

CIVIL DISPUTE OVER OWNERSHIP OF DIGITAL ASSETS NON-FUNGIBLE TOKENS (NFTS)

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Abstract

The transnational nature of Non-Fungible Tokens (NFTs) presents complex jurisdictional challenges in civil dispute resolution that transcend national boundaries. This research examines NFT ownership disputes through the lens of Private International Law, analyzing choice-of-laws, forum selection, and recognition of foreign judgments. Employing a normative legal research methodology with comparative and case-study approaches, this study investigates jurisdictional frameworks, the determination of applicable law, and cross-border enforcement mechanisms. The findings reveal that the decentralized, borderless nature of blockchain technology creates unprecedented conflicts of law, with traditional private international law principles proving inadequate. The study concludes that international harmonization of NFT regulations is essential, requiring multilateral cooperation and the adaptation of conflict-of-laws rules to accommodate the characteristics of digital assets while ensuring predictability and fairness in cross-border dispute resolution.

Keywords: blockchain technology; choice of law; cross-border dispute; NFTs; Private International Law.

INTRODUCTION

The blockchain technology revolution has created a new phenomenon in the global legal sphere, particularly regarding the ownership and transfer of digital assets in the form of *Non-Fungible Tokens* (NFTs). In contrast to traditional assets tied to specific territorial jurisdictions, NFTs have characteristics that challenge the fundamental concepts of international civil law. Each NFT transaction involves several jurisdictions simultaneously: the seller's location, the buyer's location, the blockchain server's location, and the trading platform's location that facilitates the transaction.

The global NFT market has reached a transaction value of billions of dollars with exponential growth in recent years. NFTs not only penetrate the digital art industry but also music, virtual real estate, gaming, digital fashion, and other sectors of the digital economy.

However, this rapid growth has not been matched by adequate harmonization of international regulations. Each jurisdiction has a different approach to classifying and regulating NFTs, creating significant legal uncertainty in cross-border transactions.

International civil law problems arise when there is an NFT ownership dispute involving parties from various countries. The fundamental question that arises is: which state courts have jurisdiction to adjudicate disputes? Which country laws should apply? What is the mechanism for the recognition and enforcement of foreign court judgments related to NFTs? And how to determine *the connecting factors* in NFT transactions that are *intangible* and spread across *multiple nodes of the blockchain*?

Traditional international civil law principles such as *lex rei sitae* (the law of where objects are located), *lex loci contractus* (the law of the place where contracts are made), and *lex fori* (forum law) face challenges in applying to NFTs. The concept of "where things belong" becomes ambiguous when NFTs are stored in blockchains spread across thousands of *computer nodes* in different countries. Similarly, the "place where the contract was created" becomes unclear when the transaction is executed through a smart contract that operates automatically, without a definite geographical location.

Various international NFT dispute cases have occurred, ranging from *Hermès v. Rothschild* in the United States regarding *trademark infringement* in NFTs, to *Yuga Labs v. Ryder Ripps* disputes regarding copyright infringement, to cases of NFT theft worth millions of dollars involving perpetrators from various countries. These cases expose fundamental weaknesses in the national legal system in handling transnational digital asset disputes.

This research is crucial given the lack of a comprehensive study of international civil law in NFT disputes. The majority of the legal literature on the existence of NFTs still focuses on national legal aspects, while the transnational dimension that is an inherent characteristic of NFTs has not received adequate attention. Without a clear mapping of international civil law, NFT owners and perpetrators face serious legal uncertainty, which could hinder the development of the global digital economy.

The objectives of this study are to analyze the complexity of jurisdiction in NFT ownership disputes from the perspective of international civil law, examine the choice of *law* in cross-border NFT transactions and disputes, evaluate the mechanism for recognition and enforcement of foreign judgments in NFT dispute cases, and formulate a framework for international legal harmonization for the resolution of NFT disputes. This research is expected to make a theoretical contribution to the development of international civil law in the digital

era and provide policy recommendations for the harmonization of international NFT regulations.

LITERATURE REVIEW

Principles of International Civil Law

Private *International Law/Conflict of Laws* is a branch of law that regulates civil law relations that contain foreign elements. The three main problems of international civil law are jurisdiction, *choice of law*, and *recognition and enforcement of foreign judgments*. These three aspects are interrelated and determine the effectiveness of cross-border dispute resolution.

In international civil law, jurisdiction refers to a country's courts' authority to try cases involving foreign elements. The theory of jurisdiction includes several principles: *forum rei sitae* (jurisdiction based on the location of the object), *forum domicilii* (jurisdiction based on the domicile of the defendant), *forum contractus* (jurisdiction based on where the contract is executed), and *forum delicti commissi* (jurisdiction based on where the unlawful act occurred). Legal choice is a mechanism to determine which country's substantive law should be applied in resolving disputes. The main principles of choice of law include: *lex rei sitae* for immovable objects, *lex loci contractus* for contracts, *lex loci delicti commissi* for unlawful acts, and *party autonomy*, which gives the parties the freedom to determine the applicable law. However, *party autonomy* is limited by *public policy* and *the forum's mandatory rules*.

The recognition and implementation of foreign judgments is regulated through the principle of *reciprocity (reciprocity)* and *treaty-based mechanisms*. Some countries implement *automatic recognition* with certain conditions, while others require a *domestication or exequatur process*. Foreign judgments are generally recognized if they meet the following criteria: the court that renders the judgment has legal jurisdiction, affords fair and due process of justice, does not conflict with the public policy of the implementing country, and is reciprocated.

Characteristics of NFTs in a Transnational Context

NFTs are unique digital tokens recorded on the blockchain that represent ownership of a specific digital asset. The fundamental characteristics of NFTs relevant to international civil law include: first, their borderless nature, which allows NFTs to be transacted globally without geographical barriers. Second, *decentralization*, because there is no central authority that

controls the blockchain. Third, *immutability*, where transaction records cannot be changed or deleted. Fourth, *pseudonymity*, where the identity of the owner is hidden behind the *wallet address*.

Smart contracts, as a technical mechanism for NFT transactions, are executed automatically when the programmed conditions are met. *Smart contracts* can include choice-of-laws and choice-of-forum clauses, but the enforceability of these clauses under international civil law remains a matter of debate. The question of whether *smart contracts* can qualify as contracts in the traditional legal sense has significant implications for the application of the principle of legal choice.

NFT marketplace platforms such as *OpenSea*, *Rarible*, and *SuperRare* generally operate globally, serving users from various jurisdictions. *The platform's terms of service* usually contain legal choice-of-laws and forum-selection clauses, but the validity of these clauses can be questioned if they are considered adhesion contracts that do not give users real bargaining power. In addition, *enforcement* of platforms that operate in a *decentralized* manner or those based on Web3 technology faces significant practical challenges.

International NFT Regulation Comparison

Various jurisdictions have developed different approaches to regulating NFTs. The European Union, through the Markets in Crypto-Assets (MiCA) regulation, provides a comprehensive mapping for crypto-assets, including NFTs. MiCA classifies NFTs as crypto assets and subjects them to financial market regulations with certain adjustments. The EU's approach emphasizes consumer protection, market integrity, and financial stability. Singapore, through the Payment Services Act and the Singapore Digital Token Offering Guidelines, recognizes NFTs as digital payment tokens that are properties capable of ownership and transfer. *The Singapore Court of Appeal* in *Janesh s/o Rajkumar v Unknown Person* recognized cryptocurrencies as protectable property under proprietary injunctions, setting a *precedent* for NFT protection.

The United States applies a fragmentation approach, with different regulators having jurisdiction depending on the classification of NFTs. The SEC (*Securities and Exchange Commission*) regulates NFTs that qualify as *securities* based on *the Howey Test*. The CFTC (*Commodity Futures Trading Commission*) has jurisdiction over NFTs that are considered commodities. *Federal courts* have issued several rulings recognizing NFTs as legally protected digital property.

China applies a restrictive approach by banning *cryptocurrency trading* but allowing NFTs within a controlled *digital collectibles* framework. Japan regulates NFTs through *the Payment Services Act* and *the Financial Instruments and Exchange Act* with a focus on consumer protection. South Korea is developing a *regulatory sandbox* for NFTs with a more permissive approach to technological innovation.

B. RESEARCH METHODS

This study uses normative legal research methods, including a statute-based approach, a comparative approach, and a case-based *approach*. The legislative approach is carried out by analyzing national and international regulations relevant to NFTs, as well as international civil law, including international conventions such as *the Hague Convention on Choice of Court Agreements* and *the New York Convention on Recognition and Enforcement of Foreign Arbitral Awards*.

A comparative approach was used to examine the international civil law and NFT regulatory frameworks of leading jurisdictions, including the United States, the European Union, Singapore, Japan, and Indonesia. The comparative analysis examines aspects of jurisdiction, legal choice, and law enforcement mechanisms to assess their overall effectiveness and challenges.

The case approach was carried out by analyzing court rulings and actual NFT dispute cases from various jurisdictions, including *Hermès International v. Mason Rothschild*, *Yuga Labs v. Ryder Ripps*, *OpenSea phishing cases*, and *Bored Ape Yacht Club copyright disputes*. The case analysis aims to identify recurring patterns and issues in transnational NFT disputes.

Primary legal materials include Indonesian national laws and regulations (Civil Code, ITE Law, Arbitration Law), international regulations, international conventions, and court decisions from various jurisdictions. Secondary legal materials include international civil law textbooks, scientific journals, academic articles, and *policy papers* from international organizations. Tertiary legal materials include legal dictionaries and encyclopedias, which provide definitions and conceptual context.

The data collection technique is carried out through a literature review, identifying, classifying, and analyzing relevant legal materials from international legal databases, academic institutional *repositories*, and primary sources of regulations. Data analysis uses descriptive-prescriptive methods, including systematic interpretation, legal conflict analysis, and the construction of legal frameworks for transnational NFT dispute resolution.

C. RESULTS AND DISCUSSION

Jurisdictional Complexity in Transnational NFT Disputes

Jurisdictional determination in NFT disputes poses fundamental complexities that do not arise in traditional asset disputes. Unlike tangible objects that have a clear physical location, NFTs are stored in a *distributed ledger blockchain* spread across thousands of *computer nodes* in various countries. This creates ambiguity in the application of the principle of *forum rei sitae*, which requires identifying the location of objects as the basis for jurisdiction.

Several theories have been put forward to address this problem. The first theory is the *wallet location theory*, which identifies the jurisdiction based on the location of the NFT owner's digital wallet. However, this theory faces criticism because the wallet can be accessed from anywhere, and the owner can use a VPN to hide the actual location. The second theory is the *blockchain network location theory* which identifies jurisdictions based on the location of the majority of *blockchain validator nodes*. However, for a global blockchain like *Ethereum*, *nodes* are spread across the globe, so there is no *clear single jurisdiction*.

The third theory is *marketplace location theory*, which bases jurisdiction on the location of the marketplace platform where NFT transactions occur. This approach is more practical because the place of buying and selling generally has a clear corporate domicile. However, this theory faces challenges when markets operate in a *decentralized* manner or when transactions occur *peer-to-peer* without intermediaries.

In judicial practice, different countries apply different approaches. The United States court in *Hermès International v. Mason Rothschild* based jurisdiction on the *effects doctrine*, where the court has jurisdiction if the defendant's actions cause a substantial effect within that jurisdiction, even though the defendant is abroad. This approach is consistent with the Zippo sliding scale test applied in *internet jurisdiction cases*.

The European Union implements the *Brussels I Regulation (recast)*, which regulates jurisdiction in *civil and commercial matters*. Article 4 gives jurisdiction to the domicile of the defendant, while Article 7 gives *special jurisdiction to tort claims* where a *harmful event occurred*. In the context of NFTs, the interpretation of "*harmful event*" is crucial. *The European Court of Justice, in various internet-related cases, has adopted the place where damage approach, which, in the case of NFTs, can be interpreted as the location where the victim suffered a loss.*

Singapore, in the Singapore Rules of Court, adopts long-arm jurisdiction, which allows courts to claim jurisdiction over *foreign defendants* if there is *a sufficient connection* to the jurisdiction. In the context of NFTs, a Singapore court may claim jurisdiction if the plaintiff or defendant is domiciled in Singapore, or if the NFT platform operates in Singapore, or if *a substantial part of the transaction occurred in Singapore*.

Choice of Law

Determining the applicable law in NFT disputes is the most complex aspect of international civil law. The principle of *party autonomy*, which gives the parties the freedom to determine the law that can be applied to address practical challenges. *Smart contracts* can include a choice-of-laws clause, but most NFT transactions are carried out through marketplace platforms with terms that do not give users real negotiating power.

When the parties do not make an explicit choice-of-laws agreement, the court must apply conflict-of-laws rules to determine the proper law. For contractual disputes, the principle of *lex loci contractus*, or the closest connection test, can be applied. However, determining the "place where the contract is created" in a smart contract transaction that is executed automatically on the blockchain becomes problematic. Some jurisdictions apply *a characteristic performance test*, under which the law applies to the party who performs the characteristic performance. In NFT buying and selling transactions, the seller is deemed to have performed the characteristic performance, so the seller's domicile law applies.

For non-contractual disputes, such as torts, the principle of *lex loci delicti commissi* requires the application of the law of the place where the unlawful act occurred. In cases of copyright or trademark infringement related to NFTs, determining the "place where the act occurred" is ambiguous because NFTs can be accessed from anywhere in the world. Some jurisdictions apply *the double actionability rule*, where the act must be *unlawful* both at the place where it occurs and in the forum.

The Rome I Regulation in the European Union provides a comprehensive mapping for the choice of law in contractual obligations. Article 3 recognizes party autonomy, subject to certain restrictions. Article 4 establishes applicable law based on characteristic performance when there is no choice of law. The Rome II Regulation regulates the choice of law for non-contractual obligations with the general principle of *lex loci damni* (the law of where the loss occurred).

A special problem arises regarding the applicable law governing property rights in NFTs. The principle of *lex rei sitae* applied to tangible property cannot be applied directly to

NFTs. Some *legal scholars* propose a *lex situs theory* that identifies NFTs' situs based on the laws governing *blockchains* or *smart contracts*. However, this approach faces criticism because it can result in buying and selling forums and legal uncertainty.

Dispute Resolution and *Enforcement Mechanism*

NFT dispute resolution can be pursued through three main mechanisms: litigation in national courts, international arbitration, and *online dispute resolution* (ODR). Each mechanism has advantages and limitations in the context of transnational disputes. Litigation in national courts faces cross-border jurisdictional and *enforcement* challenges. Although courts can render judgments, enforcing judgments in other countries requires a complex *recognition and enforcement* process. Not all countries have a *treaty on the reciprocal enforcement of civil judgments*. Indonesia, for example, does not have comprehensive treaties with most countries, so recognition of foreign judgments is carried out on a case-by-case basis under the *reciprocity principle* stipulated in Article 436 of the HIR.

International arbitration offers significant advantages for transnational NFT disputes. The *1958 New York Convention*, which has been ratified by more than 170 countries, provides a framework for the recognition and enforcement of foreign arbitral awards. Arbitration can provide flexibility in selecting an arbitrator with blockchain technology expertise, confidentiality, and *relative speed* compared to litigation. However, arbitration requires explicit terms, which are not always present in NFT transactions made through marketplace terms.

Online Dispute Resolution (ODR) emerged as an alternative mechanism that aligns with the digital nature of NFTs. Platforms like *Kleros* and *Aragon Court* offer blockchain-based *decentralized dispute resolution* with *cryptoeconomic incentives*. However, the platform's ODR decision faces challenges of *recognition and enforcement* in the formal legal system. UNCITRAL has developed *Technical Notes on ODR* that can be a framework, but there is no *international convention* that provides a binding ruling on ODR.

Enforcement of a judgment or *arbitral award* in an NFT case faces unique technical challenges. When a court or arbitrator orders the transfer of NFTs from a defendant to a plaintiff, enforcement of the award requires access to the defendant's private-key *wallet*. If the defendant refuses to hand over the *private key*, *enforcement* becomes practically impossible because there is no mechanism to "confiscate" the NFT without *it*. Some jurisdictions have implemented *contempt-of-court sanctions* or *astreinte* to enforce compliance, but their effectiveness is limited when the defendant is outside the jurisdiction.

Transnational NFT Dispute Case Study

The case of *Hermès International v. Mason Rothschild* (2023) in the U.S. District Court for the Southern District of New York provides an important precedent for NFT trademark disputes. Rothschild, a digital artist, created a "MetaBirkins" NFT collection featuring images of furry Birkin bags. Hermès sued for trademark infringement and dilution. The court ruled that NFTs do not get First Amendment protection as artistic expression when used primarily as commercial products. This ruling clarifies that NFTs that use another party's trademark without permission may constitute trademark infringement.

The case of *Yuga Labs v. Ryder Ripps* (2023) involved alleged copyright infringement, in which Ripps created a "RR/BAYC" NFT collection that is a copycat of Bored Ape Yacht Club. The California court granted a preliminary injunction and applied the Lanham Act to protect Yuga Labs' trademark rights. This case demonstrates the application of traditional IP law to NFT disputes and clarifies the protection of copyright holders in the NFT context.

The OpenSea phishing incidents (2022) case involved a series of attacks where attackers used *phishing emails* to gain access to users' wallets and steal NFTs worth millions of dollars. The victims are spread across the United States, the UK, and Australia. The investigation involved multiple law enforcement agencies, and several stolen NFTs were successfully recovered through cooperation with exchanges. This case exposes the challenges of jurisdiction and international cooperation in cybercrime involving NFTs.

Aspects	Traditional Approach	NFT Challenge	Proposed Solutions
Jurisdiction	<i>Forum rei sitae, domicili</i>	The location of NFTs is unclear	<i>Effects doctrine, marketplace location</i>
<i>Choice of Law</i>	<i>Lex rei sitae, lex loci contractus</i>	Automatic, borderless contracts	<i>Party autonomy, closest connection test</i>
<i>Enforcement</i>	Execution confiscation, coercion of bodies	<i>Private key requirement</i>	<i>Contempt sanctions, international cooperation</i>
Proof of Ownership	Certificates, deeds	<i>Blockchain record, pseudonymity</i>	<i>On-chain verification, KYC requirements</i>

Source: Data processed by researchers (2025)

Harmonization of International Law and the Need for a Regulatory Framework

The heterogeneity of NFT regulations across jurisdictions creates opportunities for regulatory arbitrage and legal uncertainty, hindering the development of the global digital economy. The harmonization of international law is imperative to create predictability and fairness in cross-border NFT transactions. Several harmonization initiatives have been initiated, but are still in their early stages.

UNCITRAL (United Nations Commission on International Trade Law) has formed a working group to study legal issues arising from the digitalization of trade, including aspects of digital assets and smart contracts. The Model Law on Electronic Transferable Records, adopted in 2017, can serve as a framework for recognizing NFTs as electronic transferable records equivalent to paper-based documents. However, this Model Law does not specifically regulate NFTs and requires substantial adaptation.

The Hague Conference on Private International Law has started preliminary work on jurisdiction and applicable law in the digital economy. Draft principles are being developed to govern jurisdiction in online disputes, including potential applications to NFT transactions. The proposed approach combines traditional connecting factors with new criteria that account for the digital nature of transactions.

The G20 and the Financial Stability Board have issued recommendations for crypto-asset regulations that cover NFTs. The recommendations emphasize the need for international coordination, consumer protection, market integrity, and financial stability. However, these recommendations are non-binding, and implementation depends on each country's political will.

The European Union, through the MiCA Regulation, provides a comprehensive framework that could serve as a model for other jurisdictions. MiCA regulates the licensing of crypto-asset service providers, consumer protection measures, market abuse prevention, and operational resilience requirements. MiCA's risk-based regulatory approach allows for flexibility while ensuring adequate protection.

Several fundamental principles need to be adopted to harmonize international NFT regulations. First, the technology neutrality principle, which states that regulations should not favor or discriminate against specific technologies, allowing innovation while achieving

regulatory objectives. Second, the same activity, the same regulation principle, where the same economic activity must be regulated consistently, regardless of the technology used.

Third, the proportionality principle, under which regulatory requirements must be proportional to the risks posed, avoiding over-regulation that stifles innovation or under-regulation that exposes consumers to undue risks. Fourth, the cross-border cooperation principle where regulators from various jurisdictions must establish cooperation mechanisms for information sharing and coordinated enforcement.

Consumer Protection in Transnational NFT Transactions

Consumers in transnational NFT transactions face special risks that require adequate legal protection. The asymmetry of information between sellers and buyers, the technical complexity of blockchain technology, and the lack of regulatory oversight create vulnerability. The international consumer protection framework needs to be adapted to accommodate the unique characteristics of NFTs.

The OECD Consumer Protection Guidelines provide a framework for consumer protection in e-commerce that can be adapted for NFTs. The principles include transparent and effective protection, fair business practices, online dispute resolution, and cross-border cooperation. In the context of NFTs, transparency requirements need to be strengthened, considering the higher technical complexity and information asymmetry.

Disclosure requirements are a crucial aspect of consumer protection. Sellers and platforms must disclose material information, including: the intellectual property rights acquired by the buyer when purchasing an NFT (usually only a limited license, not a full copyright), risks associated with blockchain technology and smart contracts, volatility and speculative nature of NFT values, and the seller's identity and contact information for dispute resolution.

The right of withdrawal that applies in traditional consumer contracts faces challenges in the NFT context. The EU Consumer Rights Directive provides a 14-day cooling-off period for distance contracts, but exemptions apply to digital content. Whether NFTs qualify as goods or as digital content remains a legal uncertainty. Some jurisdictions apply a conditional right of withdrawal, allowing consumers to withdraw if the NFT is materially different from the description or defective.

Unfair terms protection needs to be applied to marketplace terms of service that often constitute adhesion contracts. Terms that excessively limit platform liability, impose

unreasonable restrictions on user rights, or contain one-sided arbitration clauses may be considered unfair and unenforceable. The EU Unfair Contract Terms Directive and equivalent national legislation provide a framework for reviewing the fairness of standard terms.

Redress mechanisms for consumers must be accessible and effective. Online Dispute Resolution platforms can provide cost-effective mechanisms for resolving low-value disputes. The EU ODR Regulation provides a platform for cross-border consumer disputes that can be adapted to NFTs. Small claims procedures in various jurisdictions can be simplified to accommodate NFT disputes with technical assistance for judges and arbitrators.

International Taxation Aspects of NFT Transactions

Cross-border NFT transactions pose significant international tax complexity. Fundamental questions include the characterization of NFTs for tax purposes, the determination of the source of income, and the applicability of double taxation treaties. Different jurisdictions apply different approaches, creating opportunities for tax avoidance and disputes.

The characterization of NFTs as capital assets, inventory, or intangible property has different tax implications. If categorized as a capital asset, gains from sales are generally subject to capital gains tax at lower rates. If categorized as inventory for professional traders, gains are treated as ordinary income and subject to higher tax rates. Different characterizations between jurisdictions can result in double taxation or unintended non-taxation.

The OECD Model Tax Convention provides a framework for allocating taxing rights between jurisdictions. Article 13 regulates capital gains taxation, but the application of NFTs is not straightforward. Determining the situs of NFTs for tax purposes faces similar challenges to those in private international law. Some tax authorities apply residence-based taxation where gains are taxed in the residence country of the seller, while others apply source-based taxation by determining the source as the marketplace location.

Value Added Tax (VAT) or Goods and Services Tax (GST) applications on NFT transactions are also complex. The EU VAT Directive initially treated crypto-assets as payment instruments exempt from VAT. However, NFT treatment under VAT is still developing. If NFTs are considered a supply of services, the standard VAT rate applies. If it is considered a supply of goods, different treatment may apply. Place-of-supply rules for digital services further complicate cross-border transactions.

Transfer pricing issues arise in transactions between related parties across borders. When NFTs are transferred between subsidiaries of multinational entities, tax authorities are concerned whether the transfer price reflects the arm's length principle. Valuation difficulties, given the volatile and illiquid nature of many NFT markets, create uncertainties. The OECD Transfer Pricing Guidelines for intangibles can provide a framework, but adaptation is needed. Reporting requirements and information exchange between tax authorities are important for combating tax evasion. The OECD Common Reporting Standard (CRS) and Crypto-Asset Reporting Framework (CARF), adopted in 2022, aim to establish automatic exchange of information on crypto-asset transactions. CARF requires reporting entities (exchanges and wallet providers) to collect and report user information to tax authorities, which then exchange information with other jurisdictions. The implementation of CARF for NFT transactions will enhance transparency and reduce opportunities for tax evasion.

CONCLUSIONS AND SUGGESTIONS

Conclusion

This study concludes that NFT ownership disputes in transnational contexts face unprecedented complexity under international civil law. The borderless, decentralized, and immutable characteristics of blockchain technology challenge the application of traditional principles of jurisdiction, legal choice, and enforcement of foreign judgments. The determination of jurisdiction in NFT disputes cannot rely on the traditional *rei sitae* principle, given the ambiguity of the location of NFTs stored on the global distributed ledger.

Various theories have been put forward, including wallet location theory, blockchain network location theory, and marketplace location theory, but each faces practical limitations. The effects doctrine, which claims jurisdiction based on substantial effects within a jurisdiction, emerged as the most pragmatic approach, in line with precedent in internet jurisdiction cases. However, the application of the effects doctrine requires careful calibration to avoid excessive jurisdictional claims that can result in parallel proceedings and conflicting judgments.

The determination of the applicable law faces similar challenges where traditional connecting factors, such as *lex rei sitae* and *lex loci contractus*, are difficult to apply. Party autonomy through choice-of-laws clauses in smart contracts or marketplace terms of service offers a solution, but enforceability depends on real bargaining power and does not conflict with mandatory rules or public policy forums. The closest connection test, considering multiple

factors such as the domicile of the parties, the marketplace location, and the place of performance, emerged as a more flexible approach.

Enforcement of arbitral awards in the context of NFTs faces unique technical challenges related to access to private keys. Contempt sanctions and harassment can force compliance, but their effectiveness is limited when the defendant is out of jurisdiction or is non-cooperative. International cooperation between law enforcement agencies and the development of technical solutions for court-ordered transfers are necessities for effective enforcement.

International law harmonization is an imperative to overcome regulatory fragmentation that creates legal uncertainty and opportunities for regulatory arbitrage. Multilateral initiatives through UNCITRAL, the Hague Conference, and international organizations need to be accelerated to develop a unified framework that balances innovation with adequate protection. The EU MiCA Regulation can serve as a model for comprehensive crypto-asset regulation in other jurisdictions, with necessary adaptations.

Suggestions

Based on the research findings, several recommendations were submitted to various stakeholders. To international policymakers, it is recommended to accelerate the development of international conventions or model laws that specifically address NFTs and digital assets. The convention must cover jurisdictional rules, choice-of-laws principles, recognition and enforcement mechanisms, and consumer protection standards. Multilateral cooperation frameworks need to be established for information sharing, coordinated enforcement, and mutual legal assistance.

To national policymakers, including Indonesia, it is recommended to develop a comprehensive regulatory framework for NFTs that is compatible with international standards. Regulations must clearly define NFTs, establish registration or verification mechanisms, provide consumer protection measures, and specify tax treatment. The regulatory framework needs to adopt technology-neutral and risk-based approaches that allow flexibility while ensuring adequate safeguards. Capacity building for judges, arbitrators, and law enforcement officers regarding blockchain technology and NFT characteristics is a priority.

Marketplace platforms and industry players are advised to adopt best practices in transparency, consumer protection, and dispute resolution. Marketplace terms of service must include clear choice-of-laws and choice-of-forums clauses that are balanced and not unfairly one-sided. The development of industry standards for KYC/AML compliance, security

measures, and dispute resolution procedures can enhance trust and reduce disputes. Participation in regulatory dialogues and self-regulatory initiatives can help shape balanced regulatory frameworks.

To academics and legal researchers, it is recommended to conduct further research on emerging issues such as decentralized autonomous organizations (DAOs) governance, cross-chain NFT transfers, and the application of artificial intelligence in NFT dispute resolution. Comparative legal studies can identify best practices from various jurisdictions. Interdisciplinary research combining legal analysis with computer science and economics can provide a holistic understanding of the NFT ecosystem.

To users and investors, it is recommended to enhance legal literacy regarding rights and risks in NFT transactions. Due diligence before purchasing NFTs, including verifying seller authenticity, understanding the intellectual property rights acquired, and reviewing the platform's terms of service, is essential. Using reputable platforms with established dispute-resolution mechanisms and maintaining secure storage of private keys can minimize risk. Seeking legal advice for high-value transactions or complex arrangements is prudent.

The implementation of these recommendations requires coordinated efforts from multiple stakeholders across borders. International harmonization is not an instant process but a gradual development through soft-law instruments, bilateral agreements, and, eventually, binding international treaties. In the interim, pragmatic approaches, such as choice-of-laws clauses, arbitration agreements, and ODR mechanisms, can provide workable solutions for resolving disputes. Continuous dialogue between regulators, industry, academia, and civil society will be essential for developing a balanced framework that protects legitimate interests while fostering innovation in the digital economy.

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