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Triple Entry Accounting on Continuous Accounting Implementation: Does Green Transformational Leadership Matter?

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ABSTRACT

This study explores how triple entry accounting influences continuous accounting implementation and green transformational leadership as moderation variable. This is a quantitative study using questionnaires and analysed by the Partial Least Squares-Structural Equation Modelling to derive primary data. Samples are participants from supervisors, managers and directors of the finance and information technology divisions of State-Owned Enterprises in Indonesia, resulted 114 responses. There is a significant positive relationship between triple entry accounting and continuous accounting implementation. Results also demonstrate a significant positive relationship among green transformational leadership and continuous accounting implementation. However, there is no significant evidence that green transformational leadership assists in implementation between triple entry accounting and continuous accounting. Unified Theory of Acceptance is implied to explain relationship between triple entry accounting and continuous accounting implementation, updated to the current situation, with technology applied to every aspect of business. This finding shows that accountants should be aware of the blockchain system and urgently implement it to reduce the complexity of the accountant's work. The importance of adopting green transformational leadership for improving the continuous accounting implementation will be significant.

Keywords: Triple Entry Accounting; Blockchain; Green Transformational Leadership; Continuous Accounting, Unified Theory of Acceptance

INTRODUCTION

The industrial world has undergone several eras of change starting with the first industrial revolution through to the fourth industrial revolution (Binkhuysen, 2020; Vinodh *et al.*, 2020; Leitner-Hanetseder *et al.*, 2021; Trí, 2021). The fourth industrial revolution demonstrated a mix of physical assets and advances in digital technology used to communicate, analyse and act on information, enabling organizations, consumers and society to be more flexible and responsive and to make smarter decisions based on data (Haseeb *et al.*, 2019; Binkhuysen, 2020; Vinodh *et al.*, 2020; Zengin *et al.*, 2021). Companies have derived considerable benefit, with subsequent impact on the world globally. A particular interest is how goods or services are produced through smart factories (Haseeb *et al.*, 2019).

The interrelationship of institutional strategies with continuous goals is important for aligning entity outcomes with overall performance impacts (Dagiliene, 2019). After establishing sustainability

indicators, an accounting system can be created to capture data on actual performance to communicate results to stakeholders and develop programmable digital workflows (Kaur and Lodhia, 2018). Computational optimization method are implement to bring off regenerative design targets with digital mapping (Andreucci *et al.*, 2021). As a result, rising of interconnectivity and digital transformation will drive new transformation to the entities (Gulin, 2019; Rounaghi, 2019; Carayannis, 2022).

Double entry accounting has been in use for over 600 years (Cai, 2021). However, double entry accounting still has a lack of functions to acquire the requisite technology development currently available (Ibañez *et al.*, 2021). In the current era, technological changes using blockchain have led to the emergence of another promising accounting method called triple entry accounting (Cai, 2021). Hence, double entry accounting is considered insufficient to provide comprehensive information to help in the decision making process (Hartoyo, 2021). While, TEA is a breakthrough concept, accommodating blockchain technology, but there is limited research that discusses this, especially in Indonesia.

Blockchain technology is a decentralized distributed data management technology with data encryption, data chain storage, and distributed consensus mechanisms (Guo et al., 2020). Blockchain technology allows accounting evidence to be synchronized between contractors. Triple entry accounting will take over by providing tertiary objectives that automatically verify transactions for bookkeeping, and this will be fundamental to the accounting industry (Abdennadher *et al.*, 2021). Third-party verifiers themselves may act in their own interests or be the target of cyberattacks (Gröndahl, 2020). Along with the increasing use of automation in the business world, especially recording financial transactions, it will support the implementation of continuous accounting (Kaur and Lodhia, 2018; Losbichler and Lehner, 2021). Continuous accounting is familiar for its real time report recording, a outline for contemporary accounting that entittle accounting and finance division by providing real-time intelligence, enabling accountants to consume time on business strategy analysis, hence becoming proactive leaders instead of reactive operators (Tucker, 2017).

Several previous studies have learned continuous accounting implementation (CAI), including research from Pavlykivska and Marushchak, (n.d); Smith, (2018); Gulin, Hladika and Valenta (2019); Gröndahl (2020); Jasim and Raewf (2020); Abdennadher *et al.*, (2021); Cai (2021); Ibañez *et al.*, (2021) where the research still uses qualitative research paradigms only. Research from quantitative paradigms is important, especially in Indonesia. Indonesia is the world's fourth most populous nation, the world's 10th largest economy in terms of purchasing power parity, and a member of the G-20, also as new industrialized country, and Indonesia's society is embracing technology passionately (The World Bank, 2021).

The intention of green transformational leadership is harmonious with the emergence of the technology applied and the social necessity of green development. This could also be visible as a kind of culturally assisted transformational leadership (Tahgrid, 2018; Zhou *et al.*, 2018; Al Ahmad, 2019). GTL can supply a eco vision that motivate and energize companion to reach environmental objective actively, thereby magnify the entity's eco image and possibly bringing eco opportunities (Zhang, Sun and Xu, 2020). Consequently, GTL can merge the concept of blockchain as one of the innovations that could deliver their green vision to achieve green goals in their companies.

This study observes respondents' perception about continuous accounting implementation (CAI) as an innovation system in Indonesia. Jasim & Raewf (2020) addressed the information technology and innovation contribution to the development of corporate accounting systems, business performance improvements, with help from the emergence of cloud accounting. Samples were selected from the State-Owned Enterprises as innovation is increasing rapidly along with pressure from the government (Zhan and Zhu, 2021). State-Owned Enterprises manages state assets with the aim of national interest. In addition, TEA has the immutability of the blockchain so it can audit itself (Chen, Tsai and Tahnk, 2021). This can reduce audit costs and the risk of corruption.

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LITERATURE REVIEW

Venkatesh *et al.* (2003) formulated the theory of acceptance and use of integrated technology. This theory was developed through review and consolidation of the construction of eight models that previous research has used to explain the behaviour of the use of information systems (derived action theory, technology acceptance model, motivation model, plan behaviour theory, plan behaviour combined theory or technology acceptance models, PC utilization models, innovation diffusion theory and social cognitive theory). The Unified Theory of Acceptance and Use of Technology (UTAUT) is used to explain the application of the triple entry accounting variable (Ibañez et al., 2021). The application of triple entry accounting is still rarely discussed in accounting practice (Bonsón & Bednárová, 2019; Maffei et al., 2021). This concept is a new development for accounting in Indonesia (Hartoyo et al., 2021) and it is expected that triple entry accounting will be accepted in Indonesia, and also in other relevant companies in different countries.

Triple Entry Accounting (TEA) stores transactions through the blockchain (Ibañez *et al.*, 2021). With the increased integration of technology throughout the accounting process, a critical drawback in today's financial reporting process is that data and information is not available in a secure and sustainable way (Momany, Al-Malkawi and Mahdy, 2014). Blockchain technology and other technological tools are positioned to drive innovation and creativity across the profession (Abdennadher *et al.*, 2021). In particular, the implementation and further refinement of blockchain tools will help professionals working in industry and public practice produce and communicate the more comprehensive reporting expected by market users (Smith, 2018).

Accounting systems are created to capture data on actual performance and to communicate results to stakeholders in accorandce with sustainability goals (Kaur and Lodhia, 2018). Managing sustainability goals, especially with regard to environmental protection, is a competitive priority as there is a strong emphasis on integrating environmental protection technologies into manufacturing systems and technologies (Tiwari and Khan, 2020). Based on this understanding on the role of triple entry accounting, the first hypothesis is stated as follows:

H1: Triple entry accounting (TEA) can have a positive influence on continuous accounting implementation (CAI).

GTL could affiliate the concept of eco top management into the business development, which not only escalate the entities social responsibility for eco protection and contributes to sustainable development goals (El Karim Srour, Kheir-El-Din and Samir, 2020; Zhang, Sun and Xu, 2020). The intention of green transformational leadership is in line with the technological development and social needs of green development, so it can also be visible as a kind of culturally underpin transformational leadership (Wang, Zhou and Liu, 2018). So it relates the sustainability actions of the company's overall strategy management, in particular to the accounting department (Lee and Hageman, 2018).

As a reassuring leadership style, GTL could provide a eco vision that inspires and motivates companion to complete environmental objectives actively, thereby leveraging the company's green image and possibly bringing eco opportunities (Wang, Zhou and Liu, 2018). The company identifies which functions should be reorganized into an agile diversity team and which should not. Entities that successfully scale up by being agile can see the supervision of change in their business (Rigby, Sutherland and Noble, 2018). Hence, the second hypothesis is stated as:

H2: Green transformational leadership (GTL) can have a positive influence on continuous accounting implementation (CAI).

Blockchain, with industry 4.0, will create new business opportunities for new models, solution offerings, and new products. Accounting systems are created to capture data on actual performance to communicate results to stakeholders in accorandce with sustainability goals (Kaur and Lodhia, 2018).

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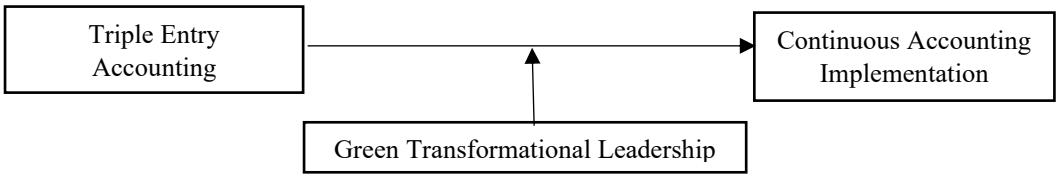
Green transformational leadership is a part of sustainability (Singh *et al.*, 2020). Green transformational leadership is a very complex subject that deals with many variables. Managing sustainability goals is intended to demonstrate the direction of continuous accounting development (Zyznarska-Dworczak, 2020). This is a competitive priority as there is a strong emphasis on integrating environmental protection technologies into manufacturing systems and technologies (Tiwari and Khan, 2020). Transformational leaders can stimulate their employees to develop new ideas, apply their knowledge, and learn new technologies, thus, transformational leadership can create a context of organizational attention and enable an attentive organizing process. Leaders are the drivers of sustainability in organizations (Rizvi and Garg, 2020). Based on the understanding that green transformational leadership is important to support triple entry accounting, the third hypothesis is stated as:

H3: Green transformational leadership (GTL) can play a significant role in the influence of triple entry accounting (TEA) to continuous accounting implementation (CAI).

METHODOLOGY

Quantitative study is implied in this reseach through distributing questionnaires with a Likert scale of 1-6. The employees of the finance and information technology divisions of State-Owned Enterprises (SOE's) in Indonesia is the population in this study. They was selected as respondents as they were considered to have adequate mastery of accounting and technology (Rounaghi, 2019). Sampling techniques were carried out using convenience sampling. The exploration data was composite by allocating questionnaires to SOE's managers in Indonesia using Google Form. The questionnaire distribution was carried out over 14 days starting from 21-3 September 2022 via LinkedIn, chat application and email. 114 questionnaires were obtained. CAI applies measurements from the Corporate Finance Institute (2020). Triple Entry Accounting (TEA) uses measurements from Ibañez et al. (2021). GTL uses assesment from Chen & Chang (2013) and Rizvi & Garg (2020). Meanwhile, the data analysis technique in this study is divided into two, namely (1) descriptive statistical analysis in the form of tables, graphs, median calculations, mean, standard deviation, percentage calculations from respondents, and (2) Partial Least Squares-Structural Equation Modelling (PLS-SEM) using SmartPLS software. The data supporting this study are available upon request from the authors, all of whom contributed to the research.



Picture 1. Conceptual Framework

RESULT AND DISCUSSION

This research seeks to distinguish the influence of TEA on CAI with GTL as the moderating variable. The unit analysis uses Indonesian state-owned enterprises. A State-Owned Enterprise is a corporate company where the state owns all or most of the capital through direct participation derived from separate state assets (Law of the Republic of Indonesia Number 19 of 2003). Table 2 shows the profile of the 114 respondents.

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TABLE 1. Respondent Profile

	Frequency	%		Frequency	%
Gender			*Education*		
Male	57	50%	Bachelor Degree	90	78.9%
Female	57	50%	Master Degree	14	12.3%
Work Experience			Doctoral Degree	10	8.8%
5-10 years	52	45.6%			
11-15 years	27	23.7%	*Department*		
16-20 years	22	19.3%	Finance, Accounting & Tax	69	60.5%
> 20 years	13	11.4%	Information Technology	45	39.5%

Source: Data processed

Table 1 shows there were 57 females and 57 males, which provide an equal number of genders. The respondents' work experience was dominated by the period 5 to 10 years (45.6%), followed by 11-15 years (23.7%), the period 16-20 years (19.3%), and more than 20 years (11.4%). Based on their education level, the most respondents came from the bachelor's degree level with 90 people (78.9%), the master's education level with 14 people (12.3%) and the doctoral education level with 10 people (8.8%). Meanwhile, 69 respondents were from the finance, accounting, and tax departments (60.5%), and 45 from the information technology departments (39.5%).

A factor loading test was performed to investigate the validity of each indicator. The result shows that all question items have a greater outer loadings value of 0.4, hence, it can be concluded that all questions are valid. Composite reliability values for TEA variables (0.833), GTL variables (0.682) and CAI variables (0.653), where the values > 0.5, so it can be concluded that each variable are reliable. Cronbach's alpha values for the TEA variable (0.787), the GTL variable (0.667) and the CAI variable (0.652), are all greater than 0.6, so these variables are also reliable. Meanwhile, the VIF value for each indicator are < 10, indicating that there is limited multicollinearity in the model.

The adjusted value of R-Squared is 60.40%, showing that a high proportion of the variation of CAI can be explained by the independent variables (TEA and GTL).

TABLE 2. Hypothesis Test Results

Variable	**Coefficient**	**T-Statistic**	**P-Values**
TEA → CAI	0.484	3.504	0.000
GTL → CAI	0.353	2.681	0.004
Moderation_GTL → CAI	-0.013	0.295	0.384

Source: Data Processed

Table 2 shows that triple entry accounting has a positive influence on the implementation of continuous accounting, and hence, H1 is accepted and H0 is rejected. TEA has a positive regression coefficient of 0.484, t-statistic of 3,504 and p-values of 0.000. While, GTL has a positive influence on the implementation of continuous accounting, and therefore, H2 is accepted and H0 is rejected. GTL has a positive regression coefficient of 0.353, a t-statistic of 2,681 and a p-values of 0.004, where the p-values are smaller than 0.05. Furthermore, GTL does not play a significant role in moderating the influence of triple entry accounting (TEA) on continuous accounting implementation (CAI). GTL has a negative regression coefficient of -0.013, a t-statistic of 0.295 and a p-value of 0.384.

DISCUSSION

TEA saves transactions in the blockchain, where blockchain technology as a tool is positioned to drive innovation and creativity across the profession. TEA may improve productivity, efficiency, or consumer satisfaction since considerable internal and external changes, such as reorganizing or

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restructuring or employee training (Wedari, Moradi-motlagh and Jubb, 2022). Triple entry accounting is a relatively new innovation for accounting in Indonesia, but there is a need and acceptance about this concept (Hartoyo, Sukoharsono and Prihatiningtyas, 2021). This is in accorandce with the application of the theory of UTAUT. In particular, the implementation of blockchain tools will help accountants working in the industry to produce more comprehensive reporting through the implementation of continuous accounting (Smith, 2018). By using triple entry accounting, the reporting completed by the accountants can be completed by real time in accorandce with the purpose of continuous accounting. The reporting can meet the needs of stakeholders at the right time and faster, rather than if we still use the double entry accounting concept (Cai, 2021; Ibañez *et al.*, 2021).

Triple entry accounting utilizes the blockchain (Cai, 2021). Blockchain comes with the advantages of encryption with cryptography. Hence, security may not be an issue. By using cryptography, transaction history cannot be changed because it is encrypted. This is an accounting innovation that is beneficial for stakeholders (Bonsón and Bednárová, 2019). Moreover, data security in Indonesia is still low. According to data from the National Cyber Security Index, Indonesia's cybersecurity is ranked 6th from the total of 11 countries in Southeast Asia. In addition, globally, Indonesia is ranked 83rd out of 160 countries. NCSI assesses Indonesia as having a score of 38.96 out of 100 in terms of cybersecurity. That figure is well below the scores of neighbouring countries and it demonstrates that data security improvement in Indonesia is crucial. By implementing triple entry accounting, it is, then, expected that data security in Indonesia can be more reliable when following rapid technological changes (Hartoyo, Sukoharsono and Prihatiningtyas, 2021).

The development of technology and information systems creates opportunities for great social change and threatens the existing distribution of power, money, rights, and obligations. By using information systems, it is important to question how ethically and socially responsibilities can be adequately placed through the utilization of information systems (Pereira and Romero, 2017; Holroyd, 2020). The use of information technology does not always have a good impact on humans, where the misuse of the benefits of information technology causes harm to the person who does it, as well as to other people affected by the abuse (Yang *et al.*, 2017). Moreover, there is a high social gap between urban and rural communities in Indonesia where this research was carried out (Hino and Cunha, 2021). Urban accountants tend to better understand and apply technology in every activity, while accountants in rural areas are the opposite. So the relevant authorities need to enhance digital literacy for accountants who are still lagging behind in terms of technology, either in the form of regulations or regular socialization (El-Firjani, Menacere and Pegum, 2014).

Green transformational leadership explicity connects the sustainability actions of entity strategy including in accounting. Leaders will find out the best direction and what they need to reorganize so the company will have a stable position (Tingey-Holyoak, Pisaniello and Buss, 2021). Several disasters have occurred, including the severe COVID-19 outbreaks across the world. This significantly impacted economic performance around the world. Many companies have temporarily stopped operating. In fact, some companies were also forced to terminate their employment relations with their employees. Hence, the leaders need to use the appropriate strategy to achieve the company goals through transformation. The transformation could support the company to be more agile (Tucker, 2017; Rigby, Sutherland and Noble, 2018). The transformation could start with the mindset, vision, ideas, business, digital and others. Nowadays, one of the hype transformations is digital transformation since there is economic turbulence occurring along with rising COVID-19 cases. The company day-to-day operations have shifted from conventional to digitalization. Hence, the digital transformation must be urgently implemented so that the leaders could face the economic turbulence.

Tian, Zhang and Li (2020) state that the rise of digital transformation in the COVID-19 era decreased pollution levels in some areas, especially in business areas. This happened as leaders instructed their subordinates to work from anywhere, not only in the office, to increase working flexibility. To support this, companies digitalized their operations by applying the internet of things, cloud systems, and artificial intelligence (Leitner-Hanetseder *et al.*, 2021; Losbichler and Lehner, 2021; Narvaez Rojas *et al.*, 2021). These activities reduced operational costs for companies so they have a

chance to survive and protect their continuity. The leaders are then prepared to ensure the availability of uninterrupted key business resources necessary to support business activities, in the event of business disruption and to accelerate a return to business as normal. While, another real action by companies was to support the government sustainability programmes, such as net zero carbon.

Based on UTAUT theory, the new technology will bring significant shifting, it brings changes to all business activities including financial impact and managerial decisions. On the other hand, transformation in the accounting department could be done by continuous accounting implementation (Corporate Finance Institute, 2020). Not only that, using technology in accounting practices supports the green vision coming from green activities that are required by the leaders. The results of accepted H2 are interesting, because even though there is no specific regulation that requires leaders to report activities related to sustainability, it seems that middle up managers in Indonesia are aware that GTL is important to support innovations, including improvement of accounting systems.

GTL does not yet play a significant role in moderating the influence of triple entry accounting (TEA) on continuous accounting implementation (CAI) in Indonesia. Transformational leaders (without a green or sustainability approach) can still stimulate their employees to develop new ideas, apply their knowledge, and learn new technologies, thus, transformational leadership can create a context of organizational attention and enable an attentive organizing process (Longshore and Bass, 1987; Chen, Chang and Lin, 2014; Tahgrid, Abdallah and Janini, 2018; Zhou *et al.*, 2018). However, the role of green transformational leadership (GTL) is more advanced than transformational leadership. GTL is more focussed on how the leader thinks about how the act of sustainability they can implement in their company will achieve the company goals (Zhang, 2020).

A lack of understanding about the green or sustainability approach for the Indonesian leadership may become a main concern (Kasoa, 2020). Despite the fact that Indonesia has the largest digital economy in Southeast Asia with a value of US$ 40 billion, which is expected to reach US$ 133 billion by 2025, Indonesian leaders still focus on applying digital transformation rather than green transformational leadership (Bahagijo *et al.*, 2022). It seems that Indonesian leaders are still in a transition stage of understanding leadership based on a green vision, even though they know that GTL is essential to support a transformational accounting system.

Currently, Indonesia is becoming increasingly willing to achieve its digital ambitions. Based on Research on the Digital Agility Index 2020 from Workday, as many as 96 percent of company leaders in Indonesia place digital transformation as one of their priorities. Indonesia has enormous potential in the digital economy sector, where its development is increasingly (Devi, Warasniasih and Masdiantini, 2020). Having seen this phenomenon, it could be assumed that the greater implementation of GTL in Indonesia is only a matter of time: whether in a near or longer time may depend on the Government's support and pressure (Martinez, 2014).

A number of state-owned companies have adapted and implemented digital transformation in the industrial era 4.0 in their respective core businesses and services (Zhan and Zhu, 2021). To date, as many as 29 SOEs are considered to have implemented digital transformation in their operations (Aman, 2019). There are five main pillars in accelerating the transformation of SOEs, including creating economic value and social value for society; business model innovation; technology utilization; investment; and human resource development. Digital transformation is still on-going and growing. However, once again, in the near future, GTL is absolutely needed since changing the mindset from business as usual to sustainability business is significant for leaders to gain a global competitive advantage (Braendle *et al.*, 2020).

The results of this study show that triple entry accounting (TEA) influences continuous accounting implementation (CAI). This result is in accorandce with The Unified Theory of Acceptance and Use of Technology (UTAUT). One of the models in UTAUT is innovation diffusion built from TEA. TEA is combination of double entry accounting along with blockchain, and this manifest innovation diffusion. Hence, the position of GTL which influences CAI, may indicate that UTAUT is applicable to explain the significant support of GTL to technology innovation.

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CONCLUSION

The originality of this paper is putting together the triple entry accounting (TEA) with continuous accounting implementation (CAI), and examining the role of green transformational leadership towards TEA and CAI. The findings indicate a significant positive relationship between triple entry accounting and continuous accounting implementation. We also found a significant positive relationship between green transformational leadership and continuous accounting implementation. However, we did not find a significant influence of green transformational leadership on moderating TEA to CAI.

Throughout this paper, several insights have been provided. The study clarifies that by developing blockchain in accounting through triple entry accounting could increase continuous accounting implementation. Besides, leaders with a strong passion for green transformation in their companies could improve continuous accounting implementation. Thus, if the employees have good information about blockchain and there is motivation from the leaders to carry out transformational activities in the companies, then they may achieve continuous accounting.

This study provides significant contributions. The results suggest that triple entry accounting may diffuse continuous accounting in accountants work by developing blockchain in recording transactions. Accountants should be made aware of the blockchain system's importance, and the urgent need to implement it in accounting. Developing blockchain in accounting systems will reduce the complexity of the accountant's work. The accountants could then be more focused on the strategy of how companies could attain a stable position. Second, transformational leadership style has featured strongly in studies of environmental leaders. This study reinforces the importance of adopting green transformational leadership for improving the continuous accounting implementation. As Indonesian State-Owned Enterprises still have no regulations that force them to think about sustainability, and leaders are thus motivated only by their personal desire to support sustainable development goals. In this case, the government needs to support and provide guiandce for Indonesia State-Owned Enterprises so they understand the importance of sustainability leaders position to support development goals and transformation.

Furthermore, in line with the rise in cryptocurrency transactions in Indonesia, the accountants need more space to record transactions related to cryptocurrency, and TEA is an appropriate way to handle this type of transaction. However, one important challenge is the need to pay attention to data security. In many cases, this issue is becoming a trend, particularly in data breaches. TEA has blockchain technology that is more secure through the application of data encryption, data chain storage, and distributed ledger, so TEA may improve data security, especially in accounting systems. This system should also be evaluated using proper standards, perhaps by achieving ISO 27000. Finally, given the results of this study, organizations can decide where to dedicate their resources for greater positive technology in accounting. Furthermore, it will be of great benefit if there is cooperation between Blockchain and Accountancy Associations in Indonesia to develop software for implementing triple entry accounting in Indonesia.

This study is a step forward to providing insight into how technology affects accounting global practices. Due to the increasing and numerous problems in digital transformation, there is an urgent need for conducting further studies. However, this study is not without limitations. First, among our suggestions for future research is the model generalization test and the results of this research. In addition to differences within respondent perception about technology, not all of the respondents have a good knowledge and understanding of modern technology, and they might not understand what a blockchain is. Such differences may enhance or hinder continuous accounting implementation. Second, another limitation of this study is the fact that it relies on a mix of respondents from finance and IT divisions and therefore, data bias becomes questionable due to the knowledge inequality about accounting and technology. However, this approach to data collection has been utilized in many types of research. Finally, future research could apply a mixed method approach to obtain a better comprehensive analysis.

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