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From Blockchain to Accounting Profession: Evidence from Indonesia

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Abstract: Blockchain technology has become a world discussion due to its excellence in security, increasing trust, and real-time information availability. Also, it is strongly believed to promote excellent improvements in the accounting sphere. Blockchain would undertake the accounting profession's roles. The potential impact of Blockchain on accounting like reduced fraud, reduced auditing, improved regulatory compliance, easier reconciliation, and improved efficiency. However, there is a concern about will the accountants lose their job. For that reason, the study aims to analyze accountants' perspectives of blockchain on the impact on the accounting profession in Indonesia. This study's novel work is to build a positive perspective of implementing Blockchain, particularly Indonesia accountants, even though it will significantly affect the profession. The research method of this study is a qualitative exploratory study. The data collection was derived from in-depth interviews of four Indonesian top layer accountants. As a result, this study finds that the initial perception that accountants will lose their job of the presence of Blockchain is not true. The responsibilities of accountants will not change dramatically. Moreover, this study's findings will be divided into three (3) themes; understanding the blockchain, obstacles on the blockchain, and investment in blockchain. Eventually, the business still needs qualified accountants to interpret and categorize the information resulting from Blockchain. Therefore, blockchain's impact on the accounting profession will provide transparency, efficiency, and record permanency.

Keywords: blockchain, accounting, profession, Indonesia.

从区块链到会计职业：来自印度尼西亚的证据

摘要：区块链技术由于其卓越的安全性，增加的信任度和实时信息可用性而成为世界性的讨论。此外，我们坚信可以促进会计领域的卓越改进。区块链将承担会计行业的角色。区块链对会计的潜在影响，例如减少欺诈，减少审计，改善法规遵从性，更容易对账和提高效率。但是，人们担心会计师会失业。因此，本研究旨在分析会计师对区块链对印度尼西亚会计行业的影响的观点。这项研究的新颖工作是为实施区块链，尤其是印尼会计师，树立积极的观点，尽管这将极大地影响该行业。本研究的研究方法是定性的探索性研究。数据收集来自对四名印度尼西亚顶层会计师的深入采访。结果，这项研究发现，最初的会计认为会计师将因区块链的存在而失去工作的想法是不正确的。会计师的职责不会发生重大变化。此外，本研究的发现将分为三（3）个主题；第二个主题为：了解区块链，区块链上的障碍以及对区块链的投资。最终，企业仍然需要合格的会计师来对区块链产生的信息进行解释和分类。因此，区块链对会计行业的影响将提供透明度，效率和记录永久性。

关键词：区块链，会计，专业，印度尼西亚。

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1. Introduction

Digital technology has been highly improved in Industry 4.0 era. This has brought giant strides towards transformational effects on both systems and processes in escalating added benefit transfers to business stakeholders. However, it has already demonstrated potential gigantic criticism of value demolition and exceeded innovative value creations. One of the most innovative technologies that are sounded in Industry 4.0 is blockchain. Substantially, blockchain is a decentralized database that is persistent and transparent. This also maintains a record of financial transactions and assures data from any adjustments [7], [15], [32]. Once a business transaction is executed, it is practically immutable [22]. Moreover, blockchain manages a procedure to share business transactions, databases, and (smart) contracts among related parties. It also develops a forum to deliver assets automatically based on peer-to-peer transactions without a middleman (i.e., bank). Thus, the blockchain can record transactions between agreed participants efficiently, sustainably, and permanently [15].

[2] state that the emerging technologies (i.e., database) would undertake accountants' roles, and technological inventions are expected to reduce business dependence on accountants in many cases. Simultaneously, it is believed that business function (i.e., accounting) where the accountant's duties will be increased fully automatically by technological infrastructures [9]. However, many senior accountants in large companies reach a consensus that accountants' necessity will not absent rapidly [1]. However, the qualifications needed by accountants are expected to evolve, and there could be less demand for accountants with fewer experiences soon [17]. Accountants, and similar to other professions, can experience disruption technology. However, [21] states that little researches were conducted on the impact of technological change on accounting. Simultaneously, intelligent automation will end the status enjoyed by professionals such as accountants [26]. Emerging technologies can also disrupt accounting academics, both in terms of studies, for example, being a stimulus for new research methods [19] and in terms of the delivering accounting curriculum [23]. Therefore it is very important that accountants are involved and connected actively with various emerging technologies [12].

[18] has predicted that blockchain technology as one of the emerging technology will completely change the accounting profession in the next decade. The predetermined entities can incorporate these transactions into financial statements in real time with the scenario with private entry to the blockchain containing business transactions [32]. As a result,

auditors' need will decrease to ensure the accountability of the transactions. Blockchain technology is set to change the accounting profession through the automation validation of financial statements [7]. Blockchain technology has the ability to transform the position of accountants. More importantly, it illustrates the improved degree of trustworthiness of accounting transactions under the blockchain framework. It can be designed to verify any transaction and detect suspicious trends, checked manually [10].

Blockchain characteristics that have been beneficial to accounting often include real-time accounting [32], triple-entry accounting [4], [11] and lower risk of business fraud [8], lower accountability costs, and greater compliance [28]. The proposed business model of blockchain-accounting lies in smart contracts [27]. The blockchain embedded with smart contracts can be employed safely to store accounting records, immediately exchange sensitive information with customers, and improve company data's verifiability [7]. Smart contracts also play a central role in speeding the recording process by automatically changing account records and monitoring supply chains by real-time analysis. Besides, technology removes the need to report taxes retrospectively, creating an electronic infrastructure impregnable to multiple tax fraud forms [16].

Furthermore, how far the Blockchain effect on the accounting profession, especially in Indonesia, is its infancy state. A little related work has been done on this topic. One of the most recent studies shows that Indonesian millennial accountants have to align ethical values of adopting Blockchain 4.0 to avoid ethical dilemmas [13]. While Ikatan Akuntan Indonesia (the Indonesian Accountant Association) through Prakarsa 6.1 mentions that Indonesian accountants have to take advantage of new smart technology (i.e., Blockchain) in order to create new opportunities and encourage boundaries of authority activities [14]. Again, considering the phenomenal blockchain, accountants in Indonesia need to analyze how far blockchain will replace their roles. Then, it raises an important question. Will Indonesian accountants lose their jobs? In fact, whenever a new technology arrives, there is anxiety about its risks to job-holders who are affected by it. Consider, for example, the diminishing position of investment brokers. Now that individual customers have access to all of the data, they need to make investment decisions. Although blockchain would definitely disrupt the accounting ecosystem, the presumption of accountants' duties will largely remain unchanged. By implementing blockchain technology, accounting firms will provide their clients the confidentiality and security of all business records that auditors can access [31]. Therefore, this research aims

to analyze Indonesian accountants' perspectives of blockchain on the impact on the accounting profession. This research's originality for Indonesian accountants is building a positive perspective in adopting blockchain, although later, this technology may somehow challenge their profession.

2. Research Method

This research seeks to understand Indonesian accountants' perceptions of the impact of blockchain on their profession. Since there is little research being discussed in terms of Indonesian accountants' perspectives of blockchain. Therefore, it is a qualitative exploratory study that is appropriate given that these sites' popularity is a relatively new phenomenon, especially in Indonesia [24]. The main purpose of exploratory research is to understand a topic better, and it is an appropriate way to provide the groundwork for later rigorous studies later [24]. In short, an exploratory study is important for obtaining a good grasp of the phenomenon of interest.

A semi-structured interview was conducted to collect data. This technique could be well suited for exploring the respondents' perceptions and opinions, and it required more knowledge and clarification of the responses [3]. Since the Blockchain concept and its effect on accounting are practically new in Indonesia, obtaining information through open-ended questions may allow interviewees to come up with their own opinions, thoughts, and reasonings. The research questions were modified from interview questions of [25]. To ensure maximum diversity and coverage, this study performed four interviews with top layer accountants with differing degrees of blockchain expertise that labeled with code: AC1, AC2 AC3, and AC4. The form of the interview was conducted in a single form: online communication. The interview results were recorded, which will continue to be analyzed. The interviews were conducted with three perception issues that are; (1). Understanding the Blockchain, (2). Problems on Blockchain, and (3). Investment in Blockchain.

Besides, interview transcripts were analyzed using the open-coding methodology [6]. Related passages were defined, and axial coding was subsequently used to simplify the categories in question. The analysis was carried out carefully in order to satisfy the common criteria for qualitative studies. The interpretation process was conducted and resulting in various themes. In particular, this study triangulated the data by interviewing people from diverse perspectives and understanding the phenomenon. Consequently, the findings might be assumed to be reliable and valid.

3. Results and Discussion

This segment provides findings as to the results of data collection and analysis. The analysis of the study is resulting in three major sub-sections. The first

concerns the nature concept of blockchain relating to the accounting function. The second discusses the challenges of implementing or starting blockchain. While the third explains the evaluation of blockchain whether it is a worthwhile investment for the company.

3.1. Understanding the Blockchain: Only a Matter of Technology

In the Blockchain concept, most interviewees demonstrated nearly equal degrees of Blockchain utilization in accounting features. They agreed that accounting somewhat would change significantly of the presence of blockchain. The subsection's key themes are related to the degree of blockchain integration and the importance of blockchain quality.

According to one of the informants (AC1), Blockchain is only a medium of technology that he believed will affect the accounting functions in many ways. He was convinced that the audit procedures should or must conform to such technology. Blockchain proved very accountable in its chain network and its usage in accounting and auditing functions [5]. Blockchain deals with transferring ownership of assets and maintaining a ledger of accurate financial information [7]. Adopting the accounting roles' potential quality can be improved by reducing the expense of managing and reconciling ledgers. It also empowers accountants to guarantee that an asset remains with proven validity.

While, the other informant (AC3) said that *"If only they (accountants and auditors) know that Blockchain will improve the quality of the business since it offers numerous (high) excellences in both accounting and auditing functions like reduction in frauds, traceable audit trails, reducing time and cost of audit services"*. This perception has been supported by [32] that accounting places too much confidence in the integrity of accountants and auditors, who in turn may be and often vulnerable to unethical behavior. To validate accounting records, GAAP advises auditors to obtain sufficient and appropriate evidence to support the integrity of written events, which unsurprisingly results in massive auditing costs [10].

Evidence has shown that blockchain innovation particularly affected the accounting sphere. The idea of blockchain is well-tailored to enhancing the quality of accountants' and auditors' jobs, but the blockchain is a matter of tool to support their works. With so many opportunities offered by blockchain, accountants and auditors should make the most of it in their works.

3.2. Problems on Blockchain: A Job Killer (?)

This segment focuses on analyzing the informants' obstacle perspectives when they incorporate blockchain in their business. The most common keywords that the informants mentioned in recognizing barriers when starting blockchain were 'costly' and followed by 'a job threatening'. Therefore, we outlined and divided these

principles into two categories: organizations' difficulties in meeting their start-up on blockchain adoption and the organization's commitment to using Blockchain.

The first and major problem that the informant concerned with was the high cost of implementation. *"I do not know for sure, but the investment of Blockchain technology is extremely high. Thus I am not sure that any companies in Indonesia will agree to utilize it"* (AC2). There are also a few technical hurdles to address the widespread implementation of blockchain. In order to sustain the network through the mining process, the consumption of high energy is required. It is projected that the bitcoin network's operation requires over \$ 15 million worth of energy [27]. However, the high amount of shared ledger and automation costs would be a trade-off compared to the expenses already accrued due to human error and labor costs [29].

The second challenge is that there is a sense of job displacement as the blockchain is completely implemented in the business. One informant (AC4) said that people tend to refuse new technology. He assumed that both accountants and auditors are concern that this new thing would adversely impact their jobs. Also, he is convinced that the professions are also in prejudice. A broad issue emerges from the fact that blockchain is a potential "job killer". Blockchain accounting ecosystems are developed to eliminate the incriminated functions of bookkeeping and manual validation of transactions [10]. This results in the complete work automation that was recently performed by billions of accounting clerks. Blockchain not only challenges the life of accountants and auditors, but it also has the ability to undermine other markets and to simplify those activities that have historically demanded a large workforce. With the outsourcing of so many functions, there is the ability of the blockchain to phase out millions of workers that were once considered to be important to the industry.

In addition to threatening the professions of accountants and auditors, blockchain will give these careers great new opportunities. Blockchain is going to transform the approach to carrying out the works. With advances in accounting and auditing in automation and data processing, blockchain technologies could also have the considerable potential [30]. Besides, accounting organizations and auditors such as CPA may continue to develop their expertise and experience to satisfy the projected requests of the world of business as blockchain technology is more commonly used. To support that, there are two implications for the accounting profession in Indonesia of implementing information technology (i.e., blockchain, IoT, Cloud, and big data) as mentioned in Prakarsa 6.1 [14] are (1). Professional accountants must maintain their relevance, improve their competence to help clients facing the pace of innovation changes (2). A computer and

artificial intelligence will replace the repetitive and analytical nature of the accountants' technical function. In short, like other technology information development, the accounting profession should engage it eventually.

3.3. Investment in Blockchain: Worthiness

In the last section, it will discuss the thoughts of the future opportunities given by Blockchain. 'Provide extreme security' and 'ability to verify information instantly' were the essential reasons for investing in Blockchain. *"With the presence of blockchain, it is obvious that data breaches will not be possible"*, said the informant (AC3). A similar statement was also mentioned by another informant (AC1) that said the distributed database systems such as blockchain would result in completely transparent data to entities within the network. It helps users to control the whole process of their transactions more transparently. Consequently, once the data is stored, it becomes impossible to remove yet to be tempered. Typically, transferring values between two parties generally requires a centralized transaction processor such as a bank. This centralized processor maintains its ledger, and the transaction party relies on this processor to execute transactions accurately and securely. To provide this service, the transaction processor receives a fee. Conversely, blockchain allows individuals to settle directly with each other through a single shared ledger, thereby removing the need for a centralized transaction processor [20]. On the contrary, the other informant (AC2) argued that when a transaction is uploaded in a blockchain ledger, it is not only updated in real-time, but the transaction is closed automatically upon completion. The outcome is in easier reconciliations. The strength of blockchain is providing benefits such as speed and scalability over a proof of stake. Blockchain operates by processing around a few thousand transactions per second [17]. Based on those excellent blockchain features, it is necessary to invest and immediate adoption in many major functions in Indonesia.

4. Conclusion and Recommendation

In general, this study explored the multilevel perspectives of participants on the blockchain. This revealed various perspectives between informants concerning the blockchain towards accounting functions. It can be concluded that the perception of accountants to blockchain technology is that blockchain is valuable aids in their works. Nevertheless, there remains a slight concern if the blockchain can replace its function in the business. Also, they are aware of the high investment costs in the blockchain. However, they recognize the advantages of the blockchain, which is a highly secure technology and transaction speed availability. In short, the accountants' roles will change, but they will not be

eliminated. Clearly, blockchain's implication in the accounting profession depends on organizational problems in need of solutions and how these problems could be solved by blockchain. This study's limitation is only one major function was examined, while blockchain technology will also affect other functions (i.e., management accounting, taxes, government, supply chain management, and entrepreneurship). For future research, it could be designed and executed for more systematic and extensive study. The research method could be expanded to a quantitative method in order to obtain a larger explanation.

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