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Dynamics of Civil Law in the Digital Era: Transformation, Challenges, and Legal Certainty

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Abstract: The digital era has transformed the socio-economic landscape, giving rise to new legal objects and relationships unanticipated by the Indonesian Civil Code (KUHPerdata), a colonial-era legal product. Phenomena such as electronic contracts, digital assets (crypto assets and NFTs), and online dispute resolution (ODR) challenge the relevance and capability of the existing civil law framework. Despite partial regulations like the Information and Electronic Transactions (ITE) Law, this legal fragmentation creates uncertainty and systemic friction, where a 19th-century legal framework clashes with 21st-century digital realities, thereby hindering the growth of the digital economy that demands legal certainty. This study aims to analyze the normative limitations of the KUHPerdata in accommodating digital transformation, identify key legal challenges related to the validity of electronic contracts, the property status of digital assets, and the effectiveness of ODR, and formulate a responsive and integrative civil law reform concept. This research employs a normative juridical method with a statute approach and a conceptual approach. The analysis is conducted on primary legal materials such as the KUHPerdata and the ITE Law, as well as secondary legal materials relevant to cyber law theory and legal reform. The study finds that the concept of property ('kebendaan') in the KUHPerdata is inadequate for classifying digital assets, causing ambiguity in ownership, inheritance, and collateralization. While the ITE Law provides *de jure* legitimacy to electronic contracts, *de facto* implementation is hampered by the absence of technical rules on evidence and data security. Furthermore, the lack of a specific legal framework for ODR creates a legal vacuum that obstructs efficient e-commerce dispute resolution. Indonesia's current civil law framework is reactive and fragmented, failing to provide comprehensive legal certainty in the digital era. A fundamental and holistic reform of the KUHPerdata is imperative to modernize the concept of property law, establish secure standards for electronic transactions, and build a solid legal foundation for ODR.

Keywords: Civil Law, Digital Era, Legal Certainty, Digital Assets, Electronic Contracts

INTRODUCTION

Indonesian Civil Law, as enshrined in the Civil Code (KUHPerdata), is essentially a product of the Dutch colonial legacy enacted in 1848. The philosophy of this legal codification was heavily influenced by the views of 19th-century European society, which essentially emphasized legal certainty for tangible physical objects and localized, limited contractual relationships within a particular community (Waris, 2022). Although several principles and principles in Book III of the Civil Code, particularly those governing contract law, are still relevant today, many of its provisions are no longer in line with the developments and increasingly complex needs of modern society (Waris, 2022).

The contradiction between tradition and innovation in civil law has become increasingly apparent as we enter the digital era. Rapid developments in digital technology-based business, trade, and industry, such as e-commerce, crypto assets, and virtual ecosystems like the Metaverse, have given rise to new forms of legal relationships that are cross-border, global, and highly complex (Waris, 2022). This situation places civil law in Indonesia at a critical juncture, where it must choose between maintaining its rigid and static legal tradition or undergoing substantial transformation to meet the challenges of the times. Civil law is required to accommodate new forms of digital-based contracts while providing fair legal protection for the parties involved. Therefore, there is an urgent need to update the substance of civil law, particularly Book II, which regulates property, and Book III, which regulates contracts, to ensure it remains functional, relevant, and responsive to developments in modern society (Abunawas, Amiriani, & El Hendrianto, 2021).

This research is based on the Theory of Development Law proposed by Prof. Dr. Mochtar Kusumaatmadja, SH, LL.M., as its main philosophical framework (Triyono, 2017). This theory essentially rejects the view of law solely as a tool of power (law as a tool of social engineering) which tends to be rigid and oriented towards the tradition of colonial legism. Instead, law must be positioned as a means of societal renewal that functions as a catalyst and dynamist of social change (Triyono, 2017). With this perspective, law must not be passive, but must actively respond to the rapidly developing social, political, and technological dynamics in society.

In the context of the digital era, the application of development law theory is becoming increasingly important. Law serves not only to regulate but also to build and direct societal transformation toward justice and certainty. Therefore, synergy is needed between theoretical law practitioners, namely academics, and practical law practitioners, such as judges, advocates, and policymakers, to formulate legal policies that are not only effective but also reflect the aspirations of modern society (Triyono, 2017; Busro, 2012).

In addition to development law theory, this research also refers to the concept of responsive law as proposed by Nonet and Selznick (2008). Responsive law emphasizes the importance of flexible law, oriented towards substantive justice, and able to adapt to the changing needs of society. This view emphasizes that law is not merely an instrument of power, but also a means to achieve sustainable social justice (Nonet & Selznick, 2008). In national legal politics, law and power must work synergistically, where the authority of the ruler to determine the law is limited by the principles of the law itself, thus creating a legal order that is just, democratic, and oriented towards the interests of society (Rahardjo, 2009; Huijbers, 1995; Junaidi, 2021).

Based on the background and theoretical foundations described above, this study focuses on three main issues that reflect the urgency of civil law transformation in the digital era. First, how is Indonesian civil law undergoing transformation, particularly in the concept of property and procedural law, to accommodate digital assets and electronic evidence mechanisms that are increasingly dominant in modern legal practice? Second, what are the main regulatory challenges and legal gaps that arise in the regulation of digital contracts and online dispute resolution (ODR) mechanisms, which require new legal standards to be effective and fair? Third, how should the civil law regulatory framework be reformed to provide comprehensive and adaptive legal certainty, while also being able to respond to the dynamics of civil law developments amidst the increasingly unstoppable flow of digitalization.

METHOD

This research is categorized as normative juridical legal research, often referred to as doctrinal legal research (Riyani & Gultom, 2022; Krisnowo, 2022). The primary focus of this type of research lies in an in-depth study of legal texts, legal principles, and legal doctrines that have developed in the literature and legal practice in Indonesia. The goal is to evaluate the extent to which current laws and regulations are relevant and able to address legal challenges emerging in the digital era. In other words, normative legal research is not oriented toward empirical data in the field, but rather emphasizes the analysis of written legal materials sourced from regulations, legal literature, and court decisions. This aligns with the nature of research that seeks to identify weaknesses and gaps in existing law, while simultaneously formulating alternative normative solutions that better suit the needs of modern society (Akbar, 2024) . In this context, the research focuses on the substance of civil law contained in the Civil Code and its relevance to the development of digital technology, including electronic transactions, digital assets, and online dispute resolution mechanisms (Abunawas, Amiriani, & El Hendrianto, 2021).

In answering the formulated problem formulation, this study uses several complementary approaches. First, a statute approach is carried out by analyzing applicable formal regulations, both those sourced from the Civil Code and other related laws. Some of the regulations reviewed include Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law), Law Number 30 of 1999 concerning Arbitration and Alternative Dispute Resolution, and implementing regulations such as Supreme Court Regulation (PERMA) Number 1 of 2019 concerning Electronic Case Administration and Trials, Government Regulation (PP) Number 71 of 2019 concerning the Implementation of Electronic Transaction Systems, and PP Number 24 of 2022 concerning the Creative Economy (Syamsulbahri, 2020; Permana, 2023). Second, a conceptual approach is used to review fundamental legal concepts contained in the Civil Code, for example, the definition of objects as stated in Articles 499–500 of the Civil Code, as well as the principles of agreements in Articles 1320 and 1333 of the Civil Code. This approach is important because traditional concepts often clash when confronted with digital objects and contracts (Krisnowo, 2022; Permana, 2023). Third, a comparative approach is used to compare the online dispute resolution (ODR) regulatory framework in Indonesia with practices in other countries, thereby identifying the ideal needs for formulating more effective, adaptive, and contextual regulations in line with global legal developments (Riyani & Gultom, 2022).

The data in this study is entirely sourced from secondary data, which is classified into three types of legal materials. First, primary legal materials, namely laws and regulations that directly regulate civil aspects, electronic transactions, and online dispute resolution. Second, secondary legal materials, in the form of academic literature reviews such as legal journals, research results, and reference books from leading legal experts, such as the works of Satjipto Rahardjo, Mochtar Kusumaatmadja, and Harahap, which provide theoretical and practical perspectives on legal reform (Busro, 2012; Harahap, 2005; Rahardjo, 2009; Rahardjo, 2012). These secondary legal materials are very important because they serve to enrich the analysis, connect theory with practice, and provide alternative solutions from the perspective of experts. Third, tertiary legal materials, namely supplementary materials such as legal dictionaries and encyclopedias that are used to clarify legal terms and strengthen conceptual arguments (Anshori, 2018). The use of a combination of these three types of legal materials aims to provide a more comprehensive analytical framework, so that research is not only focused on written legal norms, but is also enriched by theoretical thinking and conceptual views.

The data analysis in this study used a descriptive qualitative method. This method was chosen because it is most appropriate for describing, interpreting, and evaluating normative legal substance. The analysis was conducted through two main stages: textual interpretation and contextual interpretation. Textual interpretation aims to understand the text of the articles as they are, for example, examining the wording of Articles 499–500 of the Civil Code concerning the definition of objects, or Article 1320 concerning the conditions for the validity of an agreement. Meanwhile, contextual interpretation is used to assess whether these articles remain appropriate and effective when faced with socio-economic realities and legal challenges in the digital era. Through contextual interpretation, researchers seek to identify patterns and themes emerging from the legal material, while also identifying potential legal gaps that could hinder legal protection. From this analysis process, the research then formulates recommendations for the modernization of civil law, particularly regarding the recognition of digital assets, electronic agreements, and online dispute resolution mechanisms (Abunawas, Amiriani, & El Hendrianto, 2021). Thus, the results of the analysis do not only stop at the descriptive level, but also produce normative arguments that can be used as a basis for developing more responsive and contextual legal regulations.

RESULTS AND DISCUSSION

Conceptual Transformation of Civil Law: Adaptation of Substance and Procedure

1. Expansion of the Concept of Objects (Matters) in the Digital Regime

The traditional concept of property as regulated in Book II of the Civil Code has undergone significant expansion. New digital assets, such as *Non-Fungible Tokens* (NFTs) and virtual land , have been classified as intangible *movable* **objects** (Krisnowo, 2022; Permana, 2023). This classification is legally supported by Article 499 of the Civil Code, which states that *property* (*zaak*) includes rights that can be controlled through ownership, and Article 500 of the Civil Code, which explicitly recognizes intangible objects as legal objects (Permana, 2023).

Contractually, NFTs are considered to meet the requirements to be the object of a civil agreement based on Article 1333 of the Civil Code, namely: (1) their existence is clear and can be determined; (2) their value can be calculated through crypto market prices; and (3) they can be traded on digital markets (Permana, 2023). The legitimacy of these electronic assets is also strengthened by Government Regulation Number 71 of 2019 (Permana, 2023).

Implications of Material Collateral. The status of NFTs as representations of Intellectual Property Rights (IPR) raises a legal dilemma regarding the appropriate collateral scheme. Pledged collateral (Articles 1150-1160 of the Civil Code) requires physical delivery (*bezit*) to the creditor (Article 1152), a requirement that is nearly impossible to apply to digital assets (Permana, 2023). Therefore, a **Fiduciary Collateral scheme** is a superior option because the fiduciary legal mechanism does not require the delivery of objects (Permana, 2023). This is very much in line with the characteristics of NFTs, allowing the debtor to retain control and management of the digital assets, the value of which can increase through utilization and exposure in the digital ecosystem (Permana, 2023). This recognition is reinforced by Government Regulation Number 24 of 2022, which opens up space for intellectual property-based financing (Permana, 2023).

This transformation reveals a fundamental shift in property law: legal control is shifting from physical possession of objects (*bezit*) to **control over data and *smart contracts*** that represent ownership rights on *the blockchain* . The acceptance of fiduciary rights for digital assets such as NFTs and the recognition of *virtual land* as intangible movable property indicate that the concepts of ownership and *leveraging* must be urgently redefined for assets tied to distributed technologies.

Table 1 presents a conceptual comparison of objects and guarantees between traditional and digital regimes.

Criteria for the Concept of Materiality	Traditional (Civil Code)	Digital (Crypto Assets/NFTs)	Implications of Legal Transformation
Physical Properties	Tangible or Intangible (Rights) (Permana, 2023)	*Intangible* Movable Objects (Krisnowo, 2022; Permana, 2023)	Expanding the definition of ownership and control in a digital, data-oriented and *smart contract manner* .
Primary Guarantee Mechanism	Pawn (requires physical delivery/possession) (Permana, 2023)	Fiduciary (without physical delivery) (Permana, 2023)	Fiduciary Preference (PP 24/2022) shows the irrelevance of some of the Pledge Articles for digital assets.
Recognition of Legitimacy	Articles 499 and 500 of the Civil Code (Permana, 2023)	ITE Law, PP 71/2019, PP 24/2022 (Permana, 2023)	Increasing legitimacy through *lex specialis regulations* that complement and sometimes ignore the Civil Code (Abunawas, Amiriani, & El Hendrianto, 2021).
Definition of Ownership	Physical control (*Possession/ Possession*)	Data control (*Private Key/Wallet Access*)	The law must adjust the mechanisms *for leveraging* (delivery) and proof of ownership.

2. Transformation of Procedural Law and the Power of Electronic Evidence

In the realm of procedural law, transformation has occurred at a faster pace than in substantive law. The legal basis is the ITE Law and its implementing regulations, which legitimize electronic evidence (Syamsulbahri, 2020). Supreme Court Regulation No. 1 of 2019 provides detailed provisions regarding the administration of cases and trials in court electronically (*e-court*) (Syamsulbahri, 2020).

Electronic evidence is admissible in civil cases, provided it meets several key requirements, similar to *the Duch Electronic Signature Act* (DESA): legibility or intelligibility of its contents, guaranteed accuracy of its contents, certainty of time, and certainty of the identity of the parties (Muhammad Ubayyu Rikza, n.d.). The evidentiary power of this electronic evidence now has a strong legal basis.

The procedural implications also extend to the conduct of virtual trials. Judges can permit the presence of witnesses via *teleconference* , where the witnesses appear virtually (Muhammad Ubayyu Rikza, n.d.). This practice is considered not to be in conflict with applicable procedural law and demonstrates the flexibility of the judiciary to accommodate technological developments in the judicial process (Muhammad Ubayyu Rikza, n.d.).

While courts have successfully adopted procedural innovations (such as *e-courts* and virtual witness testimony), this adaptation contrasts with the slow pace of reform of the substantive law underlying these disputes (the Civil Code) (Abunawas, Amiriani, & El Hendrianto, 2021). This imbalance creates a situation where digital disputes can be processed efficiently, but the substantive legal basis (e.g., the definition *of breach of contract* in the context of *smart contracts* or the mechanism for distributing digital assets) remains outdated. These procedural innovations, which precede substantive innovations, have the potential to hinder the discovery of fair law in civil cases that rely heavily on technology.

Regulatory Challenges and Legal Gaps

Fragmentation and Loss of Urgency of the Civil Code

The government's efforts to reform civil law through the principle of *lex specialis derogat legi generali* (creating special laws and regulations) have actually given rise to critical views that the Civil Code **has lost its urgency** and its status has become controversial (Abunawas, Amiriani, & El Hendrianto, 2021). The existence of various sectoral regulations outside the Civil Code has led to regulatory fragmentation.

Another substantive challenge is Contract Law. Book III of the current Civil Code is inadequate to accommodate the complexities of digital businesses and industries that cross national borders (Waris, 2022). Relations between legal entities in digital-based industries are no longer solely domestic but also incorporate international elements. The proposed contract law must explicitly accommodate this development and provide a legal framework for electronic transactions, including the concept of automated contracts or *smart contracts* (Waris, 2022).

Furthermore, the development of *online transportation modes* (such as Gojek and Grab) presents serious challenges regarding personal data protection and the risk of user data leaks (Waris, 2022). Civil law must ensure adequate protection of digital consumer rights. Ongoing regulatory fragmentation has the potential to trigger *regulatory arbitrage* , where interested parties exploit gaps between general law (the lax Civil Code) and specific law (Bappebti regulations for crypto assets) (Permana, 2023). This threatens legal certainty, particularly in determining jurisdiction and authority over digital assets.

Online Dispute Resolution (ODR) Regulatory Gaps

Online *Dispute Resolution* (ODR) is a vital dispute resolution mechanism for *e-commerce transactions* , offering the advantages of low cost, broad coverage, and no need for face-to-face meetings (Riyani & Gultom, 2022). Although ODR is an implementation of *Alternative Dispute Resolution* (ADR), which is generally supported by Law Number 30 of 1999 concerning Arbitration and APS (Riyani & Gultom, 2022; Putra & Adwinata, 2023), ODR **has not been explicitly regulated in the "lex specialis" for its implementation in Indonesia** (Riyani & Gultom, 2022).

This legal gap has serious implications for legal certainty. Lack of clear agreement regarding the choice of forum or applicable law (*choice of law*) can lead to future legal issues, particularly as transactions occur online, often across borders (Putra & Adwinata, 2023). The lack of clear regulations, particularly regarding *online mediation* , leaves online dispute resolution mechanisms entirely at the discretion of the parties involved (Putra & Adwinata, 2023).

This situation poses challenges to national legal sovereignty. If ODR regulations are not explicitly regulated by the state (Riyani & Gultom, 2022), dispute resolution could be dominated by foreign mechanisms and laws. Firm ODR regulations are a strategic step to provide legal certainty and safeguard Indonesia's legal sovereignty in a digital ecosystem dominated by global corporations.

Table 2. Analysis of Key Regulatory Gaps in Digital Civil Law

Challenge Area	Legal Gap	Impact on Legal Certainty	Proposed Regulations
Online Dispute Resolution (ODR)	The absence of explicit *lex specialis (Riyani & Gultom, 2022).*	Uncertainty of jurisdiction/forum, and difficulties in executing online arbitration awards (Putra & Adwinata, 2023).	Explicit regulation of ODR, especially *online mediation* , in relevant laws or government regulations (Riyani & Gultom, 2022).
Contract Law (Contracts)	Limitations of Book III of the Civil Code in accommodating *smart contracts* and cross-border transactions (Waris, 2022).	Legal risks in automated agreements, and the lack of protection for digital legal subjects.	Updates to National Contract Law that accommodate digital technology (Waris, 2022).
The Concept of Objects/Substances	The Civil Code in substance and grammar is no longer relevant (Abunawas, Amiriani, & El Hendrianto, 2021).	Ambiguity in the ownership status and governance of virtual assets (e.g., inheritance of digital assets) (Krisnowo, 2022).	Comprehensive revision of the Civil Code, as a step to modernize the national legal system as a whole (Abunawas, Amiriani, & El Hendrianto, 2021).

Towards Legal Certainty: Recommendations for Legislative Reform

1. Comprehensive Revision of the Civil Code

The revision of the Civil Code has long been a matter of debate. Research confirms that this revision is not merely an adjustment, but rather **an absolute necessity *to*** ensure the law continues to function effectively in modern society (Abunawas, Amiriani, & El Hendrianto, 2021).
Reforms should focus on two substantial areas:

a. **Property Law (Book II):** The definition of property rights must be explicitly expanded to include intangible digital assets, including transfer mechanisms *and* guarantees appropriate to *intangible assets* (Abunawas, Amiriani, & El Hendrianto, 2021). This is necessary to address the ambiguity arising from the current classification of virtual assets (Krisnowo, 2022).
b. **Contract Law (Book III):** A new National Contract Law is needed that explicitly regulates electronic contracts, *smart contracts* , and cross-border agreements. This new contract law must be designed to accommodate and provide legal protection for businesses based in the digital industry (Waris, 2022). In addition to substance, the revision must also include updating the language and grammar, which still adopts outdated styles, to suit the context of modern Indonesian (Abunawas, Amiriani, & El Hendrianto, 2021).

Strengthening the Legality of Online Dispute Resolution (ODR)

To ensure legal certainty in digital transactions, ODR regulations must be explicitly **and** firmly regulated **(*lex specialis*)** (Riyani & Gultom, 2022). Although Law No. 30 of 1999 regulates arbitration and APS, regulations regarding online arbitration and the technical provisions for its implementation have not been detailed (Putra & Adwinata, 2023).

Explicit ODR regulations, particularly for *online mediation* , are essential to provide legal certainty for those facing *e-commerce disputes* (Riyani & Gultom, 2022). These regulations should detail: (1) the validity of online agreements; (2) determining jurisdiction and selecting a forum; and (3) the mechanism for enforcing decisions resulting from ODR (Putra & Adwinata, 2023). The implementation of this framework also needs to be supported by legal education institutions in Indonesia through strengthening curricula that integrate digital technology into civil law teaching (Busro, 2012; Harahap, 2005; Hernoko, 2013).

Synergy of Progressive Law and National Legal Politics

Civil law reform must be driven by responsive legal politics (Nonet & Selznick, 2008), in line with the spirit of Development Law Theory (Triyono, 2017). Synergy between academics, lawyers, and policymakers is needed to create a legal framework that is not only politically effective but also socially just (Triyono, 2017; Busro, 2012).

Institutionally, regulatory harmonization in the digital asset sector is needed to address overlapping authorities and classifications. The Commodity Futures Trading Regulatory Agency's (Bappebti) authority to regulate crypto assets (Permana, 2023) must be clarified and synchronized with broader economic and financial policies to eliminate ambiguity. Synergy between law and authority in this regard must be directed toward ensuring that law serves as a tool that limits government authority while still facilitating the development of the digital economy (Rahardjo, 2009; Huijbers, 1995; Junaidi, 2021).

CONCLUSION

Based on the research and discussion, it can be concluded that Indonesian civil law is undergoing a profound conceptual transformation, both in substance and procedure, in response to the development of digital technology. In the substantive realm, the traditional concept of property in the Indonesian Civil Code has been expanded to accommodate digital assets such as Non-Fungible Tokens (NFTs) and virtual land, which are legally categorized as intangible movable property. This change requires adjustments to the collateral mechanism, with the fiduciary scheme considered more relevant than traditional pawning, while also indicating a shift in ownership control from physical possession to control over data and smart contracts. Meanwhile, civil procedural law is developing more rapidly through the recognition of electronic evidence, the implementation of electronic trials (e-courts), and the use of virtual witnesses, although substantive reforms in civil law have not yet caught up with these dynamics.

However, this transformation also presents a number of challenges, including regulatory fragmentation, the loss of urgency of the Civil Code as the primary law, and legal gaps in digital dispute resolution, particularly online dispute resolution (ODR). Sectoral regulatory fragmentation has the potential to create legal uncertainty and regulatory arbitrage, while delays in updating contract law pose risks in cross-border contracts and smart contracts. The absence of a lex specialis explicitly regulating ODR also threatens national legal sovereignty, as dispute resolution could be dominated by foreign mechanisms.

To address these challenges, legislative reform is urgently needed. A comprehensive revision of the Civil Code is essential, with a focus on modernizing property law and contract law to reflect the characteristics of digital assets and electronic contracts. Furthermore, strengthening the legality of ODR through explicit and detailed regulations is a strategic step to provide legal certainty for parties transacting in the digital realm. This reform also needs to be supported by a responsive and progressive national legal policy, involving synergy between academics, legal practitioners, regulators, and policymakers. Harmonizing regulations in the digital asset sector and synchronizing the authority of supervisory institutions is key to ensuring Indonesian civil law becomes a fair, effective, and adaptive instrument in the digital era.

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