



Article Type: Research Paper

Available online: [www.ujlbm.twistingmemoirs.com](http://www.ujlbm.twistingmemoirs.com)

## FROM HYPE TO REGULATION: LEGAL RESPONSES TO THE RISE AND FALL OF THE METAVERSE ECONOMY

<sup>1</sup> Adv. Zainab Tayyebi Johar \*<sup>1</sup>Jindal Global School of Law, LLM studentCorresponding Author: Zainab Tayyebi Johar, Email: [zainabtayyebi@gmail.com](mailto:zainabtayyebi@gmail.com)

### ABSTRACT

This paper examines the legal nature and governance of virtual property, focusing on ownership, transfer, and regulatory challenges within the metaverse. It evaluates how traditional legal frameworks struggle to adapt when blockchain, artificial intelligence (AI), augmented and virtual reality (AR/VR), 3D modelling, and edge computing converge in virtual environments. The study explains blockchain's role in underpinning non-fungible tokens (NFTs)—now a key standard for registering and asserting virtual ownership—and assesses how Indian property and commercial law (e.g., the Transfer of Property Act 1882 and the Sale of Goods Act 1930) could conceptually accommodate digital assets. A comparative analysis of the UK, US, EU, and India shows how divergent approaches to classification (e.g., “digital objects” in UK proposals) shape proprietary treatment, remedies, and risk allocation. Finding that existing property doctrines are insufficient to resolve cross-jurisdictional, platform-dependent ownership challenges, the dissertation proposes a harmonised governance approach. It integrates statutory law, soft law (e.g., UNIDROIT Principles of International Commercial Contracts), and platform-level standards to promote certainty, accountability, interoperability, and effective user protection in digital ownership.

**Keywords:** Metaverse, NFTs, Blockchain, Virtual Property, Digital Assets, Transfer of Property Act, Digital Governance.

### INTRODUCTION

The emergence of the metaverse and digital assets has transformed interaction, trade, and the creation of valuable virtual spaces—touted by some as the next frontier of the internet.<sup>1</sup> Although popularised by Neal

<sup>1</sup> David Vidal-Tomás, ‘The Illusion of the Metaverse and Meta-Economy’ (2022) 184 *Technological Forecasting and Social Change* 122020 <<https://doi.org/10.1016/j.irfa.2023.102560>> accessed 26 December 2025.

Stephenson's *Snow Crash*<sup>2</sup>, there is no single authoritative definition. The metaverse is best understood as an immersive, persistent, three-dimensional digital environment where social interaction, commerce, and creativity operate beyond physical constraints, often accessed through VR/AR and increasingly intertwined with Web3 infrastructures (blockchains, DAOs, cryptocurrencies, NFTs).<sup>3</sup>

In this ecosystem, digital assets including cryptocurrencies, NFTs, AI-generated works, and virtual real estate function as instruments of identity and ownership. Digital Twins help map real and virtual environments, while blockchains supply verifiability and tamper-evident provenance required for trust in virtual economies.

Corporate investment by firms such as Meta, Microsoft, Google, and Nvidia, and platforms like Fortnite, Roblox, and The Sandbox, created early prototypes. Yet most remain siloed, centrally governed, and non-interoperable. As a result, user autonomy and ownership experience platform-dependency risks, often constrained by Terms of Service (ToS) and End User Licence Agreements (EULAs).

The 2021–22 speculative boom marked by record NFT sales and crypto valuations—was followed by collapses (e.g., FTX, Terra-Luna) and retrenchment, exposing the fragility of virtual economies reliant on volatile markets and weak safeguards.<sup>4</sup> The resulting losses raised foundational legal questions: What is “ownership” when a platform shuts or delists an asset? When are tokens or AI-generated outputs “property,” “securities,” or “commodities”? How should liability and remedies be allocated across borderless, intermediary-dependent systems?

This dissertation explores these questions through comparative legal analysis and proposes a governance framework aligning legal characterisation, conflict-of-laws tools, and platform standards with the technical realities of virtual assets.

## **OVERVIEW**

Section 1 traces the evolution and structure of the metaverse economy and its technological underpinnings, emphasising blockchain's role in creating, validating, and exchanging NFTs that support claims to virtual property.

Section 2 analyses “property” in virtual environments. It defines virtual property, examines NFTs' function as records of title and provenance, and evaluates competing legal characterisations as property, securities, or commodities—highlighting how classification choices affect rights, duties, and remedies. It also analyses ownership and transfer in ToS/EULA-dominated ecosystems and the tension between contractual licences and proprietary claims.

Section 3 evaluates legal risks and governance gaps, surveying frameworks in India, the US, and the EU (including GDPR and MiCA) and showing how divergences complicate classification and enforcement. It then addresses choice-of-law challenges in contract and tort, proposes connecting factors adapted to digital assets, and outlines a multi-layered governance model integrating private ordering, soft law, and statutory interventions.

---

## **MATERIALS AND METHODS**

The present research article adopts a doctrinal and analytical research methodology. The study is primarily based on secondary sources of data, including statutes, judicial decisions, international treaties and conventions, government reports, policy documents, scholarly articles, books, and research papers. A

---

<sup>2</sup> J Joshua, ‘Information Bodies: Computational Anxiety in Neal Stephenson's *Snow Crash*’ (2017) 19(1) *Interdisciplinary Literary Studies* 17, < [Information Bodies: Computational Anxiety in Neal Stephenson's <em>Snow Crash</em>](#)> accessed on 28<sup>th</sup> October 2015.

<sup>3</sup> V T Truong, D T Nguyen, A H Le and M Sookhak, ‘Blockchain Meets Metaverse and Digital Asset Management: A Comprehensive Survey’ (2023) 11 *IEEE Access* 26258 < [IEEE Xplore Full-Text PDF](#)> accessed 28 October 2025.

<sup>4</sup> ‘The Mystery Behind the Collapse of FTX, 3AC, and Terra Luna: Shocking Revelations from CZ's New Book’ (Binance Square, 17 March 2025) <<https://www.binance.com/en/square/post/21697571562889>> accessed 28 October 2025.

detailed examination of relevant legal provisions, case laws, and academic literature was undertaken to analyze the existing legal framework governing the subject matter.

The research employs a comparative and critical approach wherever necessary to evaluate different legal perspectives, identify gaps in the current framework, and assess the effectiveness of existing laws and policies. Relevant national and international developments have also been examined to provide a comprehensive understanding of the issues under study.

The collected material was systematically analyzed to draw reasoned conclusions and formulate recommendations aimed at addressing the legal and practical challenges identified during the course of the research.

---

## **THE RISE OF THE METAVERSE ECONOMY**

Metaverse architecture can be understood through four layers: (1) infrastructure (IoT devices and sensors that capture real-world data; communications networks; cloud/edge computing), (2) tools (VR/AR headsets, interfaces, identity/wallet tooling), (3) virtual worlds (platforms and environments), and (4) virtual life (economic and social interactions). Blockchain supports smart contracts, cryptocurrencies, NFTs, and dApps, enabling decentralised record-keeping and token-based markets.

Technically, a blockchain is a consensus-maintained ledger of linked blocks secured by cryptographic hashes. Smart contracts autonomously enforce agreed-upon state changes. NFTs provide unique, verifiable on-chain references to assets, and interoperability (via bridges and shared standards like ERC-721) facilitates movement and use across compatible platforms.<sup>5</sup>

The creator economy within virtual worlds leverages NFTs to tokenise user-generated content and virtual land, enabling monetisation and secondary markets. Yet the metaverse remains nascent: hardware constraints, usability frictions, walled gardens, and governance concerns (privacy, safety, consumer protection, and systemic risk) have tempered the hype. Both Web2 and Web3 virtual economies reveal longstanding tensions: real-money trading, game balance, and the legal status of virtual items; now compounded by crypto volatility and decentralised infrastructure.

A working definition of “digital assets” spans digitally stored content and online accounts with economic or personal value, including virtual goods, tokens, domain names, credentials, and data inventories. This breadth underscores why property doctrines, consumer law, financial regulation, and data protection intersect in the metaverse.<sup>6</sup>

---

## **CHAPTER 2 – PROPERTY IN THE METAVERSE**

### **What is virtual property?**

Virtual property can share three salient features with tangible property:

- Rivalrousness: a unique asset (e.g., a specific NFT) cannot be simultaneously owned by multiple parties in the same proprietary sense.
- Persistence: the asset continues to exist notwithstanding idleness.
- Interconnectivity: others can perceive or interact with the asset without control.<sup>7</sup>

However, status depends on the environment: MMOGs, CVEs, social virtual worlds, and AR worlds implement different architectures and rules. Platforms oscillate between tolerating secondary markets and

---

<sup>5</sup> Truong and others, ‘Blockchain Meets Metaverse and Digital Asset Management’, 26258.

<sup>6</sup> Prashant Mali and Aswathy Prakash G, ‘Death in the Era of Perpetual Digital Afterlife: Digital Assets, Posthumous Legacy, Ownership and its Legal Implications’ (2019) 15(1) *National Law School Journal* < [Death in the Era of Perpetual Digital Afterlife\\_Digital Assets.pdf](#) > accessed 29 October 2025.

<sup>7</sup> Fairfield, ‘Mixed Reality’, 60.

suppressing them, often through ToS. This variability foregrounds a core issue: are a user's interests proprietary rights in rem, or contractual licences in personam?

A functional account of Virtual Property Rights (VPR) turns on:

- Ownership and control: established via blockchain records or platform rules and constrained by ToS/EULAs.
  - Transferability and market structure: shaped by platform design, legal classification, and market integrity safeguards.
  - Enforcement and dispute resolution: challenged by jurisdictional uncertainty, identity opacity, and remedial gaps.<sup>8</sup>
- 

## **NFTs and their role in the metaverse**

NFTs are unique, non-fungible crypto-tokens that reference digital or physical assets via metadata/URIs, typically with off-chain storage (e.g., IPFS/Arweave) and on-chain provenance. In metaverse contexts, NFTs commonly perform:

- Title signalling: a publicly verifiable pointer to an identified asset, allowing provenance and authenticity checks.
- Access/membership keys: gates to worlds, events, or features (e.g., token-gated experiences).
- Identity artefacts: avatars/skins and reputation primitives that can travel across compatible systems.<sup>9</sup>

Crucially, “owning” an NFT usually means owning the token plus the rights granted by associated contracts/licences; it rarely confers copyright or absolute platform rights unless expressly granted. This separation between token, underlying asset, and IP/licence is pivotal to legal characterisation and remedies.

---

## **Transfer and ownership of virtual property**

Minting creates a unique token on a blockchain, with immutable provenance. Transfers occur through smart contract calls that reassign control of the token to a new address. However, legal title to the “thing” the NFT purports to represent depends on:

- The nature of the referenced asset (digital file, in-game item, virtual land coordinate).
- The legal capacity of the issuer to convey rights (e.g., IP licences; platform entitlements).
- The governing contracts (ToS/EULA, marketplace terms, licence terms embedded or linked in metadata).<sup>10</sup>

This yields a layered bundle: on-chain token control; off-chain asset access; and off-chain IP or contractual rights. Legal analysis must disaggregate these layers to determine remedies and applicable law.

---

---

<sup>8</sup> Sustainability Directory, ‘Virtual Property Rights’ (2 October 2025) <<https://prism.sustainability-directory.com/term/virtual-property-rights/#intermediate>> accessed 28 October 2025.

<sup>9</sup> NFT.NYC, ‘NFT Ticketing: Experiments and Solutions for Your Event’ (NFT.NYC, 8 February 2022) <<https://www.nft.nyc/blog/nft-ticketing-experiments-and-solutions-for-your-event>> accessed 5 November 2025.

<sup>10</sup> ‘Non-Fungible Tokens: Transforming Digital Ownership and Virtual Economies’ (Digital Finance News, <https://digitalfinancenews.com/research-reports/non-fungible-tokens-transforming-digital-ownership-and-virtual-economies/>) accessed 6 November 2025.

## NFT as property

Whether NFTs are “property” depends on jurisdictional doctrines. Arguments for proprietary status emphasise:

- Excludability/control: private key control confers practical exclusion against the world.
- Identifiability: on-chain uniqueness and traceable provenance.
- Transferability: structured alienation via standardised smart contracts.<sup>11</sup>

Counter-arguments stress:

- Relational dependence: utility often depends on platforms honouring the token.
- Content separability: the token is not the underlying asset or IP.
- Remedial mismatch: many disputes sound in contract or tort rather than property.

Even where proprietary status is recognised (e.g., UK’s emerging “digital objects”), scope and remedies may be calibrated to crypto-native control rather than wholesale transposition of chattel law. Practically, courts can protect token control (e.g., injunctions over wallets), while disputes over the referenced content remain contractual/IP.<sup>12</sup>

---

## NFTs as securities

Classification under securities law typically turns on an “investment contract” analysis (e.g., *Howey* in the US). Key factors:

- Expectation of profits from the efforts of others: “utility” NFTs granting static access are less likely to be securities; NFTs marketed with profit promises, revenue shares, or managerial commitments trend toward securities treatment.
- Fractionalisation and pooling: fractional NFTs (F-NFTs), revenue-sharing arrangements, and promoter-driven “roadmaps” increase securities risk.
- Economic reality over form: courts/regulators look past “NFT” labels to substance.<sup>13</sup>

The boundary is context-specific. The same token can shift categories across its lifecycle (e.g., pre-sale promotional statements, post-mint managerial efforts). Platforms and issuers should align disclosures, avoid implicit profit inducements, and segregate utility/access from investment features.

---

## NFTs as commodities

Some jurisdictions treat crypto-assets as commodities for market integrity and anti-fraud purposes. For NFTs:

- One-off, unique tokens with consumption/access utility are fewer natural fits for commodity regimes.
- Standardised NFTs with active derivatives or spot markets could trigger commodity oversight, at least for fraud/manipulation jurisdiction.
- AML/KYC obligations often apply regardless of commodity status, shaping marketplace compliance.

---

<sup>11</sup> Corinne Tan, ‘Rights in NFTs and the Flourishing of NFT Marketplaces’ (2024) 32 *International Journal of Law and Information Technology* eaac018 <<https://doi.org/10.1093/ijlit/eaac018>> accessed 6 November 2025.

<sup>12</sup> *Ibid.*

<sup>13</sup> TECHBLOAT, ‘How to Use NFTs for Virtual Property, Rentals and Transactions’.

In all characterisations, the practical takeaway is that mixed rights and hybrid functionality demand careful, context-specific analysis at issuance and at each transfer.

### Ownership constraints and platform power

Case law from virtual worlds illustrates the fragility of user “ownership” where platforms reserve unilateral control. Even were tokens evidence provenance, platforms can gate functionality. EULAs commonly assert that virtual items remain developer IP; users receive conditional licences subject to termination or suspension. Hence, users often “own” tokens but only “licence” the utility that gives them value.

## RISKS AND LEGAL PITFALLS OF THE METAVERSE-

The nature of metaverse remains volatile as it is unstable with rapid fluctuations in its value, existence and legal certainties. There exist potent risks concerning the blockchain based token and cryptocurrency. In *Figure 1* gives a comprehensive view of the blockchain supported cases in the metaverse-based financial and economic services from user application perspective and potential issues.<sup>14</sup>

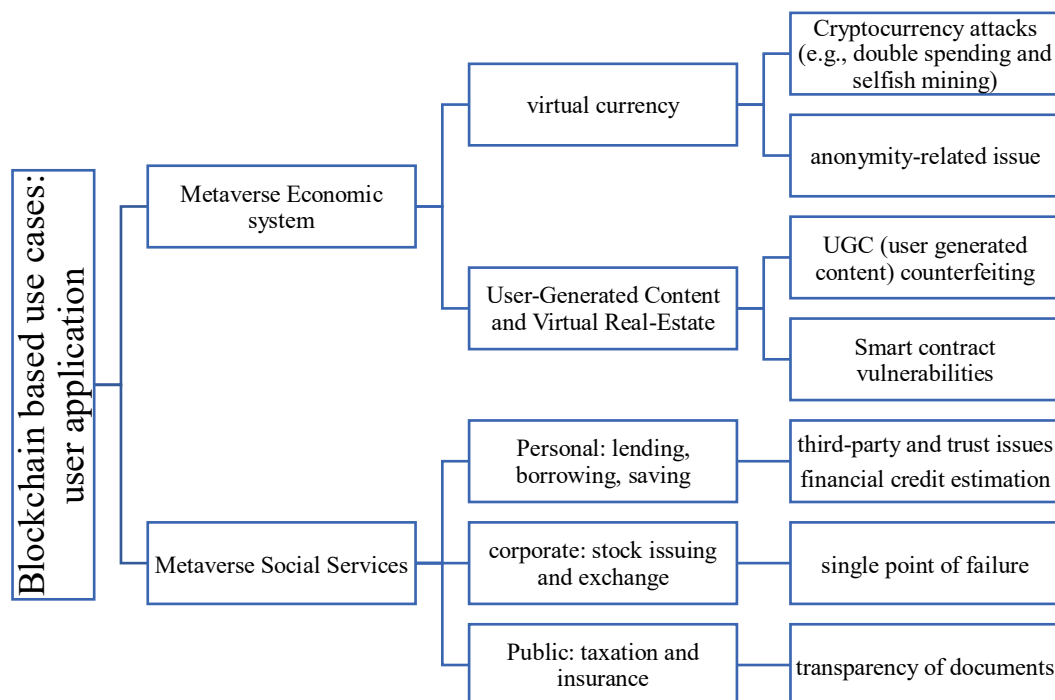


Figure 1: Blockchain based used cases in the metaverse.<sup>15</sup>

The hype of metaverse fizzled a couple of years later. The reason behind it is a combination of problems which came with it. Firstly, no one actually knew what the metaverse truly mean and many companies introducing, anything remotely digital with a tag of metaverse. There also exist a risk of platform failure, as despite the voting rights of users, there is no guarantee that the platform owner wouldn’t shut down operations if financially untenable. The entire system could collapse leaving the investments worthless.

<sup>16</sup>virtual environments, however revolutionizing it is, would not be beneficial unless we protect rights in virtual property.<sup>17</sup>Different jurisdictions have approached to regulate digital asset, digital protection and consumer accountability in different ways.

<sup>14</sup> Truong and others, ‘Blockchain Meets Metaverse and Digital Asset Management’, 26258.

<sup>15</sup> Ibid.

<sup>16</sup> Kumar, ‘Evolving Frontier’, 1032.

<sup>17</sup> Fairfield, ‘Mixed Reality’, 60.

## **Legal framework in different jurisdiction**

The rise of metaverse has presented with a new dimension of challenges relating to metaverse sovereignty and private international law. The conventional process of determining applicability of law cannot be used as the metaverse lack physicality. The classification of issue becomes important for the determination of governing law.

In India, the Digital Personal Data Protection Act <sup>18</sup>2023 (DPDA) is a legal framework enacted to safeguard the personal data, processing of digital data and focuses on protecting the privacy of individuals. Its preamble reads as-

“An Act to provide for the processing of digital personal data in a manner that recognises both the right to find individual to protect their personal data and the need to process such personal data for lawful purposes and for matters connected there with or incidental thereto.”<sup>19</sup>

This statute does not explicitly address the governance regarding virtual assets, nor does it cover any accountability of metaverse economic collapse, loss of data or funds. India's current legal system is under prepared for these complexities as there is an absence of specific data protection mechanisms. The transaction in virtual property remains dependent on End User License Agreement (EULAs) which are only contractual in nature between the user and the platforms.<sup>20</sup>

Jurisdictions like the United States does not recognize rights relating to virtual property. The laws currently governing the accountability is rooted in consumer protection and contract law, and not by a unified data protection statute. The Federal Trade Commission (FTC) is answerable body which overlooks in matters relating to deceptive practices, including misrepresentation of digital assets and platform guarantees. However, if a metaverse company collapses after promising perpetual access or ownership, the FTC could intervene under Section 5 of the FTC Act <sup>21</sup> for unfair or deceptive practices.<sup>22</sup>

In European Union comprehensive framework for data privacy. data subject rights, accountability, and data minimization are provided under the General Data Protection Regulation (GDPR)<sup>23</sup> focusing on personal data. EU (European Union) has revised the regulations under the Markets in Crypto-Assets (MiCA)<sup>24</sup>, which aims to regulate certain digital tokens, though NFTs remains not explicitly covered. If collapse of metaverse ensues, user data loss may initiate GDPR obligations, but ownership of virtual property or digital tokens is left to contractual and national civil law frameworks.

Through an analysis above, it is accurate to say that there is no law or legal framework which explicitly covers ownership, transfer, loss, fraud, theft, breach or infringement relating to virtual property at the moment. Hybrid license lease model is currently used to conceptualize ownership which lacks standard regulations.<sup>25</sup>

## **Challenges in determining the governing law**

One of the main reasons behind no prompt framework is firstly, the decentralised nature of metaverse making it difficult to determine as to which jurisdiction's law would apply, secondly the conventional legal contrast often collides with the digital paradigm of metaverse, resulting in difficulties in choice of relevant law and their applications. Such a choice is largely impacted by the obligations beneath them and their subject matters.

---

<sup>18</sup> The Digital Personal Data Protection Act 2023 (Act 22 of 2023) (India).

<sup>19</sup> Tan, 'Rights in NFTs and the Flourishing of NFT Marketplaces', eaae018.

<sup>20</sup> Kumar, 'Evolving Frontier', 1032.

<sup>21</sup> Federal Trade Commission Act 1914 (US).

<sup>22</sup> Fairfield, 'Mixed Reality', 60.

<sup>23</sup> Regulation (EU) 2016/679 (General Data Protection Regulation) [2016] OJ L119/1.

<sup>24</sup> Regulation (EU) 2023/1114 on Markets in Crypto-Assets (MiCA) [2023] OJ L150/40.

<sup>25</sup> Kumar, 'Evolving Frontier', 1032.

## Types of obligations

The legal operations of metaverse can be divided broadly into two categories- contractual and non-contractual obligations. Metaverse accommodates contractual matters which involve voluntary commitment. This arrangement can be between parties, both the parties can be users (using NFTs as collateral for loan or exchange of crypto currencies) and can be user and the platform against one another (where the platform's terms and conditions supersedes). The contracts concerning digital assets can also involve non-users and external platforms. While non-contractual obligation encompasses torts and quasi-delicts such as unjust enrichments, personal offences including defamation, harassment, misappropriation of digital assets, etc. The distinction between the contracts and torts becomes more complex in the metaverse. Due to the reliance of metaverse on different crypto-networks, there unfolds the possibility to multitude of seamless contractual links. For example, if the last indirect buyer of the NFT sues its creator for misleading and using illegal elements during minting then such an act would amount to tort as currently practiced in EU against the individual/member who is not connects to the transfer chain through any contract. Such disputes over NFTs may involve both contract and tort elements, making it difficult to determine the applicable Private International Law (PIL) rules.<sup>26</sup>

## Subject matter

The determination of applicable Law in the metaverse depends on how digital assets are classified, which varies widely across jurisdictions. As discussed earlier, assets such as cryptocurrencies, NFTs, and virtual land may be treated as *property* in the UK<sup>27</sup> or Singapore, as securities in the US (*Gary Plastic Packaging v. Merrill Lynch*)<sup>28</sup>, or even prohibited in countries like China. This divergence creates uncertainty in establishing the governing law.

## Selecting applicable law and the role of connecting factors

The selection of applicable law in the metaverse remains ambiguous as there is a void of legal provisions for virtual assets and digital transactions. Judges typically rely on pre-existing rules governing property, contracts, digital services, or securities, though these are not designed for virtual environments. The decisions of courts vary because of different jurisdiction. The determination of applicable law also involves identifying the suitable *connecting factors*. As there are legal gaps in the application of existing laws, courts often identify the closest law connecting the dispute, but it could be difficult in the metaverse as user identities, habitual residences, and the virtual "location" of assets or contracts often remain indeterminate, undermining traditional principles like *lex rei sitae*, *lex loci contractus*, or *lex loci delicti*.<sup>29</sup>

---

## **Framework and Regulatory Guidelines for Metaverse Governance-**

The fragmented and transnational nature of the metaverse necessitates a governance framework that extends beyond traditional legal approaches. Since virtual assets exist at the intersection of property law, contract law, financial regulation, technology governance, and data protection, no single regulatory regime is capable of addressing all associated risks. Consequently, a sustainable metaverse ecosystem requires a

---

<sup>26</sup> Ekaterina Oger Grivnova, 'Metaverse and Private International Law: Challenges in Determining Governing Law' in Maud Piers and Sean McCarthy (eds), *Transforming Arbitration: Exploring the Impact of AI, Blockchain, Metaverse and Web3* (Radboud University Press 2025).

<sup>27</sup> UK Law Commission, Digital assets: Final Report, 28 June 2023, Law Com No. 412.

<sup>28</sup> *Gary Plastic Packaging v. Merrill Lynch, Pierce, Fenner & Smith Inc.*, 756 F.2d 230, 240-41 (2d Cir. 1985).

<sup>29</sup> Grivnova, 'Metaverse and Private International Law'.

**multi-layered governance model** that combines private ordering, technological standards, consumer protection mechanisms, and public regulatory oversight.<sup>30</sup>

### Strengthening Private Ordering and Technical Standardisation

Given that most metaverse interactions occur within privately governed digital platforms, governance reform must begin with greater transparency and standardisation at the platform level. One of the most significant sources of legal uncertainty concerns the rights associated with NFTs. Users frequently assume that the purchase of an NFT grants ownership of the underlying digital content, whereas, in reality, they often acquire only limited contractual rights governed by platform terms and licensing agreements.<sup>31</sup> To reduce ambiguity, platforms should adopt standardised disclosure mechanisms, sometimes described as “rights passports”—embedded within token metadata. These disclosures should clearly identify the scope of access rights, intellectual property licences, transfer restrictions, and circumstances under which such rights may be modified or revoked.<sup>32</sup>

Interoperability is equally important for the long-term sustainability of the metaverse. The promise of decentralised ownership is undermined when digital assets remain confined within isolated virtual environments. Technical standards facilitating asset portability, verifiable credentials, and cross-platform functionality should therefore be encouraged. Complementary legal standards should ensure that platforms do not arbitrarily exclude assets that comply with recognised interoperability requirements.<sup>33</sup>

Furthermore, because ownership and transactions are increasingly governed through smart contracts, mechanisms ensuring transparency and accountability are essential. Smart contract governance should incorporate transparent upgrade procedures, public audit requirements, timelocks, and mandatory notice periods to reduce the risks associated with unilateral modifications by platform operators.<sup>34</sup>

### Enhancing Consumer Protection and Market Integrity

The rapid expansion of virtual asset markets has exposed users to significant risks, including fraud, market manipulation, misinformation, and speculative investment schemes. Regulatory frameworks should therefore require clear differentiation between NFTs that primarily provide utility and those marketed as investment opportunities. Where digital assets are promoted with promises of future profits or managerial efforts by issuers, securities regulation may become applicable under established investment contract principles.<sup>35</sup>

Consumer confidence may also be strengthened through the introduction of minimum protection standards. Users should have access to refund mechanisms, dispute-resolution procedures, and remedies where NFTs are misrepresented or where linked content becomes unavailable. Escrow arrangements and insurance mechanisms could further mitigate risks associated with high-value digital transactions.<sup>36</sup>

Cybersecurity protections are equally critical. Given the prevalence of phishing attacks, wallet compromises, and smart contract exploits, marketplaces and platforms should be required to maintain

---

<sup>30</sup> EO Grivnova, ‘Metaverse and Private International Law: Challenges in Determining Governing Law’ in Maud Piers and Sean McCarthy (eds), *Transforming Arbitration: Exploring the Impact of AI, Blockchain, Metaverse and Web3* (Radboud University Press 2025).

<sup>31</sup> Chiara Tan, ‘Rights in NFTs and the Flourishing of NFT Marketplaces’ (2024) 32 *International Journal of Law and Information Technology* eaae018.

<sup>32</sup> Michael D Murray, ‘Trademarks, NFTs, and the Law of the Metaverse’ (2023) 6 *Arizona Law Journal of Emerging Technologies* 3.

<sup>33</sup> VT Truong and others, ‘Blockchain Meets Metaverse and Digital Asset Management: A Comprehensive Survey’ (2023) 11 *IEEE Access* 26258.

<sup>34</sup> *Ibid.*

<sup>35</sup> *SEC v WJ Howey Co* 328 US 293 (1946); *Gary Plastic Packaging v Merrill Lynch, Pierce, Fenner & Smith Inc* 756 F 2d 230 (2d Cir 1985).

<sup>36</sup> UNIDROIT, *Principles of International Commercial Contracts* (2016).

minimum security standards, conduct periodic audits, and implement transparent vulnerability disclosure programmes.<sup>37</sup>

### **Clarifying Property Rights and Insolvency Protection**

One of the most pressing legal questions concerns whether digital assets should be recognised as property. Traditional property doctrines were developed for tangible assets and often struggle to accommodate decentralised digital environments. Nevertheless, recent developments, particularly within the United Kingdom, support the recognition of certain digital assets as a distinct category of personal property characterised by control, exclusivity, and transferability.<sup>38</sup>

A modern governance framework should therefore recognise control-based proprietary interests in tokens and provide access to proprietary remedies, including injunctions, tracing orders, and recovery actions. Such recognition would improve legal certainty while aligning legal principles with the technical realities of blockchain-based ownership.<sup>39</sup>

Greater clarity is also required regarding custody and insolvency treatment. Users frequently entrust digital assets to exchanges, marketplaces, and custodial wallet providers. In cases of platform insolvency, however, ownership claims may become uncertain. Regulatory frameworks should therefore require segregation of customer assets and establish clear rules governing the treatment of digital assets in insolvency proceedings.<sup>40</sup>

In addition, legal mechanisms linking off-chain rights to on-chain assets should be developed. Registries, digital attestations, and standardised licensing frameworks may help ensure that contractual and intellectual property rights associated with NFTs remain identifiable and enforceable.<sup>41</sup>

### **Resolving Cross-Border Disputes and Applicable Law Challenges**

The borderless nature of the metaverse presents significant challenges for private international law. Traditional connecting factors such as territorial location are often inadequate when applied to decentralised networks and pseudonymous participants.<sup>42</sup> Consequently, a hierarchy of connecting factors should be developed to provide greater certainty in cross-border disputes.

Priority should be given to expressly designated governing law clauses contained within smart contracts, platform terms, or associated licences. Where such provisions are absent or unenforceable, alternative connecting factors such as the issuer's principal place of business, the platform's operational nexus, or the consumer's habitual residence may be considered.<sup>43</sup>

Dispute resolution mechanisms should likewise be adapted to the digital environment. Low-value transactional disputes may be addressed through online dispute resolution systems or blockchain-based arbitration procedures, while more complex matters involving fraud, intellectual property infringement, tortious conduct, or injunctive relief should remain subject to judicial supervision.<sup>44</sup>

### **Coordinated Public Regulation**

Private governance alone cannot adequately address systemic risks arising within virtual economies. Public regulatory intervention remains necessary to safeguard financial stability, market integrity, and individual rights. Anti-money laundering (AML) and know-your-customer (KYC) obligations should be

---

<sup>37</sup> Truong and others, 'Blockchain Meets Metaverse and Digital Asset Management' 26270.

<sup>38</sup> UK Law Commission, *Digital Assets: Final Report* (Law Com No 412, 2023).

<sup>39</sup> Ibid.

<sup>40</sup> UK Law Commission, *Digital Assets*.

<sup>41</sup> Tan, 'Rights in NFTs and the Flourishing of NFT Marketplaces'.

<sup>42</sup> Grivnova, 'Metaverse and Private International Law'.

<sup>43</sup> UNIDROIT, *Principles of International Commercial Contracts*.

<sup>44</sup> Maud Piers and Sean McCarthy (eds), *Transforming Arbitration: Exploring the Impact of AI, Blockchain, Metaverse and Web3* (Radboud University Press 2025).

implemented in a manner proportionate to risk while preserving the privacy-enhancing features of decentralised technologies.<sup>45</sup>

Similarly, data protection frameworks must evolve to address the unprecedented volume of biometric, behavioural, and identity-related information generated within immersive virtual environments. Existing regimes such as the GDPR and India's Digital Personal Data Protection Act 2023 provide useful foundations but require adaptation to the unique challenges posed by avatar identities, persistent virtual interactions, and pseudonymous participation.<sup>46</sup>

Given the inherently transnational nature of metaverse activities, effective governance will ultimately depend upon enhanced international cooperation. Regulatory authorities should collaborate in areas such as enforcement, information sharing, market supervision, and cybersecurity oversight to address platform failures, cross-border fraud, and digital market manipulation.<sup>47</sup>

---

## **CONCLUSION-**

The metaverse, as an evolving digital ecosystem, has redefined traditional notions of property, ownership, and value. Traditional legal principles are proven to be insufficient to address the concept of virtual property as they were primarily designed for the tangible forms of property. It is demonstrated by this dissertation that existing laws which governs property (such as the Transfer of Property Act, 1882, the Sale of Goods Act, 1930, and international principles under Private International Law (PIL)) are not able to address the complex system of decentralization, borderless transaction and anonymity which are fundamentals of metaverse, even if they are adapted or interpreted expansively to regulate virtual property. A significant legal shift can be seen in the legal system by the recognition of digital assets as property, introduced as a different category. In *Tata Consultancy Services v. State of Andhra Pradesh*<sup>48</sup>, the Hon'ble **Supreme Court of India** while interpreting the definition of goods made it clear that the physicality of goods is not an essential element, as goods must be capable of utility, transmission, delivery, storage, and possession and gave legal recognition to the modern virtual assets such as software, digital content, NFTs and other blockchain-based assets. Notwithstanding such developments, significant uncertainty persists with respect to the determination of jurisdiction, the applicable governing law, and the identification of accountable authorities or legal persons within the metaverse, particularly in the absence of dedicated, clearly defined and comprehensive regulatory mechanisms.

There is a strong need to exercise harmony between the traditional property principles and emerging digital realities to build a regulatory framework to ensure user protection, fairness and accountability. The inclusiveness of digital objects in the definition of property on the national level clubbed with international corporations is crucial to establish a universal framework for defining the status the ownership and resolving problems of inoperability across platforms, contradicting laws and disputes.

Ultimately the law must not only respond to present challenges but also be forward-looking, given the rapid pace of technological development. There is a pressing need for an equitable and adaptable legal framework capable of upholding justice within virtual spaces, which will transform the experimental domain of metaverse into a safe and legally secure ecosystem, making it a real-virtual world, enjoying the same protection and recognition of the real-world.

---

<sup>45</sup> Regulation (EU) 2023/1114 on Markets in Crypto-Assets (MiCA) [2023] OJ L150/40.

<sup>46</sup> Regulation (EU) 2016/679 (General Data Protection Regulation) [2016] OJ L119/1; Digital Personal Data Protection Act 2023 (India).

<sup>47</sup> UNIDROIT, *Principles of International Commercial Contracts*; Grivnova, 'Metaverse and Private International Law'

<sup>48</sup> *Tata Consultancy Services v State of Andhra Pradesh* (2005) 1 SCC 308 (SC).

## REFERENCES

1. Blackstone, W. (1766). *Commentaries on the laws of England* (Vol. 2). Clarendon Press.
2. Bragg v. Linden Research, Inc., 487 F. Supp. 2d 593 (E.D. Pa. 2007).
3. BullPerks. (2023, January 26). *Types of virtual worlds within the metaverse*. <https://bullperks.com/types-of-virtual-worlds-within-the-metaverse/>
4. Digital Personal Data Protection Act, 2023, No. 22, Acts of Parliament, 2023 (India).
5. Evans v. Linden Lab, No. C-11-01078 DMR, 2013 WL 5781284 (N.D. Cal. Oct. 25, 2013).
6. Fairfield, J. A. T. (2005). Virtual property. *Boston University Law Review*, 85, 1047–1102.
7. Federal Trade Commission Act, 15 U.S.C. §§ 41–58 (1914).
8. Gary Plastic Packaging v. Merrill Lynch, Pierce, Fenner & Smith Inc., 756 F.2d 230 (2d Cir. 1985).
9. Grivnova, E. O. (2025). Metaverse and private international law: Challenges in determining governing law. In M. Piers & S. McCarthy (Eds.), *Transforming arbitration: Exploring the impact of AI, blockchain, metaverse and Web3*. Radboud University Press.
10. Joshua, J. (2017). Information bodies: Computational anxiety in Neal Stephenson's Snow Crash. *Interdisciplinary Literary Studies*, 19(1), 17–35. <https://doi.org/10.5325/intelitestud.19.1.0017>
11. Kastrenakes, J., & Heath, A. (2021, October 25). Facebook is spending at least \$10 billion this year on its metaverse division. *The Verge*. <https://www.theverge.com/2021/10/25/22745381/facebook-reality-labs-10-billion-metaverse>
12. Kindig, B. (2022, February 18). Nvidia on how the metaverse can overtake the current economy. *Forbes*. <https://www.forbes.com/sites/bethkindig/2022/02/18/nvidia-on-how-the-metaverse-can-overtake-the-current-economy/>
13. Kumar, V. (2024). The evolving frontier: Examining the legal status of virtual property in metaverse platforms. *International Journal of Legal Science and Innovation*, 6(3), 1032–1045.
14. Lastowka, G., & Hunter, D. (2004). The laws of the virtual worlds. *California Law Review*, 92(1), 1–74.
15. Law Commission of England and Wales. (2023). *Digital assets: Final report* (Law Com No. 412).
16. Lawton, G. (2024, March 7). Is the metaverse dead? Here's what happened and what's next. *TechTarget*. <https://www.techtarget.com/searchCIO/feature/Is-the-metaverse-dead-Heres-what-happened-and-whats-next>
17. Mali, P., & Prakash, G. A. (2019). Death in the era of perpetual digital afterlife: Digital assets, posthumous legacy, ownership and its legal implications. *National Law School Journal*, 15(1).
18. Murray, M. D. (2023). Trademarks, NFTs, and the law of the metaverse. *Arizona Law Journal of Emerging Technologies*, 6, 3–34. [https://uknowledge.uky.edu/law\\_facpub/781](https://uknowledge.uky.edu/law_facpub/781)
19. NFT.NYC. (2022, February 8). *NFT ticketing: Experiments and solutions for your event*. <https://www.nft.nyc/blog/nft-ticketing-experiments-and-solutions-for-your-event>
20. Öztürk, Ö. (2023, January 11). *Intellectual property in NFTs and legal challenges*. <https://www.researchgate.net/publication/367220919>
21. Pandey, S. (2025, August 5). *How to use NFTs in metaverse games: A simple guide for players*. AST Consulting. <https://astconsulting.in/metaverse/how-to-use-nfts-metaverse-games>
22. Piers, M., & McCarthy, S. (Eds.). (2025). *Transforming arbitration: Exploring the impact of AI, blockchain, metaverse and Web3*. Radboud University Press.
23. Ready Player One. (2018). [Film]. Warner Bros. Pictures.
24. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 (General Data Protection Regulation). (2016). *Official Journal of the European Union*, L119, 1–88.
25. Regulation (EU) 2023/1114 of the European Parliament and of the Council on Markets in Crypto-Assets (MiCA). (2023). *Official Journal of the European Union*, L150, 40–205.
26. Sale of Goods Act, 1930 (India).
27. Securities and Exchange Commission v. W.J. Howey Co., 328 U.S. 293 (1946).

28. Sustainability Directory. (2025, October 2). *Virtual property rights*. <https://prism.sustainability-directory.com/term/virtual-property-rights/>
29. Tata Consultancy Services v. State of Andhra Pradesh, AIR 2005 SC 371.
30. Tan, C. (2024). Rights in NFTs and the flourishing of NFT marketplaces. *International Journal of Law and Information Technology*, 32, eaac018. <https://doi.org/10.1093/ijlit/eaac018>
31. TechBloat. (2023, April 30). *How to use NFTs for virtual property, rentals and transactions*. <https://www.techbloat.com/how-to-use-nfts-for-virtual-property-rentals-and-transactions.html>
32. Transfer of Property Act, 1882 (India).
33. Truong, V. T., Nguyen, D. T., Le, A. H., & Sookhak, M. (2023). Blockchain meets metaverse and digital asset management: A comprehensive survey. *IEEE Access*, 11, 26258–26290. <https://doi.org/10.1109/ACCESS.2023.3241234>
34. UNIDROIT. (2016). *UNIDROIT principles of international commercial contracts*. UNIDROIT.
35. Vidal-Tomás, D. (2022). The illusion of the metaverse and meta-economy. *Technological Forecasting and Social Change*, 184, 122020.
36. Weston, G. (2021, December 24). NFTs and their role in the metaverse. *101 Blockchains*. <https://101blockchains.com/nfts-and-metaverse/>