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A Juridical Analysis Of The Validity And Legal Protection Of Smart Contracts As Electronic Contracts In Indonesia

Analisis Yuridis Keabsahan Dan Perlindungan Hukum *Smart Contract* Sebagai Kontrak Elektronik Di Indonesia

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ABSTRACT
The development of blockchain technology has given rise to the innovation of smart contracts, digital contracts that execute automatically based on programming code without third-party intervention. Smart contracts offer efficiency, transparency, and security in electronic transactions, but their implementation in Indonesia requires in-depth legal review. This study uses a normative juridical method with a statutory and conceptual approach to analyze the validity of smart contracts under the Civil Code (KUHPerdata) and the Electronic Information and Transactions Law (UU ITE), as well as the legal protection provided to the parties using them. The results indicate that smart contracts can be recognized as valid electronic contracts if they meet the requirements for a valid agreement as stipulated in Article 1320 of the Civil Code, as well as the criteria for electronic contracts in the ITE Law and Government Regulation No. 71 of 2019. Legal protection for parties in smart contracts is dual: normative protection through statutory regulations and technical protection through blockchain characteristics, such as immutability, transparency, and cryptography. However, specific regulations regarding smart contracts in Indonesia are still limited, necessitating further regulation regarding identity verification, cross-border jurisdiction, the recognition of blockchain-based evidence in court, and dispute resolution mechanisms appropriate to the nature of the technology.

INTRODUCTION

The development of information technology has changed the way humans transact and make deals. One of the innovations that has emerged from blockchain technology is smart contracts. Unlike traditional agreements, smart contracts are executed automatically based on programming code without the intervention of a third party. This technology offers efficiency, openness, and security in digital transactions. However, the progress of smart contracts needs to be accompanied by strict legal regulations to prevent conflicts and uncertainties related to violations of smart contracts. As one of the developing countries, Indonesia must be able to adapt to the world's technological advancements today. Along with this progress, the government has also begun to draft regulations related to technology, and with this regulation, the law plays an important role in regulating the situation and becoming a reference in solving various problems in the field of technology . The law must basically run dynamically and be able to be open by making legal innovations in order to provide space for change, especially changes in the digital era which has a number of big challenges in the future. One of the technological innovations in this era is the existence of smart contracts. Smart contracts are an advancement in the application of blockchain after the advent of cryptocurrency, which is a computer program that basically functions as an electronic agreement in a blockchain database system that aims to run a protocol in implementing an agreement or agreement between parties that can automate the implementation of agreement clauses. Smart contracts are an advanced innovation in the use of blockchain after the existence of cryptocurrency, which is a software that is essentially a digital agreement in a blockchain database system with the aim of implementing protocols in the implementation of agreements between parties that can execute the terms of the agreement automatically. In essence, a smart contract is a computer application that functions as a digital agreement in a blockchain database system, with the intention of implementing a protocol that can automatically execute an agreement or agreement between the parties involved . Smart contracts were first created by Nick Szabo in 1994, and are designed to provide security in transactions within the blockchain. The term "smart" in this contract refers to an automated system, which allows this mechanism to make decisions independently with a very high degree of automation. Nick Szabo describes a smart contract as a set of code that is stored and processed in a distributed ledger system (Distributed Ledger Technology (DLT) that has been programmed to operate automatically

as per with certain conditions that have been predetermined. He also explained that the purpose of smart contracts is to ensure compliance with the terms of contracts or general agreements (such as payment terms, pawns, confidentiality, and law enforcement), reduce intentional and unintentional abandonment, and reduce dependence on intermediaries.

These characteristics are expected to reduce losses due to fraud, arbitration, and law enforcement costs, as well as other transaction costs. Smart contracts can be done without the need for the presence of a third party. In addition, the transactions carried out can be traced, cannot be changed, and contain information contained in the contract and the conditions for carrying it out. Smart contracts allow buying and selling transactions in e-commerce to be more efficient, as sellers and buyers do not need to meet in person to make transactions. In Indonesia, there is a crucial issue regarding the validity and validity of smart contracts in applicable legal regulations. In accordance with Article 1320 of the Civil Code (KUHPer), an agreement is considered valid if it meets four conditions: (1) there is an agreement between the parties involved; (2) legal ability; (3) obvious objects; and (4) valid reasons. In addition, Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law) along with amendments through Law Number 19 of 2016, recognizes electronic documents, electronic signatures, and electronic contracts as valid legal evidence. This condition raises the need to analyze the extent to which smart contracts can be accepted as a valid and legally binding agreement in Indonesia.

LITERATURE RIVIEW

Smart Contract Concept

Smart Contracts are the latest breakthrough in the application of blockchain technology that has emerged after cryptocurrencies. Basically, a smart contract is a software that functions as a digital agreement in a blockchain database system, with the aim of implementing a protocol that can automatically execute agreements or contracts between various parties. Automatically. The concept of smart contracts was first coined by Nick Szabo in 1994, and is designed to ensure security in transactions that occur on the blockchain. Smart contracts are made unilaterally by the seller so that the content of the contract becomes stricter than the usual agreement. The concept of smart contracts emerged in response to the need for the exchange of goods and services that require an effective, reliable, fast, objective, direct, and online intermediary. In addition, the increase in human interaction in the digital world and technology also plays a key driver of smart contracts. The advantages of smart contracts include speed, accuracy, high accessibility, connectivity to reality, and the ability to solve problems in existing systems. The use of smart contracts is now widespread, especially in electronic transactions such as stock and cryptocurrency trading, hotel rentals, and others.

Treaty Law in Indonesia

The law on contracts in Indonesia is listed in Book III of the Civil Code (KUHPerdata). Article 1313 of the Civil Code, explains that a contract is an act in which one or more parties make a promise to one or more other parties. In addition, Article 1320 of the Civil Code stipulates four conditions for the validity of the agreement, which are divided into two categories: Subjective Conditions: a. An agreement between the parties (an agreement is the basis of the formation of an agreement. In the context of smart contracts, agreements are often realized through digital agreements made by both parties before the contract code is entered into the blockchain. Such approvals can be in the form of consent clicks, electronic signatures, or approval through decentralized applications. The challenge here is to ensure that the consent given reflects the original will of the parties, without coercion, deception, or fraud. b. The legal skills of the parties involved in a contract must be legally capable, which means that they must have reached the age of majority and are not under legal supervision. In smart contracts, this aspect can be problematic because blockchain systems do not automatically verify the age or legal status of the parties. Therefore, a mechanism for identity verification is needed to ensure that all parties have sufficient legal skills. Objective Terms: a. A particular object the object of the agreement must be clear and identifiable, whether it is a goods, services, or a negotiable right. In smart contracts, such objects are often clearly stated in the code, such as the amount of cryptocurrency transferred or the services that will be provided once certain conditions are met. b. The legitimate cause purpose of the agreement must not conflict with regulations, public order, or moral norms. Smart contracts used for illegal activities, such as money laundering or illicit trade, will still be considered invalid even if they are technically operable on the blockchain. Looking at the explanation above, basically a smart contract can meet the valid requirements of the agreement as described in Article 1320 of the Civil Code, as long as all parties provide a valid agreement, have legal skills, have a clear object of agreement, and have a valid purpose of the contract. However, special attention needs to be paid to technical challenges such as identity verification, proof of

agreement, and monitoring of contract objectives in order for the implementation of smart contracts to be in accordance with the provisions of the applicable civil law in Indonesia.

Legal Basis of Electronic Transactions

The legal basis that regulates electronic transactions in Indonesia mainly comes from Law Number 11 of 2008 concerning Information and Electronic Transactions (UU ITE) which has been amended by Law Number 19 of 2016. This law serves as a legal foundation that recognizes the validity of electronic documents, electronic signatures, and electronic contracts, which have legal force and consequences equivalent to conventional documents. Some of the important provisions related to the validity of smart contracts include: Article 1 number 17 of the ITE Law states that electronic transactions are legal actions carried out through the use of computers, computer networks, and/or other electronic means. Article 5 paragraphs (1) and (2) of the ITE Law show that electronic information and/or electronic documents and copies thereof are evidence that has legal validity. Article 6 of the ITE Law stipulates that electronic information is declared valid as long as its content can be accessed, displayed, guaranteed integrity, and accountable. This Government Regulation provides a more in-depth explanation of the obligations of electronic system operators, personal data protection, system security, and procedures for implementing electronic transactions. Regarding smart contracts, the ITE Law and PP PSTE provide a general legal framework that recognizes the existence of electronic contracts, including those executed automatically through computer systems or blockchain. However, currently there are no specific technical regulations governing the implementation of smart contracts, so the legal interpretation still refers to the general principles of agreements in the Civil Code and the general provisions of electronic transactions.

METHODS

This type of study is a normative legal study, which focuses on the analysis of the application of legal norms contained in positive law to a real issue related to the extent to which law can be implemented. The approach techniques applied include juridical and conceptual approaches. This study utilizes secondary data consisting of primary, secondary, and tertiary legal sources, which are obtained through literature research and then analyzed by qualitative descriptive methods. When solving the problems faced in this scientific study, a legal approach method and a conceptual approach are used to understand legal protection for parties who use the smart contract system in making agreements and to find out the legal position of smart contracts in civil law in Indonesia. This information is obtained from books, articles, and other references related to this research to enrich the understanding of the subject and object of the research.

RESULT AND DISCUSSION

The Validity and Legal Protection of Smart Contracts as Electronic Contracts in Indonesia According to the Indonesian Civil Code

According to Article 1320 of the Civil Code, a smart contract will be considered valid if it meets the following conditions: Agreement (expressed in the form of a digital consent supported by a verified electronic signature); Legal proficiency (each party has the legal ability to enter into an agreement); Specific objects (the content of the agreement must be clear, recognizable, and enforceable); Halal reasons (not violating laws, public order, or moral norms). Based on this, the provisions in the smart contract are the same as the provisions listed in civil law in Indonesia but in a different form. The different form as referred to is the existence of an electronic contract that does not require the parties to meet in person in making a sale and purchase agreement . The use of smart contracts is an efficient way to create contracts. Smart contracts can be another option to overcome issues such as high transaction fees, slow transaction completion process, complexity of transaction services, and manipulative practices in ongoing and unresolved transactions . Based on the stages of the smart contract lifecycle, the implementation of smart contracts begins when the parties involved negotiate the terms and conditions of the agreement until an agreement is reached (a predetermined contract). Once an agreement is reached, all or some of the agreed clauses will be converted into program code or a smart contract programming language and stored in the blockchain ledger (set rules). Furthermore, after the agreement is recorded in the ledger (logbook), each party must meet the agreed terms and conditions to execute the contract (verifying the rules). The last stage is (executing the rules), if one party, such as the buyer, has fulfilled its obligations, then the contract will automatically execute the existing agreement (self-executing) and grant the rights that belong to the buyer . The process of making a smart contract begins when the parties who want to make a smart contract have agreed on the terms and conditions (price, amount, deadline, etc.)

submitted by each other. Moving on to the element of naturalia, in the context of a smart contract, this element can be included in the agreement clause. While this element does not have to exist, the agreeing parties can add this element in the clause that covers the smart contract. For example, in the practice of buying and selling goods online, the seller and buyer may establish a clause stating that the shipping costs will be charged to one of the parties. Incidental elements can also be added in the agreement clauses of smart contracts. The main point to note is that the elements in the agreement that use smart contracts have similarities with those in traditional agreements, but the difference lies in the way they are implemented which depends on digital platforms. Based on the explanation above, it can be concluded that smart contracts have met various conditions and elements so that they can be recognized as having legal force. In addition, the implementation of smart contracts strongly emphasizes the principle of consensualism. This principle suggests that an agreement does not always require certain formalities (the parties do not need to meet in person), but it is enough to have a clear and firm agreement between the two. In addition, the principles of freedom of contract and legal certainty can also be found in this system, where the parties are given the freedom to determine the form of the agreement and once they have reached an agreement, they cannot change the agreement. Furthermore, if analyzed, the concept of making smart contracts is also in line with many essential principles contained in article 1320 regarding the provisions of the validity of agreements. The principle that an agreement must be formed on the basis of agreement (consensus), have a specific object, and that the object is not prohibited by law has been fulfilled.

The Validity of Smart Contracts as Electronic Contracts

In Indonesia, smart contracts are included in the category of electronic contracts described in Article 1 paragraph (17) and officially recognized in Article 18 paragraph (1) of Law Number 1 of 2024 concerning the second amendment to Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law). Edmon Makarim and Deliana stated that an electronic contract is an agreement or legal relationship that is approved in a digital way. The implementation process utilizes computer-based information network infrastructure plus communication systems that run through the internet and telecommunication services. In this case, the global internet network (network of networks) serves as the main link for the implementation of electronic contracts . Law Number 11 of 2008 concerning Electronic Information and Transactions (UU ITE), which has been revised through Law Number 19 of 2016, recognizes that electronic contracts are a valid agreement, as long as they comply with the applicable provisions of civil law. In particular, Article 18 paragraph (1) of the ITE Law states that an electronic contract is considered valid if it is made in accordance with the provisions of the terms of the validity of the agreement contained in the Civil Code (KUHPerdata). Thus, a smart contract can be seen as a type of electronic contract if:

1. Comply with the provisions of Article 1320 of the Civil Code which includes the existence of an agreement, legal capacity, specific objects, and legitimate reasons.
2. Fulfilling the criteria for electronic contracts in the ITE Law This is in line with the definition of electronic contracts in the ITE Law, namely contracts that are formed through electronic platforms, can be accessed, displayed, guaranteed to be intact, and can be taken into account.

The characteristics of blockchain technology that are the basis of smart contracts support the fulfillment of these criteria: Immutability (immutable): Contract information stored in the blockchain cannot be changed or deleted by one party unilaterally, thus fulfilling the principle of the integrity of electronic documents stated in Article 6 of the ITE Law; Transparency: All parties with access can examine the content and flow of contract transactions, supporting the principles of openness and accountability; Security: Cryptographic systems on the blockchain protect contract data from attacks and manipulation. Regarding electronic signatures, Article 11 of the ITE Law stipulates that electronic signatures will be considered valid if: a) The data of signature generation can be linked only to the signer. The implementation of smart contracts faces various obstacles such as legal and regulatory issues, lack of knowledge about blockchain and cryptocurrency, and the need for more in-depth education and training. Cybersecurity issues and vulnerability to attacks are also important factors, which require the blockchain to have a very high level of security. Another obstacle faced is scalability, as blockchain systems need to be able to handle large volumes of transactions. Finally, the adoption and application of this technology in the construction sector is still very minimal, possibly due to a lack of sufficient technical knowledge and expertise.

Forms of Legal Protection for Parties in Business Transactions Using *Smart Contracts*

Normative Protection Based on Laws and Regulations includes:

(Law No. 11 of 2008 jo. Law No. 19 of 2016) provides a legal basis for electronic-based contracts, including *smart* contracts. This protection includes: a. Valid recognition of electronic documents and digital signatures; b. Protection for the integrity and security of electronic information from manipulation and hacking (Articles 30 to 37 of the ITE Law). The Civil Code provides protection through the principle of freedom of contract (Article 1338 of the Civil Code) and the provisions of the validity of agreements (Article 1320 of the Civil Code). The Regulation on Personal Data Protection (Law No. 27 of 2022) secures data used in smart contracts, including the identities and sensitive information of the parties involved.

Technical Protection Based on *Blockchain Characteristics*

Data Integrity: Blockchain technology ensures that contract information cannot be changed after obtaining approval, making it immutable, which avoids the possibility of alteration by either party; Transparency and Auditability: All parties have the ability to verify the contract process directly, thereby reducing the likelihood of fraud; Cryptography and Digital Signatures: Provides authentication for the transacting party, ensuring only the authorities can execute the contract.

Protection through Dispute Resolution Mechanisms

Even though *smart contracts* are designed to perform tasks automatically, disputes can still arise, for example due to errors in code, differences in understanding clauses, or violations outside of the agreement. Forms of protection that can be applied include: a. Arbitration (in accordance with Law No. 30 of 1999 concerning Arbitration and Alternative Dispute Resolution, the parties may add arbitration clauses in *the smart contract);* b. District Court (if the parties choose to resolve the dispute through litigation); c. *Online Dispute Resolution* (ODR) (a dispute resolution mechanism carried out online that is relevant to the characteristics of *digital smart contracts).*

Preventive Protection Through Technical Arrangements and Contractual Clauses

Digital Force Majeure Clause: Responding to non-success in the execution of the agreement due to system disruptions, software errors, or cyber attacks; Identity Verification (*Know Your Customer* / KYC): To ensure that the parties involved have the correct legal capacity;Contract Code Audit: Conducted before implementation to avoid any security vulnerabilities.

Protection against Abuse and Fraud

The application *of smart contracts* does not exempt from criminal provisions if fraud or manipulation occurs, as stipulated in Article 378 of the Criminal Code (fraud) or Article 35 of the ITE Law (fraudulent electronic information); b. Law enforcement officials have the authority to crack down on such violations, including the seizure of illegally obtained digital assets in accordance with legal procedures. The form of legal protection related to *smart contracts* in Indonesia is hybrid; integrating normative protection from the law as well as technical protection related to *blockchain technology*. However, optimizing such protections requires more specific follow-up regulations, especially with regard to cross-jurisdictional identity verification, blockchain-based evidentiary recognition in court, and dispute resolution procedures that are more adaptive to technological developments.

CONCLUSION AND SUGGESTION

Conclusion

Smart contracts basically meet the criteria for agreement validity stipulated in Article 1320 of the Civil Code, namely the existence of an agreement between the parties concerned, legal capabilities, clear objects, and valid reasons. In the context of positive Indonesian law, *smart contracts* can be qualified as electronic contracts if they comply with the provisions of the ITE Law and Government Regulation No. 71 of 2019. The characteristics of blockchain technology, such as immutability, transparency, and cryptographic-based security, support the fulfillment of the validity of electronic contracts and provide technical protection for the integrity of data and transaction processes. Legal protection for parties who use *smart contracts* includes normative protection through the ITE Law, Civil Code, Personal Data Protection Law, and technical protection sourced from *the blockchain* mechanism. Protection can also be provided through dispute resolution mechanisms, such as arbitration, courts, and *online dispute resolution* (ODR). Although it has a fairly strong legal basis, the implementation of smart contracts in Indonesia still requires more specific regulations to regulate aspects of identity verification, international

jurisdiction, blockchain-based electronic evidence recognition in court, and contract clauses that are adaptive to technological developments.

Suggestion

1. The government and lawmakers need to immediately draft technical regulations that specifically regulate the implementation of *smart contracts* in Indonesia, including provisions for identity verification of parties, security standards, and dispute resolution procedures based on *blockchain technology*.
2. Electronic system operators and *smart contract* developers are advised to conduct regular code audits, implement Know Your Customer (KYC) procedures, and include digital *force majeure* clauses to minimize the risk of system failures or cyberattacks.
3. Business people and smart *contract users* must understand the legal and technical aspects before using this technology, including ensuring that the content of the contract does not conflict with law, public order, or morality.
4. Academics and researchers in the field of law and information technology are expected to continue to conduct cross-disciplinary research on the implementation of *smart contracts*, especially related to juridical, security, and ethical aspects, in order to support the development of regulations that are adaptive to technological advances.

DAFTAR PUSTAKA

Artanti, D. A., & Widiatno, M. W. (2020). Keabsahan Kontrak Elektronik Dalam Pasal 18 Ayat 1 UU ITE Ditinjau Dari Hukum Perdata Di Indonesia.JCA of Law,Vol. 1, No. 1.DOI: https://doi.org/10.31933/jca.v1i1.10

Benny Riyanto. 'PEMBANGUNAN HUKUM NASIONAL DI ERA 4.0'. Rechvinding 9, no. 2 (2020): 162–63.DOI:10.33331/rechtsvinding.v9i2.455

Bima Danubrata Adhijoso, 'Legalitas Penerapan Smart Contract Dalam Asuransi Pertanian Di Indonesia',Jurist-Diction 2, no. 2 (2019): 395–414. https://doi.org/10.20473/jd.v2i2.14224

De Filippi, P., & Wright, A. (2018). Blockchain and the law: The Rule of Code. Harvard University Press, hlm. 74. https://doi.org/10.2307/j.ctv2867sp

Fikri, E. A, & Anggoro, T. (2022). Penggunaan Smart Contract Pada Teknologi Blockchain Untuk Transaksi Jual Beli Benda Tidak Bergerak. JISIP (Jurnal Ilmu Sosial dan Pendidikan), Vol. 6, No. 3.DOI: http://dx.doi.org/10.58258/jisip.v6i3.3301

Gabriella Mansula, Perlindungan Hukum Atas Penyelesaian Hukum Tidak Berfungsinya Proses Transaksi Melalui Smart Contract Pada Sistem Blockchain, Al Qodiri: Jurnal Pendidikan, Sosial dan Keagamaan Vol. 21, No. 2, 2023, hlm. 792.7

Primavera De Filippi dan Aaron Wright, Blockchain and The Law: The Ruleof Code, Harvard University Press, 2018, hlm. 74 http://repository.ubaya.ac.id/id/eprint/44811

Harahap, E. P., Aini, Q., & Anam, R. K. (2020). Pemanfaatan Teknologi BlockchainPada Platform Crowdfunding.Technomedia Journal,Vol. 4, No. 2, Februari. DOI: https://doi.org/10.33050/tmj.v4i2.1108

Reggie O'Shields, Smart Contracts: Legal Agreements for The Blockchain. Nort Carolina Banking Institute, Vol. 21, 2017, hlm. 177. http://scholarship.law.unc.edu/ncbi/vol21/iss1/11?utm_source=scholarship.law.unc.e2Fncbi%2Fvol21%2Fiss1%2F11&utm_medium=PDF&utm_campaign=PDFCoverPages

Reza Yogaswara, 'Artificial Intelligence Sebagai Penggerak Industri 4.0 Dan Tantangannya Bagi Sektor Pemerintah Dan Swasta', Masy. Telematika Dan Inf 10 1, no. 1 (2019): 68.DOI:10.17933/mti.v10i1.144

Savelyev, A. (2018). Contract law 2.0: 'Smart' contracts as the beginning of the end of classic contract law. Information & CommunicationsTechnology Law, 27(2), 116-134. https://doi.org/10.1080/13600834.2017.1301036

Yayan Hanapi. 'Perjanjian Terhadap Kontrak Perdagangan Melalui Internet'. Jurnal SuryaKeadila 3, no. 1 (2019): 1–20.

Z. Chen, H. Wu, X. Wang, J. Xu, W. Zou, L. Zhang, "Mutation Testing for Ethereum Smart Contract", ArXiv, arXiv:1908, (2019).