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The Convergence of 5.0 and Forensic Accounting: Leveraging Blockchains for Effective Corruption Prevention in Indonesia

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ABSTRACT
This research aims to investigate the great potential of blockchain technology as a prevention tool effective corruption in Indonesia by combining blockchain technology and forensic accounting practices. This research will involve in-depth literature analysis to explore understanding of the basic concepts of blockchain and how this technology can be used in forensic accounting practice for prevention corruption. The results of this study are expected can provide deep insight into how blockchain technology can be used as a preventative tool effective corruption in Indonesia. We plan to produce a model that can provide guidance practical for government agencies, organizations, and accounting practitioners in adopting and implementing blockchain in an effort prevention corruption. This research will provide a foundation theoretical and practical use of blockchain as a preventative tool potential corruption in Indonesia.

Keyword: Blockchain, Corruption, Anti-Corruption

1. INTRODUCTION

The development of technology is now increasing rapidly and the world is currently shifting to the era of Society 5.0 which is characterized by integration and collaboration between technology and humans. This era brought significant changes in ways we live, work, and interact so as to generate new opportunities and threats, including acts of crime, one of which is corruption (Cacciagrano et al., 2021).

At present, corruption is a very complex global issue, even becoming a topic of many kinds studied in the social sciences. In Indonesia, efforts to prevent Effective corruption is becoming increasingly important as countries aspire to build good and sustainable governance. According to a survey conducted by Transparency.org, corruption cases in Indonesia will rank 96th out of 180 countries in 2022 (Transparency.org, 2023). This proves that the problem of corruption in Indonesia is an issue which must be addressed immediately.

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The existence of 5.0 technology makes it easy perpetrator crime carry out every action, including acts of corruption that have the possibility to be facilitated thanks to the latest technology. Therefore, it is necessary to change policies and government work patterns so that they always keep abreast of the times so that crimes that utilize renewable technology can prevented, including corruption (Aarvic, 2020).

Forensic accounting practices have an important role in uncovering acts of corruption, ensuring the integrity of financial reports, and providing accurate reports to the authorities. However, in the era of Society 5.0, where high connectivity and extensive data exchange are not impossible, the challenges faced by forensic accounting practitioners are increasingly complex (Cacciagrano et al., 2021).

One of the emerging and promising technologies in the effort prevention corruption is blockchain. This technology, which underlies cryptocurrencies like Bitcoin, offer high security, transparency, and data reliability. In the context of prevention corruption, blockchain can facilitate the recording of irreversible transactions and reduce the risk of data manipulation. Through the integration of blockchain technology with forensic accounting practices, it can built a system that can increase transparency, accountability, and effectiveness in preventing corruption in Indonesia.

This study aims to explore convergence between technology 5.0 and forensic accounting practices in prevention corruption in Indonesia by utilizing blockchain technology. We will conduct an in-depth analysis of the literature to understand the potential and challenges of using blockchain in forensic and preventive accounting practices corruption in the era of Society 5.0. In addition, we will also designing a model or framework that describes how a blockchain can be applied effectively in the effort prevention corruption in Indonesia.

With a deeper understanding of the potential and challenges of using blockchain in forensic accounting practices in the Society 5.0 era, it is hoped that this research can contribute to the development of strategies and policies prevention innovative and effective corruption in Indonesia.

2. LITERATURE REVIEW AND HYPOTHESIS

Blockchain technology promises innovative solutions in overcoming corruption cases in Indonesia. Blockchain is a technology that allows recording of transactions in the form of encrypted and connected blocks in a manner chronological. Uniqueness the main point of the blockchain lies in its decentralized and immutable nature, so that data recorded on the blockchain becomes more transparent, secure, and resistant to manipulation. In the context of prevention corruption, blockchain can used to support a more reliable and efficient financial system, minimizing risk manipulation of financial data, as well as increasing accountability in the management of public and private funds (Aggarwal & Floridi, 2018).

In the government system in Indonesia, blockchain technology can adopted to record and verify financial transactions, including public budgets, social assistance, and development projects. With the adoption of blockchain in the management of public finances, information regarding the disbursement of funds can be accessed in a manner transparent by the public and the authorities. This can help prevent corruption and misuse of public funds, while increasing public trust in government (Abodei et al., 2019).

Apart from that, blockchain can also used in forensic accounting systems to detect and investigate cases of corruption and fraud in the private sector. The use of blockchain in recording business transactions can enable more accurate audits and can be held accountable. record Transaction traces recorded in

the blockchain can be strong evidence in uncovering acts of corruption or fraud in business processes (Abodei et al., 2019).

Even though it has great potential in overcoming corruption and fraud cases, the adoption of blockchain technology in Indonesia still faces several challenges, including the readiness of technological infrastructure, regulations that are not yet fully supportive, and understanding society about this technology. Therefore, collaboration between governments, institutions supervisors, and the private sector are key in encouraging application of blockchain technology extensive and effective in effort prevention and control corruption as well as anti-fraud in Indonesia.

3. METHODS

This research methodology is designed to develop a blockchain model that can address corruption cases in Indonesia and support forensic accounting in its efforts prevention and control of acts of corruption. The following are the steps to be taken in this research:

a. Literature Study: The first step is to do a literature study in-depth about blockchain technology, implementation of blockchain in prevention corruption, and the role of forensic accounting in uncovering acts of corruption. Literature study will provide a solid understanding of blockchain concepts and applications as well as up-to-date information on the use of this technology in corruption cases in Indonesia.
b. Blockchain Model Design: After identifying the case study, the next step is to design a blockchain model that can address corruption in the case. Model design will covers data structures, mechanisms consensus, and desired transaction flow to record and verify information related to financial transactions and fund management.

Through this methodology, it is hoped that this research will make a significant contribution to the development of an effective and innovative blockchain model in dealing with corruption cases in Indonesia and help strengthen the role of forensic accounting in preventing and overcoming acts of corruption.

3. RESULTS AND DISCUSSION

How Blockchain technology works

An innovative digital system designed to record and verify transactions online safe and transparent. In contrast to traditional databases that are controlled by a single central party, blockchain uses a distributed network where multiple computers or "nodes" participate in the process of verifying transactions. Each transaction that occurs is included in the connected blocks in a manner chronological, forming chain or "chain" these blocks (Davis et al., 2021).

Decentralized nature is a thing fundamental to how the blockchain works. Every node in the network has a complete copy of all transactions that have ever occurred, and each block of transactions must be approved by a majority of nodes before being added to the chain. This means nothing authority single can control or modify recorded transactions. On the other hand, the data in the blockchain becomes highly secure and immutable, as every block is contains references to previous blocks, making it difficult to manipulate or tamper with existing data (García, 2021).

Apart from security, transparency is also a key feature of blockchain technology. Every transaction recorded in the blockchain is visible to all parties participating in the network. This means that everyone can independently verify transactions, eliminating the need for trust authority central. As a result, blockchains are often described as "open ledgers" that can accessed and verified by anyone (Aarvik, 2020).

Implementation of Blockchain technology are crypto payment systems, including in digital currencies such as Bitcoin and Ethereum. However, its potential extends to a wide range of other areas as well, such as logistics, health, digital identity and

prevention corruption. In the context of prevention corruption, blockchain can used to ensure transparency and accountability in the management of public and private funds, help uncover acts of corruption, and increase public trust in institutions and organizations (Figure 1).

Overall, blockchain technology offers an innovative and secure way to record, verify, and secure transactions and information. With the potential to overcome challenges corruption and fraud, these technologies are becoming increasingly attractive and relevant in building a more transparent and fair system for society in a manner whole.

The Blockchain Model For Governance

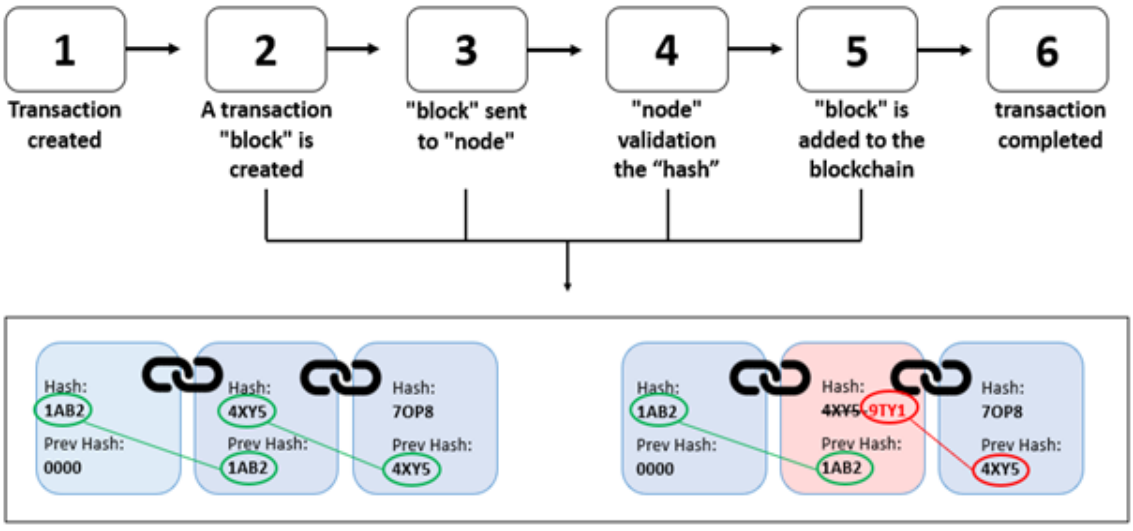
Blockchain adoption in the sector government as a coping tool corruption is a necessary initiative understanding deep and well-thought-out strategy. The first stage in this initiative is the determination of the government's specific goals and needs. For example, knowing the area or aspect which government most needs the transparency and reliability that blockchain offers. It can be management public records, monitoring government financial transactions, or controlling the process of procuring goods and services (Azmi & Nugroho, 2023).

Once the government's goals and needs are determined, the government should evaluate the various existing blockchain platforms and technologies, taking into account their performance, security, and ability to meet the stated needs and goals. This evaluation will provide a clear picture of what this technology can and cannot do.

Next, the government needs to build the necessary infrastructure to run the blockchain. It covers build and manage a network of computers (or nodes) that will running the blockchain, as well install and configure required software. The key aspect of this phase is ensuring that the infrastructure is built secure, reliable, and capable of handling expected volumes of data and transactions.

Once the infrastructure is ready, blockchain operations can starting with recording data and carrying out transactions on the blockchain. During this stage, the government needs to ensure that all operations run smoothly and data is recorded accurate and safe. All of these initiatives must be within the applicable legal and regulatory framework. The use of blockchain in the public sector must comply with all relevant laws and regulations, whether related to technology, data or corruption .

Figure 1. **How Blockchain Works**



Source : Data Processed

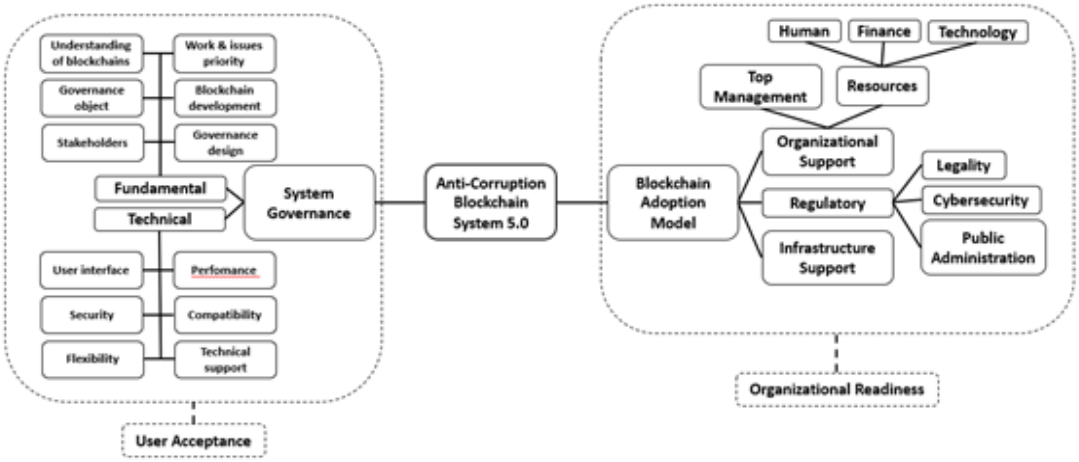
Therefore, researchers created a model for using blockchain technology for governance in overcoming potential corruption in Indonesia. Researcher refer from study literature as well as complementing the blockchain adoption model carried out by Azmi & Nugroho (2023). Azmi & Nugroho (2023) made a conception of the 4.0 anti- corruption system model that researchers feel is still lacking and there is a need for an evaluation of the concept of an anti-corruption system model. In addition, we have entered the 5.0 era, which of course really needs collaboration between humans and technology. According to researchers, although Azmi & Nugroho (2023) applies the TOE (Technology, Organization, and Environment) model, the Azmi & Nugroho's (2023) conception model does not discuss application the overall model of the anti-corruption system in government, but only describes it fundamentally the Organization part of the TOE model concept.

Thus, the researcher proposes thoughts regarding the concept of a new anti-corruption system model, namely the researcher's blockchain 5.0 anti-corruption system develop following the TOE model and combine them into one framework unit. The thought in question can be seen in Figure 2.

The researcher's anti-corruption system 5.0 has two elements, namely a blockchain adoption model and a governance system government. The blockchain adoption model consists from Organizational Support, Regulatory, and Infrastructure Support. Support the organization must be supported by good Top Management and Resources which include human resources, financial resources, and access to technology itself. If the blockchain adoption model has been fulfilled, it can be said that the government agency is ready to implement the blockchain system.

Likewise System Governance on the blockchain 5.0 anti-corruption system which must meet fundamental and technical elements. In System Governance, this is done so that all people involved in government agencies are able to adopt the blockchain system itself. That is, if the blockchain 5.0 anti-corruption system is implemented but has low User Acceptance, there is potential for corruption will be even greater by holding a manufacturing work program blockchain infrastructure. Therefore, before implementing block-chain technology, it is ensured especially Previously, the government had fulfilled Organizational Readiness and User Acceptance. This is expensive but can be paid tackling corruption cases more effectively and efficiently.

Figure 2. **Anti-Corruption Blockchain System 5.0**



Source : Data Processed

Finally, the government must be prepared to face and overcome various obstacles and challenges that may arise, whether related to technology, regulations, or acceptance by users and other interested parties. With good preparation and strong cooperation between all parties involved, the adoption of blockchain in the sector government for countermeasures corruption can be a successful initiative and generate significant benefits.

4. RESULTS AND DISCUSSION

Implementation of the Blockchain 5.0 Anti-Corruption System

The government's adoption of a blockchain-based anti- corruption system 5.0 marks a revolution in the field of transparency and public accountability. This process begins with identification specific area of government that can benefit from the advantages of blockchain, which can covers management public records, supervision of government financial transactions, or control of the process of procuring goods and services.

In the technology evaluation stage, governments study the various available blockchain platforms and technologies, focusing on their performance, security, and ability to meet predetermined needs and goals. At this stage, the government gains important insights into the potential and limitations of this technology.

Building the necessary infrastructure to run the blockchain is the next step in this initiative. It covers construction and management of computer networks (or nodes) running blockchains, as well as installation and configuration required software. This stage aims to ensure that the infrastructure being built is reliable, secure, and capable of handling the expected volume of data and transactions.

Once the infrastructure is ready, blockchain operations can started. The government then records data and performs transactions on the blockchain, ensuring that all operations run smoothly and data is recorded accurate and safe .

All of these initiatives must be carried out within the applicable legal and regulatory framework. In this context, use of blockchain by the public sector must comply with all relevant laws and regulations, whether related to technology, data or corruption.

SWOT Analysis for Blockchain 5.0 Anti-Corruption System

SWOT analysis for the Blockchain 5.0 Anti-Corruption System is the same as for other systems, a SWOT analysis is needed to detect what is needed and needs to be prepared to implement the system. Based on this, we describe our SWOT analysis which can be a consideration for implementing this renewable technology.

Strengths

High Transparency

Blockchain, by its very nature, allows all transactions to be recorded and stored in a chain of interlinked blocks. Each new block contains a trace of the previous block, creating a digital footprint that cannot be changed without changing all previous blocks, which is almost impossible to do without being noticed. In a government context, this means that every financial transaction, resource transfer, or important decision can be clearly tracked. Additionally, most blockchains are public or at least semi-public, allowing interested parties, such as private citizens, to verify transactions without having to rely on third parties. This can significantly reduce the potential for acts of corruption because such acts will be easily detected.

Data Efficiency and Security

Compared to traditional systems that may be vulnerable to hacker attacks, human error, or internal manipulation, blockchain offers much better security. Its decentralized structure means that there is no single point of failure; to change the data, one would have to change the majority of blockchain copies existing across the network, which is practically very difficult to do. Additionally, transactions

on blockchain are usually faster and more efficient, especially when dealing with cross-border or cross-institution systems. In a government context, this means that distribution of resources, management of funds, and other decisions can be made more quickly and securely, minimizing the potential for error or abuse.

Corruption Detection and Prevention

With every transaction or decision recorded on the blockchain, there is a clear digital footprint of who was involved, when it happened, and what exactly happened. This creates an environment where acts of corruption are difficult to commit without leaving clear traces. Watchdog organizations, auditors, and even the public can utilize this data to monitor government activities and ensure that all actions comply with applicable laws and policies. If there are suspicious or inappropriate actions, they can be easily detected and investigated further, which can ultimately prevent corruption or at least ensure that the perpetrators are caught and prosecuted.

These three strengths show how blockchain has the potential to revolutionize the government sector, especially when it comes to fighting corruption. By leveraging the benefits of this technology, governments have the opportunity to build trust with their citizens and increase their efficiency and accountability.

Weaknesses

High Initial Investment

Implementing blockchain technology in the government sector requires significant initial investment. The technological infrastructure required to run and support a blockchain system is sophisticated and expensive. In addition to hardware and software, there are costs associated with training personnel to manage and maintain these systems. Additionally, initial implementation requires resources to migrate data from the legacy system to the new blockchain system, as well as to integrate with other systems that may already be in place. In the context of often limited government budgets, allocating large funds for such projects can be a challenge.

Privacy and Security Issues

Although blockchain is known for its secure nature, there are privacy challenges to face. Most blockchains are transparent, meaning transactions can be seen by anyone. In a government context, this can raise privacy issues for individuals or organizations involved in the transaction. Additionally, while the blockchain itself may be secure from change, it can still be vulnerable to attacks such as a "51% attack" or other issues such as problems at access points (such as exchanges or digital wallets) that may be less secure.

Lack of Understanding

Blockchain is a relatively new and complex concept for many people. While there are many resources and training available, there is a steep learning curve for those new to this technology. In a government context, this means that there are challenges in training staff and other stakeholders to understand, adopt and utilize these technologies effectively. Additionally, the general public may also have misunderstandings or ignorance about how blockchain systems work, which can lead to distrust or confusion.

Identifying and understanding these weaknesses is a critical step in designing effective blockchain solutions for government. By understanding these potential obstacles, interested parties can plan and allocate resources appropriately to overcome these challenges and ensure successful blockchain implementation.

Opportunities

Education and Training

As the need to understand and adopt blockchain increases, there is a great opportunity to introduce training and education programs specifically designed for government employees and other stakeholders. This education can take the form of seminars, workshops, or in-depth online courses, allowing participants to understand this technology from the basics to its application in a government context. Educational institutions and private companies can collaborate with the government in providing these educational resources.

Inter-Institutional Collaboration

By involving various government, private and NGO institutions, blockchain implementation can be strengthened and accepted more widely. This collaboration can include the exchange of knowledge, resources and best practices. For example, government agencies that have successfully adopted blockchain technology can share their experiences and lessons they have learned with other agencies that are just starting out. In addition, by establishing a consortium or alliance between institutions, it will be possible to standardize procedures and increase public confidence in the application of this technology.

Increased Accountability

With blockchain, governments have the opportunity to increase accountability and public trust. In addition to reducing the potential for corruption, blockchain also allows citizens to verify government transactions in real-time. This opens up opportunities for the government to get feedback from the public and interact with them more transparently. This increase in trust can increase government legitimacy and support other policies and programs that are implemented.

New Technology Innovation

As blockchain technology develops, there is an opportunity to adopt additional technological solutions that may improve the efficiency, security, or other features of government systems. This could be in the form of companion technology to the blockchain or improvements to the blockchain technology itself. By identifying and exploiting these opportunities, governments can ensure that they gain maximum benefit from blockchain technology while overcoming challenges that may arise during its implementation.

Threats

Legal and Regulatory Barriers

Like any new technology, blockchain may encounter challenges from existing legal and regulatory frameworks. Regulations that are not yet supportive or that are unclear can hinder the adoption or operation of blockchain systems. Governments need to ensure that implementation of these technologies complies with existing regulations and laws, and may need to create or change regulations to support the efficient and ethical adoption of these technologies.

Resistance from Certain Parties

It is possible that some groups or individuals may feel threatened or uncomfortable with the introduction of this new technology. These could be government employees who are worried about changes to their jobs, those who have a stake in the old system and feel they are losing out on benefits, or the general public who are skeptical of new technology.

Technical Issues

Like any new technology, blockchain may experience unanticipated technical problems. This could range from scalability issues, errors in the code, or unknown security issues. Reliability and security are key in implementing technology in the government sector, and any significant technical issues can hinder trust and adoption.

Speed of Technological Change

Blockchain technology, like other technologies, is developing rapidly. There is a

risk that solutions implemented today may become obsolete in the next few years, forcing governments to make further investments in updates or migration to other systems.

Interoperability Issues
It is possible that different government agencies or parts of the government may adopt different blockchain solutions. This can cause interoperability issues where these systems must interact with each other.

Over-reliance or Excessive Dependence
If you rely too heavily on blockchain technology without having appropriate backups or alternatives, there is a risk that if this technology fails or encounters critical issues, the entire system that supports government operations could be disrupted. Recognizing these threats allows governments and interested parties to plan appropriate preventive and response measures so that these risks can be minimized.

Recommendations for Implementing the Blockchain 5.0 Anti- Corruption System
Blockchain has demonstrated its ability to provide levels unprecedented transparency and efficiency in government operations. Its implementation has reduced opportunities for data manipulation and corruption by ensuring that all data transactions and changes are recorded and retrievable verified. However, there are also challenges that need to be faced. For example, adoption of this new technology requires significant investment in infrastructure and training, and there are potential issues with data privacy and security that need to be addressed.

Based on this evaluation, the following are some recommendations for the future:

Continuing and Improving Training
To ensure that all parties involved understand and can to use blockchain technology effectively, ongoing training and education about blockchain needs to be a priority .

Developing a Stronger Regulatory Framework
To ensure data security and privacy, a strong and up-to-date legal and regulatory framework needs to be developed and implemented.

Improving Infrastructure
To support adoption and operation of blockchain technology, adequate infrastructure needs to be built and upgraded. This includes not only physical infrastructure such as computers and networks, but also software and protocols security.

Encouraging Collaboration
The adoption of this new technology will benefit from collaboration between various parties, including government departments, the private sector, academia, and non-governmental organizations. These collabs can help share knowledge, solve problems, and develop new solutions.

Provide Effective Technical Support
Support effective techniques will greatly assist in overcoming challenges technical issues that may arise and ensure the smooth operation of the blockchain system. By paying attention to and implementing these recommendations, the government will are in a strong position to maximize the benefits of blockchain technology in their anti- corruption efforts.

5. CONCLUSION

Implementation of blockchain technology in the sector government as a coping tool corruption offers very promising prospects. By offering a rate transparency, efficiency, and data security like never before, blockchain can play important role in prevention and detection corruption. However, the adoption of this new technology is not without its challenges. Governments must be prepared to face a variety of barriers and challenges, including significant investment in infrastructure

and training, as well as potential issues with data privacy and security. In addition, governments must also comply with relevant laws and regulations and ensure that blockchain adoption is sound and safe. Although, with proper preparation and cooperation between all parties involved, blockchain implementation can be successful and generate significant benefits. Through the wise and effective use of these technologies, governments can make great strides in the fight against corruption and build a more transparent and accountable future.

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