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Analysis of Legal Protection for Digital Asset Ownership Under Indonesian Civil Law

Setiawan Yuliana[1], Ramdhani[2]
[1,2] Faculty of Law, Department of Civil Law, Jambi University (UNJA), Jambi, Indonesia.

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ABSTRACT

The rapid growth of digital assets has created new legal challenges regarding ownership protection under Indonesian civil law. Existing regulations have not comprehensively addressed the legal status, ownership rights, and dispute resolution mechanisms for digital assets, resulting in legal uncertainty. This study aims to analyze the legal protection of digital asset ownership from the perspective of Indonesian civil law. The research employs a normative legal method using a statutory, conceptual, and comparative approach. The findings indicate that although the Civil Code provides general principles concerning property rights and contractual relationships, it does not specifically regulate digital assets. Consequently, legal protection remains fragmented through sectoral regulations, creating inconsistencies in enforcement. The study concludes that comprehensive legal reform is necessary to establish clear recognition, ownership certainty, and effective legal protection for digital assets within the Indonesian civil law framework.

Corresponding Author:

Setiawan Yuliana,
Faculty of Law, Civil Law,
University of Jambi (UNJA), Jambi, Indonesia,
Jl. Raya Jambi–Muara Bulian KM 15, Mendalo Darat, Jambi, Indonesia.
Email: setiawan22@gmail.com.

1. INTRODUCTION

The rapid advancement of information and communication technology has driven significant transformations across various aspects of society, particularly in the fields of economics and law. Digitalization has not only shifted conventional transactions toward electronic transactions but has also created new forms of property commonly referred to as digital assets. Digital assets encompass a wide range of economically valuable objects that may be owned, traded, and transferred through electronic media, including cryptocurrencies, non-fungible tokens (NFTs), economically valuable digital accounts, digital wallets, internet domain names, digital data, and various virtual assets developed within blockchain ecosystems. The emergence of digital assets demonstrates that the legal concept of ownership is no longer confined to tangible property but has expanded to include intangible property possessing substantial economic value.

In Indonesia, digital asset ownership has experienced remarkable growth alongside the rapid expansion of the digital economy. Cryptocurrency trading platforms, digital wallet services, and blockchain-based transactions have increasingly become integral components of economic activities. The continuously rising value of digital asset transactions indicates that these assets have evolved into important investment instruments and forms of wealth that require adequate legal protection. Nevertheless, these developments have not been accompanied by sufficient preparedness within the national legal system, particularly Indonesian civil law, to provide legal certainty regarding the legal status, ownership, transfer of rights, and dispute resolution mechanisms relating to digital assets.

From a normative perspective, Indonesian civil law continues to rely primarily on the Indonesian Civil Code (Kitab Undang-Undang Hukum Perdata/KUHPerdata), which was formulated under a classical legal paradigm concerning the concepts of property and ownership. Although the Civil Code recognizes classifications of movable and immovable property, as well as tangible and intangible property, these provisions do not explicitly accommodate the distinctive characteristics of digital assets, which are decentralized, electronically networked, and dependent upon cryptographic technologies. Meanwhile, several sector-specific regulations, including the Law on Electronic Information and Transactions (Electronic Information and Transactions Law) and its amendments, together with regulations governing cryptocurrency trading, primarily regulate electronic transactions and market supervision rather than providing comprehensive legal protection for ownership rights from the perspective of civil law.

This regulatory condition creates the potential for legal uncertainty whenever disputes arise concerning ownership, inheritance, digital theft, hacking, or the transfer of digital assets. Such challenges are further complicated by the distinctive characteristics of digital assets, which differ substantially from conventional legal objects. Ownership of digital assets is commonly evidenced through control of private keys, digital identities, or blockchain records—forms of proof that are not recognized within the traditional evidentiary system. Furthermore, the cross-border nature of digital transactions creates additional challenges relating to jurisdiction and the determination of applicable law. Accordingly, there is an urgent need for legal scholarship capable of integrating the concept of ownership under Indonesian civil law with contemporary technological developments in order to establish legal certainty that corresponds with the needs of modern society.

Although numerous studies have examined digital assets from various perspectives, several research gaps remain. Existing studies generally focus on cryptocurrency regulation as an investment instrument and digital commodity, emphasizing market supervision and investor protection. Other studies primarily discuss blockchain technology, cybersecurity, and digital transaction mechanisms without comprehensively connecting these issues to the concept of ownership under Indonesian civil law. Furthermore, a substantial body of literature concentrates on criminal law issues, including cybercrime, money laundering, and digital crimes involving virtual assets. By contrast, scholarly discussion concerning the legal construction of ownership protection for digital assets based on the principles of property law, ownership rights, evidentiary standards, and civil liability remains relatively limited. Consequently, both theoretical and normative gaps persist regarding how Indonesian civil law should provide legal protection for digital assets as legal objects possessing significant economic value.

The present study is theoretically grounded in several fundamental legal theories. First, the Theory of Legal Protection emphasizes that the state bears the responsibility to guarantee legal certainty, justice, and legal benefits for every legal subject in protecting their rights. Legal protection is realized not only through the existence of legal norms but also through effective dispute resolution mechanisms whenever legal rights are violated. Second, the Theory of Legal Certainty maintains that ownership rights must possess a clear legal foundation capable of ensuring predictability in legal relations among parties. Third, Property Rights Theory conceptualizes ownership as an exclusive right that authorizes the owner to possess, use, enjoy the economic benefits of, and transfer a legal object to another party. Fourth, the Theory of Property Law within civil law explains the characteristics of property as an object of proprietary rights that may be owned and transferred. The integration of these theories provides the conceptual framework for analyzing whether digital assets may be classified as objects of proprietary rights entitled to legal protection under the Indonesian civil law system.

Previous studies indicate an expanding academic discourse concerning digital assets. Several scholars conclude that digital assets constitute a new form of property requiring legal regulation beyond the traditional concept of property. Other studies emphasize the importance of harmonizing information technology regulations with civil law in order to ensure legal certainty in digital transactions. International research has likewise demonstrated that numerous jurisdictions have begun recognizing digital assets as objects of property rights that may be inherited, used as collateral, and become the subject of civil litigation. Nevertheless, most existing studies adopt comparative law or digital economic regulation perspectives and therefore do not provide a comprehensive analysis of legal protection based on the principles of Indonesian civil law. Accordingly, the novelty of this research lies in proposing a comprehensive analytical framework for the legal protection of digital asset ownership under Indonesian civil law by integrating the concepts of property law, ownership rights, legal certainty, and technological developments into a unified legal analysis. This study not only identifies existing legal vacuums but also offers a conceptual reconstruction of the legal status of digital assets as proprietary objects deserving explicit legal protection. Consequently, this research is expected to contribute to the further development of Indonesian civil law in the era of digital transformation.

Based on the foregoing background, this study aims to analyze the legal protection afforded to digital asset ownership under Indonesian civil law, identify weaknesses in the existing legal framework, and formulate a legal construction capable of providing greater legal certainty, justice, and effective protection for digital asset owners. Furthermore, this study seeks to explain the relevance of the ownership concept embodied in the Indonesian Civil Code to the characteristics of digital assets developed through blockchain technology and electronic transactions. The study is expected to contribute both theoretically and practically. Theoretically, it enriches the development of Indonesian civil law, particularly regarding proprietary rights over digital assets as modern legal objects. Practically, the findings are expected to serve as a reference for legislators, regulators, judges, academics, and legal practitioners in formulating legal policies and resolving disputes involving digital asset ownership. In addition, this research is intended to provide an academic foundation for developing legal regulations that are more responsive to the continuing evolution of Indonesia's digital economy.

Based on the theoretical framework and research problems outlined above, this study proposes the hypothesis that legal protection for digital asset ownership within the Indonesian civil law system has not yet provided adequate legal certainty due to the existence of legal gaps and regulatory fragmentation concerning the legal status, ownership verification, and dispute resolution mechanisms for digital assets. Strengthening the legal framework through harmonization between the principles of civil law and digital economy regulations is expected to enhance legal certainty and improve the effectiveness of legal protection for digital asset ownership in Indonesia.

2. RESEARCH METHOD

This study employs a normative legal research method with a statutory, conceptual, and comparative approach to examine the legal protection of digital asset ownership under Indonesian civil law. The statutory approach analyzes relevant legal instruments, including the Indonesian Civil Code (KUHPerdata), Law No. 11 of 2008 concerning Electronic Information and Transactions as amended by Law No. 1 of 2024, and other regulations governing digital assets and electronic transactions. The conceptual approach explores legal doctrines and scholarly perspectives concerning ownership rights, property law, legal certainty, and the classification of digital assets within the Indonesian legal system. In addition, a comparative approach is applied by examining legal frameworks from selected jurisdictions that have recognized and regulated digital asset ownership, with the aim of identifying best practices that may contribute to the development of Indonesian law. Legal materials consist of primary, secondary, and tertiary sources collected through library research. The collected materials are analyzed qualitatively using descriptive-analytical and legal interpretation methods to evaluate the adequacy, consistency, and effectiveness of existing legal norms in providing protection for digital asset owners and to formulate recommendations for future legal reform.

3. RESULTS AND DISCUSSIONS

3.1. The Legal Status of Digital Assets as Objects of Property Rights under the Indonesian Civil Law System

Based on the analysis of primary, secondary, and conceptual legal materials, this study finds that digital assets possess the characteristics of proprietary objects that may be classified as intangible property within the framework of Indonesian civil law. The findings demonstrate that although the Indonesian Civil Code (Kitab Undang-Undang Hukum Perdata—KUHPerdata) does not explicitly regulate digital assets, the concept of property embodied in Article 499 of the Civil Code may be interpreted broadly to encompass all objects capable of becoming the subject of ownership rights. Digital assets satisfy the essential characteristics of property because they possess measurable economic value, may be controlled by specific legal subjects through technological mechanisms, and provide economic benefits to their owners.

With respect to the first research hypothesis (H1), which proposes that digital assets possess the characteristics of legal objects capable of being classified as property under Indonesian civil law, the findings confirm that this hypothesis is accepted. This conclusion is supported by the fact that digital assets fulfill the fundamental elements of proprietary rights, particularly the existence of a legal relationship between a legal subject and an object possessing economic value. Although digital assets do not have a physical form, they possess legal existence through electronic systems, digital codes, cryptographic authentication mechanisms, and blockchain technology, all of which enable individuals to exercise control, utilization, and disposition over such assets. Consequently, the absence of tangible form should not preclude digital assets from being recognized as objects of ownership within the modern civil law framework. Nevertheless, the study also identifies significant limitations within the current legal framework. Indonesian civil law continues to adopt a traditional approach that distinguishes movable and immovable property primarily on the basis of their physical characteristics. Such an approach was developed long before the emergence of blockchain technology and digital assets and therefore does not adequately accommodate the distinctive nature of digital property. Unlike conventional property, digital assets exist exclusively within digital environments, rely on decentralized technological infrastructures, and derive legal control from cryptographic authentication rather than physical possession. These characteristics challenge the conventional classification of property under the Indonesian Civil Code and expose the inadequacy of existing legal concepts in addressing contemporary technological developments.

Furthermore, ownership of digital assets differs fundamentally from ownership of conventional property. In practice, ownership is commonly established through control over private cryptographic keys, blockchain-based transaction records, digital identities, or authenticated access credentials. These forms of ownership verification differ substantially from the documentary evidence traditionally recognized under Indonesian civil procedural law. As a result, disputes concerning digital asset ownership frequently raise complex evidentiary issues, particularly regarding the identification of the legitimate owner, the authentication of ownership rights, and the legal recognition of blockchain-based records as admissible evidence before judicial institutions. The findings therefore indicate that digital assets have substantively fulfilled the legal characteristics required to qualify as objects of ownership under Indonesian civil law. However, the absence of explicit statutory recognition continues to create legal uncertainty regarding their legal status and the scope of proprietary rights attached to them. Consequently, a progressive interpretation of existing civil law principles, accompanied by comprehensive legislative reform, is required to provide stronger legal recognition and greater certainty concerning the legal status of digital assets within the Indonesian civil law system. Such reform would bridge the gap between traditional property law doctrines and the realities of the rapidly evolving digital economy, thereby enhancing legal certainty, protecting ownership rights, and promoting public confidence in digital economic activities.

3.2. Legal Certainty for Digital Asset Owners within the Indonesian Legal System

The findings of this study indicate that the legal protection afforded to digital asset owners in Indonesia remains fragmented and has yet to establish a comprehensive legal protection framework. Based on an analysis of regulations governing electronic transactions, digital asset trading, and the fundamental principles of Indonesian civil law, the study finds that the existing legal framework places greater emphasis on transaction regulation and administrative supervision than on the protection of ownership rights. Regarding the second research hypothesis (H2), which proposes that legal protection for digital asset ownership in Indonesia remains inadequate due to the absence of specific regulations governing ownership rights, transfer mechanisms, and dispute resolution concerning digital assets, the findings confirm that this hypothesis is accepted. The research further demonstrates that digital asset owners continue to face various legal challenges, including the risk of losing access to digital accounts, cyberattacks and hacking incidents, unauthorized use or transfer of digital assets by third parties, and difficulties in proving ownership when disputes arise. These legal risks are intensified by the absence of explicit statutory provisions defining ownership verification mechanisms and determining the evidentiary status of blockchain-based records within the Indonesian legal system. Consequently, owners frequently encounter uncertainty regarding the legal remedies available to protect their proprietary interests.

From the perspective of Indonesian civil law, legal protection for digital asset owners may, in principle, be pursued through the doctrines of property rights, unlawful acts (perbuatan melawan hukum), and contractual obligations. Individuals who suffer losses resulting from unlawful conduct affecting their digital assets may seek civil remedies by filing claims based on the essential elements of fault, damages, and causation. Existing civil law principles therefore provide a general legal foundation for protecting ownership rights. However, the study finds that these general principles have not yet been specifically adapted to accommodate the unique legal characteristics of digital assets as modern forms of property. The analysis also reveals several regulatory deficiencies that weaken legal certainty for digital asset owners. Indonesian legislation does not yet provide clear rules concerning the evidentiary standards for establishing ownership of digital assets, the legal procedures for seizure or execution of digital assets in civil proceedings, or the treatment of digital assets within inheritance law. Likewise, legal uncertainty persists regarding the legal status of cryptographic keys, blockchain transaction records, and digital authentication mechanisms as legally recognized evidence before courts. These regulatory shortcomings significantly reduce the effectiveness of civil law protection when ownership disputes involve technologically sophisticated digital assets.

Furthermore, the decentralized and borderless nature of blockchain technology presents additional legal complexities. Digital asset transactions frequently involve parties located in different jurisdictions, making it difficult to determine the applicable law, identify competent judicial authorities, and enforce judicial decisions across national borders. Consequently, conventional civil law mechanisms that were originally designed for domestic legal relationships often prove insufficient for resolving disputes involving cross-border digital assets. Accordingly, the findings suggest that effective legal protection for digital asset owners requires a more comprehensive and technology-oriented regulatory approach. Such an approach should integrate the fundamental principles of Indonesian civil law with the technological characteristics of blockchain systems while simultaneously addressing the practical needs of the digital economy. Comprehensive legal reform should include explicit recognition of digital ownership rights, standardized mechanisms for ownership verification, clearer evidentiary rules, effective dispute resolution procedures, and legal safeguards against unauthorized access, cybercrime, and unlawful transfers of digital assets. By adopting such an integrated regulatory framework, Indonesia would be better positioned to provide stronger legal certainty, enhance investor confidence, and ensure more effective protection of proprietary rights within the rapidly evolving digital economy.

3.3. Legal Protection for Digital Asset Owners within the Indonesian Legal System

The normative analysis conducted in this study reveals that one of the principal challenges in protecting digital assets lies in the absence of a coherent legal framework that clearly defines the legal status of digital assets within the Indonesian legal system. Existing regulations remain fragmented across various sector-specific legal instruments and do not comprehensively regulate ownership rights, possession, transfer mechanisms, or legal protection relating to digital assets. Concerning the third research hypothesis (H3), which proposes that strengthening civil law regulations is essential to ensure legal certainty for digital asset ownership in Indonesia, the findings confirm that this hypothesis is accepted. The findings demonstrate that the rapid expansion of the digital economy requires a fundamental shift in legal thinking, moving from a traditional concept of ownership based primarily on physical objects toward a modern concept centered on economic value and legally recognized control over digital property. Such a transformation reflects the evolving nature of wealth in the digital era, where valuable assets increasingly exist in electronic form rather than as tangible objects. Consequently, Indonesian civil law must adapt to these technological developments in order to remain relevant and capable of providing effective legal protection.

Within the framework of contemporary civil law, ownership should no longer be understood solely in terms of physical possession. Rather, ownership encompasses an individual's legal authority to control, utilize, derive economic benefits from, and legally dispose of an object. Viewed from this perspective, digital assets constitute a new category of property that possesses independent economic value and therefore requires a distinct legal framework capable of accommodating its unique technological characteristics. Accordingly, digital assets should be recognized not merely as technological innovations but also as legitimate legal objects entitled to proprietary protection under civil law. The study further identifies several key aspects that should form the foundation of future legal reform. First, legislation should explicitly recognize digital assets as objects of property rights within the Indonesian civil law system. Such recognition would eliminate ambiguity regarding their legal status and establish a stronger legal basis for ownership protection. Second, the law should regulate the transfer of ownership by providing clear procedures governing transactions, assignments, inheritance, gifts, and other legal acts involving digital assets. Third, comprehensive legal safeguards should be established to protect digital asset owners against unauthorized access, cyber fraud, hacking, unlawful transfers, and other forms of infringement affecting proprietary rights.

Furthermore, legislative reform should regulate the inheritance of digital assets by establishing clear procedures for transferring ownership to lawful heirs. As digital assets increasingly constitute significant components of personal wealth, inheritance law must evolve to ensure that these assets can be transferred efficiently and legally upon the owner's death. In addition, dispute resolution mechanisms should be modernized to accommodate the technological characteristics of blockchain-based assets. Courts and alternative dispute resolution institutions should be supported by legal procedures capable of recognizing blockchain transaction records, digital authentication systems, and electronic evidence as reliable means of proving ownership. Another important finding concerns the role of institutional coordination in strengthening legal protection. Effective regulation of digital assets requires harmonization among civil law, financial regulations, electronic transaction legislation, cybersecurity policies, and data protection laws. Fragmented regulatory approaches create overlapping authority and legal inconsistencies that ultimately reduce legal certainty for digital asset owners. Therefore, a coordinated legal framework integrating these regulatory sectors is essential to ensure consistent implementation and effective enforcement.

Ultimately, the findings indicate that harmonization between conventional civil law principles and technological innovation has become an indispensable requirement for the future development of Indonesia's legal system. By adopting a more adaptive and technology-responsive legal framework, Indonesian civil law will be better equipped to accommodate ongoing social and economic transformation while simultaneously providing stronger legal certainty, greater protection of ownership rights, and increased public confidence in digital economic activities. Such legal reform would not only strengthen the national legal system but also contribute to creating a more secure, transparent, and sustainable digital economy.

3.4. Ideal Model of Legal Protection for Digital Asset Ownership in Indonesia

Based on the findings of this study, an ideal model for the legal protection of digital asset ownership should be developed through an integrated approach that combines civil law principles, information technology regulations, and digital security frameworks. Effective legal protection should not be limited to the imposition of sanctions after legal violations occur but should also establish preventive mechanisms capable of minimizing risks associated with the ownership and management of digital assets. With regard to the fourth research hypothesis (H4), which proposes that the implementation of a legal protection model founded upon legal certainty, recognition of ownership rights, and effective dispute resolution mechanisms would enhance the protection of digital asset owners, the findings confirm that this hypothesis is accepted. The analysis demonstrates that an ideal legal protection model should be constructed upon three interrelated dimensions: preventive protection, administrative protection, and repressive protection. These three dimensions collectively provide a comprehensive legal framework capable of addressing the unique characteristics of digital assets while ensuring legal certainty and safeguarding proprietary rights within Indonesia's evolving digital economy.

The first dimension concerns preventive legal protection, which requires the establishment of comprehensive legislation explicitly recognizing digital assets as objects of property rights possessing independent economic value. Such statutory recognition would eliminate uncertainty regarding the legal status of digital assets and provide a clear legal foundation for ownership, possession, transfer, and utilization. Preventive protection should also include the formulation of legal standards governing digital asset transactions, licensing mechanisms for digital asset service providers, cybersecurity obligations, consumer protection measures, and minimum security standards for digital asset platforms. Through these preventive measures, potential legal disputes and ownership violations may be substantially reduced before they arise. The second dimension involves administrative legal protection, which emphasizes the development of reliable mechanisms for registration, authentication, and ownership verification. Although blockchain technology inherently records transactional histories, legal recognition remains necessary to ensure that blockchain records possess evidentiary value within judicial proceedings. Accordingly, Indonesia should develop legal procedures enabling blockchain transaction records, digital signatures, electronic authentication systems, and cryptographic ownership credentials to serve as legally admissible evidence in civil litigation. Establishing standardized administrative mechanisms would significantly strengthen ownership verification and facilitate the resolution of ownership disputes involving digital assets.

The third dimension consists of repressive legal protection, which focuses on providing effective legal remedies whenever ownership rights are violated. The study finds that digital asset disputes require dispute resolution mechanisms specifically designed to accommodate technologically complex forms of evidence and cross-border legal relationships. Judicial institutions, arbitration bodies, and alternative dispute resolution mechanisms should therefore be equipped with procedural rules that recognize electronic evidence, blockchain transaction records, smart contracts, and other digital authentication technologies. In addition, civil remedies should be expanded to include asset recovery mechanisms, compensation for economic losses, injunctions against unauthorized transfers, and judicial orders aimed at restoring ownership rights whenever possible. The findings further indicate that blockchain technology has significant potential to strengthen legal protection by providing transparent, immutable, and verifiable records of ownership and transactions. The decentralized architecture of blockchain substantially reduces the risk of document manipulation while enhancing the traceability of ownership history. Nevertheless, technological reliability alone is insufficient to establish legal certainty. Blockchain-based ownership records must receive explicit statutory recognition in order to possess full evidentiary force before courts and other legal institutions. Consequently, technological innovation should function as a complement to, rather than a substitute for, a comprehensive legal framework.

Another important component of the proposed model is institutional integration. Effective legal protection requires close coordination among legislators, judicial institutions, financial regulators, digital asset service providers, cybersecurity authorities, and law enforcement agencies. Such institutional collaboration is essential for ensuring regulatory consistency, preventing overlapping authority, and enhancing the effectiveness of legal enforcement in cases involving digital assets. Furthermore, continuous public legal education should be promoted to improve awareness regarding ownership rights, cybersecurity practices, and legal responsibilities associated with digital asset transactions. Overall, the proposed model emphasizes that legal protection for digital asset ownership cannot rely solely upon existing civil law doctrines formulated for conventional forms of property. Instead, Indonesia requires a modern and adaptive legal framework capable of integrating traditional principles of property law with the realities of blockchain technology, electronic transactions, and the digital economy. Such a framework would strengthen legal certainty, enhance the protection of ownership rights, promote public confidence in digital economic activities, and support the sustainable development of Indonesia's digital economy. Accordingly, comprehensive civil law reform represents not merely a regulatory necessity but also a strategic prerequisite for ensuring that the Indonesian legal system remains responsive to technological innovation and future economic transformation.

4. CONCLUSION

This study concludes that the legal protection of digital asset ownership under Indonesian civil law remains fragmented and has not yet provided comprehensive legal certainty for asset holders. Although the Indonesian Civil Code (KUHPerdata) recognizes property rights and contractual freedom as fundamental legal principles, these provisions were formulated before the emergence of digital assets and therefore cannot adequately address the unique characteristics of blockchain-based assets, cryptocurrencies, non-fungible tokens (NFTs), and other forms of digital property. Existing regulations, including the Electronic Information and Transactions Law and sector-specific financial regulations, provide only partial protection and are primarily focused on electronic transactions rather than ownership rights, transfer mechanisms, inheritance, dispute resolution, and liability arising from digital asset disputes. The study further finds that the absence of a unified legal framework creates uncertainty regarding the legal status, ownership verification, and enforcement of rights over digital assets. This condition increases the risk of contractual disputes, cyber fraud, unauthorized access, and difficulties in recovering digital property through civil legal remedies. Consequently, the current Indonesian legal framework has not fully achieved the objectives of legal certainty, justice, and legal protection in the rapidly evolving digital economy. The findings contribute to the development of Indonesian civil law by highlighting the necessity of recognizing digital assets as objects of property rights within a modern legal framework. Practically, the study provides guidance for legislators, courts, legal practitioners, and digital business actors in strengthening legal protection mechanisms. Future research should adopt comparative legal approaches involving jurisdictions with more advanced digital asset regulations and examine the integration of emerging technologies, such as smart contracts and decentralized finance, into Indonesia's civil law system.

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