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LEGAL ASPECTS OF THE USE OF *BLOCKCHAIN* TECHNOLOGY IN *SMART CONTRACTS*

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ABSTRACT

Technology is developing so rapidly that it knows no boundaries. *Blockchain smart contracts* are one of the real proofs of technological development. This innovation was born out of the urgent need for faster, more convenient, and efficient digital transactions. Its existence is an extension of conventional agreements that have legal validity when the provisions as stated in Article 1243 of the Civil Code are fulfilled. This normatif juridical research is compiled using a statutory approach and the data is obtained from literature studies. Sources of data obtained from primary legal materials in the form of laws and secondary legal materials from literacy that have relevance to the issues raised are then processed with descriptive analysis methods. The objectives are to: 1) Know the legal aspects contained in the use of *Blockchain* smart contract technology; and 2) Knowing the legal settlement of disputes arising in the use of *Blockchain smart contracts*. The results of the study indicate that a *Blockchain* smart contract can be considered a valid agreement if it fulfills the 4 (four) elements of a conventional agreement along with other additional provisions. Its utilization in the cyber world creates friction with international law, so that the implementation, legal protection, and disputes that arise must also pay attention to the provisions of international law. This shows that the *Blockchain* smart contract is an innovation that provides convenience for the community which also requires more attention, especially its legal status in Indonesia.

Keywords: *Blockchain*; Law; Agreement; Smart contract; Technology

INTRODUCTION

Nowadays, the development of technology can no longer be stopped. Every day, new innovations are born that make human work easier.(1) This development has resulted in changes across a range of sectors, from those with a more straightforward focus, such as culinary arts, to those with a more expansive scope, such as trade. The pervasive use of technology has led to the emergence of a new domain that transcends traditional boundaries. (2) Technological developments are increasingly showing a positive trend at least when covid-19 hit. Many modifications to activities that were originally carried out face-to-face then switched and affiliated with the cyber world such as for example regarding contract agreements.(3)

Many people assume that a contract must be in writing, either made as a deed or just under the hand. Generally, an agreement contract is made by presenting all interested parties in one place and carrying out a mutual agreement by affixing their respective signatures on the agreement paper. The agreement is then used as the basis for a transaction involving an element of agreement on a matter that has great value. (4) But with the development of human needs, the need for electronic contract agreements is increasing.(5) There are various kinds of new things with various models, one of which is the presence of a *Blockchain* smart contract model in an agreement by linking artificial intelligence capabilities that have great potential in simplifying the process of making agreement contracts. (6)

Blockchain smart contracts are a revolutionary innovation that further facilitates the transaction process, especially for transactions carried out digitally and electronically. Its presence is an information infrastructure that facilitates the creation of contracts so that they can be implemented much more easily and efficiently. *Blockchain* is a program that allows the development of a system in a decentralized manner, where no single party controls its authority. Every party in the system has the same authority rights. This decentralized nature has a huge impact on the security and transparency of the system. (7) A smart contract is a system stored on a *blockchain* that is a computer protocol that facilitates and verifies the negotiation or execution of contracts digitally. Typically, *smart contracts* are used for process automation that can trigger subsequent actions when certain conditions are met. (8)

Blockchain in *Smart contracts* provides a set of exciting benefits as well as challenges to overcome. *Blockchain smart contracts* offer high security through the use of strong cryptography, thus minimizing the risk of manipulation or fraud in transactions. In addition, the transparency provided by *blockchain* technology allows all parties involved to access information openly and clearly. Speed and efficiency are also a plus, with the automation of contract processes reducing administrative costs and speeding up execution. However, behind these benefits, there are a number of drawbacks that need to be considered. One of these is the risk of errors in the smart contract code that can cause large losses and be difficult to fix once the contract has been executed. Furthermore, concerns have been raised regarding the reliance on *blockchain* technology and the challenges associated with scalability. Furthermore, the lack of fully defined regulatory and legal frameworks may present obstacles to the implementation of *smart contracts* in certain jurisdictions. (9)

Blockchain smart contract is a combination of 2 (two) computer systems that run together to form a program that facilitates the transactional process in which an agreement is required. Its use is not only limited to buying and selling transactions, but penetrates more broadly, for example in the banking sector, insurance, to the procurement and provision of services. This concept has been widely used in developed countries such as America and Singapore. In Indonesia itself, *Blockchain smart contracts* have not been widely found except in Qoo10 electronic transactions originating from Singapore. (10)

The legal basis regarding *Blockchain smart contracts* refers back to the legal basis for making conventional agreement contracts. Making agreements in general has been regulated in the Civil Code. Along with the law, considering its electronic form, the provisions are also regulated in Law Number 19 of 2016 concerning Amendments to Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law), Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions (PP PSTE) and Government Regulation Number 80 of 2019 concerning Trading Through Electronic Systems (PP PMSE) which specifically regulates the scope of trade. It is also supported by Law No. 08/1999 on Consumer Protection if there is a dispute over transactional activities.

Based on the description above, seeing that its use is still limited and there are still overlapping positions with contracts in general, in this study the researcher focuses on the legal aspects of *blockchain* in *smart contracts*. The aim is to find out what elements and legal aspects are contained in it. In addition, the results of this research are expected to be a contribution to science in the future, especially in the field of law regarding electronic agreements.

RESEARCH METHOD

This research is a normative juridical research or research that focuses on examining a phenomenon from a legal point of view. The data processed in this research is obtained through literature studies by utilizing data that has previously been available. The existing data are secondary data sources consisting of primary legal materials in the form of laws and regulations and secondary legal materials obtained from books, articles, journals, and other literature that have relevance to the issues studied. All data is then analyzed using descriptive analysis method to produce a paper that can be accounted for.

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RESULTS AND DISCUSSION

Legal aspects of the use of blockchain technology in smart contracts

Blockchain smart contracts are legal products that are born from technological developments. Technology is not only used for secondary needs but also has a positive impact on fields that have a standard impression such as law. *Smart contracts* are digital forms of contracts in general in the form of computer code that is written and operates in a *blockchain* or distributed ledger. (11) It is a derivative of *blockchain* where *smart contracts* run by utilizing *blockchain* data systems in the form of large digital data banks with the aim of executing contracts and executing the clauses contained in them automatically. The clauses can consist of payment, return, warranty, indemnity, and force majeure clauses. (12) This allows the agreement to be executed and enforce its provisions automatically, without the need for third-party intervention, through self-executing and self-enforcing mechanisms. (11)

The use of *blockchain* in *smart contracts* allows for the recording of all assets and transactions globally, with payments using cryptocurrency or the transmission of information in a decentralized data system. (13) Through this decentralized system, *blockchain*s work by processing uniform or similar data in each block, so changes to one block can impact the others. Each block in the system is connected sequentially through a set of characters that make up the information in the block, called a *"hash"*, so *blockchain* technology is immutable. (10)

Initially, *smart contracts* were born because of the increasing demand for digital transactions. *Smart contracts* facilitate the exchange of goods and services by providing services that are much easier, faster, more efficient, real time, and can be accessed anywhere at any time with just the internet. The use of *smart contracts* allows transactions that are only possible digitally such as buying and selling stocks, cryptocurrencies, and transactions of high value objects. (14)

Blockchain smart contracts are basically derivatives of conventional contracts. The most obvious difference lies in the situation where conventional contracts are written in writing, while *Blockchain smart contracts* are digital contracts that are written in the form of computer language. The difference between the two more or less leads to different legal consequences. Based on the

explanation above, the author finds legal aspects that need to be considered in the enforceability of *Blockchain smart contracts*, namely:

1. Jurisdiction in Cyber Space

Blockchain smart contracts are legal products whose enforceability is carried out digitally through cyberspace. The cyber world itself is not only limited to Indonesia, but also penetrates territorial boundaries internationally. Although its utilization is not specifically regulated, the legal provisions regarding *Blockchain smart contracts* in Indonesia have been stipulated in the Electronic Information and Transactions Law which is then supported by the Government Regulation on the Implementation of Electronic Systems and Transactions and the Government Regulation on Trading Through Electronic Systems. There are 2 (two) major divisions in the Electronic Information and Transaction Law, namely the first part which regulates information and electronic transactions and the second part regarding prohibited acts. (15) The execution of this law also considers the applicability of international laws such as the UNCITRAL Model Law on Electronic Commerce and the UNCITRAL Model Law on Electronic Signature to ensure legal protection for the public in conducting electronic transactions.

The Electronic Information and Transaction Law in its application is based on the principle of technology neutrality which can be interpreted that: a) legal provisions are not presented to provide restrictions on technological innovation but are used to prevent negative consequences that may arise from the use of these technologies; b) existing regulations will still apply regardless of the form of technology utilized; and c) regulators are prohibited from using regulations to lead the market to certain goals. (16)

The principle of technology neutrality opens up the most futuristic opportunities in creating a safe place with guaranteed legal certainty in the world of electronic transactions. This principle indirectly recognizes *blockchain-smart contracts* as electronic contracts. It shows that the use of *blockchain* technology systems in *smart contracts* does not make them merely considered as legal electronic information or documents but has a broader legal legacy.

2. The validity of Blochain *Smart contracts* as legal agreements

Blockchain smart contracts are often referred to as electronic agreements. Electronic agreements have the same legal consequences as conventional agreements, so this situation seems to make *Blockchain smart contracts* in which the provisions of agreements in general apply. Electronic

contracts are agreements that are deliberately made through electronic systems, while *smart contracts*, which are a special type of electronic contract, function to execute agreements automatically after the parties fulfill certain requirements that have been pre-programmed in the form of programming languages. (17) If explored further, there are many things that must be considered before finally stating that *Blockchain smart contracts* are a valid agreement in the eyes of the law.

An agreement is basically an agreement. Agreements by law are defined as actions to bind themselves to each other, even agreements that have been made and agreed upon are binding like a law for the parties who make them as stipulated in Articles 1313 and 1338 of the Civil Code. Both articles do not limit an agreement to a certain form, so as long as an agreement has occurred either in writing or in another form, the agreement is considered as one element of a complete agreement that can make an agreement valid if 3 (three) elements of the other 4 (four) are also fulfilled. (18)

Article 1320 of the Civil Code explains that an agreement has legality before the law if it fulfills 4 (four) elements, namely agreement, capability, a certain thing, and a halal clause. *Blockchain smart contracts* at first glance have similarities with conventional agreements, but it turns out that they cannot be explicitly equated. Agreements create legal consequences while *smart contracts* cause consequences in the form of actions. An agreement is born from an agreement, whereas a smart contract is realized when the parties have fulfilled the "if/then" formula in a programming language. The basic concept of *smart contracts* is to eliminate the need for a third party, allowing parties to connect directly through a virtual platform and execute legal transactions without the need for intervention from an authorized authority. (19)

Users typically utilize *Blockchain* smart contract innovations in transactional activities. Parties generally transact by utilizing *smart contracts* through *blockchain*. The transaction is allowed but not legally binding. *Smart contracts* can have the same legal force if their formation contains 4 (four) elements of a valid agreement. An agreement by a capable party on a certain lawful clause is then written in a computer programming language. In addition, the existence of an obligation clause is important. Although in *smart contracts* the obligation is automatically executed, but pouring it into program language makes it its own urgency so that when a situation occurs where the contract cannot be fully implemented, the injured party can take action in the form of a claim for a due performance.(19)

If the *Blockchain* smart contract has fulfilled the elements of a valid agreement, then the legal consequences of a conventional agreement apply to it. Given its digital condition, additional provisions also apply as Article 48 of the Government Regulation on the Implementation of Electronic Systems and Transactions regarding electronic contracts, one of which must be stated in Indonesian. (20) This provision is an additional obligation which means that in addition to being in computer language, in order to be considered valid as an agreement, the smart contract must also be made in Indonesian using standard clauses. Electronic signature is also an element that should not be underestimated. Article 1 (19) of the Government Regulation on the Implementation of Electronic Systems and Transactions states that an electronic signature is a tool to verify a digital document, so that its existence is an extension of evidence in procedural law to show the validity of an electronic agreement. Until here, it can be concluded that the *Blockchain* smart contract is legally considered valid as an agreement if the elements of the agreement are fulfilled without excluding other additional legal provisions.

3. Legal Protection in *Blockchain Smart contracts*

Legal protection arises as a result of the creation of legal products that are desired and regulated by the provisions of the Law. Legal protection is present to restore the rights that should be obtained by legal subjects. When an object or event is legally recognized in a legal context, then the object has the right to be protected by law in the event of a violation against it. However, the law cannot be effectively enforced if the object or event is not recognized by the applicable regulations or in other words, the legality of an object or event is a prerequisite for obtaining appropriate legal protection. The certainty that an object or situation is recognized by law is important to ensure that the rights associated with the object or situation can be effectively enforced and protected in the legal system.

Blockchain Smart contracts are not only used in buying and selling activities, but have been widely used in various sectors to provide convenience in human work. *Blockchain smart contracts* are widely used in transactional activities involving a group of parties. *Blockchain* Smart contract users will get legal protection if the existing contract is made in accordance with statutory provisions. This means that if at any time there is a violation, the law can be enforced by looking at the existing circumstances and legal facts, whether *Blockchain smart contracts* are used in buying and selling transactions or as a mere agreement.

When *Blockchain Smart contracts* are used in electronic buying and selling transactions, then in the event of violations against consumers, legal protection must be based on the Consumer Protection Law while also paying attention to the provisions in the Electronic Information and Transactions Law and other supporting legal regulations. For example, if a consumer suffers a loss from a transaction, he is entitled to compensation or compensation for the loss he experienced, either in the form of replacing the unit or replacing the nominal amount for the transaction that has been carried out.

If *Blockchain smart contracts* are used as the foundation for a valid agreement, then violations of the existing agreement can be submitted for legal resolution, in accordance with the provisions of civil law. This includes situations where there is a default, where one of the parties does not fulfill the agreed upon obligations, as well as cases where there is an unlawful act that harms one of the parties. *Blockchain smart contracts* provide a strong foundation for the enforcement of rights and obligations associated with electronic agreements. This shows that *Blockchain smart contracts* as long as they are carried out as applicable law, then users who experience losses are entitled to legal protection.

DISPUTE RESOLUTION AGAINST *BLOCKCHAIN* MISUSE IN *SMART CONTRACTS*

Today, the challenges that emerge from the cyber realm are increasingly diverse and complex. Every day, we are faced with new problems, including one related to the use of *Blockchain* smart contract technology. Although *Blockchain smart contracts* offer great potential in improving efficiency and security in online transactions, however, along with the benefits, there are also a number of issues that need to be addressed.

The initial problem that arises is the possibility of third-party disclaimers in *smart contracts* because execution can occur automatically. Third parties here can be interpreted as parties who also have an interest in an agreement, but notaries are the parties who have the most crucial role in making an agreement. Article 1 paragraph (1) of Law Number 30 of 2004 concerning Notary Position (UUJN) explains the role of notaries who have the authority to make authentic deeds including agreements. This provision seems to indicate that the agreement must be made authentically before a notary in order to have legal value before the law.(21) Even though there are some striking differences between conventional agreements and *smart contracts*, it does not mean that *smart contracts* lose

their legality because based on the provisions of article 5 paragraph (2) of the Electronic Information and Transactions Law, the expansion of electronic evidence is permitted as applicable provisions. This indicates that *smart contracts* still have binding legal force even though they are presented in electronic form and can be used as valid evidence when there is a dispute over an agreement.(22)

It is important to remember that the use of *Blockchain smart contracts* is not only limited to domestic transactions and agreements, but also often involves parties from abroad. This may result in the confluence of different laws when a problem arises. This suggests greater complexity in resolving disputes involving this technology, as it requires proper legal coordination between different jurisdictions.

In the event of a dispute in the utilization of *Blockchain smart contracts* in the country involving only Indonesian citizens, the settlement can refer to the applicable positive law, which in this case is based on the Provisions of Civil Law, the Electronic Information and Transactions Law and the Consumer Protection Law. According to the Provisions of Civil Law, when one party fails to fulfill an obligation or violates the rights of another party, that party can be sued on the basis of default in accordance with Article 1243 of the Civil Code. In addition, if one party suffers a loss due to unlawful actions by another party, then that party has the right to file a lawsuit for violation of law as stipulated in article 1365 of the Civil Code. If *Blockchain smart contracts* are used as the basis for transactions, such as in buying and selling, disputes that arise are more often related to default than violation of the law. However, if *Blockchain smart contracts* are only used as a tool to validate agreements, then both types of violations can occur.

The Electronic Information and Transaction Law also explains that if at any time a dispute arises from an electronic transaction, one of which can occur through a *Blockchain* smart contract, the injured party can file a civil lawsuit in court. Dispute resolution through arbitration or consumer dispute resolution bodies as stipulated in article 23 of the Consumer Protection Law is an alternative that can be considered to resolve disputes in a faster and more efficient manner than through litigation. (23) This demonstrates the flexibility of the legal system in handling disputes involving *Blockchain* smart contract technology, as well as giving the parties involved the option to choose the means of settlement that best suits their needs and interests. Dispute resolution emphasizes the principle of equal justice between the parties. (24)

It is different if the dispute contains international elements such as involving foreign subjects and

objects. When *Blockchain smart contracts* are made as the basis for electronic transactions, the cross-border foreign disputes that arise will require a choice of law to be applied. Article 18 of the Electronic Information and Transaction Law and Article 5 paragraph (2) of the Government Regulation on the Implementation of Electronic Systems and Transactions broadly states that parties to electronic transactions must determine the choice of law for a dispute that may occur. In the absence of such provisions, disputes will be resolved under international civil law.(25) This is in line with the principle contained in the agreement, namely freedom of contract. This can be interpreted that each party has the legal freedom to determine the choice of which law to apply as long as the chosen law is implemented based on good faith, has relevance and substantial relationship with the agreement made, and is not intended for legal smuggling.(26)

The Proper Law of Contract and the theory of The Most Characteristic Connection are two theories that are often considered in determining the applicable law to electronic commerce transactions, including transactions based on *Blockchain smart contracts*. Both offer different but complementary approaches in the context of globalization and the complexity of cross-border transactions. The Proper Law of Contract emphasizes the importance of determining the most appropriate law to govern a contract. The appropriate law is determined based on criteria such as the place where the contract is entered into, the place where the transaction is executed, and the nationality of the parties involved. This approach pays attention to justice and legal certainty in resolving disputes, and considers the interests of the parties involved in the contract. Meanwhile, The Most Characteristic Connection theory focuses on the most pertinent and significant element in a contract. This element can be the place of residence of the parties, the place of execution of the transaction, or the location where the contract has the greatest impact. This approach considers the practical and functional aspects of determining the applicable law, focusing on the interests and unique characteristics of each transaction. (27)

In the case of electronic commerce transactions that often involve multiple jurisdictions from different countries, both theories can be a useful foundation. Proper Law of Contract provides a solid framework for determining the appropriate law based on clear and measurable criteria, while The Most Characteristic Connection theory helps identify the most relevant and significant elements in the context of complex electronic transactions. The combination of these two theories makes decision-making regarding the applicable law more comprehensive and in accordance with the needs

of each electronic commerce transaction.

CONCLUSION

The conclusion of the legal aspects of the use of *blockchain* technology in *smart contracts* is that this technology has a significant impact on the field of law and electronic transactions. *Blockchain smart contracts* are legal products born from technological developments, enabling the automatic execution of contracts without third-party intervention, through self-executing and self-enforcing mechanisms. However, the use of this technology also raises a number of legal considerations that need to be taken into account. First, jurisdiction in cyberspace is important because transactions cross territorial boundaries, requiring good legal coordination between different jurisdictions. Indonesia's Electronic Information and Transaction Law has established a legal framework for the use of *Blockchain smart contracts*, with the principle of technology neutrality providing legal protection for the public. Second, the validity of *Blockchain smart contracts* as legal agreements requires the fulfillment of the elements of the agreement, including agreement, capability, certain objects, and halal. The basic concept of a smart contract is to eliminate the need for a third party, so its creation must pay attention to applicable legal provisions. Third, legal protection in the use of *Blockchain smart contracts* is important to guarantee the rights and obligations associated with this electronic agreement. This protection ensures that users who experience losses can file a dispute resolution lawsuit in accordance with applicable legal provisions.

Dispute resolution against *blockchain* misuse in *smart contracts* requires good legal coordination, especially in cases of disputes involving foreign subjects or objects. If the dispute does not involve foreign legal subjects and objects, then the dispute resolution is based on the applicable positive law, namely civil law by considering the provisions in the Electronic Information and Transaction Law and the Consumer Protection Law. Meanwhile, if the dispute involves foreign elements, there are 2 (two) theories that are often considered, namely The Proper Law of Contract and The Most Characteristic Connection theory. Both provide a useful foundation in determining the applicable law in electronic commerce transactions. Overall, the use of *blockchain* technology in *smart contracts* brings great benefits in the efficiency and security of online transactions, but also creates a number of legal complexities that need to be considered. Through understanding and following

applicable legal requirements, users can utilize this technology effectively and securely in their transactional activities.

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