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The Overview of Smart Contract: Legality and Enforceability

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ABSTRACT

The purpose of the research is to provide an overview of the legality and enforceability of smart contracts. The research aims to examine the legal implications of the use of smart contracts in agreements. The study used qualitative research. The type of this study is normative. The second primary legal are from journals, books, and news. The recognition of the validity of smart contracts can be achieved through the setting of special clauses in contracts that recognize their validity, especially in cross-border transactions that require the addition of choice of law and choice of jurisdiction clauses. Smart contracts offer a great opportunity to revolutionize business transactions and contract law with greater efficiency and autonomy. However, for this technology to be well integrated in the legal framework, it requires the development of regulations that address the challenges of legal validity, enforceability, jurisdiction, and data security. In Indonesia, although smart contracts are permitted, legal uncertainties in various jurisdictions indicate the

need for more dynamic legal adaptation to support the development of this technology.

Keywords: Enforceability; Legality; Smart Contract

I. INTRODUCTION

Blockchain technology has brought significant changes in many aspects of life, including the way contracts are created and executed. One of the innovations resulting from this technology is smart contracts, which are contracts that are executed automatically when agreed conditions are met. This concept offers a higher level of transparency, efficiency, and security compared to conventional contracts.

Imelda Martinelli states that the effectiveness of smart contracts can be seen from the aspects of transparency, security, and automation offered[1]. According to Hesti Ayu Wahyuni, the elements of the smart contract agreement have fulfilled the elements of the agreement[2]. However, regarding the validity of smart contracts, Korintus stated that it is difficult to fulfill some of the elements of Article 1320 BW because what is agreed by the parties may be contrary to applicable legal regulations as well as moral values or social order in the jurisdiction of one or both parties[3]. In addition, Ulul Azmi revealed that there are legal risks that can arise due to smart contracts because there are no specific regulations governing smart contracts in Indonesia[4]. Deeper research was conducted by Winda Fitri that sharia smart contracts have the opportunity to be enforced in Indonesia as long as they continue to involve sharia legal authorities, sharia experts, and sharia

[1] Martinelli, Imelda, et al. "Legalitas Dan Efektivitas Penggunaan Teknologi Blockchain Terhadap Smart Contract Pada Perjanjian Bisnis Di Masa Depan." *UNES Law Review*, Vol. 6, No. 4, 2024, pp. 10761–76, https://doi.org/10.31933/unesrev.v6i4.2049.

[2] Wahyuni, Hesti Ayu, et al. "Penggunaan Smart Contract Pada Transaksi E-Commerce Dalam Perspektif Hukum Perdata Di Indonesia." *Jurnal Hukum In Concreto*, Vol. 2, No. 1, 2023, pp. 1–11, https://doi.org/10.35960/inconcreto.v2i1.1018.

[3] Hutapea, Korintus, et al. "Keabsahan Smart Contract Dengan Teknologi Blockchain Menurut Kitab Undang-Undang Hukum Perdata." *Jurnal Hukum, Pendidikan Dan Sosial Humaniora*, Vol. 1, No. 3, 2024, pp. 86–94, https://doi.org/10.62383/aliansi.v1i3.177.

[4] Azmi, M. Ulul, et al. "Risiko Hukum Penggunaan Smart Contract Pada Ethereum Di Indonesia." *Locus Journal of Academic Literature Review*, Vol. 2, No. 3, 2023, pp. 235–42, https://jurnal.locusmedia.id/index.php/jalr/article/view/140.

financial institutions[5]. There are no research that focuses on the practical implementation of smart contracts in Indonesia. In addition, the previous research needs to be complemented with specifically examined how smart contracts can be integrated with Indonesian positive law.

Looking ahead, the legal framework for smart contracts will need to evolve to address the challenges posed by this new technology. This may involve updating existing contract law to account for digital and automated agreements, as well as developing new legal mechanisms for resolving disputes and enforcing smart contracts. In the meantime, businesses that use smart contracts will need to carefully consider the legal implications of their use, and take steps to ensure that their contracts comply with the relevant laws in each jurisdiction where they operate[6].

While smart contracts offer many advantages, there are major challenges related to their legality and enforcement. These challenges involve questions of whether smart contracts are legally recognized, how courts and legal authorities interpret such contracts, and how they are enforced in practice. In addition, regulatory differences across countries also complicate the adoption of smart contracts on a global level.

This research aims to provide an overview of the legality and enforceability of smart contracts. It is important to understand how this technology can be integrated into the existing legal system and what obstacles need to be overcome for smart contracts to be widely and securely adopted. Also, this research aims to examine the legal implications of using smart contracts in agreements.

This research is expected to provide a deeper understanding of the potential and challenges of smart contracts from a legal perspective, as well as offer relevant recommendations for the development of regulations that can support the implementation of smart contracts in various industry sectors.

The purpose of the research is to provide an overview of the legality and enforceability of smart contracts. To achieve this goal, the authors use qualitative research methods. The type of this study is normative. The second primary legal are from journals, books, and news. Technique and data collection procedure is a documentary study from

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[5] Fitri, Winda. "Kajian Penerapan Smart Contract Syariah Dalam Blockchain: Peluang Dan Tantangan." *JATISWARA*, Vol. 38, No. 2, July 31, 2023, pp. 223–32, https://doi.org/10.29303/jtsw.v38i2.526.

[6] Werbach, Kevin, and Nicolas Cornell. "Contracts Ex Machina." *Duke Law Journal*, Vol. 67, 2017, pp. 313–82, https://scholarship.law.duke.edu/dlj/vol67/iss2/2.

the journals and books. Documentary studies can explore relevant information that occurred in the past, present, and future 5. The method of data analysis are: first, the data analyzed is diverse that has different basic properties from one data to another. Second, the nature of the data analyzed is that it is entirely unity. It is characterized by a diversity of data and requires in-depth information[7].

II. DISCUSSION

2.1 Validity and Enforceability of Smart Contracts in E-Commerce Transactions in Law

The growing use of smart contracts in e-commerce transactions has raised numerous legal questions, particularly concerning their validity and enforceability under existing legal frameworks. Smart contracts, unlike traditional contracts, operate autonomously and are executed automatically when certain pre-defined conditions are met, without the need for human intervention. This characteristic of smart contracts introduces a new dimension of efficiency in business transactions, but it also poses significant legal challenges, especially regarding their recognition and enforceability in the context of e-commerce[8].

In traditional contract law, a valid contract must meet several essential criteria: there must be an offer, acceptance, consideration, and the intention to create legal relations. For a contract to be enforceable, it must comply with these legal principles, and the parties involved must be competent to enter into the contract. In the context of smart contracts, these elements are often embedded within the code itself, leading to questions about whether the execution of a smart contract can truly satisfy the traditional requirements for contract formation[9].

One of the key concerns surrounding the validity of smart contracts is the issue of "offer and acceptance." In a conventional contract, an offer is made by one party, and the

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[7] Djuniarti, Evi. "The Legal Position of Sumang Child According to Customary Law in Kopong Village of East Nusa Tenggara." *Jurnal Penelitian Hukum De Jure*, Vol. 22, No. 1, 2022, pp. 135–44, https://doi.org/http://dx.doi.org/10.30641/dejure.2022.V22.135-144.

[8] Savelyev, Alexander. "Contracts Law 2.0: Smart Contracts as The Beginning of The End of Classic Contract Law." *Information & Communications Technology Law*, Vol. 26, No. 2, 2017, pp. 1–24, http://dx.doi.org/10.1080/13600834.2017.1301036.

[9] Wright, Aaron, and Primavera De Filippi. "Decentralized Blockchain Technology and The Rise of Lex Cryptographia." *SSRN Electronic Journal*, 2015, https://doi.org/10.2139/ssrn.2580664.

other party accepts the offer, either verbally, in writing, or through conduct. In the case of smart contracts, offer and acceptance are represented by the execution of code. Once a smart contract is deployed on a blockchain, the parties involved have essentially agreed to the terms embedded in the code. However, the lack of human interaction in the negotiation process may raise questions about whether the contract reflects the true intent of the parties. For instance, if one party does not fully understand the technical aspects of the smart contract or the conditions embedded in the code, there could be a lack of informed consent, which is a fundamental element of contract formation[10].

The concept of smart contracts executed on decentralized systems such as Blockchain enables market automation without requiring trust between the parties involved. However, the main challenge is to ensure smart contracts are legally enforceable within the existing judicial framework[11].

It was found that smart contracts can be created and legally enforced by integrating crypto-primitives such as digital signatures. However, legal issues arise in various jurisdictions that have different legislative requirements regarding the use of Distributed Ledger Technology (DLT) and smart contracts. For example, smart contracts used to support transactions in Initial Coin Offerings (ICOs) may be considered illegal in some jurisdictions[12].

A framework for designing and executing legally enforceable smart contracts has been developed through a case study of a Freelancer application, where smart contracts can become legally enforceable contracts if they are carefully drafted and include digital signatures. The implementation of these smart contracts requires integration with legal contracts written in plain text. In addition, such smart contracts can be stored in distributed file systems such as the InterPlanetary File System (IPFS), a revolutionary decentralized file storage and access system, to ensure their legal validity[13].

As such, smart contracts can be an important part of a system that enables the

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[10] Mik, Eliza. "Smart Contracts: Terminology, Technical Limitations and Real World Complexity." Law, Innovation and Technology, Vol. 11, No. 1, 2017, pp. 92–105, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3038406.

[11] Patel, Dhiren, Keivan Shah, Sanket Shanbhag, and Vasu Mistry. "Towards Legally Enforceable Smart Contracts." *Blockchain – ICBC 2018, edited by Shiping Chen, Harry Wang, and Liang-Jie Zhang, Springer International Publishing*, 2018, pp. 153–65, http://dx.doi.org/10.1007/978-3-319-94478-4_11.

[12] *Ibid.*

[13] *Ibid.*

exchange of payments and services according to predefined rules. However, for smart contracts to be legally enforceable, digital signatures are required. Proper implementation and attention to the jurisdiction's legal framework is necessary for smart contracts to be accepted by all parties involved[14].

According to Durovic, smart contracts are a new technology used in commercial transactions, which raises the question of whether they can be enforced in court. There is debate as to whether smart contracts are truly contracts or merely a means of executing conventional contracts. Some legal scholars argue that smart contracts should be considered a type of enforceable contract, provided they fulfill the elements necessary for the formation of a contract. In the United States, several states have recognized smart contracts as legally valid[15]. In conclusion, smart contracts can be considered valid if they meet the legal contract requirements in a country and can be implemented by the courts. When referring to the legal requirements of contracts in Indonesia, the guideline used is Article 1320 BW.

According to Caria, the legal status of smart contracts remains unclear as there are no specific regulations governing them. While some states in the US, such as Arizona and Vermont, have passed laws that recognize and regulate smart contracts and blockchain technology, there is no specific international legal framework for this technology. The lack of specific regulation does not mean that existing laws and general legal principles do not apply to smart contracts; rather, they should be governed by existing laws. As self-executing software, smart contracts have the potential to revolutionize business practices by reducing transaction and litigation costs, as their execution occurs automatically without the need for a third party. As blockchain technology evolves and is supported in various industries, careful steps need to be taken to ensure proper regulation and usage. Smart contracts that are decentralized and run on blockchain technology are considered revolutionary because they are able to execute agreements autonomously without intermediaries. However, legal challenges remain, especially regarding legality issues. Although smart contracts are designed to be self-sustaining, the distinction between the real and virtual worlds can make enforcement difficult. Therefore, third-party

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[14] *Ibid.*

[15] Durovic, Mateja, and Franciszek Lech. "The Enforceability of Smart Contracts." *Italian LJ*, Vol. 5, 2019, pp. 493, https://theitalianlawjournal.it/data/uploads/5-italj-2-2019/493-durovic-lech.pdf.

intervention may be required to correct errors or ensure a legitimate outcome. It is important to determine the applicable law and jurisdiction for smart contracts, which can be addressed through special provisions or the creation of new legal rules. Although smart contracts have great transformational potential, they are not expected to trigger a legal revolution, but rather require adjustments within the existing legal framework[16].

Furthermore, the concept of "intention to create legal relations" is crucial in determining the validity of a contract. In traditional contracts, the parties involved must demonstrate that they intend for the contract to be legally binding. In the case of smart contracts, this intention is typically implied through the deployment of the contract on a blockchain. However, the autonomous nature of smart contracts may lead to situations where the parties do not fully understand the legal implications of their actions, particularly if the smart contract is executed without their active participation or awareness. This could create issues of enforceability, especially if one party claims that they did not intend for the contract to be legally binding.

In terms of enforceability, smart contracts present unique challenges that differ from traditional contracts. One of the key benefits of smart contracts is their ability to execute automatically, without the need for third-party intervention. However, this very feature can also create problems in terms of legal enforceability. For example, if a smart contract fails to execute correctly due to a bug in the code or an unforeseen technical issue, it may be difficult to determine who is responsible for the failure and how the contract should be enforced. Traditional contracts often include provisions for dispute resolution, such as mediation or arbitration, but smart contracts may not have these mechanisms built into the code.

Moreover, the immutability of blockchain technology, which is one of the core features of smart contracts, can also pose challenges for enforceability. Once a smart contract is executed, the terms of the contract cannot be altered, and the transaction is recorded permanently on the blockchain. While this provides a high level of security and transparency, it also means that any errors or ambiguities in the contract cannot be corrected. In traditional contracts, parties can renegotiate or amend the terms of the contract if necessary, but this is not possible with smart contracts unless a new contract

[16] Caria, Riccardo De. "The Legal Meaning of Smart Contracts." *European Review of Private Law*, Vol. 26, No. 6, 2018, pp. 731–51, https://doi.org/10.54648/erpl2018052.

is created. This rigidity can lead to situations where parties are bound by the terms of the contract even if those terms no longer reflect their intentions or if circumstances have changed[17].

The growing use of smart contracts in e-commerce transactions has raised numerous legal questions, particularly concerning their validity and enforceability under existing legal frameworks. Smart contracts, unlike traditional contracts, operate autonomously and are executed automatically when certain pre-defined conditions are met, without the need for human intervention. This characteristic of smart contracts introduces a new dimension of efficiency in business transactions, but it also poses significant legal challenges, especially regarding their recognition and enforceability in the context of e-commerce.

The implementation of smart contracts is faced with various challenges that need to be considered. These challenges include ensuring compliance with legal principles in the design and implementation of smart contracts, customization with applicable contract law, and effective monitoring and regulatory arrangements. It is important to understand the legal basis applicable in Indonesia and involve legal experts and financial institutions in the process of implementing smart contracts.

The use of smart contracts in e-commerce also raises concerns about consumer protection. In traditional e-commerce transactions, consumers are typically protected by laws that regulate issues such as refunds, warranties, and product liability. However, because smart contracts are self-executing and often involve little to no human intervention, they may not provide consumers with the same level of protection. For example, if a smart contract automatically charges a consumer for a product or service that they did not receive or that was defective, the consumer may have limited options for disputing the charge or obtaining a refund. In traditional contracts, consumers can often rely on regulatory bodies or consumer protection agencies to resolve disputes, but smart contracts may lack these mechanisms. This highlights the need for new legal frameworks that address the unique challenges posed by smart contracts in e-commerce and that provide adequate protection for consumers.

In addition to jurisdictional issues, the legal recognition of digital signatures is

[17] Raskin, Max. "The Law and Legality of Smart Contracts." *Duke Law Journal*, Vol. 1, No. 2, 2017, pp. 305–41, https://dx.doi.org/10.2139/ssrn.2842258.

another critical factor in the enforceability of smart contracts. Many smart contracts rely on digital signatures to verify the identities of the parties involved and to execute the contract. However, the legal status of digital signatures varies from one jurisdiction to another. While some countries, such as the United States and members of the European Union, have passed laws recognizing digital signatures as legally binding, other countries have not yet adopted such laws. This creates uncertainty about whether a smart contract executed with a digital signature will be enforceable in all jurisdictions.

Despite these challenges, there have been several efforts to create legal frameworks that support the use of smart contracts in e-commerce. For example, the United States has taken steps to recognize the validity of smart contracts through the Uniform Electronic Transactions Act (UETA) and the Electronic Signatures in Global and National Commerce Act (ESIGN). These laws provide a legal framework for the use of electronic signatures and contracts, including smart contracts, and they ensure that contracts executed electronically are legally binding and enforceable. Similarly, the European Union's eIDAS Regulation provides a legal framework for the use of electronic signatures and trust services, which can be applied to smart contracts[18].

2.2 Legal Implications of the Use of Smart Contracts in Agreements

The legal implications of using smart contracts extend beyond issues of enforceability. They also involve questions about how these contracts interact with existing regulations around data privacy, intellectual property, and consumer protection. For example, because smart contracts are executed automatically, they can collect and process large amounts of data without the need for human intervention. This raises concerns about data privacy, particularly in regions with strict data protection laws like the European Union's General Data Protection Regulation (GDPR). If a smart contract collects personal data, businesses must ensure that the contract complies with all relevant data protection regulations, or they could face significant fines.

Smart contracts are digital agreements that are executed automatically by computer code, without the need for human intervention once the contract is agreed upon.

[18] Buterin, Vitalik. "Ethereum: A Next-Generation Smart Contract and Decentralized Application Platform." Whitepaper, No. January, 2014, pp. 1–36, https://blockchainlab.com/pdf/Ethereum_white_paper-a_next_generation_smart_contract_and_decentralized_application_platform-vitalik-buterin.pdf.

This new technology inevitably has legal implications that require governments to regulate the dynamic nature of current trade practices. The legal implications include aspects such as legal validity, enforceability, jurisdiction, and other issues that may arise.

Smart contracts are gaining popularity in business transactions along with the growth of internet usage and e-commerce. Different from conventional and electronic contracts, smart contracts utilize blockchain technology to automate contract execution. In Indonesia, smart contracts are permitted as long as they comply with the Civil Code. Smart contracts provide benefits such as transparency, autonomy, speed, accuracy, security, and cost savings. While there is no specific regulation on smart contracts at the global level, some countries such as India and Malaysia have started implementing laws to adapt to this technology[19].

Legal experts have different views on the role of smart contracts in the civil law system. In general, smart contracts have the potential to revolutionize business transactions by simplifying processes and reducing trust issues. Smart contracts are essentially program code that reflects the terms of a contract. They are used to ensure the fulfillment of commitments and operate automatically within the blockchain system to execute the clauses of the contract. Based on this opinion, smart contracts are recognized as having great potential to revolutionize business transactions by simplifying the process and reducing the need for trust between the parties involved. With the automation of contract execution through program code, the process becomes more efficient and free from third-party interference, which can reduce the potential for conflicts and errors.

Data privacy is another area where the use of smart contracts raises legal concerns. Smart contracts often involve the collection and processing of personal data, which can be problematic in regions with strict data protection laws like the European Union's General Data Protection Regulation (GDPR). Under the GDPR, businesses are required to obtain consent from individuals before collecting or processing their personal data, and they must also provide individuals with the right to access, rectify, or delete their data. However, the automated nature of smart contracts may make it difficult to comply with these requirements, particularly if the contract is designed to execute without human

[19]Abidin, Muhammad Ilman. "Legal Review of the Validity of the Use of Smart Contracts in Business Transactions in Indonesia and Its Regulation in Various Countries." *Unnes Law Journal*, Vol. 9, No. 2, 2023, pp. 289–310, https://doi.org/10.15294/ulj.v9i2.74957.

intervention. In cases where a smart contract processes personal data without obtaining the necessary consent, businesses could face significant legal and financial penalties.

Moreover, the transparency and immutability of blockchain technology can also conflict with data privacy laws. While blockchain ensures that smart contracts are tamper-proof and that transactions are publicly recorded, this level of transparency can be problematic when it comes to sensitive personal data. For example, once personal data is recorded on the blockchain, it cannot be altered or deleted, which may violate the GDPR's "right to be forgotten" provision. This presents a significant challenge for businesses that use smart contracts in industries that handle sensitive information, such as healthcare or finance.

The legal status of smart contracts in Russian civil law is debatable, with some foreign legal systems considering them to be computer code. In Russian civil law, the legal status of smart contracts is still a matter of debate, with some foreign legal systems considering them to be computer code. This demonstrates the uncertainty that exists in many jurisdictions as to how smart contracts should be regulated and legally accepted. In Indonesia, the emergence of smart contracts is supported by the Civil Code which allows for new forms of contracts[20]. This indicates an attempt to accommodate technological innovation within the existing legal framework, with the hope that smart contracts can be integrated into the existing legal system.

Smart contracts offer benefits such as transparency, cost savings, and faster processing. However, the issue of data protection is still a challenge that needs to be addressed. This reflects that while smart contracts bring significant benefits, there are important aspects such as data privacy and security that must be carefully managed.

The validity of smart contracts in Indonesia is governed by specific requirements contained in the Civil Code and other regulations. Smart contracts are transforming conventional contract law, providing convenience and efficiency in various sectors. This shows that new technologies can modify and enhance existing legal practices. Therefore, there is a need for legal adaptation to accommodate this new technology.

Consumer protection is also an important consideration. Smart contracts are typically designed to be self-executing, which means that consumers may not have the

[20]Muko, Adam. "Kajian Smart Contract Dalam Perspektif Hukum Positif Di Indonesia." *Doktrin: Jurnal Dunia Ilmu Hukum Dan Politik*, Vol. 2, No. 2, 2024, pp. 13–24, https://doi.org/10.59581/doktrin.v2i2.2517.

same recourse as they would with traditional contracts if something goes wrong. For example, if a smart contract automatically charges a consumer for a service they did not receive, they may not have an easy way to dispute the charge or request a refund. To address this, regulators may need to develop new consumer protection laws specifically for smart contracts, ensuring that consumers have access to the same rights and protections as they do with traditional contracts.

One of the most significant legal implications of smart contracts is the challenge of integrating them into the existing legal frameworks. Traditional contracts typically involve human intervention at several stages—drafting, negotiation, execution, and enforcement. In contrast, smart contracts are self-executing, meaning that once the terms are agreed upon and coded into the contract, there is no further need for human oversight. This can create legal issues, especially if the smart contract does not account for unforeseen circumstances or ambiguities.

For example, in traditional contracts, parties can renegotiate or amend the terms if new information comes to light or if a situation changes. With smart contracts, the rigid nature of the code may not allow for such flexibility, potentially leading to disputes that are difficult to resolve.

Furthermore, Savelyev states that the future of smart contracts depends on resolving the challenges and developing the existing regulatory framework. The document discusses the emergence of smart contracts, defined as agreements in the form of software code on Blockchain platforms, as well as their potential impact on conventional contract law[21].

Smart contracts represent a paradigm shift in the world of contracts, offering new opportunities for automation and efficiency across multiple industries. Based on Boolean logic, smart contracts are interpreted by machines to reduce the problem of human subjectivity. They are agreements that operate autonomously and do not require interpretation from outside entities. However, challenges arise from technical complexity and potential coding errors. Smart contracts lack traditional legal obligations and remedies for breaches, so they can be vulnerable to exploitation. As autonomous and self-sustaining entities, they provide no protection for weak parties. The existence of illegal smart contracts is a threat, and the adjustment between government power and blockchain

[21] Savelyev, Alexander., *Op.cit.*

technology is still an important issue[22].

Another critical legal implication is the issue of enforceability. While smart contracts are designed to automatically enforce themselves, the question remains as to whether they can be legally enforced in a court of law. Many legal systems around the world still require written or verbal contracts to be enforceable, and the use of code as a form of contract may not meet these requirements. In some jurisdictions, there is no clear legal framework governing the use of smart contracts, which raises the question of whether they are considered legally binding. For instance, in Indonesia, the legal status of smart contracts remains unclear, as there are no specific regulations governing their use. While some legal scholars argue that smart contracts fulfill the basic requirements of a contract—offer, acceptance, and consideration—others contend that their automated nature makes them fundamentally different from traditional contracts.

While smart contracts offer significant advantages in terms of efficiency, transparency, and automation, they also present a range of legal challenges that must be addressed before they can be widely adopted. The legal implications of smart contracts are complex and multifaceted, encompassing issues related to enforceability, jurisdiction, data privacy, intellectual property, and consumer protection. As businesses and industries increasingly turn to smart contracts to streamline their operations, it is essential that legal frameworks are developed to address these challenges and to ensure that smart contracts are legally binding and enforceable in a court of law.

Additionally, businesses must take steps to mitigate the risks associated with smart contracts, such as ensuring that their contracts comply with relevant data protection laws, obtaining the necessary intellectual property licenses, and implementing mechanisms for dispute resolution and consumer protection.

Overall, this opinion reflects an understanding that smart contracts have great potential to transform business practices and contract law, but also face legal challenges that need to be addressed to ensure successful integration within existing legal frameworks.

[22] *Ibid.*

III. CONCLUSION

The author suggests that recognizing the validity of smart contracts can resolve ambiguity. National-level e-commerce transactions can use national law, while cross-border transactions require choice of law and jurisdiction clauses. Smart contracts offer efficiency, transparency, and autonomy, but challenges like legal validity, enforceability, jurisdiction, and data security need to be addressed. The future of smart contracts depends on balancing technology with legal frameworks and developing suitable regulations.

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