IPR ENFORCEMENT IN THE METAVERSE: LEGAL CHALLENGES AND FUTURE DIRECTIONS

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ABSTRACT

Intellectual property rights (IPR) encompass ideas, inventions, and creative works that society recognizes as property deserving protection. These rights grant creators or inventors exclusive privileges, allowing them to benefit commercially from their innovations and reputations. In the context of the fourth industrial revolution, the emergence of the metaverse marks a significant shift in internet technology, offering more immersive and interactive digital experiences.[1] As the boundaries between physical and virtual lives become increasingly blurred, users are engaging in virtual spaces where the creation, sale, and purchase of digital goods are commonplace. These rapid transformations introduce new complexities and risks for participants-whether users, developers, or platform owners-within the metaverse. Such changes necessitate a re-examination of regulatory frameworks, particularly with respect to intellectual property rights. This study aims to explore both the opportunities and challenges that the metaverse presents for IPR, focusing specifically on the Indian context[2]. The paper examines key issues surrounding the creation, ownership, and enforcement of intellectual property in digital environments. Particular attention is given to the unique features of the metaverse, including user-generated content, non-fungible tokens (NFTs), and immersive digital experiences, which often challenge the adequacy of existing legal doctrines. Ultimately, the paper contends that a critical reassessment and potential evolution of copyright and trademark law are essential for effectively safeguarding intellectual property in the rapidly evolving metaverse.[3]

Keywords: Intellectual Property Rights, Metaverse, Legal Challenges and IP Protection.

[1] Bhattacharya, Sanjib, Intellectual property rights: An overview, National Institute of Health(Journal), 2011
[2] Vig, Shinu, Intellectual property rights and the metaverse: An Indian perspective, The Journal of World Intellectual Property, 2022
[3] Mahla, Pooja, Intellectual Property Rights in the Metaverse: New Challenges for Copyright and Trademark Law, International Journal of Law Management and Humanities Volume 8, Issue 3, Page 2190 – 2201 (2021)

CHAPTER -1: SYNOPSIS

1.1 LITERATURE REVIEW:

The research of Intellectual Property Rights (IPR) within the field of the digital environment has also changed considerably during the emergence of the metaverse. Literature existing revolves around three key themes:

1. IRP Laws Re Wire - It is claimed that copyright, trademark, and patent regulations are better suited to physical (or classic) digital frameworks and are somewhat challenged in the case of NFTs, avatars, and virtual products.

2. Problem of Jurisdiction and Enforcement - Researchers pay attention to the fact that the metaverse is borderless, which gives rise to problems related to the collision of laws, problems with collecting evidence, and problems with making pseudonymous violators responsible.

3. Comparative Legal perspectives - Studies emphasize Pre-eminence On early case law companies have studied Hermes v. Rothschild in America, demonstrates how the courts are starting to extrapolate current doctrines to over virtual areas. Nevertheless, the Indian literature is minimal, and the majority of the work is devoted to e-commerce and NFTs, and not to full-fledged discussions in the metaverse.

1.2 RESEARCH METHODOLOGY:

In this research a comparative legal study framework and research method of analytical one will be used with some slight empirical observations.

- Comparative Approach: Analysis on regulatory responses in U.S., EU, China and India with a view to detect convergence and divergency.

- Analytical Framework: The level of adequacy of existing laws, gaps in their enforcement and suggested changes.

1.3 RESEARCH QUESTION:

So what are the key legal and jurisdictional issues when trying to enforce IPR in virtual worlds all over the world?

1.4 HYPOTHESIS:

The intersection of national laws, the absence of clear digital borders, and courts still grappling with the very concept of the "metaverse" all contribute to this complexity. Rather than creating entirely new frameworks, most judicial bodies attempt to adapt traditional IP law to these evolving virtual contexts. Sometimes this adaptation holds up; other times, it's a rather awkward fit.

CHAPTER -2 : CONCEPTS

2.1 INTELLECTUAL PROPERTY RIGHTS:-

The foundation of intellectual property rights itself is deeply rooted in history. The principle is relatively uncomplicated: when an individual creates something original, society recognizes that creator's right to acknowledgment or financial reward. This is facilitated through a limited monopoly, intended to incentivize innovation and creativity. Yet, this privilege is not absolute. Exceptions-such as licensing arrangements and the doctrine of fair use-exist precisely to prevent a scenario where public interest is entirely sidelined in favor of individual gain[4]. As a result, there is a continual balancing act between protecting creators' rights and ensuring public access. This balancing act manifests in the legal frameworks for patents, copyrights, and trademarks. Ideally, when the system functions as intended, it benefits both inventors and society at large: creators receive recognition and potential compensation, and the broader community continues to benefit from a steady stream of new ideas and advancements. Of course, in practice, achieving this balance can be far more challenging.[5]

2.2 TYPES OF INTELLECTUAL PROPERTY RIGHTS:-

Intellectual Property Rights are categorized in a universal manner across the globe. In India, the different forms of Intellectual Property Rights are:

1. **Copyright –** It protects the literacy, musical, graphic or other artistic form in which the author express his intellectual concepts. Copyright can also provide protection to compare programmes . However, it does not protect ideas or facts.

[4] https://www.wipo.int/en/web/about-ip
[5] Shyam Sunder Mahapatra, AN INTRODUCTION TO INTELLECTUAL PROPERTY RIGHTS, Manupatra

2. **Patent –** Patent law protects the invention of all individuals, the national law require an "invention" to be – Novel, Useful and Non-obvious. In US, Patent is granted to first inventor while in other nations, patent is granted to the person who first file the patent. Patents are territorial and a patent has rights only in the territory in which patent is issued. To gain rights in other countries, the inventor must file a patent application in those countries under the Patent Co-operation Treaty.

3. **Trademark –** It protects any word, symbol, logo or device used to identify, distinguish or indicate the source of goods or services. Trademark includes trade dress and product configuration. In most countries, trademarks rights arise through registration on a first come first serve basis and there is no requirement of prior use but in US trademark rights are arise through the use of the marks.

4. **Geographical Indication –** These are denominations that indentify a good as originating in a region or locality, where reputation or quality of the good is attributed to its geographical origin.

5. **Trade Secrets –** It is broadly defined are information such as formula, program, method, technique that has economic value and with regard to which efforts aremade to keep them confidential. In most countries trade secrets are not subject to registration but are protected through laws against unfair competitions.

6. **Industrial Design –** It protect works of applied art that have industrial application such as design of chair. The Hague Agreement authorized nationals of member countries to make a single design application.

7. **Layout Designs –** It refers to integrated circuits, the stencils used to encode an electric circuit. They are usually protected under copyright or special law.

2.3 METAVERSE :

A Metaverse as an answer might shape this digital future, in which economic and political barriers of the current Internet could be overcome. To begin with, Metaverse is a collective term for digital three-dimensional worlds, wherein companies have made large investments in their own Metaverse projects in the recent past. According to certain investors, the Metaverse could become the next generation of the Internet and thus establish Web 3.0 or at least become a part of it. Moreover, another target vision of the Metaverse is a kind of walkable version of the Internet, which might also open up entirely new business areas. As one of the largest corporations worldwide, Facebook, announced in 2021 to usher the next digital revolution through their Metaverse and subsequently renamed their company to Meta. With this event, the term Metaverse experienced a renewed momentum that went strongly beyond the circles of the scientific community. It can be observed that the search queries on google.com of the term Metaverse skyrocketed after this event and have not dropped to the former level since. It is presumable that the term Metaverse has been established among a broad audience inside and outside the scientific community, thus creating a certain level of awareness about the Metaverse. Furthermore, Ghose et al. projected that by 2030, the Metaverse economy could grow to a market size of between USD 8 trillion and USD 13 trillion if an open and accessible implementation succeeds.[6] While the Metaverse as such is still evolving, it is used as a buzz phrase to attract users, companies, and investors This immersive platform not only enhances consumer interactions but also reshapes work, socialization, and experiential dynamics beyond physical constraints. By exploring virtual service dynamics, product interactions, and engaging immersive experiences, the metaverse reveals vast potential for redefining consumer behavior and value creation. It signifies a network of interconnected virtual worlds, continuously evolving as a crucial element in digital interaction and engagement.[7]

According to my analysis by connecting Intellectual Property Rights with Metaverse, it clearly shows that Metaverse operates as a digital ecosystem of creativity and commerce whereas Intellectual Property Rights function as the foundational legal framework ensuring safeguard and legitimacy of virtual assets.

CHAPTER-3: LEGAL CHALLENGES OF INTELLECTUAL PROPERTY RIGHTS IN METAVERSE

The emergence of a shared, immersive virtual environment—driven by the convergence of augmented reality (AR), virtual reality (VR), blockchain, and the internet—has transitioned from speculative fiction to tangible reality. This evolving metaverse ecosystem fundamentally

[6] G. D. Ritterbusch and M. R. Teichmann, "Defining the Metaverse: A Systematic Literature Review," in *IEEE Access*, vol. 11, pp. 12368-12377, 2023, doi: 10.1109/ACCESS.2023.3241809.
[7] Risitano, M., La Ragione, G., Palazzo, M., Parola, F. (2025). Exploring the Relevance of the Metaverse for Consumers: A Systematic Literature Review. In: Schiavone, F., Omrani, N., Gabteni, H. (eds) Advanced Perspectives and Trends in Digital Transformation of Firms, Networks, and Society. DTS 2024. Springer Proceedings in Business and Economics. Springer, Cham. https://doi.org/10.1007/978-3-031-80692-6_38

challenges the boundaries between physical and digital existence. Major technology companies, including Meta, Microsoft, and Roblox, are investing significant resources to develop these platforms, positioning them as new frontiers for technological innovation, economic expansion, and social change. Yet, this rapid transformation presents substantial legal complexities, especially concerning intellectual property (IP) law. Traditional frameworks for safeguarding creativity and innovation struggle to address the realities of a decentralized, borderless digital environment. Questions around authorship, ownership, and the enforcement of trademarks and copyrights have already surfaced, casting doubt on the sufficiency of current legal systems.

In the metaverse, users actively create content, from virtual art to entire environments. This raises critical copyright questions:

Who owns the copyright for user-generated content?

Within the metaverse, users frequently generate original content, ranging from digital artworks to intricate virtual worlds. This proliferation of user-generated content (UGC) raises fundamental copyright issues. For instance, the determination of copyright ownership in such works becomes highly contested. Conventionally, the creator of a work is presumed to hold copyright. However, platforms like Roblox, through their terms of service, secure expansive licenses over user creations, granting themselves broad rights to use, reproduce, and distribute this content. While this flexibility benefits the platform, it raises concerns about potential erosion of individual creators' ownership rights.

Enforcement of IP Rights in a Borderless Digital Space

Enforcement of IP rights in such a decentralized domain poses additional challenges. The absence of traditional jurisdictional boundaries complicates the pursuit of legal remedies against unauthorized reproductions, counterfeit digital products, and other IP violations. The anonymity inherent in blockchain-based platforms further impedes the identification of infringers, who often operate under pseudonyms or across multiple platforms. Consequently, IP owners struggle to identify violations or initiate legal proceedings. Moreover, fragmented legal frameworks exacerbate these enforcement difficulties. IP laws vary significantly across countries, and the lack of harmonization impedes effective action in the metaverse. For example, while some jurisdictions recognize digital trademarks and copyrights for virtual goods, others have yet to update their statutes to address these novel concerns.

The Role of Blockchain and NFTs in IP Enforcement

Blockchain technology and non-fungible tokens (NFTs) offer potential tools for IP enforcement. By embedding metadata that records the creator, date of creation, and other relevant details, NFTs can establish a clear chain of ownership, distinguishing authentic digital assets from counterfeit ones. Smart contracts—self-executing agreements on the blockchain—can automate licensing and royalty payments, reinforcing creators' rights. Nevertheless, these technological solutions are not without limitations, including regulatory uncertainty, scalability challenges, and inconsistent adoption across platforms. The metaverse thus presents both significant opportunities and risks. While it fosters unprecedented creative expression and the development of innovative digital goods, it simultaneously creates conditions conducive to IP infringement, counterfeit products, and protracted legal disputes. If these issues remain unresolved, they could undermine trust and stifle further innovation in the metaverse. Finally, accessibility remains a notable barrier. The cost and complexity of requisite hardware, coupled with physical side effects such as eye fatigue and nausea, restrict widespread participation. Dependence on high-speed internet further limits access, particularly in less connected regions. Even in technologically advanced locales, engagement is often confined to those with advanced digital literacy.[8]

Equal access

In summary, while the metaverse holds great promise, it also necessitates a critical reexamination of intellectual property law and policy to ensure a fair, accessible, and innovative digital future.[9]

CHAPTER-4: REGULATORY APPROACHES AND CASE LAW ACROSS JURISDICTIONS

The emergence of the metaverse as a central space for social interaction, commerce, and creative expression is presenting unique challenges for intellectual property law. As virtual assets and services proliferate, companies are increasingly proactive in protecting

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[8] https://hedera.com/learning/metaverse/metaverse-challenges

[9] Blockchain Council. (2024). The Role of Blockchain in IP Enforcement. Retrieved from https://www.blockchain-council.org

their brands and IP rights within these digital environments. While legal frameworks and precedents specific to the metaverse remain under development, ongoing cases and regulatory initiatives are gradually shaping the contours of IP protection in this context.

4.1 INDIA

The application of Indian law to virtual offenses involving cross-border participants is far from straightforward. Indian users regularly interact with a global user base on metaverse platforms, making legal conflicts that invoke multiple jurisdictions inevitable. Traditional jurisdictional principles, rooted in physical presence or the location of the cause of action as outlined in the Code of Civil Procedure, 1908, become increasingly complex in virtual settings. **Section 75 of the Information Technology Act, 2000**, somewhat expands India's jurisdiction to certain offenses committed outside the country if they are connected to Indian computer systems. A relevant precedent is found in **Banyan Tree Holdings (P) Ltd. v. A. Murali Krishna Reddy (2010), where the Delhi High Court** recognized that jurisdiction in online IP disputes could extend to cases where Indian users are specifically targeted. This provides some guidance for addressing disputes arising within metaverse platforms. Furthermore, the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, impose concrete obligations on intermediaries—including those operating metaverse platforms—to expeditiously remove unlawful content and appoint designated grievance officers**. The Supreme Court's decision in Shreya Singhal v. Union of India (2015)** remains foundational, articulating a balance between safeguarding freedom of speech and assigning responsibility to digital platforms, particularly **under Section 79 of the IT Act**. Collectively, these legal developments illustrate the evolving nature of India's approach to regulating virtual environments and protecting intellectual property within them.

4.2 UNITED STATES

Hermes v Rothschild - The Jury awarded Hermès damages for Trademark infringement, dilution and cybersquatting, 133000$. They further stated that MetaBirkins was not liable to protection under the First Amendment.

It means that the First Amendment does not provide a free pass to the upcoming entrepreneurs to deceptively copy the designs or infringe the trademarks of renowned brands. The NFT virtual market is not a lawless society but it too, is bound by the laws of Intellectual Property.

This is a quintessential landmark case which shows us how law is a very dynamic field which is flexible when new advances take place. The ambit of Trademark extended itself to the virtual accounting systems and virtual designs in the form of NFTs. The verdict of this case ultimately boiled down to the test named “Rogers Test” which had taken place in a precedent in 1989. The test stipulates that Trademark protection will be given when there is no artistic relevance to the underlying work. The case of Hermès v Rothschild has brought about a precedent as to the control of Trademark Laws and their applicability in the virtual world as well. It stipulates that no one, especially entrepreneurs are free from the reigns of the Law and would not be given a carte blanche in using any similar trademarks of well-known enterprises.[10]

4.3 CHINA

Xuan Company vs Qiao Company - The court found that, without authorization from Xuan Company, Qiao Company and other defendants not only used the trademark “G.PATTON” on physical goods such as automobiles but also authorized third parties to incorporate the infringing trademark into virtual goods within online games through brand collaboration agreements. This cross-context trademark imitation misled the public regarding the origin of the goods, seriously infringing Xuan’s trademark rights. The court also determined that the defendants’ false advertising constituted unfair competition. This ruling breaks with the traditional boundaries of "class of goods" in conventional trademark infringement determination, and firstly recognizes that virtual vehicle assets in online games and real-world automobiles may be considered as similar goods. Finally, the court ordered the defendants to immediately cease all infringing and unfair competition activities and fully supported Xuan’s claim for RMB 1 million in damages, strongly upholding the intellectual property rights of the trademark owner. A key breakthrough in the case is the court’s clarification of the boundaries for trademark infringement involving digital virtual goods and real-world goods:

Unauthorized use of a real-world brand in online games constitutes trademark infringement if it causes public confusion. Concerning the criteria and factors for determining likelihood of confusion, the court elaborated in its ruling that although the “G. PATTON” virtual automobiles authorized by Qiao differed from real-world automobiles in function, sales channels, and target consumers on the surface, critical connections between the two were

[10] Eesha Parande, https://ijalr.in/volume-3-issue-3-2023/a-critical-analysis-of-hermes-v-rothschild-vis-a-vis-trademark-infringement-dilution-and-cybersquatting-eesha-parande/

undeniable: functionally, as a game vehicle, the virtual automobiles not only serve a transportation function similar to real-word automobiles but also highly simulates the appearance and interior design of real-word automobiles, creating a strong visual correlation; from a consumer perspective, players using the virtual vehicle may become interested in—and potentially purchase—the corresponding real-world automobile, indicating a significant overlap in consumer groups; in terms of public perception, through gameplay and promotional content, the relevant public would naturally identify "G. PATTON" as an automobile brand and assume the brand had authorized the game collaboration, leading to confusion regarding the source of the goods.

Throughout the proceedings, the NTD team provided expert legal support to Xuan. During the second-instance court debates and in written submissions, the team systematically demonstrated the connection logic between virtual and real-world goods, persuading the appellate court to reverse the first-instance finding that "virtual goods do not constitute infringement". This critical reversal secured robust protection for Xuan's trademark rights.[11]

4.4 EUROPE

Glashütte/Sa. vs. EUIPO - The dispute involving Glashütte/Sa. and the EUIPO centered on an attempt to register "Glashütte ORIGINAL" as an EU trade mark for downloadable virtual goods—specifically, digital watches, clocks, and related accessories—as well as for online retail and associated services. The key legal question was whether the mark possessed sufficient distinctiveness given Glashütte's established reputation in traditional watchmaking. The General Court observed that Glashütte is synonymous with high-quality watchmaking in Germany. The Court held that, in the eyes of consumers, the distinction between physical and virtual watches is largely irrelevant; the reputation of Glashütte transfers across both mediums. As such, using "Glashütte ORIGINAL" for virtual watches was seen as a straightforward extension of the town's reputation, rather than as an indicator of unique origin. The mark was thus regarded more as a promotional statement regarding quality and authenticity than as a distinct source identifier. This decision highlights the increasing convergence between digital and physical brand perception.

This case exemplifies the tensions that arise between digital innovation and established

[11] http://www.chinantd.com/news-page.asp?id=10111

intellectual property rights frameworks. Both brands and creators are seeking to secure ownership in virtual environments where creative possibilities and duplication are essentially limitless. Nike, for instance, has proactively acquired virtual assets to protect its brand presence in the metaverse, aiming to preserve both exclusivity and consumer loyalty—demonstrating that authenticity remains important in both digital and physical contexts. Courts have so far applied established intellectual property principles to these new digital contexts. Nevertheless, the unprecedented nature of such cases suggests that legal systems may need to adapt in order to address the distinctive issues associated with digital ownership, modification, and resale. As more companies become involved in legal disputes over intellectual property in the metaverse, the resulting cases are likely to set significant legal precedents and influence future policy development. The ongoing evolution of the metaverse will necessitate rapid adaptation of the legal framework, driven both by private litigation and by regulatory efforts to achieve a fair balance between innovation and the protection of creators' rights. Ultimately, as commercial activity and consumer investment in digital assets increase, the effective protection of intellectual property in virtual environments will be essential to ensure a secure and innovative digital ecosystem. This, in turn, will provide creators and consumers with confidence that their intellectual property rights will not be undermined in the metaverse.

CHAPTER-5: FUTURE DIRECTIONS AND CONCLUSION

FUTURE DIRECTIONS:

- The landscape of intellectual property protection in the metaverse is rapidly evolving and demands serious scholarly attention. As digital environments continue to expand, safeguarding original creations grows increasingly complex and vital.

- While traditional intellectual property frameworks remain applicable to emerging technologies such as NFTs

- The challenges of enforcement, particularly regarding trademark licensing and franchising, are becoming more pronounced.

- Patents retain their significance in securing innovations, especially in novel hardware and software solutions that drive the metaverse forward.

- Ultimately, a robust, multi-pronged strategy that integrates patents, trademarks, copyrights, and trade secrets is indispensable for comprehensive intellectual property protection in these new digital frontiers.

CHAPTER 6 - CONCLUSION:

According to my opinion, the metaverse is a paradigm shift of the three coming together with creativity, innovation and commerce in a digital setting. Although the traditional Intellectual Property Rights systems still exist, the implementation of their enforcement in an online context presents distinct issues of jurisdiction, anonymity, liability of a platform, as well as cross-border operations. Although Indian jurisprudence is still in its early phases, it has already started to tackle the issues concerning it by using cases related to online platforms, e-commerce, and NFTs to establish the basis of metaverse-specific legal conflicts. Hermes v. is one of the landmark cases around the world. Rothschild (MetaBirkins) show how the courts are applying the traditional principles of IP to new digital realms, which will be useful in future lawsuit cases.

In the future, a mixture of the law, technological solutions, and international collaboration will be necessary to successfully protect IPR in the metaverse. National regulators should modify the already existing laws to be applicable to virtual goods and services and international organizations such as WIPO should do this by attempting laws to have harmony so as to limit jurisdictional overlaps. Metaverse ecosystems hosted by platforms will also be important in the process of implementing rights and enforcing rights via proactive monitoring and takedown tools.

After all, IPR protection in the metaverse is not only a matter of law but perpetuating trust, innovation and value in nascent digital economies. The way this virtual frontier will evolve is how much balance is there between protecting creators and granting freedoms to the users.