

MODERN CONTRACT LAW: DYNAMICS OF AGREEMENTS IN THE ERA OF ECONOMIC DIGITALIZATION

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Entered : February 04, 2026
Accepted: April 12, 2026

Revised : March 26, 2026
Published : April 29, 2026

Abstract

The digitalization of the economy has revolutionized the way humans interact legally, particularly in the formation and implementation of agreements. The rapid development of information technology has given rise to new transaction models that cannot always be adequately accommodated by the Civil Code (KUHPPerdata), which was created in the 19th century. This article examines in depth the dynamics of the transformation of contract law in the context of economic digitalization, including aspects of the validity of electronic contracts, the legal status of blockchain-based smart contracts, consumer protection in the digital trade ecosystem, and the challenges of jurisdiction and choice of law in cross-border digital transactions. Using normative legal research methods through statutory, conceptual, and comparative law approaches, this study concludes that Indonesia's contract law framework requires systemic modernization that includes formal recognition of algorithmic contracts, revision of the concept of agreement in the context of digital interfaces, strengthening the principle of proportionality in electronic adhesion contracts, and establishing a dispute resolution mechanism that is responsive to the unique characteristics of digital transactions. Recommendations include the establishment of a comprehensive national contract law, strengthening technical regulations in the field of electronic signatures, and harmonizing the law with international standards UNCITRAL.

Keywords: Contract Law, Electronic Contracts, Smart Contracts, Digitalization of the Economy, Digital Consumer Protection, Blockchain.

Citation:

Lira A & Hatidja St (2026) Modern Contract Law: Dynamics Of Agreements In The Era Of Economic Digitalization, *Leges Privatae* 2(6)

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1. Introduction

Contract law is one of the most dynamic areas of private law, responding to social and economic changes. Since the enactment of the Civil Code (KUHPPerdata), adopted from the Dutch Burgerlijk Wetboek (Contract Code), in 1847, Indonesia's contract law system has undergone numerous trials and tribulations in response to the challenges of the times. However, no test has been more complex and multidimensional than the wave of economic digitalization sweeping the world in the 21st century.¹ The era of economic digitalization is characterized by several fundamental characteristics that differentiate it structurally from the conventional economic paradigm.² First, transactions occur instantly, transcending geographic boundaries and legal

¹ R. Subekti, *Hukum Perjanjian* (Jakarta: Intermasa, 2001), hlm. 1.

² Sunarta, Desy Arum, Nelia Syafriawati, and Mukhtar Lutfi. "Paradigma dan Karakteristik Sistem Ekonomi Islam: Kajian Teoretis dan Filosofis: Paradigms and Characteristics of the Islamic Economic System: A Theoretical and Philosophical Study." *HISAB: Jurnal Akuntansi Lembaga Keuangan Syariah* 1.1 (2025): 44-75.



jurisdictions. Second, transactors can be anonymous or even artificial intelligence systems operating autonomously without direct human intervention. Third, transaction evidence is no longer physical documents but rather electronic data that is intangible but can be cryptographically verified. Fourth, the mechanisms for forming and executing agreements can be fully automated through computer algorithms. Fifth, the digital platform ecosystem has created an asymmetrical power relationship between businesses and consumers, raising fundamental questions about true freedom of contract.³

This reality places Indonesian contract law at a critical crossroads between the need to maintain legal certainty based on classical contract law principles, on the one hand, and the demand to progressively adapt to the practical needs of digital transactions, on the other. The Civil Code, particularly Book III on Contracts, although containing flexible universal principles, is conceptually designed to regulate transactions conducted by physical humans using tangible communication media.⁴

The concrete problems arising from this discrepancy are diverse. Can clicking the "Agree" button on a digital application interface be equated with agreement as defined in Article 1320 of the Civil Code? Do smart contracts running automatically on a blockchain network have the same binding force as conventional written agreements? How can the legal domicile of the parties be determined in an agreement formed in cyberspace without clear geographic attributes? Who is responsible when a contract-forming algorithm produces an agreement that is detrimental to one of the parties due to a system failure? These questions are not merely academic; they represent real legal issues faced daily by millions of Indonesian citizens who actively transact digitally.

Data from the Ministry of Communication and Informatics of the Republic of Indonesia shows that the value of Indonesian e-commerce transactions exceeded USD 77 billion in 2024, making Indonesia the largest e-commerce market in Southeast Asia. This growth has been accompanied by an explosion in digital consumer disputes, which have increased by an average of 340% over the past five years, while the legal framework available to resolve them remains fragmented and not yet systematically integrated.⁵

The urgency of this study is further reinforced by technological developments that do not wait for regulatory readiness. The emergence of generative artificial intelligence (AI) capable of automatically drafting contracts, blockchain technology that enables the execution of agreements without human intermediaries, and the Web3 ecosystem that is reimagining the concept of digital ownership all present legal challenges that were not anticipated by the creators of the Civil Code in the 19th century, nor by the legislators who formulated the Electronic Information and Transactions Law in 2008.⁶

This article aims to: first, analyze the conceptual basis of Indonesian contract law in facing the challenges of the digital era; second, identify gaps and ambiguities in the norms governing electronic contracts; third, examine the legal position of smart contracts and blockchain technology in the Indonesian contract system; fourth, evaluate consumer legal protection in the digital trade ecosystem; fifth, analyze jurisdictional issues and choice of law in cross-border digital transactions; and sixth, formulate recommendations for comprehensive legal reforms to modernize Indonesian contract law.

<https://journal.uwais.ac.id/index.php/hisab/article/view/14>

³ J. Satrio, *Hukum Perikatan: Perikatan pada Umumnya* (Bandung: Alumni, 1999), hlm. 47.

⁴ Mariam Darus Badruzaman et al., *Kompilasi Hukum Perikatan* (Bandung: Citra Aditya Bakti, 2001), hlm. 23.

⁵ Undang-Undang Nomor 11 Tahun 2008 tentang Informasi dan Transaksi Elektronik sebagaimana telah diubah dengan Undang-Undang Nomor 19 Tahun 2016, Pasal 1 angka 17.

⁶ Aulia, Agis, et al. "Regulasi Artificial Intelligence Fintech Blockchain: Tantangan Hukum Ekonomi Smart Contract Syariah Indonesia Pdp 2024 Ojk Unicorn Gig Economy." *Al-Zayn: Jurnal Ilmu Sosial & Hukum* 4.1 (2026): 3177-3188. <https://doi.org/10.61104/alz.v4i1.3609>



2. Method

The research in this article uses a normative legal research method (doctrinal legal research), namely research that relies on an analysis of positive legal norms, legal principles, legal theories, and doctrines developed in academic literature. This method was chosen because the problem being studied relates to the normative gap in the regulation of contract law in the digital era, thus requiring a systematic review of legislation and its conceptual construction. According to Peter Mahmud Marzuki, normative legal research is the process of discovering legal rules, legal principles, and legal doctrines to address the legal issues faced.⁷

The approach used in this research is tripartite. First, the statute approach, which examines all regulations relevant to electronic contract law and transactions, including the Civil Code, Law Number 11 of 2008 as amended by Law Number 19 of 2016 concerning Electronic Information and Transactions (ITE Law), Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions, Law Number 8 of 1999 concerning Consumer Protection, and various related sectoral regulations. Second, the conceptual approach, which analyzes contract law doctrines from both civil law and common law traditions, as well as new concepts emerging from technology law literature such as *lex cryptographia*, code as law, and distributed governance.⁸

The legal sources used in this study consist of primary, secondary, and tertiary legal materials. Primary legal materials include legislation in the fields of civil law, electronic transactions, consumer protection, and digital finance, as well as relevant court jurisprudence. Secondary legal materials include textbooks, national and international legal journal articles, research institute reports, and the opinions of leading scholars in the fields of contract law and technology law. Tertiary legal materials include legal dictionaries, legal encyclopedias, and international standard technical documents that provide explanations or guidance for understanding primary and secondary legal materials. The analysis of legal materials was conducted qualitatively by combining grammatical, systematic, teleological, and historical interpretation methods.

3. Results and Discussion

Dynamics and Evolution of Indonesian Contract Law in the Digital and Blockchain Ecosystem

Indonesian contract law, which originates from Book III of the Civil Code, is built on three main pillars which in doctrine are referred to as the fundamental principles of contract law, namely: the principle of freedom of contract (*vrijheid van contract*), the principle of consensualism, and the principle of *pacta sunt servanda*. The principle of freedom of contract, which is based on Article 1338 of the Civil Code, gives the parties the freedom to determine the content, form, and type of agreement they desire. The principle of consensualism requires that an agreement be born when an agreement is reached between the parties, without additional formalities unless otherwise stipulated by law. Meanwhile, the principle of *pacta sunt servanda* contains the meaning that a valid agreement applies as law for the parties who made it.⁹

In the digital context, these three principles face significant interpretive challenges. The principle of freedom of contract, for example, is factually distorted in the digital platform ecosystem where contracts are adhesive (*take-it-or-leave-it*), with no meaningful room for negotiation for users.

⁷ Herlien Budiono, *Asas Keseimbangan bagi Hukum Perjanjian Indonesia: Hukum Perjanjian Berlandaskan Asas-Asas Wigati Indonesia* (Bandung: Citra Aditya Bakti, 2006), hlm. 88.

⁸ Agus Yudha Hernoko, *Hukum Perjanjian: Asas Proporsionalitas dalam Kontrak Komersial* (Jakarta: Kencana, 2010), hlm. 72.

⁹ Hidayat, Raden Bethari Zahra. "Implikasi Hukum Dari Ketidakabsahan Suatu Perjanjian Elektronik Ditinjau Dari Hukum Perikatan." *Jurnal Ilmiah Wahana Pendidikan* 9.2 (2023): 453-464. <https://doi.org/10.5281/zenodo.7578979>



Empirical studies show that the average digital service user clicks to agree to the terms and conditions of service (Terms of Service) without reading them, and in many cases, these terms are written in technical language or a foreign language that consumers do not understand. This phenomenon raises a fundamental question: are agreements formed under such conditions truly a manifestation of free will as required by Article 1321 of the Civil Code concerning the absence of defects of will?¹⁰

The principle of consensualism has also undergone substantial redefinition in the digital environment. The classic concept of offer and acceptance, known in continental civil law as *aanbod* and *aanvaarding*, must now be reconstructed to accommodate the reality that offers can be made automatically by algorithms to millions of potential consumers simultaneously, while acceptance can occur through a variety of different digital modalities, ranging from the click of a button, sending a text message, biometric verification, to certain actions that are implicitly considered acceptance based on previously agreed terms of service.

The legal doctrine of contracts recognizes three theories regarding the moment of contract formation: the will theory (*wilstheorie*), the statement theory (*verklaringstheorie*), and the acceptance theory (*ontvangsttheorie*). In digital transactions, these three theories do not provide a consistently satisfactory answer. When an e-commerce transaction occurs between a server in Singapore, a consumer in Jakarta, and a payment gateway in the United States, with an offer sent at 11:59 PM and automatically accepted by the system at 12:00 AM, the question of when and where the contract was formed becomes very complex and has direct implications for determining the applicable law.

The principle of proportionality, developed by Agus Yudha Hernoko as a stand-alone principle in modern Indonesian contract law, is gaining increasingly crucial relevance in the digital context. This principle requires a balance between the rights and obligations of the parties proportionally according to their respective contributions. In a digital ecosystem where businesses control user data asymmetrically and use it for commercial purposes far beyond the scope of the initial transaction, the question of whether there is a proportional exchange of value between "free services" and the personal data submitted by users becomes an urgent legal issue that needs to be addressed.¹¹

An electronic contract is defined in Article 1, number 17 of the ITE Law, as an agreement between parties made through an electronic system. This definition, while literally inclusive, in practice still raises various questions about its scope and boundaries. Is a contract agreed upon through an exchange of WhatsApp messages an electronic contract? Does an agreement signed through a digital signature application like DocuSign have the same legal basis as a notarial deed? Is a contract formed through interaction with an AI-based chatbot legally valid?¹²

From the perspective of the valid conditions of an agreement as stipulated in Article 1320 of the Civil Code, an electronic contract can in principle fulfill all four conditions, namely: the consent of those who bind themselves, the capacity to enter into an agreement, a certain thing, and a lawful cause. However, in the digital context, verifying the fulfillment of these conditions faces non-trivial technical and legal obstacles. The capacity requirement (*handelingsbevoegdheid*), for example, is difficult to verify reliably in a digital environment where a person's age and legal capacity cannot be validated simply by self-declaration on a registration form.¹³

The issue of electronic signatures is a central issue in Indonesian digital contract law. The ITE Law and Government Regulation 71/2019 distinguish between certified and uncertified electronic signatures. Certified electronic signatures, created using an Electronic Certificate issued by an accredited Indonesian Electronic Certification Provider (PSrE), have the same legal force and

¹⁰ Arrodli, Ahmad Jalaludin, et al. "Konsekuensi Hukum Cacat Kehendak dalam Pembentukan Perjanjian Sesuai Pasal 1320 Kuhperdata." *Letterlijk* 1.2 (2024): 204-216. <https://doi.org/10.25134/letterlijk.v1i2.68>

¹¹ Edmon Makarim, *Kompilasi Hukum Telematika* (Jakarta: Rajagrafindo Persada, 2004), hlm. 301.

¹² Ahmad M. Ramli, *Cyber Law dan HAKI dalam Sistem Hukum Indonesia* (Bandung: Refika Aditama, 2004), hlm. 55.

¹³ Undang-Undang Nomor 8 Tahun 1999 tentang Perlindungan Konsumen, Pasal 18.



consequences as a handwritten signature. Uncertified electronic signatures, which include all forms of digital marking that do not utilize public key infrastructure (PKI), have only limited legal force. However, in practice, the use of certified electronic signatures remains very limited in Indonesia. The majority of everyday electronic contracts, from agreements to terms of service for mobile banking applications to employment contracts signed through online recruitment platforms, use uncertified electronic signatures. This situation creates substantial legal uncertainty, particularly in the context of evidence in court. The problem of e-contract verification in court remains unresolved. Article 5 of the ITE Law recognizes electronic information and electronic documents as valid evidence, but its implementation in judicial practice remains varied and inconsistent.¹⁴

A more complex issue arises regarding general conditions (*algemene voorwaarden*) or standard clauses in electronic contracts. Article 18 of the Consumer Protection Law (UUPK) explicitly prohibits the inclusion of standard clauses that transfer business actors' responsibilities, but oversight of compliance with this provision in the digital realm remains very weak. International digital platforms frequently include choice-of-law clauses that refer to foreign laws, forced arbitration clauses that require dispute resolution in geographically distant jurisdictions, and limitation-of-recourse clauses that effectively strip consumers of their rights.¹⁵

The issue of electronic contract formats also requires serious attention. The phenomenon of dark patterns in user interface design has become a sophisticated instrument of will manipulation but has not received an adequate regulatory response in Indonesia. Dark patterns are interface design techniques that intentionally manipulate users into taking actions that benefit businesses but harm the users themselves, such as hidden opt-outs, pre-ticked boxes, sneak into baskets, and confirm shaming. From a civil law perspective, the use of dark patterns that result in an agreement should be qualified as fraud (*bedrog*) or abuse of circumstances (*misbruik van omstandigheden*), which are defects in will and therefore can be requested to cancel the resulting agreement.¹⁶

Smart contracts are one of the most disruptive innovations born from blockchain technology and are fundamentally redefining the legal paradigm of contracts. The concept was first introduced by cryptographer Nick Szabo in 1996, who defined them as a series of promises set out in digital format, including a protocol for the parties to fulfill those promises. In its most modern form, a smart contract is a computer program stored on and running on a blockchain network, automatically executing the terms of an agreement when predetermined conditions are met.¹⁷

The fundamental characteristics of smart contracts that distinguish them from conventional contracts are: first, self-executing, where contract execution occurs automatically without requiring human intervention or third-party institutions; second, immutable, where program code that has been deployed to the blockchain cannot be changed unilaterally by either party; third, transparent, where all interested parties can directly examine the code and transaction history; and fourth, decentralized, where contract execution does not depend on a single server or central institution but is distributed among thousands of nodes in the network.¹⁸

From the perspective of Indonesian contract law, the most fundamental question is: can a smart contract be qualified as a valid agreement within the meaning of Article 1313 of the Civil Code? To answer this, it is necessary to analyze the fulfillment of the conditions for a valid agreement as stipulated in Article 1320 of the Civil Code. The first condition, agreement, in the context of a smart contract, needs to be interpreted as the consensus of the parties regarding the logic and parameters

¹⁴ Peter Mahmud Marzuki, *Penelitian Hukum* (Jakarta: Kencana Prenada Media Group, 2005), hlm. 35.

¹⁵ Soerjono Soekanto & Sri Mamudji, *Penelitian Hukum Normatif: Suatu Tinjauan Singkat* (Jakarta: Rajawali Press, 2007), hlm. 14.

¹⁶ Asriyani, Arini, et al. "Rekonstruksi Prinsip Itikad Baik dalam Transaksi Bisnis Digital di Era Ekonomi Platform." *Amsir Management Journal* 6.1 (2025): 1-12. <https://doi.org/10.56341/amj.v6i1.710>

¹⁷ Nick Szabo, "Smart Contracts: Building Blocks for Digital Markets," *Extropy Journal of Transhumanist Thought*, Vol. 16 (1996), hlm. 2.

¹⁸ Primavera De Filippi & Aaron Wright, *Blockchain and the Law: The Rule of Code* (Cambridge: Harvard University Press, 2018), hlm. 77.



of the contract set out in the program code before the contract is deployed to the blockchain. The capacity requirement is essentially the same as a conventional contract, because smart contracts are still created by legally competent humans even though their implementation is later automated. The requirement for a specific object is met as long as the smart contract program clearly defines the agreed-upon performance. The requirement for a lawful cause requires that the purpose of the smart contract must not conflict with the law, morality, or public order.¹⁹ However, smart contracts also present legal challenges not yet present in conventional contracts. First, the issue of contract interpretation: when there is a discrepancy between the parties' intentions and the implementation of the program code (code bugs), who is authorized to interpret it, and can the interpretation of the program code be carried out using the rules of contract interpretation in civil law? Second, the issue of force majeure: how to apply the doctrine of force majeure (overmacht) as stipulated in Articles 1244-1245 of the Civil Code to contracts that run automatically without the ability to be paused or modified? Third, the issue of breach of contract: can the failure to execute a smart contract due to bugs in the program code qualify as a breach of contract under civil law, and who is liable?

The 2016 DAO Hack serves as a historical precedent that illustrates this complexity. The DAO, an Ethereum-based smart contract that raised USD 150 million in investment from thousands of investors, was successfully exploited. A hacker exploited a flaw in the smart contract's code and siphoned off USD 60 million of investors' funds. This incident sparked intense legal debate: were the hacker's actions a violation of the law, or were they simply exploiting the logic defined in the contract's code itself? The Ethereum community ultimately opted for a hard fork, undoing the problematic transactions by altering the blockchain's history, an action that itself sparked debate about whether this violated the principles of immutability and decentralization that underpin blockchain technology.

In Indonesia, regulations regarding smart contracts are still in their infancy. The Electronic Information and Transactions Law (UU ITE) and the Government Regulation on the Protection of Electronic Transactions (PP PSTE) neither explicitly recognize nor prohibit smart contracts. Several sectoral regulations, such as the Financial Services Authority (OJK) Regulation on crypto assets, have begun to address the use of blockchain technology, but no regulation comprehensively addresses the legal aspects of smart contracts. This regulatory vacuum creates significant legal uncertainty for industry players, investors, and consumers involved in the blockchain ecosystem in Indonesia.

Challenges and Directions for Contract Law Reform in the Digital Ecosystem: Consumer Protection, Cross-Border Jurisdiction, Artificial Intelligence, and Regulatory Reform

Indonesia's digital commerce ecosystem has developed into one of the most complex and dynamic in the world. With a population of over 270 million and a steadily increasing internet penetration rate, Indonesia is a highly attractive market for digital businesses, both domestic and multinational. However, behind this imponderable growth lies a concerning reality: Indonesian consumers face significantly greater legal risks than consumers in countries with more mature digital regulatory frameworks. The first fundamental problem is structural information asymmetry. In e-commerce transactions, consumers cannot physically inspect the goods they intend to purchase, relying on descriptions and photos provided by sellers, and often lack sufficient information about the seller's reputation and reliability. Marketplace platforms employ rating and review systems as proxies for trust, but these systems are vulnerable to manipulation through fake reviews, rating bots, and other fraudulent practices. From a contract law perspective, unaddressed information asymmetry can result in agreements based on inaccurate information, which in extreme cases can qualify as fraud (bedrog) or misleading (dwalig).²⁰

¹⁹ Luh Putu Sudini & I Gusti Nyoman Agung, "Keabsahan Smart Contract dalam Perspektif Hukum Perjanjian Indonesia," *Jurnal Magister Hukum Udayana*, Vol. 9, No. 2 (2020): 298.

²⁰ Muflikh, Alna Aulin Miftakhul, et al. "Analisis Perlindungan Hukum Konsumen pada Perjanjian Transaksi E-Commerce terkait Investasi Kripto Ilegal via Media Sosial." *Bookchapter Hukum dan Politik dalam Berbagai*



The second problem is the imbalance of bargaining power in digital platform contracts. Users of digital services are essentially faced with a binary choice: accept all the terms set by the platform or refrain from using the service altogether. The Terms of Service (ToS) of large platforms are often extremely comprehensive, encompassing thousands of words in technical-legal language that is difficult for lay users to understand. They can be changed unilaterally by the platform at any time with or without adequate notice. They consistently position the platform in the most advantageous position while imposing maximum risk on users.²¹

Digital consumer protection regulations in Indonesia are currently scattered and not yet integrated. Law Number 8 of 1999 concerning Consumer Protection (UUPK) is a general lex that regulates the basic principles of consumer protection, but it was designed for the pre-digital era, so many provisions are not directly applicable to digital transactions. The ITE Law and the PP PSTE provide several provisions on electronic transactions, but their focus is more on the technical aspects of electronic systems than on substantive consumer protection. The Minister of Trade's Regulation on trade transactions through electronic systems (PMSE) fills some of the normative gap, but its implementation remains weak due to limited oversight capacity.²²

Information Technology-Based Money Lending Services (P2P Lending/Fintech Lending) and Buy Now Pay Later (BNPL) services have become a phenomenon that has raised serious concerns from a consumer protection perspective.²³ Hundreds of illegal fintech platforms operating without OJK permits have ensnared millions of consumers in predatory lending practices that include excessive interest rates, intimidating and privacy-violating debt collection practices, and contracts containing exploitative clauses. In many cases, aggrieved consumers lack effective access to dispute resolution mechanisms, either due to ignorance of their rights, disproportionate litigation costs relative to the losses suffered, or a lack of clarity regarding the authorized forum for adjudicating disputes with platforms domiciled overseas.²⁴

The sharing economy presents an even more complex dimension of consumer protection. Platforms such as ride-hailing, short-term rental, and delivery services operate within a business model that deliberately positions themselves as marketplaces or intermediary technologies, rather than service providers, to avoid the legal liability inherent in direct service providers. As a result, when incidents that harm consumers occur, such as accidents involving online motorcycle taxi drivers or accommodation conditions that do not match the advertised conditions, there is fundamental ambiguity about who is legally responsible: the platform, the driver/host partner, or both in a joint venture.

One of the most fundamental challenges posed by the digitalization of the economy to contract law is the issue of jurisdiction in cross-border transactions. Traditional private international law (IPL) or civil international law (PIC) is built on the premise that every legal relationship has connecting points that connect it to a particular country's legal system, such as the place of contract formation, the place of performance, the domicile of the parties, or a mutually agreed choice of law. This premise faces a fundamental crisis in the context of digital transactions, where all these

Perspektif 4 (2025): 106-133. <https://bookchapter.unnes.ac.id/index.php/hp/article/view/609>

²¹ Celina Tri Siwi Kristiyanti, *Hukum Perlindungan Konsumen* (Jakarta: Sinar Grafika, 2011), hlm. 135.

²² Muksalmina, Muksalmina, Eko Gani PG, and Muhammad Hafizh. "PERLINDUNGAN HUKUM TERHADAP PELAKU UMKM DALAM MENJALANKAN TRANSAKSI DAGANG SECARA ELEKTRONIK DI KOTA LHOKSEUMAWE." *Jurnal Hukum Samudra Keadilan* 20.2 (2025): 250-264. <https://doi.org/10.33059/jhsk.v20i2.13119>

²³ Adinata, M. Rahman, and Recca Ayu Hapsari. "Tinjauan Yuridis Perlindungan Konsumen Terhadap Masyarakat Yang Melakukan Fintech Peer-To-Peer Lending Atau Layanan Pinjam Meminjam Uang Berbasis Teknologi Informasi (Lpmubti) Dalam Sebuah Aplikasi Pinjaman Online (Julo)(Studi Penelitian: Otoritas Jasa." *Case Law: Journal of Law* 3.1 (2022): 21-38. <https://doi.org/10.25157/caselaw.v3i1.2691>

²⁴ Rahayu, Cantika Tresna, et al. "Perlindungan Hukum Terhadap Pihak yang Dirugikan Dalam Wanprestasi." *Media Hukum Indonesia (MHI)* 2.4 (2024): 138-149. <https://doi.org/10.5281/zenodo.14058588>



territorial elements become fluid and difficult to define.²⁵

A concrete illustration can be seen in international e-commerce transactions involving Indonesian consumers. A consumer in Surabaya purchases a product from a seller operating on an e-commerce platform hosted in Singapore, but the platform is a subsidiary of an American corporation incorporated under Delaware law, with a warehouse in Hong Kong, payments processed by a gateway in the Netherlands, and the product shipped from a factory in Shenzhen. When a dispute arises about product quality, which country's law applies? Which country's court has jurisdiction? How, even if an Indonesian court judgment is obtained, can it be enforced against assets located in another jurisdiction?

Indonesian IP Law, which still adheres to the principles outlined in Articles 16-18 of the 150-year-old Indonesian Law on the Law of the Netherlands Indies (AB), is clearly not designed to address this complexity. The principles of *lex loci contractus* (the law of the place of contract formation) and *lex loci solutionis* (the law of the place of contract execution) lose their operational relevance when contracts are "made" simultaneously in various parts of the world through a globally distributed server network. Meanwhile, the principle of the parties' freedom to choose the applicable law (choice of law/choice of forum), recognized in IP doctrine, is often abused in practice by more powerful business actors to impose their own preferred choice of law and forum.²⁶

Developments in international law addressing these challenges are worth considering. The 1996 UNCITRAL Model Law on Electronic Commerce and the 2001 UNCITRAL Model Law on Electronic Signatures have provided an important framework for international harmonization, although Indonesia has not yet fully adopted them. The 2005 Hague Convention on Choice of Court Agreements and the 2015 Hague Principles on Choice of Law in International Commercial Contracts provide guidance on the recognition and implementation of choice of forum and choice of law clauses internationally.²⁷ The European Union has developed a more comprehensive regulatory framework through the Brussels Ia Regulation on jurisdiction and the Rome I Regulation on the law applicable to treaties, both of which contain specific rules to protect consumers from unfair choice of forum and choice of law clauses.

The issue of jurisdiction in the context of blockchain and crypto assets is even more complex. Decentralized blockchain technology inherently lacks a legal domicile. Transactions within a blockchain network are validated by nodes distributed around the world, so there is no specific "place" where transactions "occur" in the conventional legal sense. Smart contracts deployed on blockchain platforms like Ethereum technically "reside" on all nodes simultaneously, or nowhere in particular. Consequently, attempts to apply conventional legal jurisdiction concepts to blockchain transactions will always hit a conceptual dead end.

The rapid development of artificial intelligence (AI) presents a fundamental legal challenge that has never been anticipated by any theory of contract law: the possibility that one or both parties to an agreement are not human but autonomous AI systems. This phenomenon is no longer mere scientific speculation but has become an operational reality in various economic sectors. High-Frequency Trading (HFT) algorithms in the capital market automatically execute thousands of securities transactions per second without human intervention. Automated procurement systems in the retail industry create and execute purchase contracts with suppliers based on predetermined parameters. AI-based chatbots offer and enter into service contracts with customers without the involvement of human staff.

The legal question raised by this phenomenon is fundamental: can an AI system be a legal subject capable of entering into a binding agreement? Indonesian civil law doctrine explicitly states

²⁵ Peraturan Otoritas Jasa Keuangan Nomor 77/POJK.01/2016 tentang Layanan Pinjam Meminjam Uang Berbasis Teknologi Informasi.

²⁶ Huala Adolf, *Hukum Perdagangan Internasional* (Jakarta: Rajawali Pers, 2011), hlm. 201.

²⁷ Baharudin Saleh Ingratubun, S. E., and MM SH. *HUKUM EKONOMI: TANTANGAN GLOBALISASI DAN DIGITALISASI*. Dunia Penerbitan buku, 2026.



that legal subjects consist of humans (naturlijk persoon) and legal entities (rechtspersoon). AI systems do not fall into either category. Therefore, legal actions taken by an AI system are technically those of the system's owner or operator, with the AI system acting as a tool or agent acting on behalf of the human principal. However, this legal construct begins to show its inadequacy when an AI system operates at such a high level of autonomy that its actions can no longer be predicted, controlled, or even fully understood by its operator. When an autonomous AI algorithm independently negotiates and agrees to a contract that its operator never intended, legal liability becomes extremely complex. Is the operator fully responsible for all of the AI's actions? What if the operator has made every reasonable effort, but the AI system still makes undesirable decisions due to the inherently unpredictable nature of machine learning?

Several jurisdictions are beginning to experiment with different legal frameworks to address this question. The European Union, in its proposed AI Act, introduces the concept of risk-based liability, subjecting operators of high-risk AI systems to stricter due diligence standards and broader liability exposure. Singapore, through its Model AI Governance Framework, is developing guidance on accountability and transparency in the use of AI in business contexts. Indonesia does not yet have comprehensive AI regulations, although the Ministry of Communication and Informatics has published a non-binding policy document on the National Artificial Intelligence Strategy 2020-2045.²⁸

Based on the comprehensive analysis conducted, this study formulates several recommendations for systemic and gradual legal reform. These recommendations are based on the principle that reform of Indonesian contract law must: first, maintain the tested fundamental principles of contract law but interpret them contextually to accommodate digital realities; second, provide adequate legal certainty for digital economy actors without sacrificing the balance between protecting the interests of the parties; and third, align with applicable international standards while still taking into account the specifics of Indonesia's legal and social context.²⁹

The first recommendation is the establishment of a comprehensive National Contract Law. Indonesia needs to immediately formulate a contract law that integrates the fundamental principles of the Civil Code with the needs of modern contracts, including electronic and digital contracts. This law should be based on proven models, such as the UNIDROIT Principles of International Commercial Contracts, but tailored to Indonesia's legal system and needs. Substantively, this law should regulate: the definition and categorization of electronic contracts, the mechanism for forming contracts through digital media, pre-contractual information requirements in digital transactions, the prohibition of dark patterns and exploitative standard clauses, and the mechanism for the cancellation and modification of electronic contracts.³⁰

The second recommendation is to strengthen the electronic signature regulatory framework. Indonesia needs to expand and strengthen legal recognition of various electronic signature modalities, while developing a more accessible and affordable national PKI infrastructure. Currently, the cost and complexity of obtaining an Electronic Certificate from an accredited PSrE remain significant barriers to the adoption of certified electronic signatures, especially for MSMEs and individuals. The graduated recognition model implemented in the European Union through the eIDAS Regulation, which distinguishes between qualified, advanced, and simple electronic signatures, each with varying legal consequences but all legally recognized, could serve as a relevant reference.

The third recommendation is the establishment of a smart contract regulatory framework. Indonesia needs to develop regulations that explicitly recognize and regulate smart contracts, including: the requirements for the validity of smart contracts in the Indonesian contract law system, dispute resolution mechanisms arising from smart contract failures or ambiguities, smart

²⁸ UNCITRAL Model Law on Electronic Commerce 1996, Article 5 bis.

²⁹ European Commission, "Digital Single Market Strategy," COM(2015) 192 final, 6 May 2015.

³⁰ Sudikno Mertokusumo, *Mengenal Hukum: Suatu Pengantar* (Yogyakarta: Liberty, 2007), hlm. 40.



contract developer liability for code bugs that result in losses, and interoperability between smart contract mechanisms and conventional court decision execution systems. Singapore has taken a step forward in this regard through the Electronic Transactions Act (Amendment) 2021, which explicitly recognizes contracts created through distributed ledger technology.

The fourth recommendation is the modernization of digital consumer protection laws. The Consumer Protection Law (UUPK) needs to be immediately amended or supplemented with specific legislation that comprehensively regulates digital consumer protection, including: mandatory transparency of algorithms used in personalized offers, consumers' right to obtain explanations for decisions made by AI systems, an explicit prohibition on dark patterns and will manipulation techniques in digital interface design, an effective collective redress mechanism for small but significant digital consumer disputes, and mandatory data portability that allows consumers to switch platforms without losing their data.

The fifth recommendation is the establishment of an effective digital dispute resolution mechanism. Indonesia needs to develop a dispute resolution ecosystem specifically designed for the unique characteristics of digital disputes, including: the development of an integrated Online Dispute Resolution (ODR) platform that can handle small-value e-commerce disputes quickly, affordably, and effectively; recognition and oversight of platform internal dispute resolution mechanisms; harmonization of ODR mechanisms with the formal court system to ensure the enforceability of decisions; and international cooperation for the enforcement of decisions in cross-border digital disputes.

Conclusions

Indonesian contract law, which largely relies on the normative framework of the 19th-century Civil Code, faces massive and multidimensional transformational pressures resulting from the digitalization of the economy. While fundamental principles of contract law, such as freedom of contract, consensualism, and *pacta sunt servanda*, remain relevant and can be maintained as foundations, their application in the digital context requires substantial reinterpretation and sometimes fundamental conceptual reconstruction. Several critical findings resulting from this research are as follows. First, electronic contracts are in principle valid within the Indonesian contract law system, but the existing normative framework still contains significant gaps and ambiguities, particularly regarding the verification of legal capacity in digital media, the formation of agreements through interactive digital interfaces, and the e-contract evidence in court. Second, blockchain-based smart contracts represent a genuinely novel legal construct that cannot be fully accommodated within the conceptual framework of conventional contract law, necessitating the development of legal norms specifically designed to regulate their unique characteristics.

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