Implications of Blockchain Technology in Civil Transactions: A Review of Legal Aspects

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Abstract

This study discusses the legal implications of using blockchain technology in civil transactions, focusing on aspects such as smart contracts, proof of ownership, data security, and regulation. Blockchain technology offers advantages such as transparency, security, and efficiency but also presents various legal challenges that need to be addressed. Smart contracts have the potential to be considered valid if they meet applicable contractual requirements, but their automatic and rigid execution can cause problems in certain situations. Proof of ownership recorded on the blockchain requires legal recognition to be valid and accepted in court, while the transfer of ownership through blockchain requires clear regulations to ensure its legality. In terms of data security, blockchain offers high protection but raises challenges related to privacy and compliance with data protection regulations such as GDPR. Clear and comprehensive regulations are needed to support the safe and effective adoption of blockchain, but many jurisdictions still lack an adequate legal framework. This study recommends the development of relevant regulations, increased education and awareness about blockchain, and further research to develop best practices and industry standards. With the right approach, blockchain technology can enhance efficiency, security, and trust in civil transactions.

1. Introduction

In the ever-evolving digital era, blockchain technology has become the main focus as a promising innovation, not only in the context of digital currencies such as Bitcoin, but also in various aspects of life, including in the business world (B, S., Sh, AS, E, SK, K, SN, & S, N, 2022). With its decentralized basis and high level of security, blockchain technology offers the potential to change the paradigm in various transactions, including civil transactions (Abduh, M., Omar, MA, & Masruki, R,2020). The uniqueness of the blockchain system makes it the most sophisticated innovation today, which can be relied on to make it easier for humans to complete their activities. One of them is in the field of regulation and business (Swan, M, 2015). Blockchain can be used as a mode for transferring computerized money, storing real deeds, and most recently, completing house and land trade exchanges. Blockchain innovation is a method for making the main power field into clear and simple records (Alahmadi, DH, Baothman, FA, Alrajhi, MM, Alshahrani, FS, & Albalawi, H. Z, 2021). Recording itself is an accounting methodology in a monetary framework (El-Qawasmeh, E., Aljarah, I., & Al-Betar, M. A, 2021).

Blockchain technology is a technology based on cryptography which is a public database. This system is understood as an institutional or social technology to coordinate something (Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L, 2019). In the business world, of course this is something valuable and accommodating in the business world (Zare, H., Gohari, M., & Zamani, E, 2021). In addition, blockchain is useful for transferring data and information between individuals safely, efficiently, securely, and traceably. Unlike the general framework created by individuals for certain interests, the recording framework on the blockchain is customized and managed as a whole by elements called hubs or friends (Tapscott, D., & Tapscott, A, 2016). Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World. Penguin.. Every data from the exchange in blockchain innovation is stored safely, easily, as a whole and cannot be changed. Blockchain is like a database; it is a way of keeping records of values and transactions. Almost anything can be recorded on the blockchain (Dr. Budi Raharjo, S. M, 2018).

In Indonesia, where the technology industry is growing rapidly, the use of blockchain technology is starting to get serious attention from business people and regulators. However, along with its innovative potential, questions have also arisen about the legal implications of adopting blockchain technology in the business context in Indonesia (Mansula, G,2023).

This study aims to summarize the theoretical basis and practical context of this topic and formulate the main issues that will be discussed in this article. In this regard, it is important to understand that blockchain technology is not just a technical tool,

but also has a significant impact in legal and regulatory aspects (Kadly, EI, Rosadi, SD, & Gultom, E,2021). The legal implications of the use of blockchain technology cover a wide range of aspects, including data security, consumer protection, electronic transactions, and privacy. Amid the legal uncertainties that may arise, it is important to consider how existing legal frameworks can adapt to the new dynamics brought about by this technology (Setia, TEA, & Susanto, A, 2019).

However, adequate research on the legal implications of blockchain technology use in business in Indonesia is still limited. Therefore, this article aims to fill this knowledge gap by exploring in depth how the implementation of blockchain technology may impact the existing legal framework in Indonesia, as well as to offer insights into effective strategies to manage the associated legal challenges.

The formulation of the problem in this study is as follows: 1) What are the legal implications of using blockchain technology in civil transactions? 2) How is the analysis of the case of implementing blockchain technology in business in Indonesia?

2. Research methods

The approach method used in this legal research is to use the normative legal approach method. Normative legal research is research that prioritizes library data, namely research on secondary data (Hanitijo, R,2000), This research includes research onimplications of blockchain technology in civil transactions: a review of legal aspects. Then the data analysis in this study was carried out using the analytical descriptive method, namely a method used to describe a condition or the purpose of which is to provide data on the object of research so as to be able to explore things that are ideal, then analyzed based on the theory of law or applicable laws and regulations ((2022)

The research method steps explained in this final assignment are as follows:

1. **Normative Legal Approach**: This study examines the legal implications of the use of blockchain technology in civil transactions. Therefore, this method focuses more on the analysis of applicable laws and regulations and related literature.
2. **Secondary Data Collection**: The data sources used are library materials consisting of books, scientific journals, laws and regulations, and other relevant legal documents. This secondary data is used to analyze and understand the legal issues arising from the application of blockchain in civil transactions.
3. **Data analysis**: The collected data were analyzed using analytical descriptive methods. This method is used to describe existing conditions and relate them to legal theories and applicable regulations. The goal is to understand the legal problems that arise and formulate legal solutions or recommendations based on existing theories and regulations.

4. **Legal Sources and Literature**: This research uses legal sources relevant to blockchain and civil transactions, such as the Personal Data Protection Law, the ITE Law, and other regulations related to technology and electronic transactions.

Overall, this research method is qualitative and normative, with the main focus on examining the legal aspects of the use of blockchain technology.

3. Research Results and Discussion

LEGAL IMPLICATIONS OF THE USE OF BLOCKCHAIN TECHNOLOGY IN CIVIL TRANSACTIONS

Blockchain is a distributed or decentralized database that uses independent nodes to store and retrieve data (LaFountain, C,2021). Blockchain innovation connects blocks of information sequentially in a circulated record. Each block stores different items, including a "hash", which is a unique identifier of the actual block. Hash recognizes and connects this block to all blocks, both previous and subsequent blocks (Meth, M,2019). So it tends to be reasonable that Blockchain is a collection of blocks that contain information exchanges that are connected (chain) and sequential with each other. Blockchain can be considered a computerized information capacity framework where each new block or the latest related block must have hash data (hash = alphanumeric code that addresses words, messages, or information) from the previous block. A chain will be formed by each block that makes reference to the previous block and so on. besides that Blockchain technology automates and provides useful information for solving various problems (Alexander Sugiharto, S,2020).

In Blockchain innovation, overall a block consists of 3 things, namely certain information, the hash of the actual block, and the hash of the previous block. Therefore, each block must have its own cryptographic results in addition to the hash of the previous block in order for a chain to remain connected. Hash in this case consists of one alphanumeric number calculated using data from the block itself, its timestamp, and the hash of the previous block (Hasan, N, 2020). The data stored in the blockchain database is arranged into several groups. A certain amount of data is stored in each block or data set. When filled, each block will be associated with the previous block (the block behind it) and then to the block after it (the previous block), thus forming a Blockchain chain. When a block is added to a chain, it acts as a permanent data record that cannot be changed or deleted, has a clear timestamp, and remains connected to the network forever.

The use of blockchain technology in civil transactions carries a number of significant legal implications. Here are some key aspects to consider:

1. Validity and Legal Recognition
   a. Legality of Contract: Blockchain can be used to create and store smart contracts, which are computer codes that automatically execute the terms of a contract. However, from a legal perspective, there needs to be recognition that smart contracts have the same legal force as traditional contracts. Some jurisdictions may require legal adjustments to recognize the validity of smart contracts.
   b. Validity of Evidence: Transactions recorded on the blockchain are considered immutable and transparent. This may affect how evidence is obtained and used in trials. Some jurisdictions may need to establish specific rules regarding the admissibility and assessment of blockchain-based evidence in court.
2. Privacy and Data Protection
   a. Personal Data Regulation: Blockchain tends to be transparent and immutable, which can conflict with data protection regulations such as the GDPR in the European Union. The GDPR regulates the right of individuals to request the deletion or amendment of their personal data, while blockchain does not inherently support data deletion. Regulation adjustments or clarifications are needed to address this conflict.

      Data Privacy Law, it is important to review and possibly adjust or clarify regulations to accommodate blockchain technology without compromising the protection of personal data. This could involve developing new methods to protect privacy in blockchain networks, such as the use of encryption techniques or the creation of off-chain data that can be deleted or changed at the individual's request. Data privacy and technologies such as blockchain vary depending on the jurisdiction of each country. The applicable law, namely Law No. 27 of 2022 concerning Personal Data Protection, regulates the rights of individuals over their personal data, including the right to access, correct, and request deletion of data. This law aims to protect the privacy of personal data and regulates how personal data can be collected, used, and stored by organizations or individuals.(Personal)
   b. Access Rights Management: While blockchain provides transparency, it also poses challenges in terms of managing data access rights. Implementing appropriate mechanisms to control access to sensitive information becomes essential.
3. Security and Responsibility
   a. Technology Security: Although blockchain is known for its security, the technology can still be vulnerable to attacks or code errors. Those responsible for smart contracts must ensure that the code used is secure and well-tested to avoid potential legal risks.

b. Legal Responsibility: Determining who is responsible if a smart contract fails or if there is a loss due to a transaction conducted via the blockchain is an important issue. The parties involved, such as smart contract developers, must be clear about their responsibilities.

4. Regulation and Compliance
   a. Local and International Regulations: Blockchain regulations may vary across jurisdictions. Organizations and individuals should ensure compliance with local and international regulations regarding the use of blockchain in civil transactions.
   b. Standards and Certification: To ensure integrity and legal compliance, industry standards and certification for blockchain applications may be required. This helps in ensuring that blockchain implementations meet relevant legal and technical requirements.
5. Disputes and Conflict Resolution
   a. Mediation and Arbitration: With the advent of blockchain, dispute resolution mechanisms may need to be updated. Adjustments in mediation and arbitration methods for cases involving blockchain should be considered, including the use of smart contracts in the dispute resolution process.
   b. Jurisdiction: Blockchain-based transactions are often cross-border, which can pose challenges in terms of jurisdiction. Clear regulations regarding jurisdiction in the blockchain context can help resolve disputes effectively.

Overall, the integration of blockchain technology into civil transactions requires special attention to various legal implications. Adjustments to laws, regulations, and policies are needed to ensure that this technology is used effectively and in accordance with existing legal frameworks. In a typical blockchain system, each party shares information and consensus coverage according to previously agreed rules. To prevent consensus information from being tampered with, the system stores data in blocks that form a cryptographic chain of data structures in chronological order, and node records are selected by consensus mechanisms to determine the data of the latest block and other nodes participate in the verification, storage, and maintenance of the latest block data.(Annisa, 2015)

CASE ANALYSIS OF BLOCKCHAIN TECHNOLOGY IMPLEMENTATION IN BUSINESS IN INDONESIA

A search of the Legal Documentation and Information Network (JDIH) shows that there are no regulations in the form of laws and regulations governing the implementation of blockchain in Indonesia. There are only two regulatory policies that are used as operational standards for the implementation of blockchain explicitly,

namely Bank Indonesia Regulation Number 19/12/PBI 2017 concerning the Implementation of Financial Technology. This regulation does not regulate explicitly, but the implementation of this blockchain can be utilized as one of the platforms for implementing financial technology in the payment system category.

Further regulatory policies can be found in the Regulation of the Financial Services Authority of the Republic of Indonesia Number 37/POJK.04/2018 Concerning Crowdfunding Services Through Information Technology-Based Stock Offerings (Equity Crowdfunding) hereinafter referred to as OJK Regulation 37/POJK.04/2018. This regulation also only regulates the use of blockchain related to technology-based stock offering activities. Blockchain is qualified as a technology-based supporting service to improve the quality of Crowdfunding Services.

Blockchain is a decentralized technology that stores data in the form of blocks that are linked to each other. In the context of the ITE Law, there are several things that are relevant to analyze:

a. Electronic Transactions (Article 1 paragraph 2 of the ITE Law): Blockchain is often used for digital transactions, both in the form of asset transfers (such as cryptocurrency) and data validation (for example, smart contracts). Transactions carried out via blockchain can be considered electronic transactions recognized by the ITE Law.
b. Electronic Signature (Article 1 paragraph 12 and Article 11 of the ITE Law): Blockchain allows the use of digital signatures to authenticate the identity of the transaction actor. The ITE Law recognizes electronic signatures as long as they can be verified and have strong integrity, which is in line with the basic principles of blockchain in providing security and the inability to falsify data.
c. The implementation of blockchain in business in Indonesia has complied with several important aspects of the ITE Law, especially in terms of recognizing electronic transactions and electronic signatures. However, there are still challenges related to data privacy, consumer rights protection, and dispute resolution. To ensure optimal and legal blockchain adoption, specific regulatory improvements related to blockchain, smart contracts, and other digital assets are needed.

Blockchain stores data decentralized and cannot be changed without the consent of the network, which increases data security. This is in accordance with the mandate of Article 15 of the ITE Law concerning the obligation of electronic system organizers to maintain the security of managed data and information. However, there are challenges in terms of personal data protection (Article 26 of the ITE Law). Although blockchain offers high security, its decentralized and public nature can raise issues regarding users' rights to delete or change their data, as stipulated in the ITE Law.

Blockchain, by default, does not allow data deletion, which may conflict with the principle of the right to be forgotten (Muhammad, Dzulfikar, 2019).

The implementation of blockchain technology in business in Indonesia brings various opportunities and challenges. Here is a case analysis of how blockchain technology can be applied in the context of business in Indonesia (Frans, R. U,024).:

1. Blockchain Use Cases in the Financial Sector, Case: Bank Central Asia (BCA) and the Use of Blockchain

a. Implementation: BCA, one of the largest banks in Indonesia, has explored the use of blockchain technology to increase efficiency and transparency in financial transactions. For example, blockchain is used for faster cross-border payment processes and lower costs.
b. Opportunity:
    1) Transaction Efficiency: Blockchain can speed up the payment process and reduce transaction costs, especially in international transactions.
    2) Transparency and Security: With blockchain, transactions can be monitored in real-time and are more difficult to manipulate.
c. Challenge:
    1) Regulation: The banking system in Indonesia must comply with strict regulations. Adjustments to existing regulations are needed for blockchain integration.
    2) Technology Adoption: Blockchain adoption among financial institutions requires complex training and system changes.

2. Blockchain Use Cases in Supply Chain, Case: Blockchain for Agricultural Product Traceability

a. Implementation: Companies like TaniHub are using blockchain technology to improve traceability and transparency in the agricultural supply chain from farmers to consumers. Blockchain is used to record and verify every stage of the process, from planting to shipping.
b. Opportunity:
    1) Transparency: Blockchain increases transparency in the supply chain, allowing consumers to trace the origin of products.
    2) Quality and Safety: With immutable data, the risk of fraud and contamination can be minimized.
c. Challenge:
    1) Implementation Costs: Although blockchain technology offers many benefits, the cost of implementation can be high, especially for small and medium-sized businesses.

2) Integration with Existing Systems: Blockchain integration with existing supply chain systems can be complex and require significant changes in business processes.

The integration of blockchain technology into the agricultural product supply chain offers great opportunities to enhance consumer protection in accordance with the Consumer Protection Act. By increasing transparency, traceability, and product security, blockchain can help ensure that consumers receive correct and accurate information about the products they consume. However, challenges related to implementation costs, system integration, and law enforcement must be overcome to ensure that this technology can be applied effectively and fairly. To achieve the full potential of blockchain in consumer protection, collaboration between government, industry players, and technology must be strengthened. With the support of adaptive regulations and strict supervision, blockchain can be a very effective tool in realizing the objectives of the Consumer Protection Act in the digital era. Consumer Protection Act (Law No. 8 of 1999)(1999)in Indonesia aims to protect consumer rights, including the right to correct, clear, and honest information about the condition and guarantee of goods or services consumed. In the context of the agricultural product supply chain, consumers often face challenges in ensuring the origin and quality of the products they buy. Blockchain technology is present as a solution to increase transparency and traceability in the supply chain, in line with the principles set out in the Consumer Protection Law.

3. Blockchain Use Cases in Government and Administration, Case: Digitization of Land Certificates by BPN (National Land Agency)

a. Implementation: BPN explores the use of blockchain for digitizing and recording land certificates to reduce land disputes and fraud. Blockchain is proposed to store land ownership and transaction records transparently and securely.
b. Opportunity:
   1) Fraud Reduction: With blockchain, land ownership records become more secure and difficult to forge.
   2) Administrative Efficiency: The process of administration and recording land ownership can be more efficient and accurate.
c. Challenge:
   1) Regulation and Compliance: Adjustments to laws and regulations related to land ownership need to be made to suit blockchain technology.
   2) System Diversity: Integrating blockchain with existing land administration systems requires extensive customization and coordination.

4. Blockchain Use Cases in Creative Industries

Case: Copyright Protection for Content Creators

a. Implementation: Platforms like Kolase are using blockchain to protect copyright and royalties for content creators in Indonesia. Blockchain is used to automatically and transparently record ownership of works and distribution of royalties.
b. Opportunity:
    1) Increased Copyright Protection: Blockchain can help protect copyright and ensure creators receive fair payments.
    2) Royalty Transparency: An automated and transparent system helps in fairer and more timely distribution of royalties.
c. Challenge:
    1) Adoption by Creators: Content creators may need time to understand and adopt this new technology.
    2) Technical Issues: Technical issues related to the management and integration of copyright data in the blockchain need to be addressed.
d. Case investigation

In the digital era, copyright has become a crucial issue in the creative industry, especially with the increasing ease of distribution and reproduction of works via the internet. Content creators often face problems in protecting their work from copyright infringement and in receiving royalties that are commensurate with their contributions. This is where blockchain technology comes in as an innovative solution. Copyright protection is one of the important focuses in the Job Creation Law (Law No. 11 of 2020),(2020)implemented to improve protection of intellectual property rights in Indonesia. The Job Creation Law modifies various provisions in Law No. 28 of 2014 concerning Copyright, including accelerating the registration process and strengthening copyright enforcement. In this context, blockchain technology can be a very effective tool to realize the objectives set by the Job Creation Law, especially in protecting copyright and ensuring fair distribution of royalties for content creators (Darmawan, O, 2018).

1) Implementation in real context of collage platform case
    i. Recording ownership of works, platforms such as collage in Indonesia have started implementing blockchain to protect copyright and manage royalties for content creators. Through blockchain, every work uploaded to the platform can be recorded with a unique hash that shows ownership and time of creation. This allows creators to legally prove their ownership of the work and prevent plagiarism.
    ii. In addition, royalty distribution is done automatically through smart contracts embedded in the blockchain. This ensures that every time a work is used or accessed, royalties can be directly distributed to the creator without the

involvement of a third party, which often reduces transparency and increases transaction costs.

2) Opportunities presented by blockchain in the creative industry
   i. Blockchain's enhanced copyright protection allows for an immutable and distributed record of ownership across multiple parties, making it nearly impossible for anyone else to claim someone else's work as their own. It also makes it easier for creators to enforce their copyrights internationally, as ownership data is available globally and accessible to anyone.
   ii. Transparency and efficiency in royalty distribution with the blockchain system, royalty payments can be more transparent and efficient. Every time a work is used, a smart contract can trigger an automatic payment that records the transaction publicly and permanently. This reduces the risk of delays or errors in royalty payments, which are often a problem in traditional systems.
3) Legal Challenges and Adjustments
   i. Adoption by creators one of the main challenges is ensuring that content creators understand and are willing to adopt blockchain technology. Here, the Job Creation Law needs to be strengthened with educational and socialization programs regarding this new technology. The government and industry must work together to provide training and support for creators, ensuring they can utilize blockchain technology effectively.
   ii. The technical and regulatory issues of blockchain as a technology still need to be developed, especially in terms of scale and integration with existing legal systems. The Job Creation Law and related regulations may need to be updated to recognize and regulate the use of blockchain in the context of copyright protection. This includes official recognition of blockchain-based digital proof of ownership and legal adjustments related to intellectual property rights in the digital environment.
   iii. Data protection and privacy of blockchain implementation must also pay attention to the provisions of the Personal Data Protection Law stipulated in the Job Creation Law. Data recorded in the blockchain must be managed carefully to ensure it does not violate the privacy of creators and users.

Blockchain offers a solution that is in line with the objectives of the Job Creation Law in strengthening copyright protection and ensuring fair distribution of royalties. With proper adoption, blockchain can be a very effective tool to achieve these goals, although challenges related to technology adoption and regulatory adjustments still need to be overcome.

The Job Creation Law, as a dynamic regulation, must be able to adapt to technological advances such as blockchain to ensure that creators' rights are optimally

protected and innovation can thrive in a clear and supportive legal environment. Collaboration between government, industry, and the creator community will be critical to achieving this.

5. Common Challenges in Blockchain Implementation in Indonesia
   a. Regulations and Policies: Regulations on blockchain technology in Indonesia are still developing. Adjustments to laws and regulations are needed to support effective blockchain implementation.
   b. Technology Infrastructure: Technology infrastructure in Indonesia needs to be strengthened to support widespread blockchain adoption, especially in less developed areas.
   c. Education and Awareness: Education about blockchain and its benefits needs to be increased among businesses and the public to encourage wider adoption.

Overall, blockchain offers a lot of potential to improve efficiency, transparency, and security in various business sectors in Indonesia. However, challenges related to regulation, costs, and education need to be overcome to ensure successful implementation (Darmawan, O, 2018).

4. Conclusion

This study examines the legal implications of the use of blockchain technology in civil transactions, covering aspects of smart contracts, proof of ownership, data security, and regulation so that with the right approach, blockchain technology can become a strong pillar in civil law reform, increasing efficiency and trust in civil transactions.

Overall, blockchain technology offers transformational potential in civil transactions. However, to ensure maximum benefits and reduce risks, comprehensive adjustments in regulations, policies, and legal practices are needed. Governments, developers, and other stakeholders must work together to overcome legal challenges and make the most of blockchain technology's potential.

The government needs to develop regulations that support blockchain adoption, while providing legal certainty. Policies must be flexible to adapt to technological developments.

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