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Legal Certainty of Property Rights over Digital Assets in Indonesia: Towards a Comprehensive Civil Law Framework

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ABSTRAC

The rapid development of blockchain technology and the digital economy has transformed digital assets into valuable economic resources that increasingly influence commercial transactions, investment, and financial innovation. Despite their growing significance, Indonesian law has not yet established a comprehensive legal framework explicitly recognizing digital assets as objects of property rights. This study aims to examine the legal certainty of property rights over digital assets in Indonesia and to formulate legal reform proposals capable of accommodating technological developments while ensuring legal protection. This research employs a normative legal research method using statutory, conceptual, and comparative approaches. Primary legal materials include the 1945 Constitution of the Republic of Indonesia, the Indonesian Civil Code, Law Number 1 of 2024 concerning the Amendment to the Electronic Information and Transactions Law, Government Regulation Number 71 of 2019, and Law Number 27 of 2022 concerning Personal Data Protection. Secondary legal materials consist of recent national and international legal literature on digital assets and property law. This study concludes that Indonesia requires comprehensive legal reform through the express recognition of digital assets as intangible movable property, harmonization of sectoral legislation, modernization of procedural law, and strengthened institutional coordination to ensure effective legal protection and support the sustainable development of the national digital economy.

1. Introduction

The Fourth Industrial Revolution has fundamentally transformed property law through the emergence of digital assets as highly valuable economic resources. Existing entirely in electronic form, these assets ranging from cryptocurrencies and non-fungible tokens (NFTs) to tokenized real-world assets and virtual land are created, stored, and verified via blockchain, distributed ledger technology (DLT), and cryptographic systems. Their unique characteristics, such as decentralization, immateriality, cross-border accessibility, and reliance on private keys, directly challenge classical civil law doctrines, particularly those governing possession, ownership, and the principle of publicity. Globally, advanced jurisdictions like Singapore, the United Kingdom, the European Union, and the United States are gradually developing legal doctrines to recognize digital assets as proprietary interests, aiming to ensure market confidence, consumer protection, and effective dispute resolution in the digital economy.

As home to one of Southeast Asia's fastest-growing digital economies, Indonesia has witnessed widespread public investment and commercial transactions involving digital property. However, this rapid technological leap has not been matched by comprehensive legal reform, creating a stark discrepancy between innovation and regulation. Indonesia's positive law addresses electronic activities fragmentarily; legislative instruments such as Law No. 11 of 2008 concerning Electronic Information and Transactions (as amended by Law No. 1 of 2024), Government Regulation No. 71 of 2019, and the Personal Data Protection Law (Law No. 27 of 2022) primarily regulate electronic commerce, system governance, and data privacy. None of these statutes explicitly recognize digital assets as independent objects of proprietary rights (*hak kebendaan*), leaving the legal status of digital wealth highly fragmented and ambiguous.

The cornerstone of Indonesian property law remains the Civil Code (*Kitab Undang-Undang Hukum Perdata*), specifically Article 499, which broadly defines "objects" (*benda*) as any goods or rights subject to ownership. Because this colonial-era code predates modern technology by more than a century, it offers no explicit framework for blockchain-based property. This legislative silence has sparked intense scholarly debate over whether digital assets should be classified as movable intangible property, intellectual property, contractual rights, or entirely new *sui generis* legal objects. Consequently, asset holders face profound uncertainty regarding acquisition, taxation, and collateralization, while courts lack clear statutory guidance, increasing the risk of inconsistent judicial interpretations that could discourage investment and reduce market confidence.

Furthermore, the decentralized nature of digital assets severely complicates judicial enforcement and succession law. Unlike tangible property, blockchain assets are secured by cryptographic credentials, rendering traditional civil execution mechanisms under Indonesian procedural law inadequate for freezing, confiscating, or transferring them post-judgment. In family law, the absence of statutory rules creates formidable barriers for heirs attempting to claim digital estates without access to private keys. Compounding these issues is the challenge of overlapping legal regimes; for instance, an NFT may convey digital token ownership without transferring the underlying copyright, blurring the line between contractual obligations and actual property rights, and causing jurisdictional confusion among regulatory authorities.

This pervasive lack of legal certainty directly impacts Indonesia's constitutional framework. As a *rechtsstaat* (state governed by law) under Article 1 paragraph (3) and Article 28D paragraph (1) of the 1945 Constitution, the state is under a positive obligation to guarantee legal certainty and equal protection before the law. While current academic literature heavily focuses on isolated aspects of digital assets like cryptocurrency trading or financial fintech regulations, comprehensive normative analyses through the broader lens of Indonesian property law remain critically scarce. To bridge this research gap, this study examines the interplay between the Civil Code, the ITE Law, PP 71/2019, and the PDP

Law. Ultimately, this research seeks to identify normative deficiencies and propose adaptive legislative reforms capable of balancing technological innovation with robust constitutional protections for digital asset holders in Indonesia.

2. Result and Discussion

The Legal Status of Digital Assets as Objects of Property Rights under Indonesian Civil Law

The rapid proliferation of blockchain, distributed ledger technology (DLT), and cryptographic systems has introduced digital assets such as cryptocurrencies, NFTs, and tokenized securities as new forms of intangible wealth. Unlike conventional tangible property, these assets exist purely in electronic form. However, classical civil law doctrine dictates that an object of property rights must satisfy three essential criteria: it must possess measurable economic value, be susceptible to exclusive control by a legal subject, and be transferable through legal transactions. Because digital assets meet all three requirements, they extend beyond mere electronic information and function as genuine proprietary interests, requiring national legal systems to adapt traditional property doctrines to these technological realities.

In Indonesia, the primary framework for property law remains the Civil Code (*Kitab Undang-Undang Hukum Perdata*). Article 499 of the Code broadly defines "objects" (*benda*) as any goods or rights capable of ownership, thereby encompassing both tangible assets and intangible rights. Although this colonial-era statute does not explicitly mention digital technology, its expansive definition provides a solid normative basis for a functional approach to property law. By analyzing their independent economic value, susceptibility to legal dominion, and transferability, recent legal scholarship argues that digital assets can be systematically classified as intangible movable property (*benda bergerak tidak berwujud*) under the existing framework of Article 499.

Despite this conceptual alignment, contemporary Indonesian legislation lacks explicit provisions governing digital property rights. Statutes such as Law No. 1 of 2024 (amending the ITE Law), Government Regulation No. 71 of 2019, and the Personal Data Protection Law (Law No. 27 of 2022) are functionally limited; they regulate electronic transactions, system operations, and data privacy rather than proprietary rights (*hak kebendaan*). This legislative silence has created a regulatory vacuum (*rechtsvacuum*). Consequently, courts, financial institutions, and notaries face profound uncertainty regarding ownership verification, title transfers, inheritance, collateralization, and judicial execution, especially since decentralized blockchain networks defy traditional legal concepts anchored in physical possession and territorial jurisdiction.

Nevertheless, a systematic interpretation of civil law reveals that blockchain-based ownership serves as a technologically modified manifestation of classical property principles. Within decentralized networks, exclusive control over cryptographic private keys replaces physical possession, performing the identical legal function of allowing an owner to exercise dominion, exclude third parties, and execute voluntary transfers. Furthermore, formalizing this recognition is a constitutional necessity. Under Article 1 paragraph (3) (*rechtsstaat*) and Article 28D paragraph (1) of the 1945 Constitution, the state must guarantee legal certainty and equal protection before the law. As digital wealth increasingly populates individual and corporate estates, the absence of explicit statutory recognition directly undermines these constitutional guarantees. Therefore, comprehensive legal reform is urgently required to expressly integrate digital assets as intangible movable property within the national framework, successfully harmonizing civil law principles with technological innovation.

Legal Certainty of Property Rights over Digital Assets in Indonesia

Legal certainty constitutes one of the fundamental principles of the Indonesian legal system and serves as an essential element of the rule of law (rechtsstaat). Article 1 paragraph (3) of the 1945 Constitution of the Republic of Indonesia explicitly declares Indonesia as a state based on law, while Article 28D paragraph (1) guarantees every individual the right to recognition, protection, guarantees, and legal certainty before the law. These constitutional provisions require the State to establish a legal framework capable of responding to social and technological developments, including the emergence of digital assets as a new category of economic property. Consequently, the legal protection of digital asset ownership should not merely rely on contractual arrangements or technological mechanisms but must also be supported by clear statutory recognition that provides certainty regarding ownership, transfer, inheritance, collateralization, and judicial enforcement.

The findings of this study indicate that Indonesia has not yet established a comprehensive legal framework specifically regulating proprietary rights over digital assets. Existing legislation governs electronic transactions, digital platforms, and certain categories of digital commodities; however, it does not explicitly recognize digital assets as independent objects of property rights within the Indonesian civil law system. This fragmented regulatory approach creates uncertainty concerning the legal status of digital assets, particularly in relation to ownership disputes, succession, execution of court judgments, and the establishment of security interests. Recent legal scholarship similarly concludes that Indonesian property law remains inadequately prepared to accommodate digital assets because the existing legal framework continues to rely upon conventional concepts of tangible and intangible property developed long before blockchain technology emerged.

From the perspective of statutory law, Article 499 of the Indonesian Civil Code provides that property objects consist of every good and every right capable of ownership. Although this provision theoretically allows an extensive interpretation that includes intangible digital assets, the Civil Code does not expressly regulate blockchain-based assets, cryptocurrencies, non-fungible tokens (NFTs), tokenized securities, or virtual property. Consequently, legal practitioners and courts must rely upon systematic interpretation rather than explicit statutory provisions when determining whether digital assets qualify as proprietary objects. This interpretative approach inevitably results in inconsistent legal reasoning and reduces predictability in judicial decision-making.

The legal uncertainty becomes more apparent when examining Law Number 1 of 2024 concerning the Amendment to Law Number 11 of 2008 on Electronic Information and Transactions. While the ITE Law recognizes the validity of electronic information, electronic documents, and electronic transactions as legally enforceable, it primarily regulates electronic communication and digital transactions rather than ownership rights over digital assets. Likewise, Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions establishes obligations for electronic system providers but does not determine whether blockchain-based digital assets constitute legal objects subject to property rights. Similarly, Law Number 27 of 2022 concerning Personal Data Protection protects personal data processing but does not regulate ownership of digital assets possessing independent economic value. As a result, these legal instruments provide procedural certainty regarding electronic transactions while failing to establish substantive certainty concerning proprietary rights over digital assets[1].

Another important finding concerns the legal consequences arising from this regulatory fragmentation. In practice, digital asset owners frequently encounter uncertainty regarding ownership verification, inheritance, seizure, judicial execution, collateralization, and dispute resolution. Blockchain technology enables ownership through exclusive control of private cryptographic keys rather than through physical possession or governmental registration. Consequently, when disputes arise, courts often experience practical difficulties in determining ownership, executing judgments, or transferring digital assets because Indonesian procedural law remains primarily designed for conventional tangible property. Recent studies on the execution of crypto-assets conclude that the absence of explicit execution mechanisms significantly weakens legal certainty and judicial effectiveness in civil disputes involving digital assets.

Legal certainty also requires consistency between civil law principles and sectoral regulations governing digital assets. Indonesia currently recognizes crypto-assets as tradable commodities under the regulatory framework governing commodity futures trading. Nevertheless, recognition of crypto-assets as commodities does not automatically establish them as objects of proprietary rights under civil law. This distinction creates a normative inconsistency whereby digital assets may legally be traded within regulated markets but remain uncertain regarding their classification as proprietary objects capable of inheritance, collateralization, judicial execution, or protection under the general law of property. Such inconsistencies demonstrate the absence of horizontal harmonization among Indonesian legal instruments regulating the digital economy.

Comparative legal developments further demonstrate that legal certainty over digital assets depends upon explicit statutory recognition. Jurisdictions such as the United Kingdom, Singapore, and several European countries have progressively recognized digital assets as forms of property capable of ownership, transfer, inheritance, and judicial protection. Although each jurisdiction adopts different regulatory approaches, their legal reforms share the common objective of eliminating ambiguity regarding ownership rights while promoting innovation and investor confidence. Comparative studies indicate that statutory recognition substantially enhances legal predictability and reduces disputes concerning digital asset ownership.

The constitutional principle of legal certainty further reinforces the necessity of legislative reform. Article 28D paragraph (1) of the 1945 Constitution guarantees equal legal protection and certainty before the law, implying that owners of economically valuable digital assets should receive legal protection equivalent to owners of conventional movable property. The absence of explicit legislation may therefore undermine constitutional guarantees by exposing digital asset owners to uncertainty regarding ownership recognition, inheritance, execution of judgments, and commercial transactions. In the context of a rapidly expanding digital economy, maintaining legal ambiguity risks discouraging investment, reducing public confidence, and limiting Indonesia's competitiveness within the global digital marketplace.

Based on the foregoing analysis, this study finds that the current Indonesian legal framework provides only partial legal certainty regarding digital assets. Existing legislation successfully regulates electronic

[1] OEDC, *Chasing the Innovation Frontier*.

transactions and certain commercial activities involving digital assets but fails to establish comprehensive proprietary rights over such assets. Consequently, legal certainty remains incomplete because ownership, transfer, inheritance, collateralization, execution, and dispute resolution continue to depend largely upon judicial interpretation rather than explicit statutory provisions. To strengthen legal certainty, Indonesia should undertake comprehensive legal reform by expressly recognizing digital assets as intangible movable property under the Civil Code, harmonizing civil law with sectoral digital regulations, and establishing specific procedures governing registration, transfer, inheritance, security interests, and judicial execution. Such reforms would provide greater legal certainty, improve investor confidence, promote digital economic growth, and ensure effective protection of property rights in accordance with constitutional principles.

Challenges in the Recognition and Enforcement of Digital Property Rights

The recognition and enforcement of digital property rights represent one of the most significant legal challenges faced by contemporary legal systems. Although digital assets have become increasingly valuable economic resources, their intangible, decentralized, and borderless nature has fundamentally challenged conventional principles of property law that were originally developed for tangible objects. This study finds that Indonesia currently faces substantial legal and institutional obstacles in recognizing and enforcing digital property rights because the existing legal framework has not yet evolved to accommodate the unique characteristics of blockchain-based assets.

One of the primary challenges concerns the absence of explicit legal recognition of digital assets as objects of property rights within Indonesian civil law. Article 499 of the Indonesian Civil Code broadly defines property objects (benda) as every good and every right capable of ownership. However, the Civil Code does not expressly regulate cryptocurrencies, non-fungible tokens (NFTs), digital wallets, tokenized assets, virtual property, or other blockchain-based resources. Consequently, judges, legal practitioners, and regulatory authorities must rely on extensive statutory interpretation when determining whether digital assets qualify as proprietary objects. Such reliance on interpretation rather than explicit legislation creates inconsistent legal outcomes and weakens legal certainty for asset owners. Recent legal scholarship similarly concludes that Indonesia continues to experience a normative gap (rechtsvacuum) regarding the legal status of digital assets within the national property law system. (journal.uin-alauddin.ac.id)

Another significant challenge relates to the verification of ownership. Under conventional property law, ownership is generally evidenced through physical possession, public registration, certificates, or other legally recognized documentation. By contrast, ownership of blockchain-based digital assets is established through exclusive control of cryptographic private keys and blockchain records. While blockchain technology provides a highly secure and transparent technical mechanism for verifying transactions, Indonesian procedural law has not yet explicitly recognized blockchain records as conclusive proof of ownership in civil proceedings. Consequently, courts may encounter practical difficulties when assessing competing ownership claims involving digital assets, particularly where private keys are lost, stolen, or accessed without authorization. This legal uncertainty increases litigation risks and reduces confidence among digital asset holders. (research.e-greenation.org)

The decentralized architecture of blockchain technology also creates considerable obstacles for judicial enforcement. Unlike conventional movable property, which can generally be seized or confiscated through physical control, blockchain-based assets are controlled through decentralized digital networks that operate independently of governmental institutions. Access to these assets depends entirely upon possession of private cryptographic keys rather than physical custody. Consequently, even where a court has issued a legally binding judgment, enforcement authorities may encounter substantial practical difficulties in executing judicial orders if the asset holder refuses to disclose the relevant private keys or if the assets are transferred to anonymous blockchain addresses. Existing Indonesian civil execution procedures were developed primarily for tangible property and registered rights and therefore provide limited guidance regarding the execution of decentralized digital assets. Recent studies have identified this enforcement gap as one of the principal weaknesses in Indonesia's legal protection of digital property rights. (ejournal.ust.ac.id)

Cross-border transactions further complicate the recognition and enforcement of digital property rights. Blockchain networks operate globally without regard to national territorial boundaries, allowing digital assets to be transferred almost instantaneously across multiple jurisdictions. This technological characteristic creates complex questions concerning applicable law, jurisdiction, recognition of foreign judgments, and international judicial cooperation. Indonesian courts may face significant challenges in asserting jurisdiction over disputes involving foreign blockchain platforms, overseas cryptocurrency exchanges, or digital wallets maintained outside Indonesia. Moreover, differences in national regulatory approaches toward digital assets increase the likelihood of legal conflicts and inconsistent judicial outcomes. Comparative legal scholarship has therefore emphasized the importance of international cooperation and harmonization in regulating cross-border digital asset transactions. (arxiv.org)

The study also identifies substantial challenges concerning inheritance and succession. As digital assets increasingly represent valuable components of personal wealth, they inevitably become part of a deceased person's estate. However, access to blockchain-based assets generally depends upon confidential passwords, recovery phrases, or private cryptographic keys known only to the owner. Existing Indonesian inheritance law provides no specific mechanism for ensuring that heirs may lawfully obtain access to these digital credentials following the owner's death. Consequently, heirs may possess valid legal rights under succession law while remaining technically incapable of controlling or transferring the inherited assets. This gap illustrates the disconnect between traditional inheritance law and emerging forms of digital property, highlighting the need for statutory reform capable of integrating digital assets into Indonesia's succession framework [2].

Another challenge concerns the use of digital assets as collateral in secured transactions. Under Indonesian law, security rights over movable and immovable property are governed by distinct legal regimes, including fiduciary security, pledge, mortgage, and land security rights. Nevertheless, there is currently no comprehensive legal framework regulating whether blockchain-based digital assets may serve as collateral for financing arrangements. The absence of explicit legal provisions generates uncertainty regarding valuation, perfection of security interests,

[2] Kurdi, Ramadhan, and Dadek, "Legal Analysis of Ownership Rights to Intangible Movable Property (Digital Assets) From the Perspective of Property Law In Indonesia."

priority among creditors, enforcement mechanisms, and protection of secured parties in cases of debtor default. As digital assets continue to gain commercial significance, this regulatory uncertainty may limit their potential contribution to Indonesia's financial and investment sectors.

Cybersecurity risks constitute another major obstacle to the effective protection of digital property rights. Although blockchain technology itself is generally regarded as highly secure, digital asset holders remain vulnerable to cybercrime, phishing attacks, hacking, ransomware, unauthorized access, and theft of private keys. Unlike traditional banking systems, decentralized blockchain networks frequently lack centralized institutions capable of reversing unauthorized transactions or restoring stolen assets. Consequently, victims of digital asset theft often face considerable legal and technical barriers in recovering their property. The current Indonesian legal framework primarily criminalizes unlawful electronic access and cybercrime but provides limited civil remedies specifically designed to restore ownership of stolen blockchain-based assets. This deficiency further weakens legal certainty for digital asset owners.

The research further demonstrates that regulatory fragmentation remains a significant obstacle to legal certainty. Different Indonesian authorities regulate different aspects of digital assets, including electronic transactions, commodity trading, taxation, financial services, and data protection. However, these sectoral regulations have not yet been comprehensively harmonized within a unified property law framework. As a result, digital assets may simultaneously be recognized as tradable commodities, taxable economic resources, or electronic information while remaining legally uncertain as proprietary objects under civil law. This fragmented regulatory structure increases compliance costs, complicates dispute resolution, and reduces consistency in legal interpretation across governmental institutions.

Comparative legal developments indicate that jurisdictions with greater legal certainty have generally adopted explicit statutory recognition of digital assets as property capable of ownership, transfer, inheritance, and judicial enforcement. The United Kingdom has recognized crypto-assets and certain digital assets as a distinct category of personal property through judicial decisions and recommendations of the Law Commission. Singapore has similarly acknowledged cryptocurrencies and blockchain-based assets as proprietary interests capable of judicial protection, while the European Union has strengthened legal certainty through harmonized regulatory frameworks governing crypto-assets and digital financial markets. These comparative experiences demonstrate that clear legislative recognition substantially improves legal predictability while encouraging technological innovation and investor confidence [3].

Based on the foregoing analysis, this study finds that the principal challenges in recognizing and enforcing digital property rights in Indonesia arise from legislative uncertainty, technological complexity, institutional limitations, cross-border legal conflicts, inadequate procedural mechanisms, cybersecurity risks, and fragmented sectoral regulation. Although existing legal instruments provide partial protection for electronic transactions and digital economic activities, they remain insufficient to ensure comprehensive legal certainty concerning proprietary rights over digital assets. Therefore, Indonesia should

[3] Tambunan and Elisabeth Nurhaini Butarbutar, "KEPASTIAN HUKUM EKSEKUSI ASET DIGITAL KRIPTO SEBAGAI LEGAL CERTAINTY EXECUTION OF DIGITAL CRYPTO ASSETS IN INDONESIA AS."

undertake comprehensive legislative reform by explicitly recognizing digital assets as intangible movable property, establishing statutory procedures for ownership verification, judicial execution, inheritance, collateralization, and cross-border dispute resolution, while simultaneously harmonizing civil law with emerging digital economy regulations. Such reforms would strengthen legal certainty, improve judicial effectiveness, and provide a more reliable legal environment for individuals and businesses participating in Indonesia's rapidly expanding digital economy.

Comparative Analysis of Digital Asset Regulation

A comparative legal analysis demonstrates that the legal certainty of digital property rights largely depends on the extent to which national legal systems expressly recognize digital assets as objects of proprietary rights and establish clear mechanisms for their protection and enforcement. As digital assets increasingly become integral components of the global digital economy, many jurisdictions have reformed their legal frameworks to accommodate blockchain technology and other forms of digital property. This study compares the regulatory approaches adopted in the United Kingdom, Singapore, and the European Union with the current Indonesian legal framework in order to identify best practices and evaluate potential directions for legal reform.

The United Kingdom is widely regarded as one of the leading jurisdictions in the recognition of digital assets as proprietary rights. Through judicial decisions and the work of the Law Commission of England and Wales, crypto-assets have been recognized as capable of constituting personal property despite not fitting within the traditional categories of choses in possession or choses in action. The Law Commission's 2023 report proposed the recognition of a distinct category of personal property to accommodate digital assets, acknowledging that blockchain-based assets possess unique legal characteristics requiring an adaptive legal framework. English courts have also consistently recognized cryptocurrencies as property capable of being owned, transferred, frozen through injunctions, inherited, and recovered in civil proceedings. This approach provides a high degree of legal certainty by ensuring that digital assets receive protection comparable to conventional forms of property while maintaining flexibility for technological innovation [4].

Singapore has similarly developed a progressive legal framework for digital assets by combining judicial interpretation with technology-oriented financial regulation. Singaporean courts have recognized cryptocurrencies and other blockchain-based assets as proprietary interests capable of legal protection under common law. At the same time, the regulatory framework administered by the Monetary Authority of Singapore (MAS), particularly under the Payment Services Act 2019, provides legal certainty for digital payment token services while promoting innovation and financial stability. Singapore's approach demonstrates that legal certainty can be achieved through the integration of private law principles with comprehensive financial regulation, enabling digital assets to participate in commercial transactions while remaining subject to effective regulatory oversight. Comparative studies frequently identify Singapore as one of the most mature legal environments for blockchain innovation in Asia due to its

[4] Lee, “Examining the Legal Status of Digital Assets as Property : A Comparative Analysis of Jurisdictional Approaches.”

balance between investor protection and technological development [5].

Within the European Union, the regulatory framework governing digital assets has become increasingly harmonized through the adoption of the Markets in Crypto-Assets Regulation (MiCA). MiCA establishes a comprehensive legal regime governing the issuance, offering, and provision of services relating to crypto-assets across EU Member States. The regulation introduces licensing requirements for crypto-asset service providers, disclosure obligations, consumer protection mechanisms, prudential standards, and market integrity rules. Although MiCA primarily regulates financial and commercial activities involving crypto-assets rather than redefining national property law, it significantly enhances legal certainty by providing a uniform regulatory environment throughout the European Union. The harmonized approach reduces regulatory fragmentation, facilitates cross-border transactions, and strengthens investor confidence while allowing Member States to continue developing their domestic property law doctrines concerning digital assets.

In contrast, Indonesia has adopted a sectoral regulatory approach toward digital assets. Various legal instruments regulate specific aspects of digital technology, including electronic transactions, commodity trading, taxation, personal data protection, and financial supervision. Law Number 1 of 2024 concerning the Amendment to Law Number 11 of 2008 on Electronic Information and Transactions recognizes electronic information and electronic transactions as legally valid. Government Regulation Number 71 of 2019 regulates the operation of electronic systems, while Law Number 27 of 2022 concerning Personal Data Protection governs the processing of personal data within digital environments. Furthermore, crypto-assets are regulated within the framework of commodity futures trading. Nevertheless, none of these legal instruments explicitly recognize digital assets as objects of property rights under Indonesian civil law. Consequently, ownership, inheritance, collateralization, judicial execution, and other proprietary issues continue to depend upon interpretation rather than explicit statutory provisions [6].

The comparative analysis demonstrates that the principal distinction between Indonesia and the selected jurisdictions lies in the level of legal certainty concerning proprietary rights. In the United Kingdom and Singapore, judicial interpretation has evolved alongside statutory regulation to recognize digital assets as property capable of ownership and legal protection. Within the European Union, although property law remains largely governed by national legal systems, MiCA provides a harmonized regulatory framework that substantially improves legal certainty in commercial transactions involving crypto-assets. Indonesia, however, continues to regulate digital assets primarily from the perspective of electronic transactions and commodity trading without establishing a comprehensive legal regime governing proprietary rights. This fragmented regulatory structure creates uncertainty concerning ownership recognition, judicial enforcement, inheritance, security interests, and civil liability.

Another significant difference concerns judicial enforcement mechanisms. English courts have developed practical remedies,

[5] Lee.

[6] Kurdi, Ramadhan, and Dadek, “Legal Analysis of Ownership Rights to Intangible Movable Property (Digital Assets) From the Perspective of Property Law In Indonesia.”

including proprietary injunctions, freezing orders, and tracing mechanisms, to protect digital assets in civil litigation. Singaporean courts have likewise recognized blockchain-based assets as capable of judicial protection through equitable remedies and commercial litigation. Within the European Union, harmonized regulatory standards facilitate cooperation among supervisory authorities and improve cross-border enforcement. By comparison, Indonesian procedural law has yet to establish specific mechanisms governing the seizure, execution, preservation, or recovery of blockchain-based assets. As a result, enforcement authorities continue to experience substantial practical difficulties when implementing court judgments involving decentralized digital property.

The comparative study further reveals that legislative adaptability constitutes a critical factor in maintaining legal certainty amid technological change. Jurisdictions that have successfully integrated digital assets into their legal systems generally adopt technology-neutral legal principles capable of accommodating future technological developments rather than regulating individual technologies in isolation. This adaptive approach minimizes the need for frequent legislative amendments while ensuring that emerging categories of digital assets continue to receive legal protection under general property law principles. Indonesia may benefit from adopting a similar legislative strategy by introducing a broad statutory definition of digital assets as intangible movable property while allowing technical implementation to evolve through sectoral regulations and judicial interpretation.

Based on the comparative analysis, this study finds that Indonesia possesses a strong constitutional and civil law foundation capable of supporting the recognition of digital assets as proprietary objects. Article 499 of the Indonesian Civil Code already provides a broad concept of property encompassing rights capable of ownership, while Articles 1 paragraph (3) and 28D paragraph (1) of the 1945 Constitution guarantee the rule of law and legal certainty. However, unlike the United Kingdom, Singapore, and the European Union, Indonesia has not yet translated these foundational principles into explicit statutory recognition of digital assets within its property law system. Consequently, comprehensive legislative reform is required to harmonize civil law, electronic transaction law, financial regulation, and procedural law so that digital assets receive effective legal protection comparable to other forms of property.

The findings of this comparative analysis suggest that Indonesia should not merely replicate foreign regulatory models but should adapt international best practices to its own civil law tradition and constitutional framework. Legislative reform should expressly recognize digital assets as intangible movable property, establish legal rules governing ownership, transfer, inheritance, collateralization, and judicial execution, and strengthen institutional coordination among regulatory authorities. Such an approach would significantly improve legal certainty, encourage responsible innovation, enhance investor confidence, and support the continued growth of Indonesia's digital economy while remaining consistent with the principles of legal certainty and the rule of law.

Aspect	United Kingdom	Singapore	European Union	Indonesia
Legal recognition of digital assets	Recognized as personal property through case law and Law Commission recommendations	Recognized as proprietary interests under common law	Regulated through MiCA; property law remains national	No explicit recognition as objects of property rights
Specific legislation	Case law, Law Commission Report (2023)	Payment Services Act 2019	Markets in Crypto-Assets Regulation (MiCA)	Civil Code, Law No. 1/2024, PP No. 71/2019, Law No. 27/2022, sectoral regulations
Judicial protection	Strong (injunctions, tracing, freezing orders)	Strong	Strengthened through harmonized regulation	Limited and dependent on judicial interpretation
Inheritance	Recognized	Recognized	Generally recognized under national law	No explicit regulation
Collateral/Security interests	Permitted under applicable legal principles	Permitted	Developing under Member State laws	No comprehensive regulation
Level of legal certainty	High	High	High	Moderate to low

Proposed Legal Reform for Digital Property Rights in Indonesia

The preceding analysis demonstrates that Indonesia has not yet established a coherent legal framework governing proprietary rights over digital assets. While existing legislation regulates electronic transactions, personal data protection, and specific categories of digital financial activities, it does not expressly recognize digital assets as objects of property rights under Indonesian civil law. Consequently, legal uncertainty persists regarding ownership, transfer, inheritance, collateralization, judicial execution, and dispute resolution involving blockchain-based assets. This study therefore argues that Indonesia requires comprehensive legal reform capable of integrating technological innovation with the fundamental principles of civil law while preserving legal certainty, justice, and economic efficiency.

The first proposed reform is the explicit recognition of digital assets as intangible movable property within the Indonesian Civil Code (Kitab Undang-Undang Hukum Perdata). Article 499 of the Civil Code broadly defines property (benda) as every good and every right capable of ownership. Although this provision theoretically allows digital assets to be interpreted as proprietary objects, reliance solely on judicial interpretation creates uncertainty and inconsistent legal application. Legislative amendment or supplementary legislation should therefore provide a statutory definition of digital assets as economically valuable intangible property capable of ownership, possession through technological control, transfer, inheritance, collateralization, and judicial protection. Such recognition would harmonize Indonesian property law with technological developments while remaining consistent with the Civil Code's general concept of property[7].

The second reform concerns the establishment of a comprehensive statutory framework specifically governing proprietary rights over digital assets. Existing regulations—including Law Number 1 of 2024 concerning the Amendment to Law Number 11 of 2008 on Electronic Information and Transactions, Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions, and Law Number 27 of 2022 concerning Personal Data Protection—primarily regulate electronic systems and digital transactions rather than proprietary rights. A dedicated Digital Asset Law or amendments to the Civil Code should therefore regulate fundamental legal issues, including ownership, acquisition, transfer of title, inheritance, fiduciary security, judicial execution, dispute resolution, and legal remedies. Such legislation would reduce regulatory fragmentation and provide greater certainty for individuals, businesses, financial institutions, and public authorities.

A third reform involves harmonizing sectoral regulations affecting digital assets. At present, different legal institutions regulate different aspects of the digital economy, including electronic transactions, commodity trading, financial services, taxation, and personal data protection. Although these sectoral regulations perform important regulatory functions, they have not been sufficiently integrated into a unified legal framework governing proprietary rights. Legislative harmonization should therefore clarify the relationship between civil law and sector-specific regulations, ensuring that recognition of digital assets as property is consistently reflected across all relevant legal instruments. This approach would eliminate conflicting interpretations among regulatory authorities and improve the consistency of judicial decision-making.

[7] Undang-Undang Kepailitan dan PKPU, Law Number 37 of 2004 concerning Bankruptcy and Suspension of Debt Payment Obligations.

Judicial enforcement mechanisms also require substantial reform. Existing Indonesian procedural law remains primarily oriented toward tangible property and conventional proprietary rights, providing limited guidance regarding the seizure, preservation, tracing, and execution of blockchain-based assets. Legislative reform should establish specific procedural rules enabling courts to recognize blockchain records as admissible evidence, issue preservation orders over digital assets, authorize the freezing of blockchain wallets where legally justified, and facilitate the execution of judgments involving decentralized digital property. Clear procedural standards would strengthen judicial effectiveness while ensuring due process and legal certainty.

The research further proposes the development of statutory provisions governing digital inheritance. Digital assets increasingly constitute valuable components of personal wealth; however, Indonesian inheritance law contains no explicit provisions concerning blockchain-based assets, cryptocurrencies, non-fungible tokens (NFTs), or other digital property. Future legislation should expressly recognize digital assets as inheritable property and establish legal mechanisms enabling heirs to obtain lawful access to digital wallets and authentication credentials under judicial supervision. Such provisions would protect the constitutional rights of heirs while reducing practical difficulties arising from the technical characteristics of blockchain technology.

Another important aspect of legal reform concerns secured transactions involving digital assets. As digital assets continue to acquire substantial economic value, they possess significant potential to function as collateral in commercial financing. Nevertheless, Indonesian law currently provides no comprehensive legal framework governing the creation, perfection, priority, and enforcement of security interests over digital assets. Legislative reform should therefore expand existing secured transaction regimes to include eligible categories of digital property while establishing valuation standards, registration procedures where appropriate, creditor protection mechanisms, and enforcement procedures in cases of debtor default. Such reforms would enhance financial innovation and increase access to credit without compromising legal certainty.

Institutional coordination should also be strengthened through the establishment of an integrated governance framework for digital assets. Effective regulation requires close cooperation among government institutions responsible for civil law, financial supervision, digital technology, taxation, cybersecurity, and law enforcement. A coordinated regulatory framework would reduce institutional overlap, improve regulatory consistency, and facilitate efficient responses to emerging legal issues relating to blockchain technology and digital property. Enhanced institutional cooperation would likewise contribute to greater public confidence in Indonesia's digital economy.

The comparative analysis undertaken in this study demonstrates that jurisdictions such as the United Kingdom, Singapore, and the European Union have achieved higher levels of legal certainty by explicitly recognizing digital assets within their legal systems while maintaining technology-neutral regulatory principles. Rather than adopting foreign models without modification, Indonesia should develop a regulatory framework that reflects the principles of its civil law tradition, constitutional values, and national economic priorities. An adaptive and technology-neutral legislative approach would enable the legal system to respond effectively to future technological developments without requiring continuous statutory amendment.

The proposed reforms are firmly grounded in the constitutional principles of the rule of law and legal certainty. Article 1 paragraph (3) of the 1945 Constitution establishes Indonesia as a state governed by law, while Article 28D paragraph (1) guarantees every person the right to legal recognition, protection, guarantees, and certainty before the law. These constitutional provisions require the State to ensure that new forms of wealth generated through technological innovation receive legal protection equivalent to that afforded to conventional property. Failure to provide such protection may undermine investor confidence, weaken judicial effectiveness, and hinder the sustainable development of Indonesia's digital economy.

Based on the findings of this study, the proposed legal reform consists of five principal pillars: (1) explicit statutory recognition of digital assets as intangible movable property; (2) harmonization of civil law with sectoral legislation governing digital activities; (3) establishment of comprehensive rules governing ownership, transfer, inheritance, collateralization, and judicial execution; (4) modernization of procedural law to facilitate the enforcement of digital property rights; and (5) strengthened institutional coordination among relevant regulatory authorities. Collectively, these reforms would create a coherent legal framework capable of ensuring legal certainty, protecting property rights, encouraging technological innovation, and supporting Indonesia's transition toward a secure and sustainable digital economy.

3. Conclusion

This study examined the legal certainty of property rights over digital assets in Indonesia through a normative legal analysis of the Indonesian Civil Code, the 1945 Constitution of the Republic of Indonesia, Law Number 1 of 2024 concerning the Amendment to Law Number 11 of 2008 on Electronic Information and Transactions, Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions, Law Number 27 of 2022 concerning Personal Data Protection, and relevant legal literature. The analysis demonstrates that digital assets have evolved into economically valuable forms of intangible property that increasingly influence commercial activities, investment, financial technology, and digital innovation. Despite their growing economic significance, Indonesian legislation has not yet established a comprehensive legal framework expressly recognizing digital assets as objects of property rights under civil law.

The findings indicate that Article 499 of the Indonesian Civil Code provides a broad legal concept of property that may accommodate digital assets through systematic interpretation because such assets possess economic value, are capable of exclusive control, and may be transferred through lawful transactions. However, the absence of explicit statutory recognition creates legal uncertainty regarding ownership, transfer, inheritance, collateralization, judicial execution, and dispute resolution. Existing regulations primarily govern electronic transactions and sector-specific aspects of the digital economy without comprehensively regulating proprietary rights over blockchain-based assets. Consequently, the current legal framework remains fragmented and insufficient to guarantee effective legal protection for digital asset holders.

The comparative analysis further reveals that jurisdictions such as the United Kingdom, Singapore, and the European Union have significantly strengthened legal certainty by explicitly recognizing digital assets within their legal systems and establishing comprehensive regulatory mechanisms governing ownership, judicial protection, and commercial utilization. These jurisdictions demonstrate that adaptive legislation and harmonized regulation are essential for balancing technological innovation with effective legal protection. Indonesia may draw valuable lessons from these comparative experiences while developing a regulatory framework consistent with its civil law tradition and constitutional principles.

Based on these findings, this study concludes that comprehensive legal reform is urgently required to ensure legal certainty for digital property rights in Indonesia. Such reform should expressly recognize digital assets as intangible movable property within the national property law system, harmonize civil law with sectoral regulations governing digital activities, modernize procedural rules concerning judicial enforcement, inheritance, and secured transactions, and strengthen institutional coordination among relevant regulatory authorities. These reforms would not only enhance legal certainty and judicial effectiveness but also promote investor confidence, support the sustainable development of Indonesia's digital economy, and fulfill the constitutional guarantees of legal protection and the rule of law as embodied in Articles 1 paragraph (3) and 28D paragraph (1) of the 1945 Constitution.

Finally, this study contributes to the ongoing discourse on digital property rights by providing a normative legal framework for the recognition and protection of digital assets within the Indonesian legal system. Nevertheless, the research is limited to doctrinal and statutory analysis and does not examine empirical implementation or judicial practice. Future research is therefore encouraged to investigate court decisions, regulatory implementation, and cross-border dispute resolution involving digital assets in order to evaluate the practical effectiveness of future legal reforms and their impact on Indonesia's evolving digital economy.

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