

The Study of Smart Contract in the Hara Platform under the Law of Contract in Indonesia

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Abstract

Recently, the concept of smart contract has come to existence as an alternative for a more technologically sophisticated digital contract. Smart contract operates based on the blockchain technology, does not involve a third party and has self-executing ability; allowing an implementation of a contract with zero risk of failure. In regards to this, HARA, an agriculture start-up company, created a self-titled platform that focuses on data exchange in the decentralized agriculture sector in order to provide consumers with the access to data. Some of the data provided by HARA include farmer identifications; cultivation data; specific location data; ecology data; market information and transaction data which are collected from various sources. However, an in-depth study is required to better understand smart contract and its contract law application. This study is normative legal research and used the conceptual and statutory approaches. Smart contract and its self-executing or self-enforcing ability does not render a revision or renewal of the contract by the contracting parties impossible. In this case, the responsibility of the platform provider to meet the terms of the contract can still be requested. The concept of smart contract, which is also categorized as an electronic agent, has met the Indonesian requirements for contract validity. The distinct feature of a smart contract is its self-executing/self-enforcing ability. Furthermore, there are five legal relationships that exist among the users of the HARA application.

Keywords: Smart contract, Hara, contract law, Indonesia, data, self-executing.

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INTRODUCTION

The rapid changes and developments of digital technology has now affected the usage of contract whether in business or in other legal activities. Electronic contract, or in short e-contract, which has come to existence alongside with the development of information technology and the rapid increase of internet consumption in the 1990s in Indonesia [¹], has

now adjusted itself with the current trend by using a contract system that is more efficient namely the Smart Contract. This Smart Contract is a “disruption contract” that was created due to technological development, free competition and constantly-changing consumer needs.

Disruption [²] itself is a dramatic turn of event as a result of the existence of the future to the present.

¹ Sadryna Evanalia, Sejak Kapan internet ada di Indonesia, Retrieved from <https://www.kompas.tv/article/148177/sejak-kapan-internet-ada-di-indonesia> accessed on 29 April 2022. The number of internet users is increasing year by year and has an important role in various sectors of society, especially in e-commerce for business development. However, the strength and benefit of the internet is not absolute, considering the ever-increasing cybercrimes. This phenomenon is the background for the emergence of UU ITE or Law number 11 of 2018 which acts as a

respond to the problem of law vacuum that had happened during the earlier periods of technological information boom. See the history of UU ITE on the page <https://aptika.kominfo.go.id/2019/02/menilik-sejarah-uu-ite-dalam-tok-tok-kominfo-13/>

² Further reads on disruption innovation can be read on Clayton M. Christensen, et.all, “Disruptive Innovation: Intellectual History and Future Paths, Harvard Business School, Working Paper 17-057, 2016; Clayton M. Christensen, *The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail*, 1997, Harvard Business School Press, Boston, Massachusetts.

“Tomorrow is today” and it is not merely an ordinary change [3]. One characteristic of disruption is the presence of technology that allows the emergence of new products or services with affordable pricing, better quality, better speed, and ultimately better or easier access to consumers [4].

With such disruption, the development of technology combined with the trend of paperless campaign have initiated the concept of smart contract. This situation makes smart contract deemed as a fresh innovation within the contract or agreement sphere, even though e-contract has existed earlier. The smart contract system itself has already existed since 1994, initiated by one Nick Szabo, a law graduate, a cryptography expert and a computer scientist. Smart contract utilizes a technology called blockchain which consists of a structure of computer algorithm. In its implementation, smart contract has its own distinct characteristics which are the absence of a third party (middleman) [5] as an intermediary, the tracking ability and its automatic function [6].

Unlike the traditional contract system where its implementation relies on the independence of the involving parties, smart contract has the ability (or at least partially) to perform the contract through a computer, without direct intervention from the contracting parties [7]. The system of smart contract is indeed relatively new in Indonesia. And considering the

fact that there are many nations that have started to develop the law of contract in the last few decades, the language of smart contract (the usage of code, “code is law or law as code) [8] is still considered unfamiliar. However, it is undeniable that the smart contract system is needed in various sectors such as banking and finance, insurance, government administration, agriculture, healthcare, etc [9].

In Indonesia, particularly in the food and agriculture sector, HARA, which is an agricultural start-up company and at the same time a platform for data exchange, has implemented the smart contract system and has been in operation since 2015 [10]. HARA focuses on data exchange within the decentralized agriculture sector in order to provide consumer with the access to data. This data exchange is traceable, transparent, and also safe because it uses the blockchain technology. Some of the data provided by HARA include farmer identification; cultivation data; specific location data; ecology data; market information and transaction data that are collected from various sources [11].

Considering the importance of smart contract for business activities in the HARA platform, it is necessary to conduct an in-depth and comprehensive research about “The Study of Smart Contract in the Hara Platform for the Law of Contract in Indonesia”. Based on the introduction of the problem above, this research contains the following 2 (two) problem formulations, namely:

1. The characteristics of smart contract based on the Indonesian contract law.
2. The legal relationship between the smart contract parties in the HARA Platform.

RESEARCH METHOD

This research is a legal normative research with conceptual and statutory approaches. The statutory approach is a research approach method which is conducted by reviewing all laws and regulations related

³ Rhenald Kasali, *Self-Disruption*, 1st ed, Mizan, Jakarta, 2018, p. 111; see Inda Rahadiyan and Nikmah Mentari, “Keterbukaan Informasi Sebagai Risiko Peer to Peer Lending (Perbandingan Antara Indonesia dan Amerika Serikat)”, *Ius Quia Iustum Law Journal*, Vol.28, Issue 2, May 2021, p.326.

⁴ Rhenald Kasali, *Ibid*, p. 117.

⁵In relation to the role of a third party, the third party is not actually eliminated in smart contracts. However, their role is completely different, or in other words, the role of a third party is still required but will act in a different manner. See Ruben (R.W.H.G) Schulpen, *Smart contract in the Netherlands: A Legal Research Regarding the Use of Smart Contract within Dutch Contract Law and Legal Framework*, Master Thesis International Business Law, Tilburg University, 2018, p. 11. (sub-chapter on Involvement of third parties)

⁶ Andrew Tar, *Smart Contracts, Explained (Coin Telegraph)* <<https://cointelegraph.com/explained/smart-contracts-explained>> accessed on 21 August 2018 cited from Dzulfikar Muhammad, “Karakteristik Perjanjian Jual Beli Dengan Smart Contract dalam E-Commerce”, *Juris-diction: Vol.2 No.5*, September 2019, p. 1656.

⁷ Clifford Chance Report, “Are Smart Contracts Contracts?”, December 2017, Retrieved from <https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2017/08/are-smart-contracts-contracts.pdf> accessed on 20 January 2022, p.3; see also Ruben (R.W.H.G) Schulpen, *Op.Cit*, p. 16.

⁸Further reads on Code is law or law as code can be read on Ruben (R.W.H.G) Schulpen, *Ibid*.

⁹See Hussein Elasrag, *Blockchains for Islamic Finance: Obstacles & Challenges*, Munich Personal RePEc Archive (MPRA), Paper No. 92676, 6 March 2019, p. 6.

¹⁰ Hara.ag, About us, Retrieved from <https://www.hara.ag/about-us>, accessed on 10 April 2022.

¹¹ Haratoken, Retrieved from <https://haratoken.io/> accessed on 10 May 2022; see also : HARA, *Blockchain untuk Pilihan yang Lebih Baik: Pertukaran Data Berbasis Blockchain Secara Global & Transparan*, Whitepaper v1.03, 2019, accessed on 10 April 2022.

and relevant with the legal issue being discussed [12]. While the conceptual approach is a research approach method which is conducted by reviewing viewpoints based on doctrines in legal studies [13].

RESULT AND DISCUSSION

1. The Characteristic of Smart Contract based on the Indonesian Contract Law

The perks of electronic facilities are indeed important in the world of contract. However, not so different from conventional contracts, it is still possible for e-contracts to have revisions or *addendum* mid-transaction, and not to mention the possibility of a breach of contract. In other words, e-contract is essentially a paperless conventional contract. The only difference is the platform. Consequently, the development of internet technology, which now has shifted into digital technology, has provided an alternative for doing contract. That alternative minimalizes unwanted changes as well as the risk of breach of contract and other forms of fraudulence. That alternative is called smart contract with blockchain technology.

Smart contract is an electronic agreement written in computer code and operated in a blockchain or distributed ledger so it can be enforced and obey the terms of the contract automatically (self-executing/self-enforcing) [14]. The concept of blockchain technology allows the registration of all assets and global transactions with payment methods of either cryptocurrency or information transmission in a decentralized data system [15]. With a decentralized system, blockchain operates by processing identical data in each block so that changes that occur in a certain block may affect the other blocks. Each block in this system is continually connected through a set of characters that composes information in that block which is known as *hash* [16], making this blockchain technology immutable [17].

Smart contract consists of programming codes where the agreement or contract is registered. As a result, the rights and duties in regards to the contract implementation is already applied in the smart contract, even before the smart contract itself come into force. This coded agreement can be seen as a condition prior to a consequence: if the terms of both A and B are fulfilled, the consequence or C will be automatically enforced by the smart contract. The smart contract, unlike the traditional contract, acted as an autonomous agent that operates fully in blockchain and “eliminates human from the circle” [18] or erases the role of humans in the execution of a contract. Therefore, the smart contract operates automatically purely based on the instruction that has been established within the code of that smart contract. In this context, the smart contract itself will ensure the execution of the contract if the formatted prerequisites are fulfilled [19].

Smart contract is the application of the blockchain platform which has the aim to determine consensus between the contracting parties based on the adopted type of consensus and applied in the form of script or code that acts as the business logic pertaining to the usage of the system or application based on the blockchain technology [20]. Smart contract and blockchain which is more commonly known as Distributed Ledger Technology (DLT), are often assumed to be the same thing, even though, despite their complementary feature to each other, they are essentially two different technologies. In relation to smart contract, the blockchain technology or DLT acts as a platform that has the function to store contracts that have been made in the form of codes, and also to initiate contract execution automatically once the conditions are met. The role of blockchain and smart contract shows that there is a relatively new technology that transforms DLT into a contract-implementing system that serves as a storage platform as well as to

¹² Abdulkadir Muhammad, *Hukum dan Penelitian Hukum*, 2004, 1st ed, Bandung, PT Citra Aditya Bakti, p. 19

¹³ *Ibid.*

¹⁴ Gates, M. (2017). *Blockchain: Ultimate guide to Understanding Blockchain, Bitcoin, cryptocurrencies, smart contracts and the future of money* (pp. 3–5) cited from Eureka Inola Kadly, Sinta Dewi Rosadi, Elisatris Gultom, “Keabsahan Blockchain-Smart Contract Dalam Transaksi Elektronik: Indonesia, Amerika dan Singapura”, *Scientific Journal of Sosio Humaniora*, Vol.5, No. 1, June 2021, p. 205.

¹⁵ Melanie Swan in Herian, R. (2018). Legal Recognition of Blockchain Registries and Smart Contracts. December 2018, 48. <https://doi.org/10.13140/RG.2.2.12449.86886/1> cited from Eureka, *Ibid.*

¹⁶ Mathematical process or function that consists of data from various sizes that are stored in a sequence of

operation. The sizes of the data are permanent and important, especially if its related with a large transaction. Further explanation can be accessed on Bitocto.com, Apa itu hash, Retrieved from <https://bitocto.com/octopedia/apa-itu-hash/>, accessed on 7 June 2022.

¹⁷ Eureka, *Lock.Cit.*

¹⁸ P. Kasireddy, “Bitcoin, Ethereum, Blockchain, Tokens, ICOs: Why should anyone care?”, July 2017, cited from Ruben (R.W.H.G) Schulpen, *Lock.Cit.*

¹⁹ *Ibid.*

²⁰ Laurance, T. (2017). *Blockchain for Dummies*. cited from Dzaki Ahmad Badawi, *Sistem Verifikasi Dokumen Hasil Investigasi Forensik Digital Berbasis Teknologi Blockchain*, Skripsi, Prodi Teknik Informatika, Fakultas Teknologi Industri, Universitas Islam Indonesia, 2019, p.4.

respond to certain conditions which have been determined prior [21].

Smart contract is the application of the blockchain platform which has the aim to determine consensus between the contracting parties based on the adopted type of consensus and applied in the form of script or code that acts as the business logic pertaining to the usage of the system or application based on the blockchain technology [22].

In order to be able to do transaction with the blockchain technology, there are two conditions that have to be met [23]:

1. The mutual consent to do transaction without the service of a bank or a third party
2. There must be at least three individuals who agreed to utilize digital money in the form of cryptocurrency (blockchain)

The subsequent mechanism is that the contract between the parties should be formulated in the relevant programming language, which then will be transferred to blockchain and executed automatically when the previously-coded terms of the contracts are fulfilled [24]. Based on a study by Marcello Corrales *et al.*, titled "Legal Tech, Smart Contracts and Blockchain", it is stated that smart contract is not a conventional contract that is written on a paper, and even though smart contract is performed electronically, there are differences with electronic contracts in general such as the clauses of the agreement are in the form programming code, it needs blockchain as a storage distribute technology, and its ability to self-execute/self-enforce [25].

The self-executing feature in a smart contract has similar aim with the rights and duties in a traditional contract because each of them are designed to achieve

the agreed goals [26]. Traditional contract determined the exact rights and obligations of the contracting parties, and also ensuring enforcement and remedy if a breach of contract occurs [27]. Meanwhile, smart contract operates independently by default, which means that every obligation is prompted by the previous transaction [28]. Its self-executing feature enables smart contract to operate as an independent intermediary between the contracting parties due to the conditional "if/else" statement that controls the contractual obligations of the parties and enforce them [29].

Unlike other contracts in general, smart contract is designed by using cryptograph codes, which makes the implementation of smart contract is done automatically, written by using codes and established with the complex if-then statement, or the contract will be concluded when the terms of the contracts are fulfilled. Therefore, smart contract is able to eliminate the requirement of a third party, and so the contracting parties are the only parties in the contract where they interact directly [30]. Smart contract has a different concept with conventional contract. Compared to the theory of conventional contract, smart contract is more similar to an offering expression [31]. Therefore, smart contract reduces the risks of a poorly-drafted contract and ensure certainty because of the clear condition statements which is formatted into the smart contract as a part of its coding [32]. Smart contract decreases the

²⁶ Riccardo De Caria, "The Legal Meaning of Smart Contracts", *European Review of Private Law*, 6, 2019, p.747.

²⁷ *Ibid*, p.747.

²⁸ Stuart D. Levi. *An Introduction to Smart Contracts and Their Potential and Inherent Limitations*, HARV. L. SCH. F. ON CORP. GOVERNANCE AND FIN. REG. (May 26, 2018), <https://corpgov.law.harvard.edu/2018/05/26/anintroduction-to-smart-contracts-and-their-potential-and-inherent-limitations/>. . cited from Jennifer L. Frank, "Blockchain Functionality: How Smart Contracts Can Save Small Farms," accessed through an electronic copy available at: <https://ssrn.com/abstract=3662648> , p.8. accessed on 10 May 2022.

²⁹ *Ibid*.

³⁰ Dwi Hidayatul Firdaus, "Aplikasi Smart Contract dalam E-commerce Perspektif Hukum Perjanjian Syariah", *Qolamuna Journal*, Vol. 6, No. 1, July 2020, p. 39

³¹ Jung, Gyung-Young, "A Legal Study on the Smart Contract based on Blockchain", *Korea Legislation Research Institute, Research Report*, 2017, p. 4

³² Aaron Wright & Primavera De Filippi, *Decentralized Blockchain Technology and the Rise of Lex Cryptographia*, 10–11 (March 12, 2015), https://www.intgovforum.org/cms/wks2015/uploads/proposal_background_paper/SSRNid2580664.pdf (defining smart contracts as "digital, computable contracts where the performance and enforcement of

²¹ Marcelo, "Legal Tech," p. 18. cited from Sabrina Oktaviani dan Yoni Agus Setyono, "Implementasi Smart Contract Pada Teknologi Blockchain Dalam Kaitannya Dengan Notaris Sebagai Pejabat Umum", *Kertha Semaya Journal*, Vol. 9, No. 11, 2021, p. 2215-2216.

²² Laurance, T. (2017). *Blockchain for Dummies*, cited from Dzaki Ahmad Badawi, *Lock.Cit*.

²³ Ida Bagus Prayoga B, *Teknologi Cryptocurrency di Era Revolusi Digital*, The 9th National Seminar Proceeding on Information Engineering Education (SENAPATI), Bali 08 September 2018, p. 175.

²⁴ Richard Baron, "Blockchain and Smart Contract," p. 5. cited from Sabrina Oktaviani, *Op.Cit*, p. 2216.

²⁵ Marcello Corrales, Mark Fenwick dan Helena Haapio, "Legal Tech, Smart Contracts and Blockchain," (Singapore: Springer Singapore, 2019), p. 20. cited from Sabrina Oktaviani, *Op.Cit*, p. 2208

potential risks of a breach of contract which will automatically prompt obligations for each party [33]. Overall, a properly-drafted smart contract will help to overcome problems that are often founded in traditional contract such as higher cost, inconsistent contract interpretation, unpredicted remedy, and arbitrary complexities. While smart contract provides clear and concise terms, operating independently without the role of a lawyer, and remedies enforced by the court system [34].

The distinct characteristics of smart contract consists of immutability (as long as the parties do not decide otherwise); transparency (when the blockchain becomes public); serving digitally; interface that allows external interaction; there is no central control/supervision over the transaction and enforcement of the contract; and the contracting parties do not have to disclose their identities to anyone or may remain anonymous if they wish to do so [35]. According to the perspective of the law, smart contract is a contract with an execution automation that does not rely on the State in its implementation, which is a way for the contracting parties to make certain of the fulfillment of the contract [36]. Effectively, the implementation of contract is “outsourced” to a decentralized network from cryptocurrency which underlies it which by definition is an independent/neutral independent. At the same time, the implementation of smart contract may not be halted once it is in effect. This particular feature is usually seen as an advantage. In order to be able to halt a performing smart contract, a specific code has to be embedded prior, but this alternative is usually undesirable [37]. In other words, smart contract should not be modified once the blockchain structure is formed.

The concept of smart contract which is adopted from the vending machine mechanism, initiated transaction with a contract as a straightforward transaction, where the role of the buyer includes two things such as (1) choosing the desired product, and (2) to make payment with consideration [38]. Thus, vending machine as the simplest illustration on how smart contract works goes to show the important role of

contractual conditions occur automatically, without the need for human intervention.”). cited from Jennifer L. Frank, *Lock. Cit.*

³³ *Ibid.*

³⁴ *Ibid.*

³⁵ Monika di Angelo. “Smart Contracts in View of the Civil Code,” SAC ’19, April 8–12, 2019, Limassol, Cyprus, p.3.

³⁶ *Ibid.*

³⁷ *Ibid.*

³⁸ Herian, R. (2018). Legal Recognition of Blockchain Registries and Smart Contracts. December 2018, 48. <https://doi.org/10.13140/RG.2.2.12449.86886/1> cited from Eureka, *Op.Cit.*, p. 205.

machine to operate based on a contract or agreement that is simple, automatic and swift. Although in practice, there are several issues that occur such as problematic transaction, non-performing contract, errors or infringements that do not have a clear settlement mechanism [39].

Smart contract implements its obligation independently or automatically based on its own digital code. For instance, if there is a bug [40] in a smart contract between A and B, and A has promised to transfer his/her property in exchange for a sum of money promised by B, A still has the obligation to transfer the property to B even if the smart contract itself does not work (similar to a vending machine that does not deliver the chosen product after receiving the coin, it is obvious that the owner of the vending machine still has the obligation to deliver the product in question) [41]. Hence, if an error within the system occurs due to a cyber-attack which resulted in a non-performing smart contract, the second party still have the duty to perform their obligations manually, if the first party has performed his/her obligation, *vice versa*.

Technically, the design and implementation of smart contracts are different from the conventional ones, but both contracts are similar based on their purpose. Identical to conventional contract, the parties in a smart contract predetermined the terms of the agreement which then are translated into reciprocal obligations [42]. Indeed, the drafting of a written conventional contract is not the same with smart contract that uses programming language, but the core idea remains the same, where the parties arranged an agreement first and subsequently modified it into programming codes. At this level, the conventional contract is the very basic stage in the stages of contract between the parties that legally bind themselves to an agreement [43]. There is a slight difference between smart contracts and vending machines or software that suspends sits service of there is an overdue payment. For example, Netflix provides video streaming services for its users to watch legally if the pay the periodic subscription fee. In a situation where the payment is overdue, the system will temporarily suspend its service and disallow the user to log in. Any error or malfunction caused by either humans, its own software,

³⁹ *Ibid.*

⁴⁰ Bug in the computer world is defined as a mistake or error of a source code that causes a program to produce something undesirable or even something that leads to a state of crash. A computer bug can affect the performance of an application. See Patrick Trusto Jati Wibowo, Apa itu bug ?, Retrieved from <https://wartaekonomi.co.id/read373992/apa-itu-bug>. accessed on 8 May 2022.

⁴¹ Riccardo De Caria, *Lock. Cit.*

⁴² Sabrina, *Lock. Cit.*

⁴³ *Ibid.*

or the smart contract itself, in practice, apparently does not make any difference [44] that is legally relevant. Each and every smart contract is regulated and guaranteed by law, and its contracting parties have the freedom to file for a compensation to a court of law if the agreement is nullified or tampered by a malfunction due to a bug in the system [45]. Smart contract also encompasses the existing fundamentals of contract law [46]. In other words, smart contract does not need its own new and specific set of rules. On the contrary, the fundamentals of contract law will be adapted or adjusted statutorily or legally to explicitly handle smart contracts and other new technologies. There is a substantial time gap between the adoption of technology with its legal adjustment [47]. Smart contract provides many benefits and assistance for efficiency, productivity, and certainty respective to the law. For instance, if a smart contract is operating illegally, that makes the contract null and void [48].

The procedure of a smart contract that involves the role of blockchain in a transaction can be divided into two types [49]:

- a. *On-Chain Transaction*: This is a smart contract transaction that happens in a blockchain. This type of transaction covers only the contracting parties, excluding the third party. Thus, smart contract is said to have the feature of “not involving a third party”. The process of this transaction starts from the drafting of terms and conditions or contract clauses about objects or products to be sold and turn them into programming codes, which then will be uploaded and stored to the blockchain platform. After the smart contract is saved within the blockchain, it will be forwarded to the sell and purchase platform for marketing. If there is a potential buyer who is interested and agree with the terms and conditions of the contract, the buyer may sign and verify their identification by submitting their personal private key and make payment according the agreed amount in the contract. The payment fund will be transferred to the seller once the

buyer received the product according to the contract. At this point, the transaction is considered finished.

- b. *Off-Chain Transaction*: Unlike the on-chain transaction, the off-chain transaction is a smart contract transaction that happens outside the blockchain technology. As a result, a third party may get involved, such as banks in relation to payments. However, the role of a bank in this case is limited only to provide additional information required for the transaction. Before that transaction is submitted into the blockchain and used by the smart contract, that information must be firstly filtered and verified by a software called “Oracle”. If the information is declared eligible, only then the smart contract can make use of that information.

Based on the above description, the special specifications of a smart contract are as follows [50].

1. Electronic;
2. Implemented by a software. The idea is that “code as law”. The conditions of the contract are determined in the software with computer code. Therefore, smart contract is not only regulating the relations between the parties but it is also a computer program based on the intellectual property law;
3. Legal certainty. When conventional contracts are interpreted verbally and written by humans, smart contract is formed by computed codes and interpreted by the computer itself;
4. Conditional. The computer code follows the logic of “if and then”. The contracting parties will determine the terms and conditions of the contract;
5. Self-enforcing. After the smart contract is approved, the contract is self-executing and does not need a special permission. Thus, the contracting parties (or even the third party) do not have any authority to stop the contract despite of any intention of revision that may occur in the future;
6. Self-sufficient.

Despite of its benefits, smart contract does have a couple of limitations that may hinder its adoption, such as [51]:

⁴⁴ Riccardo De Caria, *Lock.Cit.*

⁴⁵ M.L. Perugini & P. Dal Checco, ‘Smart Contracts: A Preliminary Evaluation’ (December 2015), p 25. cited from Riccardo De Caria, *Lock.Cit.*

⁴⁶ P. CatchlovE, ‘Smart Contracts: A New Era of Contract Use’, cited above, note 10, p 15–16. cited from Riccardo De Caria, *Lock.Cit.*

⁴⁷ *Ibid*, p. 748.

⁴⁸ *Lock.Cit.*

⁴⁹ Luis Alejandro Estoup, “Smart Contracts and Smart Derivative Contracts: Legal Guidelines,” [https://uk.practicallaw.thomsonreuters.com/w0219121?ttransitionType=Default&contextData=\(sc.Default\)](https://uk.practicallaw.thomsonreuters.com/w0219121?ttransitionType=Default&contextData=(sc.Default)), accessed on 2 September 2021 cited from Sabrina, *Op.Cit*, p. 2214.

⁵⁰ Savelyev, A. (2016). *Contract Law 2.0: Smart Contracts as the Beginning of the End of Classic Contract Law*. [online] National Research University Higher School of Economics, p.11-16. Available at: <https://ssrn.com/abstract=2885241> accessed 10 Mar. 2018, cited from Tanash Utamchandani Tulsidas, *Smart Contracts From a Legal Perspective*, Final Degree Work, Academic Course (2017-2018), Faculty of Law, Universitat d’Alacant, p.15.

1. Embedded default rules. A smart contract is only as good as its own rules, condition, logic and scenario. Which means that the programming quality is the utmost importance. Smart contracts that only cover a few settings may not be able to perform a more comprehensive scenario. Knowing that smart contract is a computer program, all terms and conditions of the contract must be given a code. It is possible for a breach of contract or malfunction to occur if the code writer misinterprets or miscalculates.
2. Bug and code error. A bug or an error of a code may cause complication and procedural difficulties in identifying mistakes and to determine which party is responsible.

It is very important for a contract to guarantee and accommodate all expectations within the contract [⁵²]. Contract is a tool to ensure that the interests of the parties can be achieved. The law of contract is a legal instrument which regulates the exchange and at the same time protects the interest of the injured party [⁵³].

Beatson argues that there a few things that must be carefully considered when entering a contract [⁵⁴]:

1. Contract in general determines the value of exchange;
2. In a contract there are reciprocal obligations and standard of obligation performance;
3. Contract requires a rule about economic risk for the contracting parties;
4. Contract may regulate the possibility of breach of contract and its legal consequence.

It is also important to know when and how a contract is valid and lawful. One way to examine the validity of a contract is to see whether the contract has fulfilled the requirements of a contract based on the prevailing law. In Indonesia, the relevant legal basis is article 1320; the second book of the Indonesian Civil Code (ICC) and other articles (*vide* article 1335; 1337; 1339; 1347). Article 1320 stipulated that there are four requirements for a contract to be valid and to be legally binding: 1) both parties consented to legally bind themselves to the contract; 2) both parties are legally

capable; 3) a certain object in the contract; and 4) a lawful cause [⁵⁵].

The requirements of contract mentioned above is fundamental to the validity of a contract in any types or forms. However, considering that smart contract is a self-executing contract that uses programming language or codes, therefore the Law number 11 of 2008 concerning Information and Electronic Transaction (UU ITE), with its changes Law number 19 of 2016, also apply. Additionally, its implementing rules also apply which are the Government Regulation number 71 of 2019 about System Administration and Electronic Transaction (PP PSTE) and Government Regulation number 80 of 2019 about Trade Through Electronic System (PP PMSE).

Article 46 clause (2) of PP PSTE which regulates about electronic transaction based on electronic contract, stipulates that there are four requirements for an electronic contract to be valid: a) there are consent of both parties; b) conducted by a capable legal subject or someone capable to represent according to the prevailing law; c) there is a certain object in the contract; and d) the object transaction shall not violate the prevailing law, morality, and public order. Meanwhile, PP PMSE which is a government regulation does not provide any clear requirements on the validity of a contract [⁵⁶].

Smart contract is a self-executing contract where it allows a transaction that does not require the contracting parties to directly meet. *In casu*, the contracting parties are doing their transaction activity based on trust with each other [⁵⁷]. The condition of mutual consent happens where there is a respond to the seller's offer by the buyer through a payment mechanism which represents as a declaration of agreement. This situation fits with the Agreement theory (*Ontyangstheorie*) which is also adopted in article 20 of UU ITE [⁵⁸]. Acceptance is one of the

⁵⁵ Agus Yudha Hernoko, *Hukum Perjanjian, Asas Proporsionalitas dalam Kontrak Komersial*, Kencana, Jakarta, 2014, p. 156

⁵⁶ Eureka Inola Kadly, *et.all*, *Op.cit*, p. 200

⁵⁷ Ni Putu Debby Chintya Kirana et, al., "Penyelesaian Sengketa Konsumen dalam Transaksi Jual Beli Melalui Media Sosial Instagram", *Kertha Semaya*, Vol. 7, No. 1, 2018, p. 2. cited from Laila Alfina Mayasari and Dedi Farera Prasetya, "Urgensi Penggunaan Smart Contract Dalam Transaksi Jual Beli E-Commerce", *Lex Generalis Law Journal*, Vol.3, No.4, April 2022, p. 328.

⁵⁸ Clause (1) Unless determined otherwise by the contracting parties, electronic transaction happens when the transaction offer sent by the sender is received and accepted by the receiver. Clause (2) The agreement over the electronic transaction offer as mentioned in clause (1) must be done by electronically stating the will to accept.

⁵¹ Scalable solutions.io, News: Smart Contracts and their Characteristics, Retrieved from <https://scalablesolutions.io/news/smart-contracts-and-their-characteristics/>, accessed on 20 Mei 2022..

⁵² See Ninis Nugraheni, "Crowdfunding-Based Fiduciary Warrant in Providing Capital Loans for Small and Medium Enterprises", *Hasanudin Law Review*, Vol.6, Issue 3, December 2020.

⁵³ Sogar Simamora, *Hukum Kontrak*, Laksbang Pressindo, Surabaya, 2017, p. 26.

⁵⁴ Jack Friedman Beatson, Daniel (ed), *Good Faith and Fault in Contract Law*, Clarendon Press, Exford, 1995, p. 3, cited from Sogar Simamora, *Op.Cit*. p. 25

forms of a statement of will that produces consent. Acceptance (*acceptatie, aavaarding*) is a statement of will of a party to approve an offer made by the other party in order to conclude an agreement or contract. Another form of a statement of will is an offer (*aanbod, offerte*). An offer is a form of a statement of will that contains an element of initiating an agreement [59].

The existence of the Agreement theory is a respond to the theory of Knowledge (*Vernemingstheorie*). In that theory, there is a drawback where it is relatively difficult to determine an agreement because it is uncertain if the buyer either knows the details of the offer or not. Therefore, the Agreement theory emphasises that when an offer has been accepted, despite whether the offer has been carefully read by the buyer or not, the transaction still continues. This theory has become a *communis opinio docturum*. Referring to its form which is a computer code, smart contract can legally bind the contracting parties because of its legal basis on contract law [60]. Which in this case is the requirements of contract stipulated in article 1320 of ICC and PP PSTE. An agreement through an electronic media, including a smart contract, occurs when the receiver delivers an application or a recipient form pursuant to article 20 of UU ITE.

Article 20 of UU ITE specifies that consent is proved through an action in line with the *ontyangstheorie* theory. The application of smart contract in Indonesia, based on the above provision, is allowed as long as it does not contradict with the prevailing law in Indonesia and in accordance with the principles adopted in UU ITE [61]. In relation to legal capacity, there is no guarantee that the contracting parties are fully capable to do contract, or to put it simply, legally capable [62]. In electronic commerce or e-commerce industry, it is not uncommon to find standard contracts applied unilaterally by the seller. In practice, e-commerce does not set an age limit. Meanwhile, the buyer only has to give an agreement check or approve to the terms and conditions. Anyone as long as they can operate a computer and has an access to the internet, where most of them are actually teenagers, can do an online transaction. Consequently, if the subjective requirement of a contract is not fulfilled and the parents or guardians of the party do not

approve the transaction, then such transaction is voidable [63].

Taking into consideration the uniqueness of smart contract that uses the on-chain working system, where buyers have to verify their identities and submit their personal private key into the system, smart contract makes certain that the legal capacity requirement is fulfilled. Through a code setting that requires the receiving party to provide an authentic scan of their identity along with a selfie, identity card and even electronic signature, the system will automatically select the parties who are legally capable to do transactions.

In accordance to the objective requirement on article 1320 of ICC and article 46 clause (2) of PP PSTE about a certain object and a lawful cause that does not violate or go against the law, public morality and public order, the very purpose of smart contract is to make ease or simplify its own performance/enforcement. And so, the content of smart contract, similar to conventional or e-contract, does not go against the law. It is not the smart contract per se that might violate the law, but it is the content of the smart contract itself that might be unlawful. Hence, smart contract can still meet the elements of contract.

Agreements in a global scale, especially in the context of smart contract which can be done beyond international borders, creates a regulation that also applies globally. One of the examples is the United Nations Commission on International Trade Law (UNCITRAL). Pertaining to smart contract which is the development of e-contract, there is also UNCITRAL Model Law on Electronic Commerce adopted in 1996 [64].

The content of UU ITE in Indonesia is divided into two major parts: (i) rules on information and electronic transaction, and (ii) rules on prohibited action. These two rules were established by taking into

⁵⁹ Mr. J.H. Nieuwenhuis translation from Djasadin Saragih, *Pokok-Pokok Hukum Perikatan*, Airlangga University Press, Surabaya, 1985.

⁶⁰ Murphy, S., & Cooper, C. (2016). Can Smart Contracts Be Legally Binding Contracts? - Key Findings. An R3 and Norton Rose Fulbright White Paper, 6. Cited from Eureka, *Op.Cit*, p. 206.

⁶¹ Farhan Abel Septian Rachmadani, 'Tinjauan Yuridis Terhadap Legalitas Dalam Smart Contract Ditinjau Dari Hukum Positif Di Indonesia', 5 (2021), 650–64.

⁶² See article 1330 of Indonesian Civil Code on legal capacity jo Marriage Law and SEMA No.3 of 1961.

⁶³ See Sena Lingga Saputra, "Status Kekuatan Hukum Terhadap Perjanjian Dalam Jual Beli Online yang Dilakukan oleh Anak di Bawah Umur", *Wawasan Yuridika*, Vol.3, No.2, September 2019; Komang Srithi Pranisa, Komang Febrinayanti Dantes dan Ketut Sudiarmaka, "Analisis Kebasahan Perjanjian Dalam Transaksi Elektronik Melalui Media Facebook Advertising Ditinjau Berdasarkan Undang-Undang No.19 Tahun 2016 tentang Perubahan Atas Undang-Undang No.11 Tahun 2008 Tentang Informasi dan Transaksi Elektronik," *E-Journal of Yustisia Community University of Ganesha Education*, Vol.4, No. 2, 2021.

⁶⁴ UNCITRAL Model Law on Electronic Commerce with Guide to Enactment, 1996, with additional article 5 bis as adopted in 1998, promulgated by the UN General Assembly in the Resolution of 51/162 on 16 December 1996.

consideration various international legal instruments such as the UNCITRAL Model Law on Electronic Commerce and UNCITRAL Model Law on Electronic Signature. This is done with the aim to provide legal certainty for the business industry and society in general in doing electronic transaction [65].

The definition of contract gives a general description about electronic contract as an agreement formed in an electronic system. Hence, smart contract with the blockchain technology can be applied with its legal binding power. Moreover, just because of its automatic nature as an electronic system, it does not make it as an unlawful electronic transaction. UU ITE, PP PSTE, and PP PMSE define smart contract as an electronic agent that operates automatically to a predetermined or predefined terms [66]. In other words, blockchain-smart contract with its distinct feature of automation can be categorized as an electronic agent [67] pursuant to article 1 point (8) of UU ITE which defines it as a device of a system created to automatically execute an action based on electronic information. Article 47 of PP PMSE also stipulates that an electronic contract can be established based on its interaction with automatic device and the validity of such electronic contract cannot be challenged except it is proven otherwise that the automatic system did not work accordingly [68].

The electronic agent may be in the form of electronic data like a computer code or in another form. Hence, in reality, blockchain-smart contract does not have a “legal vacuum” problem in its implementation, or the absence of an applicable law. Article 37 of PP PSTE has clearly regulates the minimum standard of feature of a smart contract which must be available for its implementation, such as the feature to do correction; command cancellation; confirmation and reconfirmation option; process continuation or discontinuation; reviewing contract information or advertisement, transaction status check; and reviewing the contract itself prior transaction [69].

The risk of breach of contract may arise if undesirable situations occur. Some legal cases were handled by states according to their own laws and adjusting its norms with the implementation process of smart contracts. However, in reality, this open norm is rather difficult to be secured in a programming language and does not associate appropriately with smart contract (code is/as law) if the judge feels the

necessity to produce a decision afterward [70]. So far in the Netherlands, judges have adopted and used the interpretation doctrine in smart contract settlement cases. But there is still an obstacle for judges because the majority of them are having difficulties in comprehending programming language in smart contracts. Despite of that, smart contract is still admissible as evidence in the Netherlands court system, in accordance with article 152 paragraph (6) chapter 9 of Netherlands Code of Civil Procedure Law, where evidence can be submitted by any means.

Therefore, experts may provide some additional information to the judge and “translate” the programming language into a language easily understood by the judge. And also point out some features, bugs or errors that allows the judge to produce a decision to settle the smart contract dispute. To date, there is no court decisions pertaining to smart contract disputes. This is because there are many obstacles during the clauses examination in the smart contract. An interpretation based on Haviltex principle applies an interpretation that provides a larger consideration to a more textual interpretation, such as the utilization of blockchain, the contracting parties, and the purpose of the contract itself.

The Haviltex-based interpretation has the proclivity to be the leading or most preferred interpretation in examining smart contracts, because all contracts (including electronic contracts) must be examined corresponding to that interpretation under the Netherlands law. Consequently, all conditions and contexts must be reviewed based on equity and justice in order to assess whether or not the outcome of the smart contract will be affected.

Therefore, if one contracting party notices that there is an error or a breach of contract, that party has the right to sue the other party pursuant to article 6:265 of the Netherlands Civil Code and asks for a compensation based on article 6:271 of the same law. However, the act of termination or correction of a smart contract will be very difficult once it is stored in the blockchain. Unlike traditional contract, it is safe to assume that smart contract faces much more obstacles in its termination or correction once it is in effect and stored in the blockchain.

2. The Legal Relationship between the Smart Contract Parties in the HARA Platform

HARA adopts the blockchain technology in its sell and purchase transaction between farmers and other

⁶⁵ Eureka, *Op.Cit.* p. 205.

⁶⁶ *Ibid*, p. 209.

⁶⁷ In the Indonesian law, smart contract is equivalent with the definition of electronic agent and has been recognized by the UU ITE and PP PSTE. See Sabrina Oktaviani *Op.Cit.*, p. 2216

⁶⁸ Eureka, *Op.Cit.* p. 206

⁶⁹ *Ibid*, p. 206-207.

⁷⁰ Ruben Schulpen, ‘Smart Contracts in the Abstract’, *Smart Contracts in the Netherlands A Legal Research Regarding the Use of Smart Contracts within Dutch Contract Law and Legal Framework*, Llm, 2018, 57–90 <https://doi.org/10.1007/978-1-4842-3492-1_4>.accessed on 8 June 2022.

business groups such as banks, insurance, government, etc. The transacted data include the farmer's identity as the data provider; geotagging [71] such as area, location, and land ownership; cultivation such as types of plants, the fertilizer and drug used; ecology such as the weather and type of soil; including the value of crop selling transaction.

In order to complete its database, HARA is cooperating with several institutions namely PT Bank Negara Indonesia Tbk (BNI), agricultural research company, BOI research, government institution, and non-profit organization. From all that data, it is only the transaction value that still needs to be submitted manually, in line with the farmers' claim [72]. HARA utilizes near time data which is highly valuable to increase productivity, to reduce losses and to create market efficiency. The HARA team has been collecting data from various stakeholders for the last two years. In the transaction, the parties include the data provider who submit their data to HARA, and also the data buyer who needs the data for policy-making purposes. There is also the data qualifier whose responsibility is to guarantee the quality of the data, and a provided service to assist users in modifying raw data into references and reports [73].

Products from the HARA platform include [74]:

1. Decentralized Data Exchange – HARA ecosystem provides decentralized data exchange supplied by the data provider and to give access for data buyer. Supported by the blockchain technology, this exchange is traceable, transparent, and safe. Most of the data, including farmer identification, cultivation, specific location, ecology, market information, and transaction, are collected from various sources including from Internet of Things (IoT), satellites, farmers, government, experts, academicians, agricultural input manufacture, and other entities. These data providers are given the access to upload their dataset into the data exchange and sell their data to the data buyers through decentralized data exchange token.

2. Data Acquisition Application Sequence – Mobile application and web portal allow data providers to upload their data effortlessly. In exchange for their submitted and verified data, the data providers are rewarded with loyalty points. This loyalty points can be redeemed for other products and services, such as phone credit, discount for agricultural supplies, and education equipment. This mechanism encourages data providers to constantly upload and verify data into HARA's data exchange platform.

As mentioned before, there is an incentive system in the HARA platform to motivate data providers to submit data and to produce proper scalability. These data providers will be rewarded with incentives in the form of tokens and loyalty points [75], after they submit factual data that covers information on land/soil, weather cast, and Know Your Customer data (KYC) throughout Indonesia [76]. Based on the Indonesian positive law, the practice of smart contract is lawful as long as it does not contradict the prevailing law.

Subsequently, it is necessary to review the smart contract implementation within the HARA platform as an application that provides data exchange in Indonesia including agricultural documents such as planning schedule, crop type, harvest schedule, and yield [77].

Generally, how the HARA platform works is not entirely different from the other blockchain platforms. Blockchain has the function to register or record smart contract transactions responsibly, and to handle all token transaction within the ecosystem. Afterward, the data will be stored in a flexible cloud storage where it will be encrypted. There is also the analytic service that serves to detect fraudulence and to do verification in the application and lastly a security layer to decentralized the data [78].

Based on the objective requirement of contract validity in Indonesia, the object in the HARA platform has met that requirement. And as long as there is a

⁷¹ A process of adding data position information on the GPS in the form of latitude and longitude information in a digital photo. See Ulfani Defitria, Bayu Priyambadha, Denny Sagita Rusdianto, "Pembangunan Aplikasi Social Geotagging Destinasi Wisata Berbasis Android", Information Technology Development and Computer Science Journal, Vol. 2, No. 12, December 2018, p. 6611.

⁷² Setiyoso, Hara Platform: Helping All Sector Using Data Exchange, Retrieved <https://www.linkedin.com/pulse/hara-platform-helping-all-sector-using-data-exchange-setiyono/>, accessed on 10 May 2022.

⁷³ Marsya Nabila, Post: Hara Blockchain, Retrieved from <https://dailysocial.id/post/hara-blockchain>, accessed on 10 May 2022

⁷⁴ HARA, *Op.Cit.*, p. 7-8.

⁷⁵ Token is an incentive for the stakeholders which will turn into points to record transaction that aims to automatically distribute money. Those points can be redeemed for various products and services such as phone credits, discount on agricultural supplies, and education equipment. See HARA, *Lock.Cit.*

⁷⁶ Marsya Nabila, *Lock.Cit.*

⁷⁷ HARA, *Op.Cit.*

⁷⁸ Further explanation on blockchain technology utilized by HARA to support smart contracts can be accessed on: *Melihat Sisi Teknis HARA Bareng Kak Wina (Blockchain Developer HARA) Belajar Coding Blockchain*, Friends with Blockchain, Retrieved from <https://youtu.be/ng2wTm0XF4g> accessed on 22 April 2022..

mutual consent from the contracting parties, who act as the subjects of the smart contract, to voluntarily and legally bind themselves to an agreed contract, then the contract is valid and legally binds them.

The mutual consent of the contracting parties to a smart contract will implicate the rights and duties of the parties in performing the contract. The rights and duties of the parties are manifested through their legal standings in the contract. In the HARA platform, the four main ecosystem and the field officers have different legal relationships:

1. Data Provider and HARA

The legal relationship between the data provider and HARA is known as Distributor Contract, where the data owned by the farmer/provider is distributed through the HARA application, and in return the provider will be given incentive in a form of points as a medium of exchange.

2. Field Officer and HARA

The legal relationship between the field officer and HARA is known as Service Sale Contract. The field

officer will receive incentive in the form of a medium of exchange from HARA if they assist providers to input data.

3. Data Buyer and HARA

The contract between the data buyer and HARA is a sale contract where there is data exchange transaction received from the data provider with tokens that happens in the HARA application platform.

4. Value-added Service and HARA

This relationship is established in a Distributor Contract based on the legal relationship between the data provider and HARA because the subject and object of the contract is the same. The value-added service is the increase of data input managed by the providers into the HARA platform in exchange of incentive points.

5. Data Qualifier and HARA

This particular legal relationship is based on a Sale Contract. The data qualifier is responsible to analyze and to produce assessment on the data uploaded by the data provider in the HARA platform. In return, the data qualifiers will receive incentives from HARA.



Illustration 1: The ecosystem and legal relationships of the parties in HARA platform [79]

⁷⁹ HARA, *Op.Cit.*, p.21.

In implementing smart contracts in the HARA platform, there is the risk of lawsuits that might happen between the contracting parties. In a situation of a contract violation or breach of contract in the HARA platform, the HARA application will send a notification of a violation report from the appointed data protection officer, who will then notify the supervisory authority and shareholders (data providers, data buyers, and value-added service provider) and further process the issue with utmost priority and without delay. One way to resolve the issue is to terminate the data by HARA.

The HARA data exchange supports the right over reactivation and termination. The data provider has the absolute right to control their data collection. When an account is deleted from the platform, its private key will also be terminated, implying the loss of appropriate and encrypted data.

CONCLUSION

Based on the discussion described above, several things can be concluded as follows:

1. The concept of smart contract, which is also categorized as an electronic agent, has met the Indonesian requirements for contract validity. The distinct feature of a smart contract is its self-executing/self-enforcing ability. Furthermore, smart contract also eliminates the role of a third party and it is not easily changeable. However, if the contracting parties are intending to make revision, there is the option to renew the contract without replacing the previous/existing contract.
2. There are five types of legal relationships between the parties or users of HARA platforms which connect directly with the platform without involving a third party.

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