance*, *61*(1), 71–93. https://doi.org/10.1111/acfi.12556

Carlin, T. (2019). Blockchain and the Journey Beyond Double Entry. *Australian Accounting Review*, *29*(2), 305–311. https://doi.org/10.1111/auar.12273

Chen, W. B. (2021). Implementing triple entry accounting system with π account on block-chain protocol. *Journal of Internet Technology*, *22*(2), 491–497. https://doi.org/10.3966/160792642021032202023

Chowdhury, E. K. (2021). Financial Accounting in the Era of Blockchain - A Paradigm Shift from Double Entry to Triple Entry System. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3827591

Dai, J., & Vasarhelyi, M. A. (2017). Toward blockchain-based accounting and assurance. *Journal of Information Systems*, *31*(3), 5–21. https://doi.org/10.2308/isys-51804

Faccia, A., & Petratos, P. (2021). Blockchain, enterprise resource planning (ERP) and accounting information systems (AIS): Research on e-procurement and system integration. *Applied Sciences (Switzerland)*, *11*(15). https://doi.org/10.3390/app11156792

Fikri, N., Rida, M., Abghour, N., Moussaid, K., Omri, A. el, & Myara, M. (2022). A Blockchain Architecture for Trusted Sub-Ledger Operations and Financial Audit Using Decentralized Microservices. *IEEE Access*, *10*, 90873–90886. https://doi.org/10.1109/ACCESS.2022.3201885

Grigg, I. (2005). Triple Entry Accounting. *Tribhuvan University Journal*, 1–15. https://doi.org/10.13140/RG.2.2.12032.43524

Han, H., Shiwakoti, R. K., Jarvis, R., Mordi, C., & Botchie, D. (2023). Accounting and auditing with blockchain technology and artificial Intelligence: A literature review. *International Journal of Accounting Information Systems*, *48*. https://doi.org/10.1016/j.accinf.2022.100598

Hsieh, P. (2018). The intellectual development of Yuji Ijiri. *Accounting History*, *23*(4), 541–554. https://doi.org/10.1177/1032373217744289

Ijiri, Y. (1982). Triple-entry book-keeping and income momentum. In *American Accounting Association*.

Ijiri, Y. (1986). A Framework for Triple-Entry Bookkeeping. *The Accounting Review*, *LXI*(4).

Karajovic, M., Kim, H. M., & Laskowski, M. (2019). Thinking Outside the Block: Projected Phases of Blockchain Integration in the Accounting Industry. *Australian Accounting Review*, *29*(2), 319–330. https://doi.org/10.1111/auar.12280

Kitsantas, T. (2022). Blockchain Technology as an Ecosystem: Trends and Perspectives in Accounting and Management. *Journal of Theoretical and Applied Electronic Commerce Research*, *17*(3), 1143–1161. https://doi.org/10.3390/jtaer17030058

Kuruppu, S. C. (2022). How can NGO accountability practices be improved with technologies such as blockchain and triple-entry accounting? *Accounting, Auditing and Accountability Journal*, *35*(7), 1714–1742. https://doi.org/10.1108/AAAJ-10-2020-4972

Made Sudarma. (2010). Paradigma Penelitian Akuntansi dan Keuangan. *Jurnal Akuntansi Multiparadigma, Vol. 1 No. 1 April 2010* , *1*(1), 97–108.

Mahaini, M. F., Danessa, F. R. A., & Wulandari, A. K. (2022). Treping System (New Trebit for Bookkeeping System): Implementasi Triple Entry Accounting dalam Sistem Entitas Pendidikan. *Journal of Applied Managerial Accounting*, *6*(1), 47–58. https://doi.org/10.30871/jama.v6i1.3928

Maiti, M., Kotliarov, I., & Lipatnikov, V. (2021). A future triple entry accounting framework using blockchain technology. *Blockchain: Research and Applications*, *2*(4). https://doi.org/10.1016/j.bcra.2021.100037

Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System. *Https://Bitcoin.Org/Bitcoin.Pdf*, 2008. https://doi.org/10.2139/ssrn.3977007

Pedreño, E. P. (2021). Blockchain and its application to accounting. *Intangible Capital*, *17*(1), 1–16. https://doi.org/10.3926/IC.1522

Saidu, A. (2014). Accounting and Civilisation. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2403992

Sangster, A. (2016). The genesis of double entry bookkeeping. *Accounting Review*, *91*(1), 299–315. https://doi.org/10.2308/accr-51115

Sangster, A., & Santini, F. (2022). Lost in translation: Pacioli's de computis et scripturis. *Accounting History*, *27*(3), 311–342. https://doi.org/10.1177/10323732221098443

Schmitz, J., & Leoni, G. (2019). Accounting and Auditing at the Time of Blockchain Technology: A Research Agenda. *Australian Accounting Review*, *29*(2), 331–342. https://doi.org/10.1111/auar.12286

Staszkiewicz, P. (2021). Reporting and disclosure of investments in sustainable development. *Sustainability (Switzerland)*, *13*(2), 1–15. https://doi.org/10.3390/su13020908

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, *122*(November 2019), 889–901. https://doi.org/10.1016/j.jbusres.2019.09.022