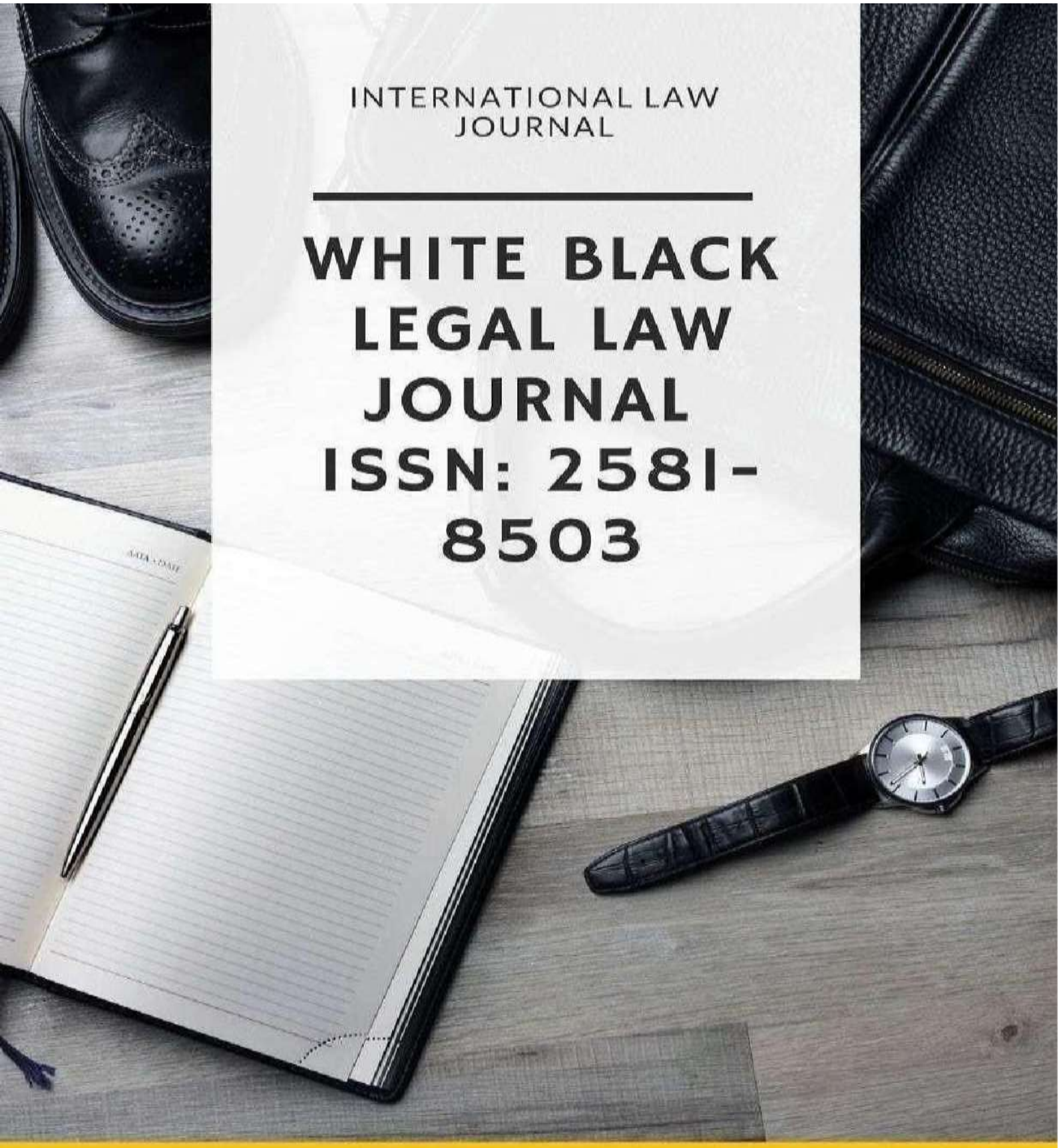

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Subhrajit did his LL.M. in Sports Law, from Nottingham Trent University of United Kingdoms, with international scholarship provided by university; he has also completed another LL.M. in Energy Law from University of Petroleum and Energy Studies, India. He did his B.B.A.LL.B. (Hons.) focussing on International Trade Law.

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INTELLECTUAL PROPERTY IN METAVERSE AND WEB3: LEGAL FRAMEWORK FOR NEW DIGITAL ECONOMY

AUTHORED BY - PRATHAM JAIN
B.A. LL.B. (H)
Amity Law School, Amity University, Noida

Declaration

I, Mr. Pratham Jain, Enrollment No. A3211120197 declare that the dissertation titled "**Intellectual property in metaverse and web3: legal framework for new digital economy**" is solely completed by me and represents my authentic work. The content presented in this dissertation has not been submitted earlier for the award of any degree or diploma to the best of my knowledge and belief. I am enclosing the plagiarism report of my dissertation to demonstrate its originality.

Signature of the Student: Name: Pratham Jain Date: 30-Apr-2025

Topic approval letter

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TOPIC APPOVAL LETTER

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Even semester 2024-25

This is to certify that Mr. Prahtam Jain Enrollment Number A3211120197 from program/sem BA LLB(h)/10sem is enrolled in Legal Writing /Dissertation NTCC, under my supervision. The Topic of research is "Intellectual property in metaverse and web3: legal framework for new digital economy"

& the same is in consensus with the undersigned. The student will follow the NTCC Guidelines and proceed with the research.

Shivani Bainsla

Faculty Supervisor
Ms. Shivani Bainsla
Amity Law School, Noida.

Acknowledgment

Every project, no matter how big or small, succeeds because of the work of several lovely individuals who have consistently provided invaluable advice or offered assistance. I truly appreciate all of the people who have inspired, helped, and mentored me to complete this project.

I, PRATHAM JAIN, a student at AMITY LAW SCHOOL, AMITY UNIVERSITY, NOIDA am incredibly grateful for the confidence bestowed on me and for entrusting my term paper.

I would like to take this opportunity to express my sincere gratitude to the esteemed Prof Dean of the Institution, for making resources available when they were needed and for offering insightful advice that helped me complete my term paper. I would also like to thank MS. SHIVANI BAINSLA, a professor at AMITY LAW SCHOOL, AMITY UNIVERSITY, NOIDA, who served as my supervisor and mentor and helped me put my term paper together. The faculty at AMITY LAW SCHOOL is also to be thanked for their invaluable counsel and direction, without which this project would not have been possible.

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PRATHAM JAIN

Table of content

Introduction to Metaverse and Web3 in the Indian Context

1.1 Definition and Overview of Metaverse and Web3

Web3 and the metaverse are co-occurring tectonic shifts in digital infrastructure that remap interaction, ownership, and economic value within India's technology landscape.

Web3: Decentralizing India's Digital Sovereignty

Web3 extends beyond its replacement, Web 2.0, as it utilizes blockchain to decentralize data ownership and democratize value creation[1]. Unlike the centralized platforms of Flipkart or Paytm, Web3 empowers Indian users with:

- Tokenized Governance: DAOs based on blockchain that facilitate decision-making by communities.
- Self-Custody: Users have control over digital assets (e.g., NFTs, cryptocurrencies) without intermediaries, in line with India's Digital India Act vision of user-centric data governance[2].
- Interoperable Ecosystems: Data portability across platforms using smart contracts, a critical need for India's fragmented fintech ecosystem[1,2].

Metaverse: India's Digital Frontier

The metaverse—a secure mesh of interconnected 3D worlds—is much more than virtual reality gaming but a socio-economic overlay spanning physical and virtual India[1,2]. Main points:

[1] https://www.telefonica.com/en/communication-room/blog/differences-between-metaverse-and- web3/

[2] https://faculty.washington.edu/weicaics/paper/papers/HongzhouCDAZWEC2023.pdf

- Spatial Computing: Application of Augmented Reality (AR) across Indian retail (e.g., virtual try-ons at Nykaa) and education (e.g., interactive modules at BYJU's)[3,4].
- Digital Twins: Bengaluru, an Indian city, leading the way with metaverse copies for city planning and disaster response.
- Creator Economy: Indian creators earning money from virtual assets (e.g., WazirX NFT galleries) and companies such as Reliance Jio creating branded metaverse worlds[5].

Synergy in the Indian Context

The convergence of Web3 and metaverse technologies is driving India's vision to reach a $1 trillion digital economy.

- Economic Forecasts: A $200 billion retail-led (40% virtual commerce penetration) and financial services (decentralized finance protocols) dominated the market in 2035.
- Policy Synergy: MeitY's National Blockchain Strategy (2023) and RBI's experimentation with CBDC trials complement Web3's decentralized philosophy.
- Challenges: Legacy systems centralized (e.g., Aadhaar) are in conflict with Web3 anonymity, and metaverse adoption relies on low-cost XR hardware for Bharat's rural majority.

This juncture places India not as an adopter but as a rule-maker within the international Web3-metaverse ecosystem—a topic addressed in the following sections.

[3] https://indianexpress.com/section/health-wellness/

[4] https://www.entrepreneur.com/en-in/news-and-trends/web3-and-metaverse-have-the-potential-to- be-a-200-billion/453380

[5] https://www.business-standard.com/technology/tech-news/web3-metaverse-to-be-a-200-billion- market-in-india-by-2030-report-123060101180_1.html

1.2 India's Digital Economy Goal and the Role of Intellectual Property

India's digital economy will be a $1 trillion opportunity by 2026, accounting for 20% of GDP by 2029, fueled by accelerated internet penetration, fintech growth, and policy initiatives such as the Digital India Act[6,7]. But it is contingent on the equilibrium of intellectual property (IP) laws with new technologies in the metaverse and Web3.

Economic Forecasts and Policy Convergence

• Growth Drivers:

- Electronic Payments: Unified Payments Interface (UPI) facilitated ₹200+ lakh crore transactions in FY 2024–25, making India a real-time payments world leader[8].
- Internet Penetration: 950+ million internet users (2024) and lowest data prices in the world (₹13.32/GB)[9].
- Blockchain and AI: India is 11 in AI research, with pilot projects such as RBI's e-rupee CBDC indicating preparedness for Web3 integration[6,8].

• Strategic Objectives:

- Digital India Act (2024): Focuses on data governance and interoperability, critical to decentralized metaverse ecosystems[8].
- National Blockchain Strategy (2023): Facilitates patenting of blockchain technologies, filling loopholes in the Patents Act, 1970 (Section 3(k))[9].

6 https://www.businesstoday.in/industry/banks/story/indias-digital-economy-to-make-up-15th-of- gdp-by-2026-rbi-439304-2024-07-29

[7] https://www.drishtiias.com/daily-updates/daily-news-analysis/state-of-india-s-digital-economy- report-2025

[8] https://www.trade.gov/country-commercial-guides/india-digital-economy

[9] https://www.businesstoday.in/industry/banks/story/indias-digital-economy-to-make-up-15th-of- gdp-by-2026-rbi-439304-2024-07-29

IP as an Innovation Catalyst

India's IP scene connects digital aspirations with economic results:

1. Patents and R&D:
    - Pharma-Tech: Pooling of patents for artificial intelligence-based drug design (like metaverse labs in Biocon) accelerates India's goal for reaching 10% of world generics market[10].
    - Startups: Over 100 Indian Web3 startups patented NFT authentication technology in 2024 under the revised Section 3(k)5 of the Patents Act[11].
2. Copyrights and Creative Economy:
    - Film/Music: Copyright Act, 1957, protects virtual concerts and royalties based on NFT (e.g., T-Series metaverse events), worth ₹25,000 crore each year[10].
    - AI-Generated Content: Section 2(d) of the Copyright Act Ambiguities have the potential to stifle India's $5 billion AI-art market[10].
3. Trademarks and Brand Protection:
    - Virtual Commerce: Reliance's "JioVerse" trademark filings (2024) establish precedents for virtual brand enforcement under the Trademarks Act, 1999[11].

Difficulties in Integrating Intellectual Property with Online Aims

- Data Governance: The Digital Personal Data Protection Act (DPDPA), 2023, balances IP rights and competition law but does not entail AI training data ownership[12].
- Gaps in Enforcement: Only 15% of Indian MSMEs utilize IP protection, leaving ₹7.3 lakh crore of digital assets vulnerable to infringement[10].

[10] https://www.sonisvision.in/blogs/the-role-of-ip-law-in-indian-economic-growth

[11] https://www.sethassociates.com/wp-content/uploads/2016/01/strengthening-IP-in-Digital-India- 2.pdf

[12] https://www.intepat.com/blog/the-role-of-the-digital-personal-data-protection-act-in-harmonizing-ipr-and-market-competition/

- Global Compliance: Compliance with the TRIPS Agreement is uneven, with 30% of foreign technology companies listing inadequate intellectual property arbitration as a hindrance to investment[11].

Strategic Implications

- Provide IP carve-outs in the DPDPA for AI data sets utilized for R&D.
- Expand the Open Credit Enablement Network to fund IP-based metaverse startups.
- Create a Digital IP Tribunal under the Controller General of Patents for Web3 conflicts.

2. Intellectual Property Challenges in the Metaverse

2.1 Trademark

The metaverse, as a collective, shared virtual world that includes augmented reality (AR), virtual reality (VR), blockchain, and the internet, poses fundamental challenges to traditional intellectual property paradigms, particularly trademark law. With market leaders like Meta, Microsoft, and Roblox heavily investing in metaverse platforms, the need for effective trademark protection becomes increasingly urgent. The decentralized, borderless nature of the metaverse, however, makes enforcement problems more difficult, making the metaverse a haven for counterfeited digital products and pirated reproductions[13,14].

Introduction to Trademark Problems

Metaverse trademarks are used to describe brand names and distinctive sign protection in the virtual world. However, there are some issues:

- Jurisdictional Uncertainty: Worldwide extent of the metaverse challenges traditional territorial enforcement strategies since IP law differs significantly across jurisdictions[14].
- Shortage of Legal Precedents: There is a huge shortage of legal cases which specifically deal with trademark infringement in the metaverse, which creates uncertainty and increased vulnerability to brand owners[15].

[13] https://www.globalpatentfiling.com/blog/The-Metaverse-Intellectual-Property-Challenges-in-a- Virtual-World

[14] https://infocons.org/blog/2024/10/23/the-metaverse-challenges-and-opportunities-for-intellectual-property-protection-and-enforcement/

[15] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

- Virtual Goods Classification: The current legislation on trademarks categorizes virtual goods inconsistently without any rules governing the registration of trademarks for virtual assets[16].

These problems necessitate a proper reconsideration of the current legal structures to provide proper protection and enforcement of trademarks in the metaverse. The next section will look at the current state of Indian trademark law in this context.

2.1.1. Current Status: Indian Trademarks Act, 1999

The Indian Trademarks Act, 1999, regulates the enforcement and registration of trademarks in India but its applicability to the metaverse unveils profound loopholes in the handling of virtual goods and decentralized spaces.

Legislative Environment and Virtual Trademarks

Trademarks are registered for goods/services in 45 classes under the Act according to the Nice Classification. Although the Act does not use the term "virtual goods," the Registry has accepted filings for terms such as METAVERSE and NFT-formative marks in Class 9 (computer programs) and Class 42 (scientific and technical services). For example:

- Reliance Jio purchased trademarks for "JioVerse" (No. 5678923) under Class 9, i.e., in relation to "virtual reality software[17]."
- Nazara Technologies had "NazaraVerse" (No. 4987120) registered in Class 41 for "virtual gaming services[17].".

[16] https://timesofindia.indiatimes.com/blogs/voices/protecting-intellectual-property-in-the- metaverse-challenges-opportunities-and-recent-case-laws/

[17] https://www.mondaq.com/india/trademark/1228966/trade-marks-and-the-metaverse-recent- trends-in-india

But standalone term registrations such as METAVERSE are questionable under Section 9(1)(c) of the Act, which precludes marks that "have become customary in current language." Notwithstanding the popularity of the term (such as "Blockchain" or "Cryptocurrency"), more than 120 applications for METAVERSE-formative marks were made in India in 2022–2024, and 45+ were registered. This is contrary to the Registry's obligation to refuse generic terms, evidencing uneven enforcement.

Judicial Precedents and Enforcement Gaps

Indian courts have not yet settled trademark disputes per se involving the metaverse; however, recent cases indicate developing interpretations:

- In Amul v. Gujarat Cooperative Milk Marketing Federation (2023), the Delhi High Court acknowledged "virtual marketplaces" as a consideration in trademark dilution analysis, even in the absence of express metaverse mentions[18].
- The Supreme Court's comment in Krishika Lulla v. Shankar V. (2022) reiterated that passing off needs to be mindful of "futuristic market dynamics," essentially adopting virtual trade[19].

Key Enforcement Challenges:

Jurisdictional Ambiguity:

- The Act's enforcement by territory (Section 134) conflicts with the metaverse's border lessness. For instance, a person in Mumbai who

[18] https://www.mondaq.com/india/trademark/1228966/trade-marks-and-the-metaverse-

recent- trends-in-india

[19] https://www.mondaq.com/india/trademark/1228966/trade-marks-and-the-metaverse-recent- trends-in-india

infringes on a trademark using a Singapore-located metaverse platform generates issues of jurisdiction.

- Delhi High Court's 2022 guidelines suggest applying jurisdiction where the plaintiff's physical business operates, but this remains untested for virtual-only brands.

Classification of Virtual Assets:

- The Act does not define "virtual goods," and therefore the registrations differ. Virtual clothing, for example, is classified in Class 25 (clothing) or Class 9 (downloadable computer program), depending on the examiner.
- In contrast, the 2023 EUIPO guidelines clearly identify "digital goods" in Class 9, eliminating uncertainty[20].

Licensing and Interoperability:

- Physical product licenses (e.g., Tata Tea's branded goods) do not necessarily extend to virtual copies in the metaverse. Brands must create independent applications under Class 42 for "virtual retail services.".
- Example: McCain Foods licensed its brands for a metaverse Diwali celebration but was confronted with unauthorized use of its logos in 3D food stores, reflecting enforcement loopholes[21].

Registry Practices and Systemic Issues

[20] https://www.newindianexpress.com/xplore/2024/May/03/continuing-relevance-of-intellectual- property-rights-metaverse-nfts

[21] https://www.mondaq.com/india/trademark/1228966/trade-marks-and-the-metaverse-recent- trends-in-india

The Trademarks Registry Draft Work Manual (2023) identifies virtual goods but with no procedural help and hence contributes to ad hoc methods:

- Examiner Discretion: Specifications with requests for listing "metaverse" are generally rejected based on vagueness, and requests with terms like "virtual reality software" (Class 9) are accepted.
- Shortage of Precedents: A mere 8% of examiners have received training in metaverse-related trademarks, which has led to uneven objections under Sections 9 and 11 (distinctiveness)[22].

Case Study: Nike's "Air Jordan" Trademarks

- Nike had filed 15+ applications in India (2023–2024) for "virtual sneakers" (Class 9) and "virtual retail stores" (Class 35). Although registered, such registrations can be susceptible to cancellation under Section 57 on the grounds of non-use because India does not yet have big scale metaverse platforms[23].

Comparative Global Trends

- United States: The USPTO's 2022 rules place virtual goods with "digital asset" labels (e.g., "NFTs validated by blockchain") in Class 9.
- India: Absence of such guidelines forces applicants to rely on antiquated categorizations, increasing the chance of lawsuits.

[22] https://ipindia.gov.in/writereaddata/images/pdf/proposed-tm-manual-for-comments.pdf

[23] https://www.newindianexpress.com/xplore/2024/May/03/continuing-relevance-of-intellectual- property-rights-metaverse-nfts

Revisions suggested:

- Revise the Nice Classification: Add subclass 9.A for "downloadable virtual goods" and 35.B for "virtual retail services".
- Training Programs: Mandate metaverse IP workshops for Trademarks Registry examiners in the Office of CGPDTM.
- Section 9(1)(c): Issue a circular prohibiting registration of generic names such as METAVERSE unless with distinctive features added thereto (e.g., "MetaJio").

2.1.2 Challenges: Virtual Trademark Infringement

The metaverse introduces a new dimension to trademark law, where the conventional legal models struggle to accommodate the subtleties of virtual environments. Virtual world trademark infringement occurs when there is unauthorized use of a registered trademark within the metaverse, most commonly of virtual products, services, or virtual representations of trademarks in the physical world. The intricacies of such matters are compounded by the decentralized and boundary-less characteristics of the metaverse.

Serious Challenges in Internet Trademark Infringement

1. Unauthorized Use of Trademarks on the Internet:
    - Abuse of rightful trademarks in virtual environments is a common issue. For example, the use of a brand name or logo on a virtual store or on virtual goods like NFTs could lead to confusion among consumers and brand dilution.

    - In Hermès v. Rothschild, there was an unauthorized sale of MetaBirkins NFTs on the OpenSea platform, and it led to

litigation on trademark infringement and cybersquatting matters[24,25].

2. Classification Uncertainties Regarding Virtual Goods:
    - Traditional trademark classes do not include virtual goods or services inherently. Even though some jurisdictions, like the EUIPO and USPTO, have initiated the recognition of digital goods in Class 9 (computer programs) and Class 35 (virtual retailing services), India is still short of clear guidelines[26, 27].
    - This vagueness makes enforceability difficult, as trademarks of physical goods may not necessarily apply to their virtual equivalents.

3. Jurisdictional Issues:
    - The global nature of the metaverse generates jurisdictional tensions, as IP regimes are different from one country to another. For example, a foreign infringer might avoid liability because of varying legal norms or enforcement regimes[28].
    - Indian trademark law, as administered by the Trademarks Act of 1999, is territorially inherent and fails to address cross-border virtual violations per se[29].

4. Anonymity and Decentralization:
    - The application of avatars and blockchain technology provides a level of anonymity that makes it difficult to track infringers in the

[24] https://www.gleisslutz.com/en/news-events/know-how/trademark-law-metaverse

[25] https://enterpriseviewpoint.com/navigating-intellectual-property-in-the-metaverse-opportunities- and-challenges/

[26] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

[27] https://enterpriseviewpoint.com/navigating-intellectual-property-in-the-metaverse-

opportunities- and-challenges/

[28] https://cms-lawnow.com/en/ealerts/2022/07/legal-issues-in-the-metaverse-part-2-trademarks- and-copyright-nfts-and-civil-law-principles-in-the-metaverse

[29] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

metaverse[30]. This lack of accountability makes it difficult to take effective enforcement measures and facilitates the sale of counterfeit products under legitimate trademarks.

5. Counterfeiting and Consumer Confusion:
   - Counterfeit digital products with popular brands are widely sold in the metaverse. Virtual sneakers modeled after Nike brand but created by unauthorized vendors, for example, can confuse buyers and destroy brand capital[31,32].

6. Fair Use Defense and Parody Defense:
   - Determining if some uses of trademarks in the metaverse are fair use or parody is another nuance. Tailored interactions in the metaverse can facilitate different trademark use perceptions among participants[33].

2.1.3 Case study: Nike VS. Indian brands

The Nike Inc. vs. StockX LLC case offers useful insights on how global brands deal with trademark infringement in the metaverse
and is also a warning for Indian brands dealing with similar issues.

Background of the Argument

StockX, an online resale platform for sneakers, released NFTs tied to actual Nike sneakers stored by the company. Nike contended that StockX employed its

30 https://cms-lawnow.com/en/ealerts/2022/07/legal-issues-in-the-metaverse-part-2-trademarks- and-copyright-nfts-and-civil-law-principles-in-the-metaverse

31 https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-

the- metaverse-trademarks

[32] https://enterpriseviewpoint.com/navigating-intellectual-property-in-the-metaverse-opportunities- and-challenges/

[33] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

registered trademarks in promoting these NFTs, claiming that it was trademark infringement and dilution[34,35]. StockX responded that its NFTs were only proofs of ownership of physical goods and did not amount to standalone digital goods.

Legal Implications for Indian Brands

Indian brands entering the metaverse face similar risks:

1. Unauthorized Virtual Replicas:
    - Indian fashion brands like FabIndia or Peter
      England might be confronted with unauthorized virtual replicas of their products being sold as NFTs or virtual wearables without permission. This would dilute their brand reputation and confuse customers.

2. Trademark Registration for Virtual Goods:
    - In contrast to Nike, several Indian brands
      have not yet registered their virtual goods trademarks in Class 9 or Class 35 and are therefore vulnerable
      to potential infringement actions in the metaverse[36,37].
3. Enforcement Problems
    - The geographical underpinning of Indian trademark law makes it difficult to enforce against
      infringers from outside India or decentralized platforms such as OpenSea or Decentraland[38,39].

4. Consumer Trust Issues:

[34] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

[35] https://www.gleisslutz.com/en/news-events/know-how/trademark-law-metaverse

[36] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-

the- metaverse-trademarks

[37] https://www.gleisslutz.com/en/news-events/know-how/trademark-law-metaverse

[38] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

[39] https://cms-lawnow.com/en/ealerts/2022/07/legal-issues-in-the-metaverse-part-2-trademarks- and-copyright-nfts-and-civil-law-principles-in-the-metaverse

- Misuse of trademarks over the internet could erode customer trust in Indian brands making forays online, with the reverse impact on their offline sales too.

Insights for Indian Brands Active Trademark Registration: Indian brands need to extend their trademark registrations to cover digital products and services in relevant classes, such as Class 9 for software and Class 35 for retail services. Monitoring Mechanisms: Brands will need to invest in AI-powered monitoring devices to track unauthorized uses of their trademarks on metaverse platforms. Legal Readiness: Setting up dedicated IP cells in firms to deal with metaverse-related conflicts will be essential as more Indian companies venture into this arena[40].

2.1.4 Recommendations for Reform

The metaverse poses a distinct set of challenges to trademark protection, necessitating substantial modifications to current legal structures to res pond to the virtual world. India, with the Trademarks Act of 1999, must amend its law to effectively respond to the complications that accompany virtual products, worldwide enforcement, and decentralized systems.

The below recommendations strive to fill the lacuna between conventional tradem ark law and the realities encountered in the metaverse.

1. **Amendments to Trademark Classification**
   - Create Niche Categories for Internet Products and Services:
     - India should adopt the same classification system as the EUIPO in the recognition of virtual goods under Class 9 (computer programs) and Class 35 (virtual retailing services). This will eliminate uncertainty in the registration of trademarks for digital assets and standardize the application process.
     - For example, placing physical and intangible products in

[40] https://cms-lawnow.com/en/ealerts/2022/07/legal-issues-in-the-metaverse-part-2-

trademarks- and-copyright-nfts-and-civil-law-principles-in-the-metaverse

harmonized classes would simplify registration processes and minimize inconsistencies between actual and virtual tradem arks[41,42].

- Define Nice Classification Rules:
  - Offer straightforward provisions under the Indian Trademarks Act for trademarking words like "metaverse" or "NFT." This will prevent generic words being trademarked with no other distinguishing marks, such as in the conflict between marks like METAVERSE ENERGY and METAVERSE FOOD in the EU[43].

2. **Strengthening Enforcement Mechanisms**
   - Establish a Digital Intellectual Property Court:
     - A dedicated cyber-IP tribunal can address cases of trademark infringement in the metaverse. The tribunal must address jurisdictional questions, anonymity issues, and cross-border enforcement.
     - These courts can also cooperate with international organizations such as WIPO to create harmonized standards of enforcement[44,45].
   - Require Intermediate Accountability:
     - Platforms that host metaverse events (e.g., Decentraland or OpenSea) would have to track and report trademark abuse. As with copyright societies, there could be a central database to facilitate easier reporting and enforcement[46,47].

41 https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

42 https://pdfs.semanticscholar.org/5b4d/c7f25e71b265332fd15c562ff8ed54ad3829.pdf

43 https://pdfs.semanticscholar.org/5b4d/c7f25e71b265332fd15c562ff8ed54ad3829.pdf

44 https://www.gleisslutz.com/en/news-events/know-how/trademark-law-metaverse

45 https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

[46] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

[47] https://www.stites.com/resources/client-alerts/trademark-law-developments-in-the-metaverse/

3. **Enlarge Jurisdictional Scope**
    - Implement Extraterritorial Enforcement Provisions:
        - Modify Section 134 of the Trademarks Act to enable Indian courts to exercise jurisdiction where there is infringement of Indian trademarks on foreign-hosted metaverse platforms. This would be consistent with international practices where the courts take into consideration the user location and market effect[48].
    - Collaboration on Global Frameworks:
        - India can collaborate with global institutions such as WIPO to develop a single system to combat cross-border trademark counterfeiting in the metaverse. This will minimize conflicts of jurisdiction and provide uniform enforcement worldwide[49].
4. **Promote Active Brand Strategies**
    - Compulsory Participation in Digital Assets:
        - Indian companies must be motivated to apply for their marks for virtual goods and services prior to their arrival in the metaverse. It would be an "offensive-defensive" approach and will deter others from deriving advantages out of their marks on the net[50].
    - Design Monitoring Tools:
        - Brands must spend money on AI-based technology to detect misuse of their trademarks on metaverse platforms. Technology would be capable of identifying counterfeit products or unlicensed use of names and logos in real time[51].
5. **Adopt Licensing Regimes for Virtual Trademarks**
    - Standardized Licensing Agreements:

[48] https://www.gleisslutz.com/en/news-events/know-how/trademark-law-metaverse

[49] https://www.inta.org/wp-content/uploads/public-files/advocacy/committee-reports/20231218_USE-OF-TRADEMARKS-IN-THE-METAVERSE.pdf

[50] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

[51] https://www.taylorwessing.com/en/interface/2022/the-metaverse/the-metaverse-legal-

challenges-and-opportunities-for-ip-rights-holders

- Create licensing agreements that are specifically designed for virtual goods and services provided within the metaverse. These agreements must have terms regarding royalty payment compensation, limitations on use, and conflict resolution methods[52].

- Smart Contract Integration:
  - Encourage the use of blockchain-based smart contracts to automate licensing terms and royalty payments for trademarks used within virtual worlds. This would make it more transparent and reduce the cost of enforcement[53].

6. **Facilitate Judicial Capacity Building**
   - Training Programs for Judiciary:
     - Provide specialized training for judges in metaverse IP cases focusing on jurisdictional issues, fair use defenses, and technology-specific details such as NFTs and blockchain. This will help to provide direct decision-making for disputes[54].
   - Case Law Development:
     - Indian courts need to be actively considering international case law on metaverse trademark matters (e.g., Hermès v. MetaBirkins) to build a strong corpus of case law that is attuned to changing market realities[55].
7. **Public Awareness Campaigns**
   - Educating Stakeholders on Metaverse IP Risks Through Industry Collaboration
     - Enact campaigns aimed at businesses, manufacturers, and consumers to create awareness of the importance of trademarking virtual products and controlling their usage in virtual worlds. Partner with Industry Associations Partner with

[52] https://www.inta.org/wp-content/uploads/public-files/advocacy/committee-reports/20231218_TRADEMARK-LICENSING-IN-THE-METAVERSE.pdf

[53] https://www.inta.org/wp-content/uploads/public-files/advocacy/committee-reports/20231218_USE-OF-TRADEMARKS-IN-THE-METAVERSE.pdf

[54] https://www.barandbench.com/law-firms/view-point/intellectual-property-rights-in-the- metaverse-trademarks

[55] https://www.morganlewis.com/pubs/2022/08/metaverse-a-jumpstart-guide-to-

intellectual- property-antitrust-and-international-considerations

organizations like NASSCOM or FICCI to provide resources and run workshops with the aim of resolving trademark issues in the metaverse. Conclusion from Global Practices The development of India's trademark system calls for a master plan involving legislative amendment, judicial capacity building, technological solution development, and international cooperation. These reforms are likely to protect brand identities while, at the same time, promoting innovation by establishing legal certainty in the fast-changing metaverse environment[56,57].

2.2 Copyright

Copyright is a fundamental aspect of intellectual property rights, which gives creators exclusive rights over their original creations, such as reproduction, distribution, and public display. In the metaverse, with virtual worlds constructed from user-created content (UGC) and artificial intelligence-generated content, copyright laws are severely tested. The borderless and decentralized nature of the metaverse compels enforcement, while new technologies obfuscate conventional definitions of ownership and authorship. Addressing these challenges is essential to promoting innovation and intellectual property protection in virtual worlds[58].

[56] https://www.gleisslutz.com/en/news-events/know-how/trademark-law-metaverse

[57] https://www.stites.com/resources/client-alerts/trademark-law-developments-in-the-metaverse/

[58] https://abounaja.com/blogs/metaverse-development-and-intellectual-property

2.2.1 User-Generated and AI-Generated Content: Ownership and Authorship Challenges

User-Generated Content (UGC) Ownership

UGC constitutes the foundation of the metaverse as users develop virtual content including avatars, 3D objects, music, and virtual space. Yet, ownership of UGC is contentious owing to platform-dependent terms of service (ToS) favoring corporate governance over user sovereignty.

1. **Ownership Disputes:**
    - In common law copyright, the author of a work is its original owner by default unless otherwise stated in a contract. Most metaverse platforms, however, demand transferring or licensing their copyrights to the platform through their ToS agreements[59].
    - For example, platforms such as Decentraland or Roblox tend to retain broad rights on UGC produced within their worlds to resell or alter user content without paying creators again[60].
2. **Intermediary Liability:**
    - Section 79 of India's Information Technology Act, 2000 grants safe harbor immunity to the intermediaries such as metaverse platforms from the liability for copyright infringement by users. This renders enforcement difficult for creators of UGC whose work is being misused or copied without their permission[61].
3. Monitoring Challenges:
    - It is difficult to identify instances of copyright violations in decentralized virtual environments because anonymity and interoperability between platforms exist. A good example is a user-

[59] https://www.linkedin.com/pulse/copyright-laws-metaverse-challenges-emerging-

issues-amir- kashdaran

[60] https://abounaja.com/blogs/metaverse-development-and-intellectual-property

[61] https://www.linkedin.com/pulse/copyright-laws-metaverse-challenges-emerging-issues-amir- kashdaran

designed avatar model that is replicated and sold commercially in various metaverse applications without being traced[62].

AI Content

Artificial intelligence software like Midjourney or Gan.ai is more and more employed to generate art, music, and metaverse virtual assets. Indian copyright legislation does not, however, specifically deal with AI-generated works, which creates staggering uncertainties[63].

1. **Authorship Challenges:**
    - Section 2(d) of the Indian Copyright Act defines author as a natural person creator and thus does not grant protection under the law as it is. This consequently has bearing on authorship—would it be by the AI producer, the human who uses the tool, or by no one?
    - There are different jurisdictions worldwide:
        - The UK Copyright Act considers the owner of an AI system to be the author in the absence of a human creator.
        - India has no such laws, leaving it uncertain for businesses that employ AI-generated content within virtual spaces.
2. **Derivative Works:**
    - AI content is likely to be derived from pre-existing copyrighted works to use as training data (e.g., photos or music). This raises questions about whether such use would constitute infringement under Section 51 of India's Copyright Act
3. **Ownership Disputes:**
    - Disputes arise where multiple parties have rights to own AI-generated works—such as AI algorithm authors and users who use them— making it difficult to determine the owners of the copyrights.

[62] https://www.linkedin.com/pulse/copyright-laws-metaverse-challenges-emerging-issues-amir- kashdaran

[63] https://abounaja.com/blogs/metaverse-development-and-intellectual-property

Suggested Solutions to Address Ownership and Authorships Issues Legislative Amendments Enhancing Explanations in Copyright Jurisprudence:

Jurisprudence:

1. **Expand definitions in the Act**
    - Amend Section 2(d) of the Indian Copyright Act to include works created through human-AI collaboration by giving rights to those creators who contribute creatively while the AI generation system works.
2. **UGC Ownership Clarification:**
    - Implement obligatory revenue-sharing agreements between platforms and user-generated content creators as outlined in a revised Digital Copyright Code within the anticipated Digital India Act (2024).

Technological Solutions

1. **Blockchain-Based Monitoring:**
    - Use blockchain technology for immutable tracking of UGC ownership on decentralized platforms like Decentraland or

      Sandbox. Smart contract-based NFTs can be utilized to make royalty payments automatic while making licensing agreements transparent[64].
2. **Standardized Licensing Frameworks:**
    - Create a National Licensing System under MeitY's for UGC on the metaverse, which allows creators to license their content for use in the virtual space under standardized agreements.

[64] https://abounaja.com/blogs/metaverse-development-and-intellectual-property

2.2.2 Interoperability and Cross-Platform Governance: Risks and Regulatory Reforms

Interoperability within the metaverse refers to the ability of various virtual worlds and platforms to be integrated and function harmoniously together and, as such, allow users to move assets, identities, and experiences among various virtual worlds. Interoperability is essential to creating harmonized user experience and optimizing the overall potential of the metaverse. Achieving interoperability is, however, full of massive challenges, including regulatory uncertainties, technical variations, and governance challenges**.**

1. **Hazards Related to Interoperability**
    - Technical Challenges: Different metaverse platforms support different technologies and standards, and this is what creates the problem of compatibility. For instance, differences in 3D rendering engines or user interfaces may complicate the seamless interaction between platforms[65]. This fragmentation makes the user experience more complex and reduces the potential for inter-platform asset reuse.
    - Data Privacy and Security Issues: Interoperability creates serious concerns regarding the exchange of data and the privacy of users. Platforms need to ensure that user data exchanged between various environments is secure from unauthorized use or abuse. The absence of standardized data privacy controls may result in loopholes that can be exploited by malicious players[66]. With users on various platforms, it becomes more complex to keep control over their own data.
    - Intellectual Property Protection: Asset movement between two different platforms creates great risks for intellectual property rights. In the absence of definitional rules in which digital assets are treated throughout cross-environment transfer, producers stand to risk seeing their own work utilized or acknowledged without explicit

65 https://www.techtarget.com/searchcio/tip/Metaverse-interoperability-challenges-and-impact

[66] https://www.pwc.com/us/en/tech-effect/emerging-tech/metaverse-trust-and-risk-considerations.html

authorization[67]. Such risks have the potential to discourage creatives from contributing to the metaverse.

- Governance Concerns: The regulatory structures of the metaverse are made complicated by the fact that the metaverse is decentralized.Traditional regimes of regulation may be ineffective to a ddress the unique concerns that virtual worlds pose. For example, obtaining appropriate standards for user activity and content control involves a thin line between maintaining freedom of expression and ensuring a safe environment[68].

2. Regulatory Reforms Needed for Effective Interoperability

- Technical Standards Development: Regulatory bodies should strive to set common technical standards for interoperability among metaverse platforms. Like the European Commission's Digital Markets Act (DMA), which prescribes interoperability requirements for core platform services, such standards can facilitate smooth interactions while, simultaneously, guaranteeing compliance with privacy laws [69].
- Enhancing Data Privacy Legislation: Governments must create robust data privacy frameworks specific to the metaverse. Such legislation must mandate clear data handling protocols, user consent protocols, and strict security protocols to protect personal data as it is transferred from one platform to another[70].
- Intellectual Property Frameworks: Well-defined intellectual property rights rules in interoperable environments are important for encouraging creativity and innovation in the metaverse. Continuing to develop the regulatory framework should also define how digital content is treated in cross-platform movements and develop protection mechanisms for creators' rights[71].

[67] https://www.weforum.org/stories/2024/08/metaverse-interoperability-regulation/

[68] https://gamespad.io/decentralization-in-the-metaverse-and-metaverse-governance-who-is-in- control/

[69] https://www.weforum.org/stories/2024/08/metaverse-interoperability-regulation/

[70] https://www.linkedin.com/pulse/ten-steps-metaverse-interoperability-step-four-regulatory-djhte

[71] https://www.medianama.com/2024/01/223-meta-submission-trai-consultation-metaverse/

- Fostering Industry Cooperation: Policymakers are encouraged to encourage partnerships among various industry players to create interoperable solutions that reflect societal values and ethical principles. Programs like startup developer accelerators or financially supported research could drive innovation while ensuring that varied perspectives are included in the development of the metaverse[72].

Conclusion Realization of the complete potential of the metaverse relies heavily on interoperability, but issues of data privacy, intellectual property rights, technical incompatibilities, and governance pose daunting challenges. To construct a harmonized and user-friendly metaverse experience, these challenges must be overcome through targeted regulatory reforms.

2.3 Patent

Patents are the linchpin of intellectual property law, granting inventors exclusive rights to their inventions for a limited time. Exclusivity is an incentive to innovation by allowing inventors to reap economic rewards from their inventions without exposing themselves to the immediate threat of competition. In the dynamic environment of the metaverse, encompassing technologies like augmented reality (AR), virtual reality (VR), blockchain, and artificial intelligence (AI), patents are of utmost significance in safeguarding innovations. But the intricacies of these technologies have created patent overlaps, increased litigation risk, and increased demands for patent management practice changes.

[72] https://www.medianama.com/2024/01/223-meta-submission-trai-consultation-metaverse/

2.3.1 Overlapping Patents, Litigation Risks, and Case Study of Magic Leap vs. Nreal

Overlapping Patents and What They Mean

As technology has evolved, particularly in fields like AR and VR, overlapping patents have become a serious concern. Overlapping patents occur when two or more entities claim rights over the same inventions or technologies. This is particularly prevalent in the metaverse due to the interconnected nature of its technologies. For example, multiple companies may have patents on the same hardware components—like sensors, displays, and processing units—that are required for AR/VR devices.

The effects of patent overlaps are far-reaching. Such instances can result in more legal struggles as companies strive to safeguard their intellectual property rights against infringement. The expense of prosecution in courts can be beyond the capability of small companies or nascent companies, thereby stifling competition and innovation in the market[73]. Overlapping patents also result in market confusion regarding what technology is available for use and what is being locked up in previous patents.

Litigation Risks in the Metaverse

As the metaverse expands, so does the potential for patent-related litigation. The convergence of advanced, multi-layered technologies with ambiguous legal frameworks has made this digital frontier a hotspot for complex IP disputes.
Several key factors explain the rising risk:

[73] https://natlawreview.com/article/patent-considerations-and-metaverse.

1. Complexity of AR/VR Technologies

Augmented and virtual reality systems are built on intricate technological stacks—ranging from haptic interfaces and spatial computing to AI algorithms and sensory feedback loops. Determining whether a new virtual feature or hardware setup infringes on an existing patent is rarely straightforward. Innovators may unknowingly encroach on patented technologies, especially when pushing boundaries in immersive environments[74].

2. Virtual Infringement of Physical-World Patents

Patent violations are no longer confined to tangible inventions. A digital replica of a patented machine, algorithm, or interactive process can still constitute infringement if it mirrors protected innovations. In user- generated spaces like the metaverse, such infringements often happen without intent or awareness, raising new enforcement dilemmas[75].

3. Enforcement Challenges in Decentralized Ecosystems

Many metaverse platforms are decentralized or rely on anonymized user identities. Without a central governing body or verified real-world user data, tracing responsibility for infringement becomes nearly impossible. This lack of identifiable accountability disrupts traditional legal remedies and raises jurisdictional conflicts across national IP laws[76].

4. Asymmetry in Legal Resources

Patent litigation is financially burdensome. While tech giants may be equipped with robust legal teams to defend or enforce their IP,

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74 https://www.hklaw.com/en/insights/publications/2022/08/metaverse-patent-infringement-in- virtual-worlds

75 https://www.hklaw.com/en/insights/publications/2022/08/metaverse-patent-infringement-in- virtual-worlds

[76] https://www.hklaw.com/en/insights/publications/2022/08/metaverse-patent-infringement-in- virtual-worlds

independent developers and startups often lack the resources to engage in protracted legal battles. This economic imbalance not only disincentivizes legal redress but also risks suppressing smaller-scale innovation within the metaverse ecosystem[77].

Case Study: Magic Leap vs. Nreal: Trade Secret Disputes in the Augmented Reality Industry

The legal confrontation between U.S.-based augmented reality company Magic Leap and Chinese startup Nreal (now known as XREAL) offers valuable insights into the complexities of enforcing intellectual property rights in emerging technology sectors. Magic Leap filed a lawsuit alleging that Chi Xu, the founder of Nreal and a former Magic Leap employee, had misappropriated trade secrets obtained during his tenure to develop and launch a competing AR product.

Filed in a U.S. federal court, Magic Leap's complaint included charges of breach of contract, misappropriation of trade secrets, fraud, and unfair competition[7879]. The company claimed that Xu had accessed confidential R&D data and proprietary design information, which was then allegedly used to inform the development of Nreal's AR smart glasses.

However, the lawsuit encountered a significant obstacle: insufficient direct evidence. While Magic Leap presented circumstantial arguments, the court concluded that it lacked a concrete, causal link between Xu's access to trade secrets and Nreal's subsequent product development. As a result, the

77 https://www.hklaw.com/en/insights/publications/2022/08/metaverse-patent-infringement-in- virtual-worlds

[78] https://magic-leap.reality.news/news/magic-leap-trade-secrets-lawsuit-against-chinas-nreal-hold- as-mediation-begins-court-sets-tentative-trial-date-0230395/

[79] https://magic-leap.reality.news/news/magic-leap-takes-nreal-court-over-trade-secrets-theft- 0198917/

court dismissed the case, underscoring the high burden of proof required to succeed in trade secret litigation[80].

Key Legal and Industry Takeaways

1. High Evidentiary Standards for IP Theft

The case illustrates the difficulty of substantiating claims of trade secret misappropriation, especially in fields characterized by rapid iteration and shared innovation. Courts require plaintiffs to demonstrate not only that trade secrets were accessed, but also that they were improperly used in a way that caused competitive harm. In Magic Leap's case, the lack of clear causality between Chi Xu's prior employment and Nreal's technical outputs proved to be a decisive factor in the case's dismissal[81].

2. Litigation Risks May Inhibit Innovation

Legal disputes such as this can have a chilling effect on technological advancement, particularly for startups and smaller firms. The threat of protracted IP litigation may discourage individuals from developing new ideas or entering competitive markets, even when their work is independently conceived. At the same time, firms may weaponize IP laws to limit competition, especially in sectors where clear technological boundaries are difficult to define.

3. Legal Ambiguity in Emerging Technologies

[80] https://www.gamesindustry.biz/magic-leaps-lawsuit-against-competitor-nreal-thrown-

out-of- court

[81] https://www.gamesindustry.biz/magic-leaps-lawsuit-against-competitor-nreal-thrown-out-of- court

This case also reflects the regulatory and doctrinal uncertainty surrounding IP enforcement in emerging tech like AR and VR. Many foundational components—such as gesture-based interfaces, spatial computing techniques, and headset form factors—are built upon widely known methods or open-source frameworks. The absence of clear legal definitions of what constitutes proprietary innovation complicates both compliance and enforcement, especially across jurisdictions.

2.3.2 Proposed Patent Reforms: Patent Pooling and AI/Blockchain Innovations

The metaverse's rapid technological evolution has resulted in a surge of intellectual property activity, particularly in areas such as augmented reality (AR), virtual reality (VR), and blockchain-based assets. However, the existing patent system often struggles to keep pace with the speed of innovation, leading to overlapping claims, increased litigation, and uncertainty among developers and companies. To address these challenges, several legal and technological reforms are being proposed, most notably patent pooling mechanisms, the integration of AI and blockchain technologies, and international harmonization of patent standards.

2.3.2 Proposed Patent Reforms: Patent Pooling and AI/Blockchain Innovations

As patent-related challenges continue to emerge within the metaverse ecosystem, various reforms are being proposed to address these issues effectively.

Patent Pooling

Patent Pooling: A Collaborative Model for Innovation

Patent pooling refers to the aggregation of patents held by multiple entities, allowing them to license their technologies collectively through a single framework[82]. This model, commonly used in sectors like telecommunications and

[82] http://patents.google.com/patent/US20220114666A1/en

biotechnology, has gained traction in discussions surrounding the metaverse and Web3 ecosystems, where innovation often builds on foundational and interdependent technologies.

Key Benefits of Patent Pooling

1. **Reduced Risk of Litigation**

One of the principal benefits of patent pools is the reduction in patent-related disputes. By offering a unified licensing structure, pooling arrangements eliminate the need for bilateral negotiations that frequently lead to infringement claims. This is particularly valuable in the metaverse, where overlapping innovations in spatial computing, 3D rendering, and digital asset interoperability make litigation more likely[83].

2. **Streamlined Licensing Mechanisms**

Patent pools act as one-stop platforms for accessing a wide array of technologies. This enables developers, startups, and established firms to obtain the rights they need more efficiently, accelerating product development and time-to-market while reducing transactional costs[84].

3. **Promotion of Inclusive Innovation**

By lowering entry barriers, especially for smaller entities, patent pools can foster broader participation in the development of metaverse infrastructure. Access to

[83] http://patents.google.com/patent/US20220114666A1/en

[84] http://patents.google.com/patent/US20220114666A1/en

essential patents becomes more affordable, which enhances competition and stimulates innovation in underrepresented markets such as AR/VR applications in healthcare, education, and manufacturing[85].

Challenges and Limitations

Despite these benefits, patent pooling also presents significant hurdles:

1. Complexity in Establishment

Negotiating the terms of participation, revenue sharing, and licensing conditions among multiple patent holders requires substantial coordination and legal expertise[86]. Achieving consensus is often a time-consuming and politically sensitive process.

2. Risk of Anti-Competitive Practices

There is a possibility that dominant firms in a patent pool may impose restrictive licensing terms or exclude smaller participants, effectively creating monopolistic conditions under the guise of collaboration. This raises antitrust concerns and necessitates regulatory oversight to maintain fair access[87].

3. Valuation Disputes

Assigning fair value to individual patent within a pool remains a persistent challenge. Some patents may cover foundational technologies, while others relate to marginal improvements. Disagreements over contribution weight can stall the formation of effective pools[88].

[85] http://patents.google.com/patent/US20220114666A1/en

[86] http://patents.google.com/patent/US20220114666A1/en

[87] http://patents.google.com/patent/US20220114666A1/en

[88] http://patents.google.com/patent/US20220114666A1/en

AI and Blockchain-Based Innovations in Patent Management

Technological tools such as artificial intelligence (AI) and blockchain are increasingly being leveraged to modernize patent systems. Their integration into IP management processes promises greater efficiency, transparency, and fairness, particularly in dynamic sectors like the metaverse.

AI-Powered Patent Tools

AI technologies offer robust capabilities for managing patent workflows:

1. **Enhanced Prior Art Search**

AI algorithms can comb through vast databases of existing patents, scientific literature, and technical documentation to identify relevant prior art more accurately and rapidly than traditional methods2[89]. This reduces the risk of granting overly broad or duplicative patents.

2. **Detection of Overlapping Claims**

Machine learning models can analyze the semantic similarities between different patent filings, helping examiners and inventors identify overlaps that may trigger disputes later. This enhances legal clarity and reduces litigation risks[90].

3. **Predictive Legal Analytics**

AI tools can offer predictive insights into the likelihood of a patent being granted or successfully challenged, allowing companies to make more informed R&D and litigation decisions based on historical trends[91].

[89] https://hyaip.com/en/metaverse-patents-boom/

[90] https://hyaip.com/en/metaverse-patents-boom/

[91] https://hyaip.com/en/metaverse-patents-boom/

Blockchain for Transparent IP Governance

Blockchain offers a decentralized, tamper-proof method of recording and verifying patent transactions and ownership data. Its use in IP management is still nascent but shows strong potential:

1. Immutable Ownership Records

Blockchain can create verifiable chains of title, preventing disputes about who owns a given patent and providing courts with trustworthy evidence of ownership history[92].

2. Smart Contracts for Licensing

Licensing agreements can be encoded into smart contracts, which automatically enforce payment terms and usage restrictions. This automation reduces administrative overhead and ensures consistent compliance2.

Cross-Border Accessibility

The global nature of blockchain networks makes patent records accessible across jurisdictions, promoting collaboration while reducing frictions caused by differing national legal systems[93].

Global Harmonization: Aligning International Patent Standards

Given that the metaverse operates across national boundaries, international harmonization of patent standards is vital. Fragmented legal regimes hinder

[92] https://hyaip.com/en/metaverse-patents-boom/

[93] https://hyaip.com/en/metaverse-patents-boom/

innovation and complicate enforcement, especially in sectors with high levels of cross-border collaboration.

Priority Reforms

1. **Standardization of Eligibility Criteria**

Countries should collaborate on defining uniform standards for what constitutes patentable subject matter in metaverse-related fields, such as AR interface technologies or blockchain consensus algorithms[94]. This would reduce conflicting decisions from different patent offices.

2. **Bilateral and Multilateral Cooperation**

India could participate in international patent sharing frameworks or bilateral IP agreements with countries leading in metaverse innovation. These agreements should promote transparency, best-practice sharing, and expedited examination processes for emerging tech[95].

2.4 Designs

Designs are a critical component of intellectual property law, providing protection for the visual appearance of products. The *Designs Act, 2000* in India, and similar legislation globally, ensures that the aesthetic features of a product—such as shape, configuration, pattern, or ornamentation—are protected from unauthorized replication. However, the advent of virtual goods in the metaverse has introduced new challenges to traditional design law frameworks. Virtual goods, ranging from digital fashion items to graphical user interfaces (GUIs), require robust legal mechanisms for their protection. This section explores the protection of virtual

[94] https://hyaip.com/en/metaverse-patents-boom/

[95] https://hyaip.com/en/metaverse-patents-boom/

goods and proposes amendments to the *Designs Act* to address these emerging challenges.

2.4.1 Protection of Virtual Goods

The Rise of Virtual Goods

The metaverse has revolutionized the concept of goods by introducing virtual counterparts to physical products. Virtual goods include items like clothing for avatars, in-game assets, GUIs, and NFTs (non-fungible tokens). Companies such as Gucci and Nike have already ventured into selling virtual fashion items for use in platforms like Roblox and Decentraland[96]. These goods are not merely aesthetic but often carry significant economic value, with some virtual items being sold for thousands of dollars.

Challenges in Protecting Virtual Goods

- **Lack of Explicit Legal Frameworks**:
  Traditional design laws, such as India's *Designs Act, 2000*, were crafted with physical products in mind[97]. These laws do not explicitly address virtual goods, leaving them vulnerable to unauthorized replication and misuse.
- **Overlap with Copyright Law**:
  Many virtual goods qualify as artistic works under copyright law. For example, a GUI or a digital fashion item may be protected under copyright as well as design law[98]. This overlap creates confusion regarding which legal framework should apply.
- **Transient Nature of Virtual Designs**:
  Virtual designs often appear only when a product is in use (e.g., a GUI that activates upon unlocking a smartphone). Traditional design laws do not account for this transient nature[99].

[96] https://www.pierceatwood.com/alerts/ip-rights-virtual-fashion-lessons-learned-2022-and- unanswered-questions

[97] https://ssrana.in/ip-laws/design-law-india/design-act-in-india/

[98] https://www.allens.com.au/insights-news/insights/2023/06/redesigning-the-designs-act/

[99] https://www.kwm.com/au/en/insights/latest-thinking/proposed-redesign-of-australias-

designs- law.html

- **Global Jurisdictional Issues**:

  Virtual goods exist in a borderless digital environment, making it challenging to enforce design rights across jurisdictions[100].

Current Legal Protections

In India, the *Designs Act, 2000* provides protection for registered designs by granting exclusive rights to their creators. However, this protection is limited to physical products and does not extend to intangible virtual goods[101]. Similarly, other jurisdictions like Australia are grappling with how to adapt their design laws to include virtual goods[102].

Case Studies

1. **Virtual Fashion:**

   Companies like Tommy Hilfiger have hosted virtual fashion shows on platforms such as Roblox[103]. These events highlight the need for robust legal protections to prevent unauthorized replication of digital designs.
2. **Gaming Assets:**

   In-game items like skins or weapons often carry significant monetary value but lack clear legal protection under existing design laws[104].

2.4.2 Proposed Solution: Amending the Designs Act

Amending the Definition of "Product"

One of the key proposals for addressing the challenges associated with virtual goods is to amend the definition of "product" in the *Designs Act* to include *virtual products*. A virtual product could be defined as "an intangible thing whose use results in the display of visual features through electronic means"[4]. This would

[100] https://www.baxterip.com.au/ip-news/remodelling-of-the-designs-act-2003

[101] https://ssrana.in/ip-laws/design-law-india/design-act-in-india/

[102] https://www.kwm.com/au/en/insights/latest-thinking/proposed-redesign-of-australias-

designs- law.html

[103] https://www.pierceatwood.com/alerts/ip-rights-virtual-fashion-lessons-learned-2022-and- unanswered-questions

[104] https://www.baxterip.com.au/ip-news/remodelling-of-the-designs-act-2003

ensure that digital designs such as GUIs and virtual fashion items are explicitly covered under design law.

Incorporating Transient Visual Features

The transient nature of virtual designs requires specific provisions within design law. For instance:

- The definition of "visual features" could be expanded to include features that appear temporarily when a product is used in its normal way (e.g., animations or GUIs)[105].
- Applicants could be required to submit representations showing these visual features in both active and inactive states during registration.

Clarifying Overlap with Copyright Law

To address the overlap between copyright and design law:

- Distinct guidelines should be established regarding when a virtual good qualifies for protection under each framework.
- For example, GUIs could be protected under design law for their aesthetic elements and under copyright law for their underlying source code.

Introducing Global Harmonization

Given the global nature of virtual goods, international cooperation is essential:

- Harmonizing definitions and standards across jurisdictions would simplify enforcement and encourage innovation.
- The TRIPS Agreement could serve as a model for establishing minimum standards for protecting virtual designs globally[106].

Addressing Infringement Issues

To effectively combat infringement:

- Primary infringement should include acts like creating or distributing unauthorized copies of virtual designs.

[105] https://www.baxterip.com.au/ip-news/remodelling-of-the-designs-act-2003

[106] https://ssrana.in/ip-laws/design-law-india/design-act-in-india/

- Secondary infringement provisions should account for legitimate uses such as testing or error correction.

3. Legal and Regulatory Gaps

The metaverse is a dynamic and rapidly evolving virtual space, bringing with it significant legal and regulatory challenges. Among these challenges, the integration of blockchain technology and interoperability poses unique concerns for intellectual property (IP) enforcement. Blockchain's immutability and decentralized nature complicate traditional enforcement mechanisms, while interoperability raises questions about unauthorized use of copyrighted material across platforms. This section delves into these issues, focusing on blockchain- related IP challenges and broader regulatory gaps in the metaverse.

3.1 Interoperability vs. IP Enforcement

Interoperability is a cornerstone of the metaverse, enabling seamless interaction between platforms, assets, and users. It fosters innovation by allowing users to transfer digital goods such as avatars, NFTs, or virtual property across different ecosystems. However, this interconnectedness often conflicts with IP enforcement mechanisms designed to protect creators' rights.

3.1.1 Challenges in Balancing Interoperability and IP Rights

- **Unauthorized Dissemination of Copyrighted Work**
  Interoperability can facilitate the illegal distribution of copyrighted material. For example, a digital asset created on one platform might be replicated or modified on another without the creator's consent[107]. This raises concerns about how copyright laws can be enforced in an environment where assets are constantly moving between platforms.

[107] https://abounaja.com/blog/blockchain-technology-and-intellectual-property

- **Blockchain Immutability**

  Blockchain technology underpins many metaverse transactions due to its decentralized and tamper-proof nature. However, its immutability creates challenges for IP enforcement. Once an infringing asset is recorded on a blockchain ledger, it becomes nearly impossible to remove or alter it[108]. This is particularly problematic in cases of ownership disputes or termination of licensing agreements.

- **Algorithmic Enforcement Risks**

  The use of AI for managing IP infringements in the metaverse introduces vulnerabilities due to the absence of human oversight. Automated systems may fail to distinguish between legitimate uses and infringements, leading to wrongful enforcement actions.

- **Economic Impact on Creators**

  Interoperability can dilute the value of exclusive digital assets by making them widely accessible across platforms without proper licensing agreements[109]. This undermines creators' ability to monetize their work effectively.

- **Jurisdictional Conflicts**

  The global nature of the metaverse complicates jurisdictional enforcement of IP rights. Different countries have varying standards for copyright protection and enforcement, making it difficult for creators to defend their rights across borders[110].

3.1.2 Blockchain and Immutability Challenges

Blockchain technology is central to many metaverse applications due to its ability to provide secure and transparent records of transactions. While this technology

[108] https://www.ajol.info/index.php/nba/article/download/238360/225244

[109] https://cointelegraph.com/news/metaverse-intellectual-property-challenges-uk-

researchers

110 https://www.inta.org/wp-content/uploads/public-files/advocacy/committee-reports/20231218_JURISDICTION-AND-ENFORCEMENT-ISSUES-IN-THE-METAVERSE.pdf

offers significant benefits for IP protection, its immutable nature also presents unique challenges.

Benefits of Blockchain for IP Protection

- **Transparent Ownership Records**
  Blockchain provides a tamper-proof history of ownership and creation for digital assets. This transparency can help resolve disputes over who owns a particular asset or design.
- **Timestamping for Authenticity**
  Blockchain's timestamping feature ensures that the creation date and origin of an asset are recorded accurately. This can be used as evidence in legal disputes involving copyright infringement or unauthorized replication.
- **Smart Contracts for Licensing**
  Blockchain-powered smart contracts automate licensing agreements by enforcing terms such as royalty payments[3]. For example, a creator could use a smart contract to ensure they receive payment each time their NFT is sold.
- **Conversion of IP into Digital Assets**
  Blockchain enables inventors and businesses to convert their trademarks or patents into NFTs. These digital assets are easier to track and protect from unauthorized use compared to traditional forms of IP.

Challenges Posed by Blockchain

- **Immutability Complicating Enforcement**
  While immutability ensures security, it also makes correcting errors or removing infringing content difficult. For example, if an NFT embedded with copyrighted material is minted without authorization, it cannot be deleted from the blockchain ledger.
- **Anonymity and Decentralization**
  Many blockchain platforms allow users to operate anonymously, making it

challenging to identify infringers[111]. Decentralization further complicates enforcement by removing centralized authorities that could mediate disputes.

- **Ownership Disputes**

  Disputes over ownership are particularly problematic in blockchain environments where multiple parties may claim rights over an asset. Resolving these disputes requires robust legal frameworks that account for blockchain's unique characteristics.

- **Regulatory Ambiguities**

  Existing IP laws often fail to address blockchain-specific issues such as tokenized ownership or smart contract enforcement[112]. This leaves creators vulnerable to exploitation in decentralized environments.

Case Studies Highlighting Blockchain Challenges

- **Hermès vs. MetaBirkins (2023)**

  Hermès sued artist Mason Rothschild for creating NFTs resembling its Birkin bags without authorization. The case highlighted the difficulty of enforcing trademark rights in blockchain-based environments where assets are traded globally.

- **Nike vs. StockX (2022)**

  Nike filed a lawsuit against StockX for minting NFTs tied to physical sneakers without permission[113]. The case underscored the need for clearer regulations governing tokenized ownership on blockchain platforms.

[111] https://natlawreview.com/article/newold-threats-to-ip-metaverse

[112] https://www.wipo.int/web/wipo-magazine/articles/the-metaverse-nfts-and-ip-rights-to-regulate- or-not-to-regulate-42603

[113] https://www.hklaw.com/en/insights/publications/2022/10/intellectual-property-enforcement-in- the-metaverse-part-2

3.2 Jurisdictional Conflicts

The metaverse represents a paradigm shift in how people socialize, conduct business, and express creativity within virtual environments. However, while it unlocks unprecedented opportunities, it simultaneously undermines traditional legal construct built on territorial sovereignty. The decentralized and global nature of the metaverse complicates the application of national laws, particularly regarding intellectual property, contract enforcement, taxation, and consumer protection. This section explores these jurisdictional complexities, with a focus on cross-border transactions and territorial enforcement.

3.2.1 Cross-Border Transactions and Territorial Enforcement The Rise of Borderless Digital Commerce

Virtual platforms like Decentraland, Roblox, and OpenSea allow users from any part of the world to trade digital assets, buy virtual land, and offer services that generate real-world income. These transactions are often facilitated by blockchain technology and governed by smart contracts, with little to no regard for the physical locations of the parties involved[114].

This borderless nature of commerce in the metaverse brings to the forefront a critical issue: **Which laws govern these transactions when they span multiple jurisdictions?** Unlike traditional trade governed by international treaties, the rules of virtual engagement remain fragmented and inconsistent[115].

Key Legal and Regulatory Challenges

1. **Jurisdictional Ambiguity**

[114] https://theswissquality.ch/addressing-the-legal-challenges-of-cross-border-transactions-in-the- metaverse/

115

https://www.wipo.int/edocs/mdocs/enforcement/en/wipo_ace_16/wipo_ace_16_10_presentation.p df

Traditional legal concepts such as the location of the transaction, domicile of the parties, or place of harm do not translate cleanly into the metaverse[116]. For instance:

- If a digital asset is created in Germany, listed on a U.S.-based platform, purchased by a buyer in Brazil, and stored on a blockchain operated by nodes worldwide—where does the transaction "occur" legally?
- Courts struggle to assert jurisdiction when neither party is physically located within their territory, leading to confusion and potentially conflicting legal outcomes.

2. **Enforceability of Legal Judgments**

Even if a legal body asserts jurisdiction and rules on a dispute, enforcing the judgment across borders is often impractical. There may be:

- No mutual legal assistance treaties (MLATs) or reciprocal enforcement agreements.
- Technical obstacles in seizing or transferring digital assets like NFTs or cryptocurrencies[117].

3. **Taxation Dilemmas**

The decentralized and pseudonymous nature of metaverse economies challenges traditional tax regimes[118]. Tax authorities face questions like:

- Who is responsible for collecting VAT or sales tax?
- How should income from virtual property be reported and monitored?
- Which country's tax system takes precedence when a transaction spans multiple jurisdictions?

[116] https://www.inta.org/wp-content/uploads/public-files/advocacy/committee-reports/20231218_JURISDICTION-AND-ENFORCEMENT-ISSUES-IN-THE-METAVERSE.pdf

[117] https://cointelegraph.com/news/metaverse-intellectual-property-challenges-uk-researchers

[118] https://www.hklaw.com/en/insights/publications/2022/10/intellectual-property-enforcement-in- the-metaverse-part-2

4. **Consumer Protection**

Consumers engaging in virtual commerce are often left without recourse when disputes arise, especially when the vendor operates under anonymity or outside national regulatory reach. Refunds, product authenticity, and misrepresentation of digital goods often fall into legal grey areas.

5. **Data Privacy Regulations**

Metaverse platforms routinely process personal data across borders. However, compliance with data protection laws such as the EU's GDPR or California's CCPA is difficult:

- Platforms must ensure lawful cross-border data transfers.
- Users often lack visibility into how and where their data is stored or processed.

Territorial Enforcement in a Virtual World

Enforcing laws in a borderless environment remains one of the metaverse's most daunting legal challenges. National courts are bound by geography, yet the metaverse is not.

Specific Enforcement Challenges

- **Anonymity and Pseudonymity**

Many participants operate under usernames or wallet addresses, making it difficult to attribute ownership or fault to real-world identities. Even with forensic blockchain analysis, locating an infringer can be virtually impossible without cooperation from platforms.

- **Lack of Centralized Control**

Decentralized platforms lack traditional intermediaries that could enforce terms of service or comply with takedown orders. Without a governing entity, enforcement efforts are scattered and often unenforceable.

- **Conflicting Legal Doctrines**

  National IP laws differ significantly. For example:

  - Trademark laws may recognize different standards for ownership (e.g., first-to-use vs. first-to-file).
  - Copyright protections and enforcement timelines vary. This legal fragmentation results in uncertainty and increased legal risk for creators and businesses operating internationally.

- **Liability of Platforms**

  Whether platforms should be liable for facilitating or hosting infringing content is hotly debated:

  - Advocates for liability argue it would incentivize platforms to monitor and moderate content.
  - Opponents warn that such obligations could stifle innovation and impose undue burdens.

Case Studies Demonstrating Jurisdictional Conflicts

- **Hermès vs. MetaBirkins (2023):**
  This case illustrated the complexity of enforcing trademark rights in the metaverse. Hermès sued Mason Rothschild over NFT representations of its iconic Birkin bag. The court grappled with questions of jurisdiction, artistic expression, and digital likeness[119].
- **Nike vs. StockX (2022):**
  Nike challenged StockX for issuing NFTs tied to physical sneakers. The

[119] https://www.nytimes.com/2023/02/08/arts/hermes-metabirkins-lawsuit-verdict.html

case centered on unauthorized tokenization and raised jurisdictional issues due to the global user base of both companies[120].

- **Unstoppable Domains Disputes:**

  These domain name disputes underscore the lack of clear legal frameworks for blockchain-based domain registration. Conflicting claims and the absence of oversight bodies have led to uncertainty and protracted legal battles.

Proposed Legal and Regulatory Solutions

1. **International Legal Harmonization**

   Organizations like WIPO and UNCITRAL could lead the development of harmonized legal standards and model laws for metaverse-related issues. These frameworks would aim to reduce conflicts and create predictable legal outcomes.

2. **Smart Contracts with Built-in Jurisdiction Clauses**

   Embedding jurisdiction and dispute resolution provisions in smart contracts would clarify applicable law from the outset. These self- enforcing terms can serve as digital equivalents to choice-of-law clauses in traditional contracts.

3. **Platform Due Diligence and Accountability**

   Regulators could require platforms to:

   - Verify identities of content creators and users.
   - Establish mechanisms for dispute resolution and IP takedowns.
   - Cooperate with law enforcement and regulatory bodies across jurisdictions.

[120] https://www.thefashionlaw.com/nike-v-stockx-a-timeline-behind-the-trademark-lawsuit/#:~:text=Nike%20filed%20a%20headline%2Dmaking,goods%20and%20thereby%2C%20 legally%20permissible.

4. **Creation of Specialized Virtual Tribunals**

   Virtual arbitration panels or international tribunals focused on metaverse- related disputes could offer more agile and tech-savvy adjudication processes, ensuring quicker and more relevant decisions.

5. **Bilateral and Multilateral Agreements**

   Countries can negotiate treaties or agreements covering data sharing, tax policy alignment, and mutual recognition of judgments. These agreements would enhance legal cooperation and consistency in dealing with metaverse-related issues.

3.2.2 Case for Adopting WIPO's Unified Metaverse Treaty

The metaverse, a decentralized and immersive virtual ecosystem, has revolutionized the way individuals interact, transact, and create. It offers boundless opportunities in commerce, culture, education, and entertainment. However, its very decentralization and borderless nature pose significant hurdles for traditional legal systems, particularly in the realm of intellectual property (IP) law. Jurisdictional ambiguity, enforcement challenges, and inconsistent IP standards have become more pronounced in the digital landscape. In response, the World Intellectual Property Organization (WIPO) has proposed a unified treaty that aims to provide a coherent global framework to regulate IP within the metaverse. This section explores the necessity, features, benefits, and potential barriers to implementing such a treaty.

The Need for a Unified Metaverse Treaty

1. Borderless Nature of the Metaverse

Unlike physical spaces, the metaverse is not confined by national borders. It allows for seamless interaction and transactions between users located in different jurisdictions, often without awareness of national legal boundaries.

- **Jurisdictional Ambiguity**: When a copyright infringement occurs between two users based in different countries, it is unclear which legal system has authority over the dispute. This legal grey area makes traditional enforcement mechanisms ineffective.
- **Ownership Disputes in Decentralized Markets**: Digital assets such as NFTs are traded across international platforms, often without oversight or consensus on the applicable legal framework[121].
- **Erosion of Territorial IP Principles**: Most IP laws rely on territoriality, which clashes with the global reach of the metaverse[122].

A WIPO-led treaty could serve as a common legal denominator, establishing shared rules that override conflicting national laws in virtual contexts.

2. <u>Fragmentation of IP Standards</u>

The international IP landscape is highly fragmented, with countries adopting varying approaches to copyright, patent, and trademark protections.

- **Trademark Conflict**: The U.S. adheres to a "first-to-use" system, whereas the EU follows "first-to-file," resulting in conflicting claims to digital trademarks and domain names[123].
- **Inconsistent Copyright Durations and Protections**: The term and scope of copyright protection vary widely, leading to confusion when a digital asset is accessible worldwide.

[121] https://www.wipo.int/about-ip/en/frontier_technologies/metaverse-and-ip.html

[122] https://www.natlawreview.com/article/jurisdictional-issues-metaverse

[123] https://www.law.cornell.edu/wex/trademark

This inconsistency creates significant legal uncertainty for developers, creators, and platforms operating in the metaverse. Harmonized standards would enhance predictability and global compliance[124].

3. Enforcement Challenges

Even when IP rights are clear, enforcing them in virtual environments remains daunting.

- **Anonymity and Pseudonymity**: Blockchain systems enable users to transact without revealing personal identities, hindering the identification of infringers[125].
- **Decentralized Networks**: Many metaverse platforms lack central governing bodies to facilitate compliance or respond to legal orders[126].
- **Blockchain Immutability**: Once infringing content is recorded on-chain, it cannot be altered or removed, complicating enforcement[127].

A unified treaty could create a pathway for digital enforcement mechanisms and enable cooperation between jurisdictions and platforms.

Key Features of WIPO's Proposed Metaverse Treaty

1. Harmonized IP Standards

At its core, the treaty aims to align IP law across member states, providing:

- Uniform procedures for **trademark registration and enforcement**.
- Clear guidelines on **copyright protection** for digital works, NFTs, and user-generated content.

[124] https://www.wipo.int/about-ip/en/frontier_technologies/metaverse-and-ip.html

[125] https://cointelegraph.com/news/metaverse-intellectual-property-challenges-uk-researchers

[126] https://www.hklaw.com/en/insights/publications/2022/10/intellectual-property-enforcement-in- the-metaverse-part-2

[127] https://www.natlawreview.com/article/jurisdictional-issues-metaverse

- Agreed-upon criteria for **patent eligibility** in virtual and augmented reality technologies[128].

This legal alignment would reduce the risks of forum shopping, double registration, and conflicting rights claims.

2. Cross-Border Dispute Resolution Mechanisms

The treaty would create specialized forums—arbitration panels, digital tribunals, or WIPO-administered courts—with the following features:

- Jurisdiction to resolve IP disputes arising in virtual environments.
- Expert judges and arbitrators with backgrounds in **blockchain, digital law, and virtual economies**.
- Faster resolutions than conventional courts, with optional mediation processes[129].

3. Global Digital Asset Registry

WIPO could launch a trusted, blockchain-based registry for digital assets, including:

- NFTs, virtual trademarks, patents, and copyrights.
- Integrated **proof-of-ownership** and **authenticity verification** mechanisms.
- Compatibility with major metaverse platforms to facilitate licensing and rights transfers[130].

4. Smart Contract Governance

The treaty could incorporate standards for smart contracts used in IP licensing:

- **Royalty automation**: Ensuring creators receive compensation in secondary markets.

[128] https://www.wipo.int/about-ip/en/frontier_technologies/metaverse-and-ip.html

[129] https://www.natlawreview.com/article/jurisdictional-issues-metaverse

[130] https://cointelegraph.com/news/metaverse-intellectual-property-challenges-uk-researchers

- **License enforcement**: Defining contractual terms for asset use and automatically disabling infringing assets.
- **Dispute triggers**: Enabling automated alerts or arbitration when contract terms are violated.

Potential Benefits of a Unified Metaverse Treaty

1. Legal Certainty and Confidence

By creating a predictable legal framework, the treaty would reduce ambiguity for users, developers, and businesses—fostering **greater investment** and participation in metaverse development.

2. Streamlined Global Enforcement

Centralized dispute mechanisms and cross-border enforcement provisions would provide effective tools for rights holders—particularly smaller creators who lack the resources for international litigation.

3. Innovation Acceleration

Legal harmonization would reduce friction in licensing and collaborations, encouraging rapid development of AR/VR, AI, and blockchain technologies.

4. Economic Development

A robust legal foundation would bolster the emerging digital economy, support creative industries, and protect stakeholders from IP theft and exploitation.

Challenges in Implementing a Unified Treaty

1. Sovereignty and Legal Autonomy

Nations may be reluctant to cede control over IP policies or accept supranational arbitration mechanisms, fearing loss of legal independence.

2. Rapid Technological Change

Keeping treaty provisions up to date with evolving technologies poses a challenge. Regular updates and flexible, tech-neutral language will be essential.

3. Resource Disparities

Enforcement across low-resource jurisdictions may be inconsistent. International cooperation and support will be needed to level the playing field.

4. Diverse Stakeholder Interests

Balancing the needs of multinational corporations, independent creators, platforms, and users will require a multi-stakeholder negotiation framework.

Case Studies Highlighting Jurisdictional Challenges Hermès vs. MetaBirkins (2023)

Hermès sued Mason Rothschild for creating NFTs mimicking its Birkin bags. Despite U.S. jurisdiction, global sales and decentralized distribution made enforcement complicated.

Nike vs. StockX (2022)

Nike's trademark lawsuit over NFTs tied to its sneakers illustrated the ambiguity of digital asset ownership and licensing, emphasizing the need for global rules.

Unstoppable Domains Disputes

Ownership conflicts over blockchain-based domain names reveal gaps in digital property rights governance, underscoring the importance of an international registry[131][132][133].

4. Case Studies: India's Readiness

India is actively carving out a leadership role in the evolving digital economy by embracing emerging technologies such as blockchain, artificial intelligence, and the metaverse. Recognizing the transformative potential of these technologies, the Indian government—spearheaded by the Ministry of Electronics and Information Technology (MeitY)—has undertaken several proactive measures to build a robust regulatory and technological foundation. Central to these efforts are the **National Blockchain Strategy** and the **Draft Digital India Act (DIA)**, both of which signal a comprehensive and forward-looking approach to digital governance. This section explores these initiatives to assess India's preparedness for a technology-driven future.

4.1 Positive Steps: MeitY's Blockchain Strategy and the Draft Digital India Act

MeitY's Blockchain Strategy: Laying the Groundwork for a Trusted Digital Ecosystem

India's National Blockchain Strategy reflects a holistic vision to harness blockchain's decentralization, immutability, and transparency for public benefit and economic resilience. Through policy, infrastructure, and capacity-building initiatives, MeitY seeks to integrate blockchain into core sectors of national interest.

[131] https://www.hklaw.com/en/insights/publications/2022/10/intellectual-property-enforcement-in- the-metaverse-part-2

[132] https://www.natlawreview.com/article/jurisdictional-issues-metaverse

[133] https://cointelegraph.com/news/metaverse-intellectual-property-challenges-uk-researchers

1. National Blockchain Strategy

The strategy provides a detailed roadmap for institutionalizing blockchain technology across multiple domains—healthcare, agriculture, education, finance, and more[134]. It is structured around three core objectives:

- **Standardization:** The strategy advocates for the development of common technical standards to facilitate interoperability and seamless integration of blockchain solutions across states and departments.
- **Cross-Sector Collaboration:** It promotes a multi-stakeholder approach by encouraging partnerships among government entities, startups, academia, and private enterprises. Such synergies are critical for scaling innovations and ensuring real-world impact.
- **Human Capital Development:** Recognizing the need for skilled professionals, MeitY supports specialized training programs, academic research initiatives, and the establishment of blockchain centers of excellence throughout India.

Additionally, expert committees and inter-ministerial groups have been proposed to monitor implementation, address policy gaps, and align development with national priorities and global best practices[135].

2. Vishvasya Blockchain Technology Stack

To operationalize its blockchain vision, MeitY introduced the **Vishvasya Blockchain Technology Stack** in 2023—an indigenous framework aimed at scaling blockchain infrastructure across public and private sectors[136]. Key components include:

- **Blockchain-as-a-Service (BaaS):** A permissioned infrastructure that enables secure, scalable deployment of decentralized applications (dApps) by government bodies and enterprises.

[134] https://dig.watch/resource/indias-national-blockchain-strategy

[135] https://dig.watch/resource/indias-national-blockchain-strategy

[136] https://www.expresscomputer.in/news/meity-unveils-vishvasya-blockchain-technology-stack- and-national-blockchain-framework-to-enhance-digital-trust-and-service-delivery/115919/

- **NBFLite:** A lightweight platform designed for educational use, rapid prototyping, and experimentation with blockchain models.
- **Praamaanik:** A verification tool that leverages blockchain to authenticate mobile applications' provenance, enhancing trust in digital platforms.

These tools are hosted across geographically redundant National Informatics Centre (NIC) data centers in Bhubaneswar, Pune, and Hyderabad, ensuring resilience and continuity of service[137].

3. Sectoral Applications of Blockchain

India is already piloting blockchain solutions across diverse fields:

- **Healthcare:** Secure and interoperable systems for storing and transferring patient medical histories.
- **Agriculture:** Transparent supply chain systems that empower farmers and reduce inefficiencies.
- **Education:** Blockchain-backed credentialing systems for tamper-proof academic records and certificates.

These use cases illustrate how India is leveraging blockchain to foster trust, reduce fraud, and streamline public services[138].

Draft Digital India Act: Creating a Legal Framework for the Digital Age

India's legal and regulatory ecosystem is undergoing a much-needed transformation to keep pace with emerging technologies. The Draft Digital India Act (DIA), proposed as a successor to the outdated Information Technology Act of 2000, is a cornerstone of this shift.

[137] https://www.expresscomputer.in/news/meity-unveils-vishvasya-blockchain-technology-stack- and-national-blockchain-framework-to-enhance-digital-trust-and-service-delivery/115919/

[138] https://theprint.in/ani-press-releases/innovation-opportunities-and-the-future-to-be-shaped-at- india-blockchain-horizons-2025/2501715/

1. A Modern Replacement for the IT Act

The DIA is designed to regulate contemporary digital technologies and platforms more effectively. It introduces legal recognition and oversight for innovations that were absent or undefined under the IT Act, such as:

- **Metaverse platforms**
- **Blockchain networks and cryptocurrencies**
- **AI-driven tools**
- **IoT ecosystems**
- **5G-enabled applications**
- **Cloud computing and digital marketplaces**

By doing so, the act aligns Indian law with the demands of a hyperconnected, data-intensive global economy[139].

2. Enhancing Accountability and Compliance

The draft legislation also emphasizes platform accountability through several mechanisms:

- **Proactive moderation:** Online intermediaries are required to implement proactive content moderation to counter misinformation, hate speech, and cybercrimes.
- **Tiered regulation:** Different categories of intermediaries—such as social media platforms, cloud service providers, and metaverse operators—are subject to specific obligations based on their functions and risk profiles.
- **Stricter penalties:** Non-compliance with the act, particularly regarding data protection and user rights, attracts substantial penalties, ensuring a strong incentive for corporate responsibility[140].

3. Promoting a Competitive Digital Economy

[139] https://www.upguard.com/blog/digital-india-act

[140] https://www.expresscomputer.in/news/meity-unveils-vishvasya-blockchain-technology-stack- and-national-blockchain-framework-to-enhance-digital-trust-and-service-delivery/115919/

The DIA also addresses concerns around digital monopolies by encouraging fair competition. It includes provisions that aim to:

- Prevent anti-competitive practices by dominant tech firms.
- Facilitate market access for domestic startups and MSMEs (Micro, Small, and Medium Enterprises).
- Offer regulatory clarity and support for innovators developing solutions in emerging tech sectors[141].

Impact on India's Digital Ecosystem

1. Catalyzing Economic Growth

By investing in digital infrastructure and regulatory frameworks, India is creating a conducive environment for digital entrepreneurship. A **Deloitte report** estimates that the metaverse could contribute between **$79 billion to $148 billion annually to India's GDP by 2035**[142], with blockchain forming the backbone of this projected growth. These figures underscore blockchain's role as a foundational enabler of next-generation digital services.

2. Advancing Global Leadership

India's policy innovation positions it not just as a participant, but as a leader in the global digital order. The combination of regulatory foresight and technological infrastructure makes India a credible voice in international forums discussing digital sovereignty, cross-border data governance, and intellectual property in virtual environments.

3. Strengthening Governance Mechanisms

Blockchain-based tools like **Praamaanik** are being used to enhance transparency in public digital infrastructure. By enabling verifiable and tamper-proof records,

[141] https://vidhilegalpolicy.in/blog/explained-the-digital-india-act-2023/

[142] https://inc42.com/buzz/metaverses-economic-impact-on-india-to-reach-79-148-bn-by-2035/

these tools foster citizen trust, improve accountability, and safeguard government systems from manipulation or fraud.

4. Supporting Innovation and Entrepreneurship

The government's support for lightweight, modular blockchain frameworks (e.g., NBFLite) lowers the barrier to entry for startups and educational institutions. This decentralized innovation model encourages experimentation and empowers smaller players to contribute to digital transformation[143].

Challenges on the Horizon

While India has taken significant strides, several challenges persist:

- **Implementation Disparities:** Coordinating between central ministries, state governments, and private actors is complex and may lead to inconsistent or delayed rollouts.
- **Regulatory Uncertainty:** Emerging technologies like cryptocurrencies continue to provoke policy debates, with differing views among regulatory bodies such as the Reserve Bank of India and Ministry of Finance.
- **Digital Divide:** Large parts of rural India still lack reliable internet access, limiting the equitable reach of digital initiatives.
- **Cybersecurity Threats:** As more services go online, vulnerabilities increase. A comprehensive and proactive cybersecurity policy is essential to preserve user trust and safeguard critical infrastructure[144][145][146].

4.2 Shortcomings: Omissions in India's Digital Personal Data Protection Act, 2023

[143] https://www.expresscomputer.in/news/meity-unveils-vishvasya-blockchain-technology-stack- and-national-blockchain-framework-to-enhance-digital-trust-and-service-delivery/115919/

[144] https://www.weforum.org/stories/2022/03/india-could-build-metaverse/

[145] https://dig.watch/resource/indias-national-blockchain-strategy

[146] https://inc42.com/buzz/metaverses-economic-impact-on-india-to-reach-79-148-bn-by-2035/

The **Digital Personal Data Protection (DPDP) Act, 2023** marks a pivotal moment in India's data governance journey, aiming to introduce a structured regime for the processing of personal data and to uphold individuals' privacy rights. While the Act signifies progress, it contains several critical omissions and ambiguities that may compromise its effectiveness—particularly in the context of advanced digital ecosystems such as the **metaverse**, where personal data takes on new dimensions of complexity and risk. This section unpacks the most pressing concerns related to the DPDP Act and analyzes their potential implications for privacy, transparency, and accountability.

1. Broad Government Exemptions: A Threat to Privacy Rights

Among the Act's most debated provisions is **Section 18(2)**, which grants wide- ranging exemptions to government bodies, allowing them to bypass compliance obligations under loosely defined conditions. These exemptions lack procedural safeguards or independent oversight, leading to serious apprehensions regarding **state surveillance** and the erosion of constitutionally guaranteed privacy rights— especially in light of the Supreme Court's landmark judgment in *KS Puttaswamy v. Union of India*, which affirmed privacy as a fundamental right[147].

Implications:

- **Erosion of Accountability**: State actors may collect and process personal data without transparency, undermining democratic oversight.
- **Unchecked Surveillance**: The lack of judicial or parliamentary checks could result in mass data surveillance practices, diminishing civil liberties[148].

2. Dilution of the RTI Act: Reduced Government Transparency

The Act amends **Section 8(1)(j)** of the **Right to Information (RTI) Act, 2005**, thereby restricting access to information involving personal data unless it serves a clear public interest. This change has drawn criticism from activists and legal

147 https://ohrh.law.ox.ac.uk/unpacking-indias-digital-personal-data-protection-act-a-new-dawn-or- a-false-start/

[148] https://www.medianama.com/2023/08/223-major-concerns-india-data-protection-bill-2023-2/

scholars, who argue that it compromises the public's ability to hold government officials accountable[149].

Implications:

- **Compromised Transparency**: Public scrutiny of government actions may be weakened, especially regarding the assets or misconduct of public servants.
- **Conflicting Public Interest Standards**: The balance between individual privacy and collective transparency is tilted disproportionately in favor of the former, undermining democratic accountability[150].

3. Vague Consent Mechanisms: Undermining User Autonomy

While the Act attempts to simplify the consent process, it fails to mandate the disclosure of key information—such as the entities accessing data, its intended use, retention periods, or the scope of cross-border transfers[151].

Implications:

- **Illusory Consent**: Without full knowledge of data usage, individuals cannot make meaningful or informed choices.
- **Increased Risk of Exploitation**: Non-transparent practices may lead to unethical profiling or monetization of user data without their informed participation.

4. Undefined Security Standards: Inconsistent Data Protection

The Act calls for the adoption of "reasonable security safeguards" but offers no concrete definition or sector-specific benchmarks for these measures.

[149] https://www.medianama.com/2023/08/223-major-concerns-india-data-protection-bill-2023-2/

[150] https://ohrh.law.ox.ac.uk/unpacking-indias-digital-personal-data-protection-act-a-new-dawn-or- a-false-start/

[151] https://www.medianama.com/2023/08/223-major-concerns-india-data-protection-bill-2023-2/

Furthermore, despite the imposition of substantial penalties for data breaches, there is **no provision for victim compensation**[152].

Implications:

- **Regulatory Ambiguity**: Companies may struggle to interpret compliance requirements, leading to disparate security standards across sectors.
- **Lack of Recourse for Citizens**: Victims of data breaches remain without statutory rights to restitution or redress.

5. Lack of Independence in Enforcement Mechanisms

The **Data Protection Board (DPB)**—tasked with enforcement—suffers from a lack of structural independence, as its members are appointed directly by the central government[153]. This raises serious concerns about potential bias, particularly in cases involving state entities.

Implications:

- **Conflict of Interest**: Investigations into state actors may be compromised by the Board's lack of autonomy.
- **Erosion of Public Trust**: Perceived or real conflicts could undermine confidence in the Act's enforcement architecture[154].

6. No Special Treatment for Sensitive Data

The final version of the DPDP Act omits earlier distinctions between sensitive and non-sensitive personal data. This is a major setback given the inherent vulnerabilities associated with categories like biometric identifiers, health data, and financial records.

Implications:

[152] https://ohrh.law.ox.ac.uk/unpacking-indias-digital-personal-data-protection-act-a-new-dawn-or- a-false-start/

[153] https://ohrh.law.ox.ac.uk/unpacking-indias-digital-personal-data-protection-act-a-new-dawn-or- a-false-start/

[154] https://www.medianama.com/2023/08/223-major-concerns-india-data-protection-bill-2023-2/

- **Heightened Privacy Risks**: Without enhanced safeguards, sensitive data is more susceptible to misuse or theft.
- **Regulatory Uncertainty**: Entities handling high-risk data lack guidance, increasing legal and reputational exposure.

5. Recommendations for India

To reinforce its digital governance infrastructure, India must go beyond reactive policy design and embrace forward-thinking legislative reforms. As new technologies like the **metaverse**, blockchain, and AI redefine digital interactions, existing legal frameworks must be recalibrated to ensure robust protections for privacy, intellectual property, and digital sovereignty. This section proposes actionable reforms through a **Metaverse Amendment Bill**, intended to bridge these legal gaps and future-proof India's regulatory ecosystem.

5.1 Legislative Reforms: The Metaverse Amendment Bill

1. A Dedicated Legal Framework for Virtual Environments

The Metaverse Amendment Bill should be conceived as a **comprehensive legislative instrument** to address the unique legal challenges of virtual spaces[155]. Its scope should include:

- **Clear Definitions**: Codify terms such as avatars, virtual identities, digital currencies, and NFTs to eliminate ambiguity.
- **Tailored IP Protection**: Establish enforceable digital IP rights suited to decentralized content creation and distribution.
- **Jurisdiction and Dispute Resolution**: Create mechanisms that address cross-border enforcement and virtual governance.

[155] https://www.natlawreview.com/article/jurisdictional-issues-metaverse

Rationale: A well-structured legal framework would lend predictability and legitimacy to virtual markets, enabling responsible innovation and global compliance.

2. Enhancing IP Rights in Digital Realms

To encourage creative innovation in the metaverse, the bill should include:

- **Legal Ownership of Digital Assets**: Codify creator rights over virtual products, avatars, and environments.
- **Digital Asset Registry**: Set up a national database for registering metaverse-based creations[156].
- **Cross-Platform Enforcement Tools**: Enable rights holders to combat infringement across jurisdictions and platforms.

Rationale: Strong IP protections would incentivize innovation and attract investment into India's digital creative economy.

3. Strengthening User Privacy Norms

Given the immersive and data-intensive nature of the metaverse, privacy protections must be rigorous:

- **Explicit Consent Requirements**: Mandate that platforms obtain informed, opt-in consent for data collection.
- **Transparency Mandates**: Platforms must disclose data processing practices in accessible language[157].
- **Alignment with Global Norms**: Provisions should mirror GDPR principles while adapting to Indian socio-legal contexts.

Rationale: Robust privacy protections will foster user trust and prevent exploitative data practices in virtual ecosystems.

4. Content Moderation and Platform Accountability

[156] https://www.wipo.int/about-ip/en/frontier_technologies/metaverse-and-ip.html

[157] https://www.natlawreview.com/article/jurisdictional-issues-metaverse

To safeguard users against harmful virtual experiences:

- **Content Governance Guidelines**: Define offensive, illegal, or harmful content in the metaverse.
- **Platform Liability Rules**: Hold operators accountable for failing to act against flagged content.
- **User-Centric Reporting Tools**: Require intuitive reporting and grievance mechanisms[158].

Rationale: A clear moderation framework would ensure safe and inclusive digital environments without curbing free expression.

5. Promoting Interoperability Standards

To prevent fragmentation in the metaverse economy:

- **Cross-Platform Standards**: Enable seamless transfer of avatars, assets, and identities between platforms.
- **Stakeholder Collaboration**: Involve private firms, developers, and public agencies in creating shared interoperability protocols.

Rationale: Interoperability enhances user experiences, stimulates competition, and reduces monopolistic tendencies.

5.2 Judicial Capacity Building: Equipping the Judiciary to Navigate Metaverse Disputes

As the metaverse becomes increasingly integrated into key areas of public and private life—including commerce, governance, education, and entertainment—it brings with it a host of novel legal complexities. Traditional legal paradigms are often ill-equipped to address disputes arising in these immersive, borderless digital environments. In this evolving landscape, **judicial capacity building**

158 https://www.hklaw.com/en/insights/publications/2022/10/intellectual-property-enforcement-in- the-metaverse-part-2

becomes not merely a desirable policy initiative but an essential pillar of legal preparedness. Judges must be empowered with the knowledge and tools to adjudicate metaverse-related cases, striking a careful balance between technological innovation and the enduring principles of justice and due process.

1. The Need for Specialized Judicial Training

The metaverse introduces unprecedented legal questions, many of which are intricately tied to emerging technologies. Judges are now confronted with cases that may involve:

- **Intellectual property violations** involving digital goods, virtual art, or avatars;
- **Ownership claims over NFTs (Non-Fungible Tokens)** and other blockchain-based assets;
- **Jurisdictional challenges** across decentralized platforms that defy traditional geographic boundaries;
- **Privacy and data protection disputes** arising from biometric tracking, behavior analysis, and immersive user profiling within virtual spaces[159].

Adjudicating such matters requires a foundational understanding of underlying technologies such as blockchain, smart contracts, virtual reality (VR), and artificial intelligence (AI). Without specialized training, judicial reasoning risks falling short of technological and contextual accuracy, potentially leading to unjust outcomes[160].

2. International Precedents: Judicial Training in Action

a. UNESCO's MOOC on AI and the Rule of Law

[159] https://www.unesco.org/en/articles/training-judges-lawyers-and-prosecutors-artificial- intelligence-and-rule-law

[160] https://www.unesco.org/en/artificial-intelligence/rule-law/mooc-judges

A leading example of judicial capacity building is the **Massive Open Online Course (MOOC)** launched by UNESCO, which has trained more than 17,000 judicial actors globally[161]. The course is designed to:

- Introduce the ethical and legal dimensions of AI;
- Explore real-world case studies that illustrate the intersection of law and emerging technologies;
- Promote international standards for the ethical use of digital tools in legal systems.

This initiative underscores the critical role of continuous learning in judicial systems and provides a replicable model for metaverse-related judicial education.

b. Virtual Trials in Colombia and China

Several countries have also begun **integrating metaverse technologies directly into courtroom procedures**:

- In **Colombia**, courts have experimented with fully virtual hearings, where participants appear as avatars while maintaining procedural integrity.
- **China** has introduced "smart courts" that utilize metaverse platforms for trials, including those dealing with **insurance disputes and minor civil matters**[162].

These developments signal a shift toward a more adaptive judiciary, capable of administering justice in both physical and virtual domains.

3. A Strategic Training Framework for India's Judiciary

To position India's legal system at the forefront of digital justice, a multi-pronged approach to judicial training is essential. The following components are recommended:

[161] https://www.unesco.org/en/artificial-intelligence/rule-law/mooc-judges

[162] https://www5.open.ac.uk/open-justice/blog/digital-justice-metaverse-now-being-used-hold- virtual-court-hearings

a. Tailored Courses on Metaverse Law

India should develop specialized curricula addressing:

- The implications of blockchain for contract and property law;
- Digital ownership, copyright, and trademark enforcement in virtual environments;
- Conflict of law principles applicable to cross-border transactions in decentralized platforms[163].

These modules should be incorporated into the **National Judicial Academy's** regular training calendar.

b. Experiential Learning Through Virtual Mock Trials

Practical exposure is vital for judicial comprehension. Mock trials held in metaverse simulations can:

- Familiarize judges with the mechanics of avatar representation, virtual evidence presentation, and real-time procedural challenges;
- Enhance interpretative abilities when adjudicating novel forms of digital harm or interaction[164].

c. Engagement with Technical and Academic Experts

Effective jurisprudence in this domain requires interdisciplinary engagement. Courts and judicial academies should:

- Collaborate with technology institutes and digital law centers;
- Host guest lectures and advisory sessions by blockchain developers, cybersecurity experts, and data privacy scholars[165].

[163] https://www.unesco.org/en/artificial-intelligence/rule-law/mooc-judges

[164] https://www5.open.ac.uk/open-justice/blog/digital-justice-metaverse-now-being-used-hold- virtual-court-hearings

[165] https://www.nja.gov.in/Concluded_Programmes/2023-24/P-1403_PPTs/4.Session-5%20-%20Justice%20Mustaque.pdf

d. Continuous Professional Development

Given the dynamic nature of technology, judicial learning must be ongoing. Regular workshops, online modules, and certification programs should be institutionalized to keep the judiciary abreast of the latest advancements[166].

5.3 Public-Private Partnerships: Toward Collaborative Self-Regulation in the Metaverse

The decentralized architecture of the metaverse challenges conventional regulatory frameworks. Traditional top-down regulatory mechanisms often struggle to keep pace with the speed of technological innovation and the borderless nature of digital interactions. In this context, **public-private partnerships (PPPs)** emerge as a pragmatic solution—enabling a cooperative governance model where public authorities, private enterprises, civil society, and academia collaboratively shape the rules of engagement.

1. The Strategic Value of Public-Private Collaborations

PPPs can play a transformative role in shaping ethical, technical, and legal standards in the metaverse by addressing:

- **Data privacy and user safety** through co-developed protection protocols;
- **Content governance**, including moderation of harmful, unlawful, or misleading virtual interactions;
- **Interoperability frameworks** that allow virtual identities, avatars, and digital assets to move across platforms seamlessly[167].

By fostering consensus-building and shared accountability, PPPs offer a flexible and responsive form of metaverse governance.

166 https://www.nja.gov.in/Concluded_Programmes/2023-24/P-1403_PPTs/4.Session-5%20-%20Justice%20Mustaque.pdf

167 https://about.fb.com/news/2022/05/ensuring-an-open-and-interoperable-metaverse

2. Global Models of Effective PPPs

a. Meta's XR Programs and Research Fund

Meta (formerly Facebook) has committed $50 million toward the ethical development of extended reality (XR) technologies. Through partnerships with **academic institutions and non-profit organizations**, this initiative:

- Supports research on equity, accessibility, and safety in virtual environments;
- Promotes the co-creation of global governance principles for the metaverse[168].

b. World Economic Forum's Metaverse Governance Initiative

The World Economic Forum has launched a **multi-stakeholder initiative** to design governance frameworks for the metaverse. This collaborative network addresses:

- **User privacy and safety**;
- **Digital inclusion and equity**;
- **Economic sustainability and innovation ethics**[5].

These initiatives illustrate the benefits of leveraging diverse expertise to develop norms that are inclusive, anticipatory, and enforceable.

3. Building a PPP Ecosystem for India

India has the opportunity to create a **nationally tailored PPP model** that balances innovation with socio-economic priorities. Key policy proposals include:

a. Co-Development of Metaverse Governance Standards

Government agencies, technology firms, legal experts, and civil society should work together to:

[168] https://about.fb.com/news/2021/09/building-the-metaverse-responsibly/

- Draft voluntary codes of conduct around data use, avatar behavior, and digital asset management;
- Create enforceable community standards for content moderation and virtual conduct[169].

b. Establishment of a National Metaverse Council

A permanent advisory body—comprising representatives from the Ministry of Electronics and IT (MeitY), judiciary, academia, tech companies, and user communities—can serve as a **regulatory think tank**. The Council would:

- Oversee the evolution and implementation of self-regulatory standards;
- Mediate disputes between platforms and users;
- Advise on legislative and policy reforms[170].

c. Incentivization Through Certification and Recognition

To encourage adherence, platforms demonstrating compliance with self-regulatory standards could:

- Receive **government-endorsed certifications** indicating safety, transparency, and interoperability;
- Be eligible for tax incentives or grants to further responsible innovation[171].

6. Conclusion

The emergence of Web3 and the metaverse marks a transformative shift in India's digital landscape, offering immense potential to propel the nation toward its $1 trillion digital economy goal and achieve digital sovereignty. These technologies redefine interaction, ownership, and value creation—making them key enablers of India's next phase of digital growth. However, their integration into existing legal

[169] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4749302

[170] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4749302

[171] https://about.fb.com/news/2021/09/building-the-metaverse-responsibly/

frameworks, particularly intellectual property (IP) laws, presents substantial challenges that must be urgently addressed.

Key Intellectual Property Challenges

1. **Trademarks:**

   The decentralized, borderless nature of the metaverse complicates territorial enforcement. Virtual trademark infringement, lack of legal precedents, jurisdictional ambiguities, and inconsistent classification of virtual goods under laws like the Indian Trademarks Act, 1999 hinder effective protection. Physical-world licenses often do not cover virtual replicas. High-profile cases like *Nike vs. StockX* illustrate the urgent need for digital trademark registration and proactive brand protection in virtual spaces.

2. **Copyright:**

   The metaverse thrives on user-generated and AI-generated content, but current copyright laws struggle to address ownership, authorship, and liability. Under India's Copyright Act, 1957, authorship issues under Section 2(d) remain unresolved for AI works. Section 79 of the IT Act, 2000, meanwhile, raises questions about intermediary liability for infringing UGC in decentralized platforms. Furthermore, AI training datasets raise concerns over derivative rights and content attribution.

3. **Patents:**

   Technologies like AR, VR, AI, and blockchain—central to the metaverse—are prone to overlapping patents and complex litigation. Enforcing patents in anonymous, decentralized environments is particularly difficult. The *Magic Leap vs. Nreal* case underscores both the evidentiary burden in trade secret litigation and how such disputes can deter innovation.

4. **Designs:**

   The Designs Act, 2000, was not crafted to protect the aesthetics of digital goods such as virtual fashion or GUIs. Virtual designs often remain unprotected, face overlaps with copyright law, and pose jurisdictional

enforcement issues. Their intangible and transient nature further complicates registration and rights enforcement.

Broader Legal and Regulatory Gaps

The metaverse introduces additional systemic issues beyond IP law. Interoperability, while key to a seamless virtual experience, enables the unauthorized transfer of digital assets across platforms. Blockchain's immutability complicates takedown mechanisms for infringing content, while user anonymity undermines enforcement. Jurisdictional conflicts are rife, as virtual transactions transcend borders, raising uncertainty over applicable laws and enforcement mechanisms. Cases like *Hermès vs. MetaBirkins* and *Nike vs. StockX* highlight the growing need for international legal harmonization. One proposed solution is the adoption of a **Unified Metaverse Treaty under the aegis of WIPO**, which would provide shared rules, dispute resolution frameworks, and a global digital asset registry.

India's Readiness and Gaps

India has made commendable progress, notably through MeitY's **National Blockchain Strategy** and the proposed **Digital India Act**, which aim to modernize the legal infrastructure and promote accountability in digital platforms. These initiatives signal a forward-looking approach to digital transformation.

However, there are critical shortcomings. The **Digital Personal Data Protection Act, 2023** has been criticized for its vague consent provisions, weak security standards, broad governmental exemptions, dilution of the RTI Act, and the lack of an independent enforcement authority. It also omits tailored safeguards for sensitive data—an essential component of metaverse governance.

Recommendations for Reform

To align with the evolving digital paradigm, the following steps are recommended:

- **Legislative Reforms:** Enact a **Metaverse Amendment Bill** that clearly defines metaverse-related concepts, introduces customized IP protection,

and addresses privacy, jurisdiction, content moderation, and interoperability.

- **Judicial Capacity Building:** Empower the judiciary to handle metaverse- related disputes through specialized training, virtual mock trials, and collaboration with technology experts.
- **Collaborative Governance:** Establish **public-private partnerships** to foster co-regulation, develop ethical standards, and create a **National Metaverse Council** to oversee innovation while protecting users.

In conclusion, while the metaverse and Web3 technologies hold vast promise for India's digital future, this potential can only be realized through **proactive, adaptive, and collaborative legal reform**. Addressing IP complexities, strengthening enforcement mechanisms, and embracing cross-sector cooperation will be essential in shaping a secure, inclusive, and innovation-driven virtual ecosystem for India.

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files/advocacy/committee-reports/20231218_TRADEMARK- LICENSING-IN-THE-METAVERSE.pdf

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